# APPENDIX E

## Bay-Goose Dike Grouting:
## E1: Grouting
## E2: Jet Grouting

# APPENDIX E1

## Grouting

# E1-1 Drilling Methodology Trials

- Description and Results
- Geophysical Surveying Records
- Permeability Testing Reports

## Description and Results

# DRILLING METHODOLOGY TRIALS

The following describes a series of trials that were conducted in the North Portion of the Bay-Goose Dike to determine optimal drilling strategies through portions of the cut-off wall constructed with cement-soil-bentonite (CSB) materials. Down-the-hole hammer (DTH), top hammer, and tricone drilling methods were each attempted and assessed for their damaging effects through optical televiewing and permeability testing within holes drilled through the CSB materials.

Tricone pre-drilling with water flush of the "to-be-cased" grout hole was ultimately chosen as the optimal, least damaging method. Based on the success of the selected method, further strategies were developed for drilling in the transition zones of the dike where CSB materials overlie soil-bentonite (SB) and similarly, where SB materials overlie CSB. Details of the trials as well as the ultimate drilling strategies developed are summarized in Tables 1 and 2. Acoustic televiewer (ATV) and permeability testing results are contained within Appendices E1-2-1 and E1-2-2, respectively.

By inspection of the ATV logs, it can be seen that the CSB materials were, in general, very homogeneous, with little to no signs of fracturing caused by any of the trialed drilling methods. A potential fracture of the CSB materials within trial hole T-30+381.5 was observed between 5.3 and 5.5 m depth. Being very close to the base of the installed collar casing, and most likely to be subjected to low hydraulic head, the observed fracture was deemed to be inconsequential.

Rising head tests carried out in top hammer drilled trial hole T-30+405.5 and triconed hole P-30+380 yielded test results of $4.9 \times 10^{-7}$ m/s and $5.2 \times 10^{-10}$ m/s, respectively. The homogeneity of the CSB materials, more confidence that pre-drilling with the tricone would provide a straighter "pilot" hole through the CSB materials, and the slightly less permeable result, led to the selection of the tricone drilling method as the preferred method of advancing a hole through the CSB materials.

**Table 1: Trial Details**

| Trial | Date | Drilling Method | Hole | Televiewer (Y/N) | Approx. CSB Permeability (m/s) | Comments |
|---|---|---|---|---|---|---|
| 1 | April 26, 2010 | 4.5" Tricone water flush | T-30+396.5 | N | -- | ■ Hole drilled to 10.4 m<br>■ Unstable conditions noted near-surface due to loose rockfill cap<br>■ Rod / drill bit dropped down hole<br>■ Hole subsequently backfilled with grout |
| 2 | April 27, 2010 | Top Hammer air/water flush | T-30+405.5 | Y | $4.9 \times 10^{-7}$ | ■ 4.5" steel casing installed to approximate water table level 3 m below ground surface to reduce collapse and maintain hole stability<br>■ Hole drilled with top hammer to 10 m, approx. 2 m above anticipated bedrock<br>■ CSB noted in material returning to surface |

| Trial | Date | Drilling Method | Hole | Televiewer (Y/N) | Approx. CSB Permeability (m/s) | Comments |
|---|---|---|---|---|---|---|
| | | | | | | ■ Potential hole deviation suspected due to ¾" material noted in cuttings upon airlifting at the bottom of the hole<br>■ Single rising head test carried out at 10 m depth; noted approximately 50% recovery after 1 hour and 20 minutes |
| 3 | April 27, 2010 | Top Hammer air/water flush | T-30+399.5 | Y | -- | ■ 4.5" steel casing installed to 3.4 m<br>■ Top hammer drilling repeated to same depth as trial # 2<br>■ Noted similar cutting returns to those from trial # 2<br>■ Based on hole stability requirements at surface, a series of steel casing installations began in sequence through the frozen cap materials to the approximate water table level |
| 4 | April 29 and 7-May, 2010 | 4.5" Tricone water flush | P-30+380 | Y | 5.2 x $10^{-10}$ | <u>April 29, 2010</u><br>■ 6" plastic LDPE pipe installed to 3.4 m as potential new means to stabilize loose rockfill materials at surface<br>■ Hole drilled with tricone to 11.7 m; cuttings similar to those seen during previous trials noted again<br>■ A collapse of approx. 2 m noted at the bottom of the hole<br>■ Televiewer and rising head testing carried out<br><u>May 7, 2010</u><br>■ Tested installation of 4.5" diameter casing through triconed hole; progressed smoothly<br>■ ODEX hammer did not need to be actuated along entire length of the installation and in some instances the casing could be pushed into the open hole<br>■ Decision made from this point to install in CSB-only areas by installed LDPE pipe and using 4.5" tricone followed by gentle ODEX installation of steel casing |

| Trial | Date | Drilling Method | Hole | Televiewer (Y/N) | Approx. CSB Permeability (m/s) | Comments |
|---|---|---|---|---|---|---|
| 5 | May 5-7, 2010 | 3.5" Tricone Water Flush | T-30+381.5 | Y | -- | May 5, 2010<br>■ Triconed through CSB to bedrock/cutoff wall interface. Encountered rock at 14.0 m<br>■ Drilled 10 m into rock with Tamrock Top Hammer; materials / cuttings settled into the bottom of the hole at 13.3 m depth<br>■ Televiewer survey carried out<br>May 6, 2010<br>■ Air-lifted / flushed materials from and re-measured depth to materials / cuttings settling back into the bottom of the hole: 13.9 m depth in comparison to previous day's 13.3 m depth<br>■ Did not re-televiewer<br>May 7, 2010<br>■ Test installed a 4.5" casing into the 3.5" triconed hole; results proved marginally better than those from installation in P-30+410<br>■ ODEX hammer still had to be actuated over entire length, however casing was successfully installed |
| 6 | May 5, 2010 | 3.5" Tricone Water Flush | P-30+410 | Y | -- | May 5, 2010<br>■ Triconed through CSB to bedrock/cutoff wall interface. Encountered rock at 13.4 m<br>■ Attempted to drill 10 m into rock with Tamrock Top Hammer; only achieved 2.5 m as materials in the hole were binding the rods/bit; materials settled into the hole ( at 10.3 m total depth)<br>■ Attempted to install 4.5" casing on into 3.5" triconed hole; casing was binding against triconed hole walls and ODEX hammer had to be triggered during entire installation process |

| Trial | Date | Drilling Method | Hole | Televiewer (Y/N) | Approx. CSB Permeability (m/s) | Comments |
|---|---|---|---|---|---|---|
| | | | | | | May 6, 2010<br>■ Attempted to complete the installation of the 4.5-inch casing into the 3.5-inch hole; again had to activate ODEX hammer over the entire length of installation<br>■ Difficulty experienced during extraction of central drilling rods as casing tended to lift up as well;<br>■ During recovery attempts, the 4.5-inch casing and shoe slid/dropped too far into the hole and material collapsed in around it<br>■ Hole was abandoned and subsequently backfilled |

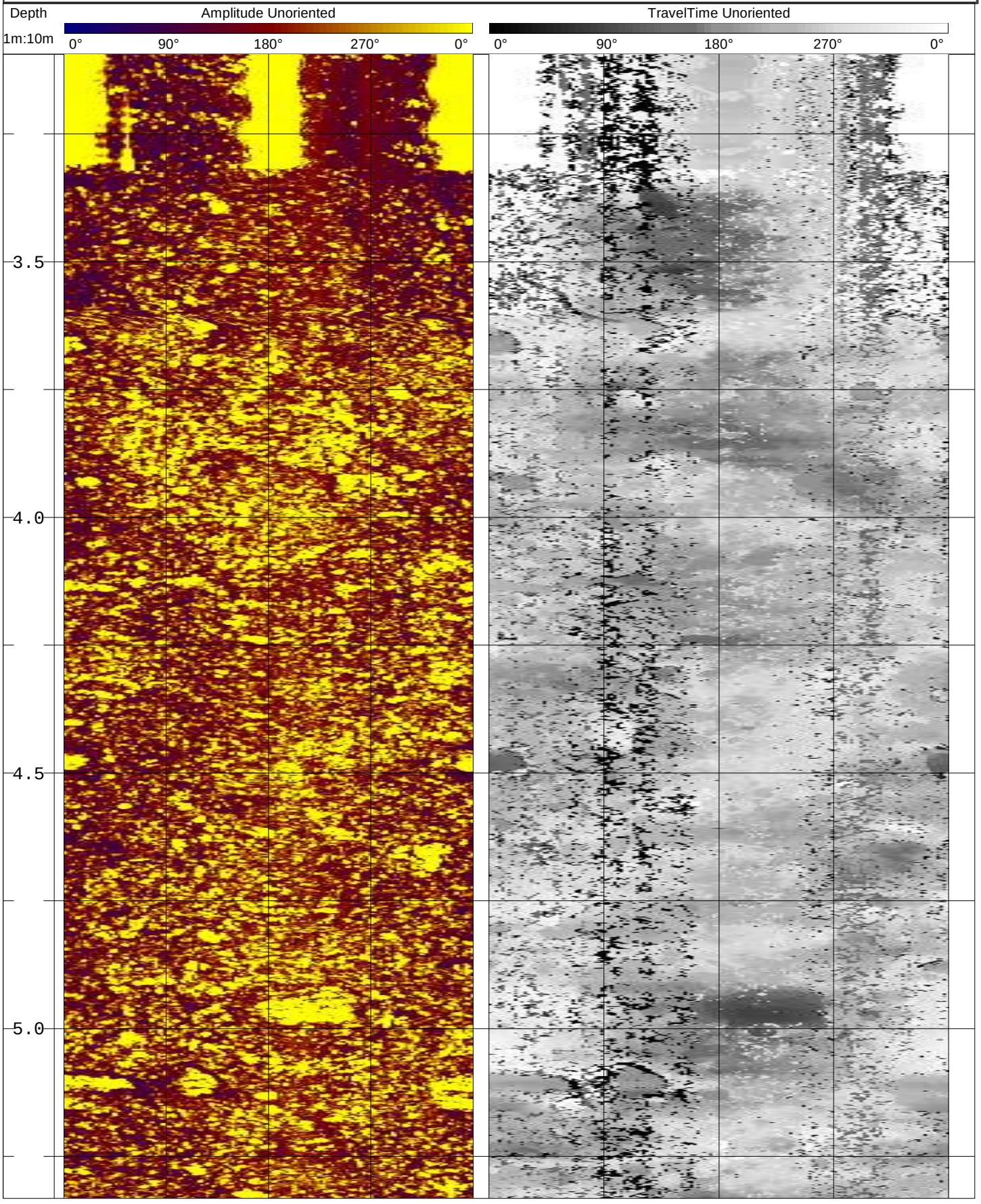
**Table 2: Final Selected Methods For Each Work Area**

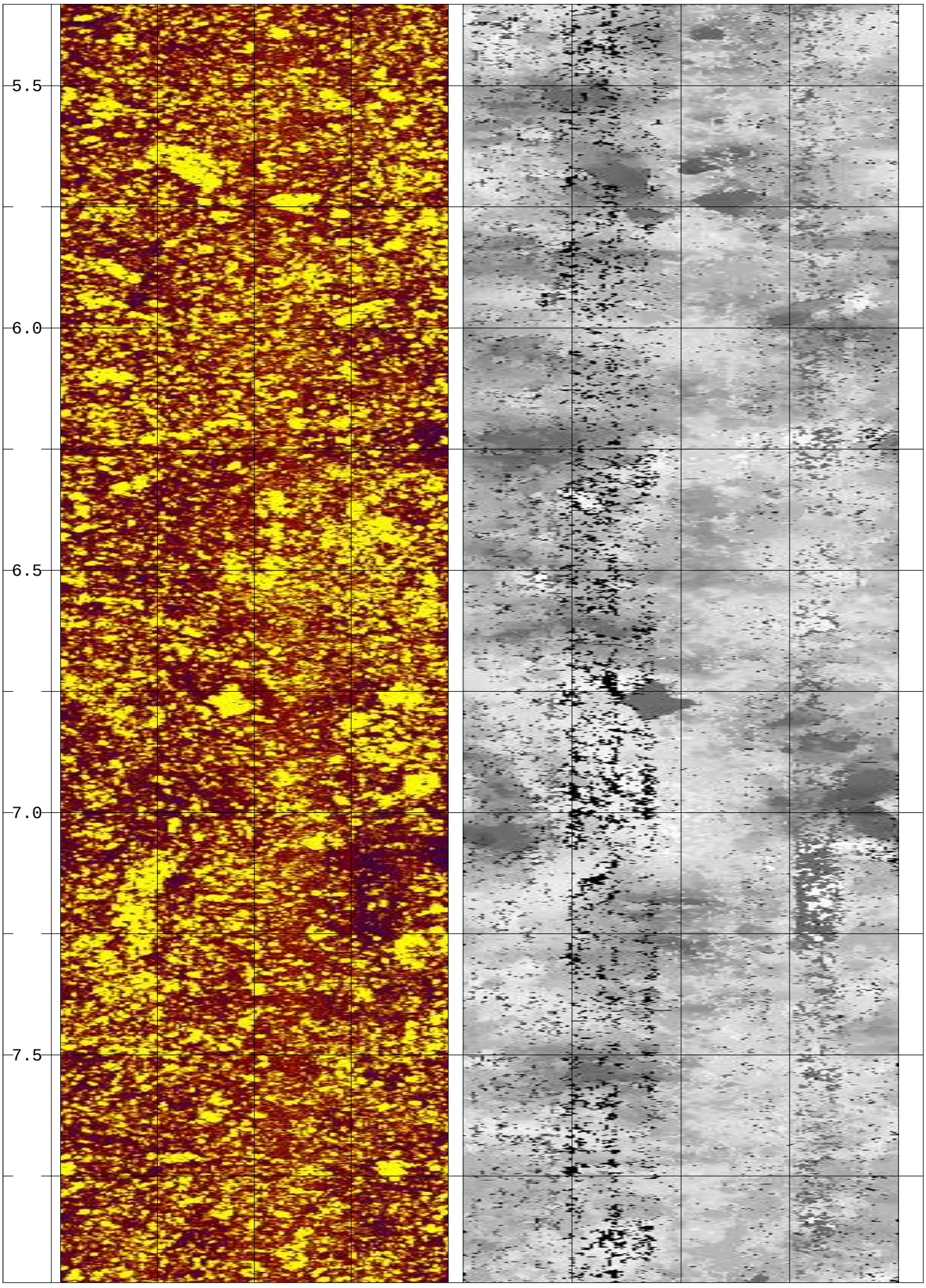
| Zone | Method |
|---|---|
| SB-only | Install 4.5” steel casing with DTH from surface |
| CSB-only | 1. Install 6” LDPE pipe from surface to ~4 m depth<br>2. Run 4.5” tricone to bedrock contact<br>3. Install 4.5” casing through the open hole with light / minimal DTH triggering and embed in rock |
| CSB/SB - Where CSB does not extend beyond 4 m from surface | 1. Install 6” LDPE pipe from surface to ~4 m depth<br>2. Install 4.5” casing with full DTH advance through underlying SB materials and embed in rock |
| CSB/SB - Where CSB extends beyond 4 m from surface | 1. Install 6” LDPE pipe from surface to ~4 m depth<br>2. Run 4.5” tricone to the top of the interface with SB material<br>3. Install 4.5” casing in the open hole with light / minimal DTH triggering<br>4. Continue installation of 4.5” steel casing with full DTH advance through SB materials and embed in rock |
| SB/CSB - Where SB materials are frozen within the upper ~ 4 m and do not extend beyond | 1. Install 6” LDPE pipe from surface to ~4 m depth<br>2. Run 4.5” tricone through CSB materials to bedrock contact<br>3. Install 4.5” steel casing through the open hole with light / minimal DTH triggering and embed in rock |
| SB/CSB – Where SB materials extend beyond 4 m | 1. Install 4.5” steel casing with full DTH advance from surface to top of interface with CSB material<br>2. Run smaller 3.5” tricone within steel casing and through CSB materials to bedrock contact<br>3. Ream 4.5” casing the remaining distance within the 3.5” open hole through CSB materials with reduced DTH triggering and embed in rock |

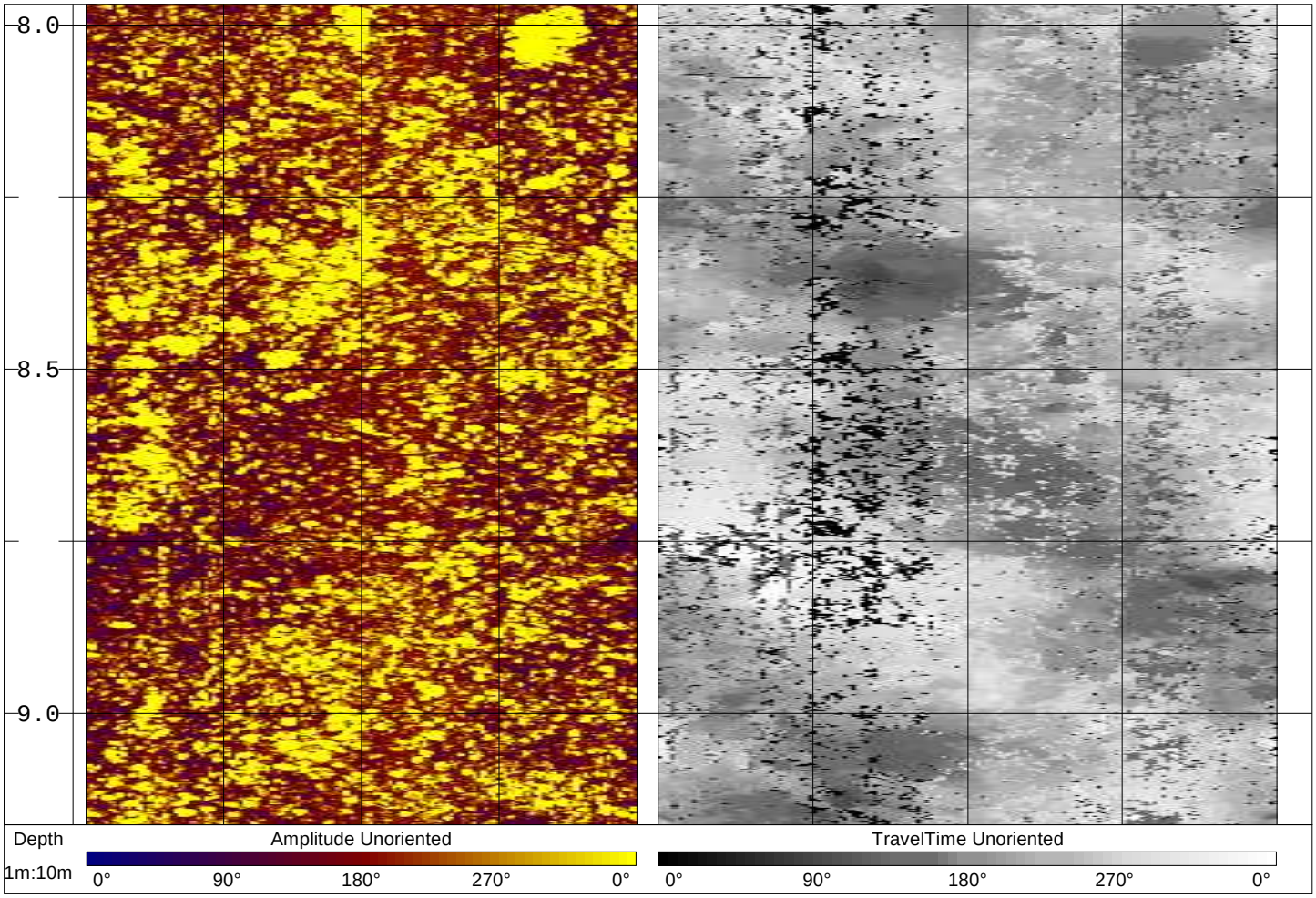
# Geophysical Surveying Records

## GEOPHYSICAL RECORD OF BOREHOLE 30+380

| | | | |
|---|---|---|---|
| **PROJECT REF.** | *09-1428-5007 - 2000* | **LOG REF.** | *Ground Surface* |
| **LOCATION** | *Bay-Goose Dike, Meadowbank* | **STATIC WATER LEVEL** | *In the Casing* |
| **LOG DATE** | *April 29, 2010* | **DRILL METHOD** | *Tricone* |
| **LOGGED BY** | *BB* | **DRILLHOLE DIA.** | *4.5"* |



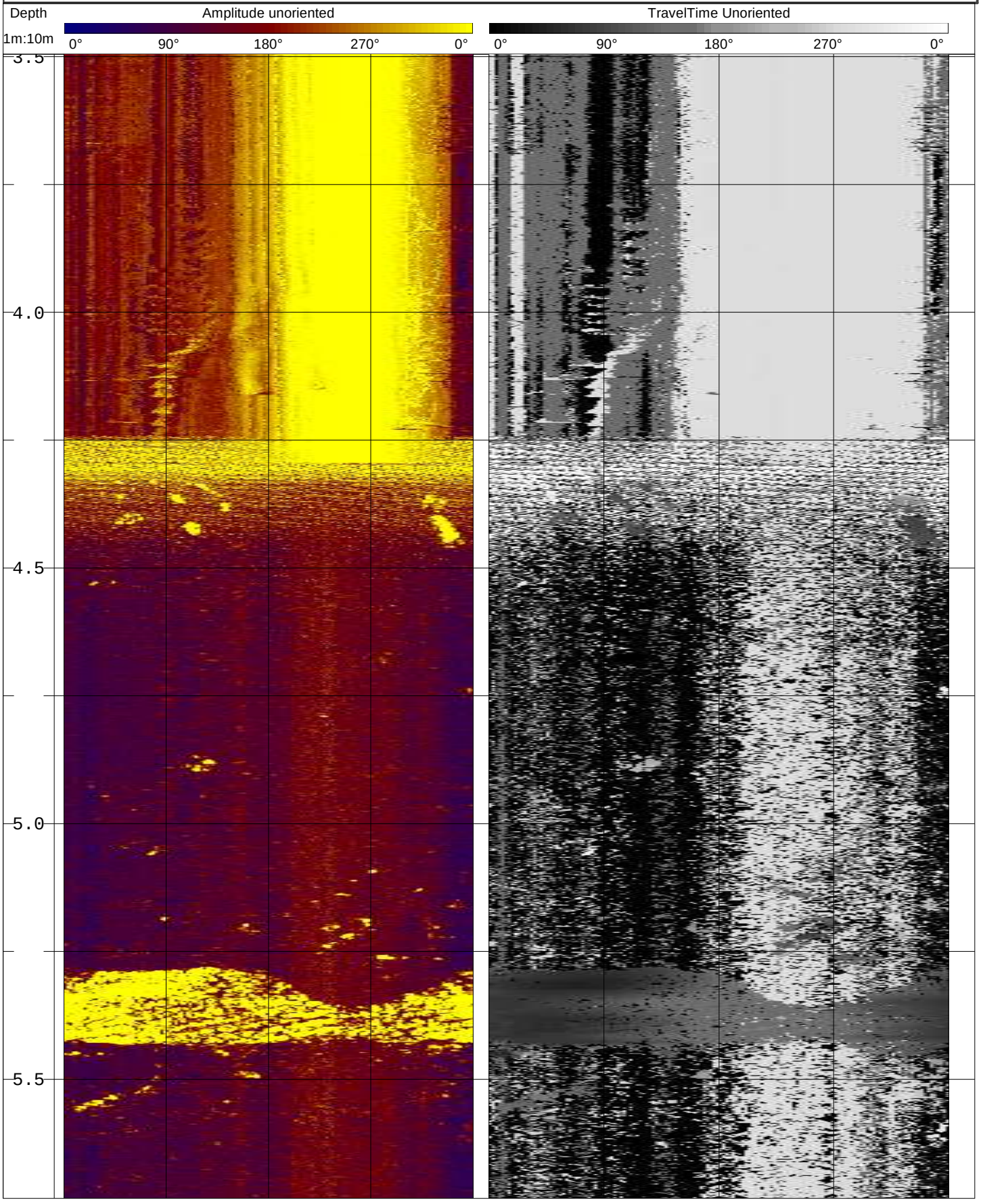

5.5
6.0
6.5
7.0
7.5

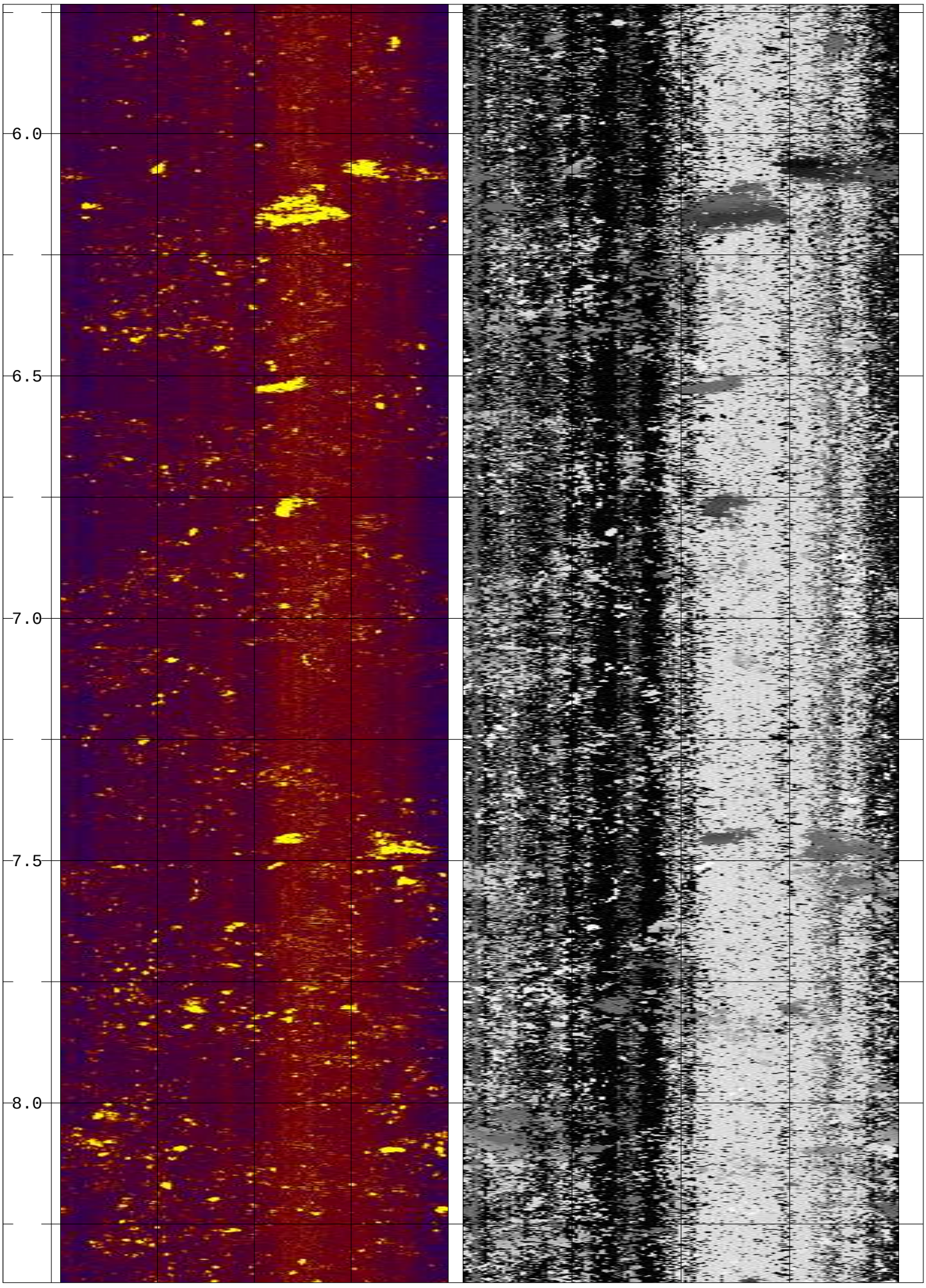

8.0
8.5
9.0
Depth
1m:10m
Amplitude Unoriented
0°
90°
180°
270°
0°
TravelTime Unoriented
0°
90°
180°
270°
0°

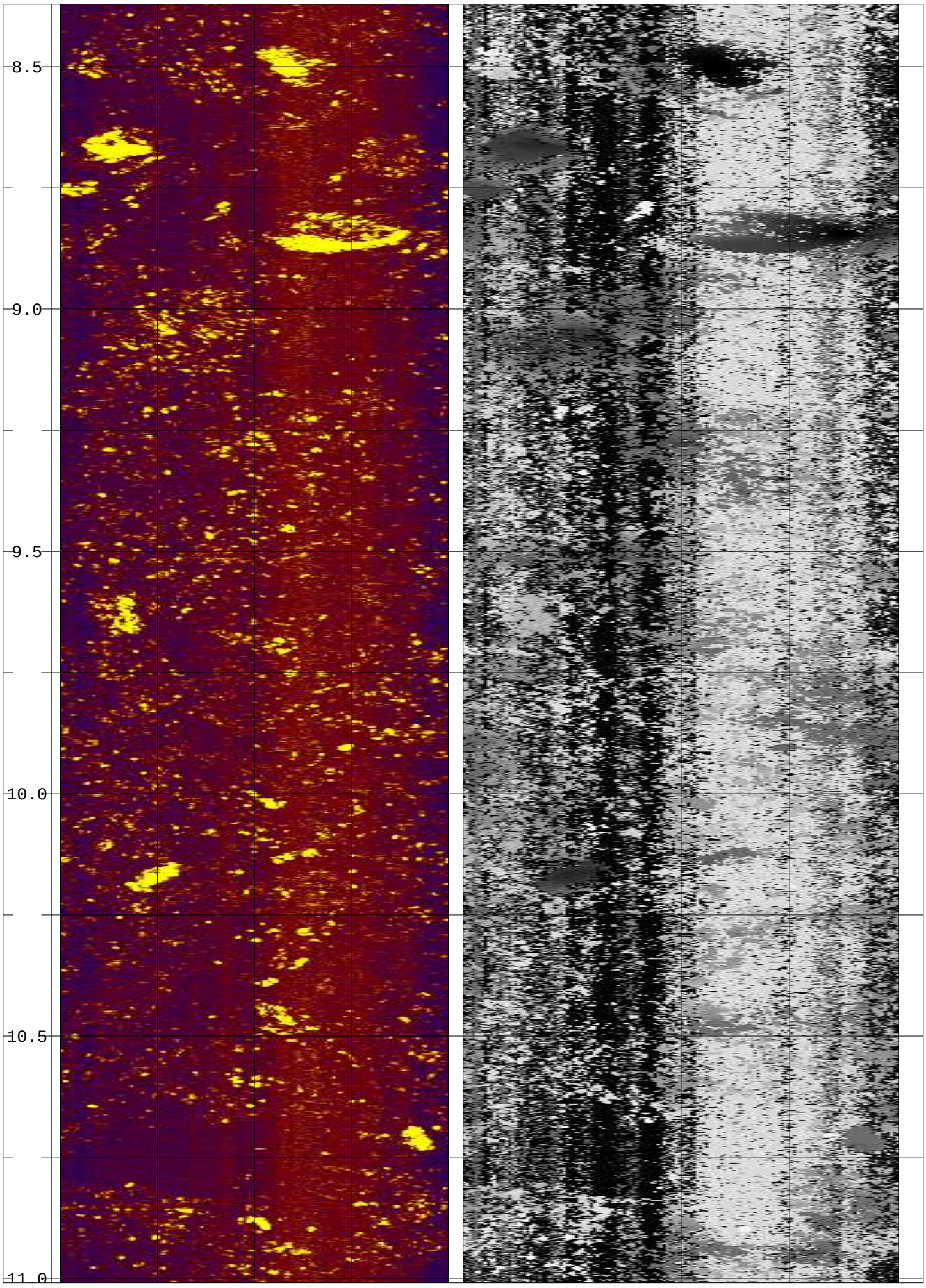
## GEOPHYSICAL RECORD OF BOREHOLE 30+381.5 (1)

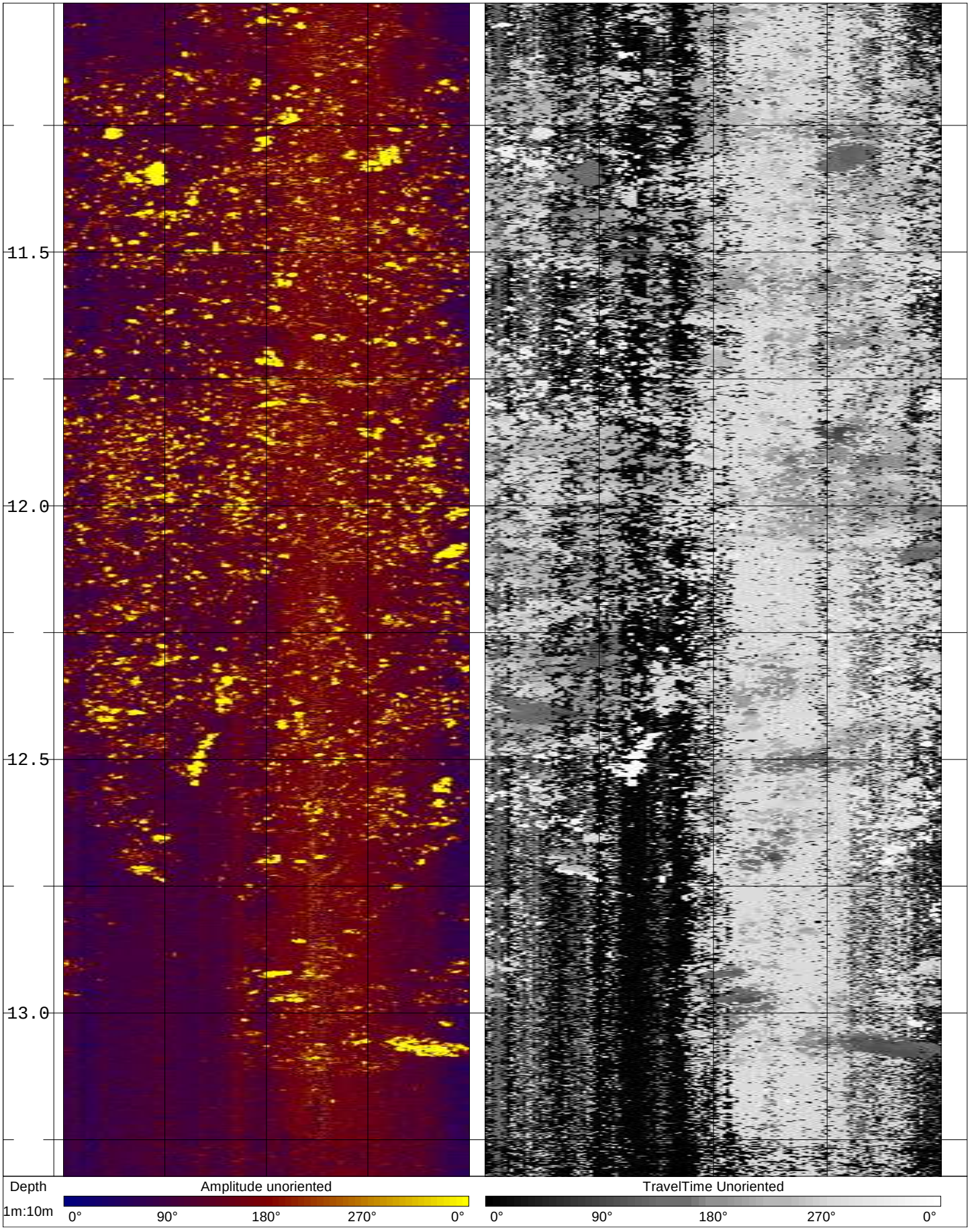
| | | | |
|---|---|---|---|
| **PROJECT REF.** | *09-1428-5007 - 2000* | **LOG REF.** | *Ground Surface* |
| **LOCATION** | *Bay-Goose Dike, Meadowbank* | **STATIC WATER LEVEL** | *In the Casing* |
| **LOG DATE** | *May 5, 2010* | **DRILL METHOD** | *Bottom- & Top-hammer* |
| **LOGGED BY** | *BB* | **DRILLHOLE DIA.** | *3.5"* |

Golder Associates




6.0
6.5
7.0
7.5
8.0

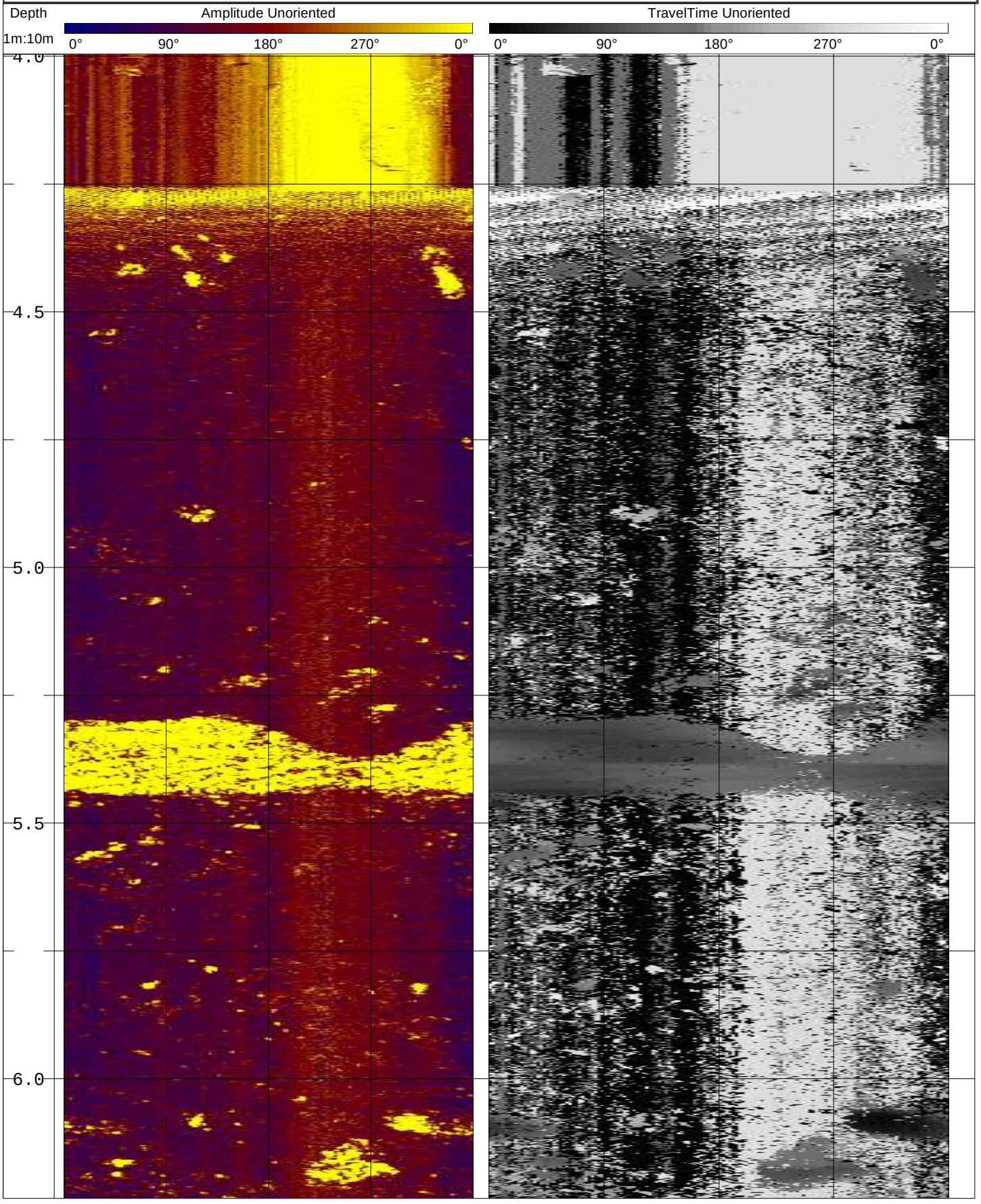

8.5
9.0
9.5
10.0
10.5
11.0

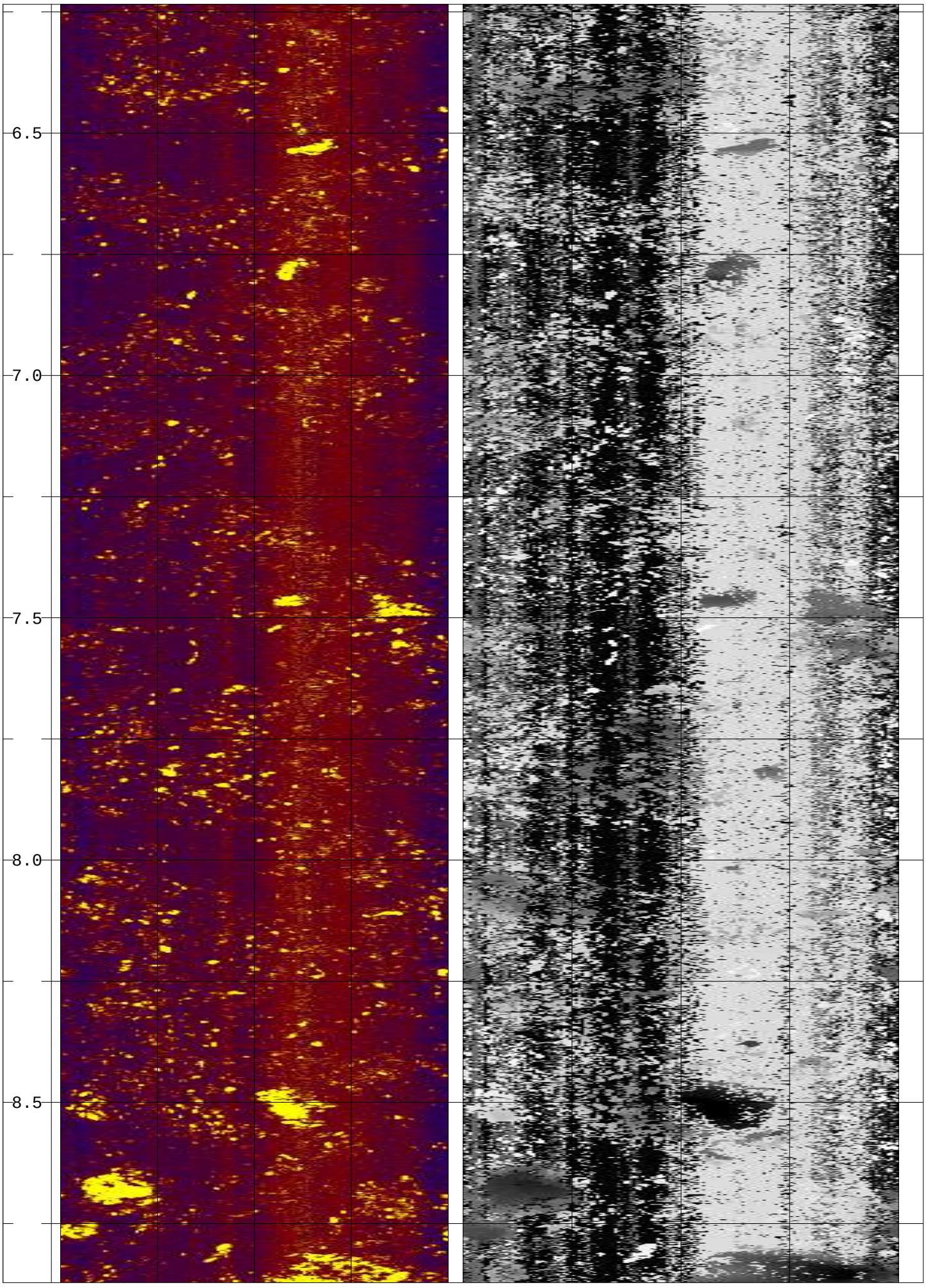

11.5
12.0
12.5
13.0
Depth
1m:10m
Amplitude unoriented
0°
90°
180°
270°
0°
TravelTime Unoriented
0°
90°
180°
270°
0°

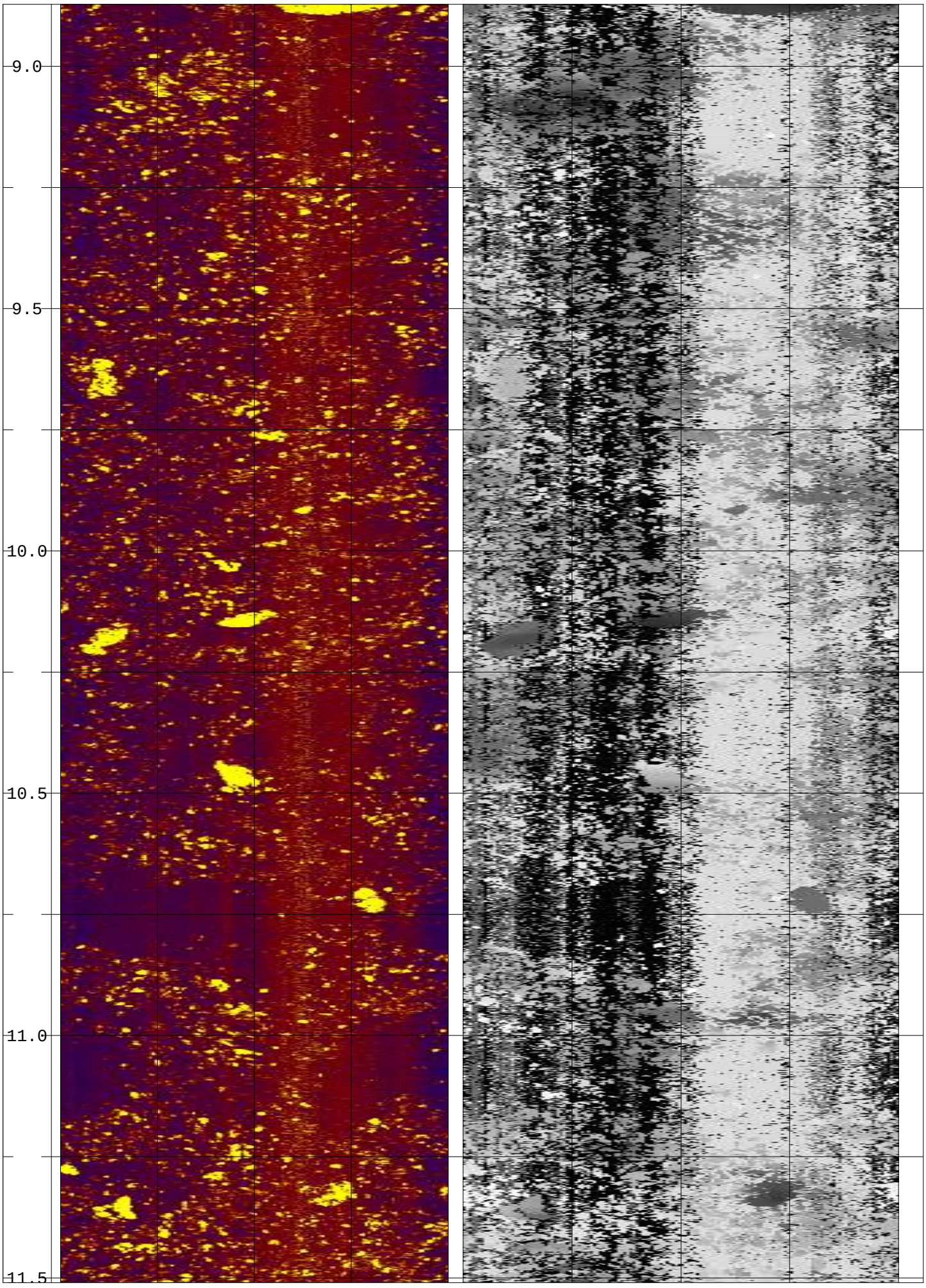
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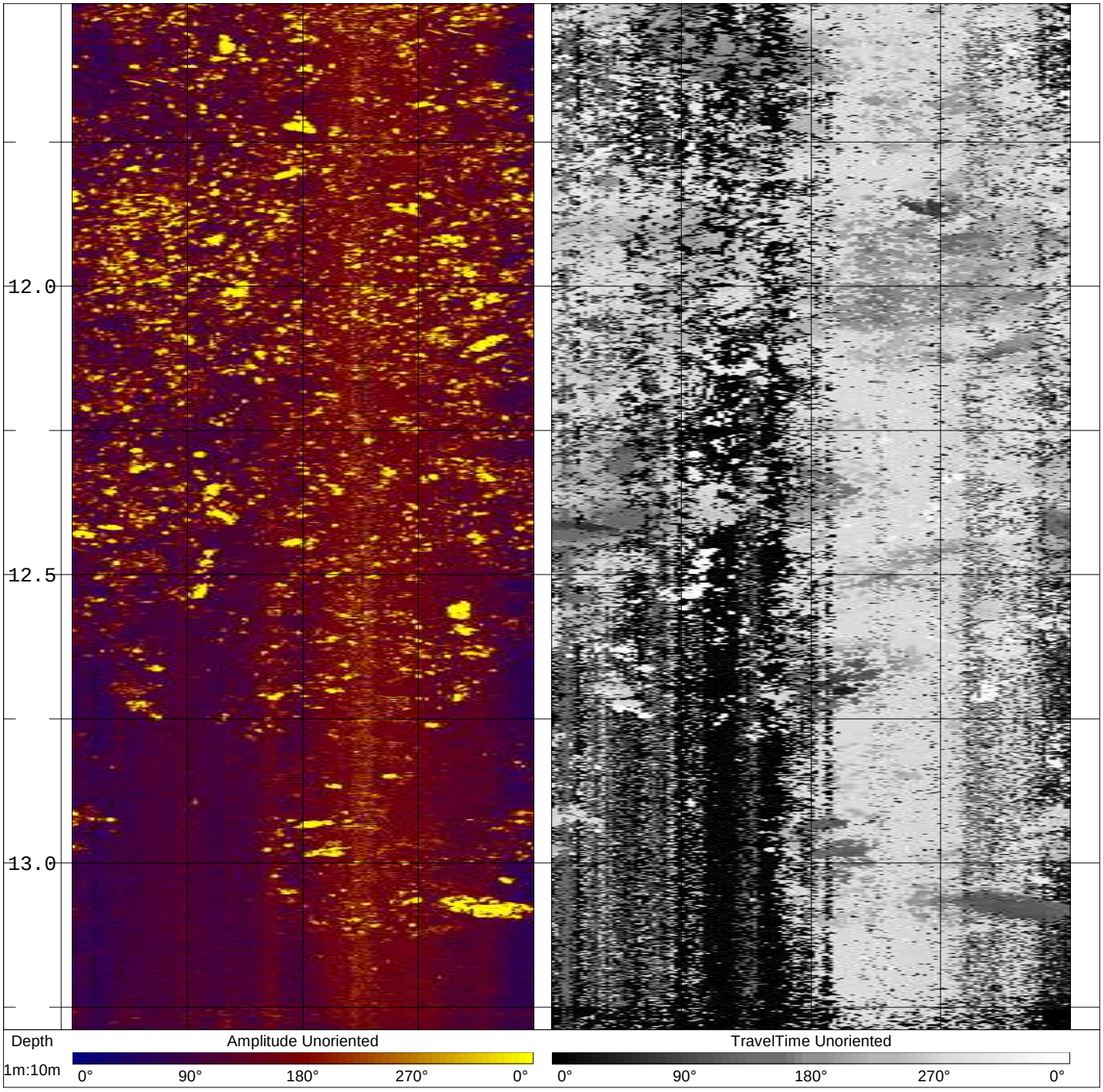
| | | | |
|---|---|---|---|
| **PROJECT REF.** | *09-1428-5007 - 2000* | **LOG REF.** | *Ground Surface* |
| **LOCATION** | *Bay-Goose Dike, Meadowbank* | **STATIC WATER LEVEL** | *In the Casing* |
| **LOG DATE** | *May 5, 2010* | **DRILL METHOD** | *Bottom- & Top-hammer* |
| **LOGGED BY** | *BB* | **DRILLHOLE DIA.** | *3.5"* |

Golder Associates



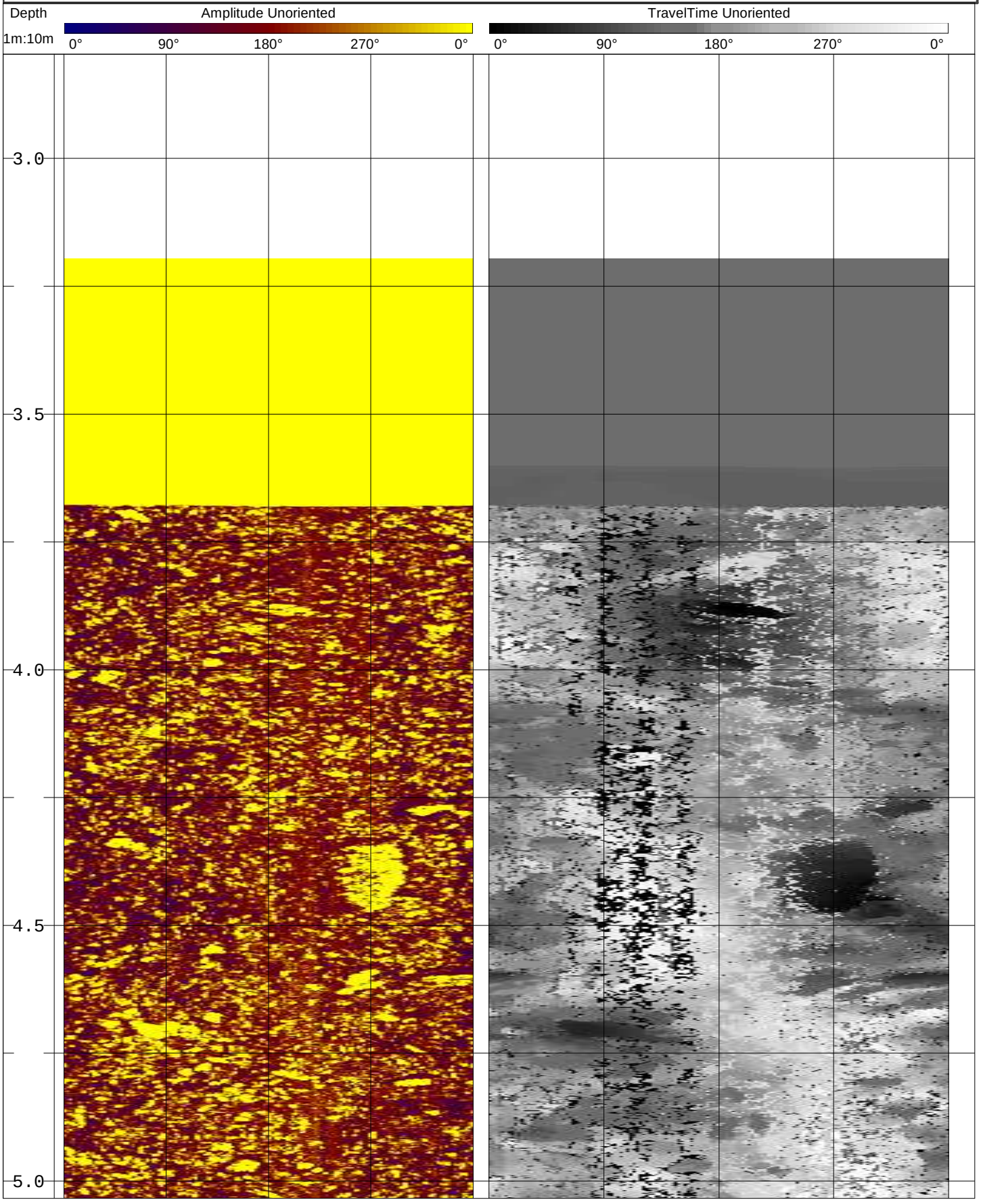

6.5
7.0
7.5
8.0
8.5

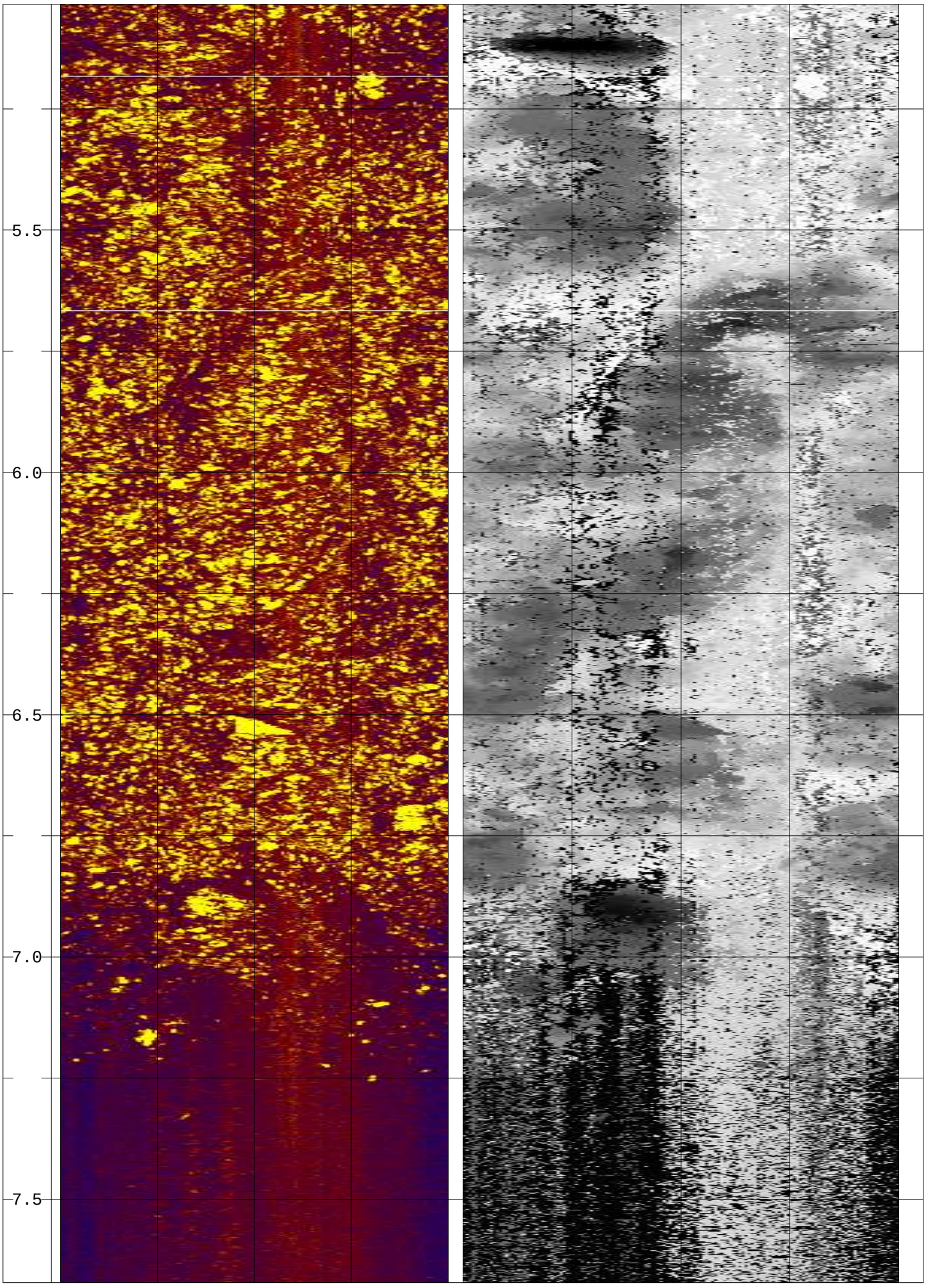

9.0
9.5
10.0
10.5
11.0
11.5

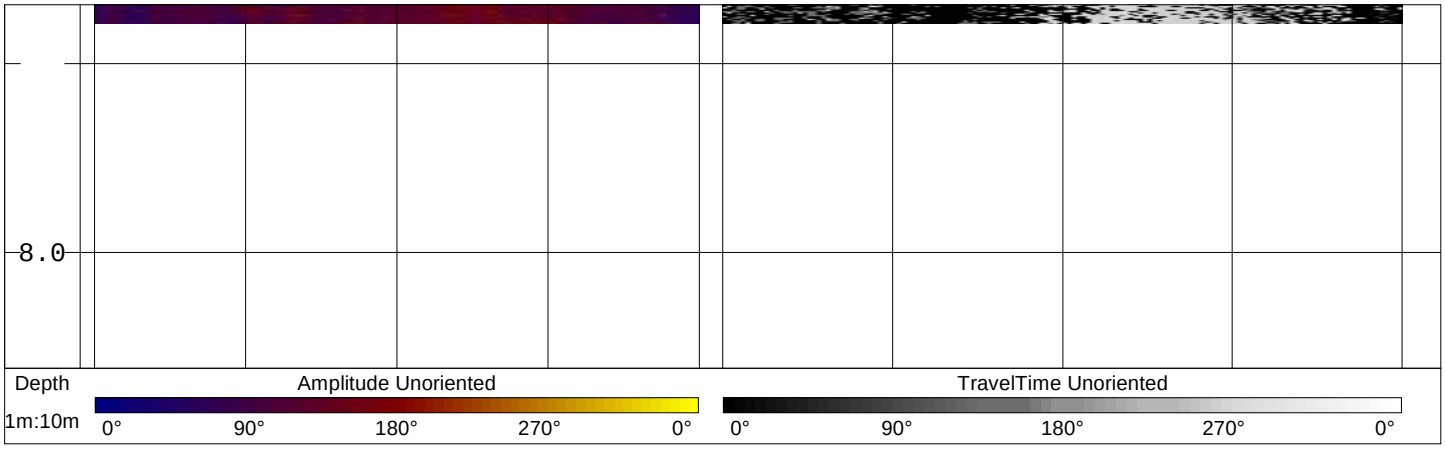

12.0
12.5
13.0
Depth
1m:10m
Amplitude Unoriented
0°
90°
180°
270°
0°
TravelTime Unoriented
0°
90°
180°
270°
0°

## GEOPHYSICAL RECORD OF BOREHOLE T-30+399.5

| | | | |
|---|---|---|---|
| **PROJECT REF.** | *09-1428-5007-2000* | **LOG REF.** | *Ground Surface* |
| **LOCATION** | *Meadowbank - Bay Goose Dyke* | **STATIC WATER LEVEL** | *In the casing* |
| **LOG DATE** | *April 27, 2010* | **DRILL METHOD** | *Top Hammer* |
| **LOGGED BY** | *BB* | **DRILLHOLE DIA.** | *3.5"* |

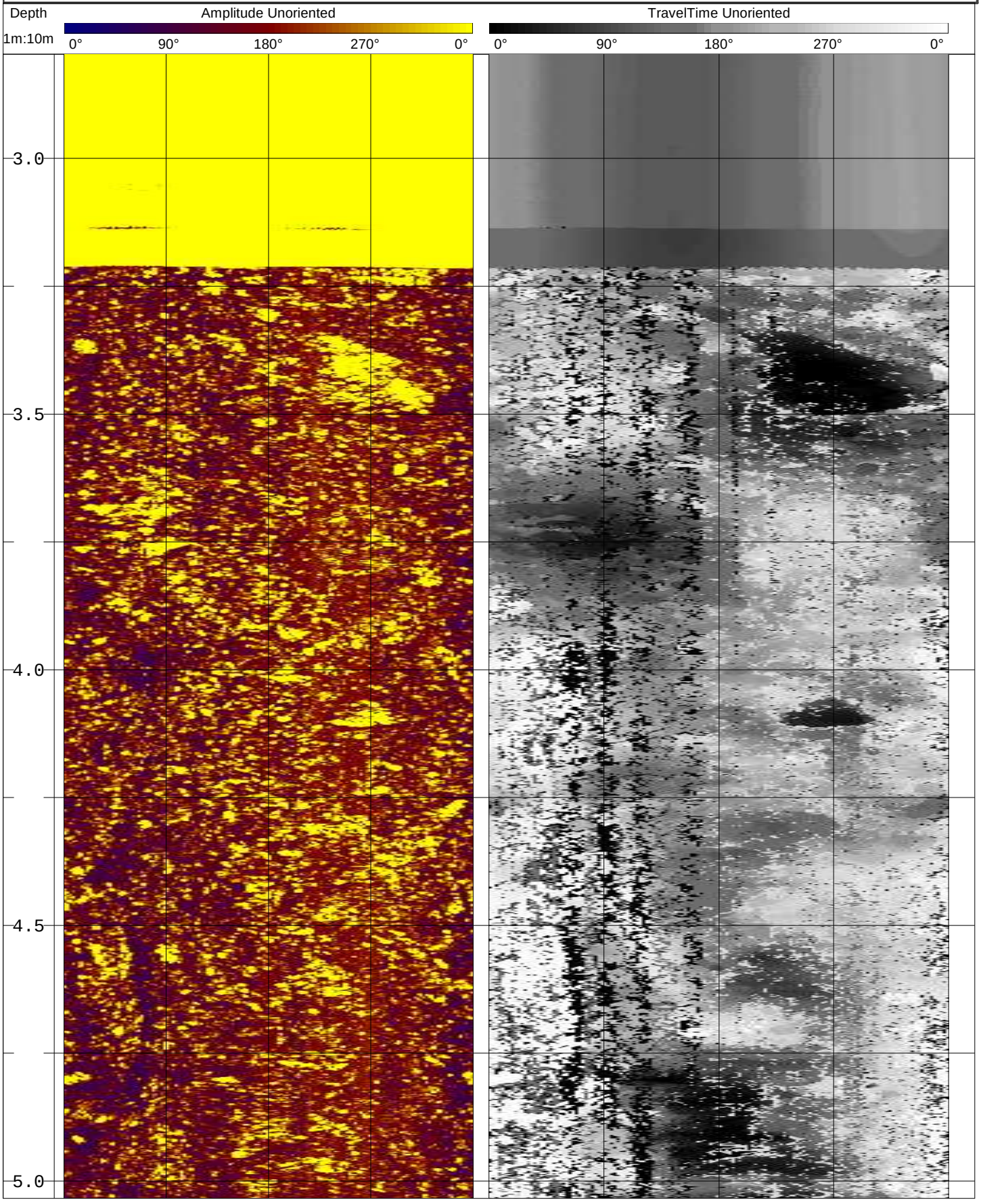


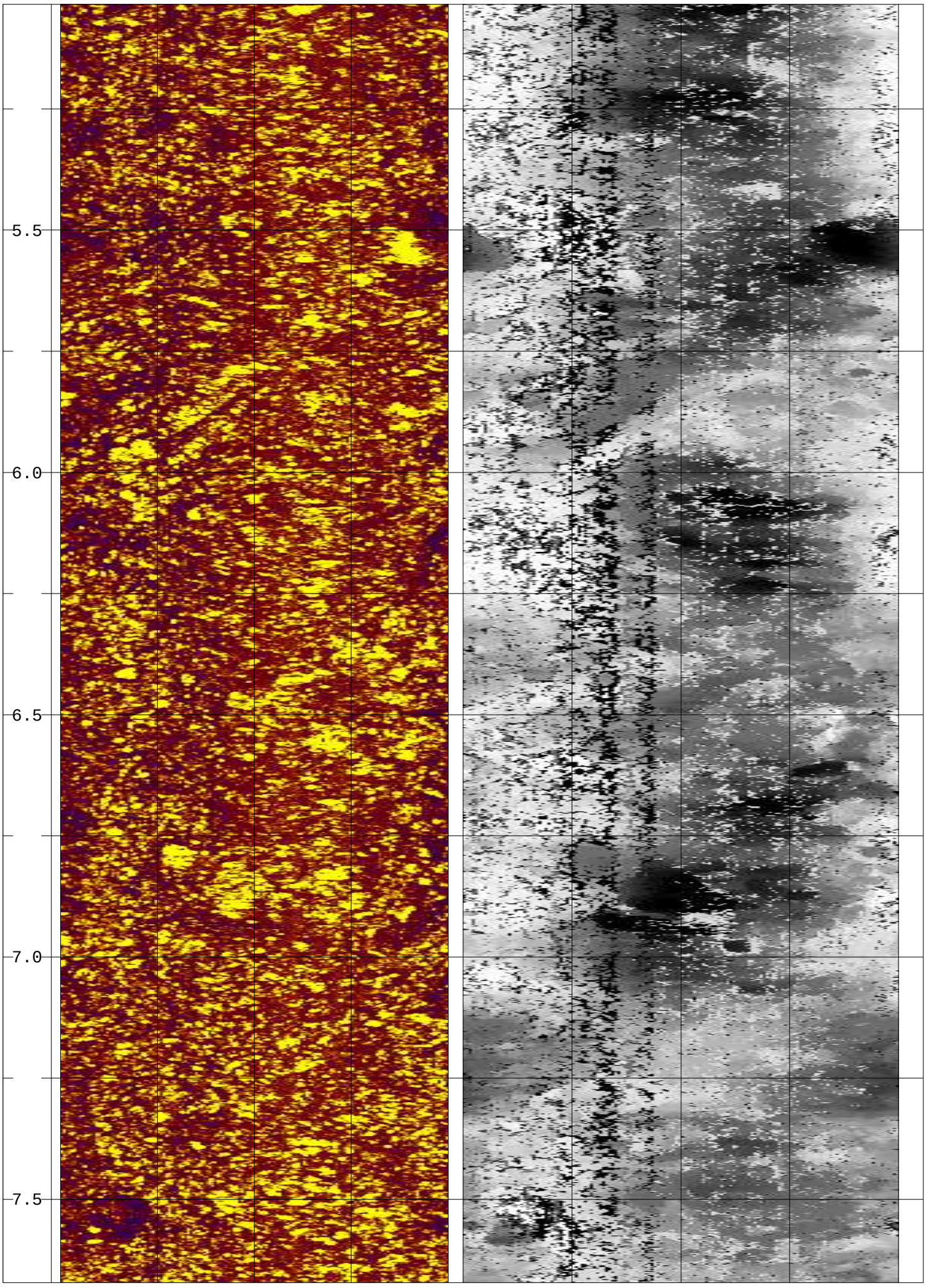

5.5
6.0
6.5
7.0
7.5

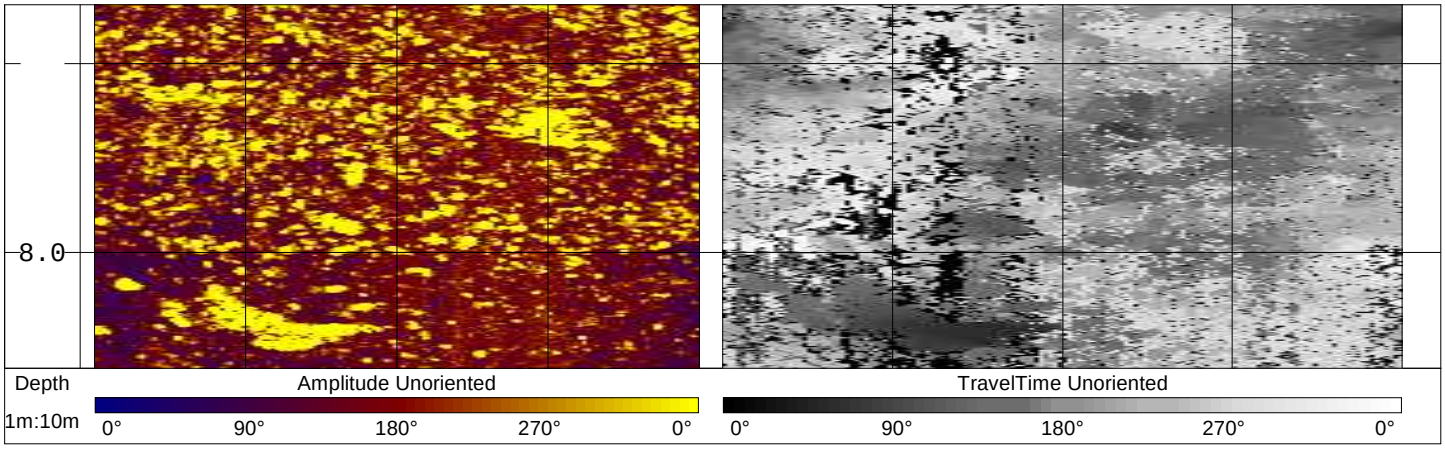

8.0
Depth
1m:10m
Amplitude Unoriented
0°
90°
180°
270°
0°
TravelTime Unoriented
0°
90°
180°
270°
0°

## GEOPHYSICAL RECORD OF BOREHOLE T-30+405.5

| | | | |
|---|---|---|---|
| **PROJECT REF.** | *09-1428-5007-2000* | **LOG REF.** | *Ground Surface* |
| **LOCATION** | *Meadowbank - Bay Goose Dyke* | **STATIC WATER LEVEL** | *In the casing* |
| **LOG DATE** | *April 27, 2010* | **DRILL METHOD** | *Top Hammer* |
| **LOGGED BY** | *BB* | **DRILLHOLE DIA.** | *3.5"* |

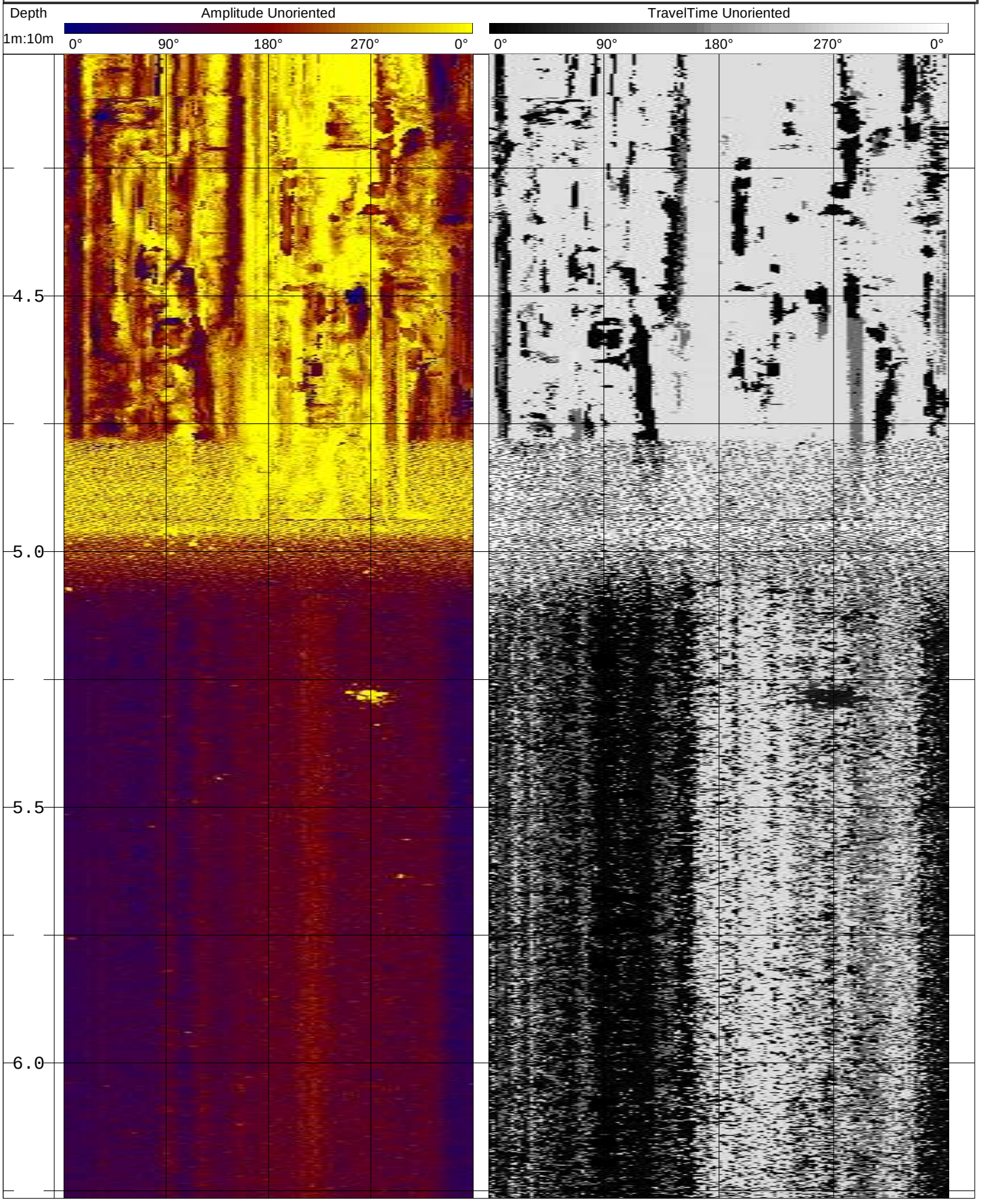


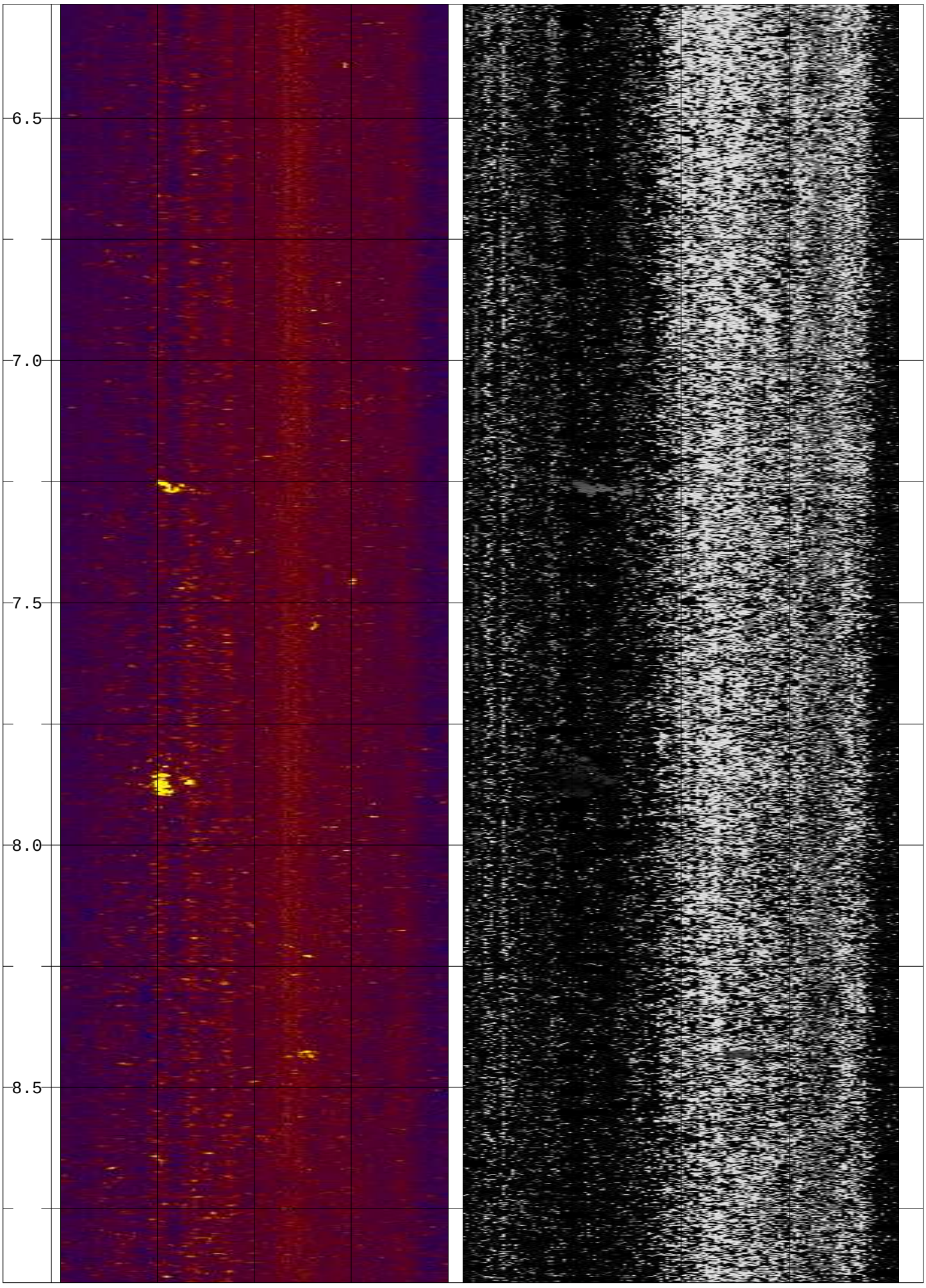

5.5
6.0
6.5
7.0
7.5

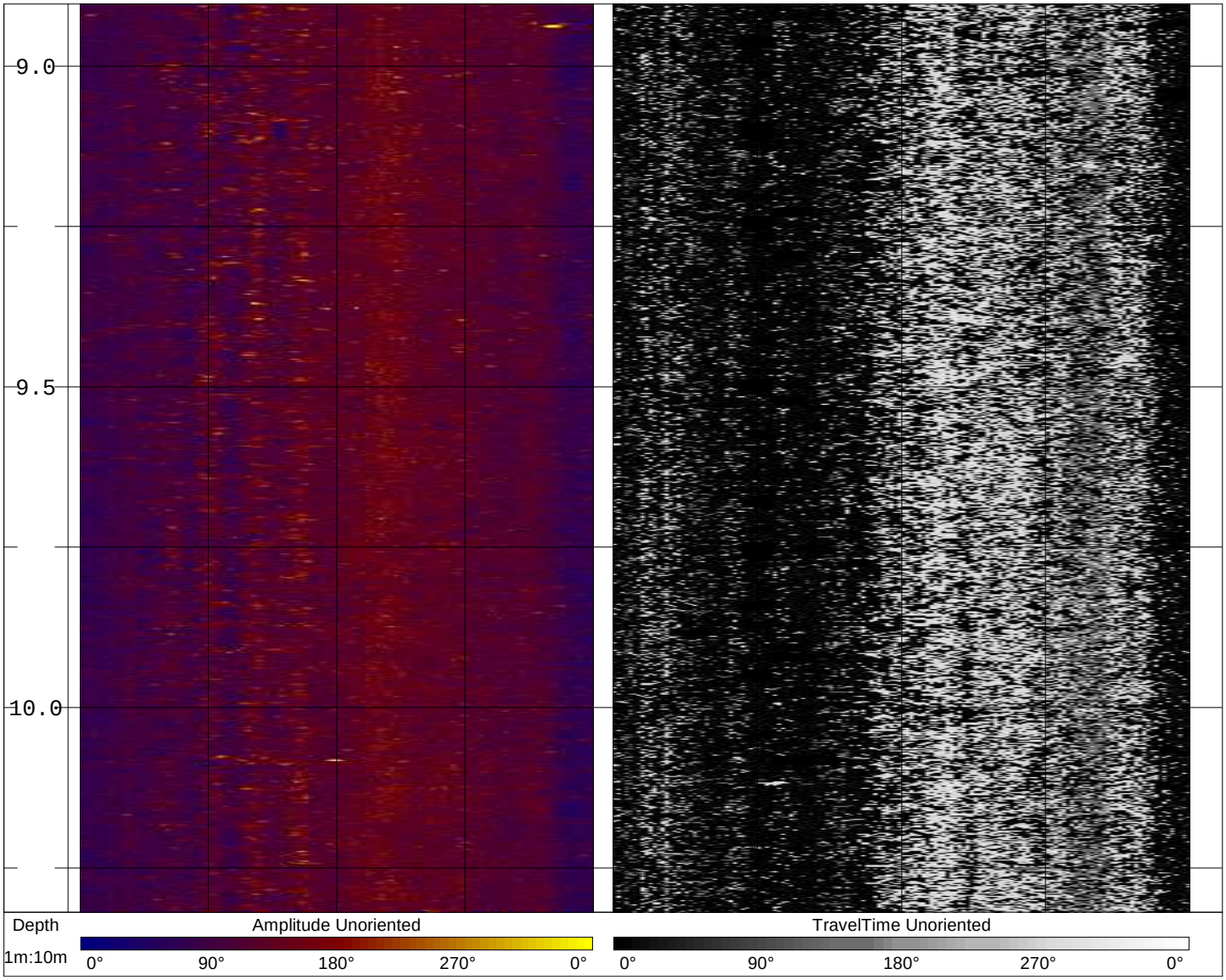

8.0
Depth
1m:10m
Amplitude Unoriented
0°
90°
180°
270°
0°
TravelTime Unoriented
0°
90°
180°
270°
0°

## GEOPHYSICAL RECORD OF BOREHOLE 30+410 (1)

| | | | |
|---|---|---|---|
| **PROJECT REF.** | *09-1428-5007 - 2000* | **LOG REF.** | *Ground Surface* |
| **LOCATION** | *Bay-Goose Dike, Meadowbank* | **STATIC WATER LEVEL** | *In the casing* |
| **LOG DATE** | *May 5, 2010* | **DRILL METHOD** | *Bottom- & Top-Hammer* |
| **LOGGED BY** | *BB* | **DRILLHOLE DIA.** | *PQ* |

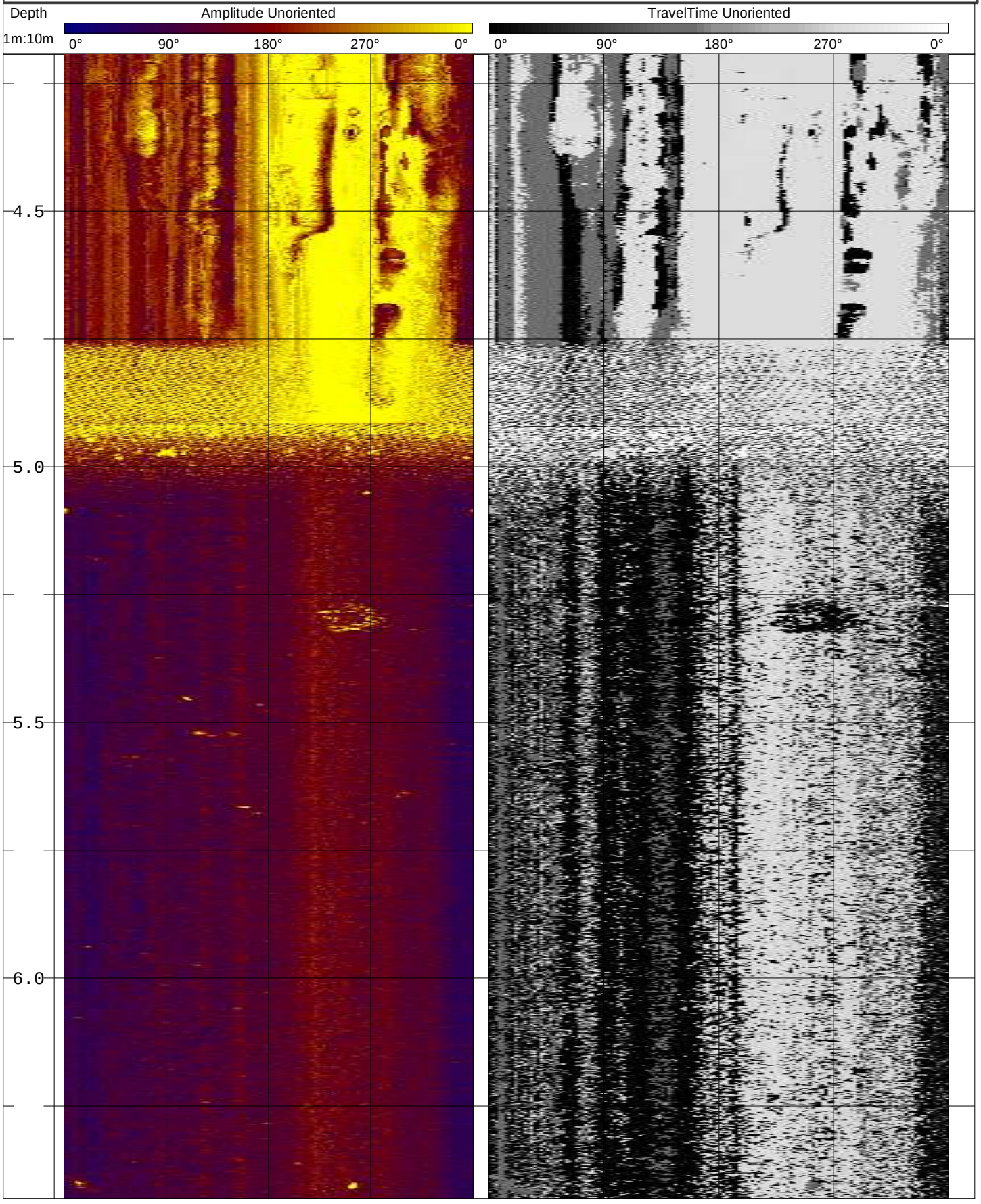


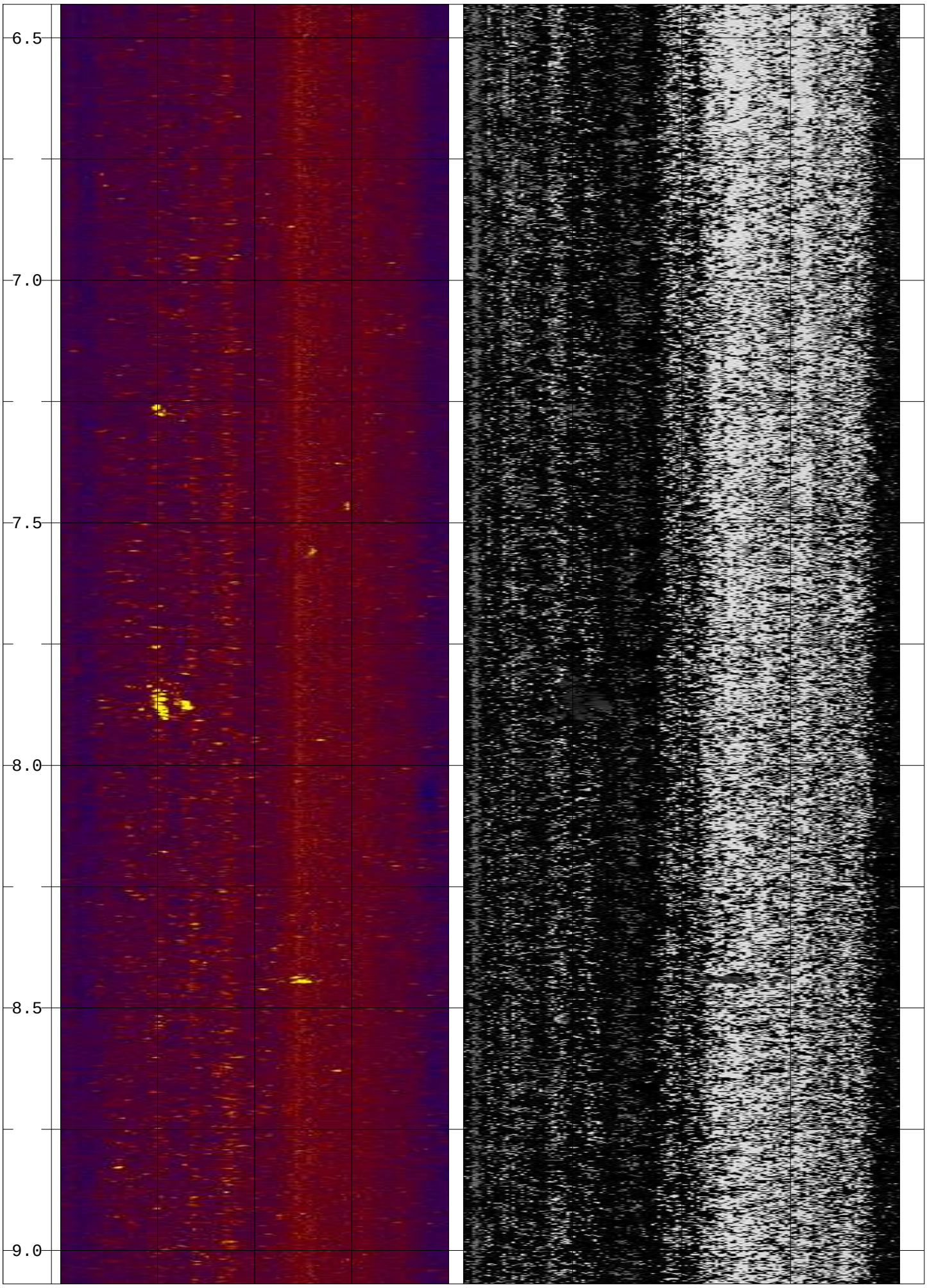

6.5
7.0
7.5
8.0
8.5

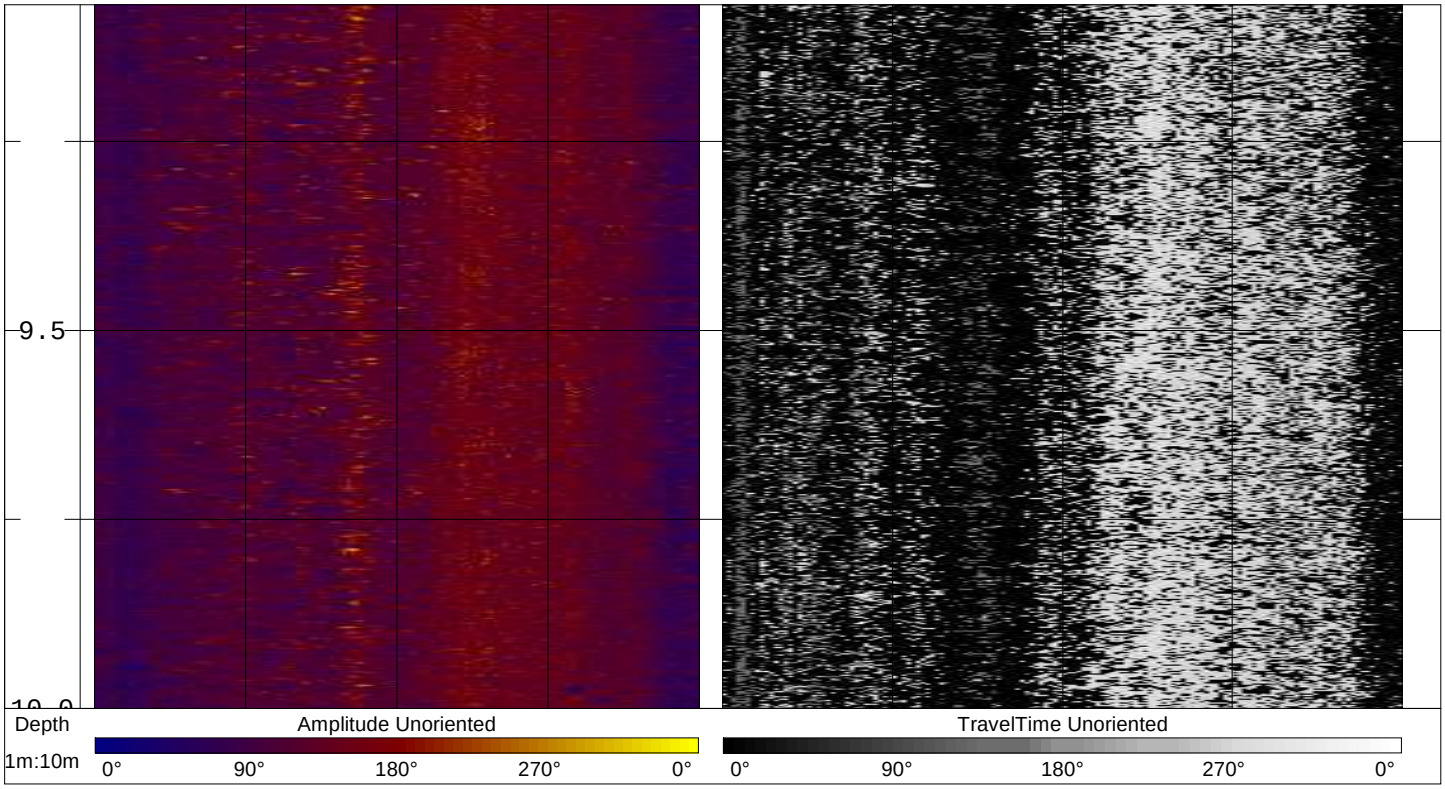

9.0
9.5
10.0
Depth
1m:10m
Amplitude Unoriented
0°
90°
180°
270°
0°
TravelTime Unoriented
0°
90°
180°
270°
0°

## GEOPHYSICAL RECORD OF BOREHOLE 30+410 (2)

| | | | |
|---|---|---|---|
| **PROJECT REF.** | *09-1428-5007 - 2000* | **LOG REF.** | *Ground Surface* |
| **LOCATION** | *Bay-Goose Dike, Meadowbank* | **STATIC WATER LEVEL** | *In the casing* |
| **LOG DATE** | *May 5, 2010* | **DRILL METHOD** | *Bottom- & Top-hammer* |
| **LOGGED BY** | *BB* | **DRILLHOLE DIA.** | *3.5"* |




6.5
7.0
7.5
8.0
8.5
9.0


9.5
Depth
1m:10m
Amplitude Unoriented
0°
90°
180°
270°
0°
TravelTime Unoriented
0°
90°
180°
270°
0°

# Permeability Testing Reports

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dyke |
| Source Well | 30+405.5 |
| Test Name | Test 1 |
| Test Date/Time | 27/04/2010, 15:30 |
| Interval | top: 3.00 m bottom: 10.00 m |
| Description | Open Hole Test |
| | Interval defined by bottom of Steel casing and End of Hole Depth |

## Basic Data

| | | |
|---|---|---|
| Test Interval | 7.00 m | |
| Porosity | 0.10 | |
| Well Radius | 0.044 m | Tubing Radius |
| Inclination | 0.0 deg | |
| Test Volume | 43.450 l | |
| Well Type | Source | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 66.62 | | | 6.3e-07 |
| SW-Init | dP-Event | 0.03389 | 66.62 | 24.1 * | | 6.3e-07 |
| SW | Slug | 0.04167 | 42.57 | 66.6 | | 6.3e-07 |

## Analysis Results

**Analysis "SW_Final"**

Static Pressure: 66.62 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 3.4e-06 | 1.4e-05 | 9.04 | 2.0 |
| Shell 2 | 1.1e-08 | 1.4e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 5.2e-07 | 0.0 |
| SW-Init | 6.3e-07 | 0.0 |
| SW | 6.3e-07 | 0.0 |

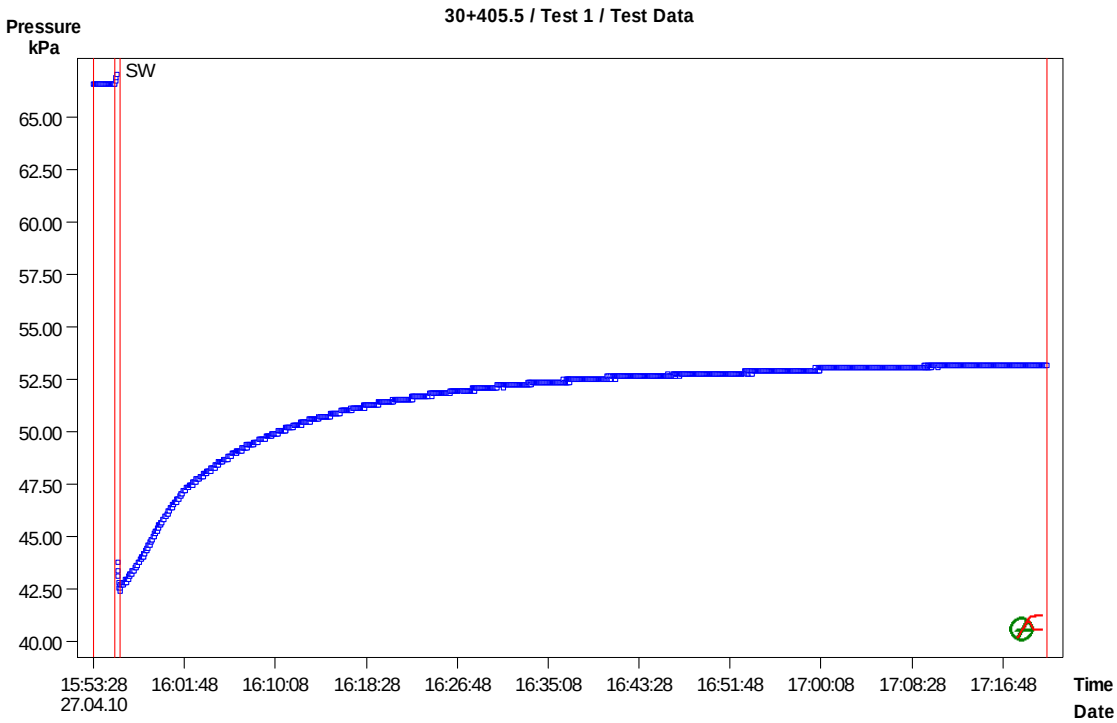



Figure 1: Pressure response and sequence definition

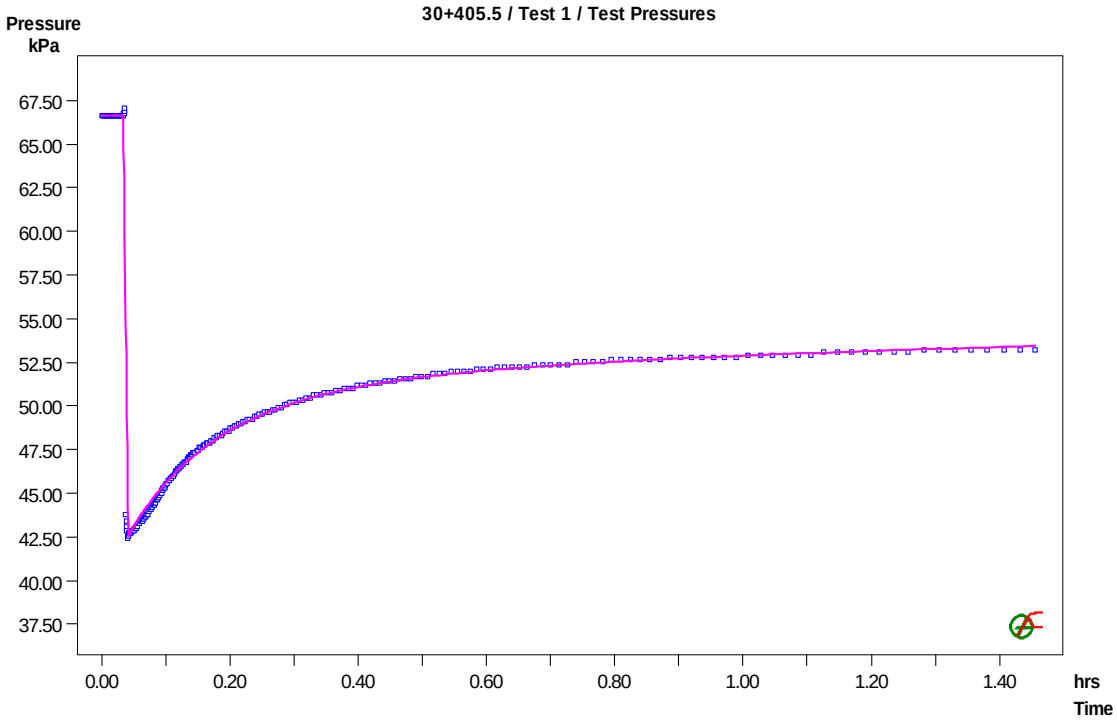



Figure 2: Pressure response and simulation: cartesian plot

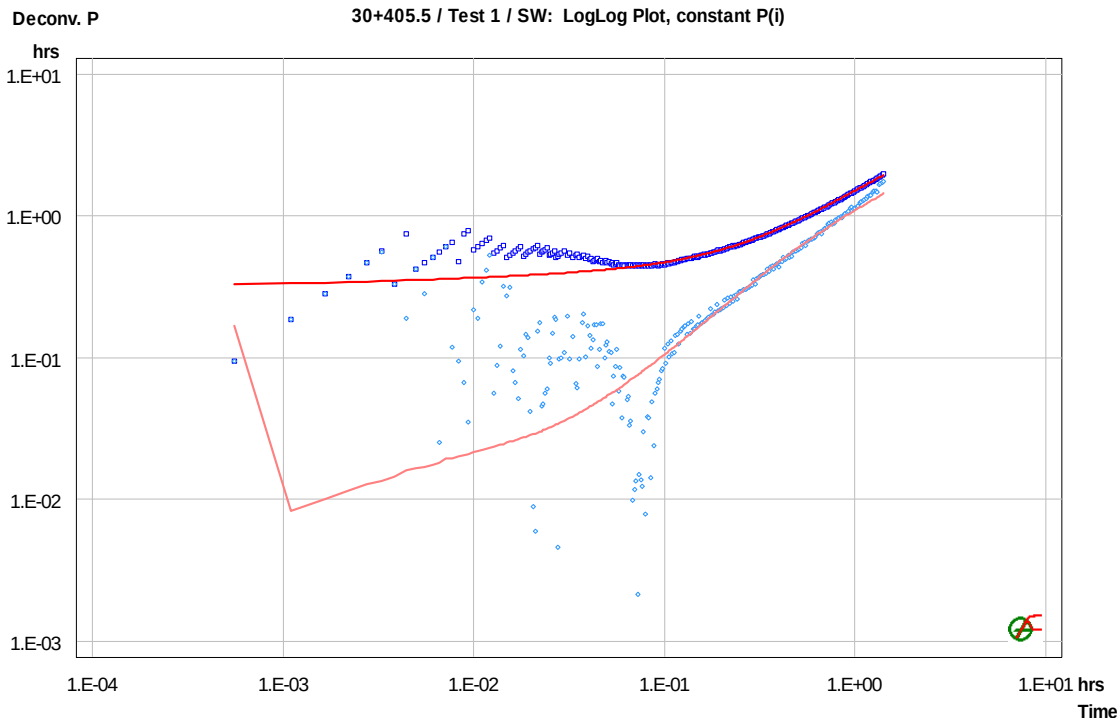



Figure 3: Pressure response, derivative and simulation: Log-Log diagnostic plot, SW-sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dyke |
| Source Well | 30+380.0 |
| Test Name | Test 1 |
| Test Date/Time | 29/04/2010, 14:40 |
| Interval | top: 3.40 m bottom: 11.70 m |
| Description | Open hole test |

## Basic Data

| | | |
|---|---|---|
| Test Interval | 8.30 m | |
| Porosity | 0.10 | |
| Well Radius | 0.058 m | Tubing Radius |
| Inclination | 0.0 deg | |
| Test Volume | 86.211 l | |
| Well Type | Source | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 80.20 | | | 1.1e-06 |
| SW-Init | dP-Event | 0.19222 | 80.20 | 40.1 * | | 1.1e-06 |
| SW | Slug | 0.23111 | 40.11 | 80.2 | | 1.1e-06 |

## Analysis Results

**Analysis "SW_Final"**

Static Pressure: 80.20 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 4.3e-09 | 1.6e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 6.9e-07 | 0.0 |
| SW-Init | 1.1e-06 | 0.0 |
| SW | 1.1e-06 | 0.0 |

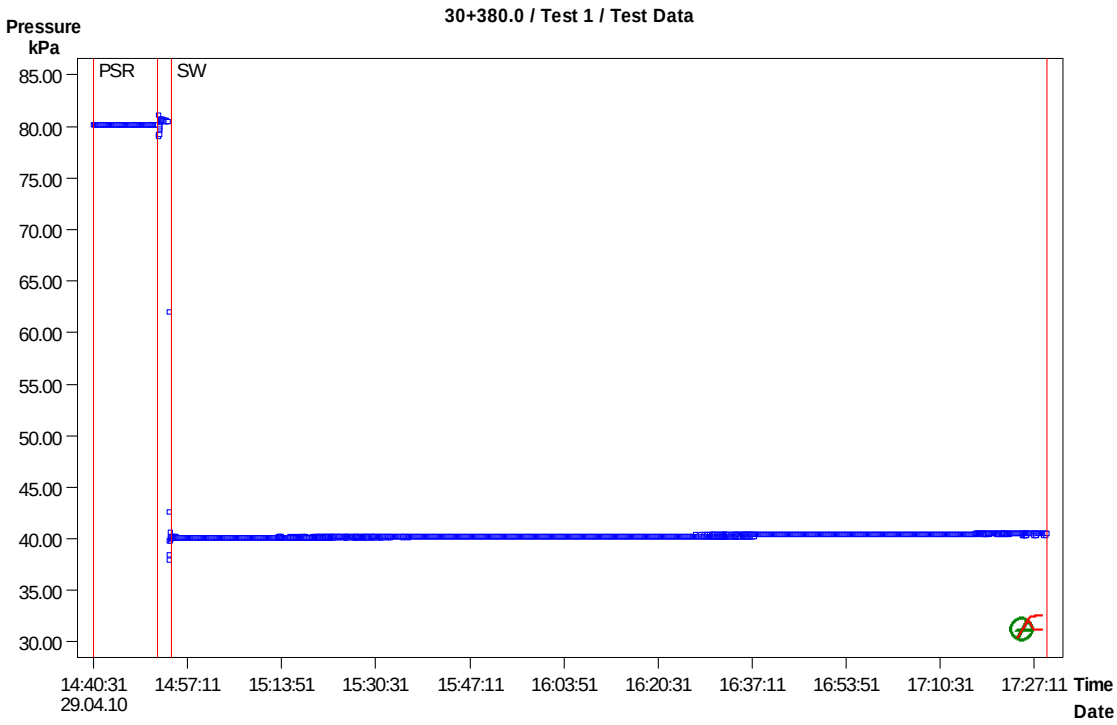



Figure 1: Pressure response and sequence definition

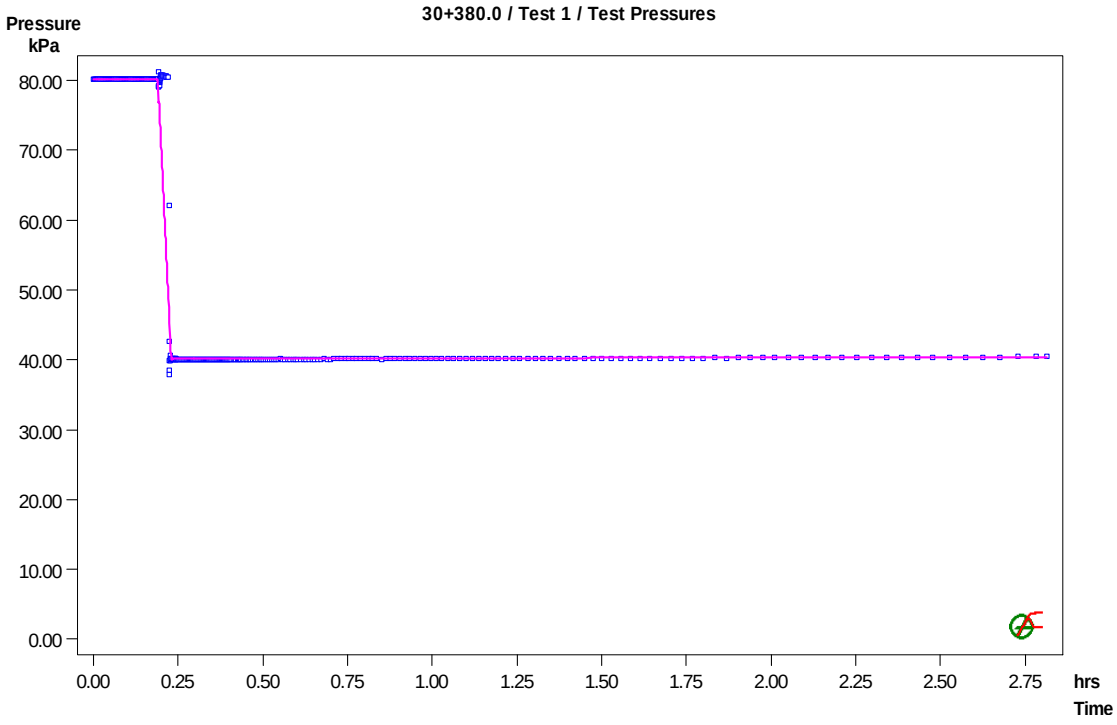



Figure 2: Pressure response and simulation: cartesian plot

# E1-2 Grout Mix Testing Results

# GROUT MIX TESTING AND DESIGN

The following describes the range of grout mix designs used for bedrock and contact grouting along the Bay-Goose Dike. All mix testing was carried out on site using a 420 L capacity Chemgrout CG-680/3L8/EH high shear colloidal mixer with a minimum 2-bag batch size. Standard mixes were designed using St. Lawrence Type 30 (HE) hydraulic cement while microfine mixes were designed with both Nittetsu Super Fine as well as Spinor A12 microfine cements. All additives used for controlling grout rheology were dosed by weight of cement and included:

- BASF Glenium 3030 NS superplasticizer for water-reduction / lowering viscosity;
- BASF Pozzutec 20+ cold weather accelerator for injection in anticipated frozen zones;
- Baroid Quik-Gel high yield bentonite for medium to high viscosity mix designs;
- Eucon AWA anti-washout additive for medium to high viscosity mix designs; and
- Minova thixotropic additive Celbex 653 for high viscosity mix designs.

A summary of mix designs used throughout the grouting program is provided in Table 1.

**Table 1: Summary of Grout Mixes Tested and Designed**

| Mix | W:C Ratio | Glenium (%) | Pozzutec 20+ (%) | Bentonite (%) | Eucon AWA (%) | Marsh (sec) | Specific Gravity (g/cc) | Comment |
|---|---|---|---|---|---|---|---|---|
| MF | 1.2 : 1 | - | - | - | - | 31 | 1.43 | +Mighty 150 SuperP (0.92%) |
| A | 0.7 : 1 | 0.4 | - | - | - | 32 | 1.67 | |
| A* | 0.7 : 1 | 0.4 | 0.75 | - | - | 32 | 1.67 | |
| B | 0.7 : 1 | - | - | - | - | 35 | 1.67 | |
| C | 0.66 : 1 | - | - | 0.8 | - | 45 | 1.70 | Pre-hydrated Bentonite |
| C | 0.7 : 1 | - | - | - | 1.2 | 45 | 1.67 | Anti-Washout Additive |
| C | 0.5 : 1 | - | - | - | - | 45 | 1.83 | No Additives |
| D | 0.66 : 1 | - | - | 1.4 | - | 60 | 1.70 | Pre-hydrated Bentonite |
| D | 0.7 : 1 | - | - | - | 1.36 | 60 | 1.67 | Anti-Washout Additive |
| E | 0.56 : 1 | - | - | 1.4 | - | 90 | 1.78 | Pre-hydrated Bentonite |
| X | 0.5 : 1 | - | - | - | - | - | 1.83 | +0.06% Celbex |

Note: All admixture dosages were calculated with respect to weight of cement.

## North Portion

Initial mixes were confirmed in April 2010 at the start of the works, with designs for the low viscosity Mixes A, cold weather accelerated Mix A* and Mix B following those used previously on site during the East Dike grouting program. Marsh funnel viscosities were targeted and achieved at 32 and 35 seconds respectively for Mixes A and B. Designs incorporated the use of water and cement with superplasticizer Glenium 3030 NS and cold weather accelerator Pozzutec 20+. For the medium viscosity Mixes C and D (Marsh times of 45 and 60 seconds respectively), new designs were to be incorporated which included the use of the anti-washout additive Eucon AWA due to its enhanced stabilizing effects over mixes designed purely with bentonite. However, due to the lack of AWA available on site at the beginning of the program, Mix C was re-designed as a low 0.5:1 water:cement ratio mix with no additives while Mix D was designed using pre-hydrated bentonite left over from the East Dike program.

New pre-hydrated bentonite was eventually batched (94 L of water to 6 kg of dry bentonite) and both Mixes C and D were re-designed accordingly. Injection continued with the bentonite-based mixes until June 2010 when the supply of AWA arrived on site, at which time, a further re-design of Mixes C and D was carried out again. Due to noted instances of low pressure build during high grout take situations, further new designs of high viscosity mixes were also incorporated into the mix thickening sequence in an attempt to close stages by pressure as opposed to increasing the specified volume limits. Mix E (Marsh time of 80+ seconds) was developed with both pre-hydrated bentonite as well as AWA once it became available on site, while a thixotropically controlled “very thick” mix, Mix X, using Minova’s Celbex 653 was also designed as a final closing mix (no ability to pass through Marsh Funnel).

As used previously on site during the East Dike grouting program, a low viscosity Microfine mix, Mix MF (Marsh 32 seconds), was developed using Nittetsu Super Fine cement in combination with the superplasticizer Mighty 150 for injection of the contact in tertiary and higher order holes.

## South Portion

Upon completion of Cut-off Wall construction in the South Portion of the dike, grouting activities resumed in October 2010 using the same mix designs which had been in effect at the end of the North Portion program. While injection of Mixes A, A* and B did not show any deviation in the reported QA/QC values for viscosity and bleed, the medium to high viscosity Mixes C, D and E eventually began to deviate from the accepted criteria. With the onset of winter conditions, the cement which was being stored in outdoor sea-containers was beginning to be supplied to the mobile grout shacks at sub-zero temperatures, and often with portions already pre-hydrated in “clumps”. In turn, the AWA additive proved unable to control the consistency of grout viscosity and bleed due to the sub-zero temperatures, and as such, it was decided to return to the use of bentonite-based mix designs in the thickening sequence.

Based on the contractor’s ability to maintain a consistent supply of pre-hydrated bentonite, as well as separate batching techniques between the two grout shacks, the use of either pre-hydrated or dry bentonite mix designs were accepted beginning in November 2010 and largely held until the end of the works in July 2011. However, due to the lack of consistency in temperature of cement, the mix designs were often adjusted (a minor amount) by the batch plant operator, as conditions dictated, to maintain consistency of mix viscosity and bleed. In addition to altering the amount of bentonite being added to each mix, the amount of water was often adjusted to

achieve the required design viscosities for the specified mix thickening sequence. Towards the end of the South Portion program, as temperatures began to warm once again, mix designs eventually stabilized with the use of dry bentonite and consistent mix proportions.

While injection of the contact in tertiary and higher order holes for the North Portion used a starting mix design based on Nittetsu Super Fine cement, a change was made to using the newly supplied Spinor A12 microfine cement for the South Portion. The required viscosity of 32 seconds was held and achieved during mix testing sessions in November 2010.

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-2\Appendix E1-2_Grout Mix Testing.docx

## E1-3 Tables of Quantities

- Casing Installation
- Bedrock/Contact Grouting

## Casing Installation

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P-30+050 | P | 25-Apr-10 | 137.10 | 2.97 | 0.48 | 3.75 | 639174.118 | 7213141.062 | 137.38 | | |
| T-30+051.5 | T | 25-Apr-10 | 137.03 | 2.98 | 0.48 | 3.76 | 639174.012 | 7213139.401 | 137.37 | | |
| S-30+053 | S | 25-Apr-10 | 136.99 | 3.05 | 0.48 | 3.83 | 639173.940 | 7213137.93 | 137.35 | | |
| T-30+054.5 | T | 25-Apr-10 | 136.96 | 3.08 | 0.51 | 3.89 | 639173.916 | 7213136.448 | 137.30 | | |
| P-30+056 | P | 25-Apr-10 | 136.91 | 3.12 | 0.44 | 3.88 | 639173.832 | 7213134.93 | 137.20 | | |
| T-30+057.5 | T | 25-Apr-10 | 136.87 | 3.15 | 0.51 | 4.01 | 639173.714 | 7213133.431 | 137.29 | | |
| S-30+059 | S | 25-Apr-10 | 136.87 | 3.16 | 0.48 | 3.99 | 639173.692 | 7213131.955 | 137.24 | | |
| T-30+060.5 | T | 25-Apr-10 | 136.84 | 3.30 | 0.51 | 4.12 | 639173.646 | 7213130.411 | 137.21 | | |
| P-30+062 | P | 25-Apr-10 | 136.79 | 3.29 | 0.51 | 4.10 | 639173.521 | 7213128.965 | 137.09 | | |
| T-30+063.5 | T | 25-Apr-10 | 136.82 | 3.25 | 0.52 | 4.07 | 639173.440 | 7213127.445 | 137.18 | | |
| S-30+065 | S | 25-Apr-10 | 136.82 | 3.26 | 0.53 | 4.12 | 639173.331 | 7213125.97 | 137.16 | | |
| T-30+066.5 | T | 25-Apr-10 | 136.83 | 3.32 | 0.52 | 4.14 | 639173.284 | 7213124.452 | 137.18 | | |
| P-30+068 | P | 25-Apr-10 | 136.83 | 3.33 | 0.53 | 4.16 | 639173.286 | 7213123.027 | 137.20 | | |
| T-30+069.5 | T | 25-Apr-10 | 136.82 | 3.20 | 0.51 | 4.01 | 639173.147 | 7213121.504 | 137.20 | | |
| S-30+071 | S | 25-Apr-10 | 136.80 | 4.41 | 0.51 | 5.22 | 639173.110 | 7213119.932 | 137.14 | | |
| T-30+072.5 | T | 25-Apr-10 | 136.81 | 3.43 | 0.45 | 4.19 | 639173.073 | 7213118.477 | 137.18 | | |
| P-30+074 | P | 25-Apr-10 | 136.81 | 3.99 | 0.51 | 4.80 | 639173.010 | 7213116.981 | 137.00 | | |
| T-30+075.5 | T | 25-Apr-10 | 136.83 | 4.42 | 0.50 | 5.23 | 639172.963 | 7213115.452 | 137.19 | | |
| S-30+077 | S | 25-Apr-10 | 136.80 | 4.42 | 0.51 | 5.24 | 639172.891 | 7213113.95 | 137.14 | | |
| T-30+078.5 | T | 25-Apr-10 | 136.80 | 4.62 | 0.49 | 5.41 | 639172.816 | 7213112.496 | 137.17 | | |
| P-30+080 | P | 25-Apr-10 | 136.80 | 3.88 | 0.51 | 4.70 | 639172.714 | 7213110.897 | 136.95 | | |
| T-30+081.5 | T | 25-Apr-10 | 136.81 | 4.97 | 0.46 | 5.74 | 639172.642 | 7213109.435 | 137.13 | | |
| S-30+083 | S | 25-Apr-10 | 136.83 | 4.00 | 0.49 | 4.70 | 639172.592 | 7213107.999 | 137.06 | | |
| T-30+084.5 | T | 25-Apr-10 | 136.81 | 3.95 | 0.52 | 4.70 | 639172.539 | 7213106.456 | 137.07 | | |
| P-30+086 | P | 25-Apr-10 | 136.82 | 3.75 | 0.49 | 4.54 | 639172.482 | 7213105.038 | 137.09 | | |
| T-30+087.5 | T | 25-Apr-10 | 136.82 | 4.05 | 0.49 | 4.85 | 639172.412 | 7213103.482 | 137.13 | | |
| S-30+089 | S | 25-Apr-10 | 136.80 | 3.95 | 0.46 | 4.70 | 639172.328 | 7213102.029 | 137.14 | | |
| T-30+090.5 | T | 6-Apr-10 | 136.83 | 3.86 | 0.56 | 4.70 | 639172.468 | 7213100.498 | 137.13 | Hole drilled in wrong location, 15 cm towards lake side. | |
| P-30+092 | P | 6-Apr-10 | 136.83 | 4.61 | 0.51 | 5.42 | 639172.147 | 7213099.034 | 137.12 | | |
| T-30+093.5 | T | 6-Apr-10 | 136.83 | 4.95 | 0.35 | 5.61 | 639172.099 | 7213097.456 | 137.12 | Hammer bit broken at 0.35 m in bedrock. | |
| S-30+095 | S | 7-Apr-10 | 136.83 | 5.33 | 0.51 | 6.14 | 639172.069 | 7213095.882 | 137.14 | Casing anchored in weathered bedrock. | |
| T-30+096.5 | T | 7-Apr-10 | 136.85 | 5.63 | 0.59 | 6.52 | 639171.922 | 7213094.484 | 137.14 | | |
| P-30+098 | P | 7-Apr-10 | 136.85 | 5.66 | 0.56 | 6.52 | 639171.858 | 7213092.998 | 137.13 | | |
| T-30+099.5 | T | 7-Apr-10 | 136.86 | 6.18 | 0.67 | 7.15 | 639171.754 | 7213091.447 | 137.18 | Water encountered ~5.3 m. | |
| S-30+101 | S | 7-Apr-10 | 136.88 | 5.96 | 0.50 | 6.76 | 639171.721 | 7213089.983 | 137.18 | Water encountered ~5.3 m. | |
| T-30+102.5 | T | 7-Apr-10 | 136.88 | 6.17 | 0.50 | 6.97 | 639171.635 | 7213088.481 | 137.23 | Water at 6.0 m. | |
| P-30+104 | P | 7-Apr-10 | 136.91 | 6.03 | 0.50 | 6.83 | 639171.650 | 7213087.111 | 137.18 | No water. Connection w/hole t-30+102.5 from 6.03 to 6.13 m. | |
| T-30+105.5 | T | 7-Apr-10 | 136.91 | 6.39 | 0.50 | 7.19 | 639171.593 | 7213085.458 | 137.19 | No water. No connections. | |
| S-30+107 | S | 7-Apr-10 | 136.90 | 5.89 | 0.53 | 6.72 | 639171.522 | 7213084.052 | 137.22 | No water. No connections. | |
| T-30+108.5 | T | 7-Apr-10 | 136.91 | 6.08 | 0.52 | 6.90 | 639171.406 | 7213082.477 | 137.22 | No water. No connections. | |
| P-30+110 | P | 7-Apr-10 | 136.92 | 6.36 | 0.51 | 7.17 | 639171.434 | 7213081.021 | 137.22 | No water. No connections. | |
| T-30+111.5 | T | 7-Apr-10 | 136.91 | 7.01 | 0.51 | 7.82 | 639171.357 | 7213079.508 | 137.21 | No water. No connections. | |
| S-30+113 | S | 7-Apr-10 | 136.91 | 7.08 | 0.52 | 7.90 | 639171.300 | 7213078.118 | 137.22 | No water. No connections. | |

Golder Associates

# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-30+114.5 | T | 8-Apr-10 | 136.91 | 6.97 | 0.58 | 7.85 | 639171.230 | 7213076.5 | 137.23 | | |
| P-30+116 | P | 8-Apr-10 | 136.92 | 6.78 | 0.65 | 7.73 | 639171.148 | 7213075.087 | 137.22 | Connection to T-30+114.5 noted while drilling in bedrock. | |
| T-30+117.5 | T | 8-Apr-10 | 136.92 | 6.96 | 0.55 | 7.81 | 639171.083 | 7213073.538 | 137.23 | | |
| S-30+119 | S | 8-Apr-10 | 136.92 | 7.07 | 0.56 | 7.93 | 639170.942 | 7213071.925 | 137.24 | | |
| T-30+120.5 | T | 8-Apr-10 | 136.92 | 7.81 | 0.53 | 8.64 | 639170.911 | 7213070.467 | 137.24 | SB material becoming softer. Materials compressing and rebounding while drilling. | |
| P-30+122 | P | 8-Apr-10 | 136.92 | 7.70 | 0.51 | 8.51 | 639170.890 | 7213068.936 | 137.24 | Water encountered at ~7.0 m. | |
| T-30+123.5 | T | 8-Apr-10 | 136.93 | 7.39 | 0.65 | 8.34 | 639170.805 | 7213067.521 | 137.27 | | |
| S-30+125 | S | 8-Apr-10 | 136.93 | 7.57 | 0.46 | 8.33 | 639170.733 | 7213065.934 | 137.28 | | |
| Q-30+125.75 | Q | 7-Jul-10 | 137.02 | 7.94 | 0.50 | 8.65 | -- | -- | -- | | |
| T-30+126.5 | T | 8-Apr-10 | 136.94 | 7.55 | 0.51 | 8.37 | 639170.645 | 7213064.443 | 137.26 | No water. No connections. | |
| Q-30+127.25 | Q | 7-Jul-10 | 136.83 | 8.27 | 0.50 | 8.87 | -- | -- | -- | | |
| P-30+128 | P | 8-Apr-10 | 136.95 | 8.23 | 0.51 | 9.05 | 639170.579 | 7213062.957 | 137.30 | Blizzard conditions. Hole re-drilled because of bad welding conditions among casings. Bedrock contact confirmed. | |
| T-30+129.5 | T | 9-Apr-10 | 136.95 | 7.96 | 0.43 | 8.69 | 639170.477 | 7213061.571 | 137.28 | | |
| S-30+131 | S | 9-Apr-10 | 136.95 | 8.12 | 0.54 | 8.96 | 639170.452 | 7213060.054 | 137.31 | | |
| T-30+132.5 | T | 9-Apr-10 | 136.98 | 8.50 | 0.38 | 9.20 | 639170.440 | 7213058.543 | 137.36 | Connection to S-30+131 noted at 7.5 m, no return or change in advance at 7.5 m, possibly weathered bedrock. | |
| P-30+134 | P | 9-Apr-10 | 136.96 | 8.00 | 0.50 | 8.80 | 639170.349 | 7213056.974 | 137.31 | | |
| T-30+135.5 | T | 9-Apr-10 | 136.96 | 7.93 | 0.50 | 8.73 | 639170.289 | 7213055.597 | 137.32 | | |
| S-30+137 | S | 9-Apr-10 | 136.94 | 7.83 | 0.52 | 8.65 | 639170.104 | 7213054.007 | 137.27 | | |
| T-30+138.5 | T | 10-Apr-10 | 136.94 | 7.58 | 0.47 | 8.35 | 639169.986 | 7213052.593 | 137.27 | | |
| Q-30+139.25 | Q | 7-Jul-10 | 137.01 | 8.22 | 0.52 | 8.97 | -- | -- | -- | | |
| P-30+140 | P | 10-Apr-10 | 136.97 | 7.78 | 0.44 | 8.52 | 639170.043 | 7213051.066 | 137.30 | Connection to T-30+138.5 while drilling in bedrock. | |
| P-30+140A | P | 25-Jun-10 | 137.29 | 8.30 | 0.50 | 9.07 | -- | -- | -- | Replacement for bent casing. Connected to 30+146, 30+152, 30 +155, & 30+167 at bedrock interface. | |
| T-30+141.5 | T | 10-Apr-10 | 136.95 | 8.46 | 0.42 | 9.21 | 639169.348 | 7213049.69 | 137.32 | | |
| S-30+143 | S | 10-Apr-10 | 136.93 | 8.95 | 0.50 | 9.52 | 639168.541 | 7213048.384 | 137.26 | | |
| T-30+144.5 | T | 10-Apr-10 | 136.94 | 9.05 | 0.51 | 9.87 | 639167.708 | 7213047.099 | 137.28 | Rockmaster. No connections observed. | |
| P-30+146 | P | 10-Apr-10 | 136.91 | 9.13 | 0.51 | 9.95 | 639166.927 | 7213045.91 | 137.30 | Rockmaster. No connections observed. | |
| T-30+147.5 | T | 10-Apr-10 | 136.92 | 8.93 | 0.51 | 9.75 | 639166.122 | 7213044.569 | 137.28 | Rockmaster. Connection with P-30+146 at 8.9 m upon contact with bedrock, water being pushed out of casing. | |
| S-30+149 | S | 10-Apr-10 | 136.92 | 9.07 | 0.51 | 9.88 | 639165.361 | 7213043.395 | 137.25 | Rockmaster. No connections observed. | |
| T-30+150.5 | T | 10-Apr-10 | 136.91 | 8.71 | 0.51 | 9.52 | 639164.554 | 7213042 | 137.22 | Rockmaster. No connections observed. | |
| P-30+152 | P | 11-Apr-10 | 136.91 | 8.58 | 0.47 | 9.35 | 639163.794 | 7213040.758 | 137.21 | | |
| T-30+153.5 | T | 11-Apr-10 | 136.92 | 9.62 | 0.51 | 10.43 | 639163.071 | 7213039.492 | 137.23 | | |
| S-30+155 | S | 11-Apr-10 | 136.90 | 8.97 | 0.51 | 9.78 | 639162.276 | 7213038.303 | 137.27 | Connection to T-30+153.5 at bedrock contact. | |
| T-30+156.5 | T | 11-Apr-10 | 136.94 | 9.19 | 0.50 | 9.99 | 639161.410 | 7213036.949 | 137.23 | | |
| P-30+158 | P | 11-Apr-10 | 136.93 | 9.98 | 0.51 | 10.79 | 639160.699 | 7213035.587 | 137.18 | Connection to T-30+156.5 at bedrock contact. possible bedrock at 9.0 m due to change in advance. no return due to connection, unable to verify material until deeper bedrock contact, advanced to 10.49 m. | |
| T-30+159.5 | T | 11-Apr-10 | 136.93 | 9.96 | 0.51 | 10.77 | 639159.933 | 7213034.424 | 137.24 | | |
| S-30+161 | S | 11-Apr-10 | 136.93 | 9.05 | 0.51 | 9.86 | 639159.110 | 7213033.147 | 137.23 | Rockmaster. Connection with T-30+159.5 from 8.71 to 9.00 m, water and air blown out. | |
| T-30+162.5 | T | 11-Apr-10 | 136.92 | 8.78 | 0.52 | 9.61 | 639158.255 | 7213031.787 | 137.25 | Rockmaster. Connection with P-30+182 from 6.65 to 9.3 m. | |
| P-30+164 | P | 11-Apr-10 | 136.92 | 8.66 | 0.51 | 9.47 | 639157.489 | 7213030.532 | 137.24 | Rockmaster. No connections observed. | |
| T-30+165.5 | T | 11-Apr-10 | 136.91 | 8.61 | 0.52 | 9.43 | 639156.672 | 7213029.242 | 137.24 | Rockmaster. Connection with P-30+164 from 8.61 to 9.13 m. Air, water and SB forced out of casing. | |
| S-30+167 | S | 12-Apr-10 | 136.90 | 9.61 | 0.55 | 10.46 | 639155.872 | 7213028.022 | 137.22 | | |
| T-30+168.5 | T | 12-Apr-10 | 136.87 | 10.14 | 0.62 | 11.06 | 639155.101 | 7213026.78 | 137.21 | Connection to S-30+167 while drilling in bedrock. | |

Golder Associates

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P-30+170 | P | 12-Apr-10 | 136.88 | 10.41 | 0.52 | 11.23 | 639154.405 | 7213025.485 | 137.19 | Cobbles / boulders noted at approximately 10 m. | |
| T-30+171.5 | T | 12-Apr-10 | 136.87 | 9.50 | 0.55 | 10.35 | 639153.534 | 7213024.125 | 137.22 | | |
| S-30+173 | S | 12-Apr-10 | 136.87 | 9.51 | 0.49 | 10.30 | 639152.776 | 7213022.949 | 137.22 | | |
| T-30+174.5 | T | 12-Apr-10 | 136.86 | 9.24 | 0.42 | 9.96 | 639151.899 | 7213021.583 | 137.25 | | |
| P-30+176 | P | 12-Apr-10 | 136.85 | 9.25 | 0.50 | 10.05 | 639151.112 | 7213020.354 | 137.20 | No connections observed. | |
| T-30+177.5 | T | 12-Apr-10 | 136.86 | 10.57 | 0.50 | 11.38 | 639150.430 | 7213019.074 | 137.22 | No connections observed. | |
| S-30+179 | S | 12-Apr-10 | 136.88 | 9.48 | 0.55 | 10.33 | 639149.644 | 7213017.806 | 137.17 | | |
| T-30+180.5 | T | 11-Apr-10 | 136.90 | 10.05 | 0.51 | 10.86 | 639148.958 | 7213016.560 | 137.18 | Novamac. Connection with T-30+183.5 from 8.8 to 9.95 m. Water / Sb forced out of casing. Soft material from 5.85 to 9.8 mbgs. | |
| P-30+182 | P | 11-Apr-10 | 136.84 | 9.41 | 0.40 | 10.11 | 639148.054 | 7213015.179 | 137.19 | Novamac. Connection with T-30+183.5 from 9.2 to 9.8 m. Welding problems among casings. | |
| T-30+183.5 | T | 11-Apr-10 | 136.86 | 9.06 | 0.51 | 9.87 | 639147.323 | 7213013.993 | 137.15 | | |
| S-30+185 | S | 11-Apr-10 | 136.87 | 9.31 | 0.64 | 10.22 | 639146.467 | 7213012.738 | 137.13 | | |
| T-30+186.5 | T | 11-Apr-10 | 136.87 | 9.54 | 0.51 | 10.35 | 639145.646 | 7213011.402 | 137.17 | Connection to P-30+188 before bedrock contact. | |
| P-30+188 | P | 11-Apr-10 | 136.86 | 9.42 | 0.51 | 10.28 | 639144.767 | 7213010.256 | 137.25 | Connection to T-30+189.5 and S-30+191 while drilling in bedrock. | |
| T-30+189.5 | T | 10-Apr-10 | 136.85 | 8.84 | 0.51 | 9.65 | 639144.025 | 7213008.955 | 137.15 | Novamac. Connection with S-30+191 at 8.75 m upon contact with bedrock, water being pushed out of casing. | |
| S-30+191 | S | 10-Apr-10 | 136.88 | 8.97 | 0.58 | 9.86 | 639143.124 | 7213007.789 | 137.14 | Novamac. Connection with T-30+192.5 @9.24 m, water being pushed out of casing. | |
| T-30+192.5 | T | 10-Apr-10 | 136.85 | 8.60 | 0.71 | 9.61 | 639142.119 | 7213006.566 | 137.09 | Excessive embedment due to small amount of SB noted in return while drilling in bedrock. | |
| P-30+194 | P | 10-Apr-10 | 136.86 | 8.64 | 0.55 | 9.49 | 639141.191 | 7213005.366 | 137.17 | Connection to T-30+195.5 while drilling in bedrock. | |
| T-30+195.5 | T | 10-Apr-10 | 136.83 | 8.78 | 0.54 | 9.62 | 639140.302 | 7213004.169 | 137.24 | | |
| S-30+197 | S | 9-Apr-10 | 136.89 | 9.31 | 0.51 | 10.12 | 639139.413 | 7213003.034 | 137.19 | SB materials soft, hammer triggered for entire length. | |
| T-30+198.5 | T | 9-Apr-10 | 136.92 | 9.81 | 0.51 | 10.62 | 639138.544 | 7213001.897 | 137.20 | SB materials soft, hammer triggered for entire length. | |
| P-30+200 | P | 9-Apr-10 | 136.94 | 8.87 | 0.51 | 9.68 | 639137.500 | 7213000.743 | 137.18 | No return while drilling in bedrock. | |
| T-30+201.5 | T | 12-Apr-10 | 136.89 | 8.74 | 0.50 | 9.54 | 639136.453 | 7212999.653 | 137.21 | No connections observed. Casings installed during day shift were removed. | |
| S-30+203 | S | 13-Apr-10 | 136.91 | 9.02 | 0.53 | 9.85 | 639135.376 | 7212998.508 | 137.20 | | |
| T-30+204.5 | T | 13-Apr-10 | 136.89 | 9.28 | 0.29 | 9.87 | 639134.365 | 7212997.44 | 137.20 | | |
| P-30+206 | P | 13-Apr-10 | 136.89 | 8.51 | 0.57 | 9.38 | 639133.255 | 7212996.472 | 137.26 | SB in return at approximately 8.8 m, driller stated infilled cracks in bedrock. No SB in return after 8.8 m. | |
| T-30+207.5 | T | 13-Apr-10 | 136.91 | 8.72 | 0.48 | 9.50 | 639132.232 | 7212995.385 | 137.16 | | |
| S-30+209 | S | 13-Apr-10 | 136.89 | 9.09 | 0.50 | 9.89 | 639131.050 | 7212994.205 | 137.23 | Connection with T-30+207.5 from 9.05 to 9.59 m (air, water and SB forced out of casing).- Soft material before bedrock. | |
| T-30+210.5 | T | 13-Apr-10 | 136.90 | 9.24 | 0.50 | 10.04 | 639130.122 | 7212993.253 | 137.17 | No connections observed - soft material ~ 3 m before bedrock. | |
| P-30+212 | P | 13-Apr-10 | 136.88 | 9.30 | 0.50 | 10.10 | 639129.022 | 7212992.192 | 137.22 | No connections observed - soft material ~ 3 m before bedrock. | |
| T-30+213.5 | T | 13-Apr-10 | 136.88 | 8.86 | 0.51 | 9.67 | 639127.934 | 7212991.16 | 137.23 | No connections observed - soft material ~ 3m before bedrock - posible fractured rock. | |
| S-30+215 | S | 13-Apr-10 | 136.89 | 9.17 | 0.51 | 9.98 | 639126.867 | 7212990.156 | 137.24 | No connections observed - soft material ~ 3m before bedrock - posible fractured rock. | |
| T-30+216.5 | T | 13-Apr-10 | 136.89 | 8.67 | 0.50 | 9.47 | 639125.808 | 7212989.113 | 137.23 | No connections observed - soft material ~ 3m before bedrock - posible fractured rock. | |
| P-30+218 | P | 13-Apr-10 | 136.88 | 9.00 | 0.51 | 9.81 | 639124.680 | 7212988.017 | 137.26 | No connections observed - soft material ~ 3 m before bedrock. | |
| T-30+219.5 | T | 14-Apr-10 | 136.92 | 9.24 | 0.51 | 10.05 | 639123.577 | 7212986.94 | 137.23 | | |
| S-30+221 | S | 14-Apr-10 | 136.93 | 9.30 | 0.50 | 10.10 | 639122.509 | 7212986.020 | 137.26 | | |
| T-30+222.5 | T | 14-Apr-10 | 136.94 | 8.96 | 0.44 | 9.70 | 639121.457 | 7212984.919 | 137.30 | | |
| P-30+224 | P | 14-Apr-10 | 136.93 | 8.68 | 0.50 | 9.48 | 639120.307 | 7212983.830 | 137.27 | | |
| T-30+225.5 | T | 14-Apr-10 | 136.94 | 8.86 | 0.56 | 9.72 | 639119.258 | 7212982.851 | 137.18 | | |
| S-30+227 | S | 14-Apr-10 | 136.97 | 8.49 | 0.57 | 9.36 | 639118.173 | 7212981.876 | 137.28 | | |
| T-30+228.5 | T | 16-May-10 | 136.92 | 8.18 | 0.48 | 8.96 | 639117.108 | 7212980.758 | 137.32 | | |
| P-30+230 | P | 16-May-10 | 136.95 | 8.09 | 0.53 | 8.92 | -- | -- | -- | | |

Golder Associates

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-30+231.5 | T | 16-May-10 | 136.93 | 8.31 | 0.50 | 9.11 | -- | -- | -- | | |
| S-30+233 | S | 16-May-10 | 136.94 | 8.44 | 0.53 | 9.27 | -- | -- | -- | | |
| T-30+234.5 | T | 16-May-10 | 136.96 | 8.44 | 0.53 | 9.27 | -- | -- | -- | | |
| P-30+236 | P | 16-May-10 | 136.97 | 7.96 | 0.51 | 8.77 | -- | -- | -- | | |
| T-30+237.5 | T | 17-May-10 | 136.97 | 8.30 | 0.50 | 9.10 | -- | -- | -- | | |
| S-30+239 | S | 18-May-10 | 136.95 | 8.65 | 0.50 | 9.45 | -- | -- | -- | | |
| T-30+240.5 | T | 18-May-10 | 136.95 | 8.67 | 0.50 | 9.47 | -- | -- | -- | | |
| P-30+242 | P | 18-May-10 | 136.92 | 8.20 | 0.50 | 9.00 | -- | -- | -- | | |
| T-30+243.5 | T | 18-May-10 | 136.96 | 8.90 | 0.50 | 9.70 | 639106.231 | 7212970.365 | 137.34 | | |
| S-30+245 | S | 18-May-10 | 136.98 | 9.03 | 0.50 | 9.83 | 639105.215 | 7212969.381 | 137.29 | | |
| T-30+246.5 | T | 18-May-10 | 136.98 | 9.00 | 0.50 | 9.80 | 639104.158 | 7212968.285 | 137.37 | | |
| P-30+248 | P | 18-May-10 | 136.98 | 8.95 | 0.50 | 9.75 | 639103.003 | 7212967.275 | 137.30 | | |
| T-30+249.5 | T | 18-May-10 | 136.99 | 8.30 | 0.50 | 9.10 | 639101.893 | 7212966.220 | 137.32 | | |
| S-30+251 | S | 18-May-10 | 136.92 | 8.46 | 0.50 | 9.26 | 639100.909 | 7212965.212 | 137.27 | | |
| T-30+252.5 | T | 19-May-10 | 136.98 | 8.42 | 0.50 | 9.22 | 639099.698 | 7212964.223 | 137.29 | | |
| P-30+254 | P | 19-May-10 | 136.92 | 8.17 | 0.50 | 8.97 | 639098.647 | 7212963.160 | 137.26 | | |
| T-30+255.5 | T | 19-May-10 | 136.93 | 8.46 | 0.48 | 9.20 | 639097.563 | 7212962.015 | 137.25 | Connection to P-30+254 while drilling. heavy hammer trigger required. | |
| S-30+257 | S | 19-May-10 | 136.96 | 8.60 | 0.54 | 9.42 | 639096.446 | 7212961.040 | 137.28 | Heavy hammer trigger required to advance casing. | |
| T-30+258.5 | T | 19-May-10 | 136.96 | 8.57 | 0.51 | 9.40 | 639095.481 | 7212960.030 | 137.31 | Very light to no hammer trigger required to advance casing. | |
| Q-30+259.25 | Q | 29-Sep-11 | 137.30 | 8.79 | 0.50 | 9.44 | -- | -- | -- | | |
| P-30+260 | P | 19-May-10 | 136.98 | 8.59 | 0.50 | 9.40 | 639094.409 | 7212959.007 | 137.19 | Very light to no hammer trigger required to advance casing. | |
| T-30+261.5 | T | 19-May-10 | 136.98 | 8.82 | 0.53 | 9.65 | 639093.253 | 7212957.946 | 137.33 | Very light to no hammer trigger required to advance casing. | |
| S-30+263 | S | 19-May-10 | 136.99 | 9.06 | 0.50 | 9.90 | 639092.158 | 7212956.877 | 137.36 | Very light to no hammer trigger required to advance casing. | |
| T-30+264.5 | T | 19-May-10 | 137.00 | 9.18 | 0.49 | 9.97 | 639090.989 | 7212955.941 | 137.30 | Very light to no hammer trigger required to advance casing. | |
| P-30+266 | P | 19-May-10 | 137.01 | 9.04 | 0.48 | 9.82 | 639089.893 | 7212954.900 | 137.29 | Very light to no hammer trigger required to advance casing. | |
| Q-30+266.75 | Q | 29-Sep-11 | 137.29 | 9.41 | 0.50 | 10.29 | -- | -- | -- | | |
| T-30+267.5 | T | 19-May-10 | 137.01 | 9.17 | 0.57 | 10.04 | 639088.847 | 7212953.931 | 137.39 | Very light to no hammer trigger required to advance casing. | |
| S-30+269 | S | 20-May-10 | 137.00 | 9.12 | 0.50 | 9.92 | 639087.809 | 7212952.891 | 137.32 | | |
| T-30+270.5 | T | 20-May-10 | 137.00 | 9.54 | 0.50 | 10.34 | 639086.708 | 7212951.810 | 137.37 | | |
| P-30+272 | P | 20-May-10 | 137.05 | 9.48 | 0.43 | 10.16 | 639085.634 | 7212950.744 | 137.32 | No loss of water return noted. Unable to determine depth to interface between CSB and SB as there was no observed change in the rate of advance during triconing. | |
| Q-30+272.75 | Q | 26-Sep-11 | 137.31 | 9.27 | 0.48 | 9.93 | -- | -- | -- | Communication to hole Q-30+266.75. | |
| T-30+273.5 | T | 21-May-10 | 137.03 | 9.35 | 0.50 | 10.15 | 639084.583 | 7212949.663 | 137.39 | Lost water return at final triconed depth, 4.6 m. | |
| S-30+275 | S | 21-May-10 | 137.05 | 8.82 | 0.46 | 9.62 | 639083.470 | 7212948.674 | 137.44 | QA of tricone drilling not carried out. Hammer triggered very lightly while advancing casing. Final triconed depth 5.18 m. | |
| T-30+276.5 | T | 21-May-10 | 137.03 | 8.29 | 0.47 | 9.06 | 639082.362 | 7212947.616 | 137.36 | Lost water return at 4.71 m. Soft material encountered between 4.71 and 5.30 m. Final triconed depth 5.30 m. Connected to S-30+275 while advancing casing through SB and bedrock; air blown out of PVC. Hammer triggered very lightly while advancing casing through SB materials. | |
| P-30+278 | P | 21-May-10 | 137.06 | 8.44 | 0.47 | 9.19 | 639081.260 | 7212946.722 | 137.42 | Lost water return at 4.67 m bgs. Final triconed depth 6.20 m bgs. Faster advance with tricone between 4.67 and 6.20 m bgs. Hammer triggered very lightly while advancing casing through SB materials. | |
| Q-30+278.75 | Q | 26-Sep-11 | 137.30 | 8.98 | 0.50 | 9.61 | -- | -- | -- | Communication to hole Q-30+284.75 and Q-30+272.75. | |
| T-30+279.5 | T | 21-May-10 | 137.08 | 8.51 | 0.51 | 9.32 | 639080.029 | 7212945.613 | 137.40 | Lost water return at 4.36 m bgs. Final triconed depth 5.3 m bgs. Faster advance rate with tricone between 4.36 and 5.30 m bgs. Hammer triggered very lightly while advancing casing through SB materials. | |
| S-30+281 | S | 22-May-10 | 137.10 | 8.44 | 0.50 | 9.25 | 639078.977 | 7212944.520 | 137.44 | No loss of water return. | |
| T-30+282.5 | T | 22-May-10 | 137.10 | 8.34 | 0.50 | 9.14 | 639077.867 | 7212943.591 | 137.51 | No loss of water return. | |
| P-30+284 | P | 22-May-10 | 137.11 | 8.46 | 0.50 | 9.26 | 639076.767 | 7212942.479 | 137.44 | No loss of water return. | |

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-30+284.75 | Q | 26-Sep-11 | 137.42 | 8.72 | 0.50 | 9.45 | -- | -- | -- | Communication to hole Q-30+290.75 and Q-30+296.75. | |
| T-30+285.5 | T | 22-May-10 | 137.11 | 8.36 | 0.50 | 9.16 | 639075.707 | 7212941.584 | 137.42 | No loss of water return. | |
| S-30+287 | S | 22-May-10 | 137.13 | 8.30 | 0.49 | 9.09 | 639074.701 | 7212940.643 | 137.49 | QA of casing installation not carried out. Driller observed softer material at 4 m bgs while installing casing. | |
| T-30+288.5 | T | 22-May-10 | 137.11 | 8.23 | 0.49 | 9.02 | -- | -- | -- | Lost water return at 5.28 m bgs. Triconed to 6 m bgs. Soft material encountered between 5.28 and 6 m bgs. | |
| P-30+290 | P | 22-May-10 | 137.09 | 8.11 | 0.52 | 8.93 | -- | -- | -- | Lost water return at 4.99 m bgs. Triconed to 6 m bgs. Soft material encountered below 4.99 m bgs. Connected to S-30+281 during bedrock drilling. Brown water blown out of casing. | |
| Q-30+290.75 | Q | 26-Sep-11 | 137.23 | 8.29 | 0.50 | 9.04 | -- | -- | -- | Communication to hole Q-30+284.75. | |
| T-30+291.5 | T | 22-May-10 | 137.08 | 8.14 | 0.51 | 8.99 | 639071.399 | 7212937.334 | 137.51 | Lost water return at 5.13 m bgs. Soft material noted between 5.13 and 5.75 m bgs. Triconed to 6.2 m bgs. Connected to S-30+281 while drilling through SB. | |
| S-30+293 | S | 23-May-10 | 137.12 | 8.26 | 0.50 | 9.06 | 639070.490 | 7212936.225 | 137.46 | Lost water return at 4.57 m bgs. Little to no resistance between 4.57 and 4.83 m bgs. Connected to S-30+281 at bedrock interface. | |
| T-30+294.5 | T | 23-May-10 | 137.12 | 8.45 | 0.50 | 9.25 | 639069.343 | 7212935.082 | 137.46 | Boulder / cobbles at 4.37 m bgs, changed to hammer bit and casing, boulder ~ 1m thick. | |
| P-30+296 | P | 23-May-10 | 137.14 | 8.34 | 0.50 | 9.14 | 639068.239 | 7212934.051 | 137.45 | No loss of water water return. | |
| Q-30+296.75 | Q | 25-Sep-11 | 137.30 | 8.46 | 0.45 | 8.96 | -- | -- | -- | Communication to hole Q-30+302.75 (between steel and black plastic casing). | |
| T-30+297.5 | T | 23-May-10 | 137.15 | 8.54 | 0.50 | 9.34 | 639067.249 | 7212933.118 | 137.44 | No loss of water water return. | |
| S-30+299 | S | 23-May-10 | 137.11 | 8.38 | 0.50 | 9.18 | 639066.107 | 7212932.141 | 137.39 | Connected to S-30+281 and S-30+293 at bedrock interface. | |
| T-30+300.5 | T | 23-May-10 | 137.11 | 8.64 | 0.44 | 9.38 | 639064.948 | 7212931.183 | 137.42 | Boulder / cobbles at 4.78 m bgs, changed to casing. Connected to S-30+281 while drilling in bedrock. | |
| P-30+302 | P | 23-May-10 | 137.14 | 8.56 | 0.50 | 9.36 | 639063.991 | 7212930.145 | 137.41 | Lost water return at 5.44 m bgs, little resistance between 5.44 and 6.17 m bgs. Connected to T-30+291.5 and S-30+281 while installing casing in SB. | |
| Q-30+302.75 | Q | 25-Sep-11 | 137.14 | 9.26 | 0.30 | 9.59 | -- | -- | -- | | |
| T-30+303.5 | T | 23-May-10 | 137.11 | 8.72 | 0.50 | 9.52 | 639062.811 | 7212929.053 | 137.47 | No loss of water return or soft zone noted. Connected to T-30+291.5 while installing casing in SB. | |
| S-30+305 | S | 23-May-10 | 137.17 | 8.82 | 0.46 | 9.58 | -- | -- | -- | Soft material noted between 6.05 and 6.42 m bgs. Loss of water return possibly due to the rate of advancement. Water return recovered when csb encountered. Connected to T-30+303.5 while advancing through SB. | |
| T-30+306.5 | T | 23-May-10 | 137.15 | 8.43 | 0.59 | 9.32 | -- | -- | -- | Lost water return at 5.19 m bgs, very soft material between 5.19 and 5.79 m bgs. | |
| P-30+308 | P | 24-May-10 | 137.17 | 8.85 | 0.50 | 9.65 | -- | -- | -- | Cobble(s) encountered at 4.70 m bgs. Switched to odex to advance casing. Connected to P-30+302 and T-30+297.5 at bedrock interface. | |
| Q-30+308.75 | Q | 25-Sep-11 | 137.22 | 8.82 | 0.50 | 9.42 | -- | -- | -- | Communication to hole Q-30+302.75. | |
| T-30+309.5 | T | 24-May-10 | 137.11 | 8.27 | 0.50 | 9.07 | -- | -- | -- | soft zone between 6.5 and 6.9 m bgs. momentary loss of water return as rods dropped. water level stayed within 0.5 m of the top of the casing and was quickly recovered. | |
| S-30+311 | S | 24-May-10 | 137.15 | 7.86 | 0.54 | 8.70 | -- | -- | -- | Connected to T-30+309.5 while advancing casing through SB. Water blown out of annular space between steel and PVC collar casings. | |
| T-30+312.5 | T | 24-May-10 | 137.14 | 8.36 | 0.49 | 9.15 | -- | -- | -- | Triconed through cobble at 6.3 m. No loss of water return. CSB/SB interface intersected at 7.34 m. Connected to S-30+305 at bedrock contact. | |
| P-30+314 | P | 24-May-10 | 137.13 | 8.17 | 0.44 | 8.91 | -- | -- | -- | Soft material noted between 5.8 and 6.2 m bgs. No loss of water return. CSB/SB interface intersected at 7.29 m. | |
| Q-30+314.75 | Q | 25-Sep-11 | 136.99 | 9.12 | 0.50 | 9.82 | -- | -- | -- | | |
| T-30+315.5 | T | 24-May-10 | 137.11 | 8.46 | 0.52 | 9.28 | -- | -- | -- | No soft layer or loss of water return. No changes in advancement rate or return were observed. Unable to determine location of CSB/SB interface. | |
| S-30+317 | S | 24-May-10 | 137.10 | 8.70 | 0.53 | 9.53 | -- | -- | -- | Attempted to tricone through cobble at 3.83 m for 20 minutes. Changed to odex to advance casing. CSB/SB interface encountered at 7.75 m while advancing casing. | |
| T-30+318.5 | T | 25-May-10 | 137.05 | 8.47 | 0.50 | 9.27 | -- | -- | -- | No soft layer encountered. No loss of water return. | |
| P-30+320 | P | 25-May-10 | 137.07 | 8.39 | 0.50 | 9.19 | -- | -- | -- | Noulder/cobbles at 7.5 m bgs. Very even steady tricone drilling | |
| Q-30+320.75 | Q | 25-Sep-11 | 137.08 | 8.74 | 0.48 | 9.35 | -- | -- | -- | | |

**TABLE E1-3.1**
**SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES**

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-30+321.5 | T | 25-May-10 | 137.09 | 8.45 | 0.50 | 9.26 | -- | -- | -- | QA of this activity not carried out. Driller reported that underlying SB was not encountered. | |
| S-30+323 | S | 25-May-10 | 137.07 | 8.71 | 0.50 | 9.51 | -- | -- | -- | QA of this activity not carried out. Driller reported that underlying SB was not encountered. | |
| T-30+324.5 | T | 25-May-10 | 137.05 | 8.87 | 0.48 | 9.65 | -- | -- | -- | QA of this activity not carried out. No reported comments from driller. | |
| P-30+326 | P | 25-May-10 | 137.08 | 9.14 | 0.51 | 9.95 | -- | -- | -- | Cobble(s) encountered at 4.26 m bgs. Switched to odex to advance casing. Odex bit clogged while advancing casing through CSB, casing was cut, removed and replaced. Connected to T-30+315.5 and S-30+323 during bedrock drilling. | |
| Q-30+326.75 | Q | 24-Sep-11 | 137.08 | 9.59 | 0.30 | 10.02 | -- | -- | -- | Communication to hole Q-30+332.75. | |
| T-30+327.5 | T | 25-May-10 | 137.05 | 9.38 | 0.52 | 10.20 | -- | -- | -- | Cobble(s) encountered at 6.5 m bgs. Switched to odex to advance casing. | |
| S-30+329 | S | 25-May-10 | 137.06 | 9.54 | 0.50 | 10.37 | -- | -- | -- | Cobble(s) encountered at 6.35 m bgs. Switched to odex to advance casing. | |
| T-30+330.5 | T | 26-May-10 | 137.08 | 9.56 | 0.50 | 10.36 | -- | -- | -- | Cobbles encountered at 8.33 m bgs; Switched to odex to advance casing. Odex hammer jammed inside of casing. Casing was pulled out and pushed back in. Casing possibly not properly seated into bedrock. | |
| P-30+332 | P | 26-May-10 | 137.08 | 9.74 | 0.50 | 10.49 | -- | -- | -- | Cobbles encountered at 4.3 m. Lost water return at 6 m bgs. Switched to odex casing. Soft zone encountered at 7.71 m bgs. Connected to 30+330.5. | |
| Q-30+332.75 | Q | 24-Sep-11 | 137.08 | 10.12 | 0.50 | 10.92 | -- | -- | -- | Installed beyond triconed SB. | |
| T-30+333.5 | T | 26-May-10 | 137.08 | 9.53 | 0.50 | 10.28 | -- | -- | -- | Cobble(s) encountered at 5.6 m bgs. Soft zone encountered at 7.8 m bgs. CSB/SB zone possibly encountered at 6.2 m bgs. Connected to 30+330.5. | |
| S-30+335 | S | 26-May-10 | 137.09 | 9.03 | 0.50 | 9.83 | -- | -- | -- | No soft zones observed. | |
| T-30+336.5 | T | 26-May-10 | 137.10 | 9.64 | 0.50 | 10.44 | -- | -- | -- | Odex hammer jammed inside of casing. Casing was pulled and replaced. Casing possibly not seated properly into bedrock. | |
| P-30+338 | P | 26-May-10 | 137.11 | 9.44 | 0.50 | 10.24 | -- | -- | -- | Cobble(s) / boulder encountered at 3.79 m bgs. Switched to odex hammer to advance casing into bedrock. Connected to 30+336 and 30+330.5. | |
| Q-30+338.75 | Q | 24-Sep-11 | 137.12 | 10.99 | 0.50 | 11.62 | -- | -- | -- | | |
| T-30+339.5 | T | 26-May-10 | 137.13 | 9.46 | 0.50 | 10.21 | -- | -- | -- | Boulder / cobble(s) encountered at 4.17 m bgs. Switched to odex hammer to advance casing into bedrock. cConnected to 30+333.5 and 30+330.5 along bedrock. | |
| S-30+341 | S | 27-May-10 | 137.16 | 10.08 | 0.54 | 10.87 | -- | -- | -- | Cobbles encountered at 6.0 m bgs. Soft layer encountered beween 8.8 m bgs and bedrock (10.08 m bgs). Switched to odex hammer to advance casing at 10 m bgs. Connected to 30+336.5, 30+335, 30+333.5, 30+330.5, 30+327.5, and 30+326. | |
| T-30+342.5 | T | 27-May-10 | 137.17 | 10.19 | 0.46 | 10.85 | -- | -- | -- | Cobbles encountered between 5.5 and 6.2 m bgs. Cobble(s) / boulder at 6.9 m bgs (approximate diameter 0.6 m). Switched to odex casing , to advance hammer. Soft zone encountered between 8.7 m bgs and bedrock (10.19 m bgs). Connected to 30+341, 30+336.5, 30+333.5 through bedrock and soft zone. | |
| P-30+344 | P | 27-May-10 | 137.19 | 9.95 | 0.67 | 10.92 | -- | -- | -- | Cobble(s) / boulder encountered (approximate diameter 0.6 m) at 4.5 m bgs. Switched to odex casing to advance hammer. Slow rate of penetration with odex drill. Soft zone encountered between 9.0 and 9.95 m bgs. Connected to 30+336.5 along bedrock. | |
| Q-30+344.75 | Q | 23-Sep-11 | 137.19 | 11.06 | 0.50 | 11.71 | -- | -- | -- | | |
| T-30+345.5 | T | 27-May-10 | 137.19 | 10.62 | 0.49 | 11.42 | -- | -- | -- | Cobble(s) encountered at 4.5 m bgs and between 5.74 and 6.3 m bgs. Switched to odex hammer to advance casing. Soft layer was not encountered. Connected to 30+341 and 30+336.5 through bedrock. | |
| S-30+347 | S | 28-May-10 | 137.21 | 10.90 | 0.57 | 11.77 | -- | -- | -- | Cobble(s) encountered at 8.2 m bgs. Soft layer encountered between 9.4 m bgs and bedrock (10.9 m bgs). No loss of water return. Connected with 30+341 and 30+336.5 in soft layer and while advancing casing within bedrock. | |
| T-30+348.5 | T | 28-May-10 | 137.24 | 11.00 | 0.40 | 11.70 | -- | -- | -- | Cobbles encountered at 5.1 and 6.2 m bgs. Lost water return at 7.6 m bgs. Switched to odex hammer to advance casing. Connected to 30+347, 30+341 and 30+336.5 between 8.4 m bgs and bedrock. Soft zone encountered between 9.4 m bgs and bedrock (11.0 m bgs). | |
| P-30+350 | P | 28-May-10 | 137.24 | 11.09 | 0.50 | 11.89 | -- | -- | -- | Soft layer encountered between 10.6 m bgs and bedrock (11.09 m bgs). Connected to 30+348.5 at bedrock. Casing possibly not seated properly. | |
| Q-30+350.75 | Q | 23-Sep-11 | 137.23 | 11.10 | 0.48 | 11.78 | -- | -- | -- | Communication to 30+344.75. | |
| T-30+351.5 | T | 28-May-10 | 137.23 | 10.90 | 0.50 | 11.70 | -- | -- | -- | Soft layer encountered between 9.4 m bgs and bedrock (10.9 m bgs). Connected to 30+348.5 and 30+350. Casing possibly not seated properly. | |
| S-30+353 | S | 29-May-10 | 137.26 | 10.70 | 0.46 | 11.46 | -- | -- | -- | Cobbles encountered at 5.2 and 7.2m bgs. Soft zone encountered between 9.6 m bgs and bedrock. Connected to 30+350; no return, most likely due to materials encountered. Soft zone encountered from 9.6 m bgs to bedrock (10.7 m bgs). | |
| S-30+353A | S | 8-Jul-10 | 137.52 | 10.78 | 0.50 | 11.56 | -- | -- | -- | Replacement casing. | |
| T-30+354.5 | T | 29-May-10 | 137.31 | 10.84 | 0.60 | 11.77 | -- | -- | -- | Cobbles encountered at 4.9, 6.7 and 7.9 m bgs. Soft zone encountered at 10 m bgs. No loss of water return. | |

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P-30+356 | P | 29-May-10 | 137.26 | 11.12 | 0.60 | 12.00 | -- | -- | -- | Cobbles encountered at 4.0, 5.5 and 8.0 m bgs. No lost water return. Soft zone encountered at 10.6 m bgs. | |
| T-30+357.5 | T | 29-May-10 | 137.29 | 11.85 | 0.50 | 12.65 | -- | -- | -- | Small soft zone encountered at the bedrock interface. Connected to 30+356. | |
| S-30+359 | S | 29-May-10 | 137.33 | 12.00 | 0.70 | 13.00 | 639023.829 | 7212889.672 | 137.56 | Triconed through cobble(s) at 6.2 m bgs. | |
| T-30+360.5 | T | 30-May-10 | 137.33 | 12.02 | 0.54 | 12.82 | 639022.641 | 7212888.763 | 137.58 | Soft to very soft zone encountered from 9.8 m bgs to bedrock (12.02 m bgs). Connected to 30+575.5 from 9.0-12.02 m bgs. No loss of water return. | |
| P-30+362 | P | 30-May-10 | 137.33 | 12.10 | 0.71 | 13.10 | 639021.509 | 7212887.480 | 137.61 | Cobbles encountered at 4.2 and 6.2 m bgs. Soft zone encountered from 10 m bgs to bedrock (12.10 m bgs). No loss of water return. | |
| T-30+363.5 | T | 30-May-10 | 137.33 | 12.10 | 0.72 | 13.18 | 639020.725 | 7212886.362 | 137.59 | Cobbles encountered at 3.9, 6.3, 9.2 and 10 m bgs. Soft layer encountered from 11 m bgs to bedrock (12.10 mbgs). no loss of water return. | |
| S-30+365 | S | 30-May-10 | 137.33 | 12.56 | 0.55 | 13.37 | 639019.563 | 7212885.235 | 137.59 | Cobbles encountered at 4.6, 6.2, 8.5 and 10 m bgs. Soft layer encountered from 10.6 m bgs to bedrock (12.56 m bgs). No loss of water return. | |
| T-30+366.5 | T | 30-May-10 | 137.33 | 13.20 | 0.50 | 14.00 | 639018.617 | 7212884.116 | 137.60 | QA of this activity not carried out. | |
| P-30+368 | P | 30-May-10 | 137.33 | 12.98 | 0.50 | 13.78 | 639017.722 | 7212883.000 | 137.61 | Soft zone encountered from 11.25 m bgs to bedrock (12.98 m bgs). Connected to 30+365. | |
| T-30+369.5 | T | 30-May-10 | 137.33 | 12.70 | 1.13 | 14.13 | 639016.644 | 7212881.896 | 137.61 | Soft zone encountered from 11.63 m bgs to bedrock (12.7 m bgs). Very fractured bedrock to 12.7 m bgs. | |
| S-30+371 | S | 31-May-10 | 137.33 | 11.80 | 0.60 | 12.70 | 639015.598 | 7212880.848 | 137.61 | Soft zone encountered at 11.4 m bgs. Lost water return at 11.7 m bgs. Connected to 30+369.5 at bedrock interface (11.8 m bgs). | |
| T-30+372.5 | T | 31-May-10 | 137.33 | 13.09 | 0.50 | 13.89 | 639014.619 | 7212879.659 | 137.64 | Cobbles encountered at 5.8, 7.0 and 8.8 m bgs. No loss of water return. | |
| P-30+374 | P | 31-May-10 | 137.28 | 13.08 | 0.50 | 13.88 | -- | -- | -- | | |
| T-30+375.5 | T | 1-Jun-10 | 137.31 | 13.00 | 0.55 | 13.83 | -- | -- | -- | Encountered cobble at 6.3 m bgs. Encountered soft zone at 11.7 m bgs. Water return lost (50%) at bedrock interface (13 m bgs). Switched to odex casing from 12.25 m to bedrock. | |
| S-30+377 | S | 1-Jun-10 | 137.30 | 13.40 | 0.52 | 14.22 | -- | -- | -- | Encountered cobbles at 5.6 and 10.5 m bgs. Soft zone encountered at 10.7 m bgs. No water return loss. Connected to 375.5 at 13.4 m bgs. | |
| T-30+378.5 | T | 1-Jun-10 | 137.33 | 13.58 | 0.46 | 14.34 | -- | -- | -- | Encountered cobble at 7.5 m bgs. Encountered soft layers at 8.5 m bgs and soft / sticky material from 10.4 m bgs to bedrock (13.58 m bgs) which blocked the tricone. | |
| P-30+380 | P | 7-May-10 | 137.35 | 13.92 | 0.53 | 14.75 | 639009.585 | 7212874.113 | 137.67 | Water encountered at 7.5m, 6" dia PVC previously installed to 3.36m. Steady advance as bedrock approached. Very light triggering of hammer bit required to advance casing. Borehole previously drilled with 4.5" tri-cone bit. connection to T-30+381.5 at bedrock contact, water and air blown from inside and outside of casing. | |
| T-30+381.5 | T | 7-May-10 | 137.35 | 14.28 | 0.39 | 14.97 | 639008.563 | 7212873.059 | 137.72 | Water encountered at 4.7m, air return also coming from outside of casing, steady advance as approaching bedrock. Hammer triggered for entire length of borehole, borehole previously drilled with 3.5" tri-cone bit. | |
| S-30+383 | S | 8-May-10 | 137.35 | 12.80 | 0.49 | 13.59 | 639007.572 | 7212871.903 | 137.69 | 6" dia PVC installed to 3.36 m. from 13.27 to 13.91 m very fast advance with little to no resistance (tri-cone). | |
| T-30+384.5 | T | 9-May-10 | 137.35 | 13.94 | 0.50 | 14.74 | 639006.546 | 7212870.794 | 137.74 | 6" PVC installed to 3.36 m. Connection to T-30+381.5 while drilling bedrock. | |
| P-30+386 | P | 9-May-10 | 137.35 | 14.36 | 0.43 | 15.09 | 639005.564 | 7212869.696 | 137.74 | 6" PVC installed to 3.36 m. Connection to T-30+381.5 while drilling bedrock. Very fast advance with little to no resistance from 13.25 to 14.43 m (tri-cone). | |
| T-30+387.5 | T | 9-May-10 | 137.32 | 13.52 | 0.50 | 14.32 | 639004.579 | 7212868.562 | 137.71 | 6" PVC installed to 3.36 m. Very fast advance with little to no resistance from 13.25 to 14.09 m (tri-cone). | |
| S-30+389 | S | 11-May-10 | 137.22 | 14.19 | 0.50 | 14.99 | 639003.592 | 7212867.485 | 137.69 | Connection to T-30+387.5 at 6 m, water blown out of PVC casing; connection to T-30+390.5 at bedrock contact. No casing installed in T-30+390.5 at time of connection, hole drilled with tri-cone to bedrock. SB like material blown out of hole. | |
| T-30+390.5 | T | 11-May-10 | 137.31 | 13.84 | 0.56 | 14.70 | 639002.607 | 7212866.348 | 137.65 | Bit clogged at 7 m while installing casing due to material in hole from connection while installing casing in S-30+389. Return also from outside of casing. | |
| P-30+392 | P | 12-May-10 | 137.31 | 12.62 | 0.50 | 13.42 | 639001.588 | 7212865.180 | 137.64 | Connection to T-30+390.5 at 4.0 m (under frozen layer); Connection again from 10.9 to 12.92 m. Random blow outs from 10.9 to 12.92 m. Grey sandy / silty water blown out of PVC while drilling within wall and out of steel casing while drilling in bedrock. 6" dia PVC installed to 3.36 m. | |
| T-30+393.5 | T | 12-May-10 | 137.29 | 12.70 | 0.56 | 13.56 | 639000.634 | 7212864.088 | 137.56 | Becoming slightly softer at 12.0 m, advance only slightly faster (tri-cone). No connection noted while drilliing within wall or bedrock. 6" dia PVC installed to 3.36 m. Light hammer trigger required to set casing, although slow advance. | |
| S-30+395 | S | 14-May-10 | 137.29 | 12.82 | 0.50 | 13.62 | 638999.565 | 7212862.964 | 137.60 | 6" dia PVC previously installed. Very soft material from 12.22 to 13.22 m, very fast advance with little to no resistance. Information provided TCG. | |
| T-30+396.5 | T | 10-Jun-10 | 137.28 | 13.17 | 0.50 | 14.03 | -- | -- | -- | | |
| P-30+398 | P | 14-May-10 | 137.27 | 12.79 | 0.50 | 13.59 | 638997.585 | 7212860.716 | 137.59 | Very soft material from 12.0 to 13.09 m; very fast advance with little to no resistance (tri-cone). | |

Golder Associates

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-30+399.5 | T | 11-Jun-10 | 137.26 | 13.41 | 0.50 | 14.34 | -- | -- | -- | | |
| S-30+401 | S | 3-Jun-10 | 137.25 | 13.51 | 0.56 | 14.30 | -- | -- | -- | Encountered cobbles at 5.28, 8.1 m bgs. | |
| T-30+402.5 | T | 3-Jun-10 | 137.24 | 12.64 | 0.55 | 13.49 | -- | -- | -- | Very hard rock at 6.2 m bgs (light grey return). Encountered cobbles at 7.4 m bgs. No loss of water return. No connections. | |
| P-30+404 | P | 1-Jun-10 | 137.23 | 13.46 | 0.49 | 14.30 | 638993.587 | 7212856.247 | 137.53 | Encountered cobbles at 4.0 and 8.0 m bgs. Encountered soft zone from 9.5 to 10 m bgs and again at 11.5 m bgs. | |
| T-30+405.5 | T | 1-Jun-10 | 137.22 | 13.01 | 0.21 | 13.58 | 638992.581 | 7212855.111 | 137.35 | | |
| S-30+407 | S | 1-Jun-10 | 137.21 | 11.92 | 0.56 | 12.81 | 638991.552 | 7212854.033 | 137.49 | Cobbles encountered at 4.57 and 7.92 m bgs. Loss of water return from 10.7 to 13.3 m bgs. Connnected to 30+405.5 at 13.3 m bgs | |
| T-30+408.5 | T | 2-Jun-10 | 137.19 | 13.21 | 0.50 | 14.01 | 638990.568 | 7212852.924 | 137.50 | Encountered soft zone from 10.06 to 12.86 m bgs. Loss of water return from 10.06 to 12.86 m bgs and at 13.21 m bgs. Cconnected to 30+407, 30+410 at 13.21 m bgs. | |
| P-30+410 | P | 9-Jun-10 | 137.19 | 13.21 | 0.50 | 14.01 | -- | -- | -- | Encountered soft material at 11.45 mbgs while drilling with tri-cone. | |
| T-30+411.5 | T | 3-Jun-10 | 137.17 | 13.72 | 0.53 | 14.55 | -- | -- | -- | Encountered cobbles at 4.88, 5.7 m bgs. Connected to 30+410 at 13.4 m bgs. | |
| S-30+413 | S | 4-Jun-10 | 137.15 | 13.62 | 0.50 | 14.42 | -- | -- | -- | Hard rock; No connections. | |
| T-30+414.5 | T | 4-Jun-10 | 137.12 | 13.56 | 0.50 | 14.36 | -- | -- | -- | Encountered cobbles at 6.9, 8.9 and 12 m bgs. No loss of water return. No connections. | |
| P-30+416 | P | 4-Jun-10 | 137.10 | 13.75 | 0.50 | 14.55 | -- | -- | -- | Communication to 30+414.5 at 12.8 m bgs. Medium hard bedrock. | |
| T-30+417.5 | T | 4-Jun-10 | 137.10 | 13.72 | 0.50 | 14.52 | -- | -- | -- | Encountered cobble at 8.23 m bgs. Communication with 414.5 at 13 m bgs. | |
| S-30+419 | S | 10-Jun-10 | 137.09 | 13.59 | 0.63 | 14.52 | -- | -- | -- | Connection to 30+423.5 (water and air) while drilling with tri-cone and odex. Walls of 30+423.5 washed away approximately 0.3 m around casing to a depth of 4.8 m below ground surface. Odex bit became clogged while approaching bedrock. | |
| T-30+420.5 | T | 10-Jun-10 | 137.02 | 13.41 | 0.50 | 14.21 | -- | -- | -- | Connection (water and air) to 30+423.5, 30+426.5 and 30+428 while advancing with tri-cone and odex. | |
| P-30+422 | P | 9-Jun-10 | 137.15 | 13.29 | 0.51 | 13.95 | -- | -- | -- | Connection (water and air) to 30+423.5, 30+426.5 and 30+428 while advancing through CSB and SB with the tri-cone and odex. Unable to note soft zone near bedrock. | |
| T-30+423.5 | T | 9-Jun-10 | 137.10 | 13.09 | 0.50 | 13.88 | -- | -- | -- | | |
| S-30+425 | S | 9-Jun-10 | 137.09 | 13.04 | 0.50 | 13.84 | -- | -- | -- | Encountered firm material at 8.72 mbgs. | |
| T-30+426.5 | T | 8-Jun-10 | 137.09 | 12.98 | 0.50 | 13.66 | -- | -- | -- | Encountered firm material at 8.53 mbgs. Encountered soft material during tri-cone drilling from 12-13 mbgs. | |
| P-30+428 | P | 8-Jun-10 | 137.08 | 12.71 | 0.61 | 13.57 | -- | -- | -- | Encountered firm material at 8.09 mbgs. Communication to 30+429.5 and 30+470 at 3 to 4.5 mbgs during casing install. Further communication during casing installation to 30+429.5, 414.5, 416, 470, and 473 near bedrock interface ( 13.22 mbgs). Loss of water return during tricone at 10.08 mbgs. | |
| T-30+429.5 | T | 8-Jun-10 | 137.06 | 12.90 | 0.50 | 13.70 | -- | -- | -- | Loss of water return during tricone at 10.67 mbgs; encountered firm material at 6.18 mbgs. | |
| S-30+431 | S | 8-Jun-10 | 137.06 | 12.29 | 0.50 | 13.09 | -- | -- | -- | Encountered firm material at approx. 9.0 mbgs. Consistent tri-cone blocking; firm to stiff layer at 10.67 mbgs. Connection / bubbling (air) to 30+432.5 and 30+417.5 at bedrock interface (13.1 mbgs). | |
| T-30+432.5 | T | 8-Jun-10 | 137.06 | 12.30 | 0.50 | 13.13 | -- | -- | -- | Encountered firm material at approx. 9.4 mbgs. Loss of water return at 10 mbgs (tricone blocked). Connected to 30+417.5 at bedrock interface (12.3 mbgs). | |
| P-30+434 | P | 8-Jun-10 | 137.04 | 12.35 | 0.50 | 13.15 | -- | -- | -- | Encountered firm material at approx. 10.8 mbgs; Connection to 30+417.5 at bedrock interface (12.34 mbgs). | |
| T-30+435.5 | T | 7-Jun-10 | 137.02 | 12.35 | 0.51 | 13.06 | -- | -- | -- | Connection (water) to 30+417.5 at end of casing install. | |
| Q-30+436.25 | Q | 12-Jul-10 | 137.26 | 12.60 | 0.50 | 13.24 | -- | -- | -- | | |
| S-30+437 | S | 7-Jun-10 | 137.00 | 12.24 | 0.56 | 13.10 | -- | -- | -- | Connections (water) to 30+417.5, 30+470, 30+473 near bedrock interface (12.15 mbgs) during casing install. | |
| Q-30+437.75 | Q | 16-Jul-10 | 137.21 | 12.39 | 0.51 | 13.23 | -- | -- | -- | | |
| T-30+438.5 | T | 7-Jun-10 | 137.02 | 12.21 | 0.50 | 12.81 | -- | -- | -- | Tri-cone 8.53 - 12.21 mbgs; encountered firm material at approx.10.31 mbgs. | |
| Q-30+439.25 | Q | 12-Jul-10 | 137.26 | 12.22 | 0.49 | 12.91 | -- | -- | -- | | |
| P-30+440 | P | 7-Jun-10 | 137.02 | 11.94 | 0.56 | 12.70 | -- | -- | -- | Tri-cone 9.44-11.94 mbgs; encountered firm material at approx. 9.4 m bgs. Connection (air) to 30+441.5; near 100% loss of water return at bedrock interface (11.94 mbgs). | |
| Q-30+440.75 | Q | 16-Jul-10 | 137.27 | 12.11 | 0.51 | 12.81 | -- | -- | -- | Communicated to 443.75 (light air) for entire installation. | |
| T-30+441.5 | T | 7-Jun-10 | 137.02 | 11.75 | 0.50 | 12.55 | -- | -- | -- | Tri-cone 8.99 - 11.74 mbgs; encountered firm material at approx. 11.6 mbgs. Connection (air) to 30+443. | |

Golder Associates

# TABLE E1-3.1
# SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-30+442.25 | Q | 12-Jul-10 | 137.13 | 11.57 | 0.47 | 12.23 | -- | -- | -- | | |
| S-30+443 | S | 6-Jun-10 | 137.02 | 11.58 | 0.46 | 12.30 | -- | -- | -- | Tri-cone 8.92-11.58 mbgs; encountered firm material at approx. 8.61 mbgs. | |
| Q-30+443.75 | Q | 16-Jul-10 | 137.32 | 11.43 | 0.52 | 12.09 | -- | -- | -- | Communicated to 30+446.75 (light air) entire install. | |
| T-30+444.5 | T | 6-Jun-10 | 137.06 | 11.23 | 0.50 | 12.03 | -- | -- | -- | Tri-cone from 8.45-11.23 mbgs; encountered firm material at approx. 8.15 mbgs. | |
| Q-30+445.25 | Q | 12-Jul-10 | 137.41 | 10.86 | 0.45 | 11.61 | -- | -- | -- | Soft zone 0.3 m thick zone just above bedrock interface. | |
| P-30+446 | P | 6-Jun-10 | 137.07 | 11.18 | 0.52 | 11.96 | -- | -- | -- | Tri-cone 10.08-11.18 mbgs; encountered firm material at approx. 10.16 mbgs; connection (air) to 30+350.5. | |
| Q-30+446.75 | Q | 16-Jul-10 | 137.34 | 11.16 | 0.50 | 12.03 | -- | -- | -- | Communicated to 30+448.25 and 451.25 (light air) entire install. | |
| T-30+447.5 | T | 6-Jun-10 | 137.05 | 11.59 | 0.46 | 12.35 | -- | -- | -- | Tri-cone 8.74-11.64 mbgs; encountered firm material at approx. 9.75 mbgs; black cuttings while drilling rock. | |
| Q-30+448.25 | Q | 12-Jul-10 | 137.03 | 11.61 | 0.50 | 12.41 | -- | -- | -- | Communicated to 30+445.25 & 30+442.25 at bedrock interface. | |
| S-30+449 | S | 6-Jun-10 | 137.04 | 11.38 | 0.50 | 12.18 | -- | -- | -- | Tri-cone 8.74-11.38 mbgs; encountered firm material at approx. 10 mbgs; connection (air) with 30+350.5. | |
| Q-30+449.75 | Q | 16-Jul-10 | 137.35 | 11.27 | 0.54 | 12.05 | -- | -- | -- | Communicated to 30+448.25 and 451.25 (light air) entire install. | |
| T-30+450.5 | T | 5-Jun-10 | 137.06 | 11.17 | 0.50 | 11.97 | -- | -- | -- | Tri-cone in CSB from 8.99 mbgs to bedrock (11.17 m bgs). | |
| Q-30+451.25 | Q | 12-Jul-10 | 137.02 | 10.84 | 0.51 | 11.65 | -- | -- | -- | Communicated to 30+448.25 at bedrock interface. | |
| P-30+452 | P | 5-Jun-10 | 137.05 | 10.77 | 0.50 | 11.57 | -- | -- | -- | Odex from 3.35 m to bedrock (10.48 m bgs); no tri-cone drilling. | |
| T-30+453.5 | T | 5-Jun-10 | 137.12 | 10.85 | 0.50 | 11.65 | -- | -- | -- | Odex from 3.35 m to bedrock (10.63 m bgs); no tri-cone drilling. | |
| S-30+455 | S | 5-Jun-10 | 137.14 | 11.22 | 0.50 | 12.02 | -- | -- | -- | Odex casing from 3.35 mbgs to bedrock (11.22 mbgs); no tri-cone drilling. Soft SB material at 4.4 mbgs; encountered firm material at approx. 10.8 mbgs. | |
| Q-30+455.75 | Q | 14-Jul-10 | 137.18 | 10.81 | 0.50 | 11.61 | -- | -- | -- | Communicated to 457.25 (air) at bedrock interface. | |
| T-30+456.5 | T | 5-Jun-10 | 137.17 | 10.50 | 0.51 | 11.31 | -- | -- | -- | Odex from 3.35 mbgs to bedrock (10.5 mbgs); no tri-cone drilling. Soft SB material at 4.4 mbgs; encountered firm material at approx. 10.1 mbgs. | |
| Q-30+457.25 | Q | 14-Jul-10 | 137.23 | 9.90 | 0.52 | 10.65 | -- | -- | -- | | |
| P-30+458 | P | 5-Jun-10 | 137.18 | 9.80 | 0.57 | 10.67 | -- | -- | -- | Odex from 3.35 m to bedrock (9.8 mbgs); no tri-cone drilling. Soft SB material at 4.7mbgs. | |
| Q-30+458.75 | Q | 10-Jul-10 | 137.22 | 9.72 | 0.50 | 10.45 | -- | -- | -- | | |
| T-30+459.5 | T | 5-Jun-10 | 137.21 | 10.12 | 0.50 | 10.99 | -- | -- | -- | Odex from 3.35 mbgs to bedrock (10.12 mbgs); soft SB material at 4.7 mbgs; encountered firm material at approx. 9.9 mbgs. | |
| Q-30+460.25 | Q | 9-Jul-10 | 137.30 | 10.25 | 0.51 | 10.90 | -- | -- | -- | Connected to T-30+462.5, T-30+459.5, T-30+453.5. | |
| S-30+461 | S | 5-Jun-10 | 137.22 | 10.12 | 0.60 | 10.95 | -- | -- | -- | Odex from 3.35 m bgs to bedrock (10.12 mbgs); no tri-cone drilling. Soft, SB material at 4 mbgs; encountered firm material at approx. 9.8 mbgs; fractured bedrock from 10.12 to 10.42 mbgs. | |
| Q-30+461.75 | Q | 14-Jul-10 | 137.21 | 9.79 | 0.50 | 10.57 | -- | -- | -- | Communicated to 30+463.25 (air) from 4 m depth to end of install. | |
| T-30+462.5 | T | 5-Jun-10 | 137.26 | 10.31 | 0.48 | 10.94 | -- | -- | -- | Odex from 3.35 m to bedrock (10.31 m bgs); no tri-cone drilling. | |
| Q-30+463.25 | Q | 14-Jul-10 | 137.29 | 9.38 | 0.51 | 10.13 | -- | -- | -- | Communicated to 30+460.25 (slow water outflow) at bedrock interface. | |
| P-30+464 | P | 4-Jun-10 | 137.27 | 9.56 | 0.56 | 10.42 | -- | -- | -- | Pre-drilled with 4.5" tricone to 3.35 m bgs; odex to bedrock. | |
| T-30+465.5 | T | 4-Jun-10 | 137.27 | 8.97 | 0.84 | 10.16 | -- | -- | -- | Pre-drilled with 4.5" tricone to 3.35 m bgs; odex to bedrock. | |
| S-30+467 | S | 4-Jun-10 | 137.28 | 9.00 | 0.58 | 9.93 | -- | -- | -- | Pre-drilled with 4.5" tricone to 3.35 m bgs; odex to bedrock. | |
| T-30+468.5 | T | 13-Apr-10 | 137.29 | 9.00 | 0.50 | 9.78 | -- | -- | -- | | |
| P-30+470 | P | 14-Apr-10 | 137.32 | 8.86 | 0.55 | 9.71 | 638955.512 | 7212803.480 | 137.57 | Water encountered at 4.9 m. Casing weld broken at 8.5m, casing removed and rewelded twice. | |
| T-30+471.5 | T | 14-Apr-10 | 137.32 | 8.78 | 0.51 | 9.59 | 638955.014 | 7212802.118 | 137.66 | Casing weld broken at 8.5 m, casing removed, rewelded and replaced. | |
| S-30+473 | S | 14-Apr-10 | 137.35 | 8.44 | 0.54 | 9.28 | 638954.488 | 7212800.710 | 137.61 | Connection to T-30+471.5. Was noted while drilling in bedrock | |
| T-30+474.5 | T | 14-Apr-10 | 137.33 | 8.58 | 0.51 | 9.39 | 638953.910 | 7212799.242 | 137.63 | No connections observed. | |
| P-30+476 | P | 14-Apr-10 | 137.35 | 8.67 | 0.51 | 9.49 | 638953.375 | 7212797.873 | 137.59 | No connections observed. Soft material ~2 m before bedrock. | |
| T-30+477.5 | T | 14-Apr-10 | 137.32 | 8.47 | 0.51 | 9.30 | 638952.931 | 7212796.539 | 137.64 | No connections observed. Soft material ~2m before bedrock. | |
| S-30+479 | S | 14-Apr-10 | 137.35 | 8.43 | 0.51 | 9.26 | 638952.323 | 7212795.097 | 137.68 | Connection to T-30+477.5 at 8.3 mbgs (fractured rock). Soft material ~2m before bedrock. | |
| T-30+480.5 | T | 14-Apr-10 | 137.35 | 8.34 | 0.50 | 9.14 | 638951.776 | 7212793.726 | 137.63 | No connections observed. Soft material ~2 m before bedrock. | |
| P-30+482 | P | 15-Apr-10 | 137.37 | 8.48 | 0.42 | 9.20 | 638951.311 | 7212792.371 | 137.64 | | |

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# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-30+483.5 | T | 15-Apr-10 | 137.34 | 8.26 | 0.50 | 9.06 | 638950.790 | 7212790.784 | 137.70 | Connection to P-30+482 while drilling in bedrock - water blown out of casing. | |
| S-30+485 | S | 15-Apr-10 | 137.32 | 7.98 | 0.60 | 8.88 | 638950.174 | 7212789.461 | 137.59 | | |
| T-30+486.5 | T | 15-Apr-10 | 137.31 | 8.04 | 0.52 | 8.76 | 638949.675 | 7212788.031 | 137.57 | | |
| P-30+488 | P | 15-Apr-10 | 137.36 | 9.14 | 0.50 | 9.84 | 638949.148 | 7212786.600 | 137.54 | No connections observed. | |
| T-30+489.5 | T | 15-Apr-10 | 137.35 | 9.05 | 0.50 | 9.82 | 638948.642 | 7212785.269 | 137.61 | No connections observed. | |
| S-30+491 | S | 15-Apr-10 | 137.36 | 9.02 | 0.50 | 9.82 | 638948.066 | 7212783.820 | 137.63 | Connection with T-30+495.5 when bedrock was reached. Possible fractured rock. | |
| T-30+492.5 | T | 15-Apr-10 | 137.36 | 8.73 | 0.50 | 9.53 | 638947.595 | 7212782.442 | 137.59 | Connection with T-30+495.5 from 6.3 to 9.15 mbgs (water + SB blew out of casing). | |
| P-30+494 | P | 15-Apr-10 | 137.29 | 8.38 | 0.50 | 9.18 | 638947.100 | 7212781.040 | 137.61 | Connection with T-30+495.5 at 8.25 mbgs (water + SB blew out of casing). | |
| T-30+495.5 | T | 15-Apr-10 | 137.31 | 8.35 | 0.50 | 9.15 | 638946.637 | 7212779.591 | 137.59 | No connections observed. | |
| S-30+497 | S | 15-Apr-10 | 137.25 | 7.98 | 0.50 | 8.78 | 638946.208 | 7212778.220 | 137.52 | No connections observed. | |
| T-30+498.5 | T | 16-Apr-10 | 137.25 | 7.68 | 0.46 | 8.34 | 638945.688 | 7212776.740 | 137.43 | | |
| P-30+500 | P | 16-Apr-10 | 137.23 | 7.87 | 0.51 | 8.58 | 638945.328 | 7212775.367 | 137.44 | | |
| T-30+501.5 | T | 16-Apr-10 | 137.27 | 7.87 | 0.50 | 8.57 | 638945.214 | 7212773.848 | 137.45 | | |
| S-30+503 | S | 16-Apr-10 | 137.23 | 7.88 | 0.49 | 8.57 | 638945.273 | 7212772.353 | 137.37 | | |
| T-30+504.5 | T | 15-Apr-10 | 137.15 | 7.36 | 0.51 | 8.15 | 638945.401 | 7212770.860 | 137.50 | | |
| P-30+506 | P | 15-Apr-10 | 137.18 | 7.46 | 0.44 | 8.16 | 638945.469 | 7212769.439 | 137.45 | | |
| T-30+507.5 | T | 15-Apr-10 | 137.16 | 7.66 | 0.45 | 8.36 | 638945.536 | 7212767.861 | 137.46 | | |
| S-30+509 | S | 15-Apr-10 | 137.18 | 7.57 | 0.51 | 8.36 | 638945.612 | 7212766.326 | 137.47 | | |
| T-30+510.5 | T | 15-Apr-10 | 137.15 | 7.41 | 0.47 | 8.16 | 638945.719 | 7212764.868 | 137.52 | Connection to P-30+512 at contact with bedrock - air blown out of casing. | |
| P-30+512 | P | 15-Apr-10 | 137.08 | 7.46 | 0.41 | 8.15 | 638945.735 | 7212763.374 | 137.44 | | |
| T-30+513.5 | T | 15-Apr-10 | 137.16 | 7.79 | 0.29 | 8.42 | 638945.792 | 7212761.816 | 137.50 | Connection to S-30+515 while drilling in bedrock - water blown out of casing. | |
| S-30+515 | S | 15-Apr-10 | 137.13 | 7.52 | 0.49 | 8.31 | 638945.859 | 7212760.364 | 137.49 | Connection to T-30+516.5 at contact with bedrock - water blown out of casing, air bubbling from outside of casing. | |
| T-30+516.5 | T | 15-Apr-10 | 137.18 | 7.58 | 0.50 | 8.38 | 638945.955 | 7212758.845 | 137.49 | Connection to P-30+518 at contact with bedrock - water blown out of casing, air bubbling from outside of casing. | |
| P-30+518 | P | 15-Apr-10 | 137.18 | 8.72 | 0.52 | 9.54 | 638945.992 | 7212757.328 | 137.47 | | |
| T-30+519.5 | T | 14-Apr-10 | 137.21 | 8.27 | 0.50 | 9.03 | 638946.210 | 7212755.912 | 137.50 | No connections observed. Soft material ~3 m before bedrock. Possible fractured rock. | |
| S-30+521 | S | 14-Apr-10 | 137.18 | 8.35 | 0.50 | 9.15 | 638946.262 | 7212754.408 | 137.58 | No connections observed. Soft material ~3 m before bedrock. Possible fractured rock. | |
| T-30+522.5 | T | 14-Apr-10 | 137.20 | 8.36 | 0.51 | 9.17 | 638946.281 | 7212752.858 | 137.56 | No connections observed. Soft material ~2.5 m before bedrock. Possible fractured rock. | |
| P-30+524 | P | 14-Apr-10 | 137.18 | 8.45 | 0.51 | 9.28 | 638946.303 | 7212751.388 | 137.55 | No connections observed. Soft material ~3 m before bedrock. Possible fractured rock. | |
| Q-30+524.75 | Q | 8-Jul-10 | 137.27 | 8.13 | 0.50 | 8.83 | -- | -- | -- | | |
| T-30+525.5 | T | 14-Apr-10 | 137.16 | 7.13 | 0.51 | 7.95 | 638946.372 | 7212749.899 | 137.54 | no connections observed. Soft material ~3 m before bedrock. | |
| Q-30+526.25 | Q | 8-Jul-10 | 137.24 | 8.33 | 0.50 | 8.99 | -- | -- | -- | | |
| S-30+527 | S | 14-Apr-10 | 137.21 | 8.45 | 0.51 | 9.20 | 638946.425 | 7212748.402 | 137.45 | No connections observed. Soft material ~3 m before bedrock. Possible fractured rock. | |
| T-30+528.5 | T | 16-Apr-10 | 137.16 | 8.03 | 0.47 | 8.70 | 638946.455 | 7212746.898 | 137.29 | | |
| P-30+530 | P | 16-Apr-10 | 137.15 | 7.70 | 0.50 | 8.50 | 638946.611 | 7212745.370 | 137.49 | No connections observed. | |
| T-30+531.5 | T | 16-Apr-10 | 137.14 | 7.35 | 0.50 | 8.15 | 638946.598 | 7212743.911 | 137.48 | No connections observed. | |
| S-30+533 | S | 16-Apr-10 | 137.18 | 7.12 | 0.50 | 7.92 | 638946.681 | 7212742.376 | 137.50 | No connections observed. | |
| T-30+534.5 | T | 16-Apr-10 | 137.18 | 7.68 | 0.50 | 8.48 | 638946.750 | 7212740.824 | 137.41 | No connections observed. | |
| P-30+536 | P | 17-Apr-10 | 137.16 | 7.24 | 0.50 | 8.04 | 638946.805 | 7212739.383 | 137.56 | Connection with T-30+537.5 at bedrock contact (air came out of casing). | |
| T-30+537.5 | T | 17-Apr-10 | 137.19 | 7.08 | 0.50 | 7.88 | 638946.896 | 7212737.865 | 137.54 | No connections observed. | |
| S-30+539 | S | 17-Apr-10 | 137.20 | 6.97 | 0.50 | 7.77 | 638946.942 | 7212736.433 | 137.53 | No connections observed. | |

Golder Associates

# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-30+540.5 | T | 17-Apr-10 | 137.19 | 6.82 | 0.50 | 7.62 | 638947.016 | 7212734.922 | 137.54 | Connection with S-30+545 and P-30+548 at 6.77 mbgs (water + SB blown out of casing). | |
| P-30+542 | P | 17-Apr-10 | 137.17 | 6.70 | 0.50 | 7.50 | 638947.114 | 7212733.352 | 137.49 | Connection with t-30+543.5 at 6.65 mbgs (water + SB blown out of casing). | |
| T-30+543.5 | T | 17-Apr-10 | 137.14 | 6.51 | 0.50 | 7.31 | 638947.204 | 7212731.932 | 137.53 | Connection with s-30+545 at 6.5 mbgs (water + SB blown out of casing). | |
| S-30+545 | S | 17-Apr-10 | 137.11 | 6.46 | 0.50 | 7.26 | 638947.256 | 7212730.335 | 137.47 | No connections observed. | |
| T-30+546.5 | T | 17-Apr-10 | 137.09 | 6.48 | 0.50 | 7.28 | 638947.229 | 7212728.854 | 137.43 | Connection with p-30+548 at 6.45 mbgs (water + SB blown out of casing). | |
| P-30+548 | P | 17-Apr-10 | 137.05 | 6.40 | 0.54 | 7.24 | 638947.366 | 7212727.450 | 137.45 | Connection to T-30+549.5 at bedrock contact - water blown out of casing. | |
| T-30+549.5 | T | 17-Apr-10 | 137.04 | 6.54 | 0.50 | 7.34 | 638947.440 | 7212725.877 | 137.43 | Connection to T-30+552.5 and s-30+551 while drilling bedorck - water blown out of casing. | |
| S-30+551 | S | 17-Apr-10 | 137.01 | 6.57 | 0.43 | 7.30 | 638947.515 | 7212724.387 | 137.40 | Connection to T-30+552.5 at bedrock contact - water blown out of casing. | |
| Q-30+551.75 | Q | 9-Jul-10 | 137.14 | 6.88 | 0.41 | 7.47 | -- | -- | -- | Connected to upstream edge of dike. | |
| T-30+552.5 | T | 17-Apr-10 | 137.01 | 7.68 | 0.58 | 8.56 | 638947.553 | 7212722.923 | 137.41 | | |
| Q-30+553.25 | Q | 9-Jul-10 | 137.14 | 6.92 | 0.50 | 7.65 | -- | -- | -- | Connected to upstream edge of dike, Q-30+551.75, T-30+552.5. | |
| P-30+554 | P | 16-Apr-10 | 137.00 | 6.76 | 0.49 | 7.55 | 638947.653 | 7212721.436 | 137.39 | Connection to T-30+557 at bedrock contact - water blown out of casing. | |
| T-30+555.5 | T | 16-Apr-10 | 137.01 | 6.24 | 0.50 | 7.04 | 638947.720 | 7212719.925 | 137.35 | | |
| S-30+557 | S | 16-Apr-10 | 137.04 | 6.55 | 0.48 | 7.33 | 638947.745 | 7212718.380 | 137.32 | Connection to T-30+558.5 while drilling in bedrock - water blown out of casing. | |
| T-30+558.5 | T | 16-Apr-10 | 137.05 | 6.99 | 0.56 | 7.83 | 638947.810 | 7212716.892 | 137.37 | | |
| P-30+560 | P | 16-Apr-10 | 137.06 | 7.73 | 0.39 | 8.40 | 638947.877 | 7212715.452 | 137.30 | | |
| T-30+561.5 | T | 16-Apr-10 | 137.07 | 7.50 | 0.50 | 8.34 | 638947.982 | 7212713.895 | 137.40 | | |
| S-30+563 | S | 16-Apr-10 | 137.10 | 7.85 | 0.30 | 8.45 | 638948.010 | 7212712.455 | 137.42 | Connection to T-30+564.5 at bedrock contact - water blown out of casing. | |
| T-30+564.5 | T | 15-Apr-10 | 137.12 | 7.83 | 0.50 | 8.63 | 638948.046 | 7212710.945 | 137.50 | No connections observed. | |
| P-30+566 | P | 15-Apr-10 | 137.12 | 7.65 | 0.50 | 8.45 | 638948.134 | 7212709.424 | 137.47 | Connection with T-30+567.5 at 6.95 mbgs (air came out of casing). | |
| T-30+567.5 | T | 15-Apr-10 | 137.18 | 7.88 | 0.50 | 8.68 | 638948.233 | 7212707.935 | 137.53 | No connections observed. | |
| S-30+569 | S | 15-Apr-10 | 137.23 | 7.74 | 0.50 | 8.55 | 638948.318 | 7212706.406 | 137.52 | No connections observed. | |
| T-30+570.5 | T | 15-Apr-10 | 137.24 | 7.65 | 0.50 | 8.43 | 638948.355 | 7212704.931 | 137.59 | No connections observed. | |
| P-30+572 | P | 15-Apr-10 | 137.29 | 7.98 | 0.50 | 8.78 | 638948.418 | 7212703.513 | 137.73 | Connection with T-30+573.5 at 7.5 mbgs (water + SB blew out of casing). | |
| T-30+573.5 | T | 15-Apr-10 | 137.32 | 8.20 | 0.52 | 8.97 | 638948.478 | 7212701.949 | 137.68 | No connections observed. | |
| S-30+575 | S | 15-Apr-10 | 137.34 | 7.65 | 0.50 | 8.45 | 638948.569 | 7212700.449 | 137.70 | No connections observed. | |
| T-30+576.5 | T | 15-Apr-10 | 137.36 | 7.60 | 0.50 | 8.40 | 638948.632 | 7212698.954 | 137.77 | No connections observed. | |
| P-30+578 | P | 15-Apr-10 | 137.38 | 7.37 | 0.50 | 8.15 | 638948.712 | 7212697.383 | 137.66 | No connections observed. | |
| T-30+579.5 | T | 18-Apr-10 | 137.41 | 7.61 | 0.51 | 8.42 | 638948.734 | 7212696.008 | 137.73 | | |
| S-30+581 | S | 18-Apr-10 | 137.44 | 7.69 | 0.50 | 8.49 | 638948.836 | 7212694.461 | 137.73 | | |
| T-30+582.5 | T | 18-Apr-10 | 137.39 | 7.76 | 0.49 | 8.55 | 638948.888 | 7212692.990 | 137.75 | | |
| P-30+584 | P | 18-Apr-10 | 137.39 | 7.78 | 0.50 | 8.58 | 638948.983 | 7212691.451 | 137.71 | No connections observed. Strong rock. | |
| T-30+585.5 | T | 18-Apr-10 | 137.37 | 7.94 | 0.50 | 8.74 | 638948.994 | 7212689.943 | 137.78 | No connections observed. Strong rock. | |
| S-30+587 | S | 18-Apr-10 | 137.35 | 8.03 | 0.50 | 8.83 | 638949.110 | 7212688.412 | 137.73 | No connections observed. Strong rock. | |
| Q-30+587.75 | Q | 25-Jun-10 | 137.40 | 8.14 | 0.55 | 9.02 | -- | -- | -- | | |
| T-30+588.5 | T | 18-Apr-10 | 137.35 | 8.08 | 0.50 | 8.88 | 638949.219 | 7212686.859 | 137.63 | Connection with P-30+590 at bedrock contact (air+water+SB blown out of casing). | |
| Q-30+589.25 | Q | 25-Jun-10 | 137.32 | 7.84 | 0.55 | 8.59 | -- | -- | -- | | |
| P-30+590 | P | 18-Apr-10 | 137.32 | 7.77 | 0.50 | 8.57 | 638949.179 | 7212685.461 | 137.60 | Connection with T-30+591.5 at bedrock contact (water+SB blown out of casing). | |
| T-30+591.5 | T | 18-Apr-10 | 137.29 | 7.75 | 0.50 | 8.55 | 638949.350 | 7212683.920 | 137.66 | No connections observed. | |
| T-30+591.5A | T | 25-Jun-10 | 137.63 | 7.99 | 0.50 | 8.64 | -- | -- | -- | Replacement for bent casing. | |
| S-30+593 | S | 18-Apr-10 | 137.27 | 8.14 | 0.50 | 8.94 | 638949.308 | 7212682.458 | 137.60 | No connections observed. | |
| T-30+594.5 | T | 18-Apr-10 | 137.29 | 8.00 | 0.50 | 8.80 | 638949.466 | 7212680.915 | 137.64 | Connection with P-30+596 and T-30+597.5 at bedrock contact. (water + SB blown out of casing). | |
| P-30+596 | P | 18-Apr-10 | 137.23 | 7.30 | 0.48 | 8.08 | 638949.501 | 7212679.447 | 137.54 | | |

Golder Associates

# TABLE E1-3.1
# SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-30+597.5 | T | 18-Apr-10 | 137.21 | 7.35 | 0.47 | 8.12 | 638949.581 | 7212677.982 | 137.48 | | |
| S-30+599 | S | 18-Apr-10 | 137.23 | 7.79 | 0.58 | 8.67 | 638949.660 | 7212676.498 | 137.57 | Connection to S-30+647 while drilling in bedrock. Casing for S-30+647 at 3.7 m during time of connection. | |
| T-30+600.5 | T | 18-Apr-10 | 137.15 | 8.24 | 0.51 | 9.05 | 638949.781 | 7212674.991 | 137.49 | | |
| P-30+602 | P | 18-Apr-10 | 137.16 | 8.28 | 0.50 | 9.08 | 638949.783 | 7212673.412 | 137.45 | | |
| T-30+603.5 | T | 18-Apr-10 | 137.15 | 8.28 | 0.48 | 9.18 | 638949.874 | 7212672.014 | 137.57 | Weathered bedrock from 8.28 - 8.58 m. | |
| S-30+605 | S | 18-Apr-10 | 137.13 | 8.23 | 0.42 | 8.88 | 638949.939 | 7212670.461 | 137.37 | | |
| T-30+606.5 | T | 17-Apr-10 | 137.12 | 7.93 | 0.50 | 8.73 | 638950.001 | 7212668.964 | 137.50 | No connections observed. | |
| P-30+608 | P | 17-Apr-10 | 137.16 | 8.28 | 0.50 | 9.08 | 638950.063 | 7212667.446 | 137.49 | No connections observed (SB material blown out of casing when drilling finished). | |
| T-30+609.5 | T | 17-Apr-10 | 137.15 | 7.30 | 0.50 | 8.10 | 638950.107 | 7212665.889 | 137.49 | No connections observed. | |
| S-30+611 | S | 17-Apr-10 | 137.14 | 7.05 | 0.50 | 7.85 | 638950.221 | 7212664.466 | 137.48 | Connection with T-30+612.5 at 7.0 mbgs (water + air pressure blown out of casing). | |
| T-30+612.5 | T | 17-Apr-10 | 137.18 | 6.81 | 0.50 | 7.61 | 638950.258 | 7212662.985 | 137.51 | Connection with T-30+614 at 6.76 mbgs (air pressure came out of casing). | |
| P-30+614 | P | 17-Apr-10 | 137.17 | 6.89 | 0.50 | 7.69 | 638950.411 | 7212661.462 | 137.46 | Connection with T-30+615.5 from 6.85 to 6.9 mbgs (air pressure came out of casing). | |
| Q-30+614.75 | Q | 25-Jun-10 | 137.66 | 7.04 | 0.50 | 7.74 | -- | -- | -- | | |
| T-30+615.5 | T | 17-Apr-10 | 137.17 | 6.61 | 0.50 | 7.41 | 638950.419 | 7212659.967 | 137.52 | No connections observed. | |
| Q-30+616.25 | Q | 24-Jun-10 | 137.41 | 7.18 | 0.50 | 7.81 | -- | -- | -- | | |
| S-30+617 | S | 17-Apr-10 | 137.13 | 7.09 | 0.50 | 7.89 | 638950.498 | 7212658.444 | 137.49 | No connections observed. | |
| Q-30+617.75 | Q | 24-Jun-10 | 137.29 | 7.43 | 0.50 | 8.08 | -- | -- | -- | Connected to 30+621 from ~5 m bgs to bedrock interface and to 30+619.25 at bedrock interface, and while setting casing in bedrock. | |
| T-30+618.5 | T | 17-Apr-10 | 137.12 | 7.45 | 0.50 | 8.23 | 638950.501 | 7212656.961 | 137.46 | No connections observed. | |
| Q-30+619.25 | Q | 24-Jun-10 | 137.28 | 8.02 | 0.50 | 8.67 | -- | -- | -- | Connected to 30+621 from ~4.9 m bgs to bedrock interface, and while setting casing in bedrock. | |
| P-30+620 | P | 17-Apr-10 | 137.11 | 8.07 | 0.43 | 8.80 | 638950.560 | 7212655.478 | 137.42 | | |
| T-30+621.5 | T | 17-Apr-10 | 137.12 | 8.46 | 0.50 | 9.26 | 638950.679 | 7212653.981 | 137.50 | | |
| S-30+623 | S | 17-Apr-10 | 137.11 | 8.22 | 0.49 | 8.97 | 638950.756 | 7212652.457 | 137.41 | | |
| Q-30+623.75 | Q | 24-Jun-10 | 137.27 | 8.27 | 0.50 | 8.92 | -- | -- | -- | Connected to 30+621 from ~4.7 m bgs to bedrock interface, and while setting casing in bedrock. | |
| T-30+624.5 | T | 17-Apr-10 | 137.09 | 7.92 | 0.53 | 8.75 | 638950.802 | 7212650.948 | 137.40 | | |
| Q-30+625.25 | Q | 24-Jun-10 | 137.26 | 8.13 | 0.50 | 8.76 | -- | -- | -- | Connected to 30+621 from ~5 m bgs to bedrock interface. | |
| P-30+626 | P | 17-Apr-10 | 137.12 | 7.20 | 0.52 | 8.02 | 638950.891 | 7212649.482 | 137.35 | | |
| T-30+627.5 | T | 17-Apr-10 | 137.08 | 8.19 | 0.54 | 8.99 | 638950.955 | 7212647.959 | 137.36 | | |
| S-30+629 | S | 17-Apr-10 | 137.05 | 8.07 | 0.50 | 8.87 | 638951.089 | 7212646.506 | 137.40 | | |
| T-30+630.5 | T | 17-Apr-10 | 137.09 | 8.02 | 0.44 | 8.78 | 638951.392 | 7212645.010 | 137.36 | | |
| P-30+632 | P | 16-Apr-10 | 137.08 | 7.93 | 0.50 | 8.73 | 638951.647 | 7212643.610 | 137.43 | No connections observed. | |
| T-30+633.5 | T | 16-Apr-10 | 137.09 | 8.22 | 0.50 | 9.02 | 638951.966 | 7212642.082 | 137.41 | Connection with S-30+635 at 0.3 m before bedrock contact. Water and SB material blown out of casing. | |
| S-30+635 | S | 16-Apr-10 | 137.08 | 8.24 | 0.50 | 9.04 | 638952.257 | 7212640.621 | 137.44 | Connection with T-30+636.5 at 0.5 m before bedrock contact. Water and SB material blown out of casing. | |
| T-30+636.5 | T | 16-Apr-10 | 137.07 | 8.15 | 0.50 | 8.95 | 638952.546 | 7212639.135 | 137.41 | No connections observed. | |
| P-30+638 | P | 18-Apr-10 | 137.02 | 8.11 | 0.50 | 8.91 | 638952.796 | 7212637.651 | 137.38 | No connections observed. | |
| T-30+639.5 | T | 18-Apr-10 | 137.00 | 7.91 | 0.50 | 8.71 | 638953.088 | 7212636.224 | 137.40 | No connections observed. | |
| S-30+641 | S | 18-Apr-10 | 137.00 | 7.88 | 0.50 | 8.68 | 638953.338 | 7212634.658 | 137.36 | No connections observed. | |
| T-30+642.5 | T | 18-Apr-10 | 137.01 | 7.70 | 0.50 | 8.50 | 638953.612 | 7212633.206 | 137.33 | No connections observed. | |
| Q-30+643.25 | Q | 23-Jun-10 | 137.37 | 7.96 | 0.50 | 8.69 | -- | -- | -- | Hard grout from ~7.5 to 8.5 m bgs | |
| P-30+644 | P | 18-Apr-10 | 137.00 | 7.83 | 0.50 | 8.63 | 638953.892 | 7212631.810 | 137.25 | No connections observed. | |
| T-30+645.5 | T | 18-Apr-10 | 136.99 | 7.61 | 0.50 | 8.46 | 638954.243 | 7212630.315 | 137.29 | | |
| S-30+647 | S | 18-Apr-10 | 136.98 | 7.95 | 0.47 | 8.72 | 638954.592 | 7212628.767 | 137.32 | | |

Golder Associates

# TABLE E1-3.1
# SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-30+647.75 | Q | 29-Sep-11 | 136.93 | 7.96 | 0.50 | 8.76 | -- | -- | -- | | |
| T-30+648.5 | T | 18-Apr-10 | 136.97 | -- | -- | -- | -- | -- | -- | Drill bit snapped off while embedding, all casing left in hole. | |
| T-30+648.5B | T | 18-Apr-10 | 136.97 | 7.99 | 0.42 | 8.71 | 638955.208 | 7212625.877 | 137.31 | Offset 0.3 m north of proposed location, assumed equal collar and bedrock elevations. | |
| P-30+650 | P | 19-Apr-10 | 136.98 | 7.70 | 0.44 | 8.44 | 638955.493 | 7212624.398 | 137.29 | | |
| Q-30+650.75 | Q | 29-Sep-11 | 137.27 | 8.08 | 0.50 | 8.76 | -- | -- | -- | Communication to hole Q-30+647.75. | |
| T-30+651.5 | T | 19-Apr-10 | 136.99 | 7.73 | 0.51 | 8.54 | 638955.846 | 7212623.023 | 137.40 | | |
| S-30+653 | S | 21-Apr-10 | 137.00 | 7.41 | 0.51 | 8.22 | 638956.185 | 7212621.577 | 137.36 | Connection to T-30+654.5 at bedrock contact - water and air from inside and outside of casing. | |
| Q-30+653.75 | Q | 29-Sep-11 | 137.27 | 7.68 | 0.50 | 8.31 | -- | -- | -- | | |
| T-30+654.5 | T | 21-Apr-10 | 136.97 | 7.21 | 0.50 | 8.01 | 638956.487 | 7212620.008 | 137.30 | Connection to p-30+656 at bedrock contact - water blown out of casing. | |
| P-30+656 | P | 21-Apr-10 | 137.00 | 6.94 | 0.50 | 7.74 | 638956.806 | 7212618.610 | 137.25 | | |
| T-30+657.5 | T | 21-Apr-10 | 136.98 | 6.91 | 0.49 | 7.70 | 638957.143 | 7212617.149 | 137.29 | | |
| S-30+659 | S | 21-Apr-10 | 136.98 | 7.33 | 0.47 | 8.10 | 638957.432 | 7212615.636 | 137.28 | Connection to P-30+662 while drilling bedrock - water blown out of casing. | |
| T-30+660.5 | T | 21-Apr-10 | 136.99 | 7.17 | 0.47 | 7.94 | 638957.759 | 7212614.163 | 137.34 | Connection to P-30+662 while drilling bedrock - water and air from inside and outside of casing. | |
| P-30+662 | P | 21-Apr-10 | 137.00 | 7.06 | 0.50 | 7.86 | 638958.087 | 7212612.701 | 137.31 | | |
| T-30+663.5 | T | 20-Apr-10 | 137.01 | 7.30 | 0.50 | 8.10 | 638958.406 | 7212611.173 | 137.31 | | |
| S-30+665 | S | 20-Apr-10 | 137.00 | 7.34 | 0.51 | 8.15 | 638958.753 | 7212609.742 | 137.29 | | |
| T-30+666.5 | T | 20-Apr-10 | 137.00 | 7.36 | 0.50 | 8.16 | 638959.080 | 7212608.326 | 137.34 | | |
| P-30+668 | P | 20-Apr-10 | 137.00 | 7.72 | 0.44 | 8.46 | 638959.325 | 7212606.836 | 137.36 | | |
| T-30+669.5 | T | 20-Apr-10 | 137.04 | 8.44 | 0.48 | 9.22 | 638959.629 | 7212605.414 | 137.28 | | |
| S-30+671 | S | 19-Apr-10 | 137.00 | 8.20 | 0.46 | 8.73 | 638960.017 | 7212603.894 | 137.27 | Casing embedded in weathered bedrock. | |
| T-30+672.5 | T | 19-Apr-10 | 137.05 | 8.35 | 0.22 | 8.79 | 638960.337 | 7212602.428 | 137.32 | Short embedment due to possible weathered bedrock at 8.0 m. Connection to T-30+675.5 while drilling bedrock. | |
| P-30+674 | P | 19-Apr-10 | 137.07 | 8.34 | 0.50 | 9.12 | 638960.679 | 7212600.995 | 137.28 | | |
| T-30+675.5 | T | 19-Apr-10 | 137.06 | 8.28 | 0.50 | 9.04 | 638961.017 | 7212599.483 | 137.40 | Connection to S-30+677 while drilling in bedorck - water blown out of casing. | |
| S-30+677 | S | 19-Apr-10 | 137.12 | 8.18 | 0.47 | 8.96 | 638961.320 | 7212598.077 | 137.46 | Connection to T-30+678.5 at bedrock contact - water blown out of casing. | |
| T-30+678.5 | T | 18-Apr-10 | 137.15 | 8.10 | 0.50 | 8.90 | 638961.571 | 7212596.628 | 137.60 | No connections observed. Strong rock. | |
| P-30+680 | P | 18-Apr-10 | 137.17 | 8.11 | 0.50 | 8.91 | 638962.006 | 7212595.161 | 137.52 | No connections observed. Strong rock. | |
| T-30+681.5 | T | 18-Apr-10 | 137.19 | 7.91 | 0.50 | 8.71 | 638962.300 | 7212593.702 | 137.56 | No connections observed. Fractured rock. | |
| S-30+683 | S | 18-Apr-10 | 137.24 | 8.22 | 0.50 | 9.02 | 638962.565 | 7212592.243 | 137.57 | No connections observed. Strong rock. | |
| T-30+684.5 | T | 23-Apr-10 | 137.28 | 8.16 | 0.52 | 8.98 | 638962.826 | 7212590.742 | 137.68 | | |
| P-30+686 | P | 23-Apr-10 | 137.25 | 8.02 | 0.46 | 8.78 | 638963.225 | 7212589.232 | 137.61 | | |
| T-30+687.5 | T | 22-Apr-10 | 137.25 | 7.66 | 0.52 | 8.48 | 638963.529 | 7212587.801 | 137.62 | Connection to T-30+687.5 while drilling in bedrock - water blown out of casing. | |
| S-30+689 | S | 22-Apr-10 | 137.28 | 7.62 | 0.50 | 8.42 | 638963.908 | 7212586.275 | 137.55 | | |
| T-30+690.5 | T | 22-Apr-10 | 137.27 | 7.71 | 0.50 | 8.51 | 638964.210 | 7212584.955 | 137.58 | | |
| P-30+692 | P | 21-Apr-10 | 137.28 | 7.59 | 0.50 | 8.42 | 638964.517 | 7212583.423 | 137.59 | | |
| T-30+693.5 | T | 21-Apr-10 | 137.24 | 7.40 | 0.51 | 8.21 | 638964.876 | 7212581.898 | 137.64 | | |
| S-30+695 | S | 21-Apr-10 | 137.30 | 7.17 | 0.47 | 7.97 | 638965.172 | 7212580.487 | 137.62 | | |
| T-30+696.5 | T | 21-Apr-10 | 137.25 | 7.22 | 0.50 | 8.04 | 638965.548 | 7212579.005 | 137.56 | | |
| P-30+698 | P | 21-Apr-10 | 137.29 | 7.52 | 0.50 | 8.34 | 638965.787 | 7212577.551 | 137.59 | | |
| T-30+699.5 | T | 21-Apr-10 | 137.27 | 7.43 | 0.50 | 8.23 | 638966.094 | 7212576.065 | 137.56 | | |
| S-30+701 | S | 21-Apr-10 | 137.27 | 7.25 | 0.50 | 8.06 | 638966.485 | 7212574.598 | 137.54 | | |
| T-30+702.5 | T | 21-Apr-10 | 137.26 | 7.37 | 0.50 | 8.15 | 638966.784 | 7212573.139 | 137.56 | | |
| P-30+704 | P | 21-Apr-10 | 137.26 | 7.46 | 0.50 | 8.27 | 638967.117 | 7212571.653 | 137.51 | Connection to T-30+705.5 and T-30+708.5. | |
| T-30+705.5 | T | 21-Apr-10 | 137.25 | 7.89 | 0.48 | 8.67 | 638967.416 | 7212570.258 | 137.53 | | |
| S-30+707 | S | 21-Apr-10 | 137.22 | 8.09 | 0.48 | 8.87 | 638967.734 | 7212568.763 | 137.55 | | |

Golder Associates

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AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-30+707.75 | Q | 23-Jun-10 | 137.54 | 8.62 | 0.50 | 9.25 | -- | -- | -- | | |
| T-30+708.5 | T | 21-Apr-10 | 137.21 | 8.75 | 0.53 | 9.58 | 638968.066 | 7212567.328 | 137.65 | | |
| Q-30+709.25 | Q | 23-Jun-10 | 137.63 | 9.33 | 0.50 | 10.06 | -- | -- | -- | | |
| P-30+710 | P | 21-Apr-10 | 137.20 | 9.19 | 0.47 | 9.96 | 638968.312 | 7212565.841 | 137.52 | | |
| T-30+711.5 | T | 21-Apr-10 | 137.23 | 9.14 | 0.52 | 9.96 | 638968.601 | 7212564.473 | 137.54 | | |
| S-30+713 | S | 21-Apr-10 | 137.16 | 9.49 | 0.58 | 10.37 | 638969.006 | 7212562.907 | 137.55 | Possibly very soft weathered bedrock from 9.49 to 9.89 m. | |
| T-30+714.5 | T | 20-Apr-10 | 137.16 | 9.88 | 0.50 | 10.68 | 638969.316 | 7212561.417 | 137.53 | No connections observed. Possible fractured or soft rock. | |
| P-30+716 | P | 20-Apr-10 | 137.12 | 10.09 | 0.50 | 10.89 | 638969.647 | 7212559.949 | 137.42 | Connection to T-30+720.5 at bedrock contact (water + SB blown out of casing). | |
| T-30+717.5 | T | 20-Apr-10 | 137.11 | 9.61 | 0.52 | 10.43 | 638969.972 | 7212558.473 | 137.43 | | |
| S-30+719 | S | 20-Apr-10 | 137.09 | 9.53 | 0.54 | 10.37 | 638970.325 | 7212557.018 | 137.40 | | |
| T-30+720.5 | T | 20-Apr-10 | 137.06 | 9.37 | 0.56 | 10.23 | 638970.644 | 7212555.609 | 137.45 | Connection to 30+726.5 at bedrock contact, water/air blown out of inside and outside of casing | |
| P-30+722 | P | 20-Apr-10 | 137.07 | 8.77 | 0.52 | 9.59 | 638970.999 | 7212554.103 | 137.48 | Connection to 30+726.5 at bedrock contact, water blown out of casing. | |
| Q-30+722.75 | Q | 23-Jun-10 | 137.40 | 8.92 | 0.49 | 9.59 | -- | -- | -- | | |
| T-30+723.5 | T | 19-Apr-10 | 137.07 | 8.83 | 0.50 | 9.63 | 638971.092 | 7212552.648 | 137.40 | No connections observed. Strong rock. | |
| Q-30+724.25 | Q | 23-Jun-10 | 137.42 | 9.10 | 0.50 | 9.83 | -- | -- | -- | Connected to T-30+726.5 at bedrock interface. | |
| S-30+725 | S | 19-Apr-10 | 137.07 | 8.65 | 0.50 | 9.45 | 638970.894 | 7212551.165 | 137.46 | No connections observed. Strong rock. | |
| T-30+726.5 | T | 19-Apr-10 | 137.06 | 8.29 | 0.50 | 9.09 | 638970.758 | 7212549.694 | 137.39 | No connections observed. Strong rock. | |
| P-30+728 | P | 19-Apr-10 | 137.03 | 8.57 | 0.80 | 9.67 | 638970.655 | 7212548.297 | 137.41 | No connections observed. First 0.3 m fractured rock then 0.5 m strong rock. | |
| T-30+729.5 | T | 19-Apr-10 | 137.03 | 8.49 | 0.50 | 9.29 | 638970.491 | 7212546.674 | 137.43 | No connections observed. Strong rock. | |
| S-30+731 | S | 19-Apr-10 | 137.02 | 8.10 | 0.50 | 8.90 | 638970.311 | 7212545.201 | 137.43 | Connection with T-30+732.5 at bedrock contact (water + SB blown out of casing) strong rock. | |
| T-30+732.5 | T | 19-Apr-10 | 137.03 | 8.25 | 0.50 | 9.05 | 638970.096 | 7212543.774 | 137.39 | No connections observed. Strong rock. | |
| P-30+734 | P | 19-Apr-10 | 137.04 | 8.27 | 0.50 | 9.07 | 638969.986 | 7212542.216 | 137.44 | | |
| T-30+735.5 | T | 19-Apr-10 | 137.07 | 8.49 | 0.48 | 9.27 | 638969.822 | 7212540.723 | 137.45 | | |
| S-30+737 | S | 19-Apr-10 | 137.08 | 7.54 | 0.49 | 8.32 | 638969.672 | 7212539.285 | 137.50 | Weathered bedrock from 7.05 to 7.3 m. | |
| T-30+738.5 | T | 23-Apr-10 | 137.09 | 7.48 | 0.46 | 8.24 | 638969.496 | 7212537.798 | 137.51 | | |
| P-30+740 | P | 23-Apr-10 | 137.12 | 7.97 | 0.45 | 8.72 | 638969.391 | 7212536.291 | 137.47 | Connection to T-30+741.5 at bedrock contact - water blown out of casing. | |
| Q-30+740.75 | Q | 22-Jun-10 | 137.55 | 9.07 | 0.46 | 9.83 | -- | -- | -- | | |
| T-30+741.5 | T | 23-Apr-10 | 137.10 | 8.14 | 0.53 | 8.97 | 638969.187 | 7212534.718 | 137.40 | Water in return from 5.5 m - connection to T-30+738.5 at bedrock contact, water and air blown from inside and outside of casing. | |
| S-30+743 | S | 21-Apr-10 | 137.07 | 8.21 | 0.50 | 9.01 | 638969.093 | 7212533.299 | 137.47 | Assumed collar elevation 137.05 (no survey at time of installation). | |
| T-30+744.5 | T | 21-Apr-10 | 137.07 | 7.73 | 0.50 | 8.53 | 638968.413 | 7212531.809 | 137.40 | Assumed collar elevation 137.05 (no survey at time of installation). | |
| P-30+746 | P | 24-Apr-10 | 137.08 | 8.66 | 0.53 | 9.49 | 638968.188 | 7212530.270 | 137.43 | | |
| T-30+747.5 | T | 24-Apr-10 | 137.08 | 8.99 | 0.47 | 9.76 | 638968.017 | 7212528.822 | 137.41 | | |
| S-30+749 | S | 24-Apr-10 | 137.08 | 8.85 | 0.49 | 9.64 | 638967.857 | 7212527.287 | 137.41 | | |
| T-30+750.5 | T | 24-Apr-10 | 137.06 | 8.66 | 0.51 | 9.47 | 638967.640 | 7212525.819 | 137.43 | | |
| P-30+752 | P | 23-Apr-10 | 137.12 | 8.79 | 0.50 | 9.59 | 638967.437 | 7212524.364 | 137.41 | | |
| T-30+753.5 | T | 23-Apr-10 | 137.09 | 8.58 | 0.51 | 9.39 | 638967.290 | 7212522.804 | 137.42 | | |
| S-30+755 | S | 23-Apr-10 | 137.10 | 8.65 | 0.53 | 9.48 | 638967.063 | 7212521.343 | 137.41 | | |
| T-30+756.5 | T | 23-Apr-10 | 137.13 | 8.71 | 0.51 | 9.52 | 638966.852 | 7212519.904 | 137.42 | | |
| P-30+758 | P | 23-Apr-10 | 137.12 | 8.48 | 0.52 | 9.30 | 638966.739 | 7212518.386 | 137.46 | | |
| T-30+759.5 | T | 22-Apr-10 | 137.11 | 8.32 | 0.50 | 9.12 | 638966.516 | 7212517.016 | 137.49 | | |
| S-30+761 | S | 22-Apr-10 | 137.11 | 8.14 | 0.50 | 8.94 | 638966.288 | 7212515.420 | 137.45 | | |
| T-30+762.5 | T | 22-Apr-10 | 137.10 | 7.96 | 0.50 | 8.77 | 638966.099 | 7212513.935 | 137.44 | | |
| P-30+764 | P | 22-Apr-10 | 137.10 | 8.14 | 0.50 | 8.94 | 638965.942 | 7212512.498 | 137.45 | | |
| T-30+765.5 | T | 22-Apr-10 | 137.09 | 8.06 | 0.50 | 8.87 | 638965.752 | 7212511.027 | 137.47 | | |

**TABLE E1-3.1**
**SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES**

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S-30+767 | S | 22-Apr-10 | 137.09 | 7.92 | 0.53 | 8.76 | 638965.547 | 7212509.498 | 137.46 | | |
| T-30+768.5 | T | 22-Apr-10 | 137.10 | 7.69 | 0.50 | 8.51 | 638965.335 | 7212508.024 | 137.50 | | |
| P-30+770 | P | 22-Apr-10 | 137.10 | 7.93 | 0.21 | 8.46 | 638965.160 | 7212506.539 | 137.49 | | |
| T-30+771.5 | T | 22-Apr-10 | 137.13 | 7.61 | 0.37 | 8.29 | 638965.004 | 7212505.048 | 137.48 | | |
| S-30+773 | S | 22-Apr-10 | 137.12 | 7.50 | 0.43 | 8.22 | 638964.815 | 7212503.564 | 137.45 | | |
| T-30+774.5 | T | 22-Apr-10 | 137.12 | 7.87 | 0.50 | 8.65 | 638964.659 | 7212502.020 | 137.48 | | |
| P-30+776 | P | 22-Apr-10 | 137.16 | 7.52 | 0.46 | 8.30 | 638964.454 | 7212500.613 | 137.48 | | |
| T-30+777.5 | T | 22-Apr-10 | 137.15 | 7.64 | 0.51 | 8.45 | 638964.255 | 7212499.060 | 137.51 | | |
| S-30+779 | S | 22-Apr-10 | 137.16 | 7.92 | 0.50 | 8.72 | 638964.089 | 7212497.599 | 137.49 | | |
| T-30+780.5 | T | 22-Apr-10 | 137.19 | 7.72 | 0.39 | 8.41 | 638963.907 | 7212496.054 | 137.46 | | |
| P-30+782 | P | 23-Apr-10 | 137.20 | 7.61 | 0.50 | 8.38 | 638963.661 | 7212494.659 | 137.53 | | |
| T-30+783.5 | T | 23-Apr-10 | 137.21 | 7.41 | 0.50 | 8.23 | 638963.493 | 7212493.115 | 137.55 | Connection to P-30+782 at bedrock contact - water blown out of casing. | |
| S-30+785 | S | 23-Apr-10 | 137.21 | 7.24 | 0.53 | 8.07 | 638963.349 | 7212491.581 | 137.55 | | |
| T-30+786.5 | T | 23-Apr-10 | 137.22 | 7.09 | 0.52 | 7.91 | 638963.106 | 7212490.116 | 137.59 | | |
| P-30+788 | P | 23-Apr-10 | 137.24 | 6.74 | 0.50 | 7.54 | 638962.934 | 7212488.657 | 137.55 | | |
| T-30+789.5 | T | 23-Apr-10 | 137.26 | 6.56 | 0.50 | 7.37 | 638962.743 | 7212487.140 | 137.56 | | |
| S-30+791 | S | 23-Apr-10 | 137.25 | 6.92 | 0.50 | 7.72 | 638962.517 | 7212485.668 | 137.59 | | |
| T-30+792.5 | T | 23-Apr-10 | 137.24 | 6.76 | 0.50 | 7.57 | 638962.381 | 7212484.164 | 137.58 | | |
| P-30+794 | P | 23-Apr-10 | 137.24 | 6.76 | 0.50 | 7.57 | 638962.139 | 7212482.681 | 137.57 | | |
| T-30+795.5 | T | 23-Apr-10 | 137.23 | 6.73 | 0.48 | 7.53 | 638961.980 | 7212481.189 | 137.59 | Possible soft/weathered bedrock. | |
| S-30+797 | S | 23-Apr-10 | 137.24 | 6.67 | 0.50 | 7.53 | 638961.790 | 7212479.704 | 137.55 | | |
| T-30+798.5 | T | 23-Apr-10 | 137.26 | 6.74 | 0.51 | 7.57 | 638961.555 | 7212478.228 | 137.59 | | |
| P-30+800 | P | 23-Apr-10 | 137.24 | 6.59 | 0.51 | 7.48 | 638961.408 | 7212476.717 | 137.56 | | |
| T-30+801.5 | T | 23-Apr-10 | 137.23 | 6.22 | 0.51 | 7.03 | 638961.230 | 7212475.224 | 137.54 | | |
| S-30+803 | S | 23-Apr-10 | 137.23 | 6.32 | 0.32 | 6.97 | 638961.041 | 7212473.748 | 137.56 | | |
| T-30+804.5 | T | 23-Apr-10 | 137.23 | 6.12 | 0.48 | 6.91 | 638960.810 | 7212472.292 | 137.59 | | |
| P-30+806 | P | 23-Apr-10 | 137.24 | 6.27 | 0.51 | 7.04 | 638960.632 | 7212470.799 | 137.58 | | |
| T-30+807.5 | T | 23-Apr-10 | 137.22 | 6.40 | 0.52 | 7.23 | 638960.423 | 7212469.296 | 137.59 | | |
| S-30+809 | S | 24-Apr-10 | 137.20 | 6.60 | 0.51 | 7.41 | 638960.264 | 7212467.818 | 137.56 | | |
| T-30+810.5 | T | 24-Apr-10 | 137.23 | 7.07 | 0.53 | 7.90 | 638960.071 | 7212466.347 | 137.58 | Water in return ~5.5 m. | |
| P-30+812 | P | 24-Apr-10 | 137.25 | 6.72 | 0.52 | 7.54 | 638959.907 | 7212464.807 | 137.61 | | |
| T-30+813.5 | T | 24-Apr-10 | 137.19 | 6.58 | 0.57 | 7.45 | 638959.678 | 7212463.313 | 137.60 | | |
| S-30+815 | S | 25-Apr-10 | 137.18 | 6.58 | 0.53 | 7.41 | 638959.524 | 7212461.861 | 137.54 | | |
| T-30+816.5 | T | 25-Apr-10 | 137.22 | 6.78 | 0.50 | 7.58 | 638959.288 | 7212460.384 | 137.58 | | |
| P-30+818 | P | 25-Apr-10 | 137.21 | 6.54 | 0.44 | 7.28 | 638959.110 | 7212458.918 | 137.54 | Water in return at ~6.0 m. | |
| T-30+819.5 | T | 25-Apr-10 | 137.16 | 6.78 | 0.54 | 7.62 | 638958.865 | 7212457.389 | 137.53 | | |
| S-30+821 | S | 25-Apr-10 | 137.18 | 6.65 | 0.50 | 7.45 | 638958.700 | 7212455.917 | 137.43 | | |
| T-30+822.5 | T | 25-Apr-10 | 137.11 | 6.32 | 0.49 | 7.11 | 638958.504 | 7212454.427 | 137.50 | | |
| P-30+824 | P | 25-Apr-10 | 137.11 | 6.05 | 0.46 | 6.81 | 638958.378 | 7212452.965 | 137.42 | | |
| T-30+825.5 | T | 25-Apr-10 | 137.11 | 6.27 | 0.55 | 7.12 | 638958.139 | 7212451.457 | 137.38 | | |
| S-30+827 | S | 25-Apr-10 | 137.04 | 6.10 | 0.52 | 6.92 | 638957.972 | 7212449.965 | 137.36 | | |
| T-30+828.5 | T | 24-Apr-10 | 137.10 | 6.12 | 0.52 | 6.94 | 638957.750 | 7212448.477 | 137.36 | | |
| P-30+830 | P | 24-Apr-10 | 137.08 | 6.15 | 0.53 | 6.98 | 638957.676 | 7212446.948 | 137.39 | | |
| T-30+831.5 | T | 25-Apr-10 | 137.04 | 6.11 | 0.48 | 6.89 | 638957.442 | 7212445.377 | 137.36 | | |
| S-30+833 | S | 25-Apr-10 | 137.04 | 6.03 | 0.56 | 6.89 | 638957.268 | 7212443.983 | 137.46 | | |
| T-30+834.5 | T | 24-Apr-10 | 137.06 | 6.15 | 0.52 | 7.01 | 638957.077 | 7212442.499 | 137.38 | | |

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P-30+836 | P | 24-Apr-10 | 137.08 | 6.27 | 0.51 | 7.06 | 638956.863 | 7212441.036 | 137.45 | | |
| T-30+837.5 | T | 24-Apr-10 | 137.08 | 6.33 | 0.54 | 7.17 | 638956.695 | 7212439.515 | 137.46 | Soft Bedrock. | |
| S-30+839 | S | 24-Apr-10 | 137.08 | 6.35 | 0.49 | 7.20 | 638956.510 | 7212438.056 | 137.44 | Soft Bedrock. | |
| T-30+840.5 | T | 24-Apr-10 | 137.09 | 6.41 | 0.52 | 7.24 | 638956.254 | 7212436.529 | 137.49 | Soft Bedrock. | |
| P-30+842 | P | 24-Apr-10 | 137.14 | 6.48 | 0.51 | 7.27 | 638956.091 | 7212435.066 | 137.53 | Soft Bedrock. | |
| T-30+843.5 | T | 24-Apr-10 | 137.14 | 6.38 | 0.49 | 7.20 | 638955.939 | 7212433.617 | 137.52 | Soft Bedrock. | |
| S-30+845 | S | 24-Apr-10 | 137.18 | 6.40 | 0.51 | 7.23 | 638955.666 | 7212432.078 | 137.51 | Soft Bedrock. | |
| T-30+846.5 | T | 24-Apr-10 | 137.18 | 6.43 | 0.53 | 7.26 | 638955.524 | 7212430.614 | 137.60 | Soft Bedrock. | |
| P-30+848 | P | 24-Apr-10 | 137.23 | 6.60 | 0.52 | 7.45 | 638955.355 | 7212429.124 | 137.58 | Soft Bedrock. | |
| T-30+849.5 | T | 24-Apr-10 | 137.22 | 6.38 | 0.51 | 7.23 | 638955.355 | 7212429.124 | 137.58 | Soft Bedrock. | |
| S-30+851 | S | 28-Sep-10 | 136.45 | 7.10 | 0.43 | 7.83 | 638955.066 | 7212427.715 | 137.36 | | |
| T-30+852.5 | T | 28-Sep-10 | 136.47 | 6.98 | 0.40 | 7.68 | 638954.929 | 7212426.397 | 137.41 | Ground surface rising while drilling bedrock due to excessive air pressure being used. | |
| P-30+854 | P | 28-Sep-10 | 136.49 | 6.75 | 0.50 | 7.55 | 638954.750 | 7212424.910 | 137.45 | Ground surface rising while drilling bedrock due to excessive air pressure being used. | |
| T-30+855.5 | T | 28-Sep-10 | 137.14 | 6.12 | 0.45 | 6.87 | 638954.543 | 7212423.456 | 137.39 | | |
| S-30+857 | S | 25-Sep-10 | 137.15 | 5.26 | 0.45 | 6.01 | 638954.248 | 7212422.139 | 137.31 | | |
| T-30+858.5 | T | 25-Sep-10 | 137.11 | 5.10 | 0.44 | 5.84 | 638954.115 | 7212420.546 | 137.32 | SB forced out of ground surface while advancing through bedrock due to excessive air pressure being used. | |
| P-30+860 | P | 25-Sep-10 | 137.07 | 4.79 | 0.52 | 5.61 | 638953.911 | 7212419.179 | 137.29 | SB forced out of ground surface while advancing through bedrock due to excessive air pressure being used. | |
| T-30+861.5 | T | 25-Sep-10 | 137.00 | 4.64 | 0.40 | 5.34 | 638953.620 | 7212417.509 | 137.25 | | |
| S-30+863 | S | 25-Sep-10 | 137.05 | 4.65 | 0.39 | 5.34 | 638953.496 | 7212416.081 | 137.29 | SB forced out of ground surface while advancing through bedrock due to excessive air pressure being used. | |
| T-30+864.5 | T | 25-Sep-10 | 137.07 | 4.55 | 0.45 | 5.30 | 638953.360 | 7212414.583 | 137.25 | | |
| P-30+866 | P | 25-Sep-10 | 137.03 | 4.44 | 0.57 | 5.31 | 638953.177 | 7212413.064 | 137.25 | SB forced out of ground surface while advancing through bedrock due to excessive air pressure being used. | |
| T-30+867.5 | T | 24-Sep-10 | 136.96 | 4.91 | 0.50 | 5.72 | 638952.954 | 7212411.536 | 137.24 | QA of activity not carried out; records retrieved from TCG. | |
| S-30+869 | S | 24-Sep-10 | 136.93 | 4.35 | 0.50 | 5.16 | 638952.903 | 7212409.996 | 137.19 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+870.5 | T | 25-Sep-10 | 137.01 | 4.59 | 0.34 | 5.25 | 638952.627 | 7212408.453 | 137.37 | | |
| P-30+872 | P | 25-Sep-10 | 136.99 | 4.85 | 0.10 | 5.25 | 638952.388 | 7212407.129 | 137.32 | | |
| T-30+873.5 | T | 25-Sep-10 | 136.94 | 4.68 | 0.31 | 5.29 | 638952.081 | 7212405.612 | 137.28 | | |
| S-30+875 | S | 25-Sep-10 | 137.02 | 4.48 | 0.57 | 5.35 | 638951.844 | 7212404.128 | 137.30 | | |
| T-30+876.5 | T | 25-Sep-10 | 137.08 | 4.49 | 0.47 | 5.26 | 638951.550 | 7212402.781 | 137.32 | | |
| P-30+878 | P | 25-Sep-10 | 137.03 | 4.49 | 0.50 | 5.29 | 638951.352 | 7212401.227 | 137.33 | | |
| T-30+879.5 | T | 25-Sep-10 | 136.96 | 4.43 | 0.83 | 5.61 | 638951.079 | 7212399.641 | 137.30 | SB forced out of ground surface while advancing through bedrock due to excessive air pressure being used. | |
| S-30+881 | S | 25-Sep-10 | 137.06 | 4.87 | 0.37 | 5.59 | 638950.704 | 7212398.289 | 137.40 | | |
| T-30+882.5 | T | 25-Sep-10 | 137.03 | 4.70 | 0.45 | 5.49 | 638950.468 | 7212396.790 | 137.42 | | |
| P-30+884 | P | 25-Sep-10 | 137.04 | 4.59 | 0.45 | 5.34 | 638950.207 | 7212395.378 | 137.40 | | |
| T-30+885.5 | T | 25-Sep-10 | 136.97 | 4.53 | 0.41 | 5.24 | 638949.927 | 7212393.901 | 137.30 | | |
| S-30+887 | S | 25-Sep-10 | 137.09 | 4.80 | 0.41 | 5.51 | 638949.591 | 7212392.384 | 137.33 | | |
| T-30+888.5 | T | 25-Sep-10 | 137.00 | 4.61 | 0.47 | 5.38 | 638949.210 | 7212390.961 | 137.35 | | |
| P-30+890 | P | 25-Sep-10 | 137.04 | 4.68 | 0.57 | 5.55 | 638948.945 | 7212389.428 | 137.42 | | |
| T-30+891.5 | T | 25-Sep-10 | 137.00 | 4.47 | 0.69 | 5.51 | 638948.637 | 7212388.030 | 137.41 | | |
| S-30+893 | S | 25-Sep-10 | 136.96 | 4.80 | 0.40 | 5.50 | 638948.444 | 7212386.549 | 137.33 | | |
| T-30+894.5 | T | 25-Sep-10 | 137.08 | 4.55 | 0.40 | 5.25 | 638948.146 | 7212384.997 | 137.30 | | |
| P-30+896 | P | 25-Sep-10 | 137.08 | 4.52 | 0.42 | 5.24 | 638947.828 | 7212383.573 | 137.37 | | |
| T-30+897.5 | T | 25-Sep-10 | 137.10 | 4.66 | 0.62 | 5.58 | 638947.541 | 7212382.025 | 137.37 | Connection to 30+902 while advancing through bedrock. | |
| S-30+899 | S | 25-Sep-10 | 137.01 | 4.68 | 0.50 | 5.49 | 638947.244 | 7212380.704 | 137.39 | QA of activity not carried out; records retrieved from TCG. | |

Golder Associates

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID / Chainage | Sequence (P, S, T, Q) | Installation Date (dd-mmm-yy) | Grout Platform Elevation (masl) | Depth to Rock / Hard (mbgs) | Final Embedment Length (m) | Final Length of Casing (w/ stickup) (m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl) (masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-30+900.5 | T | 24-Sep-10 | 137.10 | 5.09 | 0.50 | 5.89 | 638946.897 | 7212379.180 | 137.42 | QA of activity not carried out; records retrieved from TCG. | |
| P-30+902 | P | 24-Sep-10 | 137.04 | 4.73 | 0.50 | 5.54 | 638946.606 | 7212377.769 | 137.28 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+903.5 | T | 24-Sep-10 | 137.01 | 4.25 | 0.50 | 5.06 | 638946.212 | 7212376.317 | 137.34 | QA of activity not carried out; records retrieved from TCG. | |
| S-30+905 | S | 24-Sep-10 | 137.07 | 3.72 | 0.50 | 4.52 | 638945.919 | 7212374.800 | 137.38 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+906.5 | T | 24-Sep-10 | 137.10 | 3.49 | 0.50 | 4.29 | 638945.653 | 7212373.402 | 137.34 | QA of activity not carried out; records retrieved from TCG. | |
| P-30+908 | P | 24-Sep-10 | 137.01 | 3.26 | 0.50 | 4.07 | 638945.339 | 7212371.901 | 137.36 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+909.5 | T | 24-Sep-10 | 137.03 | 3.26 | 0.50 | 4.07 | 638945.114 | 7212370.362 | 137.33 | QA of activity not carried out; records retrieved from TCG. | |
| S-30+911 | S | 24-Sep-10 | 137.05 | 3.18 | 0.50 | 3.99 | 638944.798 | 7212368.858 | 137.34 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+912.5 | T | 24-Sep-10 | 137.01 | 3.39 | 0.50 | 4.19 | 638944.415 | 7212367.433 | 137.44 | QA of activity not carried out; records retrieved from TCG. | |
| P-30+914 | P | 24-Sep-10 | 137.13 | 3.01 | 0.50 | 3.81 | 638944.105 | 7212365.906 | 137.42 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+915.5 | T | 24-Sep-10 | 137.06 | 3.06 | 0.50 | 3.86 | 638943.862 | 7212364.488 | 137.41 | QA of activity not carried out; records retrieved from TCG. | |
| S-30+917 | S | 24-Sep-10 | 137.09 | 3.36 | 0.50 | 4.17 | 638943.647 | 7212363.038 | 137.40 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+918.5 | T | 24-Sep-10 | 137.15 | 3.44 | 0.46 | 4.19 | 638943.311 | 7212361.480 | 137.42 | Very little to no hammer trigger required to advance through SB. | |
| P-30+920 | P | 24-Sep-10 | 137.12 | 3.15 | 0.46 | 3.89 | 638942.956 | 7212360.067 | 137.38 | | |
| T-30+921.5 | T | 24-Sep-10 | 137.10 | 3.27 | 0.43 | 3.97 | 638942.710 | 7212358.527 | 137.40 | | |
| S-30+923 | S | 24-Sep-10 | 136.94 | 2.63 | 0.27 | 3.20 | 638942.333 | 7212357.126 | 137.37 | | |
| T-30+924.5 | T | 25-Sep-10 | 137.13 | 2.85 | 0.60 | 3.67 | 638941.886 | 7212355.610 | 137.40 | | |
| P-30+926 | P | 25-Sep-10 | 137.05 | 2.84 | 0.37 | 3.55 | 638941.688 | 7212354.151 | 137.47 | | |
| T-30+927.5 | T | 25-Sep-10 | 137.06 | 2.82 | 0.46 | 3.61 | 638941.370 | 7212352.754 | 137.48 | | |
| S-30+929 | S | 25-Sep-10 | 137.03 | 3.04 | 0.41 | 3.73 | 638941.115 | 7212351.339 | 137.36 | | |
| T-30+930.5 | T | 25-Sep-10 | 137.15 | 2.71 | 0.44 | 3.43 | 638940.770 | 7212349.951 | 137.35 | | |
| P-30+932 | P | 25-Sep-10 | 137.02 | 2.76 | 0.44 | 3.50 | 638940.349 | 7212348.390 | 137.40 | | |
| T-30+933.5 | T | 25-Sep-10 | 136.97 | 3.16 | 0.44 | 3.90 | 638940.128 | 7212346.920 | 137.30 | | |
| S-30+935 | S | 25-Sep-10 | 137.07 | 3.11 | 0.64 | 4.08 | 638939.763 | 7212345.440 | 137.38 | | |
| T-30+936.5 | T | 26-Sep-10 | 137.07 | 3.21 | 0.50 | 4.01 | 638939.514 | 7212343.891 | 137.32 | QA of activity not carried out; records retrieved from TCG. | |
| P-30+938 | P | 26-Sep-10 | 137.04 | 3.06 | 0.50 | 3.86 | 638939.210 | 7212342.546 | 137.32 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+939.5 | T | 26-Sep-10 | 137.00 | 3.40 | 0.42 | 4.12 | 638938.864 | 7212341.199 | 137.28 | | |
| S-30+941 | S | 26-Sep-10 | 137.00 | 3.17 | 0.40 | 3.87 | 638938.545 | 7212339.680 | 137.32 | | |
| T-30+942.5 | T | 26-Sep-10 | 137.03 | 3.16 | 0.42 | 3.88 | 638938.237 | 7212338.125 | 137.32 | | |
| P-30+944 | P | 26-Sep-10 | 137.03 | 2.82 | 0.35 | 3.47 | 638938.032 | 7212336.658 | 137.28 | | |
| T-30+945.5 | T | 26-Sep-10 | 137.06 | 3.05 | 0.39 | 3.72 | 638937.788 | 7212335.177 | 137.39 | | |
| S-30+947 | S | 26-Sep-10 | 137.05 | 2.90 | 0.34 | 3.57 | 638937.528 | 7212333.650 | 137.41 | | |
| T-30+948.5 | T | 26-Sep-10 | 137.06 | 2.77 | 0.45 | 3.52 | 638937.187 | 7212332.152 | 137.42 | | |
| P-30+950 | P | 26-Sep-10 | 137.04 | 2.80 | 0.40 | 3.50 | 638936.887 | 7212330.719 | 137.27 | | |
| T-30+951.5 | T | 26-Sep-10 | 137.07 | 3.27 | 0.47 | 4.04 | 638936.571 | 7212329.302 | 137.34 | | |
| S-30+953 | S | 26-Sep-10 | 137.05 | 3.58 | 0.44 | 4.32 | 638936.278 | 7212327.772 | 137.34 | | |
| T-30+954.5 | T | 26-Sep-10 | 137.04 | 3.49 | 0.42 | 4.21 | 638936.035 | 7212326.335 | 137.37 | | |
| P-30+956 | P | 26-Sep-10 | 137.10 | 3.16 | 0.50 | 3.96 | 638935.711 | 7212324.782 | 137.40 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+957.5 | T | 26-Sep-10 | 137.09 | 2.83 | 0.50 | 3.63 | 638935.331 | 7212323.419 | 137.38 | QA of activity not carried out; records retrieved from TCG. | |
| S-30+959 | S | 26-Sep-10 | 137.13 | 2.32 | 0.50 | 3.13 | 638935.038 | 7212321.916 | 137.38 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+960.5 | T | 26-Sep-10 | 137.08 | 2.22 | 0.50 | 3.02 | 638934.770 | 7212320.452 | 137.28 | QA of activity not carried out; records retrieved from TCG. | |
| P-30+962 | P | 26-Sep-10 | 137.14 | 2.31 | 0.41 | 3.02 | 638934.507 | 7212319.002 | 137.38 | Very hard rock. | |
| T-30+963.5 | T | 26-Sep-10 | 137.12 | 2.34 | 0.41 | 3.05 | 638934.139 | 7212317.559 | 137.40 | Very hard rock. | |
| S-30+965 | S | 26-Sep-10 | 137.14 | 2.19 | 0.50 | 3.00 | 638933.776 | 7212316.045 | 137.37 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+966.5 | T | 26-Sep-10 | 137.03 | 2.17 | 0.50 | 2.97 | 638933.548 | 7212314.536 | 137.37 | QA of activity not carried out; records retrieved from TCG. | |
| P-30+968 | P | 26-Sep-10 | 137.04 | 2.45 | 0.50 | 3.25 | 638933.264 | 7212313.105 | 137.35 | QA of activity not carried out; records retrieved from TCG. | |

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# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID / Chainage | Sequence (P, S, T, Q) | Installation Date (dd-mmm-yy) | Grout Platform Elevation (masl) | Depth to Rock / Hard (mbgs) | Final Embedment Length (m) | Final Length of Casing (w/ stickup) (m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl) (masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-30+969.5 | T | 26-Sep-10 | 137.02 | 2.57 | 0.50 | 3.38 | 638933.051 | 7212311.652 | 137.39 | QA of activity not carried out; records retrieved from TCG. | |
| S-30+971 | S | 26-Sep-10 | 137.01 | 2.63 | 0.50 | 3.43 | 638932.686 | 7212310.179 | 137.38 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+972.5 | T | 26-Sep-10 | 136.95 | 2.37 | 0.50 | 3.18 | 638932.407 | 7212308.676 | 137.33 | QA of activity not carried out; records retrieved from TCG. | |
| P-30+974 | P | 26-Sep-10 | 137.03 | 2.37 | 0.50 | 3.18 | 638932.018 | 7212307.208 | 137.32 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+975.5 | T | 26-Sep-10 | 137.01 | 2.37 | 0.50 | 3.18 | 638931.744 | 7212305.748 | 137.38 | QA of activity not carried out; records retrieved from TCG. | |
| S-30+977 | S | 26-Sep-10 | 136.92 | 2.32 | 0.50 | 3.13 | 638931.426 | 7212304.320 | 137.26 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+978.5 | T | 26-Sep-10 | 136.96 | 2.27 | 0.50 | 3.07 | 638931.127 | 7212302.799 | 137.24 | QA of activity not carried out; records retrieved from TCG. | |
| P-30+980 | P | 26-Sep-10 | 136.88 | 2.37 | 0.50 | 3.18 | 638930.905 | 7212301.375 | 137.24 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+981.5 | T | 26-Sep-10 | 136.70 | 2.27 | 0.50 | 3.07 | 638930.507 | 7212300.044 | 137.14 | QA of activity not carried out; records retrieved from TCG. | |
| S-30+983 | S | 26-Sep-10 | 136.67 | 2.35 | 0.50 | 3.15 | 638930.238 | 7212298.457 | 137.12 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+984.5 | T | 26-Sep-10 | 136.89 | 2.65 | 0.50 | 3.46 | 638929.939 | 7212297.130 | 137.16 | QA of activity not carried out; records retrieved from TCG. | |
| P-30+986 | P | 26-Sep-10 | 136.86 | 3.03 | 0.50 | 3.84 | 638929.650 | 7212295.499 | 137.11 | QA of activity not carried out; records retrieved from TCG. | |
| T-30+987.5 | T | 26-Sep-10 | 136.80 | 3.51 | 0.50 | 4.32 | 638929.297 | 7212294.074 | 137.19 | QA of activity not carried out; records retrieved from TCG. | |
| S-30+989 | S | 28-Sep-10 | 136.89 | 3.02 | 0.39 | 3.71 | 638929.101 | 7212292.563 | 137.20 | | |
| T-30+990.5 | T | 28-Sep-10 | 136.85 | 2.95 | 0.47 | 3.67 | 638928.822 | 7212291.104 | 137.12 | | |
| P-30+992 | P | 28-Sep-10 | 136.80 | 2.89 | 0.50 | 3.69 | 638928.444 | 7212289.644 | 137.15 | | |
| Q-30+992.75 | Q | 21-Feb-11 | 136.94 | 3.00 | 0.50 | 3.57 | 638928.335 | 7212288.820 | 137.16 | | |
| T-30+993.5 | T | 28-Sep-10 | 136.87 | 3.00 | 0.52 | 3.82 | 638928.130 | 7212288.197 | 137.20 | | |
| Q-30+994.25 | Q | 21-Feb-11 | 137.00 | 3.43 | 0.50 | 4.07 | 638928.032 | 7212287.323 | 137.14 | | |
| S-30+995 | S | 28-Sep-10 | 136.71 | 3.44 | 0.12 | 3.81 | 638927.918 | 7212286.685 | 137.15 | | |
| Q-30+995.75 | Q | 21-Feb-11 | 137.07 | 3.67 | 0.50 | 4.31 | 638927.670 | 7212285.884 | 137.20 | | |
| T-30+996.5 | T | 28-Sep-10 | 136.87 | 3.49 | 0.40 | 4.19 | 638927.557 | 7212285.229 | 137.24 | | |
| Q-30+997.25 | Q | 21-Feb-11 | 137.08 | 3.58 | 0.50 | 4.22 | 638927.483 | 7212284.356 | 137.20 | | |
| P-30+998 | P | 28-Sep-10 | 136.92 | 3.35 | 0.49 | 4.12 | 638927.350 | 7212283.717 | 137.22 | | |
| Q-30+998.75 | Q | 21-Feb-11 | 137.07 | 3.46 | 0.50 | 4.12 | 638927.162 | 7212282.861 | 137.23 | | |
| T-30+999.5 | T | 28-Sep-10 | 136.95 | 3.20 | 0.47 | 3.97 | 638927.033 | 7212282.204 | 137.26 | | |
| Q-31+000.25 | Q | 21-Feb-11 | 137.13 | 3.67 | 0.50 | 4.29 | 638927.028 | 7212281.439 | 137.26 | | |
| S-31+001 | S | 28-Sep-10 | 136.92 | 3.51 | 0.48 | 4.29 | 638926.672 | 7212280.939 | 137.25 | | |
| Q-31+001.75 | Q | 21-Feb-11 | 137.17 | 4.13 | 0.50 | 4.84 | 638926.741 | 7212279.971 | 137.24 | | |
| T-31+002.5 | T | 25-Sep-10 | 136.92 | 4.25 | 0.30 | 4.85 | 638926.434 | 7212279.333 | 137.18 | | |
| Q-31+003.25 | Q | 22-Feb-11 | 137.13 | 4.60 | 0.48 | 5.31 | 638926.369 | 7212278.524 | 137.33 | | |
| P-31+004 | P | 25-Sep-10 | 136.90 | 4.17 | 0.13 | 4.60 | 638926.169 | 7212277.907 | 137.21 | | |
| Q-31+004.75 | Q | 22-Feb-11 | 137.23 | 4.64 | 0.45 | 5.28 | 638926.059 | 7212276.986 | 137.29 | | |
| T-31+005.5 | T | 25-Sep-10 | 136.92 | 3.92 | 0.16 | 4.38 | 638925.824 | 7212276.376 | 137.22 | | |
| Q-31+006.25 | Q | 22-Feb-11 | 137.19 | 4.68 | 0.37 | 5.35 | 638925.760 | 7212275.586 | 137.38 | | |
| S-31+007 | S | 25-Sep-10 | 136.90 | 4.29 | 0.31 | 5.03 | 638925.553 | 7212274.886 | 137.16 | | |
| Q-31+007.75 | Q | 22-Feb-11 | 137.29 | 4.70 | 0.36 | 5.23 | 638925.461 | 7212274.167 | 137.25 | | |
| T-31+008.5 | T | 25-Sep-10 | 136.87 | 4.64 | 0.28 | 5.33 | 638925.216 | 7212273.551 | 137.23 | | |
| Q-31+009.25 | Q | 22-Feb-11 | 137.05 | 4.73 | 0.41 | 5.25 | 638925.132 | 7212272.655 | 137.16 | | |
| P-31+010 | P | 25-Sep-10 | 136.92 | 4.14 | 0.41 | 5.01 | 638924.944 | 7212272.013 | 137.11 | | |
| Q-31+010.75 | Q | 22-Feb-11 | 137.06 | 4.54 | 0.40 | 5.10 | 638924.790 | 7212271.191 | 137.15 | | |
| T-31+011.5 | T | 25-Sep-10 | 136.92 | 4.72 | 0.41 | 5.39 | 638924.597 | 7212270.520 | 137.16 | | |
| Q-31+012.25 | Q | 22-Feb-11 | 137.02 | 5.03 | 0.40 | 5.59 | 638924.541 | 7212269.701 | 137.16 | | |
| S-31+013 | S | 25-Sep-10 | 136.97 | 5.05 | 0.41 | 5.79 | 638924.318 | 7212269.118 | 137.26 | | |
| Q-31+013.75 | Q | 22-Feb-11 | 137.09 | 5.40 | 0.40 | 5.92 | 638924.232 | 7212268.223 | 137.19 | | |
| T-31+014.5 | T | 25-Sep-10 | 136.99 | 5.30 | 0.44 | 6.04 | 638924.120 | 7212267.603 | 137.25 | | |

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# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID / Chainage | Sequence (P, S, T, Q) | Installation Date (dd-mmm-yy) | Grout Platform Elevation (masl) | Depth to Rock / Hard (mbgs) | Final Embedment Length (m) | Final Length of Casing (w/ stickup) (m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-31+015.25 | Q | 22-Feb-11 | 137.13 | 6.23 | 0.22 | 6.64 | 638923.980 | 7212266.731 | 137.29 | | |
| P-31+016 | P | 25-Sep-10 | 137.02 | 5.05 | 0.49 | 5.84 | 638923.841 | 7212266.116 | 137.27 | | |
| Q-31+016.75 | Q | 22-Feb-11 | 137.13 | 6.44 | 0.40 | 6.94 | 638923.658 | 7212265.370 | 137.24 | | |
| T-31+017.5 | T | 25-Sep-10 | 136.99 | 6.47 | 0.47 | 7.24 | 638923.466 | 7212264.903 | 137.28 | | |
| Q-31+018.25 | Q | 23-Feb-11 | 137.15 | 6.58 | 0.29 | 7.23 | 638923.323 | 7212263.988 | 137.47 | | |
| S-31+019 | S | 25-Sep-10 | 137.01 | 6.32 | 0.47 | 7.09 | 638923.161 | 7212263.355 | 137.23 | | |
| Q-31+019.75 | Q | 23-Feb-11 | 137.13 | 6.47 | 0.42 | 7.21 | 638923.020 | 7212262.546 | 137.47 | | |
| T-31+020.5 | T | 25-Sep-10 | 136.98 | 6.22 | 0.41 | 6.93 | 638922.889 | 7212261.812 | 137.29 | | |
| Q-31+021.25 | Q | 23-Feb-11 | 137.06 | 6.78 | 0.45 | 7.51 | 638922.787 | 7212261.045 | 137.42 | | |
| P-31+022 | P | 25-Sep-10 | 136.96 | 5.95 | 0.48 | 6.73 | 638922.635 | 7212260.329 | 137.24 | | |
| Q-31+022.75 | Q | 23-Feb-11 | 137.12 | 6.19 | 0.41 | 6.90 | 638922.464 | 7212259.452 | 137.43 | | |
| T-31+023.5 | T | 26-Sep-10 | 136.96 | 6.18 | 0.33 | 6.81 | 638922.384 | 7212258.935 | 137.26 | | |
| Q-31+024.25 | Q | 23-Feb-11 | 137.10 | 6.18 | 0.40 | 6.89 | 638922.237 | 7212258.014 | 137.43 | | |
| S-31+025 | S | 26-Sep-10 | 136.92 | 6.00 | 0.34 | 6.64 | 638922.100 | 7212257.477 | 137.23 | | |
| Q-31+025.75 | Q | 23-Feb-11 | 137.02 | 5.88 | 0.43 | 6.56 | 638921.835 | 7212256.608 | 137.25 | | |
| T-31+026.5 | T | 26-Sep-10 | 136.83 | 5.98 | 0.55 | 6.83 | 638921.784 | 7212256.071 | 137.21 | | |
| Q-31+027.25 | Q | 23-Feb-11 | 137.06 | 6.49 | 0.41 | 7.17 | 638921.586 | 7212255.228 | 137.32 | | |
| P-31+028 | P | 26-Sep-10 | 136.92 | 6.03 | 0.48 | 6.81 | 638921.430 | 7212254.555 | 137.23 | | |
| Q-31+028.75 | Q | 24-Feb-11 | 137.10 | 6.25 | 0.41 | 7.02 | 638921.255 | 7212253.688 | 137.37 | | |
| T-31+029.5 | T | 26-Sep-10 | 136.93 | 6.50 | 0.29 | 7.09 | 638921.076 | 7212253.001 | 137.24 | | |
| Q-31+030.25 | Q | 24-Feb-11 | 137.11 | 6.35 | 0.16 | 6.86 | 638920.989 | 7212252.196 | 137.45 | | |
| S-31+031 | S | 26-Sep-10 | 136.93 | 6.59 | 0.40 | 7.29 | 638920.777 | 7212251.573 | 137.27 | | |
| T-31+032.5 | T | 26-Sep-10 | 136.96 | 6.85 | 0.36 | 7.51 | 638920.476 | 7212250.156 | 137.28 | | |
| P-31+034 | P | 26-Sep-10 | 136.95 | 6.73 | 0.40 | 7.43 | 638920.230 | 7212248.661 | 137.33 | | |
| Q-31+034.75 | Q | 24-Feb-11 | 137.17 | 7.02 | 0.45 | 7.77 | 638919.993 | 7212247.847 | 137.50 | | |
| T-31+035.5 | T | 26-Sep-10 | 137.05 | 7.08 | 0.40 | 7.78 | 638919.868 | 7212247.233 | 137.33 | | |
| Q-31+036.25 | Q | 24-Feb-11 | 137.19 | 7.68 | 0.40 | 8.45 | 638919.607 | 7212246.349 | 137.48 | | |
| S-31+037 | S | 26-Sep-10 | 137.01 | 8.21 | 0.50 | 9.02 | 638919.621 | 7212245.721 | 137.29 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+037.75 | Q | 24-Feb-11 | 137.20 | 8.64 | 0.42 | 9.40 | 638919.368 | 7212244.956 | 137.47 | Communicated to Q-31+036.25 at bedrock interface. | |
| T-31+038.5 | T | 26-Sep-10 | 137.04 | 8.98 | 0.50 | 9.78 | 638919.243 | 7212244.289 | 137.34 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+039.25 | Q | 24-Feb-11 | 137.18 | 8.84 | 0.35 | 9.52 | 638919.064 | 7212243.383 | 137.43 | | |
| P-31+040 | P | 26-Sep-10 | 137.01 | 8.13 | 0.41 | 8.87 | 638919.006 | 7212242.772 | 137.33 | | |
| T-31+041.5 | T | 26-Sep-10 | 136.99 | 7.90 | 0.39 | 8.59 | 638918.632 | 7212241.242 | 137.32 | | |
| S-31+043 | S | 26-Sep-10 | 137.05 | 7.23 | 0.44 | 7.97 | 638918.339 | 7212239.847 | 137.29 | | |
| Q-31+043.75 | Q | 24-Feb-11 | 137.19 | 7.29 | 0.40 | 8.01 | 638918.207 | 7212238.992 | 137.44 | | |
| T-31+044.5 | T | 26-Sep-10 | 137.00 | 7.11 | 0.46 | 7.87 | 638918.127 | 7212238.353 | 137.31 | | |
| Q-31+045.25 | Q | 24-Feb-11 | 137.17 | 7.18 | 0.34 | 7.81 | 638917.929 | 7212237.454 | 137.39 | | |
| P-31+046 | P | 26-Sep-10 | 136.97 | 7.26 | 0.46 | 8.02 | 638917.760 | 7212236.916 | 137.30 | | |
| Q-31+046.75 | Q | 24-Feb-11 | 137.13 | 7.30 | 0.44 | 7.90 | 638917.642 | 7212236.034 | 137.28 | | |
| T-31+047.5 | T | 26-Sep-10 | 136.99 | 7.08 | 0.47 | 7.85 | 638917.410 | 7212235.473 | 137.30 | | |
| Q-31+048.25 | Q | 24-Feb-11 | 137.15 | 6.98 | 0.43 | 7.75 | 638917.299 | 7212234.564 | 137.35 | Communicated to Q-31+046.75. | |
| S-31+049 | S | 26-Sep-10 | 137.03 | 7.13 | 0.47 | 7.90 | 638917.170 | 7212233.948 | 137.32 | | |
| Q-31+049.75 | Q | 24-Feb-11 | 137.13 | 7.46 | 0.40 | 8.16 | 638917.068 | 7212233.142 | 137.40 | Communicated (water) to Q-31+048.25 and communicated (air) to Q-31+046.75. | |
| T-31+050.5 | T | 26-Sep-10 | 136.90 | 7.49 | 0.37 | 8.16 | 638916.851 | 7212232.552 | 137.29 | | |
| Q-31+051.25 | Q | 24-Feb-11 | 137.09 | 7.48 | 0.39 | 8.16 | 638916.756 | 7212231.647 | 137.32 | Communicated to Q-31+049.75. | |
| P-31+052 | P | 26-Sep-10 | 136.94 | 7.34 | 0.41 | 8.05 | 638916.581 | 7212231.090 | 137.17 | | |

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## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-31+052.75 | Q | 24-Feb-11 | 137.05 | 7.36 | 0.42 | 7.98 | 638916.569 | 7212230.189 | 137.25 | | |
| T-31+053.5 | T | 26-Sep-10 | 136.86 | 7.39 | 0.46 | 8.15 | 638916.369 | 7212229.602 | 137.24 | | |
| Q-31+054.25 | Q | 24-Feb-11 | 137.08 | 7.29 | 0.41 | 7.96 | 638916.295 | 7212228.637 | 137.26 | | |
| S-31+055 | S | 26-Sep-10 | 136.96 | 7.22 | 0.50 | 8.03 | 638916.078 | 7212228.069 | 137.24 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+055.75 | Q | 24-Feb-11 | 137.04 | 7.30 | 0.40 | 7.92 | 638915.945 | 7212227.237 | 137.32 | | |
| T-31+056.5 | T | 26-Sep-10 | 136.97 | 7.10 | 0.50 | 7.90 | 638915.664 | 7212226.594 | 137.28 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+057.25 | Q | 24-Feb-11 | 137.18 | 7.34 | 0.37 | 7.88 | 638915.549 | 7212225.780 | 137.26 | | |
| P-31+058 | P | 26-Sep-10 | 137.02 | 7.10 | 0.50 | 7.90 | 638915.409 | 7212225.195 | 137.36 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+058.75 | Q | 24-Feb-11 | 137.26 | 7.86 | 0.44 | 8.40 | 638915.292 | 7212224.261 | 137.26 | | |
| T-31+059.5 | T | 26-Sep-10 | 137.08 | 7.20 | 0.50 | 8.00 | 638915.098 | 7212223.524 | 137.38 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+060.25 | Q | 24-Feb-11 | 137.21 | 7.06 | 0.47 | 7.76 | 638915.073 | 7212222.830 | 137.46 | Communicated to Q-31+058.75. | |
| S-31+061 | S | 26-Sep-10 | 137.05 | 7.02 | 0.50 | 7.83 | 638914.892 | 7212222.169 | 137.37 | QA of activity not carried out; records retrieved from TCG. | |
| T-31+062.5 | T | 26-Sep-10 | 137.04 | 6.41 | 0.50 | 7.22 | 638914.572 | 7212220.700 | 137.37 | QA of activity not carried out; records retrieved from TCG. | |
| P-31+064 | P | 26-Sep-10 | 137.11 | 6.33 | 0.50 | 7.14 | 638914.325 | 7212219.281 | 137.40 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+064.75 | Q | 25-Feb-11 | 137.14 | 6.52 | 0.14 | 6.95 | 638914.214 | 7212218.493 | 137.45 | | |
| T-31+065.5 | T | 26-Sep-10 | 137.01 | 6.31 | 0.50 | 7.11 | 638914.043 | 7212217.999 | 137.37 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+066.25 | Q | 25-Feb-11 | 137.18 | 6.73 | 0.14 | 7.15 | 638913.848 | 7212217.149 | 137.43 | Communicated to Q-31+064.75. | |
| S-31+067 | S | 26-Sep-10 | 137.03 | 6.54 | 0.50 | 7.34 | 638913.693 | 7212216.378 | 137.41 | QA of activity not carried out; records retrieved from TCG. | |
| T-31+068.5 | T | 26-Sep-10 | 136.87 | 6.23 | 0.50 | 7.04 | 638913.380 | 7212215.037 | 137.32 | QA of activity not carried out; records retrieved from TCG. | |
| P-31+070 | P | 26-Sep-10 | 137.03 | 6.21 | 0.50 | 7.01 | 638913.086 | 7212213.544 | 137.34 | QA of activity not carried out; records retrieved from TCG. | |
| T-31+071.5 | T | 26-Sep-10 | 137.09 | 6.31 | 0.50 | 7.11 | 638912.793 | 7212212.039 | 137.34 | QA of activity not carried out; records retrieved from TCG. | |
| S-31+073 | S | 26-Sep-10 | 137.07 | 6.28 | 0.50 | 7.09 | 638912.544 | 7212210.637 | 137.32 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+073.75 | Q | 25-Feb-11 | 137.14 | 6.45 | 0.36 | 7.08 | 638912.515 | 7212209.865 | 137.44 | Communicated to Q-31+066.25. | |
| T-31+074.5 | T | 26-Sep-10 | 137.10 | 6.21 | 0.50 | 7.01 | 638912.263 | 7212209.050 | 137.34 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+075.25 | Q | 25-Feb-11 | 137.20 | 6.53 | 0.38 | 7.20 | 638912.211 | 7212208.320 | 137.48 | Communicated to Q-31+073.75. | |
| P-31+076 | P | 26-Sep-10 | 137.12 | 6.36 | 0.50 | 7.16 | 638912.043 | 7212207.591 | 137.39 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+076.75 | Q | 25-Feb-11 | 137.22 | 6.56 | 0.35 | 7.23 | 638911.975 | 7212206.805 | 137.49 | Communicated (water) to Q-31+075.25. | |
| T-31+077.5 | T | 27-Sep-10 | 137.07 | 6.73 | 0.43 | 7.46 | 638911.776 | 7212206.150 | 137.30 | | |
| Q-31+078.25 | Q | 25-Feb-11 | 137.20 | 6.43 | 0.37 | 7.13 | 638911.653 | 7212205.340 | 137.45 | Communicated to Q-31+076.75. | |
| S-31+079 | S | 27-Sep-10 | 137.10 | 6.47 | 0.41 | 7.18 | 638911.555 | 7212204.667 | 137.38 | | |
| T-31+080.5 | T | 27-Sep-10 | 137.10 | 6.57 | 0.47 | 7.34 | 638911.104 | 7212203.121 | 137.43 | | |
| P-31+082 | P | 27-Sep-10 | 137.06 | 6.57 | 0.47 | 7.34 | 638910.772 | 7212201.670 | 137.26 | | |
| T-31+083.5 | T | 27-Sep-10 | 137.02 | 6.57 | 0.44 | 7.31 | 638910.368 | 7212200.316 | 137.29 | | |
| S-31+085 | S | 27-Sep-10 | 137.09 | 6.55 | 0.46 | 7.31 | 638910.072 | 7212198.780 | 137.28 | | |
| Q-31+085.75 | Q | 25-Feb-11 | 137.08 | 6.57 | 0.32 | 7.12 | 638910.063 | 7212198.019 | 137.37 | | |
| T-31+086.5 | T | 27-Sep-10 | 137.01 | 6.55 | 0.41 | 7.26 | 638909.835 | 7212197.350 | 137.28 | | |
| Q-31+087.25 | Q | 25-Feb-11 | 137.05 | 6.56 | 0.40 | 7.22 | 638909.797 | 7212196.508 | 137.38 | Communicated to Q-31+085.75. | |
| P-31+088 | P | 27-Sep-10 | 137.00 | 6.55 | 0.39 | 7.24 | 638909.626 | 7212195.782 | 137.24 | | |
| Q-31+088.75 | Q | 25-Feb-11 | 137.11 | 6.49 | 0.42 | 7.12 | 638909.554 | 7212195.014 | 137.27 | | |
| T-31+089.5 | T | 27-Sep-10 | 137.00 | 6.47 | 0.41 | 7.18 | 638909.237 | 7212194.349 | 137.34 | | |
| Q-31+090.25 | Q | 25-Feb-11 | 137.14 | 6.53 | 0.37 | 7.05 | 638909.196 | 7212193.642 | 137.29 | | |
| S-31+091 | S | 27-Sep-10 | 137.02 | 6.57 | 0.44 | 7.31 | 638909.021 | 7212192.921 | 137.36 | | |
| Q-31+091.75 | Q | 25-Feb-11 | 137.14 | 6.70 | 0.43 | 7.32 | 638908.965 | 7212192.147 | 137.32 | | |
| T-31+092.5 | T | 27-Sep-10 | 136.97 | 6.90 | 0.42 | 7.62 | 638908.729 | 7212191.503 | 137.40 | | |
| Q-31+093.25 | Q | 25-Feb-11 | 137.17 | 6.73 | 0.40 | 7.36 | 638908.674 | 7212190.617 | 137.31 | | |
| P-31+094 | P | 27-Sep-10 | 137.05 | 6.83 | 0.46 | 7.59 | 638908.423 | 7212189.998 | 137.39 | | |

Golder Associates

# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-31+094.75 | Q | 25-Feb-11 | 137.21 | 6.84 | 0.41 | 7.45 | 638908.389 | 7212189.160 | 137.31 | | |
| T-31+095.5 | T | 27-Sep-10 | 137.08 | 7.01 | 0.48 | 7.79 | 638908.120 | 7212188.501 | 137.43 | | |
| Q-31+096.25 | Q | 23-Feb-11 | 137.20 | 6.98 | 0.31 | 7.67 | 638908.074 | 7212187.693 | 137.52 | | |
| S-31+097 | S | 27-Sep-10 | 137.18 | 7.16 | 0.44 | 7.90 | 638907.862 | 7212187.024 | 137.49 | | |
| Q-31+097.75 | Q | 23-Feb-11 | 137.17 | 7.34 | 0.25 | 7.89 | 638907.599 | 7212186.280 | 137.50 | Communicated to Q-31+099.25. | |
| T-31+098.5 | T | 27-Sep-10 | 137.18 | 7.16 | 0.46 | 7.92 | 638907.324 | 7212185.574 | 137.47 | | |
| Q-31+099.25 | Q | 23-Feb-11 | 137.22 | 7.40 | 0.46 | 8.16 | 638907.363 | 7212184.787 | 137.57 | | |
| P-31+100 | P | 27-Sep-10 | 137.15 | 7.26 | 0.46 | 8.02 | 638907.072 | 7212184.104 | 137.42 | | |
| Q-31+100.75 | Q | 23-Feb-11 | 137.21 | 7.62 | 0.31 | 8.24 | 638907.061 | 7212183.295 | 137.51 | | |
| T-31+101.5 | T | 27-Sep-10 | 137.13 | 8.00 | 0.41 | 8.71 | 638906.870 | 7212182.634 | 137.39 | | |
| Q-31+102.25 | Q | 22-Feb-11 | 137.11 | 7.83 | 0.02 | 8.27 | 638906.695 | 7212181.791 | 137.43 | | |
| S-31+103 | S | 27-Sep-10 | 137.09 | 7.95 | 0.41 | 8.66 | 638906.554 | 7212181.211 | 137.35 | | |
| Q-31+103.75 | Q | 22-Feb-11 | 137.20 | 8.07 | 0.38 | 8.76 | 638906.446 | 7212180.421 | 137.44 | | |
| T-31+104.5 | T | 27-Sep-10 | 137.03 | 8.25 | 0.46 | 8.99 | 638906.250 | 7212179.748 | 137.31 | | |
| Q-31+105.25 | Q | 26-Feb-11 | 137.17 | 8.37 | 0.34 | 9.01 | 638906.156 | 7212178.861 | 137.42 | Communicated (water) to Q-31+106.75 and Q-31+103.75. | |
| P-31+106 | P | 28-Sep-10 | 136.90 | 8.41 | 0.47 | 9.18 | 638906.054 | 7212178.275 | 137.24 | | |
| Q-31+106.75 | Q | 26-Feb-11 | 137.04 | 8.54 | 0.38 | 9.23 | 638905.877 | 7212177.369 | 137.41 | Communicated to Q-31+109.75. | |
| T-31+107.5 | T | 28-Sep-10 | 136.96 | 8.47 | 0.52 | 9.29 | 638905.743 | 7212176.796 | 137.28 | | |
| Q-31+108.25 | Q | 26-Feb-11 | 137.04 | 8.68 | 0.41 | 9.42 | 638905.552 | 7212175.948 | 137.37 | Communicated to Q-31+109.75. | |
| S-31+109 | S | 28-Sep-10 | 136.97 | 8.86 | 0.46 | 9.57 | 638905.440 | 7212175.357 | 137.20 | | |
| Q-31+109.75 | Q | 26-Feb-11 | 137.03 | 8.94 | 0.29 | 9.50 | 638905.207 | 7212174.450 | 137.26 | | |
| T-31+110.5 | T | 28-Sep-10 | 137.07 | 8.64 | 0.50 | 9.44 | 638905.060 | 7212173.777 | 137.22 | | |
| Q-31+111.25 | Q | 26-Feb-11 | 137.07 | 8.95 | 0.43 | 9.55 | 638905.093 | 7212173.139 | 137.16 | | |
| P-31+112 | P | 28-Sep-10 | 137.01 | 8.99 | 0.49 | 9.78 | 638904.786 | 7212172.340 | 137.29 | | |
| T-31+113.5 | T | 28-Sep-10 | 136.96 | 9.87 | 0.47 | 10.64 | 638904.486 | 7212170.964 | 137.27 | | |
| S-31+115 | S | 28-Sep-10 | 137.11 | 10.02 | 0.48 | 10.80 | 638904.115 | 7212169.510 | 137.34 | | |
| Q-31+115.75 | Q | 26-Feb-11 | 137.07 | 10.12 | 0.44 | 10.74 | 638904.032 | 7212168.651 | 137.25 | | |
| T-31+116.5 | T | 28-Sep-10 | 137.00 | 10.24 | 0.49 | 11.03 | 638903.872 | 7212167.970 | 137.29 | | |
| Q-31+117.25 | Q | 26-Feb-11 | 137.11 | 9.92 | 0.43 | 10.53 | 638903.741 | 7212167.230 | 137.29 | | |
| P-31+118 | P | 28-Sep-10 | 136.97 | 9.71 | 0.45 | 10.46 | 638903.571 | 7212166.537 | 137.27 | | |
| T-31+119.5 | T | 28-Sep-10 | 136.99 | 9.41 | 0.46 | 10.17 | 638903.265 | 7212165.127 | 137.24 | | |
| S-31+121 | S | 28-Sep-10 | 137.09 | 9.30 | 0.44 | 10.04 | 638902.914 | 7212163.666 | 137.32 | | |
| Q-31+121.75 | Q | 26-Feb-11 | 137.16 | 8.78 | 0.42 | 9.43 | 638902.794 | 7212162.713 | 137.41 | | |
| T-31+122.5 | T | 28-Sep-10 | 137.07 | 8.76 | 0.39 | 9.45 | 638902.600 | 7212162.150 | 137.40 | | |
| Q-31+123.25 | Q | 27-Feb-11 | 137.17 | 8.66 | 0.40 | 9.35 | 638902.415 | 7212161.343 | 137.47 | Communicated to Q-31+121.75. | |
| P-31+124 | P | 28-Sep-10 | 137.14 | 8.73 | 0.44 | 9.47 | 638902.193 | 7212160.634 | 137.38 | | |
| Q-31+124.75 | Q | 27-Feb-11 | 137.22 | 8.65 | 0.41 | 9.32 | 638902.168 | 7212159.963 | 137.46 | Communicated to Q-31+123.25. | |
| T-31+125.5 | T | 28-Sep-10 | 137.12 | 8.43 | 0.44 | 9.17 | 638901.909 | 7212159.245 | 137.32 | | |
| Q-31+126.25 | Q | 27-Feb-11 | 137.21 | 8.66 | 0.41 | 9.38 | 638901.841 | 7212158.523 | 137.47 | | |
| S-31+127 | S | 28-Sep-10 | 137.10 | 8.61 | 0.44 | 9.35 | 638901.687 | 7212157.738 | 137.38 | Very hard rock. | |
| Q-31+127.75 | Q | 27-Feb-11 | 137.24 | 9.07 | 0.41 | 9.77 | 638901.630 | 7212156.999 | 137.52 | Communicated to Q-31+126.25. | |
| T-31+128.5 | T | 28-Sep-10 | 137.14 | 8.71 | 0.34 | 9.35 | 638901.428 | 7212156.263 | 137.38 | Very hard rock. | |
| Q-31+129.25 | Q | 27-Feb-11 | 137.20 | 9.10 | 0.41 | 9.81 | 638901.272 | 7212155.567 | 137.48 | | |
| P-31+130 | P | 28-Sep-10 | 137.11 | 9.27 | 0.41 | 9.98 | 638901.031 | 7212154.769 | 137.39 | | |
| Q-31+130.75 | Q | 27-Feb-11 | 137.22 | 9.80 | 0.41 | 10.50 | 638900.956 | 7212154.050 | 137.47 | Communicated to Q-31+129.25. | |
| T-31+131.5 | T | 28-Sep-10 | 137.09 | 9.78 | 0.41 | 10.49 | 638900.604 | 7212153.282 | 137.42 | | |

**TABLE E1-3.1**
**SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES**

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-31+132.25 | Q | 24-Apr-11 | 137.19 | 10.10 | 0.55 | 10.73 | 638900.521 | 7212152.688 | 137.35 | | |
| S-31+133 | S | 28-Sep-10 | 137.13 | 10.29 | 0.44 | 11.03 | 638900.274 | 7212151.835 | 137.43 | | |
| Q-31+133.75 | Q | 24-Apr-11 | 137.22 | 10.55 | 0.32 | 11.13 | 638900.191 | 7212151.234 | 137.40 | | |
| T-31+134.5 | T | 28-Sep-10 | 137.14 | 10.55 | 0.50 | 11.36 | 638900.018 | 7212150.437 | 137.36 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+135.25 | Q | 24-Apr-11 | 137.20 | 10.34 | 0.36 | 10.84 | 638899.869 | 7212149.710 | 137.41 | | |
| P-31+136 | P | 29-Sep-10 | 137.13 | 9.91 | 0.45 | 10.66 | 638899.654 | 7212148.945 | 137.41 | | |
| Q-31+136.75 | Q | 24-Apr-11 | 137.27 | 9.88 | 0.24 | 10.20 | 638899.436 | 7212148.276 | 137.38 | | |
| T-31+137.5 | T | 29-Sep-10 | 137.08 | 9.49 | 0.47 | 10.26 | 638899.138 | 7212147.492 | 137.37 | | |
| Q-31+138.25 | Q | 24-Apr-11 | 137.21 | 9.80 | 0.37 | 10.22 | 638898.842 | 7212146.929 | 137.32 | | |
| S-31+139 | S | 29-Sep-10 | 137.04 | 9.84 | 0.48 | 10.62 | 638898.477 | 7212146.260 | 137.40 | | |
| T-31+140.5 | T | 29-Sep-10 | 137.16 | 9.85 | 0.43 | 10.56 | 638897.752 | 7212144.873 | 137.36 | | |
| P-31+142 | P | 29-Sep-10 | 137.18 | 9.91 | 0.48 | 10.69 | 638896.983 | 7212143.634 | 137.48 | | |
| Q-31+142.75 | Q | 24-Apr-11 | 137.24 | 9.82 | 0.14 | 10.04 | 638896.603 | 7212143.036 | 137.31 | | |
| T-31+143.5 | T | 29-Sep-10 | 137.06 | 9.46 | 0.38 | 10.14 | 638896.239 | 7212142.312 | 137.33 | | |
| Q-31+144.25 | Q | 24-Apr-11 | 137.23 | 9.68 | 0.56 | 10.36 | 638895.907 | 7212141.693 | 137.34 | | |
| S-31+145 | S | 29-Sep-10 | 137.06 | 9.50 | 0.48 | 10.25 | 638895.506 | 7212140.973 | 137.29 | | |
| Q-31+145.75 | Q | 21-Apr-11 | 137.23 | 9.43 | 0.52 | 10.01 | 638895.135 | 7212140.429 | 137.41 | | |
| T-31+146.5 | T | 29-Sep-10 | 137.08 | 8.97 | 0.46 | 9.71 | 638894.826 | 7212139.678 | 137.34 | | |
| Q-31+147.25 | Q | 21-Apr-11 | 137.24 | 9.21 | 0.51 | 9.81 | 638894.396 | 7212139.085 | 137.26 | | |
| P-31+148 | P | 29-Sep-10 | 137.12 | 9.18 | 0.45 | 9.93 | 638894.125 | 7212138.346 | 137.45 | | |
| Q-31+148.75 | Q | 21-Apr-11 | 137.24 | 9.27 | 0.60 | 9.97 | 638893.722 | 7212137.796 | 137.29 | | |
| T-31+149.5 | T | 29-Sep-10 | 137.08 | 9.10 | 0.45 | 9.83 | 638893.354 | 7212137.156 | 137.36 | | |
| Q-31+150.25 | Q | 21-Apr-11 | 137.22 | 9.30 | 0.45 | 9.78 | 638892.904 | 7212136.433 | 137.21 | | |
| S-31+151 | S | 29-Sep-10 | 137.07 | 9.24 | 0.47 | 10.01 | 638892.615 | 7212135.844 | 137.38 | | |
| T-31+152.5 | T | 29-Sep-10 | 137.06 | 9.56 | 0.50 | 10.37 | 638891.882 | 7212134.529 | 137.33 | QA of activity not carried out; records retrieved from TCG. | |
| P-31+154 | P | 29-Sep-10 | 137.12 | 8.81 | 0.44 | 9.55 | 638891.149 | 7212133.166 | 137.40 | | |
| T-31+155.5 | T | 29-Sep-10 | 137.19 | 9.17 | 0.41 | 9.88 | 638890.392 | 7212131.900 | 137.46 | | |
| S-31+157 | S | 29-Sep-10 | 137.19 | 9.12 | 0.41 | 9.83 | 638889.704 | 7212130.552 | 137.50 | | |
| Q-31+157.75 | Q | 21-Apr-11 | 137.27 | 8.69 | 0.50 | 9.49 | 638889.332 | 7212129.915 | 137.47 | QA of activity not carried out; records retrieved from TCG. | |
| T-31+158.5 | T | 29-Sep-10 | 137.13 | 8.81 | 0.49 | 9.60 | 638888.944 | 7212129.284 | 137.44 | | |
| Q-31+159.25 | Q | 21-Apr-11 | 137.32 | 8.76 | 0.50 | 9.56 | 638888.637 | 7212128.652 | 137.52 | QA of activity not carried out; records retrieved from TCG. | |
| P-31+160 | P | 29-Sep-10 | 137.11 | 9.07 | 0.44 | 9.81 | 638888.211 | 7212127.981 | 137.43 | | |
| Q-31+160.75 | Q | 21-Apr-11 | 137.11 | 8.82 | 0.50 | 9.62 | 638887.887 | 7212127.254 | 137.41 | QA of activity not carried out; records retrieved from TCG. | |
| T-31+161.5 | T | 29-Sep-10 | 137.16 | 9.50 | 0.43 | 10.29 | 638887.428 | 7212126.674 | 137.50 | | |
| Q-31+162.25 | Q | 21-Apr-11 | 137.14 | 9.15 | 0.50 | 9.95 | 638887.116 | 7212125.992 | 137.24 | QA of activity not carried out; records retrieved from TCG. | |
| S-31+163 | S | 29-Sep-10 | 137.15 | 9.80 | 0.44 | 10.54 | 638886.723 | 7212125.323 | 137.44 | | |
| Q-31+163.75 | Q | 21-Apr-11 | 137.29 | 9.76 | 0.50 | 10.56 | 638886.401 | 7212124.659 | 137.56 | QA of activity not carried out; records retrieved from TCG. | |
| T-31+164.5 | T | 29-Sep-10 | 137.13 | 10.47 | 0.43 | 11.20 | 638885.995 | 7212124.079 | 137.40 | | |
| Q-31+165.25 | Q | 22-Apr-11 | 137.20 | 10.35 | 0.65 | 11.16 | 638885.612 | 7212123.349 | 137.38 | | |
| P-31+166 | P | 29-Sep-10 | 137.04 | 10.01 | 0.44 | 10.75 | 638885.239 | 7212122.728 | 137.39 | | |
| T-31+167.5 | T | 29-Sep-10 | 137.01 | 10.44 | 0.46 | 11.20 | 638884.532 | 7212121.251 | 137.28 | | |
| S-31+169 | S | 30-Sep-10 | 136.98 | 9.76 | 0.45 | 10.51 | 638883.818 | 7212120.062 | 137.23 | | |
| Q-31+169.75 | Q | 22-Apr-11 | 137.14 | 9.89 | 0.26 | 10.24 | 638883.447 | 7212119.499 | 137.23 | | |
| T-31+170.5 | T | 30-Sep-10 | 136.99 | 9.61 | 0.43 | 10.32 | 638882.992 | 7212118.730 | 137.22 | | |
| Q-31+171.25 | Q | 22-Apr-11 | 137.13 | 9.95 | 0.65 | 10.70 | 638882.723 | 7212118.150 | 137.27 | | |
| P-31+172 | P | 30-Sep-10 | 136.99 | 9.98 | 0.44 | 10.68 | 638882.362 | 7212117.388 | 137.26 | | |

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-31+173.5 | T | 30-Sep-10 | 137.01 | 9.45 | 0.49 | 10.24 | 638881.645 | 7212116.113 | 137.33 | | |
| S-31+175 | S | 30-Sep-10 | 137.01 | 9.36 | 0.50 | 10.16 | 638880.942 | 7212114.850 | 137.33 | | |
| T-31+176.5 | T | 30-Sep-10 | 137.02 | 9.21 | 0.43 | 9.97 | 638880.186 | 7212113.550 | 137.31 | | |
| P-31+178 | P | 1-Oct-10 | 136.96 | 8.93 | 0.47 | 9.70 | 638879.434 | 7212112.106 | 137.30 | | |
| Q-31+178.75 | Q | 22-Apr-11 | 137.06 | 8.70 | 0.58 | 9.53 | 638878.776 | 7212110.946 | 137.27 | | |
| T-31+179.5 | T | 1-Oct-10 | 136.97 | 8.31 | 0.55 | 9.16 | 638878.728 | 7212110.875 | 137.26 | | |
| Q-31+180.25 | Q | 22-Apr-11 | 137.07 | 8.25 | 0.57 | 8.88 | 638878.013 | 7212109.579 | 137.18 | | |
| S-31+181 | S | 1-Oct-10 | 136.89 | 7.91 | 0.49 | 8.70 | 638877.955 | 7212109.518 | 137.20 | | |
| Q-31+181.75 | Q | 22-Apr-11 | 137.04 | 8.04 | 0.62 | 8.77 | 638877.584 | 7212108.936 | 137.14 | | |
| T-31+182.5 | T | 29-Sep-10 | 136.87 | 7.87 | 0.44 | 8.61 | 638877.208 | 7212108.244 | 137.16 | | |
| Q-31+183.25 | Q | 22-Apr-11 | 137.02 | 8.62 | 0.17 | 8.94 | 638876.884 | 7212107.624 | 137.12 | | |
| P-31+184 | P | 29-Sep-10 | 136.91 | 8.95 | 0.50 | 9.76 | 638876.539 | 7212106.943 | 137.07 | | |
| Q-31+184.75 | Q | 22-Apr-11 | 136.98 | 9.07 | 0.40 | 9.63 | 638876.119 | 7212106.354 | 137.07 | | |
| T-31+185.5 | T | 29-Sep-10 | 136.82 | 8.89 | 0.50 | 9.67 | 638875.752 | 7212105.660 | 137.18 | | |
| Q-31+186.25 | Q | 22-Apr-11 | 136.98 | 8.80 | 0.39 | 9.35 | 638875.390 | 7212105.054 | 137.07 | | |
| S-31+187 | S | 29-Sep-10 | 136.81 | 8.51 | 0.46 | 9.27 | 638875.016 | 7212104.335 | 137.15 | | |
| Q-31+187.75 | Q | 22-Apr-11 | 136.94 | 8.53 | 0.41 | 9.09 | 638874.654 | 7212103.787 | 137.11 | | |
| T-31+188.5 | T | 29-Sep-10 | 136.75 | 8.27 | 0.42 | 8.99 | 638874.290 | 7212102.982 | 137.05 | | |
| Q-31+189.25 | Q | 22-Apr-11 | 136.91 | 8.25 | 0.31 | 8.71 | 638873.960 | 7212102.434 | 137.00 | | |
| P-31+190 | P | 29-Sep-10 | 136.73 | 7.85 | 0.43 | 8.58 | 638873.608 | 7212101.661 | 136.98 | | |
| Q-31+190.75 | Q | 22-Apr-11 | 136.90 | 8.17 | 0.29 | 8.61 | 638873.251 | 7212101.070 | 137.07 | | |
| T-31+191.5 | T | 29-Sep-10 | 136.72 | 8.05 | 0.46 | 8.81 | 638872.901 | 7212100.379 | 136.98 | Ground surface rising while drilling bedrock due to excessive air pressure being used. | |
| Q-31+192.25 | Q | 23-Apr-11 | 136.90 | 8.23 | 0.56 | 8.99 | 638872.514 | 7212099.763 | 137.13 | | |
| S-31+193 | S | 29-Sep-10 | 136.73 | 8.02 | 0.57 | 8.89 | 638872.184 | 7212099.033 | 137.03 | | |
| Q-31+193.75 | Q | 23-Apr-11 | 136.87 | 8.08 | 0.70 | 8.86 | 638871.799 | 7212098.468 | 136.91 | | |
| T-31+194.5 | T | 29-Sep-10 | 136.74 | 7.87 | 0.53 | 8.70 | 638871.454 | 7212097.805 | 137.04 | Ground surface rising while drilling bedrock due to excessive air pressure being used. | |
| Q-31+195.25 | Q | 23-Apr-11 | 136.87 | 7.79 | 0.55 | 8.59 | 638871.032 | 7212097.150 | 137.10 | | |
| P-31+196 | P | 29-Sep-10 | 136.77 | 7.47 | 0.47 | 8.24 | 638870.628 | 7212096.443 | 137.07 | | |
| Q-31+196.75 | Q | 23-Apr-11 | 136.90 | 7.75 | 0.54 | 8.56 | 638870.299 | 7212095.782 | 137.17 | | |
| T-31+197.5 | T | 28-Sep-10 | 136.82 | 7.80 | 0.41 | 8.51 | 638869.933 | 7212095.065 | 137.10 | | |
| Q-31+198.25 | Q | 23-Apr-11 | 136.94 | 8.10 | 0.42 | 8.56 | 638869.549 | 7212094.551 | 136.95 | | |
| S-31+199 | S | 28-Sep-10 | 136.74 | 8.06 | 0.48 | 8.84 | 638869.095 | 7212093.879 | 137.04 | Ground surface rising while drilling bedrock due to excessive air pressure being used. | |
| Q-31+199.75 | Q | 23-Apr-11 | 136.90 | 8.10 | 0.39 | 8.53 | 638868.816 | 7212093.233 | 136.93 | | |
| T-31+200.5 | T | 30-Sep-10 | 136.88 | 7.92 | 0.47 | 8.69 | 638868.425 | 7212092.451 | 137.13 | Ground surface rising while drilling bedrock due to excessive air pressure being used. | |
| Q-31+201.25 | Q | 23-Apr-11 | 136.95 | 7.93 | 0.40 | 8.53 | 638868.078 | 7212091.996 | 137.26 | | |
| P-31+202 | P | 30-Sep-10 | 136.88 | 7.70 | 0.44 | 8.44 | 638867.637 | 7212091.187 | 137.14 | | |
| Q-31+202.75 | Q | 23-Apr-11 | 137.00 | 7.97 | 0.01 | 8.13 | 638867.335 | 7212090.617 | 137.15 | | |
| T-31+203.5 | T | 30-Sep-10 | 136.88 | 7.97 | 0.44 | 8.71 | 638866.912 | 7212089.941 | 137.20 | | |
| Q-31+204.25 | Q | 23-Apr-11 | 136.96 | 8.02 | 0.46 | 8.53 | 638866.676 | 7212089.285 | 137.07 | | |
| S-31+205 | S | 30-Sep-10 | 136.85 | 7.93 | 0.47 | 8.70 | 638866.179 | 7212088.607 | 137.18 | | |
| Q-31+205.75 | Q | 23-Apr-11 | 136.95 | 8.00 | 0.28 | 8.53 | 638865.883 | 7212088.003 | 137.28 | | |
| T-31+206.5 | T | 30-Sep-10 | 136.85 | 7.92 | 0.46 | 8.63 | 638865.455 | 7212087.196 | 137.11 | | |
| Q-31+207.25 | Q | 23-Apr-11 | 136.96 | 7.95 | 0.43 | 8.53 | 638865.154 | 7212086.695 | 137.17 | | |
| P-31+208 | P | 30-Sep-10 | 136.81 | 7.75 | 0.41 | 8.46 | 638864.829 | 7212086.064 | 137.12 | | |
| T-31+209.5 | T | 30-Sep-10 | 136.75 | 8.56 | 0.44 | 9.30 | 638864.005 | 7212084.701 | 137.07 | | |
| S-31+211 | S | 30-Sep-10 | 136.75 | 7.78 | 0.45 | 8.41 | 638863.195 | 7212083.406 | 136.96 | | |

**TABLE E1-3.1**
**SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES**

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-31+211.75 | Q | 23-Apr-11 | 136.90 | 7.89 | 0.60 | 8.53 | 638863.019 | 7212082.788 | 136.89 | | |
| T-31+212.5 | T | 30-Sep-10 | 136.63 | 7.62 | 0.46 | 8.41 | 638862.565 | 7212082.123 | 136.97 | | |
| Q-31+213.25 | Q | 24-Apr-11 | 136.84 | 7.68 | 0.55 | 8.57 | 638862.282 | 7212081.466 | 137.15 | | |
| P-31+214 | P | 30-Sep-10 | 136.63 | 7.41 | 0.44 | 8.15 | 638861.793 | 7212080.777 | 136.99 | | |
| Q-31+214.75 | Q | 24-Apr-11 | 136.90 | 7.75 | 0.53 | 8.56 | 638861.551 | 7212080.146 | 137.15 | | |
| T-31+215.5 | T | 30-Sep-10 | 136.64 | 7.65 | 0.44 | 8.39 | 638861.088 | 7212079.401 | 136.97 | | |
| Q-31+216.25 | Q | 24-Apr-11 | 136.89 | 7.61 | 0.57 | 8.45 | 638860.828 | 7212078.837 | 137.15 | | |
| S-31+217 | S | 30-Sep-10 | 136.52 | 7.07 | 0.48 | 7.85 | 638860.289 | 7212078.159 | 136.90 | | |
| Q-31+217.75 | Q | 24-Apr-11 | 136.87 | 7.35 | 0.73 | 8.30 | 638860.073 | 7212077.515 | 137.02 | | |
| T-31+218.5 | T | 30-Sep-10 | 136.54 | 7.07 | 0.50 | 7.87 | 638859.583 | 7212076.785 | 136.87 | | |
| Q-31+219.25 | Q | 30-Apr-11 | 136.84 | 7.21 | 0.77 | 8.16 | 638859.302 | 7212076.231 | 137.03 | | |
| P-31+220 | P | 30-Sep-10 | 136.58 | 6.90 | 0.42 | 7.62 | 638858.826 | 7212075.453 | 136.96 | | |
| Q-31+220.75 | Q | 24-Apr-11 | 136.82 | 7.25 | 0.42 | 7.76 | 638858.638 | 7212074.861 | 136.96 | | |
| T-31+221.5 | T | 30-Sep-10 | 136.60 | 7.34 | 0.43 | 8.07 | 638858.151 | 7212074.124 | 137.01 | | |
| Q-31+222.25 | Q | 30-Apr-11 | 136.81 | 7.46 | 0.55 | 8.19 | 638857.878 | 7212073.563 | 136.96 | | |
| S-31+223 | S | 30-Sep-10 | 136.63 | 7.34 | 0.41 | 8.05 | 638857.438 | 7212072.910 | 136.97 | | |
| Q-31+223.75 | Q | 29-Apr-11 | 136.87 | 7.48 | 0.55 | 8.16 | 638857.188 | 7212072.275 | 136.99 | | |
| T-31+224.5 | T | 30-Sep-10 | 136.64 | 7.23 | 0.44 | 7.97 | 638856.790 | 7212071.599 | 136.98 | | |
| Q-31+225.25 | Q | 30-Apr-11 | 136.82 | 7.38 | 0.53 | 8.16 | 638856.482 | 7212070.969 | 137.13 | | |
| P-31+226 | P | 30-Sep-10 | 136.55 | 7.21 | 0.44 | 7.95 | 638856.044 | 7212070.385 | 136.94 | | |
| T-31+227.5 | T | 30-Sep-10 | 136.54 | 7.28 | 0.42 | 8.00 | 638855.248 | 7212068.919 | 136.95 | | |
| S-31+229 | S | 30-Sep-10 | 136.64 | 7.08 | 0.41 | 7.79 | 638854.454 | 7212067.614 | 136.99 | | |
| T-31+230.5 | T | 30-Sep-10 | 136.66 | 6.72 | 0.50 | 7.52 | 638853.798 | 7212066.361 | 136.97 | QA of activity not carried out; records retrieved from TCG. | |
| P-31+232 | P | 1-Oct-10 | 136.69 | 7.64 | 0.46 | 8.40 | 638853.046 | 7212065.091 | 137.04 | | |
| T-31+233.5 | T | 1-Oct-10 | 136.67 | 7.08 | 0.50 | 7.88 | 638852.272 | 7212063.685 | 137.03 | | |
| S-31+235 | S | 1-Oct-10 | 136.72 | 6.43 | 0.44 | 7.17 | 638851.551 | 7212062.425 | 137.07 | | |
| T-31+236.5 | T | 1-Oct-10 | 136.73 | 6.04 | 0.49 | 6.83 | 638850.823 | 7212061.131 | 137.10 | Weak rock. | |
| P-31+238 | P | 1-Oct-10 | 136.67 | 5.80 | 0.33 | 6.43 | 638850.043 | 7212059.793 | 136.99 | Hard to very hard rock. | |
| Q-31+238.75 | Q | 27-May-11 | 136.79 | 6.08 | 0.36 | 6.59 | 638849.756 | 7212059.157 | 136.97 | | |
| T-31+239.5 | T | 1-Oct-10 | 136.68 | 5.94 | 0.26 | 6.49 | 638849.386 | 7212058.433 | 136.99 | Very hard rock. | |
| Q-31+240.25 | Q | 27-May-11 | 136.82 | 6.40 | 0.42 | 6.99 | 638849.109 | 7212057.847 | 137.02 | | |
| S-31+241 | S | 1-Oct-10 | 136.64 | 5.79 | 0.41 | 6.50 | 638848.714 | 7212057.200 | 136.93 | 0.3 m of weak rock / till above bedrock surface. | |
| T-31+242.5 | T | 1-Oct-10 | 136.62 | 5.50 | 0.50 | 6.29 | 638847.883 | 7212055.893 | 136.89 | 0.3 m of weak rock / till above bedrock surface. | |
| P-31+244 | P | 1-Oct-10 | 136.72 | 5.91 | 0.45 | 6.66 | 638847.210 | 7212054.547 | 137.00 | 0.3 m of weak rock / till above bedrock surface. | |
| T-31+245.5 | T | 1-Oct-10 | 136.79 | 5.79 | 0.44 | 6.53 | 638846.389 | 7212053.328 | 137.07 | | |
| S-31+247 | S | 1-Oct-10 | 136.79 | 6.10 | 0.46 | 6.86 | 638845.670 | 7212051.957 | 137.11 | | |
| T-31+248.5 | T | 1-Oct-10 | 136.74 | 6.35 | 0.41 | 7.06 | 638844.936 | 7212050.648 | 136.98 | | |
| P-31+250 | P | 1-Oct-10 | 136.74 | 6.71 | 0.41 | 7.37 | 638844.299 | 7212049.322 | 137.02 | | |
| T-31+251.5 | T | 1-Oct-10 | 136.79 | 6.38 | 0.41 | 7.09 | 638843.511 | 7212048.036 | 137.07 | | |
| S-31+253 | S | 1-Oct-10 | 136.87 | 6.53 | 0.41 | 7.24 | 638842.783 | 7212046.861 | 137.14 | | |
| T-31+254.5 | T | 1-Oct-10 | 136.91 | 6.58 | 0.41 | 7.29 | 638842.146 | 7212045.512 | 137.21 | | |
| P-31+256 | P | 1-Oct-10 | 136.91 | 6.68 | 0.46 | 7.37 | 638841.399 | 7212044.142 | 137.17 | | |
| T-31+257.5 | T | 1-Oct-10 | 136.95 | 6.94 | 0.41 | 7.65 | 638840.668 | 7212042.875 | 137.28 | | |
| S-31+259 | S | 1-Oct-10 | 136.90 | 6.42 | 0.42 | 7.14 | 638839.866 | 7212041.560 | 137.27 | | |
| T-31+260.5 | T | 1-Oct-10 | 136.92 | 5.74 | 0.42 | 6.46 | 638839.170 | 7212040.241 | 137.26 | | |
| P-31+262 | P | 1-Oct-10 | 136.92 | 5.08 | 0.41 | 5.79 | 638838.490 | 7212038.887 | 137.26 | | |

**TABLE E1-3.1**
**SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES**

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-31+263.5 | T | 1-Oct-10 | 136.95 | 4.88 | 0.41 | 5.59 | 638837.715 | 7212037.612 | 137.29 | | |
| S-31+265 | S | 1-Oct-10 | 136.92 | 4.73 | 0.43 | 5.46 | 638837.021 | 7212036.276 | 137.31 | | |
| T-31+266.5 | T | 1-Oct-10 | 136.90 | 5.23 | 0.44 | 5.97 | 638836.222 | 7212034.924 | 137.23 | | |
| P-31+268 | P | 1-Oct-10 | 136.88 | 4.28 | 0.50 | 5.08 | 638835.484 | 7212033.651 | 137.27 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+268.75 | Q | 27-May-11 | 136.97 | 4.35 | 0.13 | 4.70 | 638835.094 | 7212033.089 | 137.23 | | |
| T-31+269.5 | T | 2-Oct-10 | 136.80 | 4.24 | 0.48 | 5.02 | 638834.704 | 7212032.460 | 137.18 | | |
| Q-31+270.25 | Q | 27-May-11 | 136.96 | 4.59 | 0.42 | 5.16 | 638834.411 | 7212031.711 | 137.13 | | |
| S-31+271 | S | 2-Oct-10 | 136.87 | 4.58 | 0.23 | 5.11 | 638833.951 | 7212031.014 | 137.19 | | |
| T-31+272.5 | T | 2-Oct-10 | 136.86 | 4.34 | 0.42 | 5.04 | 638833.283 | 7212029.723 | 137.13 | | |
| P-31+274 | P | 2-Oct-10 | 136.87 | 4.46 | 0.44 | 5.20 | 638832.529 | 7212028.455 | 137.20 | | |
| T-31+275.5 | T | 2-Oct-10 | 136.83 | 4.52 | 0.49 | 5.30 | 638831.767 | 7212027.108 | 137.13 | | |
| S-31+277 | S | 2-Oct-10 | 136.81 | 4.85 | 0.45 | 5.60 | 638831.058 | 7212025.787 | 137.12 | | |
| T-31+278.5 | T | 2-Oct-10 | 136.79 | 5.07 | 0.44 | 5.79 | 638830.328 | 7212024.494 | 137.08 | | |
| P-31+280 | P | 2-Oct-10 | 136.82 | 4.95 | 0.47 | 5.72 | 638829.645 | 7212023.158 | 137.12 | | |
| T-31+281.5 | T | 2-Oct-10 | 136.84 | 4.87 | 0.44 | 5.61 | 638828.909 | 7212021.865 | 137.13 | | |
| S-31+283 | S | 2-Oct-10 | 136.97 | 4.77 | 0.44 | 5.51 | 638828.100 | 7212020.568 | 137.24 | | |
| T-31+284.5 | T | 2-Oct-10 | 137.04 | 5.31 | 0.43 | 6.04 | 638827.423 | 7212019.239 | 137.36 | | |
| P-31+286 | P | 2-Oct-10 | 137.03 | 5.19 | 0.37 | 5.82 | 638826.755 | 7212017.941 | 137.29 | | |
| T-31+287.5 | T | 2-Oct-10 | 137.01 | 4.98 | 0.39 | 5.67 | 638825.885 | 7212016.590 | 137.29 | | |
| S-31+289 | S | 2-Oct-10 | 137.02 | 5.12 | 0.49 | 5.86 | 638825.178 | 7212015.336 | 137.28 | | |
| T-31+290.5 | T | 2-Oct-10 | 137.00 | 5.04 | 0.46 | 5.79 | 638824.450 | 7212014.012 | 137.29 | | |
| P-31+292 | P | 2-Oct-10 | 137.01 | 6.24 | 0.47 | 7.01 | 638823.692 | 7212012.701 | 137.35 | | |
| T-31+293.5 | T | 2-Oct-10 | 136.98 | 5.69 | 0.46 | 6.44 | 638822.997 | 7212011.386 | 137.29 | | |
| S-31+295 | S | 2-Oct-10 | 136.98 | 5.77 | 0.45 | 6.50 | 638822.235 | 7212010.053 | 137.24 | 0.2 m of weak rock / till above bedrock surface. | |
| T-31+296.5 | T | 2-Oct-10 | 136.92 | 5.96 | 0.44 | 6.70 | 638821.560 | 7212008.786 | 137.21 | | |
| P-31+298 | P | 2-Oct-10 | 136.79 | 6.28 | 0.46 | 7.04 | 638820.837 | 7212007.391 | 137.06 | | |
| T-31+299.5 | T | 2-Oct-10 | 136.83 | 6.44 | 0.50 | 7.24 | 638820.080 | 7212006.133 | 137.16 | | |
| S-31+301 | S | 2-Oct-10 | 136.81 | 6.12 | 0.52 | 6.94 | 638819.323 | 7212004.883 | 137.13 | | |
| T-31+302.5 | T | 2-Oct-10 | 136.84 | 5.73 | 0.27 | 6.30 | 638818.567 | 7212003.526 | 137.16 | Ground surface rising while drilling at bedrock contact due to use of excessive air pressure. | |
| P-31+304 | P | 1-Oct-10 | 136.84 | 5.58 | 0.41 | 6.29 | 638817.907 | 7212002.451 | 137.11 | | |
| T-31+305.5 | T | 1-Oct-10 | 136.83 | 5.51 | 0.41 | 6.22 | 638817.152 | 7212000.961 | 137.14 | | |
| S-31+307 | S | 1-Oct-10 | 136.74 | 5.23 | 0.44 | 5.97 | 638816.399 | 7211999.671 | 137.07 | | |
| T-31+308.5 | T | 1-Oct-10 | 136.85 | 5.23 | 0.44 | 5.97 | 638815.587 | 7211998.341 | 137.12 | | |
| P-31+310 | P | 1-Oct-10 | 136.82 | 4.90 | 0.41 | 5.61 | 638814.870 | 7211996.992 | 137.14 | | |
| T-31+311.5 | T | 1-Oct-10 | 136.83 | 4.77 | 0.42 | 5.49 | 638814.214 | 7211995.660 | 137.15 | | |
| S-31+313 | S | 1-Oct-10 | 136.70 | 5.48 | 0.42 | 6.20 | 638813.484 | 7211994.453 | 137.07 | | |
| T-31+314.5 | T | 1-Oct-10 | 136.85 | 6.14 | 0.44 | 6.88 | 638812.755 | 7211993.147 | 137.17 | | |
| P-31+316 | P | 1-Oct-10 | 136.94 | 5.43 | 0.44 | 6.17 | 638812.012 | 7211991.757 | 137.21 | | |
| T-31+317.5 | T | 1-Oct-10 | 136.96 | 6.19 | 0.47 | 6.96 | 638811.196 | 7211990.506 | 137.24 | | |
| S-31+319 | S | 1-Oct-10 | 136.94 | 6.52 | 0.44 | 7.26 | 638810.464 | 7211989.255 | 137.29 | | |
| Q-31+319.75 | Q | 27-May-11 | 137.01 | 6.58 | 0.41 | 7.14 | 638810.168 | 7211988.571 | 137.17 | | |
| T-31+320.5 | T | 1-Oct-10 | 136.94 | 6.22 | 0.44 | 6.96 | 638809.738 | 7211987.877 | 137.26 | | |
| Q-31+321.25 | Q | 27-May-11 | 136.92 | 6.12 | 0.39 | 6.69 | 638809.427 | 7211987.201 | 137.13 | | |
| P-31+322 | P | 1-Oct-10 | 136.91 | 5.90 | 0.41 | 6.61 | 638808.956 | 7211986.556 | 137.21 | | |
| T-31+323.5 | T | 1-Oct-10 | 136.87 | 5.91 | 0.42 | 6.63 | 638808.420 | 7211985.432 | 137.18 | | |

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S-31+325 | S | 1-Oct-10 | 136.87 | 5.74 | 0.43 | 6.47 | 638807.547 | 7211983.954 | 137.19 | | |
| T-31+326.5 | T | 1-Oct-10 | 136.90 | 5.63 | 0.42 | 6.35 | 638806.944 | 7211982.666 | 137.18 | | |
| P-31+328 | P | 1-Oct-10 | 136.91 | 6.98 | 0.44 | 7.72 | 638806.146 | 7211981.327 | 137.22 | | |
| T-31+329.5 | T | 1-Oct-10 | 136.93 | 6.01 | 0.44 | 6.75 | 638805.437 | 7211980.034 | 137.19 | | |
| S-31+331 | S | 1-Oct-10 | 136.83 | 4.84 | 0.48 | 5.60 | 638804.833 | 7211978.734 | 137.10 | 0.15 m of weak rock / till above bedrock surface. | |
| T-31+332.5 | T | 1-Oct-10 | 136.84 | 5.06 | 0.41 | 5.75 | 638804.018 | 7211977.388 | 137.12 | 0.2 m of weak rock / till above bedrock surface. | |
| P-31+334 | P | 1-Oct-10 | 136.88 | 5.29 | 0.47 | 6.04 | 638803.231 | 7211976.003 | 137.17 | 0.5 m of weak rock / till above bedrock surface. | |
| T-31+335.5 | T | 1-Oct-10 | 136.92 | 5.99 | 0.51 | 6.77 | 638802.542 | 7211974.756 | 137.17 | 1.25 m of weak rock / till above bedrock surface. | |
| S-31+337 | S | 1-Oct-10 | 136.92 | 5.20 | 0.45 | 5.90 | 638801.840 | 7211973.439 | 137.16 | 0.5 m of weak rock / till above bedrock surface. | |
| T-31+338.5 | T | 1-Oct-10 | 136.90 | 5.48 | 0.40 | 6.18 | 638801.080 | 7211972.163 | 137.17 | 0.5 m of weak rock / till above bedrock surface. | |
| P-31+340 | P | 1-Oct-10 | 136.92 | 5.87 | 0.42 | 6.59 | 638800.315 | 7211970.876 | 137.21 | | |
| T-31+341.5 | T | 1-Oct-10 | 136.87 | 7.46 | 0.39 | 8.15 | 638799.616 | 7211969.191 | 137.18 | 0.5 m of weak rock / till above bedrock surface. | |
| S-31+343 | S | 1-Oct-10 | 136.89 | 7.21 | 0.37 | 7.88 | 638798.904 | 7211967.928 | 137.13 | 0.5 m of weak rock / till above bedrock surface. | |
| T-31+344.5 | T | 3-Oct-10 | 136.84 | 6.25 | 0.38 | 6.92 | 638798.098 | 7211966.838 | 137.16 | | |
| P-31+346 | P | 3-Oct-10 | 136.81 | 6.22 | 0.43 | 6.95 | 638797.330 | 7211965.596 | 137.11 | | |
| T-31+347.5 | T | 3-Oct-10 | 136.78 | 6.62 | 0.44 | 7.36 | 638796.665 | 7211964.251 | 137.10 | | |
| S-31+349 | S | 3-Oct-10 | 136.84 | 7.48 | 0.44 | 8.15 | 638795.908 | 7211963.083 | 137.10 | Ground surface rising while drilling at bedrock contact due to use of excessive air pressure. | |
| T-31+350.5 | T | 3-Oct-10 | 136.84 | 7.37 | 0.52 | 8.15 | 638795.231 | 7211961.649 | 137.17 | 0.8 m of weak rock / till above bedrock surface. | |
| P-31+352 | P | 3-Oct-10 | 136.88 | 7.13 | 0.49 | 7.92 | 638794.493 | 7211960.417 | 137.17 | | |
| T-31+353.5 | T | 3-Oct-10 | 136.89 | 7.31 | 0.48 | 8.12 | 638793.709 | 7211959.041 | 137.24 | | |
| S-31+355 | S | 3-Oct-10 | 136.91 | 7.40 | 0.31 | 8.01 | 638792.942 | 7211957.769 | 137.24 | 0.3 m of weak rock / till above bedrock surface. | |
| Q-31+355.75 | Q | 27-May-11 | 137.04 | 7.31 | 0.40 | 7.86 | 638792.702 | 7211957.085 | 137.25 | | |
| T-31+356.5 | T | 3-Oct-10 | 136.94 | 7.02 | 0.45 | 7.77 | 638792.288 | 7211956.416 | 137.23 | | |
| Q-31+357.25 | Q | 26-May-11 | 137.02 | 7.04 | 0.52 | 7.69 | 638792.051 | 7211955.821 | 137.19 | | |
| P-31+358 | P | 3-Oct-10 | 136.93 | 6.90 | 0.47 | 7.67 | 638791.483 | 7211955.130 | 137.21 | 0.1 m of weak rock / till above bedrock surface. | |
| T-31+359.5 | T | 3-Oct-10 | 136.90 | 6.95 | 0.50 | 7.75 | 638790.799 | 7211953.808 | 137.25 | | |
| S-31+361 | S | 3-Oct-10 | 136.96 | 7.06 | 0.44 | 7.80 | 638790.061 | 7211952.503 | 137.25 | | |
| T-31+362.5 | T | 3-Oct-10 | 136.93 | 6.92 | 0.41 | 7.63 | 638789.289 | 7211951.200 | 137.24 | | |
| P-31+364 | P | 3-Oct-10 | 136.96 | 6.79 | 0.47 | 7.57 | 638788.568 | 7211949.867 | 137.31 | | |
| T-31+365.5 | T | 2-Oct-10 | 136.89 | 6.47 | 0.39 | 7.16 | 638787.851 | 7211948.618 | 137.21 | | |
| S-31+367 | S | 2-Oct-10 | 136.91 | 6.30 | 0.38 | 6.98 | 638787.174 | 7211947.258 | 137.24 | | |
| T-31+368.5 | T | 2-Oct-10 | 136.87 | 6.55 | 0.31 | 7.16 | 638786.385 | 7211946.021 | 137.23 | | |
| P-31+370 | P | 2-Oct-10 | 136.88 | 5.97 | 0.44 | 6.71 | 638785.671 | 7211944.716 | 137.17 | | |
| T-31+371.5 | T | 2-Oct-10 | 136.91 | 6.17 | 0.36 | 6.83 | 638784.967 | 7211943.345 | 137.27 | | |
| S-31+373 | S | 2-Oct-10 | 136.91 | 5.92 | 0.44 | 6.66 | 638784.198 | 7211942.105 | 137.26 | | |
| T-31+374.5 | T | 2-Oct-10 | 136.95 | 5.87 | 0.46 | 6.63 | 638783.504 | 7211940.746 | 137.29 | | |
| P-31+376 | P | 2-Oct-10 | 136.94 | 6.04 | 0.44 | 6.78 | 638782.682 | 7211939.459 | 137.26 | | |
| T-31+377.5 | T | 2-Oct-10 | 136.93 | 5.89 | 0.42 | 6.61 | 638781.942 | 7211938.134 | 137.19 | | |
| S-31+379 | S | 2-Oct-10 | 136.95 | 6.20 | 0.43 | 6.93 | 638780.956 | 7211937.061 | 137.23 | | |
| T-31+380.5 | T | 2-Oct-10 | 136.91 | 6.05 | 0.51 | 6.86 | 638779.815 | 7211936.081 | 137.27 | | |
| P-31+382 | P | 2-Oct-10 | 136.95 | 6.32 | 0.44 | 7.06 | 638778.785 | 7211935.007 | 137.26 | | |
| T-31+383.5 | T | 2-Oct-10 | 136.82 | 5.92 | 0.43 | 6.65 | 638777.662 | 7211934.032 | 137.17 | | |
| S-31+385 | S | 2-Oct-10 | 136.91 | 6.12 | 0.42 | 6.84 | 638776.556 | 7211932.982 | 137.21 | | |
| T-31+386.5 | T | 2-Oct-10 | 136.87 | 5.81 | 0.44 | 6.55 | 638775.490 | 7211931.954 | 137.16 | | |
| P-31+388 | P | 2-Oct-10 | 136.82 | 5.76 | 0.47 | 6.53 | 638774.413 | 7211930.962 | 137.17 | | |
| T-31+389.5 | T | 2-Oct-10 | 136.78 | 5.99 | 0.44 | 6.73 | 638773.314 | 7211929.871 | 137.09 | | |

Golder Associates

# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S-31+391 | S | 2-Oct-10 | 136.76 | 6.85 | 0.42 | 7.57 | 638772.271 | 7211928.845 | 137.09 | | |
| T-31+392.5 | T | 2-Oct-10 | 136.73 | 7.83 | 0.53 | 8.66 | 638771.182 | 7211927.882 | 137.07 | 0.9 m of weak rock / till above bedrock surface. | |
| P-31+394 | P | 2-Oct-10 | 136.73 | 8.37 | 0.49 | 9.16 | 638770.108 | 7211926.743 | 137.04 | 0.65 m of weak rock / till above bedrock surface. | |
| T-31+395.5 | T | 2-Oct-10 | 136.73 | 7.68 | 0.27 | 8.25 | 638768.992 | 7211925.775 | 136.98 | 0.5 m of weak rock / till above bedrock surface. | |
| S-31+397 | S | 2-Oct-10 | 136.76 | 7.32 | 0.43 | 8.05 | 638767.889 | 7211924.777 | 137.08 | | |
| T-31+398.5 | T | 2-Oct-10 | 136.79 | 7.55 | 0.42 | 8.15 | 638766.908 | 7211923.667 | 136.95 | | |
| P-31+400 | P | 2-Oct-10 | 136.75 | 7.54 | 0.43 | 8.15 | 638765.621 | 7211922.694 | 136.93 | | |
| T-31+401.5 | T | 2-Oct-10 | 136.75 | 7.48 | 0.44 | 8.22 | 638764.507 | 7211921.655 | 137.06 | | |
| S-31+403 | S | 2-Oct-10 | 136.70 | 6.98 | 0.39 | 7.67 | 638763.362 | 7211920.587 | 137.07 | | |
| Q-31+403.75 | Q | 26-May-11 | 136.83 | 7.02 | 0.45 | 7.63 | 638762.970 | 7211920.073 | 136.98 | | |
| T-31+404.5 | T | 2-Oct-10 | 136.71 | 7.23 | 0.42 | 7.95 | 638762.373 | 7211919.666 | 137.05 | | |
| Q-31+405.25 | Q | 26-May-11 | 136.83 | 7.37 | 0.53 | 8.16 | 638761.911 | 7211919.084 | 137.12 | | |
| P-31+406 | P | 2-Oct-10 | 136.67 | 6.83 | 0.41 | 7.54 | 638761.221 | 7211918.610 | 136.99 | | |
| T-31+407.5 | T | 2-Oct-10 | 136.67 | 7.24 | 0.41 | 7.95 | 638760.138 | 7211917.579 | 137.02 | | |
| S-31+409 | S | 2-Oct-10 | 136.72 | 7.11 | 0.41 | 7.82 | 638758.965 | 7211916.520 | 137.02 | | |
| T-31+410.5 | T | 2-Oct-10 | 136.70 | 6.95 | 0.47 | 7.72 | 638757.911 | 7211915.511 | 136.95 | | |
| P-31+412 | P | 2-Oct-10 | 136.67 | 6.80 | 0.69 | 7.79 | 638756.869 | 7211914.471 | 136.99 | | |
| T-31+413.5 | T | 2-Oct-10 | 136.64 | 7.06 | 0.46 | 7.82 | 638755.748 | 7211913.407 | 136.99 | | |
| S-31+415 | S | 2-Oct-10 | 136.68 | 6.52 | 0.44 | 7.26 | 638754.664 | 7211912.383 | 136.96 | | |
| T-31+416.5 | T | 2-Oct-10 | 136.71 | 6.30 | 0.41 | 7.01 | 638753.510 | 7211911.339 | 137.07 | | |
| P-31+418 | P | 2-Oct-10 | 136.75 | 6.52 | 0.44 | 7.26 | 638752.473 | 7211910.336 | 137.11 | | |
| T-31+419.5 | T | 3-Oct-10 | 136.74 | 6.42 | 0.49 | 7.19 | 638751.395 | 7211909.290 | 137.01 | | |
| S-31+421 | S | 3-Oct-10 | 136.65 | 6.31 | 0.47 | 7.08 | 638750.348 | 7211908.304 | 137.03 | | |
| T-31+422.5 | T | 3-Oct-10 | 136.70 | 6.50 | 0.45 | 7.18 | 638749.204 | 7211907.293 | 136.97 | | |
| P-31+424 | P | 3-Oct-10 | 136.68 | 6.41 | 0.55 | 7.26 | 638748.141 | 7211906.278 | 137.01 | | |
| T-31+425.5 | T | 3-Oct-10 | 136.64 | 6.23 | 0.39 | 6.91 | 638747.019 | 7211905.220 | 136.98 | 0.1 m of weak rock / till above bedrock surface. | |
| S-31+427 | S | 3-Oct-10 | 136.65 | 6.45 | 0.46 | 7.23 | 638745.890 | 7211904.235 | 136.96 | | |
| T-31+428.5 | T | 3-Oct-10 | 136.61 | 7.10 | 0.46 | 7.86 | 638744.916 | 7211903.229 | 136.90 | 0.1 m of weak rock / till above bedrock surface. | |
| P-31+430 | P | 3-Oct-10 | 136.62 | 6.81 | 0.49 | 7.57 | 638743.782 | 7211902.123 | 136.86 | Ground surface rising while drilling at bedrock contact due to use of excessive air pressure. | |
| Q-31+430.75 | Q | 26-May-11 | 136.70 | 6.11 | 0.57 | 6.82 | 638743.294 | 7211901.616 | 136.87 | | |
| T-31+431.5 | T | 3-Oct-10 | 136.49 | 6.01 | 0.50 | 6.81 | 638742.652 | 7211901.097 | 136.85 | 0.2 m of weak rock / till above bedrock surface. | |
| Q-31+432.25 | Q | 26-May-11 | 136.71 | 5.90 | 0.48 | 6.56 | 638742.141 | 7211900.585 | 136.90 | | |
| S-31+433 | S | 3-Oct-10 | 136.55 | 5.70 | 0.47 | 6.42 | 638741.620 | 7211900.083 | 136.81 | 0.2 m of weak rock / till above bedrock surface. | |
| Q-31+433.75 | Q | 26-May-11 | 136.76 | 5.59 | 0.50 | 6.30 | 638741.141 | 7211899.558 | 136.98 | | |
| T-31+434.5 | T | 3-Oct-10 | 136.45 | 6.05 | 0.49 | 6.84 | 638740.614 | 7211899.011 | 136.78 | | |
| Q-31+435.25 | Q | 26-May-11 | 136.78 | 5.97 | 0.61 | 6.79 | 638739.989 | 7211898.576 | 136.90 | | |
| P-31+436 | P | 3-Oct-10 | 136.51 | 6.17 | 0.45 | 6.92 | 638739.564 | 7211897.988 | 136.85 | | |
| T-31+437.5 | T | 3-Oct-10 | 136.52 | 6.37 | 0.45 | 7.12 | 638738.312 | 7211896.958 | 136.86 | | |
| S-31+439 | S | 3-Oct-10 | 136.54 | 6.41 | 0.50 | 7.20 | 638737.221 | 7211895.973 | 136.84 | | |
| T-31+440.5 | T | 3-Oct-10 | 136.56 | 6.19 | 0.32 | 6.81 | 638736.091 | 7211894.940 | 136.91 | | |
| P-31+442 | P | 3-Oct-10 | 136.60 | 6.81 | 0.53 | 7.60 | 638735.050 | 7211893.959 | 136.89 | | |
| T-31+443.5 | T | 3-Oct-10 | 136.65 | 6.41 | 0.48 | 7.19 | 638733.861 | 7211892.954 | 136.96 | | |
| S-31+445 | S | 3-Oct-10 | 136.63 | 6.02 | 0.37 | 6.69 | 638732.788 | 7211891.903 | 136.93 | 0.2 m of weak rock / till above bedrock surface. | |
| T-31+446.5 | T | 3-Oct-10 | 136.66 | 5.57 | 0.49 | 6.35 | 638731.720 | 7211890.864 | 136.96 | 0.2 m of weak rock / till above bedrock surface. | |
| P-31+448 | P | 3-Oct-10 | 136.68 | 5.63 | 0.44 | 6.35 | 638730.662 | 7211889.881 | 137.01 | | |

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-31+449.5 | T | 3-Oct-10 | 136.59 | 5.63 | 0.42 | 6.35 | 638729.514 | 7211888.840 | 136.88 | | |
| S-31+451 | S | 3-Oct-10 | 136.60 | 6.17 | 0.44 | 6.91 | 638728.441 | 7211887.759 | 136.93 | | |
| Q-31+451.75 | Q | 26-May-11 | 136.95 | 6.44 | 0.60 | 7.19 | 638727.984 | 7211887.252 | 137.10 | | |
| T-31+452.5 | T | 3-Oct-10 | 136.63 | 6.09 | 0.41 | 6.80 | 638727.366 | 7211886.831 | 136.95 | | |
| Q-31+453.25 | Q | 26-May-11 | 136.90 | 6.24 | 0.48 | 6.88 | 638726.940 | 7211886.176 | 137.10 | | |
| P-31+454 | P | 3-Oct-10 | 136.70 | 5.65 | 0.45 | 6.40 | 638726.259 | 7211885.746 | 136.98 | | |
| T-31+455.5 | T | 3-Oct-10 | 136.78 | 5.61 | 0.46 | 6.37 | 638725.207 | 7211884.732 | 137.12 | | |
| S-31+457 | S | 3-Oct-10 | 136.87 | 5.81 | 0.44 | 6.55 | 638724.097 | 7211883.652 | 137.17 | | |
| T-31+458.5 | T | 3-Oct-10 | 136.80 | 6.47 | 0.47 | 7.24 | 638722.973 | 7211882.665 | 137.14 | | |
| P-31+460 | P | 3-Oct-10 | 136.86 | 6.55 | 0.39 | 7.24 | 638721.978 | 7211881.627 | 137.08 | | |
| T-31+461.5 | T | 3-Oct-10 | 136.78 | 6.50 | 0.44 | 7.24 | 638720.805 | 7211880.597 | 137.13 | | |
| S-31+463 | S | 3-Oct-10 | 136.80 | 6.53 | 0.43 | 7.26 | 638719.734 | 7211879.576 | 137.10 | | |
| T-31+464.5 | T | 3-Oct-10 | 136.82 | 6.75 | 0.41 | 7.46 | 638718.655 | 7211878.603 | 137.15 | | |
| P-31+466 | P | 3-Oct-10 | 136.86 | 6.75 | 0.39 | 7.44 | 638717.516 | 7211877.491 | 137.13 | | |
| T-31+467.5 | T | 3-Oct-10 | 136.89 | 6.93 | 0.41 | 7.64 | 638716.495 | 7211876.530 | 137.19 | | |
| S-31+469 | S | 3-Oct-10 | 136.86 | 7.36 | 0.41 | 8.15 | 638715.407 | 7211875.467 | 137.25 | | |
| T-31+470.5 | T | 3-Oct-10 | 136.93 | 7.41 | 0.41 | 8.15 | 638714.112 | 7211875.020 | 137.26 | | |
| P-31+472 | P | 3-Oct-10 | 136.95 | 7.49 | 0.44 | 8.15 | 638712.625 | 7211875.091 | 137.19 | | |
| T-31+473.5 | T | 3-Oct-10 | 136.96 | 7.54 | 0.43 | 8.15 | 638711.112 | 7211875.095 | 137.10 | | |
| S-31+475 | S | 3-Oct-10 | 136.77 | 7.54 | 0.41 | 8.15 | 638709.522 | 7211875.145 | 137.04 | | |
| T-31+476.5 | T | 3-Oct-10 | 136.68 | 7.36 | 0.49 | 8.15 | 638707.940 | 7211874.911 | 137.05 | | |
| P-31+478 | P | 3-Oct-10 | 136.79 | 7.49 | 0.41 | 8.20 | 638706.556 | 7211875.079 | 137.12 | | |
| Q-31+478.75 | Q | 24-May-11 | 136.87 | 7.17 | 0.36 | 7.70 | 638705.884 | 7211875.106 | 137.07 | Water surfacing around casing. | |
| T-31+479.5 | T | 3-Oct-10 | 136.86 | 6.91 | 0.41 | 7.62 | 638705.089 | 7211875.067 | 137.18 | | |
| Q-31+480.25 | Q | 24-May-11 | 136.97 | 6.68 | 0.52 | 7.35 | 638704.386 | 7211874.945 | 137.18 | | |
| S-31+481 | S | 3-Oct-10 | 136.78 | 6.88 | 0.39 | 7.57 | 638703.536 | 7211875.078 | 137.09 | | |
| Q-31+481.75 | Q | 24-May-11 | 137.03 | 6.74 | 0.49 | 7.38 | 638702.863 | 7211874.946 | 137.22 | | |
| T-31+482.5 | T | 3-Oct-10 | 136.86 | 6.55 | 0.44 | 7.29 | 638702.085 | 7211875.060 | 137.20 | | |
| Q-31+483.25 | Q | 24-May-11 | 137.11 | 6.76 | 0.50 | 7.35 | 638701.353 | 7211874.991 | 137.27 | Communicated to Q-31+484.75. | |
| P-31+484 | P | 3-Oct-10 | 136.93 | 6.61 | 0.50 | 7.42 | 638700.530 | 7211875.095 | 137.27 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+484.75 | Q | 24-May-11 | 137.04 | 6.89 | 0.44 | 7.45 | 638699.837 | 7211875.055 | 137.22 | Communicated to Q-31+486.25. | |
| T-31+485.5 | T | 4-Oct-10 | 136.82 | 6.61 | 0.47 | 7.38 | 638699.017 | 7211875.117 | 137.17 | | |
| Q-31+486.25 | Q | 24-May-11 | 136.94 | 6.41 | 0.46 | 7.06 | 638698.356 | 7211875.070 | 137.22 | | |
| S-31+487 | S | 4-Oct-10 | 136.79 | 6.22 | 0.46 | 6.97 | 638697.518 | 7211875.097 | 137.11 | | |
| Q-31+487.75 | Q | 24-May-11 | 137.00 | 6.66 | 0.52 | 7.37 | 638696.890 | 7211874.994 | 137.21 | | |
| T-31+488.5 | T | 4-Oct-10 | 136.75 | 6.55 | 0.46 | 7.30 | 638696.124 | 7211875.083 | 137.06 | | |
| Q-31+489.25 | Q | 24-May-11 | 136.98 | 6.87 | 0.56 | 7.58 | 638695.428 | 7211875.017 | 137.21 | | |
| P-31+490 | P | 4-Oct-10 | 136.78 | 6.78 | 0.46 | 7.54 | 638694.654 | 7211875.036 | 137.05 | | |
| Q-31+490.75 | Q | 24-May-11 | 136.93 | 6.92 | 0.42 | 7.47 | 638693.944 | 7211874.946 | 137.13 | | |
| T-31+491.5 | T | 4-Oct-10 | 136.80 | 6.82 | 0.46 | 7.58 | 638693.135 | 7211875.052 | 137.11 | | |
| Q-31+492.25 | Q | 24-May-11 | 136.96 | 7.06 | 0.45 | 7.64 | 638692.329 | 7211874.998 | 137.19 | | |
| S-31+493 | S | 4-Oct-10 | 136.81 | 6.50 | 0.41 | 7.21 | 638691.499 | 7211875.101 | 137.10 | | |
| Q-31+493.75 | Q | 24-May-11 | 137.02 | 6.66 | 0.49 | 7.35 | 638690.846 | 7211874.985 | 137.27 | | |
| T-31+494.5 | T | 4-Oct-10 | 136.89 | 6.47 | 0.34 | 7.11 | 638690.030 | 7211875.039 | 137.19 | | |
| Q-31+495.25 | Q | 24-May-11 | 136.93 | 6.64 | 0.52 | 7.36 | 638689.370 | 7211874.976 | 137.23 | | |
| P-31+496 | P | 4-Oct-10 | 136.84 | 6.76 | 0.51 | 7.59 | 638688.582 | 7211875.016 | 137.23 | 0.15 m of weak rock / till above bedrock surface. | |

**TABLE E1-3.1**
**SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES**

| HOLE ID / Chainage | Sequence (P, S, T, Q) | Installation Date (dd-mmm-yy) | Grout Platform Elevation (masl) | Depth to Rock / Hard (mbgs) | Final Embedment Length (m) | Final Length of Casing (w/ stickup) (m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-31+496.75 | Q | 24-May-11 | 136.97 | 6.77 | 0.51 | 7.48 | 638687.829 | 7211874.983 | 137.27 | | |
| T-31+497.5 | T | 4-Oct-10 | 136.84 | 6.58 | 0.27 | 7.14 | 638686.982 | 7211875.044 | 137.13 | 0.3 m of weak rock / till above bedrock surface. | |
| Q-31+498.25 | Q | 24-May-11 | 136.91 | 6.56 | 0.56 | 7.31 | 638686.279 | 7211874.956 | 137.24 | | |
| S-31+499 | S | 4-Oct-10 | 136.75 | 6.31 | 0.29 | 6.90 | 638685.522 | 7211875.118 | 137.06 | 0.3 m of weak rock / till above bedrock surface. | |
| Q-31+499.75 | Q | 24-May-11 | 137.04 | 6.59 | 0.58 | 7.34 | 638684.855 | 7211875.002 | 137.30 | | |
| T-31+500.5 | T | 4-Oct-10 | 136.69 | 6.24 | 0.46 | 7.00 | 638684.010 | 7211875.087 | 136.98 | | |
| Q-31+501.25 | Q | 24-May-11 | 136.99 | 6.64 | 0.54 | 7.34 | 638683.307 | 7211875.043 | 137.26 | Communicated to Q-31+502.75. | |
| P-31+502 | P | 4-Oct-10 | 136.76 | 6.47 | 0.46 | 7.23 | 638682.516 | 7211875.075 | 137.03 | | |
| Q-31+502.75 | Q | 24-May-11 | 137.06 | 6.75 | 0.52 | 7.45 | 638681.854 | 7211874.978 | 137.31 | Communicated to Q-31+504.25. | |
| T-31+503.5 | T | 4-Oct-10 | 136.81 | 6.46 | 0.43 | 7.19 | 638681.062 | 7211875.093 | 137.12 | | |
| Q-31+504.25 | Q | 24-May-11 | 137.04 | 6.66 | 0.66 | 7.51 | 638680.345 | 7211874.982 | 137.28 | | |
| S-31+505 | S | 4-Oct-10 | 136.85 | 6.50 | 0.44 | 7.24 | 638679.518 | 7211875.030 | 137.20 | | |
| Q-31+505.75 | Q | 24-May-11 | 137.00 | 6.76 | 0.58 | 7.52 | 638678.754 | 7211874.956 | 137.27 | Communicated to Q-31+507.25, 510.25, 511.75. | |
| T-31+506.5 | T | 4-Oct-10 | 136.89 | 6.83 | 0.51 | 7.64 | 638677.994 | 7211874.988 | 137.22 | | |
| Q-31+507.25 | Q | 24-May-11 | 137.01 | 6.79 | 0.56 | 7.52 | 638677.252 | 7211874.984 | 137.29 | Communicated to Q-31+510.25, 511.75. | |
| P-31+508 | P | 3-Oct-10 | 136.87 | 6.56 | 0.50 | 7.37 | 638676.434 | 7211875.042 | 137.22 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+508.75 | Q | 24-May-11 | 136.97 | 6.60 | 0.71 | 7.51 | 638675.745 | 7211874.979 | 137.27 | Communicated to Q-31+510.25, 511.75. | |
| T-31+509.5 | T | 3-Oct-10 | 136.91 | 6.62 | 0.42 | 7.34 | 638674.986 | 7211875.034 | 137.30 | | |
| Q-31+510.25 | Q | 24-May-11 | 137.03 | 6.76 | 0.56 | 7.52 | 638674.261 | 7211875.048 | 137.29 | Communicated to Q-31+510.25, 513.75, 516.25. | |
| S-31+511 | S | 3-Oct-10 | 136.89 | 6.75 | 0.44 | 7.49 | 638673.474 | 7211874.970 | 137.22 | | |
| Q-31+511.75 | Q | 23-May-11 | 137.04 | 7.01 | 0.56 | 7.72 | 638672.824 | 7211875.000 | 137.27 | | |
| T-31+512.5 | T | 3-Oct-10 | 136.82 | 6.75 | 0.41 | 7.46 | 638672.079 | 7211875.015 | 137.19 | | |
| Q-31+513.25 | Q | 23-May-11 | 137.03 | 6.96 | 0.76 | 7.87 | 638671.335 | 7211875.010 | 137.27 | | |
| P-31+514 | P | 3-Oct-10 | 136.80 | 6.73 | 0.41 | 7.44 | 638670.540 | 7211875.128 | 137.22 | | |
| Q-31+514.75 | Q | 23-May-11 | 136.95 | 7.19 | 0.49 | 7.98 | 638669.780 | 7211875.058 | 137.19 | | |
| T-31+515.5 | T | 3-Oct-10 | 136.82 | 6.91 | 0.41 | 7.62 | 638668.984 | 7211875.062 | 137.16 | | |
| Q-31+516.25 | Q | 23-May-11 | 137.02 | 7.27 | 0.54 | 7.97 | 638668.265 | 7211874.995 | 137.24 | | |
| S-31+517 | S | 3-Oct-10 | 136.81 | 6.90 | 0.44 | 7.64 | 638667.517 | 7211875.081 | 137.16 | | |
| T-31+518.5 | T | 3-Oct-10 | 136.74 | 7.03 | 0.39 | 7.72 | 638666.077 | 7211874.987 | 137.14 | | |
| P-31+520 | P | 3-Oct-10 | 136.79 | 7.11 | 0.44 | 7.85 | 638664.563 | 7211875.127 | 137.20 | | |
| Q-31+520.75 | Q | 23-May-11 | 137.00 | 7.62 | 0.48 | 8.16 | 638663.913 | 7211875.062 | 137.12 | | |
| T-31+521.5 | T | 3-Oct-10 | 136.78 | 7.27 | 0.41 | 7.98 | 638662.955 | 7211875.164 | 137.10 | | |
| Q-31+522.25 | Q | 23-May-11 | 137.05 | 7.39 | 0.55 | 8.16 | 638662.218 | 7211874.974 | 137.21 | | |
| S-31+523 | S | 3-Oct-10 | 136.74 | 7.16 | 0.44 | 7.90 | 638661.466 | 7211875.054 | 137.11 | | |
| Q-31+523.75 | Q | 23-May-11 | 137.09 | 7.48 | 0.52 | 8.16 | 638660.836 | 7211874.969 | 137.26 | | |
| T-31+524.5 | T | 3-Oct-10 | 136.90 | 7.34 | 0.39 | 8.03 | 638660.066 | 7211875.065 | 137.26 | | |
| Q-31+525.25 | Q | 23-May-11 | 137.14 | 7.65 | 0.51 | 8.17 | 638659.391 | 7211874.896 | 137.18 | | |
| P-31+526 | P | 3-Oct-10 | 136.96 | 7.39 | 0.67 | 8.36 | 638659.107 | 7211875.070 | 137.18 | | |
| Q-31+526.75 | Q | 21-May-11 | 137.15 | 7.79 | 0.35 | 8.32 | 638657.891 | 7211875.011 | 137.28 | | |
| T-31+527.5 | T | 3-Oct-10 | 137.00 | 7.48 | 0.44 | 8.17 | 638657.029 | 7211875.079 | 137.30 | | |
| Q-31+528.25 | Q | 20-May-11 | 137.14 | 7.74 | 0.31 | 8.33 | 638656.246 | 7211874.990 | 137.32 | | |
| S-31+529 | S | 3-Oct-10 | 137.00 | 7.39 | 0.44 | 8.13 | 638655.499 | 7211874.904 | 137.32 | | |
| Q-31+529.75 | Q | 20-May-11 | 137.15 | 7.82 | 0.43 | 8.43 | 638654.728 | 7211874.975 | 137.26 | | |
| T-31+530.5 | T | 3-Oct-10 | 137.03 | 7.74 | 0.39 | 8.43 | 638654.058 | 7211874.996 | 137.31 | | |
| Q-31+531.25 | Q | 20-May-11 | 137.15 | 8.01 | 0.33 | 8.54 | 638653.249 | 7211875.034 | 137.25 | | |
| P-31+532 | P | 4-Oct-10 | 136.92 | 7.49 | 0.44 | 8.13 | 638652.556 | 7211875.003 | 137.16 | | |

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# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-31+532.75 | Q | 20-May-11 | 137.08 | 7.64 | 0.29 | 8.16 | 638651.737 | 7211874.996 | 137.29 | Communicated to Q-31+534.25. | |
| T-31+533.5 | T | 4-Oct-10 | 136.98 | 7.26 | 0.41 | 7.97 | 638650.951 | 7211875.107 | 137.33 | | |
| Q-31+534.25 | Q | 20-May-11 | 137.09 | 7.49 | 0.36 | 8.16 | 638650.178 | 7211875.036 | 137.35 | | |
| S-31+535 | S | 4-Oct-10 | 136.93 | 7.09 | 0.49 | 7.88 | 638649.495 | 7211875.082 | 137.27 | | |
| Q-31+535.75 | Q | 20-May-11 | 137.11 | 7.45 | 0.40 | 8.16 | 638648.767 | 7211875.022 | 137.29 | Communicated to Q-31+538.75. | |
| T-31+536.5 | T | 13-Oct-10 | 136.96 | 7.29 | 0.55 | 8.09 | 638648.040 | 7211874.938 | 137.22 | | |
| Q-31+537.25 | Q | 20-May-11 | 137.01 | 7.51 | 0.44 | 8.16 | 638647.298 | 7211875.022 | 137.18 | | |
| P-31+538 | P | 13-Oct-10 | 136.91 | 7.47 | 0.45 | 8.16 | 638646.640 | 7211875.029 | 137.11 | | |
| Q-31+538.75 | Q | 20-May-11 | 136.96 | 7.77 | 0.20 | 8.16 | 638645.796 | 7211875.066 | 137.13 | | |
| T-31+539.5 | T | 4-Oct-10 | 136.89 | 7.21 | 0.41 | 7.95 | 638645.015 | 7211875.083 | 137.26 | | |
| Q-31+540.25 | Q | 19-May-11 | 137.01 | 7.77 | 0.21 | 8.16 | 638644.223 | 7211875.043 | 137.21 | | |
| S-31+541 | S | 4-Oct-10 | 136.85 | 7.36 | 0.44 | 8.10 | 638643.495 | 7211875.044 | 137.11 | | |
| T-31+542.5 | T | 4-Oct-10 | 136.72 | 7.34 | 0.41 | 8.05 | 638642.075 | 7211875.050 | 137.02 | | |
| P-31+544 | P | 4-Oct-10 | 136.83 | 7.06 | 0.44 | 7.80 | 638640.548 | 7211875.037 | 137.12 | Connection to outside of 31+542.5 at bedrock interface. | |
| T-31+545.5 | T | 4-Oct-10 | 136.74 | 7.36 | 0.41 | 8.07 | 638639.071 | 7211875.028 | 137.05 | | |
| S-31+547 | S | 4-Oct-10 | 136.76 | 6.95 | 0.49 | 7.74 | 638637.503 | 7211874.990 | 137.13 | | |
| Q-31+547.75 | Q | 19-May-11 | 136.92 | 7.29 | 0.40 | 7.89 | 638636.776 | 7211875.057 | 137.08 | | |
| T-31+548.5 | T | 4-Oct-10 | 136.74 | 6.88 | 0.44 | 7.62 | 638636.030 | 7211875.029 | 137.01 | | |
| Q-31+549.25 | Q | 19-May-11 | 136.93 | 6.83 | 0.63 | 7.66 | 638635.261 | 7211875.032 | 137.11 | | |
| P-31+550 | P | 4-Oct-10 | 136.76 | 6.88 | 0.41 | 7.59 | 638634.596 | 7211875.102 | 137.07 | | |
| T-31+551.5 | T | 4-Oct-10 | 136.72 | 6.71 | 0.46 | 7.47 | 638633.043 | 7211875.101 | 137.09 | | |
| S-31+553 | S | 5-Oct-10 | 136.76 | 6.64 | 0.44 | 7.37 | 638631.570 | 7211875.016 | 137.05 | 0.15 m of weak rock / till above bedrock surface. | |
| T-31+554.5 | T | 5-Oct-10 | 136.77 | 6.53 | 0.43 | 7.26 | 638629.976 | 7211875.042 | 137.07 | | |
| P-31+556 | P | 5-Oct-10 | 136.76 | 6.62 | 0.45 | 7.36 | 638628.603 | 7211874.941 | 137.08 | 0.15 m of weak rock / till above bedrock surface. | |
| T-31+557.5 | T | 5-Oct-10 | 136.79 | 6.52 | 0.52 | 7.31 | 638627.069 | 7211874.927 | 137.10 | 2m of CSB over bedrock. | |
| S-31+559 | S | 5-Oct-10 | 136.82 | 6.71 | 0.43 | 7.44 | 638625.526 | 7211874.900 | 137.16 | | |
| T-31+560.5 | T | 8-Oct-10 | 136.93 | 6.75 | 0.41 | 7.46 | 638623.956 | 7211874.952 | 137.23 | Air triggered (minimally) in CSB to install casing due to collapse. | |
| P-31+562 | P | 8-Oct-10 | 136.95 | 6.68 | 0.38 | 7.36 | 638622.500 | 7211874.943 | 137.13 | Air triggered (minimally) in CSB to install casing due to collapse. | |
| T-31+563.5 | T | 8-Oct-10 | 136.90 | 6.40 | 0.43 | 7.16 | 638621.056 | 7211874.942 | 137.29 | Air triggered (minimally) in CSB to install casing due to collapse. | |
| S-31+565 | S | 8-Oct-10 | 136.92 | 6.73 | 0.41 | 7.44 | 638619.579 | 7211874.992 | 137.21 | Air triggered (minimally) in CSB to install casing due to collapse. | |
| T-31+566.5 | T | 17-May-11 | 137.06 | 7.76 | 0.27 | 8.16 | 638617.956 | 7211874.955 | 137.17 | | |
| P-31+568 | P | 24-Oct-10 | 136.94 | 7.18 | 0.24 | 7.72 | 638616.334 | 7211874.938 | 137.39 | Below the plastic collar casing, cobbles to 2.3 m depth, then 4.76 m of soft CSB over bedrock. | |
| T-31+569.5 | T | 17-May-11 | 137.08 | 8.58 | 0.41 | 9.20 | 638614.561 | 7211874.973 | 137.36 | | |
| S-31+571 | S | 16-May-11 | 137.18 | 8.78 | 0.43 | 9.44 | 638612.701 | 7211875.008 | 137.41 | | |
| T-31+572.2 | T | 28-May-11 | 137.17 | 10.32 | 0.37 | 10.97 | 638611.333 | 7211874.902 | 137.37 | Added 2.10 m and left stick-up at 0.28 m (13 cm higher) on 05-June-11. Driller reported that while deepening casing, felt like he was in bedrock the entire distance. | |
| T-31+572.5 | T | 16-May-11 | 137.17 | 8.33 | 0.51 | 9.08 | 638611.344 | 7211875.034 | 137.46 | Sheared off casing shoe downhole while attempting to deepen. Abandoned hole. | Triconing mistakenly not carried out during re-installation. |
| P-31+574 | P | 16-May-11 | 137.25 | 12.55 | -- | 12.77 | 638609.767 | 7211875.044 | 137.51 | Added 4.61 m and left stick-up at 0.22 m (5 cm higher) on 27-May-11. Driller report that while deepening casing, felt like he was in bedrock the entire distance. | |
| T-31+575.5 | T | 16-May-11 | 137.31 | 15.46 | -- | 15.63 | 638608.185 | 7211874.988 | 137.56 | Communicated to P-31+580, T-31+581.5, S-31+582.7, T-31+584.5. Added 4.98 m and decreased stick-up by 0.08 m on 27-May-11. | |
| S-31+577 | S | 15-May-11 | 137.31 | 15.29 | -- | 15.54 | 638606.800 | 7211874.952 | 137.52 | Communicated to P-31+580 and T-31+578.5 at interface with hard material. Added 5.7 m and left stick-up at 0.25 m (3 cm higher) on 27-May-11. Communicated to T-31+581.5, 580, and 575.5 outside casing at 12.2 m. | Triconing stopped above anticipated depth to bedrock after very hard material encountered. On 27-May-11, encountered top of jet grout at 13.1 m bgs. |
| T-31+578.5 | T | 15-May-11 | 137.24 | 15.85 | 0.48 | 16.41 | 638605.274 | 7211875.074 | 137.42 | | |
| P-31+580 | P | 15-May-11 | 137.30 | 15.78 | 0.46 | 16.39 | 638603.754 | 7211875.059 | 137.50 | | Refusal on bedrock. |
| T-31+581.5 | T | 15-May-11 | 137.35 | 16.46 | 0.49 | 17.10 | 638602.240 | 7211874.996 | 137.54 | | |

Golder Associates

# TABLE E1-3.1
# SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S-31+582.7 | S | 14-May-11 | 137.28 | 17.70 | 0.46 | 18.49 | 638601.043 | 7211874.942 | 137.71 | | Refusal on bedrock. |
| S-31+583 | S | -- | 137.28 | -- | -- | -- | 638600.671 | 7211875.007 | 137.60 | Hammer lost downhole - replaced by S-31+582.7. | |
| T-31+584.5 | T | 12-May-11 | 137.30 | 16.81 | 0.43 | 17.38 | 638599.306 | 7211874.981 | 137.57 | Depth of triconing was unclear - casing was in rock when stopped as could be seen from cuttings returning to surface. | Final depth of triconing unclear (approximate). |
| P-31+586 | P | 12-May-11 | 137.27 | 17.73 | 0.49 | 18.50 | 638597.787 | 7211875.007 | 137.61 | | |
| T-31+587.5 | T | 15-May-11 | 137.30 | 16.93 | 0.93 | 18.10 | 638596.265 | 7211875.023 | 137.56 | Installed casing into soft bedrock, driller over-embedded to more competent material. Communicated to S-31+589, T-31+585.5, S-31+583, T-31+590.5, P-31+592, T-31+594.5. | |
| S-31+589 | S | 13-May-11 | 137.32 | 18.01 | 0.41 | 18.54 | 638594.730 | 7211875.032 | 137.44 | | Refusal on hard material (red-brown colour return). |
| T-31+590.5 | T | 14-May-11 | 137.26 | 17.38 | 0.48 | 18.13 | 638593.266 | 7211874.974 | 137.50 | | |
| P-31+592 | P | 13-May-11 | 137.27 | 17.73 | 0.71 | 18.54 | 638591.775 | 7211875.014 | 137.49 | Communicated to T-31+590.5 from 13.7 to 16.8 m and to S-31+589 from 14.0 to 14.6 m. | |
| T-31+593.5 | T | 14-May-11 | 137.28 | 18.59 | 0.51 | 19.25 | 638590.282 | 7211875.022 | 137.58 | | |
| S-31+595 | S | 14-May-11 | 137.30 | 18.47 | 0.48 | 19.13 | 638588.788 | 7211875.050 | 137.64 | | |
| T-31+596.5 | T | 13-May-11 | 137.35 | 19.38 | -- | 19.66 | 638587.295 | 7211874.973 | 137.72 | | |
| P-31+598 | P | 15-May-11 | 137.37 | 17.86 | 0.43 | 18.54 | 638585.794 | 7211875.068 | 137.65 | | |
| T-31+599.5 | T | 12-May-11 | 137.36 | 17.10 | 0.54 | 17.77 | 638584.306 | 7211875.049 | 137.56 | Communicated to T-31+599.5 from 14.6 to 14.9 m. | |
| S-31+601 | S | 12-May-11 | 137.36 | 16.82 | 0.48 | 17.43 | 638582.757 | 7211875.062 | 137.57 | | |
| T-31+602.5 | T | 12-May-11 | 137.35 | 16.53 | 0.48 | 17.25 | 638581.387 | 7211874.995 | 137.71 | Communicated to P-31+610 and P-31+611.5 from 13.1 to 14 m. | Refusal on very hard material. |
| P-31+604 | P | 13-May-11 | 137.36 | 17.02 | 0.59 | 17.87 | 638579.779 | 7211874.992 | 137.67 | | |
| T-31+605.5 | T | 12-May-11 | 137.47 | 14.87 | -- | 15.07 | 638578.203 | 7211875.041 | 137.63 | | |
| S-31+607 | S | 13-May-11 | 137.36 | 14.25 | 0.53 | 15.09 | 638576.741 | 7211874.962 | 137.68 | Communicated to T-31+605.5 at 11.9 m and to T-31+608.5 at 12.8 m. | |
| T-31+608.5 | T | 10-May-11 | 137.24 | 14.23 | 0.40 | 15.06 | 638575.289 | 7211874.971 | 137.69 | | Very soft bedrock; did not reach refusal with tricone but stopped due to significant advance below anticipated depth to rock. |
| P-31+610 | P | 10-May-11 | 137.33 | 12.80 | 0.09 | 13.34 | 638573.838 | 7211874.951 | 137.65 | | 3.5" tricone used after pushing odex to clear obstruction at 4.42 m |
| T-31+611.5 | T | 11-May-11 | 137.37 | 13.57 | -- | 13.77 | 638572.293 | 7211875.053 | 137.55 | Installed casing into competent material. Communicated to P-31+610 between plastic and steel casing from 4.7 to 11.1 m. Added 1.21 m and decreased stick-up by 41 cm on 27-May-11. Added 1.35 m and left stick-up at 20 cm (13 cm higher) on 28-May-11. | |
| S-31+613 | S | 11-May-11 | 137.40 | 11.66 | -- | 12.04 | 638570.870 | 7211874.875 | 137.67 | Installed casing into competent material. Added 0.91 m and left stick-up at 38 cm (20 cm higher) on 28-May-11. | |
| T-31+614.5 | T | 11-May-11 | 137.11 | 10.09 | -- | 10.39 | 638569.339 | 7211874.909 | 137.48 | Installed casing into competent material. | |
| P-31+616 | P | 11-May-11 | 137.22 | 8.82 | 0.45 | 9.52 | 638567.752 | 7211874.950 | 137.46 | Installed casing into competent material. | |
| T-31+617.5 | T | 11-May-11 | 137.13 | 7.13 | 0.44 | 7.67 | 638566.286 | 7211874.965 | 137.27 | Installed casing into competent material. Communicated to S-31+619, P-31+616 and T-31+611.5 at the bedrock interface. | |
| S-31+619 | S | 11-May-11 | 137.12 | 7.28 | 0.50 | 8.15 | 638564.725 | 7211874.976 | 137.51 | Installed casing into competent material. Communicated to T-31+617.5 at bedrock interface. | |
| T-31+620.5 | T | 11-May-11 | 137.09 | 6.70 | 0.42 | 7.30 | 638563.241 | 7211874.960 | 137.29 | Installed casing into competent material. | Refusal on bedrock. |
| P-31+622 | P | 24-Oct-10 | 137.05 | 6.67 | 0.54 | 7.51 | 638561.945 | 7211875.020 | 137.36 | Below the plastic collar casing, soft CSB to 5.33 m, cobbles to 5.50 m, then 1.12 m of soft CSB over bedrock. | |
| T-31+623.5 | T | 11-May-11 | 137.07 | 6.24 | 0.44 | 6.78 | 638560.573 | 7211875.009 | 137.23 | | |
| S-31+625 | S | 11-May-11 | 137.07 | 6.27 | 0.43 | 6.97 | 638559.276 | 7211874.997 | 137.40 | | |
| T-31+626.5 | T | 11-May-11 | 137.07 | 6.47 | 0.42 | 7.19 | 638558.017 | 7211874.970 | 137.46 | | |
| P-31+628 | P | 23-Oct-10 | 137.10 | 6.02 | 0.39 | 6.76 | 638556.729 | 7211874.922 | 137.33 | Below the plastic colar casing, 0.3 m of cobbles, then 1.6m of soft CSB over bedrock. | |
| T-31+629.5 | T | 10-May-11 | 137.03 | 6.77 | -- | 6.94 | 638554.990 | 7211874.952 | 137.23 | | Not triconed as CSB below SB material minimal. |
| S-31+631 | S | 5-Oct-10 | 137.07 | 6.55 | 0.56 | 7.37 | 638553.524 | 7211874.934 | 137.33 | 3.2 m of CSB over bedrock. | |
| T-31+632.5 | T | 5-Oct-10 | 137.03 | 6.57 | 0.49 | 7.38 | 638552.103 | 7211874.976 | 137.35 | 2.8 m of CSB over bedrock. | |
| P-31+634 | P | 5-Oct-10 | 137.00 | 5.87 | 0.41 | 6.58 | 638550.486 | 7211874.999 | 137.37 | | |
| T-31+635.5 | T | 5-Oct-10 | 136.99 | 5.54 | 0.41 | 6.25 | 638549.044 | 7211875.021 | 137.32 | | |
| S-31+637 | S | 5-Oct-10 | 136.99 | 5.64 | 0.44 | 6.38 | 638547.509 | 7211875.122 | 137.31 | | |
| T-31+638.5 | T | 5-Oct-10 | 136.95 | 4.77 | 0.41 | 5.48 | 638546.024 | 7211875.040 | 137.31 | | |
| P-31+640 | P | 5-Oct-10 | 136.99 | 4.88 | 0.44 | 5.62 | 638544.578 | 7211875.019 | 137.27 | | |
| T-31+641.5 | T | 5-Oct-10 | 137.00 | 4.87 | 0.41 | 5.58 | 638542.963 | 7211875.061 | 137.31 | | |

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S-31+643 | S | 5-Oct-10 | 136.92 | 4.86 | 0.41 | 5.57 | 638541.482 | 7211875.094 | 137.20 | | |
| T-31+644.5 | T | 5-Oct-10 | 136.85 | 4.49 | 0.44 | 5.23 | 638540.094 | 7211875.009 | 137.16 | | |
| P-31+646 | P | 5-Oct-10 | 136.86 | 4.90 | 0.44 | 5.64 | 638539.911 | 7211876.400 | 137.19 | | |
| T-31+647.5 | T | 5-Oct-10 | 136.92 | 4.29 | 0.44 | 5.03 | 638539.622 | 7211878.009 | 137.27 | | |
| S-31+649 | S | 5-Oct-10 | 136.95 | 4.34 | 0.44 | 5.08 | 638539.481 | 7211879.483 | 137.36 | | |
| T-31+650.5 | T | 5-Oct-10 | 137.03 | 4.20 | 0.50 | 5.01 | 638539.446 | 7211880.927 | 137.43 | | |
| P-31+652A | P | 6-Oct-10 | 136.99 | 4.37 | 0.40 | 5.05 | 638539.198 | 7211882.388 | 137.29 | Offset 0.3 m along alignment due to bit broken in original location. | |
| T-31+653.5 | T | 6-Oct-10 | 137.03 | 4.51 | 0.47 | 5.24 | 638538.929 | 7211884.016 | 137.29 | 0.3 m of weak rock/till above bedrock surface. | |
| S-31+655 | S | 6-Oct-10 | 137.04 | 4.44 | 0.40 | 5.14 | 638538.721 | 7211885.477 | 137.34 | | |
| T-31+656.5 | T | 6-Oct-10 | 137.04 | 4.62 | 0.21 | 5.11 | 638538.539 | 7211886.878 | 137.34 | Connection to 31+655. | |
| P-31+658 | P | 6-Oct-10 | 137.12 | 4.35 | 0.42 | 5.00 | 638538.419 | 7211888.352 | 137.33 | | |
| T-31+659.5 | T | 6-Oct-10 | 137.12 | 4.79 | 0.49 | 5.57 | 638538.089 | 7211889.887 | 137.41 | | |
| S-31+661 | S | 6-Oct-10 | 137.14 | 4.62 | 0.46 | 5.38 | 638537.978 | 7211891.404 | 137.41 | | |
| T-31+662.5 | T | 6-Oct-10 | 137.15 | 4.51 | 0.40 | 5.20 | 638537.834 | 7211892.923 | 137.41 | 0.1 m of weak rock / till above bedrock surface. Ground surface rising while drilling due to the use of excessive air pressure. | |
| P-31+664 | P | 6-Oct-10 | 137.08 | 4.50 | 0.34 | 5.13 | 638537.583 | 7211894.295 | 137.34 | | |
| T-31+665.5 | T | 6-Oct-10 | 137.06 | 4.89 | 0.45 | 5.64 | 638537.338 | 7211895.793 | 137.36 | 0.6 m of weak rock / till above bedrock surface. | |
| S-31+667 | S | 6-Oct-10 | 137.13 | 5.37 | 0.40 | 6.07 | 638537.226 | 7211897.322 | 137.49 | | |
| T-31+668.5 | T | 6-Oct-10 | 137.08 | 5.66 | 0.45 | 6.40 | 638536.951 | 7211898.801 | 137.40 | 1.0 m of weak rock / till above bedrock surface. | |
| P-31+670 | P | 6-Oct-10 | 136.89 | 5.70 | 0.47 | 6.47 | 638536.713 | 7211900.247 | 137.22 | | |
| T-31+671.5 | T | 6-Oct-10 | 137.07 | 6.09 | 0.36 | 6.75 | 638536.729 | 7211901.485 | 137.40 | | |
| S-31+673 | S | 6-Oct-10 | 137.06 | 6.14 | 0.42 | 6.82 | 638536.488 | 7211903.335 | 137.37 | 0.3 m of weak rock / till above bedrock surface. | |
| T-31+674.5 | T | 6-Oct-10 | 137.06 | 5.27 | 0.42 | 5.97 | 638536.209 | 7211904.791 | 137.40 | | |
| P-31+676 | P | 5-Oct-10 | 137.11 | 5.48 | 0.41 | 6.19 | 638536.071 | 7211906.296 | 137.43 | | |
| T-31+677.5 | T | 5-Oct-10 | 137.06 | 5.81 | 0.47 | 6.58 | 638535.873 | 7211907.772 | 137.45 | | |
| S-31+679 | S | 5-Oct-10 | 137.03 | 5.46 | 0.41 | 6.17 | 638535.604 | 7211909.369 | 137.44 | | |
| T-31+680.5 | T | 5-Oct-10 | 137.09 | 5.56 | 0.49 | 6.35 | 638535.462 | 7211910.585 | 137.40 | | |
| P-31+682 | P | 5-Oct-10 | 137.06 | 5.76 | 0.44 | 6.50 | 638535.159 | 7211912.183 | 137.44 | | |
| T-31+683.5 | T | 5-Oct-10 | 137.06 | 6.09 | 0.41 | 6.80 | 638534.840 | 7211913.601 | 137.44 | | |
| S-31+685 | S | 5-Oct-10 | 137.03 | 6.12 | 0.46 | 6.88 | 638534.672 | 7211915.320 | 137.37 | | |
| T-31+686.5 | T | 5-Oct-10 | 137.04 | 6.14 | 0.44 | 6.88 | 638534.524 | 7211916.632 | 137.36 | | |
| P-31+688 | P | 5-Oct-10 | 137.02 | 6.27 | 0.44 | 7.01 | 638534.407 | 7211918.140 | 137.35 | | |
| T-31+689.5 | T | 5-Oct-10 | 136.94 | 6.30 | 0.44 | 7.04 | 638534.106 | 7211919.592 | 137.33 | | |
| S-31+691 | S | 5-Oct-10 | 137.00 | 6.32 | 0.44 | 7.06 | 638533.889 | 7211920.965 | 137.35 | | |
| T-31+692.5 | T | 5-Oct-10 | 137.03 | 6.73 | 0.43 | 7.46 | 638533.756 | 7211922.488 | 137.32 | | |
| P-31+694 | P | 6-Oct-10 | 137.02 | 7.02 | 0.50 | 7.83 | 638533.620 | 7211924.005 | 137.30 | QA of activity not carried out; records retrieved from TCG. | |
| T-31+695.5 | T | 6-Oct-10 | 137.03 | 7.13 | 0.65 | 8.08 | 638533.604 | 7211925.328 | 137.30 | | |
| S-31+697 | S | 6-Oct-10 | 137.05 | 7.34 | 0.51 | 8.15 | 638533.376 | 7211926.821 | 137.37 | | |
| T-31+698.5 | T | 6-Oct-10 | 137.09 | 7.58 | 0.50 | 8.38 | 638533.177 | 7211928.297 | 137.37 | | |
| P-31+700 | P | 6-Oct-10 | 137.10 | 7.41 | 0.47 | 8.13 | 638532.981 | 7211929.781 | 137.34 | | |
| Q-31+700.75 | Q | 1-Jun-11 | 137.07 | 7.86 | -- | 8.08 | 638532.817 | 7211930.490 | 137.38 | | |
| T-31+701.5 | T | 6-Oct-10 | 137.04 | 7.25 | 0.57 | 8.15 | 638532.768 | 7211931.274 | 137.40 | | |
| Q-31+702.25 | Q | 1-Jun-11 | 137.04 | 7.67 | -- | 7.87 | 638532.594 | 7211932.014 | 137.27 | | |
| S-31+703 | S | 6-Oct-10 | 137.05 | 7.34 | 0.47 | 8.15 | 638532.602 | 7211932.819 | 137.39 | | |
| Q-31+703.75 | Q | 14-Jun-11 | 137.04 | 7.49 | 0.56 | 8.15 | 638532.548 | 7211933.493 | 137.23 | | |
| T-31+704.5 | T | 6-Oct-10 | 137.00 | 7.46 | 0.44 | 8.18 | 638532.403 | 7211934.208 | 137.29 | | |

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# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-31+705.25 | Q | 14-Jun-11 | 137.06 | 7.56 | 1.21 | 9.02 | 638532.322 | 7211935.006 | 137.29 | | |
| P-31+706 | P | 6-Oct-10 | 137.04 | 7.57 | 0.44 | 8.26 | 638532.185 | 7211935.731 | 137.26 | | |
| T-31+707.5 | T | 6-Oct-10 | 136.97 | 7.75 | 0.44 | 8.49 | 638531.987 | 7211937.184 | 137.29 | | |
| S-31+709 | S | 6-Oct-10 | 136.95 | 8.26 | 0.40 | 9.02 | 638531.716 | 7211938.661 | 137.36 | | |
| T-31+710.5 | T | 6-Oct-10 | 137.05 | 8.48 | 0.44 | 9.22 | 638531.602 | 7211940.089 | 137.35 | | |
| P-31+712 | P | 6-Oct-10 | 136.95 | 8.56 | 0.44 | 9.30 | 638531.361 | 7211941.566 | 137.30 | | |
| T-31+713.5 | T | 6-Oct-10 | 136.93 | 8.66 | 0.44 | 9.40 | 638531.156 | 7211943.061 | 137.24 | | |
| S-31+715 | S | 6-Oct-10 | 136.90 | 8.33 | 0.44 | 9.07 | 638530.975 | 7211944.584 | 137.25 | | |
| T-31+716.5 | T | 6-Oct-10 | 136.92 | 8.25 | 0.43 | 8.98 | 638530.884 | 7211946.100 | 137.24 | | |
| P-31+718 | P | 6-Oct-10 | 137.00 | 8.61 | 0.46 | 9.37 | 638530.672 | 7211947.578 | 137.26 | | |
| T-31+719.5 | T | 6-Oct-10 | 136.93 | 9.06 | 0.47 | 9.83 | 638530.462 | 7211949.028 | 137.24 | | |
| S-31+721 | S | 6-Oct-10 | 136.96 | 9.24 | 0.47 | 10.01 | 638530.302 | 7211950.536 | 137.28 | | |
| T-31+722.5 | T | 6-Oct-10 | 136.93 | 9.12 | 0.31 | 9.73 | 638530.020 | 7211952.002 | 137.16 | | |
| P-31+724 | P | 6-Oct-10 | 136.95 | 8.71 | 0.44 | 9.45 | 638529.545 | 7211953.466 | 137.29 | | |
| T-31+725.5 | T | 6-Oct-10 | 137.00 | 8.31 | 0.44 | 9.05 | 638528.796 | 7211954.797 | 137.28 | | |
| S-31+727 | S | 7-Oct-10 | 137.01 | 7.84 | 0.45 | 8.59 | 638527.980 | 7211956.092 | 137.28 | | |
| T-31+728.5 | T | 7-Oct-10 | 136.96 | 8.39 | 0.49 | 9.17 | 638527.038 | 7211957.183 | 137.28 | Communicated (air) to 31+727. | |
| P-31+730 | P | 7-Oct-10 | 136.94 | 9.02 | 0.48 | 9.80 | 638526.087 | 7211958.408 | 137.27 | Communicated (air) to 31+728.5. | |
| Q-31+730.75 | Q | 14-Jun-11 | 136.96 | 9.53 | 0.41 | 10.14 | 638525.730 | 7211959.069 | 137.19 | | |
| T-31+731.5 | T | 7-Oct-10 | 136.92 | 9.10 | 0.54 | 9.95 | 638525.293 | 7211959.676 | 137.23 | Communicated (air) to 31+728.5. | |
| Q-31+732.25 | Q | 14-Jun-11 | 137.05 | 9.30 | 0.43 | 9.91 | 638524.814 | 7211960.239 | 137.23 | | |
| S-31+733 | S | 7-Oct-10 | 136.90 | 8.63 | 0.50 | 9.43 | 638524.462 | 7211960.875 | 137.20 | | |
| T-31+734.5 | T | 7-Oct-10 | 136.92 | 8.90 | 0.47 | 9.67 | 638523.673 | 7211962.115 | 137.20 | | |
| P-31+736 | P | 7-Oct-10 | 137.04 | 8.93 | 0.44 | 9.67 | 638522.793 | 7211963.289 | 137.24 | Approximately 0.15 m of weak rock / till above bedrock surface. | |
| T-31+737.5 | T | 7-Oct-10 | 136.97 | 10.07 | 0.60 | 10.97 | 638522.029 | 7211964.541 | 137.24 | | |
| S-31+739 | S | 20-Oct-10 | 136.94 | 10.72 | 0.58 | 11.62 | 638521.156 | 7211965.910 | 137.25 | | |
| T-31+740.5 | T | 21-Oct-10 | 136.94 | 9.41 | 0.36 | 10.08 | 638520.362 | 7211967.084 | 137.24 | | |
| P-31+742 | P | 21-Oct-10 | 136.95 | 9.87 | 0.42 | 10.57 | 638519.635 | 7211968.178 | 137.24 | | |
| T-31+743.5 | T | 21-Oct-10 | 136.99 | 8.66 | 0.19 | 9.14 | 638518.642 | 7211969.479 | 137.32 | Very strong rock. No return while drilling bedrock. Bedrock assumed due to rate of advance. | |
| S-31+745 | S | 21-Oct-10 | 136.95 | 8.58 | 0.47 | 9.34 | 638517.833 | 7211970.625 | 137.27 | No return while drilling bedrock. Bedrock assumed due to rate of advance. | |
| T-31+746.5 | T | 21-Oct-10 | 137.03 | 8.57 | 0.44 | 9.30 | 638516.863 | 7211971.967 | 137.34 | Connected to T-31+743.5 at contact and while drillling bedrock. | |
| P-31+748 | P | 22-Oct-10 | 136.93 | 8.41 | 0.48 | 9.17 | 638515.967 | 7211973.258 | 137.21 | | |
| T-31+749.5 | T | 22-Oct-10 | 136.89 | 8.60 | 0.32 | 9.18 | 638515.037 | 7211974.479 | 137.20 | | |
| S-31+751 | S | 22-Oct-10 | 136.91 | 8.82 | 0.43 | 9.55 | 638514.270 | 7211975.642 | 137.26 | | |
| T-31+752.5 | T | 22-Oct-10 | 136.90 | 8.94 | 0.52 | 9.75 | 638513.526 | 7211976.904 | 137.24 | | |
| P-31+754 | P | 22-Oct-10 | 136.88 | 8.57 | 0.46 | 9.33 | 638512.702 | 7211978.222 | 137.24 | | |
| Q-31+754.75 | Q | 14-Jun-11 | 136.95 | 8.58 | 0.42 | 9.25 | 638512.259 | 7211978.741 | 137.17 | | |
| T-31+755.5 | T | 22-Oct-10 | 136.89 | 8.35 | 0.52 | 9.14 | 638511.847 | 7211979.354 | 137.15 | | |
| Q-31+756.25 | Q | 14-Jun-11 | 136.92 | 8.27 | 0.14 | 8.59 | 638511.338 | 7211980.049 | 137.13 | | |
| S-31+757 | S | 8-Oct-10 | 136.93 | 8.17 | 0.43 | 8.88 | 638510.840 | 7211980.664 | 137.21 | | |
| T-31+758.5 | T | 7-Oct-10 | 136.86 | 7.60 | 0.50 | 8.41 | 638510.028 | 7211981.857 | 137.13 | QA of activity not carried out; records retrieved from TCG. | |
| P-31+760 | P | 7-Oct-10 | 136.95 | 8.41 | 0.41 | 9.07 | 638509.138 | 7211983.104 | 137.17 | | |
| T-31+761.5 | T | 7-Oct-10 | 136.92 | 7.74 | 0.41 | 8.45 | 638508.367 | 7211984.359 | 137.16 | | |
| S-31+763 | S | 7-Oct-10 | 136.92 | 7.46 | 0.44 | 8.15 | 638507.468 | 7211985.635 | 137.16 | | |
| T-31+764.5 | T | 7-Oct-10 | 136.97 | 7.44 | 0.41 | 8.15 | 638506.680 | 7211986.924 | 137.24 | | |

Golder Associates

# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P-31+766 | P | 7-Oct-10 | 136.96 | 7.47 | 0.41 | 8.13 | 638505.790 | 7211988.064 | 137.23 | | |
| T-31+767.5 | T | 7-Oct-10 | 136.96 | 7.22 | 0.34 | 7.84 | 638505.080 | 7211989.462 | 137.23 | | |
| S-31+769 | S | 7-Oct-10 | 136.99 | 7.15 | 0.46 | 7.91 | 638504.149 | 7211990.641 | 137.25 | | |
| T-31+770.5 | T | 7-Oct-10 | 136.96 | 7.27 | 0.54 | 8.11 | 638503.301 | 7211991.819 | 137.24 | | |
| P-31+772 | P | 7-Oct-10 | 136.96 | 7.33 | 0.51 | 8.15 | 638502.478 | 7211993.089 | 137.24 | | |
| T-31+773.5 | T | 7-Oct-10 | 136.99 | 7.45 | 0.42 | 8.16 | 638501.591 | 7211994.404 | 137.21 | | |
| S-31+775 | S | 7-Oct-10 | 136.93 | 7.55 | 0.50 | 8.15 | 638500.809 | 7211995.640 | 137.09 | Ground settled slightly under weight of rig. | |
| Q-31+775.75 | Q | 14-Jun-11 | 136.88 | 6.92 | 0.56 | 7.73 | 638500.333 | 7211996.229 | 137.20 | | |
| T-31+776.5 | T | 6-Oct-10 | 136.95 | 6.46 | 0.50 | 7.27 | 638499.912 | 7211996.855 | 137.23 | QA of activity not carried out; records retrieved from TCG. | |
| Q-31+777.25 | Q | 14-Jun-11 | 136.96 | 6.89 | 0.57 | 7.63 | 638499.525 | 7211997.444 | 137.20 | | |
| P-31+778 | P | 6-Oct-10 | 136.93 | 7.27 | 0.41 | 7.98 | 638499.134 | 7211998.067 | 137.25 | | |
| Q-31+778.75 | Q | 14-Jun-11 | 137.04 | 7.40 | 0.47 | 8.15 | 638498.763 | 7211998.740 | 137.28 | | |
| T-31+779.5 | T | 6-Oct-10 | 136.96 | 7.34 | 0.41 | 8.05 | 638498.288 | 7211999.365 | 137.25 | | |
| Q-31+780.25 | Q | 14-Jun-11 | 136.92 | 7.31 | 0.50 | 8.15 | 638497.902 | 7212000.040 | 137.28 | | |
| S-31+781 | S | 6-Oct-10 | 136.95 | 7.39 | 0.44 | 8.13 | 638497.487 | 7212000.607 | 137.29 | | |
| T-31+782.5 | T | 6-Oct-10 | 136.92 | 7.42 | 0.41 | 8.13 | 638496.714 | 7212001.886 | 137.17 | | |
| P-31+784 | P | 6-Oct-10 | 136.96 | 7.64 | 0.36 | 8.30 | 638495.902 | 7212003.083 | 137.21 | | |
| T-31+785.5 | T | 6-Oct-10 | 136.96 | 7.79 | 0.44 | 8.53 | 638495.026 | 7212004.419 | 137.27 | 0.3 m CSB above bedrock interface. | |
| S-31+787 | S | 6-Oct-10 | 137.00 | 7.82 | 0.44 | 8.56 | 638494.273 | 7212005.682 | 137.23 | 1 m CSB above bedrock interface. | |
| S-31+787B | S | 1-May-11 | 137.11 | 7.45 | 0.40 | 8.00 | 638493.319 | 7212006.627 | 137.22 | | |
| T-31+788.5 | T | 7-Mar-11 | 137.06 | 7.43 | 0.53 | 8.16 | 638492.547 | 7212007.528 | 137.35 | Drilled with tricone on 07-Mar-11 without casing through the SB. | |
| P-31+790 | P | 1-May-11 | 137.07 | 8.52 | 0.32 | 8.95 | 638491.651 | 7212008.705 | 137.29 | | Tricone refusal within bedrock. |
| T-31+791.5 | T | 1-May-11 | 137.15 | 8.60 | 0.51 | 9.34 | 638490.792 | 7212009.947 | 137.48 | Communicated to outsdie of P-31+790 from 6 to 8 m . | Tricone refusal within bedrock. |
| S-31+793 | S | 1-May-11 | 137.18 | 8.53 | 0.44 | 9.22 | 638489.939 | 7212011.149 | 137.48 | Communicated to outside of T-32+788.5 and S-32+791 from 5 to 8 m. | Tricone refusal within bedrock. |
| T-31+794.5 | T | 8-Mar-11 | 137.19 | 8.89 | 0.33 | 9.40 | 638489.157 | 7212012.387 | 137.47 | | |
| P-31+796 | P | 17-Oct-10 | 137.12 | 8.88 | 0.47 | 9.55 | 638488.268 | 7212013.620 | 137.36 | | |
| T-31+797.5 | T | 8-Mar-11 | 137.37 | 8.49 | 0.44 | 9.12 | 638487.363 | 7212014.832 | 137.59 | | |
| S-31+799 | S | 8-Mar-11 | 137.24 | 8.08 | 0.48 | 8.79 | 638486.615 | 7212016.142 | 137.62 | Triggered hammer over entire length. Sidewalls of triconed hole were frozen. | |
| T-31+800.5 | T | 8-Mar-11 | 137.20 | 7.84 | 0.37 | 8.36 | 638485.715 | 7212017.418 | 137.57 | | Stopped by cobbles. |
| P-31+802 | P | 8-Mar-11 | 137.27 | 8.65 | 0.43 | 9.13 | 638484.920 | 7212018.640 | 137.45 | Medium hamer trigger required to advance casing. Mostly due to sidewall friction. | |
| T-31+803.5 | T | 8-Mar-11 | 137.27 | 8.52 | 0.31 | 9.03 | 638484.049 | 7212019.915 | 137.58 | Communicated to P-31+802 while advancing through CSB wall. Water blown out. | |
| S-31+805 | S | 8-Mar-11 | 137.28 | 8.92 | 0.46 | 9.55 | 638483.179 | 7212021.119 | 137.61 | Communicated to T-31+803.5 and P-31+802 while advancing through bedrock. | |
| T-31+806.5 | T | 9-Mar-11 | 137.36 | 9.08 | 0.50 | 9.73 | 638482.310 | 7212022.306 | 137.64 | | |
| P-31+808 | P | 17-Oct-10 | 137.26 | 9.24 | 0.38 | 9.90 | 638481.434 | 7212023.505 | 137.60 | | |
| T-31+809.5 | T | 31-Mar-11 | 137.41 | 9.47 | 0.44 | 10.10 | 638480.419 | 7212024.624 | 137.61 | | |
| S-31+811 | S | 31-Mar-11 | 137.33 | 10.53 | 0.47 | 11.18 | 638479.499 | 7212025.980 | 137.60 | | |
| T-31+812.5 | T | 1-Apr-11 | 137.34 | 10.91 | 0.51 | 11.63 | 638478.545 | 7212026.988 | 137.62 | Communicated to S-31+811 and P-31+814 during 3rd casing. | |
| P-31+814 | P | 1-Apr-11 | 137.41 | 12.18 | 0.55 | 12.95 | 638477.677 | 7212028.269 | 137.65 | Communicated to S-31+811 during 3rd casing; and S-31+811 and T-31+815.5 during 4th casing. | |
| T-31+815.5 | T | 1-Apr-11 | 137.35 | 13.00 | 0.51 | 13.74 | 638476.928 | 7212029.451 | 137.67 | Communicated to S-31+817 during 4th casing (outside casing). | |
| S-31+817 | S | 18-Oct-10 | 137.22 | 13.33 | 0.46 | 13.96 | 638476.102 | 7212030.681 | 137.47 | | |
| T-31+818.5 | T | 2-Apr-11 | 137.38 | 14.34 | 0.75 | 15.09 | 638475.206 | 7212031.980 | 137.62 | Communicated to P-31+820 from 12.5 m to bedrock interface; and T-31+821.5 at bedrock interface. | |
| P-31+820 | P | 2-Apr-11 | 137.36 | 15.13 | 0.49 | 15.87 | 638474.326 | 7212033.203 | 137.62 | Communicated to T-31+818.5 and T-31+821.5 during 4th and 5th casings. | No water return at 8.53 m. |
| T-31+821.5 | T | 2-Apr-11 | 137.38 | 15.36 | 0.47 | 16.09 | 638473.471 | 7212034.358 | 137.64 | Communicated to P-31+820 and T-31+818.5 at 4th casing. | |
| S-31+823 | S | 2-Apr-11 | 137.37 | 16.34 | 0.50 | 17.26 | 638472.658 | 7212035.692 | 137.61 | Communicated to T-31+821.5, P-31+820, and T-31+818.5 at 4th casing; and T-31+821.5 at 5th casing. | |

**TABLE E1-3.1**
**SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES**

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-31+824.5 | T | 2-Apr-11 | 137.33 | 15.79 | 0.40 | 16.41 | 638471.699 | 7212036.916 | 137.53 | | |
| P-31+826 | P | 3-Apr-11 | 137.30 | 15.88 | 0.56 | 16.54 | 638470.897 | 7212038.175 | 137.49 | Communicated to T-31+824.5 in bedrock. | Lost water return at 12.5 m bgs. |
| T-31+827.5 | T | 3-Apr-11 | 137.32 | 16.43 | 0.11 | 16.59 | 638470.103 | 7212039.312 | 137.65 | Communicated to P-31+826 and S-31+829 at 8.14 m bgs. | |
| S-31+829 | S | 4-Apr-11 | 137.28 | 18.93 | 0.47 | 19.50 | 638469.224 | 7212040.614 | 137.51 | | Refusal on cobbles at 11.0 m. Installed casing. Triconed with 3-inch bit. Completed casing installation. |
| T-31+830.5 | T | 4-Apr-11 | 137.26 | 19.68 | 0.45 | 20.31 | 638468.452 | 7212041.833 | 137.67 | Communicated to S-31+829 at 15 and 18.5 m bgs. | |
| P-31+832 | P | 4-Apr-11 | 137.24 | 19.78 | 0.11 | 20.34 | 638467.590 | 7212043.134 | 137.82 | Communicated to S-31+829 and T-31+830.5; communicated to T-31+833.5 at 18.5 m and within bedrock. | |
| T-31+833.5 | T | 5-Apr-11 | 137.18 | 19.56 | 0.50 | 20.36 | 638466.810 | 7212044.338 | 137.58 | Communicated to S-31+835 between 8 and 8.5 m; and P-31+832 between 16.5 and 17 m bgs. | |
| S-31+835 | S | 5-Apr-11 | 137.20 | 18.99 | -- | 19.15 | 638465.956 | 7212045.614 | 137.47 | Communicated to S-31+829 from 7 to 11.5 m; T-31+836.5 between 13.5 and 14 m; and P-31+832 between 17 and 17.5 m bgs. | Tricone refusal within jet grout column. |
| T-31+836.5 | T | 5-Apr-11 | 137.23 | 19.87 | 0.45 | 20.50 | 638465.026 | 7212046.872 | 137.48 | Communicated to 31+835 at 13.5 and 20 m bgs. | |
| P-31+838 | P | 5-Apr-11 | 137.18 | 20.41 | 0.51 | 21.08 | 638464.306 | 7212048.041 | 137.42 | Communicated to T-31+839.5 at 13.7 m; T-31+836.5 and T-31+839.5 at 14.8 m; and S-31+829, S-31+835, T-31+836.5 and T-31+839.5 at CSB / jet grout interface at 15.2 m bgs. | |
| T-31+839.5 | T | 5-Apr-11 | 137.18 | 21.07 | 0.50 | 21.89 | 638463.370 | 7212049.281 | 137.44 | Communicated to P-31+838 between 6 and 7 m; and between 12 and 15 m bgs. | |
| S-31+841 | S | 5-Apr-11 | 137.13 | 19.81 | 0.37 | 20.36 | 638462.616 | 7212050.627 | 137.50 | Communicated to T-31+842.5 at 8 m and between 12.5 and 13 m bgs. | |
| T-31+842.5 | T | 3-Apr-11 | 137.15 | 20.89 | 0.39 | 21.51 | 638461.935 | 7212051.955 | 137.48 | | Drilling stopped due to presence of cobbles. |
| P-31+844 | P | 4-Apr-11 | 137.23 | 21.11 | 0.47 | 21.71 | 638461.123 | 7212053.240 | 137.60 | | |
| T-31+845.5 | T | 3-Apr-11 | 137.24 | 19.61 | 1.00 | 20.64 | 638460.443 | 7212054.590 | 137.53 | | |
| S-31+847 | S | 2-Apr-11 | 137.22 | 20.53 | 0.53 | 21.16 | 638459.621 | 7212055.734 | 137.53 | Tricone refusal at 9.2 m; hammer triggered for casing install to depth. | Drilling stopped due to presence of cobbles. |
| T-31+848.5 | T | 2-Apr-11 | 137.29 | 17.34 | -- | 17.56 | 638458.787 | 7212057.005 | 137.52 | | |
| P-31+850 | P | 2-Apr-11 | 137.49 | 19.77 | 0.40 | 20.48 | 638457.923 | 7212058.316 | 137.61 | | Connected to T-31+848.5 from 3.3 m bgs. |
| T-31+851.5 | T | 6-Apr-11 | 137.20 | 20.07 | 0.51 | 20.63 | 638457.138 | 7212059.385 | 137.52 | Communicated to T-31+842.5 at approx. 8 m and between 12.5 and 13.0 m bgs. | |
| S-31+853 | S | 5-Apr-11 | 137.21 | 19.96 | 0.53 | 20.49 | 638456.294 | 7212060.795 | 137.56 | Hammer triggered at 6.1 m bgs. | |
| T-31+854.5 | T | 6-Apr-11 | 137.21 | 20.35 | 0.45 | 20.85 | 638455.377 | 7212062.050 | 137.57 | Communicated to S-31+853 and T-31+851.5 at 15 m bgs. | |
| P-31+856 | P | 6-Apr-11 | 137.18 | 20.55 | 0.50 | 21.33 | 638454.538 | 7212063.245 | 137.61 | Communicated to S-31+859 from 18 m to bedrock interface at 20.55 m bgs; heavy hammer. | |
| T-31+857.5 | T | 7-Apr-11 | 137.19 | 20.24 | 0.22 | 20.70 | 638453.679 | 7212064.371 | 137.61 | | |
| S-31+859 | S | 7-Apr-11 | 137.21 | 20.62 | 0.41 | 21.15 | 638452.818 | 7212065.709 | 137.49 | Communicated to T-31+857.5 from 15 m to bottom of hole. Communicated to P-31+836 at 18.9, 19.2 and 20 m bgs. | Lost water return at 18.9 m. Communicated to P-31+836. |
| T-31+860.5 | T | 7-Apr-11 | 137.26 | 20.39 | 0.47 | 21.09 | 638451.981 | 7212066.925 | 137.55 | | |
| P-31+862 | P | 7-Apr-11 | 137.20 | 20.53 | 0.44 | 21.25 | 638451.175 | 7212068.226 | 137.56 | Communicated to T-31+866.5 and P-31+868 in the CSB. Communicated to 31+860.5 below 10 m depth. Communicated to T-31+860.5 and S-31+865 at 18.5 m. | |
| T-31+863.5 | T | 8-Apr-11 | 137.23 | 20.87 | 0.43 | 21.50 | 638450.273 | 7212069.458 | 137.49 | Communicatd briefly to P-31+862 at 17.5 m. | |
| S-31+865 | S | 8-Apr-11 | 137.22 | 19.96 | 0.48 | 20.62 | 638449.453 | 7212070.685 | 137.57 | Communicated to P-31+862 and T-31+863.5 between 15.1 m and end of hole. Communicated to T-31+869.5 between 18.5 m and end of hole. | |
| T-31+866.5 | T | 8-Apr-11 | 137.24 | 20.50 | 0.49 | 21.07 | 638448.646 | 7212071.890 | 137.50 | Communicated to P-31+868 at approx. 9.14 m. | |
| P-31+868 | P | 5-Apr-11 | 137.17 | 21.85 | 0.46 | 22.39 | 638447.612 | 7212073.002 | 137.41 | Communicated to S-31+871 between 17.0 and 17.5 m, and 18.5 and 20.0 m bgs. | |
| T-31+869.5 | T | 5-Apr-11 | 137.20 | 20.73 | 0.53 | 21.31 | 638446.807 | 7212074.353 | 137.45 | Hammer triggered at 6.1 m. Communicated to S-31+871 between 19.5 and 20.25 m bgs. | |
| S-31+871 | S | 4-Apr-11 | 137.15 | 20.70 | 0.57 | 21.34 | 638446.084 | 7212075.573 | 137.50 | | |
| T-31+872.5 | T | 7-Apr-11 | 137.12 | 20.24 | 0.37 | 20.79 | 638445.312 | 7212076.778 | 137.51 | Communicated to T-31+869.5. | |
| P-31+874 | P | 7-Apr-11 | 137.12 | 20.13 | 0.34 | 20.71 | 638444.410 | 7212078.076 | 137.60 | Communicated to T-31+875.5 at approx. 10 and 13 m bgs. Communicated to T-31+869.5, S-31+871, and T-31+875.5 from 14.5m to bottom of hole. | |
| T-31+875.5 | T | 6-Apr-11 | 137.09 | 20.11 | 0.54 | 20.69 | 638443.540 | 7212079.180 | 137.42 | Heavy hammer use at 10.4 m bgs. | |
| S-31+877 | S | 6-Apr-11 | 137.03 | 20.35 | 0.39 | 20.82 | 638442.657 | 7212080.498 | 137.40 | Difficult drilling at 11.3 m bgs. | |
| T-31+878.5 | T | 6-Apr-11 | 137.07 | 19.72 | 0.31 | 20.03 | 638441.665 | 7212081.896 | 137.22 | Difficult drilling at 9.14 m bgs. | |
| P-31+879.7 | P | 24-Apr-11 | 137.01 | 19.07 | 0.37 | 19.74 | | | 137.31 | | |
| P-31+880 | P | 6-Apr-11 | 137.01 | 19.50 | 0.41 | 20.17 | 638441.06 | 7212083.07 | 137.40 | Communicated to ST-31+878.5 at 7.0 and 13.5 m bgs. | Connected to T-31+881.5 between 3.1 and 6.1 m bgs. |
| T-31+881.5 | T | 8-Apr-11 | 137.04 | 20.50 | 0.49 | 21.07 | 638439.98 | 7212084.52 | 137.48 | Communicated to T-31+878.5, P-31+880, S-31+883, and T-31+884.5. | Lost water return at 1.45 m bgs. |

**TABLE E1-3.1**
**SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES**

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S-31+883 | S | 7-Apr-11 | 137.01 | 19.86 | 0.40 | 20.34 | 638439.32 | 7212085.55 | 137.30 | Communicated to T-31+875.5 and P-31+880. | |
| T-31+884.5 | T | 8-Apr-11 | 137.02 | 20.10 | 0.37 | 20.68 | 638438.43 | 7212086.88 | 137.32 | Communicated to P-31+880 between 11.6 and 18.5 m bgs. | |
| P-31+886 | P | 9-Apr-11 | 136.99 | 19.75 | 0.43 | 20.31 | 638437.58 | 7212087.97 | 137.23 | | |
| T-31+887.5 | T | 10-Apr-11 | 137.03 | 19.89 | 0.40 | 20.39 | 638436.77 | 7212089.28 | 137.43 | Communicated to P-31+886, S-31+889, T-31+890.5 and P-31+892. | |
| S-31+889 | S | 10-Apr-11 | 137.01 | 18.92 | 0.44 | 19.47 | 638436.04 | 7212090.54 | 137.30 | Communicated to T-31+890.5 above bedrock. | |
| T-31+890.5 | T | 9-Apr-11 | 137.01 | 19.03 | 0.40 | 19.52 | 638435.06 | 7212091.79 | 137.34 | | |
| P-31+892 | P | 9-Apr-11 | 136.98 | 18.82 | 0.42 | 19.38 | 638434.21 | 7212093.03 | 137.23 | | |
| T-31+893.5 | T | 11-Apr-11 | 137.06 | 18.29 | 0.49 | 18.93 | 638433.33 | 7212094.22 | 137.38 | Communicated to P-31+892 and T-31+896.5 at 11 m. | |
| S-31+895 | S | 7-Apr-11 | 137.01 | 18.09 | 0.46 | 18.54 | 638432.64 | 7212095.43 | 137.20 | | |
| T-31+896.5 | T | 11-Apr-11 | 137.05 | 17.74 | 0.49 | 18.42 | 638431.70 | 7212096.76 | 137.42 | Communicated to T-31+893.5 at 14.5 m and between 15.1 and 18.5 m bgs. | |
| P-31+898 | P | 11-Apr-11 | 137.12 | 18.11 | 0.41 | 18.66 | 638430.81 | 7212098.00 | 137.36 | Communicated to T-31+899.5 between 8.2 and 11.5 m bgs. | |
| T-31+899.5 | T | 11-Apr-11 | 137.02 | 18.78 | 0.35 | 19.24 | 638429.97 | 7212099.17 | 137.47 | Communicated to T-31+893.5 at 11.3 m and then to T-31+905.5 at 11.6 m. | |
| S-31+901 | S | 9-Apr-11 | 137.09 | 19.28 | 0.44 | 19.81 | 638429.15 | 7212100.49 | 137.40 | | |
| T-31+902.5 | T | 9-Apr-11 | 137.20 | 18.64 | 0.42 | 19.22 | 638428.31 | 7212101.72 | 137.46 | | |
| P-31+904 | P | 8-Apr-11 | 137.23 | 17.66 | 0.65 | 18.53 | 638427.50 | 7212103.00 | 137.44 | | |
| T-31+905.5 | T | 8-Apr-11 | 137.21 | 18.93 | 0.49 | 19.56 | 638426.55 | 7212104.14 | 137.46 | | |
| S-31+907 | S | 7-Apr-11 | 137.12 | 18.69 | 0.47 | 19.23 | 638425.80 | 7212105.46 | 137.51 | | |
| T-31+908.5 | T | 10-Apr-11 | 137.27 | 17.06 | 0.50 | 17.67 | 638424.94 | 7212106.59 | 137.56 | Tricone refusal at 16.9 m; within jet grout column. | Tricone refusal within jet grout column. |
| P-31+910 | P | 7-Apr-11 | 137.22 | 20.46 | 0.39 | 21.01 | 638423.97 | 7212107.71 | 137.40 | Communicated to S-31+907 and T-31+905.5 at 10.4 m bgs. | |
| T-31+911.5 | T | 8-Apr-11 | 137.18 | 17.51 | 0.43 | 18.10 | 638423.23 | 7212109.17 | 137.44 | Communicanted to T-31+905.5 from 15 m to end of hole. | Connected to S-31+913 at end of hole. |
| S-31+913 | S | 10-Apr-11 | 137.18 | 17.68 | 0.51 | 18.44 | 638422.42 | 7212110.36 | 137.58 | | |
| T-31+914.5 | T | 12-Apr-11 | 137.16 | 16.75 | 0.54 | 17.43 | 638421.55 | 7212111.63 | 137.54 | Communicated to T-31+911.5 between 11.6 and 15.0 m bgs. | |
| P-31+916 | P | 11-Apr-11 | 137.16 | 15.75 | 0.25 | 16.22 | 638420.69 | 7212112.82 | 137.50 | Communicated to T-31+905.5, S-31+913, and T-31+914.5. | |
| Q-31+916.75 | Q | 15-Jun-11 | 137.31 | 15.74 | 0.30 | 16.24 | 638420.344 | 7212113.594 | 137.51 | | Firm to soft with few random cobbles; refusal on possible cobble; stopped drilling as close to anticipated depth to rock. |
| T-31+917.5 | T | 11-Apr-11 | 137.26 | 15.64 | 0.16 | 16.05 | 638419.858 | 7212114.089 | 137.51 | Communicated to S-31+913. Only embedded 20 cm into bedrock because drillers did not want to break the casing shoe. | |
| S-31+919 | S | 12-Apr-11 | 137.31 | 14.87 | 0.30 | 15.38 | 638419.060 | 7212115.292 | 137.61 | Communicated to T-31+917.5 between 9 and 12 m bgs; P-31+916 between 11 and 13 m bgs; and T-31+920.5 between 11 and bedrock at 14.9 m depth. | |
| Q-31+919.75 | Q | 15-Jun-11 | 137.31 | 14.40 | 0.44 | 15.14 | 638418.601 | 7212115.905 | 137.59 | | Firm and steady with random cobbles; triconing seems to have been taken deeper than actual casing install. |
| T-31+920.5 | T | 12-Apr-11 | 137.26 | 14.82 | 0.18 | 15.07 | 638418.22 | 7212116.51 | 137.54 | Communicated to S-31+919 and P-31+916 between 11 m bgs and the end of hole. | |
| P-31+922 | P | 13-Apr-11 | 137.29 | 14.93 | 0.56 | 15.65 | 638417.34 | 7212117.82 | 137.77 | Communicated to S-31+919.0, T-31+920.5, and T-31+923.5 from 12.5 m to end of hole. | |
| Q-31+922.75 | Q | 15-Jun-11 | 137.48 | 15.37 | 0.46 | 15.98 | 638416.941 | 7212118.462 | 137.60 | | Water level steady in hole while adding rods until bedrock reached; thereafter communicated to Q-31+916.75 and T-31+902.5 (water). |
| T-31+923.5 | T | 14-Apr-11 | 137.34 | 14.73 | 0.38 | 15.34 | 638416.50 | 7212119.09 | 137.79 | | |
| S-31+925 | S | 15-Apr-11 | 137.20 | 15.15 | 0.45 | 15.60 | 638415.66 | 7212120.34 | 137.51 | | |
| Q-31+925.75 | Q | 15-Jun-11 | 137.38 | 14.66 | 0.18 | 15.04 | 638415.25 | 7212120.97 | 137.59 | | Firm few random cobbles; water level steady in hole while adding rods. |
| T-31+926.5 | T | 13-Apr-11 | 137.25 | 14.41 | 0.67 | 15.08 | 638414.810 | 7212121.526 | 137.49 | Lower resistance zone encountered below originally interpreted competent bedrock interface; embedded deeper than 0.5 m. | |
| Q-31+927.25 | Q | 16-Jun-11 | 137.30 | 14.91 | 0.43 | 15.42 | 638414.45 | 7212122.12 | 137.45 | | Water level steady in hole while adding triconing rods until bedrock interface. |
| P-31+928 | P | 14-Apr-11 | 137.27 | 14.12 | -0.03 | 14.21 | 638413.949 | 7212122.797 | 137.43 | Communicated to T-31+926.5 from 9.7 m to end of hole; communicated to T-31+929.5 at bedrock interface. | |
| Q-31+928.75 | Q | 16-Jun-11 | 137.34 | 14.25 | 0.40 | 14.83 | 638413.603 | 7212123.425 | 137.57 | | Water level steady in hole during rod changes. |
| T-31+929.5 | T | 14-Apr-11 | 137.23 | 13.95 | 0.56 | 14.68 | 638413.14 | 7212123.93 | 137.47 | Communicated to P-31+928 at 10.3 m and and bedrock interface. | |
| Q-31+930.25 | Q | 16-Jun-11 | 137.41 | 14.08 | 0.36 | 14.59 | 638412.66 | 7212124.61 | 137.52 | | Refusal due to cobble / v.hard material at 13.9 m; water level steady during rod changes. |
| S-31+931 | S | 14-Apr-11 | 137.34 | 14.04 | 0.29 | 14.50 | 638412.248 | 7212125.074 | 137.51 | Communicated to T-31+929.5 at 11 m. | Stopped by a cobble ~1.9 m above anticipated depth to bedrock; did not re-enter small tricone after passing casing through. |

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# TABLE E1-3.1
# SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q-31+931.75 | Q | 16-Jun-11 | 137.31 | 13.95 | 0.54 | 14.67 | 638411.79 | 7212125.76 | 137.56 | | Refusal due to cobble / v.hard material at 12.8 m; water level steady during rod changes. |
| T-31+932.5 | T | 13-Apr-11 | 137.30 | 14.02 | 0.34 | 14.45 | 638411.36 | 7212126.36 | 137.54 | Communicated to T-31+938.5 at 10.7 m. | |
| Q-31+933.25 | Q | 16-Jun-11 | 137.36 | 13.69 | 0.06 | 13.90 | 638410.96 | 7212127.02 | 137.59 | | Refusal due to cobble / v.hard material at 13.1 m; water level steady during rod changes. |
| P-31+934 | P | 13-Apr-11 | 137.32 | 13.54 | 0.37 | 14.02 | 638410.54 | 7212127.58 | 137.58 | | |
| Q-31+934.75 | Q | 17-Jun-11 | 137.33 | 12.44 | 0.41 | 13.03 | 638410.105 | 7212128.188 | 137.58 | Communicated to Q-31+922.75 at bedrock interface. | V.hard / cobble at 8.36 m; could not advance tricone; material did not soften during casing drive, therefore hammered to depth. |
| T-31+935.5 | T | 13-Apr-11 | 137.34 | 13.09 | 0.43 | 13.60 | 638409.64 | 7212128.82 | 137.54 | | |
| Q-31+936.25 | Q | 17-Jun-11 | 137.33 | 12.21 | 0.41 | 12.75 | 638409.178 | 7212129.503 | 137.50 | V.hard material during casing install; stopped above anticipated depth to hard material. | |
| S-31+937 | S | 13-Apr-11 | 137.43 | 12.97 | 0.33 | 13.45 | 638408.86 | 7212130.10 | 137.66 | | |
| T-31+938.5 | T | 12-Apr-11 | 137.31 | 12.64 | 0.40 | 13.07 | 638407.98 | 7212131.30 | 137.61 | Communicated to T-31+941.5 and P-31+946 at bedrock contact, 12.6 m bgs. | |
| P-31+940 | P | 11-Apr-11 | 137.32 | 12.80 | 0.28 | 13.13 | 638407.15 | 7212132.63 | 137.55 | | |
| T-31+941.5 | T | 12-Apr-11 | 137.33 | 12.96 | 0.48 | 13.44 | 638406.27 | 7212133.81 | 137.57 | Communicated to T-31+944.5 at 6.1 m; and P-31+940 at 11.3 m bgs. | |
| S-31+943 | S | 12-Apr-11 | 137.31 | 12.42 | 0.00 | 12.53 | 638405.44 | 7212135.07 | 137.56 | Communicated to P-31+940 and T-31+944.5 during embedment into bedrock. | |
| Q-31+943.75 | Q | 17-Jun-11 | 137.39 | 12.01 | 0.41 | 12.52 | 638405.06 | 7212135.70 | 137.48 | | |
| T-31+944.5 | T | 12-Apr-11 | 137.30 | 12.39 | 0.25 | 12.80 | 638404.69 | 7212136.33 | 137.61 | | |
| Q-31+945.25 | Q | 17-Jun-11 | 137.32 | 12.27 | 0.54 | 12.98 | 638404.18 | 7212136.94 | 137.51 | | Hammer used from 4.7 to 5.0 m to get beyond cobble / resistant material. |
| P-31+946 | P | 13-Apr-11 | 137.27 | 12.38 | 0.13 | 12.68 | 638403.745 | 7212137.640 | 137.60 | Previously installed. Casing broken at weld 3.73 m below ground surface first time. Not retrieved. Communicated to T-31+944.5 from 8.2 to 12 m during re-install. | |
| Q-31+946.75 | Q | 17-Jun-11 | 137.30 | 12.18 | 0.35 | 12.69 | 638403.30 | 7212138.23 | 137.54 | | |
| T-31+947.5 | T | 16-Apr-11 | 137.20 | 12.17 | 0.46 | 12.70 | 638402.92 | 7212138.87 | 137.43 | | |
| Q-31+948.25 | Q | 17-Jun-11 | 137.25 | 12.18 | 0.50 | 12.88 | 638402.50 | 7212139.47 | 137.52 | | |
| S-31+949 | S | 16-Apr-11 | 137.23 | 12.34 | 0.46 | 12.92 | 638402.05 | 7212140.03 | 137.40 | | |
| T-31+950.5 | T | 16-Apr-11 | 137.20 | 12.11 | 0.36 | 12.55 | 638401.27 | 7212141.29 | 137.38 | Communicated to P-31+946 from 10 to 12 m. | |
| P-31+952 | P | 12-Apr-11 | 137.15 | 12.35 | 0.45 | 13.02 | 638400.46 | 7212142.52 | 137.51 | | |
| T-31+953.5 | T | 14-Apr-11 | 137.19 | 12.83 | 0.36 | 13.25 | 638399.58 | 7212143.80 | 137.40 | Communicated to P-31+952 from 6 to 12 m. | |
| S-31+955 | S | 14-Apr-11 | 137.23 | 12.64 | 0.25 | 13.02 | 638398.75 | 7212145.05 | 137.46 | | |
| T-31+956.5 | T | 14-Apr-11 | 137.28 | 13.11 | 0.28 | 13.55 | 638397.86 | 7212146.28 | 137.55 | Communicated to S-31+955 from 9.5 m to end of hole. | |
| P-31+958 | P | 16-Apr-11 | 137.24 | 11.48 | 0.37 | 11.96 | 638397.02 | 7212147.49 | 137.51 | | |
| Q-31+958.75 | Q | 18-Jun-11 | 137.39 | 12.16 | 0.44 | 12.83 | 638396.58 | 7212148.08 | 137.68 | | |
| T-31+959.5 | T | 12-Apr-11 | 137.32 | 12.66 | 0.32 | 12.99 | 638396.21 | 7212148.73 | 137.58 | | |
| Q-31+960.25 | Q | 18-Jun-11 | 137.29 | 12.39 | 0.40 | 13.05 | 638395.85 | 7212149.29 | 137.64 | | Water level steady in hole during rod changes. |
| S-31+961 | S | 15-Apr-11 | 137.32 | 12.84 | 0.59 | 13.52 | 638395.38 | 7212149.97 | 137.62 | Communicated to T-31+962.5 and T-31+956.5 at 7.6 m. | Triconing stopped at 7.7 m due to very hard resistance within the CSB. |
| Q-31+961.75 | Q | 18-Jun-11 | 137.30 | 13.07 | 0.11 | 13.35 | 638395.00 | 7212150.70 | 137.67 | | Encountered v.hard material shallower than anticipated. |
| T-31+962.5 | T | 15-Apr-11 | 137.31 | 13.77 | 0.40 | 14.21 | 638394.45 | 7212151.19 | 137.58 | Communicated to S-31+961.0 and P-31+964.0. | Hammer used from 4.4 to 6.1 m to get beyond resistant material. |
| Q-31+963.25 | Q | 18-Jun-11 | 137.41 | 13.12 | -0.08 | 13.24 | 638394.04 | 7212151.80 | 137.66 | | Encountered v.hard material shallower than anticipated. |
| P-31+964 | P | 15-Apr-11 | 137.37 | 12.66 | 0.43 | 13.15 | 638393.69 | 7212152.30 | 137.53 | | |
| T-31+965.5 | T | 15-Apr-11 | 137.29 | 12.18 | 0.44 | 12.70 | 638392.86 | 7212153.69 | 137.50 | | |
| Q-31+966.25 | Q | 19-Jun-11 | 137.43 | 12.29 | 0.46 | 12.95 | 638392.41 | 7212154.23 | 137.67 | | Refusal with tricone in very hard material. |
| S-31+967 | S | 16-Apr-11 | 137.35 | 12.42 | 0.42 | 12.95 | 638392.09 | 7212154.86 | 137.57 | Communicated to T-31+965.5, T-31+968.5 and P-31+970.0 around 10.0 m. | 4" Odex hammer used from 4.3 to 4.6 m through hard material. |
| Q-31+967.75 | Q | 19-Jun-11 | 137.50 | 12.42 | 0.43 | 13.00 | 638391.60 | 7212155.49 | 137.65 | | |
| T-31+968.5 | T | 16-Apr-11 | 137.39 | 12.76 | 0.11 | 12.93 | 638391.199 | 7212156.035 | 137.62 | Communicated to S-31+967.0 and P-31+970.0 at 11.7 m, and to T-31+971.5 at the bedrock interface. | |
| Q-31+969.25 | Q | 19-Jun-11 | 137.40 | 12.82 | -0.06 | 12.96 | 638390.78 | 7212156.77 | 137.67 | | |
| P-31+970 | P | 16-Apr-11 | 137.37 | 13.03 | 0.42 | 13.62 | 638390.315 | 7212157.409 | 137.57 | Communicated to T-31+968.5 and T-31+971.5 from 9.5 m to bedrock, and to P-31+964.0 at 12.0 m. | |
| Q-31+970.75 | Q | 19-Jun-11 | 137.40 | 13.14 | 0.19 | 13.73 | 638389.88 | 7212157.95 | 137.82 | | |

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# TABLE E1-3.1
# SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-31+971.5 | T | 14-Apr-11 | 137.39 | 13.34 | 0.50 | 14.00 | 638389.57 | 7212158.62 | 137.67 | | |
| Q-31+972.25 | Q | 19-Jun-11 | 137.43 | 13.39 | 0.04 | 13.63 | 638388.99 | 7212159.23 | 137.65 | | |
| S-31+973 | S | 16-Apr-11 | 137.36 | 13.52 | 0.29 | 13.87 | 638388.617 | 7212159.794 | 137.48 | Communicated to T-31+971.5, P-31+976.0, and T-31+977.5 from 10.0 m to bedrock, and to P-31+970.0 at 10.0 m and at bedrock. | |
| Q-31+973.75 | Q | 20-Jun-11 | 137.43 | 12.91 | 0.46 | 13.57 | 638388.17 | 7212160.41 | 137.62 | | |
| T-31+974.5 | T | 18-Apr-11 | 137.28 | 13.22 | 0.07 | 13.50 | 638387.77 | 7212161.08 | 137.69 | Very hard rock encountered, unable to embed to 0.5 m. | |
| P-31+976 | P | 14-Apr-11 | 137.26 | 13.05 | 0.52 | 13.67 | 638386.98 | 7212162.26 | 137.57 | | |
| Q-31+976.75 | Q | 21-Jun-11 | 137.35 | 13.66 | 0.44 | 14.30 | 638386.55 | 7212162.94 | 137.54 | | |
| T-31+977.5 | T | 14-Apr-11 | 137.25 | 13.84 | 0.39 | 14.30 | 638386.11 | 7212163.63 | 137.43 | | Communincated to P-31+982 at 11.9 m. |
| S-31+979 | S | 15-Apr-11 | 137.30 | 13.80 | 0.43 | 14.25 | 638385.29 | 7212164.87 | 137.49 | Communicated (air) to T-31+977.5, T-31+980.5, and P-31+982.0. | |
| Q-31+979.75 | Q | 22-Jun-11 | 137.43 | 13.57 | 0.46 | 14.33 | 638384.79 | 7212165.45 | 137.66 | Cased and then re-cased June 21 / 22 after rods broke free in hole after first attempt. | Communicated to Q-31+976.75 at bedrock interface. |
| T-31+980.5 | T | 15-Apr-11 | 137.34 | 13.60 | 0.51 | 14.13 | 638384.35 | 7212166.01 | 137.58 | Communicated to T-31+980.5 and S-31+989.0. | |
| P-31+982 | P | 15-Apr-11 | 137.38 | 13.32 | 0.53 | 13.88 | 638383.49 | 7212167.36 | 137.51 | Communicated to T-31+977.5 between 6.5 and 13.0 m. | |
| T-31+983.5 | T | 15-Apr-11 | 137.40 | 15.32 | 0.56 | 15.88 | 638382.65 | 7212168.58 | 137.59 | Communicated to T-31+990.5, T-31+987.5, and P-31+982.0. | |
| S-31+985 | S | 17-Apr-11 | 137.40 | 13.07 | -0.04 | 13.15 | 638381.807 | 7212169.884 | 137.60 | Casing not embedded into rock; Communicated to 31+983.5 at 7.6 m and from 10.2 m to bedrock | |
| Q-31+985.75 | Q | 22-Jun-11 | 137.52 | 13.72 | 0.49 | 14.46 | 638381.44 | 7212170.47 | 137.66 | | |
| T-31+986.5 | T | 17-Apr-11 | 137.44 | 13.75 | 0.47 | 14.35 | 638381.04 | 7212171.05 | 137.61 | Communicated to T-31+983.5, P-31+982 and T-31+977.5 from 10 to 13 m. | 4" Odex hammer used from 3.0 to 4.3 m through hard / rockfill material |
| Q-31+987.25 | Q | 22-Jun-11 | 137.46 | 14.26 | 0.43 | 14.92 | 638380.66 | 7212171.81 | 137.71 | | |
| P-31+988 | P | 17-Apr-11 | 137.38 | 14.24 | 0.35 | 14.88 | 638380.141 | 7212172.338 | 137.71 | Communicated to P-31+982, T-31+983.5 and S-31+985 at 11 m and to T-31+986.5 within jet grout column. | |
| T-31+989.5 | T | 17-Apr-11 | 137.32 | 13.73 | 0.46 | 14.36 | 638379.32 | 7212173.53 | 137.62 | | 4" Odex hammer used from 3.6 to 3.8 m through hard / rockfill material. Fast advance from 5.8 to 6.4 m. |
| S-31+991 | S | 17-Apr-11 | 137.30 | 14.09 | 0.20 | 14.46 | 638378.487 | 7212174.760 | 137.56 | Communicated to T-31+938.5 at 10.4 m and S-31+985 and T-31+989.5 within jet grout column. | 4" Odex hammer used from 3.6 to 4.3 m through hard / rockfill material; fast advance in jet grout column from 13.1 to 13.5 m. |
| T-31+992.5 | T | 17-Apr-11 | 137.32 | 14.48 | 0.39 | 15.00 | 638377.66 | 7212175.93 | 137.61 | Communicated to S-31+991 at 11.4 m / bedrock interface. | 4" Odex hammer used from 4.1 to 4.25 m through hard / rockfill material. |
| P-31+994 | P | 18-Apr-11 | 137.27 | 14.31 | 0.40 | 14.94 | 638376.80 | 7212177.26 | 137.60 | | Fast advance in jet grout column from 7.0 to 7.8 m. |
| T-31+995.5 | T | 18-Apr-11 | 137.32 | 14.36 | 0.40 | 14.85 | 638375.88 | 7212178.56 | 137.49 | | Fast advance in jet grout column from 12.6 to 13.5 m. |
| S-31+997 | S | 18-Apr-11 | 137.31 | 14.66 | 0.14 | 15.07 | 638375.026 | 7212179.665 | 137.66 | Communicated to T-31+998.5 from 13.0 m to bedrock and to P-32+000 from 13.5 m to bedrock. | |
| Q-31+997.75 | Q | 23-Jun-11 | 137.38 | 14.91 | 0.40 | 15.67 | 638374.61 | 7212180.25 | 137.76 | | |
| T-31+998.5 | T | 18-Apr-11 | 137.32 | 15.27 | -0.05 | 15.37 | 638374.169 | 7212180.996 | 137.61 | Casing not embedded into rock; Communicated to 31+994, 32+000 and 32+001.5 at bedrock. | |
| Q-31+999.25 | Q | 23-Jun-11 | 137.36 | 15.26 | 0.26 | 15.75 | 638373.778 | 7212181.639 | 137.56 | V.hard / resistant material encountered, embedment stopped short. | Communicated to inside and outside of Q-31+997.75 during airlift for RH/FH test at bedrock interface; test not carried out. |
| P-32+000 | P | 18-Apr-11 | 137.23 | 15.62 | 0.44 | 16.21 | 638373.40 | 7212182.27 | 137.60 | Bit lost down hole 18-April-2011, drilled through 19-April-2011. | |
| T-32+001.5 | T | 17-Apr-11 | 137.19 | 15.61 | 0.29 | 16.04 | 638372.555 | 7212183.466 | 137.55 | Very hard rock encountered, unable to embed to 0.5 m. | 4" Odex hammer used from 3.6 to 4.1 m through hard / rockfill material. Fast advance in jet grout column from 12.2 to 15.59 m. |
| S-32+003 | S | 17-Apr-11 | 137.26 | 14.78 | 0.06 | 15.12 | 638371.70 | 7212184.68 | 137.59 | | 4" Odex hammer used from 3.6 to 4.1 m through hard / rockfill material. |
| T-32+004.5 | T | 19-Apr-11 | 137.29 | 14.97 | 0.54 | 15.65 | 638370.87 | 7212185.86 | 137.50 | Communicated to P-32+006, S-32+003 and T-32+004.5. | |
| P-32+006 | P | 17-Apr-11 | 137.26 | 15.46 | 0.45 | 16.05 | 638369.951 | 7212187.170 | 137.46 | | 4" Odex hammer used from 3.6 to 4.0 m through hard / rockfill material. |
| Q-32+006.75 | Q | 25-Jun-11 | 137.36 | 15.87 | 0.47 | 16.59 | 638369.59 | 7212187.76 | 137.59 | | |
| T-32+007.5 | T | 19-Apr-11 | 137.29 | 15.17 | -0.25 | 15.11 | 638369.190 | 7212188.377 | 137.57 | Communicated to S-32+009 at 10.9 and 12 m, to P-32+006 from 12 m to bedrock. Casing lifted prior to cut, was not embedded in rock. | |
| Q-32+008.25 | Q | 26-Jun-11 | 137.30 | 15.01 | 0.41 | 15.65 | 638368.77 | 7212188.92 | 137.56 | | |
| S-32+009 | S | 16-Apr-11 | 137.31 | 14.15 | 0.42 | 14.66 | 638368.34 | 7212189.67 | 137.57 | | |
| T-32+010.5 | T | 16-Apr-11 | 137.21 | 13.65 | 0.51 | 14.35 | 638367.51 | 7212190.91 | 137.54 | | |
| P-32+012 | P | 19-Apr-11 | 137.23 | 16.65 | 0.50 | 17.26 | 638366.62 | 7212192.12 | 137.48 | Communicated to P-32+006, T-32+007.5, S-32+009 and T-32+013.5 at 15 m. | Fast advance in jet grout column from 11.0 to 16.0 m. |
| T-32+013.5 | T | 19-Apr-11 | 137.26 | 17.31 | 0.00 | 17.48 | 638365.749 | 7212193.387 | 137.56 | Communicated to S-32+015 and T-32+016.5 from 13.5 m to bedrock. Very hard rock encountered, could not embed casing. | Fast advance from 8.0 to 8.8 m and again from 9.6 to 13.8 m; hard grout cuttings near bottom of hole. |
| S-32+015 | S | 20-Apr-11 | 137.28 | 17.53 | 0.02 | 17.63 | 638364.89 | 7212194.62 | 137.48 | | Brown return from 15.2 to 16.2 m (possible till). |

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# TABLE E1-3.1
# SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-32+016.5 | T | 20-Apr-11 | 137.30 | 17.47 | 0.23 | 17.81 | 638364.06 | 7212195.91 | 137.47 | Communicated to T-32+013.5 from 13.0 to 18.5 m. | Brown return from 15.24 to 17.47 m (possible till). |
| P-32+018 | P | 20-Apr-11 | 137.28 | 16.69 | 0.42 | 17.34 | 638363.24 | 7212197.10 | 137.59 | | Brown return from 15.85 to 16.46 m (possible till). |
| T-32+019.5 | T | 20-Apr-11 | 137.27 | 17.23 | 0.10 | 17.51 | 638362.343 | 7212198.418 | 137.52 | Communicated to S-32+021 at 15 m. Very hard material encountered, could not embed casing to 0.5 m. | Brown return from 15.4 to 15.8 m (possible till). |
| S-32+021 | S | 20-Apr-11 | 137.25 | 17.16 | 0.29 | 17.64 | 638361.530 | 7212199.564 | 137.51 | Communicated to P-32+030 at 14.5 m, to T-32+019.5 at 14.5 m down to bedrock, and to P-32+018 at bedrock interface. Bit dropped in the hole. | |
| T-32+022.5 | T | 20-Apr-11 | 137.18 | 17.86 | 0.44 | 18.56 | 638360.68 | 7212200.82 | 137.54 | | Brown return from 16.15 to 17.68 m (possible till). |
| P-32+024 | P | 20-Apr-11 | 137.21 | 18.15 | 0.40 | 18.58 | 638359.941 | 7212202.021 | 137.38 | Communicated to T-32+022.5, S-32+021 (no casing), T-32+025.5 and S-32+027. Slow advance from 14.9 m to bedrock with dry brown cuttings to surface. | Brown return from 12.19 to 13.72 m (possible till). |
| T-32+025.5 | T | 19-Apr-11 | 137.18 | 17.62 | 0.61 | 18.27 | 638359.01 | 7212203.32 | 137.54 | | Fast advance in CSB from 7.4 to 8.4 m; very hard grout layer at 11.6 m. |
| S-32+027 | S | 19-Apr-11 | 137.11 | 17.84 | 0.45 | 18.49 | 638358.20 | 7212204.52 | 137.42 | Communicated to T-32+025.5 at 15 m. | Sandy, brown return from 13.0 to 17.4 m (possible till). |
| T-32+28.5 | T | 19-Apr-11 | 137.17 | 17.47 | 0.55 | 18.24 | 638357.35 | 7212205.80 | 137.50 | Communicated to S-32+027 and P-32+030 from 15 m to bedrock. | |
| P-32+030 | P | 19-Apr-11 | 137.14 | 18.61 | 0.40 | 19.18 | 638356.47 | 7212206.96 | 137.44 | Communicated to S-32+033 and S-32+027. | |
| T-32+031.5 | T | 19-Apr-11 | 137.11 | 20.55 | 0.39 | 21.09 | 638355.60 | 7212208.24 | 137.46 | Communicated to S-32+033 and S-32+035. | Sandy, brown return with lots of hard grety cuttings from 12.8 to 18.4 m (possible till). |
| S-32+033 | S | 18-Apr-11 | 137.07 | 19.56 | 0.21 | 19.80 | 638354.77 | 7212209.45 | 137.46 | Very hard rock encountered, unable to embed to 0.5 m. | Sandy, brown return from 16.0 to 17.2 m (possible till). |
| T-32+034.5 | T | 18-Apr-11 | 137.12 | 20.32 | 0.38 | 20.93 | 638353.90 | 7212210.75 | 137.47 | Very hard rock encountered, unable to embed to 0.5 m. | |
| P-32+036 | P | 18-Apr-11 | 137.15 | 19.67 | 0.42 | 20.27 | 638353.15 | 7212211.88 | 137.43 | | |
| T-32+037.5 | T | 21-Apr-11 | 137.16 | 19.70 | 0.58 | 20.41 | 638352.24 | 7212213.06 | 137.41 | Communicated to S-32+039 at 15 m along casing / plastic pipe. | Soft layers 0.15 - 2.0 m thick from 8.53 to 10.67 in CSB as well as above bedrock at 18 m. |
| S-32+039 | S | 21-Apr-11 | 137.16 | 21.08 | 0.45 | 21.66 | 638351.37 | 7212214.42 | 137.44 | Communicated to T-32+040.5 at 20 m. | Falling head tests carried out within CSB and Jet Grout Columns. |
| T-32+040.5 | T | 21-Apr-11 | 137.16 | 21.12 | 0.48 | 21.98 | 638350.248 | 7212215.208 | 137.45 | Communicated to S-32+039 at bedrock interface, water at 21.67 m. | Very soft zone with fast advance from 11.27 to 11.89 m; dobbles and soft layers from 13.7 m to end of hole. |
| P-32+042 | P | 22-Apr-11 | 137.20 | 19.13 | 0.35 | 19.56 | 638348.973 | 7212215.718 | 137.45 | Communicated to S-32+039.0 above bedrock, and S-32+039.0 and T-32+040.5 within bedrock. | Very soft between 16.15 and 18.13 m, drilled very slowly to not clog bit. |
| T-32+043.5 | T | 22-Apr-11 | 137.19 | 19.11 | 0.40 | 19.62 | 638347.538 | 7212216.235 | 137.42 | Communicated to P-32+042.0 at 18.0 m, T-32+040.5 inside casing from 18.0 m to rock, and S-32+039.0 and S-32+045 inside casing at rock. | Cobble / Boulder at 18.77 m; stopped drilling. |
| S-32+045 | S | 22-Apr-11 | 137.16 | 19.71 | 0.42 | 20.35 | 638346.124 | 7212216.745 | 137.49 | Communicated to P-32+042.0 at 18.0 m, T-32+040.5 inside casing at bedrock, and S-32+039.0 and S-32+033 along casing at bedrock. | Cobble / Boulder at 18.46 m; stopped drilling. |
| T-32+046.5 | T | 23-Apr-11 | 137.12 | 19.66 | 0.47 | 20.38 | 638344.69 | 7212217.33 | 137.52 | Communicated to S-32+045 and S-32+039 from 15 to 19 m along plastic casing. | Bit blocking in jet grout at 16.4 m; Odex used through jet grout w/ slow advance. |
| Q-32+047.25 | Q | 2-Jun-11 | -- | 19.45 | 0.41 | 20.04 | 638344.01 | 7212217.56 | 137.42 | | Slow steady advance. Stopped drilling within jet grout grout wall. |
| P-32+048 | P | 23-Apr-11 | 137.11 | 19.19 | -- | 19.39 | 638343.37 | 7212217.75 | 137.58 | Cased within jet grout column and not rock due to inability to advance through hard material. | Refusal with tricone in jet grout column. |
| T-32+049.5 | T | 24-Apr-11 | 137.08 | 21.41 | 0.45 | 22.01 | 638341.78 | 7212218.30 | 137.38 | Communicated to S-32+048.0 along and inside casing from 8.5 to 15.0 m. | Hard / slow advance in jet grout / till from 18.8 to 19.3 m |
| S-32+051 | S | 25-Apr-11 | 137.05 | 21.24 | 0.48 | 22.00 | 638340.42 | 7212218.81 | 137.41 | SB soft until 5 m but driller continued with odex to 7.57 m. | Brown return (possible till) from 17 to 20 m. |
| T-32+052.5 | T | 26-Apr-11 | 137.00 | 21.74 | 0.40 | 22.32 | 638338.938 | 7212219.261 | 137.39 | Odex installed beyond anticpated depth to SB/CSB interfacet o 6.69 mbgs. Communicated to S-32+051 from 11.61 to 15.07 m. | Very soft material from 6.69 to 10 m (SB or CSB); brown return (possible till) from 18.59 to 18.9 m. |
| Q-32+053.25 | Q | 2-Jun-11 | -- | 22.54 | -- | 22.82 | 638338.064 | 7212219.580 | 137.41 | Communicated to T-32+067.5 during installation of casing through SB to CSB, most likely along base of frozen cap materials. | Communicated to T-32+067.5, most likely along base of frozen cap materials between 6.0 and 13.71 m bgs. |
| P-32+054 | P | 26-Apr-11 | 136.92 | 22.40 | 0.52 | 22.92 | 638337.589 | 7212219.752 | 137.18 | Communicated to P-32+051 at 18 m and from 22.2 to 22.8 m. | Brown return (possible till) from 13.72 to 17.99 m. Communicated to S-32+051 at 18 m (in casing). |
| T-32+055.2 | T | 26-May-11 | 136.85 | 22.25 | -- | 22.42 | 638336.47 | 7212220.23 | 137.24 | | Extremely slow advance. Stopped drilling with tricone within jet grout wall. |
| T-32+055.5 | T | 26-Apr-11 | 136.85 | -- | -- | -- | 638336.13 | 7212220.27 | 137.27 | Driller claimed steel in the hole and drill bit damaged; stopped with odex casing at 17.6 m. | |
| S-32+057 | S | 27-Apr-11 | 136.82 | 17.46 | 0.32 | 17.86 | 638334.732 | 7212220.734 | 137.25 | | Casing advanced to 18.59 m to pass cobble, then switched back to tricone to depth of 21.79 m. |
| T-32+058.5 | T | 28-Apr-11 | 136.79 | 21.33 | -- | 21.51 | 638333.37 | 7212221.28 | 137.25 | Casing not embedded - stopped in hard / jet grout. | Brown return (possible till) noted from 16.77 to 17.07 m. |
| P-32+060 | P | 2-May-11 | 136.86 | 18.40 | -- | 18.59 | 638331.74 | 7212221.86 | 137.35 | Casing not embedded - stopped in hard / jet grout. | Stopped drilling with tricone in jet grout wall. Multiple layers of cobbles. |
| T-32+061.5 | T | 1-May-11 | 136.93 | 21.26 | -- | 21.38 | 638330.368 | 7212222.506 | 137.21 | Communciated to the outside of casing T-32+073.5 from 5 to 9.5 m. Added 1.83 m and decreased stick-up by 9 cm on 25-May-11. | Refusal on cobble / hard for second time. Stopped drilling with tricone in jet grout wall. |
| S-32+063 | S | 2-May-11 | 137.01 | 22.71 | -- | 22.87 | 638329.156 | 7212222.703 | 137.37 | Communicated to T-32+064.5 from 0.00 to end of hole. Casing not embedded - stopped in hard / jet grout. Added 2.27 m and decreased stick-up by 1 cm on 25-May-11. | Brown return (possible till) encountered from 14.63 to 17.22 m. Stopped drilling with tricone in jet grout wall. |
| T-32+064.5 | T | 2-May-11 | 136.96 | 23.61 | -- | 23.76 | 638327.662 | 7212223.335 | 137.47 | Casing not embedded - difficult to distinguish between hard grout and rock. Added 5.17 m and decreased stick-up by 28 cm on 25-May-11. | Brown return (possible till) noted from 14.32 to 17.53 m. Stopped drilling with tricone in jet grout wall. |
| P-32+065.7 | P | 26-May-11 | 137.00 | 22.48 | -- | 22.65 | 638326.624 | 7212223.684 | 137.23 | Communicated to the outside of casing T-32+075 between 10.4 and 10.7 m. | Stopped drilling with tricone within jet grout wall. Deepened casing with odex from 15.54 m to end of hole. |

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# TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

AEM

| HOLE ID<br>Chainage | Sequence (P, S, T, Q) | Installation Date<br>(dd-mmm-yy) | Grout Platform Elevation<br>(masl) | Depth to Rock / Hard<br>(mbgs) | Final Embedment Length<br>(m) | Final Length of Casing (w/ stickup)<br>(m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl)<br>(masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P-32+066 | P | 28-Apr-11 | 137.00 | 22.66 | -- | 22.86 | 638326.20 | 7212223.82 | 137.25 | Casing not embedded - difficult to distinguish between hard grout and rock. | Stopped drilling with tricone within jet grout wall. |
| T-32+067.5 | T | 30-Apr-11 | 137.00 | 22.28 | -- | 22.43 | 638324.871 | 7212224.434 | 137.31 | Casing not embedded - stopped in hard / jet grout. Dropped bit in hole. Added 0.29 m and decreased stick-up by 23 cm on 25-May-11. | Stopped drilling with tricone in jet grout wall. |
| S-32+069 | S | 3-May-11 | 136.95 | 18.14 | -- | 18.29 | 638323.387 | 7212224.863 | 137.22 | Casing not embedded - stopped in hard / jet grout. | Brown return (possible till) noted from 14.02 to 15.24 m. Stopped drilling with tricone in jet grout wall. |
| T-32+070.5 | T | 29-Apr-11 | 136.96 | 23.26 | 0.40 | 23.96 | 638321.93 | 7212225.40 | 137.38 | Casing embedded in hard material, but unclear if rock or grout. | Stopped drilling with tricone within jet grout wall / rock - difficulty in distinguishing. |
| P-32+072 | P | 29-Apr-11 | 136.96 | 16.38 | -- | 16.58 | 638320.625 | 7212225.853 | 137.15 | Casing advanced to hard material above anticipated depth to bedrock and stopped after two attempts at triconing / casing through hard zones. | Stopped drilling with tricone within jet grout wall. |
| T-32+073.5 | T | 6-May-11 | 136.95 | 21.75 | -- | 22.00 | 638319.12 | 7212226.48 | 137.32 | | |
| S-32+075 | S | 4-May-11 | 136.91 | 18.38 | -- | 18.52 | 638317.75 | 7212226.98 | 137.16 | Casing not embedded - stopped in hard / jet grout. | Stopped drilling with tricone within jet grout wall. |
| T-32+076.5 | T | 7-May-11 | 136.99 | 22.21 | 0.48 | 22.89 | 638316.36 | 7212227.49 | 137.28 | | Refusal on hard material - soft chips with fine gravel. |
| P-32+078 | P | 30-Apr-11 | 137.07 | 18.07 | -- | 18.12 | 638314.924 | 7212227.921 | 137.27 | | Possible till (brown return) from 13.41 to 13.72 m. Stopped drilling with tricone within jet grout wall. |
| T-32+079.5 | T | 3-May-11 | 137.03 | 17.59 | -- | 17.85 | 638313.49 | 7212228.53 | 137.30 | Communicated to S-32+081 from 0.0 to 14 m depth. No communication between 14 m and end of hole. | |
| S-32+081 | S | 3-May-11 | 137.11 | 16.42 | -- | 16.52 | 638312.12 | 7212228.94 | 137.34 | Communicated to T-32+079.5 outside steel casing between 11.5 and 16.2 m bgs. | Stopped drilling with tricone within jet grout wall. |
| T-32+082.5 | T | 3-May-11 | 137.10 | 16.16 | -- | 16.30 | 638310.72 | 7212229.44 | 137.30 | Communicated to T-32+079.5 outside steel casing between 11.2 and 16.1 m bgs. | Stopped drilling with tricone within jet grout wall. |
| P-32+084 | P | 1-May-11 | 137.12 | 15.78 | -- | 15.91 | 638309.28 | 7212230.03 | 137.32 | Stopped within jet grout wall / hard material at 15.78 m. Not embedded in rock. Multiple instances of communication noted to this hole during casing installation of P-32+078 the previous day. | Stopped drilling with tricone within jet grout wall. |
| T-32+085.5 | T | 9-May-11 | 137.18 | 17.36 | -- | 17.49 | 638307.93 | 7212230.45 | 137.36 | SB-only: Communicated to T-32+076.5 from 4.7 to 8.16 m and with S-32+087 from 8.2 to 11.2 m; Final casing stopped in hard material / not embedded in rock. Added 2.65 m and left stick-up at 0.13 m (6 cm higher) on 29-May-11. | Refusal on hard material, above anticipated depth to rock. |
| S-32+087 | S | 9-May-11 | 137.11 | 15.78 | 0.45 | 16.43 | 638306.436 | 7212230.972 | 137.39 | SB-only: Communicated to T-32+076.5 from 4.7 to 10.2 m. Rest: Communicated to T-32+073.5 and T-32+076.5 from 11.6 m. | Refusal on rock. |
| T-32+088.5 | T | 9-May-11 | 137.22 | 15.61 | 0.40 | 16.05 | 638305.055 | 7212231.453 | 137.31 | SB-only: Communicated to T-32+076.5 from 4.7 to 11.23 m; Rest: communicated to T-32+076.5 (air) and to T-32+090. | Refusal on rock. |
| P-32+090 | P | 4-May-11 | 137.20 | 15.75 | 0.42 | 16.37 | 638303.59 | 7212231.95 | 137.43 | Communicated to S-32+069 between 10.16 and end of hole. | Brown return (possible till) noted from 13.11 to 13.41 m. |
| T-32+091.5 | T | 4-May-11 | 137.20 | 15.84 | -- | 15.94 | 638302.311 | 7212232.521 | 137.45 | Casing not embedded - stopped in hard / jet grout. Added 0.86 m and decreased stick-up by 6 cm on 29-May-11. | Stopped drilling with tricone within jet grout wall. |
| S-32+093 | S | 4-May-11 | 137.20 | 15.59 | -- | 15.69 | 638300.915 | 7212232.964 | 137.48 | Casing not embedded - stopped in hard / jet grout. Added 0.63 m and decreased stick-up by 4 cm on 29-May-11. | Stopped drilling with tricone within jet grout wall. |
| T-32+094.5 | T | 9-May-11 | 137.34 | 15.91 | -- | 16.01 | 638299.46 | 7212233.50 | 137.52 | Added 2.37 m. Stick-up remained the same, 10cm. Carried out on 29-May-11. | Refuasl on hard material, not necessarily on rock. |
| P-32+096 | P | 9-May-11 | 137.31 | 14.56 | 0.55 | 15.31 | 638298.00 | 7212234.05 | 137.52 | Communicated to T-32+073.5, T-32+076.5, and T-32+094.5 from 11.6 to 15.1 m. | Refusal on rock. |
| T-32+097.5 | T | 9-May-11 | 137.32 | 15.81 | 0.49 | 16.44 | 638296.506 | 7212234.400 | 137.50 | Communicated air to T-32+073.5 and T-32+076.5 from 11.6 to 16.2 m and brown muddy return to P-32+096.0 from 11.6 to 16.2 m. | Refusal on hard material, not necessarily on rock. |
| S-32+099 | S | 9-May-11 | 137.32 | 15.90 | 0.59 | 16.69 | 638295.18 | 7212234.97 | 137.59 | Communicated to T-32+073.5 and T-32+076.5 from 11.6 to 16.5 m. | Refusal on rock. |
| T-32+100.5 | T | 7-May-11 | 137.39 | 14.13 | 0.76 | 15.07 | 638293.67 | 7212235.58 | 137.57 | Communicated to outside of T-32+076.5 entire length of casing. | Refusal on hard material - rock. |
| P-32+101.7 | P | 28-May-11 | 136.95 | 17.63 | 0.45 | 18.18 | 638292.64 | 7212235.92 | 137.51 | | Refusal on rock. |
| P-32+102 | P | 18-Oct-10 | 136.95 | 13.10 | 1.86 | 14.15 | 638292.390 | 7212236.06 | 137.33 | Casing deepened on Oct 18th; was not installed to rock on Oct 17th. | |
| T-32+103.5 | T | 8-May-11 | 137.30 | 14.88 | -- | 15.09 | 638291.062 | 7212236.655 | 137.41 | Communicated to T-32+076.5 from 8.15 to 20.4 m. Pulled 4.66 m off because casing was installed too deep. Left 0.21 m of stick-up (9 cm higher). | Refusal on very hard material; soft chips with fine gravel. |
| S-32+105 | S | 10-May-11 | 137.19 | 14.55 | -- | 14.80 | 638289.508 | 7212237.070 | 137.37 | Pulled and cut off 7.07 m because casing was installed too deep. Left 0.25 m of stick-up (6 cm higher). | |
| T-32+106.5 | T | 3-Jul-11 | -- | 12.67 | 0.66 | 13.46 | 638288.156 | 7212237.580 | 137.10 | Completed into resistant material; notable quicker advance during second rod (frozen SB to SB transition). | |
| P-32+108 | P | 20-Oct-10 | 136.91 | 10.79 | 0.67 | 11.61 | 638286.77 | 7212238.08 | 137.07 | Collar elevation not provided. Average between adjacent primary grout holes used. | |
| T-32+109.5 | T | 3-Jul-11 | -- | 9.41 | 0.98 | 10.57 | 638285.308 | 7212238.633 | 136.96 | Completed into resistant material; notable quicker advance during second rod (frozen SB to SB transition). | |
| S-32+111 | S | 18-May-11 | 136.92 | 8.02 | 0.75 | 8.97 | 638284.05 | 7212239.09 | 137.06 | Possible Till at 5.79 m. | |
| T-32+112.5 | T | 3-Jul-11 | -- | 8.53 | 0.87 | 9.40 | 638282.529 | 7212239.603 | 136.75 | Completed into resistant material; notable quicker advance during second rod (frozen SB to SB transition) | |
| P-32+114 | P | 18-Oct-10 | 136.86 | 9.04 | 0.52 | 9.86 | 638281.09 | 7212240.08 | 137.10 | Casing deepened on Oct 18th; was not installed to rock on Oct 17th. | |
| T-32+115.5 | T | 2-Jul-11 | -- | 8.19 | 0.68 | 9.09 | 638279.773 | 7212240.656 | 137.02 | Completed into resistant material; notable quicker advance during second rod (frozen SB to SB transition). | |

## TABLE E1-3.1
## SUMMARY OF BAY GOOSE DIKE CASING INSTALLATION QA AND QUANTITIES

| HOLE ID / Chainage | Sequence (P, S, T, Q) | Installation Date (dd-mmm-yy) | Grout Platform Elevation (masl) | Depth to Rock / Hard (mbgs) | Final Embedment Length (m) | Final Length of Casing (w/ stickup) (m) | Surveyed Easting | Surveyed Northing | Surveyed Top of Casing (masl) | COMMENTS | TRICONING COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S-32+117 | S | 19-May-11 | 136.97 | 7.33 | 0.46 | 7.97 | 638278.27 | 7212241.22 | 137.13 | | |
| T-32+118.5 | T | 2-Jul-11 | -- | 7.19 | 0.57 | 8.03 | 638276.926 | 7212241.742 | 137.09 | Completed into resistant material; notable quicker advance during second rod (frozen SB to SB transition). | |
| P-32+120 | P | 19-May-11 | 137.03 | 7.05 | 0.51 | 7.74 | 638275.48 | 7212242.21 | 137.16 | | |
| S-32+123 | S | 19-May-11 | 137.00 | 6.22 | 0.46 | 6.84 | 638272.67 | 7212243.21 | 137.12 | | |
| P-32+126 | P | 19-Oct-11 | 137.08 | 6.92 | 0.64 | 7.86 | 638269.69 | 7212244.22 | 137.32 | Till at 5.47 m. | |
| S-32+129 | S | 19-Oct-11 | 136.92 | 6.30 | 0.62 | 7.12 | 638266.76 | 7212245.31 | 137.13 | Till at 5.70 m. | |
| P-32+132 | P | 19-Oct-11 | 136.91 | 6.14 | 0.61 | 7.04 | 638264.13 | 7212246.05 | 137.23 | Till at 5.47 m. | |
| S-32+135 | S | 19-Oct-11 | 136.84 | 6.23 | 0.57 | 7.06 | 638261.30 | 7212247.05 | 137.12 | Till at 5.13 m. | |
| P-32+138 | P | 19-Oct-11 | 136.86 | 5.93 | 0.64 | 6.85 | 638258.44 | 7212248.13 | 137.19 | Till at 4.06 m. | |
| S-32+141 | S | 20-Oct-10 | 137.04 | 6.12 | 0.62 | 7.03 | 638255.62 | 7212249.40 | 137.32 | Till at 4.16 m. | |
| P-32+144 | P | 20-Oct-10 | 137.02 | 5.72 | 0.48 | 6.49 | 638252.84 | 7212250.38 | 137.34 | Till at 3.70 m. | |
| S-32+147 | S | 20-Oct-10 | 137.06 | 5.68 | 0.60 | 6.56 | 638250.03 | 7212251.39 | 137.35 | Till at 3.50 m. | |
| P-32+150 | P | 20-Oct-10 | 137.14 | 5.47 | 0.67 | 6.40 | 638247.08 | 7212252.51 | 137.35 | Till at 2.70 m. | |
| S-32+153 | S | 20-Oct-10 | 137.07 | 4.99 | 0.64 | 5.89 | 638244.55 | 7212253.33 | 137.42 | Till depth not recorded. | |

## Bedrock/Contact Grouting

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+050 | P | 28-Apr-10 | 3 | 4.1 | 5.1 | 1.00 | A | 22.3 | 22.3 | 22.3 | 9:30 | 9:48 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 2 | 5.1 | 9.1 | 4.00 | A | 38.4 | 38.4 | 9.6 | 9:13 | 9:30 | 2.3 | 0.0 | 0.00 | 33.0 | 3.0 | 1.6 | 6.0 | 12.0 | 15.0 | |
| T-30+051.5 | T | 10-May-10 | 3 | 3.76 | 4.76 | 1.00 | A | 0.7 | 0.7 | 0.7 | 16:27 | 17:00 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | 12.1 | |
| | | 10-May-10 | 2 | 4.76 | 8.9 | 4.14 | A | 31.4 | 31.4 | 7.6 | 16:03 | 16:23 | 2.3 | 0.2 | 0.02 | 33.8 | 4.0 | 1.7 | 26.0 | 19.0 | 23.8 | |
| S-30+053 | S | 01-May-10 | 3 | 3.84 | 4.84 | 1.00 | A | 22.1 | 22.1 | 22.1 | 15:52 | 16:06 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-10 | 2 | 4.84 | 9.1 | 4.26 | A | 30.0 | 30.0 | 7.0 | 15:29 | 15:44 | 2.3 | 0.1 | 0.01 | 31.1 | 5.0 | 1.6 | 21.0 | 7.4 | 18.1 | |
| T-30+054.5 | T | 10-May-10 | 3 | 3.89 | 4.89 | 1.00 | A* | 13.1 | 13.1 | 13.1 | 17:37 | 17:50 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | 12.3 | |
| | | 10-May-10 | 2 | 4.89 | 8.9 | 4.01 | A | 26.3 | - | - | 17:06 | 17:15 | 1.1 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 10-May-10 | 2 | 4.89 | 8.9 | 4.01 | A* | 2.5 | 28.8 | 7.2 | 17:15 | 17:30 | 2.2 | 0.0 | 0.00 | 34.4 | 5.0 | 1.7 | 26.0 | 18.4 | 20.5 | |
| P-30+056 | P | 28-Apr-10 | 3 | 4.1 | 5.1 | 1.00 | A | 22.5 | 22.5 | 22.5 | 10:16 | 10:31 | 2.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 2 | 5.1 | 9.1 | 4.00 | A | 29.4 | 29.4 | 7.4 | 9:56 | 10:10 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+057.5 | T | 10-May-10 | 3 | 4.01 | 5.01 | 1.00 | A* | 14.5 | 14.5 | 14.5 | 18:21 | 18:36 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | 11.1 | |
| | | 10-May-10 | 2 | 5.01 | 9.3 | 4.29 | A* | 31.1 | 31.1 | 7.2 | 17:57 | 18:12 | 2.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| S-30+059 | S | 01-May-10 | 3 | 3.99 | 4.99 | 1.00 | A | 25.6 | 25.6 | 25.6 | 16:51 | 17:05 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-10 | 2 | 4.99 | 9.4 | 4.41 | A | 29.6 | 29.6 | 6.7 | 16:29 | 16:44 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+060.5 | T | 10-May-10 | 3 | 4.12 | 5.12 | 1.00 | A* | 27.2 | 27.2 | 27.2 | 19:26 | 19:35 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | 25.9 | |
| | | 10-May-10 | 2 | 5.12 | 9.6 | 4.48 | A* | 40.0 | 40.0 | 8.9 | 18:58 | 19:18 | 2.4 | 0.2 | 0.02 | - | - | - | - | - | 25.9 | |
| P-30+062 | P | 28-Apr-10 | 3 | 4.5 | 5.5 | 1.00 | A | 31.2 | 31.2 | 31.2 | 10:56 | 11:11 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 2 | 5.5 | 9.5 | 4.00 | A | 52.9 | 52.9 | 13.2 | 10:36 | 10:54 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+063.5 | T | 10-May-10 | 3 | 4.09 | 5.09 | 1.00 | A* | 22.5 | 22.5 | 22.5 | 19:59 | 20:12 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | 25.9 | |
| | | 10-May-10 | 2 | 5.09 | 9.1 | 4.01 | A* | 27.8 | 27.8 | 6.9 | 19:39 | 19:54 | 2.2 | 0.2 | 0.02 | - | - | - | - | - | 25.9 | |
| S-30+065 | S | 01-May-10 | 3 | 4.12 | 5.12 | 1.00 | A | 29.3 | 29.3 | 29.3 | 17:35 | 17:48 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 01-May-10 | 2 | 5.12 | 9.5 | 4.38 | A | 35.5 | 35.5 | 8.1 | 17:16 | 17:28 | 2.2 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-30+066.5 | T | 10-May-10 | 3 | 4.19 | 5.19 | 1.00 | A* | 9.2 | 9.2 | 9.2 | 22:42 | 22:47 | 0.4 | 5.8 | 2.20 | - | - | - | - | - | - | |
| | | 10-May-10 | 2 | 5.19 | 9.4 | 4.21 | A* | 165.0 | - | - | 22:17 | 22:34 | 2.3 | 17.3 | 1.70 | 30.0 | 5.0 | 1.7 | 23.0 | 10.1 | 20.6 | By-Pass: Outside Casing |
| | | 10-May-10 | 2 | 5.19 | 9.4 | 4.21 | B | 30.8 | 195.8 | 46.5 | 22:34 | 22:37 | 1.7 | 17.3 | 2.40 | - | - | - | - | - | - | By-Pass: Outside Casing |
| P-30+068 | P | 28-Apr-10 | 3 | 4.6 | 5.6 | 1.00 | A* | 22.4 | 22.4 | 22.4 | 14:22 | 14:35 | 2.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 2 | 5.6 | 9.6 | 4.00 | A* | 39.3 | 39.3 | 9.8 | 14:03 | 14:20 | 2.3 | 0.0 | 0.00 | 33.0 | - | 1.6 | 12.0 | 15.0 | 17.0 | |
| T-30+069.5 | T | 10-May-10 | 3 | 4.01 | 5.01 | 1.00 | A* | 20.7 | 20.7 | 20.7 | 23:10 | 23:23 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | 20.6 | |
| | | 10-May-10 | 2 | 5.01 | 9.3 | 4.29 | A* | 30.9 | 30.9 | 7.2 | 22:53 | 23:08 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | 21.0 | |
| S-30+071 | S | 02-May-10 | 3 | 5.23 | 6.23 | 1.00 | A | 24.0 | 24.0 | 24.0 | 9:56 | 10:09 | 2.5 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 6.23 | 10.9 | 4.67 | A | 26.1 | 26.1 | 5.6 | 9:28 | 9:42 | 2.3 | 0.0 | 0.00 | 30.0 | 4.0 | 1.6 | 28.0 | 5.0 | 21.7 | |
| T-30+072.5 | T | 10-May-10 | 3 | 4.19 | 5.19 | 1.00 | A* | 20.0 | 20.0 | 20.0 | 23:47 | 23:44 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | 21.9 | |
| | | 10-May-10 | 2 | 5.19 | 9.2 | 4.01 | A* | 29.3 | 29.3 | 7.3 | 23:28 | 23:44 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | 21.9 | |
| P-30+074 | P | 28-Apr-10 | 3 | 4.7 | 5.7 | 1.00 | A* | 19.1 | 19.1 | 19.1 | 14:56 | 15:10 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 2 | 5.7 | 9.7 | 4.00 | A* | 20.6 | 20.6 | 5.2 | 14:40 | 14:53 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+077 | S | 02-May-10 | 3 | 5.21 | 6.21 | 1.00 | A | 24.6 | 24.6 | 24.6 | 10:44 | 10:58 | 2.8 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 6.21 | 10.7 | 4.49 | A | 31.6 | 31.6 | 7.0 | 10:24 | 10:38 | 2.3 | 0.1 | 0.01 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+078.5 | T | 10-May-10 | 3 | 5.41 | 6.41 | 1.00 | A* | 16.1 | 16.1 | 16.1 | 0:23 | 0:38 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-10 | 2 | 6.41 | 10.8 | 4.39 | A* | 76.8 | 76.8 | 17.5 | 0:11 | 0:19 | 0.9 | 10.5 | 2.90 | - | - | - | - | - | 22.5 | By-Pass: Outside Casing |
| P-30+080 | P | 28-Apr-10 | 2 | 5.7 | 9.7 | 4.00 | A* | 155.2 | 155.2 | 38.8 | 15:16 | 15:38 | 0.2 | 12.0 | 15.00 | - | - | - | - | - | - | By-Pass: Outside Casing |
| T-30+081.5 | T | 10-May-10 | 3 | 5.74 | 6.74 | 1.00 | A* | - | - | - | - | - | - | - | - | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 10-May-10 | 2 | 6.74 | 10.7 | 3.96 | A* | 21.0 | 21.0 | 5.3 | 3:00 | 3:02 | 0.1 | 0.1 | 0.00 | 30.3 | 8.0 | 1.6 | 9.9 | 17.6 | 22.5 | By-Pass: Outside Casing |
| S-30+083 | S | 02-May-10 | 3 | 4.7 | 5.7 | 1.00 | A | 181.0 | - | - | 11:30 | 11:42 | - | - | - | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 4.7 | 5.7 | 1.00 | B | 88.0 | 269.0 | 269.0 | 11:42 | 11:57 | 0.0 | 18.0 | inf | 36.3 | - | 1.6 | 28.0 | 9.0 | 20.8 | By-Pass: Outside Casing |
| | | 02-May-10 | 2 | 5.7 | 9.7 | 4.00 | A | 24.4 | 24.4 | 6.1 | 11:13 | 11:25 | 2.2 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-30+084.5 | T | 10-May-10 | 3 | 4.7 | 5.7 | 1.00 | A* | 21.1 | 21.1 | 21.1 | 3:34 | 3:47 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | 19.9 | |
| | | 10-May-10 | 2 | 5.7 | 9.7 | 4.00 | A* | 30.8 | 30.8 | 7.7 | 3:17 | 3:30 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | 19.9 | |
| P-30+086 | P | 28-Apr-10 | 3 | 4.6 | 5.6 | 1.00 | A* | 22.2 | 22.2 | 22.2 | 16:31 | 16:43 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 2 | 5.6 | 9.6 | 4.00 | A* | 45.8 | 45.8 | 11.5 | 16:09 | 16:28 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+087.5 | T | 10-May-10 | 3 | 4.85 | 5.85 | 1.00 | A* | 25.8 | 25.8 | 25.8 | 4:18 | 4:31 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | 22.0 | |
| | | 10-May-10 | 2 | 5.85 | 9.9 | 4.05 | A* | 28.5 | 28.5 | 7.0 | 3:55 | 4:10 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | 22.0 | |
| S-30+089 | S | 02-May-10 | 3 | 4.7 | 5.7 | 1.00 | A | 23.1 | 23.1 | 23.1 | 17:33 | 11:02 | 2.7 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 5.7 | 9.9 | 4.20 | A | 32.1 | 32.1 | 7.6 | 17:14 | 17:29 | 2.3 | 0.2 | 0.02 | 31.7 | - | 1.7 | 23.0 | 8.7 | 21.7 | |
| P-30+092 | P | 21-Apr-10 | 3 | 5.7 | 6.7 | 1.00 | A* | 16.7 | 16.7 | 16.7 | 16:15 | 16:30 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Apr-10 | 2 | 6.7 | 10.7 | 4.00 | A* | 53.1 | 53.1 | 13.3 | 15:47 | 16:07 | 2.4 | 0.0 | 0.00 | 34.6 | 2.0 | 1.6 | 15.0 | 4.0 | 16.0 | |
| T-30+093.5 | T | 11-May-10 | 3 | 5.58 | 6.58 | 1.00 | A* | 14.4 | 14.4 | 14.4 | 9:46 | 10:01 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | 11.9 | |
| | | 11-May-10 | 2 | 6.58 | 10.4 | 3.82 | A* | 30.7 | 30.7 | 8.0 | 9:24 | 9:40 | 2.0 | 0.0 | 0.00 | 30.3 | 5.0 | 1.6 | 13.7 | 11.8 | 23.9 | |
| S-30+095 | S | 24-Apr-10 | 3 | 6.2 | 7.2 | 1.00 | A | 11.0 | 11.0 | 11.0 | 4:58 | 5:05 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 7.2 | 11.2 | 4.00 | A | 51.8 | 51.8 | 13.0 | 4:36 | 4:51 | 2.3 | 0.0 | 0.00 | 31.0 | - | 1.6 | 2.0 | 12.9 | 14.0 | |
| T-30+096.5 | T | 11-May-10 | 3 | 6.44 | 7.44 | 1.00 | A* | 13.5 | - | - | 10:31 | 10:39 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | 13.3 | |
| | | 11-May-10 | 3 | 6.44 | 7.44 | 1.00 | A | 0.1 | 13.6 | 13.6 | 10:39 | 10:42 | 2.2 | 0.0 | 0.00 | 32.8 | 4.0 | 1.7 | 12.4 | 10.2 | 16.3 | |
| | | 11-May-10 | 2 | 7.44 | 11.5 | 4.06 | A* | 32.3 | 32.3 | 8.0 | 10:10 | 10:26 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | 11.2 | |
| P-30+098 | P | 09-May-10 | 3A | 6.58 | 7 | 0.42 | A | 22.2 | 22.2 | 52.9 | 4:05 | 4:21 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Apr-10 | 3 | 7 | 8 | 1.00 | A* | 16.2 | 16.2 | 16.2 | 17:07 | 17:19 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Apr-10 | 2 | 8 | 12 | 4.00 | A* | 51.5 | 51.5 | 12.9 | 16:38 | 17:03 | 2.1 | 0.3 | 0.03 | - | - | - | - | - | - | |
| T-30+099.5 | T | 29-Jun-10 | 4 | 5.16 | 6.66 | 1.50 | MF | 49.7 | 49.7 | 33.1 | 13:52 | 14:18 | 2.2 | 0.0 | 0.00 | 30.3 | 2.0 | 1.4 | 10.4 | 12.5 | 13.6 | |
| | | 11-May-10 | 3 | 7.16 | 8.16 | 1.00 | A | 15.4 | 15.4 | 15.4 | 11:17 | 11:31 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | 10.1 | |
| | | 11-May-10 | 2 | 8.16 | 12.4 | 4.24 | A | 28.7 | 28.7 | 6.8 | 10:51 | 11:05 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | 13.2 | |
| S-30+101 | P | 22-Jun-10 | 4 | 4.62 | 6.12 | 1.50 | A | 31.0 | 31.0 | 20.7 | 3:25 | 3:40 | 2.5 | 0.2 | 0.04 | 32.6 | - | 1.6 | 7.0 | 8.0 | 14.0 | |
| | | 24-Apr-10 | 3 | 6.8 | 7.8 | 1.00 | A | 57.9 | 57.9 | 57.9 | 5:41 | 6:08 | 3.1 | 0.6 | 0.19 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 7.8 | 11.8 | 4.00 | A | 102.4 | 102.4 | 25.6 | 5:15 | 5:34 | 2.7 | 0.7 | 0.06 | - | - | - | - | - | - | |
| T-30+102.5 | T | 29-Jun-10 | 4 | 5.04 | 6.54 | 1.50 | MF | 36.9 | 36.9 | 24.6 | 14:21 | 14:42 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 03-May-10 | 3 | 7.04 | 8.04 | 1.00 | A* | 52.9 | 52.9 | 52.9 | 15:55 | 16:09 | 2.7 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 03-May-10 | 2 | 8.04 | 11.8 | 3.76 | A* | 42.3 | 42.3 | 11.3 | 15:52 | 15:53 | - | - | - | - | - | - | - | - | - | Backfill |
| P-30+104 | P | 22-Jun-10 | 4 | 4.5 | 6.2 | 1.70 | A | 28.6 | 28.6 | 16.8 | 3:42 | 3:54 | 2.7 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 09-May-10 | 3A | 6.82 | 7.2 | 0.38 | A | 20.3 | 20.3 | 53.4 | 3:44 | 3:58 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Apr-10 | 3 | 7.2 | 8.2 | 1.00 | A* | 222.5 | 222.5 | 222.5 | 18:05 | 19:30 | 3.0 | 0.0 | 0.00 | 35.7 | 5.0 | 1.6 | 11.3 | 11.2 | 16.9 | |
| | | 21-Apr-10 | 2 | 8.2 | 12.2 | 4.00 | A | 89.0 | 89.0 | 22.3 | 17:35 | 18:00 | 2.5 | 0.6 | 0.06 | - | - | - | - | - | - | |
| T-30+105.5 | T | 29-Jun-10 | 4 | 5.14 | 6.66 | 1.52 | MF | 38.5 | 38.5 | 25.3 | 14:48 | 15:14 | 2.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 03-May-10 | 3 | 7.16 | 8.16 | 1.00 | A* | 11.4 | 11.4 | 11.4 | 15:26 | 15:43 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-10 | 2 | 8.16 | 12 | 3.84 | A* | 62.7 | 62.7 | 16.3 | 15:01 | 15:14 | 0.0 | 6.0 | inf | - | - | - | - | - | - | By-Pass: Outside Casing |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+107 | P | 22-Jun-10 | 4 | 4.95 | 6 | 1.05 | A | 25.9 | - | - | 3:56 | 4:09 | 2.5 | - | - | - | - | - | - | - | - | Packer Set At Incorrect Depth. |
| | | 23-Jun-10 | 4 | 4.5 | 6 | 1.50 | A | 1.6 | 27.5 | 18.3 | 10:18 | 10:30 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | Re-Grouted |
| | | 25-Apr-10 | 3 | 6.8 | 7.8 | 1.00 | A | 108.8 | 108.8 | 108.8 | 6:55 | 7:41 | 3.0 | 0.7 | 0.22 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 2 | 7.8 | 11.8 | 4.00 | A | 45.7 | 45.7 | 11.4 | 6:33 | 6:50 | 2.6 | 0.4 | 0.04 | - | - | - | - | - | - | |
| T-30+108.5 | T | 29-Jun-10 | 4 | 4.89 | 6.39 | 1.50 | MF | 35.3 | 35.3 | 23.5 | 15:22 | 15:46 | 2.2 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 03-May-10 | 3 | 6.89 | 7.89 | 1.00 | A* | 63.5 | 63.5 | 63.5 | 11:24 | 11:53 | 2.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 03-May-10 | 2 | 7.89 | 11.8 | 3.91 | A* | 42.1 | 42.1 | 10.8 | 11:09 | 11:10 | - | - | - | - | - | - | - | - | - | Backfill |
| P-30+110 | S | 22-Jun-10 | 4 | 5.63 | 6.45 | 0.82 | A | 30.7 | - | - | 4:11 | 4:29 | 2.7 | - | - | - | - | - | - | - | - | Packer Set At Incorrect Depth |
| | | 23-Jun-10 | 4 | 4.95 | 6.45 | 1.50 | A | 4.2 | 34.9 | 23.3 | 10:01 | 10:15 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | Re-Grouted |
| | | 21-Apr-10 | 3 | 7.6 | 8.6 | 1.00 | A | 474.0 | 474.0 | 474.0 | 1:34 | 3:07 | 3.0 | 3.2 | 0.20 | 35.0 | - | 1.6 | 9.3 | 9.2 | 17.1 | |
| | | 21-Apr-10 | 2 | 8.6 | 12.6 | 4.00 | A | 626.0 | - | - | 21:06 | 22:08 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Apr-10 | 2 | 8.6 | 12.6 | 4.00 | B | 602.0 | 1228.0 | 307.0 | 22:08 | 23:59 | 2.5 | 0.2 | 0.02 | 37.7 | 3.0 | 1.6 | 10.0 | 6.0 | 17.0 | |
| T-30+111.5 | T | 29-Jun-10 | 4 | 5.8 | 7.3 | 1.50 | MF | 43.1 | 43.1 | 28.7 | 15:51 | 16:15 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 03-May-10 | 3 | 7.8 | 8.8 | 1.00 | A* | 52.6 | - | - | 10:39 | 10:59 | 2.0 | 0.8 | 0.10 | - | - | - | - | - | - | |
| | | 03-May-10 | 3 | 7.8 | 8.8 | 1.00 | A* | 187.7 | 240.3 | 240.3 | 13:55 | 14:46 | 2.5 | 0.5 | 0.18 | 31.7 | - | 1.7 | 27.7 | 12.0 | 20.1 | |
| | | 03-May-10 | 2 | 8.8 | 12.9 | 4.10 | A* | 40.8 | 40.8 | 10.0 | 10:38 | 10:38 | - | - | - | 32.0 | - | 1.7 | 29.0 | 13.0 | 21.8 | Backfill |
| S-30+113 | P | 22-Jun-10 | 4 | 5.12 | 7.13 | 2.01 | A | 83.7 | 83.7 | 41.6 | 4:30 | 4:55 | 2.6 | 0.7 | 0.13 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 3 | 7.9 | 8.9 | 1.00 | A | 98.5 | 98.5 | 98.5 | 10:50 | 11:45 | 3.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 2 | 8.9 | 12.9 | 4.00 | A | 477.0 | - | - | 8:48 | 10:25 | 2.4 | 2.7 | 0.35 | 33.0 | 4.0 | 1.6 | 10.0 | 9.0 | 13.0 | |
| | | 25-Apr-10 | 2 | 8.9 | 12.9 | 4.00 | B | 46.3 | 523.3 | 130.8 | 10:25 | 10:47 | 2.7 | 2.0 | 0.18 | 35.0 | 4.0 | 1.7 | 9.0 | 10.0 | 14.0 | |
| T-30+114.5 | T | 29-Jun-10 | 4 | 5.73 | 7.23 | 1.50 | MF | 60.3 | 60.3 | 40.2 | 16:23 | 16:55 | 2.4 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 7.73 | 8.73 | 1.00 | A* | 3.9 | 3.9 | 3.9 | 9:10 | 9:24 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 8.73 | 12.8 | 4.07 | A* | 25.2 | 25.2 | 6.2 | 8:46 | 9:04 | 2.8 | 0.0 | 0.00 | 31.0 | 3.0 | 1.7 | 24.0 | 12.0 | 26.0 | |
| P-30+116 | P | 22-Jun-10 | 4 | 5.7 | 6.62 | 0.92 | A | 88.0 | - | - | 4:57 | 5:19 | 2.4 | 0.4 | 0.16 | - | - | - | - | - | - | Packer Set At Incorrect Depth. |
| | | 23-Jun-10 | 4 | 5.12 | 6.62 | 1.50 | A | 12.8 | 100.8 | 67.2 | 9:32 | 9:50 | 2.6 | 0.2 | 0.04 | - | - | - | - | - | - | Re-Grouted |
| | | 09-May-10 | 3A | 7.77 | 8.2 | 0.43 | A | 22.1 | 22.1 | 51.4 | 0:51 | 1:04 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | 27.0 | Manual Pressure Gauge Reading |
| | | 21-Apr-10 | 3 | 8.2 | 9.2 | 1.00 | A | 18.4 | 18.4 | 18.4 | 4:02 | 4:18 | 2.8 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 21-Apr-10 | 2 | 9.2 | 13.2 | 4.00 | A | 60.3 | 60.3 | 15.1 | 3:24 | 3:45 | 2.5 | 0.3 | 0.03 | - | - | - | - | - | - | |
| T-30+117.5 | T | 29-Jun-10 | 4 | 5.79 | 7.29 | 1.50 | MF | 45.3 | 45.3 | 30.2 | 17:07 | 17:34 | 2.1 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 7.79 | 8.79 | 1.00 | A* | 0.8 | - | - | 9:48 | 9:51 | 0.1 | - | 0.09 | - | - | - | - | - | - | Ran Out Of Grout. Stopped Injection. |
| | | 05-May-10 | 3 | 7.79 | 8.79 | 1.00 | A* | 0.9 | - | - | 9:57 | 10:00 | - | - | - | - | - | - | - | - | - | Real-Time Monitoring System Broke |
| | | 05-May-10 | 3 | 7.79 | 8.79 | 1.00 | A* | 2.1 | 3.8 | 3.8 | 10:18 | 10:33 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 8.79 | 12.9 | 4.11 | A* | 102.3 | 102.3 | 24.9 | 9:33 | 9:44 | 2.0 | 59.6 | 7.28 | - | - | - | - | - | - | By-Pass |
| S-30+119 | S | 22-Jun-10 | 4 | 6.4 | 7.2 | 0.80 | A | 344.5 | - | - | 5:26 | 6:01 | 2.3 | 14.5 | 6.64 | - | - | - | - | - | - | Packer Set At Incorrect Depth. |
| | | 22-Jun-10 | 4 | 6.4 | 7.2 | 0.80 | B | 143.4 | - | - | 6:01 | 7:23 | 2.6 | 0.8 | 0.41 | 36.0 | - | 1.6 | 7.0 | 8.0 | 14.0 | |
| | | 23-Jun-10 | 4 | 5.7 | 7.2 | 1.50 | A | 33.3 | 521.2 | 347.5 | 8:50 | 9:22 | 2.6 | 0.4 | 0.11 | - | - | - | - | - | - | Re-Grouted |
| | | 25-Apr-10 | 3 | 8.1 | 9.1 | 1.00 | A | 22.2 | 22.2 | 22.2 | 14:53 | 15:05 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 2 | 9.1 | 13.1 | 4.00 | A | 191.7 | 191.7 | 47.9 | 14:01 | 14:49 | 2.8 | 1.4 | 0.12 | 33.0 | - | 1.6 | 12.0 | 7.0 | 12.0 | |
| T-30+120.5 | T | 29-Jun-10 | 4 | 6.6 | 8.1 | 1.50 | MF | 82.6 | 82.6 | 55.1 | 18:28 | 19:08 | 2.6 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 8.6 | 9.6 | 1.00 | A* | 31.5 | - | - | 11:15 | 11:21 | 0.7 | - | - | - | - | - | - | - | - | Mixer Froze. Stopped Injection. |
| | | 05-May-10 | 3 | 8.6 | 9.6 | 1.00 | A* | 68.4 | 99.9 | 99.9 | 11:27 | 11:46 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 9.6 | 14.1 | 4.50 | A* | 51.6 | 51.6 | 11.5 | 10:46 | 11:10 | 2.6 | 0.4 | 0.03 | - | - | - | - | - | - | By-Pass |
| P-30+122 | P | 23-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | A | 8.1 | 8.1 | 5.4 | 10:34 | 10:48 | 2.4 | 0.8 | 0.02 | - | - | - | - | - | - | |
| | | 09-May-10 | 3A | 8.61 | 9 | 0.39 | A | 22.8 | 22.8 | 58.5 | 0:24 | 0:41 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | Manual Pressure Gauge Reading |
| | | 22-Apr-10 | 3 | 9 | 10 | 1.00 | A | 303.1 | 303.1 | 303.1 | 8:13 | 9:49 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Apr-10 | 2 | 10 | 14 | 4.00 | A | 406.2 | 406.2 | 101.6 | 6:54 | 8:08 | 2.5 | 1.8 | 0.18 | 35.0 | 3.0 | 1.7 | 15.0 | 7.0 | 12.0 | |
| T-30+123.5 | T | 29-Jun-10 | 4 | 6.33 | 7.83 | 1.50 | MF | 70.1 | 70.1 | 46.7 | 19:12 | 19:38 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 8.33 | 9.33 | 1.00 | A* | 37.8 | 37.8 | 37.8 | 16:44 | 17:17 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 9.33 | 13.6 | 4.27 | A* | 277.0 | 277.0 | 64.9 | 15:32 | 16:37 | 2.6 | 0.4 | 0.04 | - | - | - | - | - | - | By-Pass |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+125 | S | 23-Jun-10 | 4 | 6.26 | 7.76 | 1.50 | A | 96.5 | 96.5 | 64.3 | 11:14 | 11:42 | 2.4 | 0.0 | 0.00 | 31.0 | - | 1.6 | 10.8 | 12.9 | 15.1 | |
| | | 25-Apr-10 | 3 | 8.5 | 9.5 | 1.00 | A | 131.7 | 131.7 | 131.7 | 20:49 | 21:49 | 3.1 | 0.6 | 0.19 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 2 | 9.5 | 13.5 | 4.00 | A | 156.0 | 156.0 | 39.0 | 19:47 | 20:42 | 2.7 | 0.0 | 0.00 | 30.5 | 7.0 | 1.6 | 2.0 | 12.7 | 19.7 | |
| Q-30+125.75 | Q | 15-Jul-10 | 4 | 6.64 | 8.14 | 1.50 | MF | 99.1 | 99.1 | 66.1 | 2:13 | 2:48 | 2.1 | 0.3 | 0.11 | - | - | - | - | - | - | Communicated To Q-30+127.25 |
| | | 09-Jul-10 | 3 | 8.65 | 9.9 | 0.25 | MF | 150.0 | - | - | 22:59 | 23:29 | 1.5 | 3.3 | 1.72 | - | - | - | - | - | - | |
| | | 09-Jul-10 | 3 | 8.65 | 9.9 | 0.25 | A | 27.2 | 177.2 | 708.8 | 23:29 | 0:05 | 2.6 | 0.0 | 0.01 | 29.9 | - | 1.5 | 14.9 | 16.1 | 21.5 | |
| T-30+126.5 | T | 29-Jun-10 | 4 | 6.35 | 7.85 | 1.50 | MF | 378.0 | - | - | 19:46 | 20:20 | 0.4 | 15.5 | 28.40 | 31.9 | 8.0 | 1.6 | 12.3 | 15.3 | 19.5 | |
| | | 29-Jun-10 | 4 | 6.35 | 7.85 | 1.50 | A | 62.0 | - | - | 20:20 | 20:30 | 0.3 | 14.9 | 36.29 | 32.9 | 5.0 | 1.6 | 11.7 | 15.3 | 18.9 | |
| | | 29-Jun-10 | 4 | 6.35 | 7.85 | 1.50 | B | 160.0 | - | - | 20:30 | 20:42 | 0.5 | 14.0 | 17.59 | - | - | - | - | - | - | |
| | | 29-Jun-10 | 4 | 6.35 | 7.85 | 1.50 | C | 140.0 | - | - | 20:42 | 20:52 | 0.7 | 14.4 | 13.98 | 44.2 | - | 1.6 | 12.0 | 15.6 | 19.0 | By-Pass: Outside Casing |
| | | 29-Jun-10 | 4 | 6.35 | 7.85 | 1.50 | D | 268.0 | 1008.0 | 672.0 | 20:52 | 21:09 | 0.5 | 12.2 | 15.89 | 67.0 | - | 1.7 | 12.6 | 15.4 | 19.0 | |
| | | 05-May-10 | 3 | 8.35 | 9.35 | 1.00 | A* | 31.5 | 31.5 | 31.5 | 14:51 | 15:16 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 9.35 | 13.7 | 4.35 | A* | 26.2 | 26.2 | 6.0 | 14:29 | 14:45 | 2.5 | 0.0 | 0.00 | 31.1 | 5.0 | 1.7 | 25.0 | 13.0 | 25.1 | |
| Q-30+127.25 | Q | 15-Jul-10 | 4 | 6.76 | 8.26 | 1.50 | MF | 56.6 | 56.6 | 37.7 | 1:44 | 2:10 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Jul-10 | 3 | 8.87 | 9.87 | 1.00 | MF | 53.0 | 53.0 | 53.0 | 22:29 | 22:54 | 2.5 | 0.4 | 0.15 | - | - | - | - | - | - | |
| | | 09-Jul-10 | 2 | 9.87 | 14.2 | 4.33 | MF | 26.1 | 26.1 | 6.0 | 22:04 | 22:23 | 2.8 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-30+128 | P | 23-Jun-10 | 4 | 6.27 | 8.27 | 2.00 | A | 165.2 | 165.2 | 82.6 | 14:51 | 15:35 | 2.6 | 0.7 | 0.14 | 32.5 | 4.0 | 1.6 | 11.2 | 11.8 | 14.7 | |
| | | 22-Apr-10 | 3 | 9.3 | 10.3 | 1.00 | A | 7.4 | 7.4 | 7.4 | 14:17 | 14:32 | 3.2 | 0.3 | 0.10 | 33.0 | - | 1.7 | - | - | - | |
| | | 22-Apr-10 | 2 | 10.3 | 14.3 | 4.00 | A | 500.0 | - | - | 10:04 | 9:49 | 0.0 | 0.0 | 0.00 | - | - | 1.7 | - | - | - | |
| | | 22-Apr-10 | 2 | 10.3 | 14.3 | 4.00 | B | 767.0 | 1267.0 | 316.8 | 10:04 | 12:04 | 2.5 | 1.8 | 0.18 | - | - | - | - | - | - | |
| T-30+129.5 | T | 29-Jun-10 | 4 | 6.69 | 8.19 | 1.50 | MF | 131.7 | 131.7 | 87.8 | 21:20 | 22:41 | 2.1 | 0.7 | 0.23 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.69 | 9.69 | 1.00 | A* | 32.0 | - | - | 14:52 | 14:55 | 0.0 | - | inf | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.69 | 9.69 | 1.00 | A* | 152.0 | - | - | 16:10 | 16:30 | 0.0 | 11.5 | inf | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.69 | 9.69 | 1.00 | B | 343.4 | 527.4 | 527.4 | 16:30 | 17:36 | 2.5 | 0.2 | 0.08 | 37.0 | 3.0 | 1.6 | 20.0 | 11.0 | 21.0 | |
| | | 04-May-10 | 2 | 9.69 | 14.7 | 5.01 | A* | 25.0 | 25.0 | 5.0 | 14:27 | 14:43 | 2.6 | 0.0 | 0.00 | 32.0 | 2.0 | 1.6 | 19.0 | 13.0 | 23.0 | |
| S-30+131 | S | 23-Jun-10 | 4 | 6.88 | 8.38 | 1.50 | A | 63.5 | 63.5 | 42.3 | 15:40 | 16:08 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 3 | 9 | 10 | 1.00 | A | 196.0 | 196.0 | 196.0 | 17:12 | 18:05 | 3.0 | 0.6 | 0.20 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 2 | 10 | 14 | 4.00 | A | 475.0 | - | - | 15:51 | 16:37 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 2 | 10 | 14 | 4.00 | B | 133.0 | 608.0 | 152.0 | 16:37 | 18:05 | 3.0 | 0.6 | 0.20 | 35.0 | - | 1.7 | 4.0 | 9.0 | 10.0 | |
| T-30+132.5 | T | 29-Jun-10 | 4 | 6.7 | 8.7 | 2.00 | MF | 119.7 | 119.7 | 59.9 | 22:46 | 23:44 | 2.1 | 0.7 | 0.17 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.2 | 10.2 | 1.00 | A* | 24.5 | 24.5 | 24.5 | 21:20 | 21:37 | 2.8 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 10.2 | 14.3 | 4.10 | A* | 22.6 | 22.6 | 5.5 | 20:55 | 21:15 | 2.8 | 0.0 | 0.00 | 31.0 | 3.0 | 1.7 | 26.0 | 15.0 | 23.0 | |
| P-30+134 | P | 23-Jun-10 | 4 | 6.72 | 8.22 | 1.50 | A | 160.7 | 160.7 | 107.1 | 16:12 | 17:25 | 2.7 | 0.8 | 0.21 | - | - | - | - | - | - | Communicated To P-30+128 |
| | | 22-Apr-10 | 3 | 8.7 | 9.7 | 1.00 | A | 247.4 | 247.4 | 247.4 | 16:08 | 17:22 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Apr-10 | 2 | 9.7 | 13.7 | 4.00 | A | 344.2 | 344.2 | 86.1 | 14:59 | 16:02 | 2.4 | 0.4 | 0.04 | - | - | 1.7 | - | - | - | |
| T-30+135.5 | T | 29-Jun-10 | 4 | 6.74 | 8.24 | 1.50 | MF | 58.0 | 58.0 | 38.7 | 1:37 | 2:01 | 2.2 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 8.74 | 9.74 | 1.00 | A* | 281.6 | 281.6 | 281.6 | 22:12 | 23:22 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 9.74 | 14 | 4.26 | A* | 28.3 | 28.3 | 6.6 | 21:53 | 22:07 | 2.6 | 0.4 | 0.04 | - | - | - | - | - | - | |
| S-30+137 | S | 23-Jun-10 | 4 | 6.51 | 8.01 | 1.50 | A | 210.0 | 210.0 | 140.0 | 15:38 | 18:53 | 2.6 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 3 | 8.7 | 9.7 | 1.00 | A | 61.5 | 61.5 | 61.5 | 23:03 | 23:35 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 2 | 9.7 | 13.7 | 4.00 | A | 242.2 | 242.2 | 60.6 | 22:10 | 22:55 | 2.6 | 0.7 | 0.07 | - | - | - | - | - | - | |
| T-30+138.5 | T | 03-Jul-10 | 4 | 6.42 | 7.29 | 0.87 | MF | 250.4 | - | - | 8:10 | 8:34 | 0.0 | 13.6 | inf | 30.8 | 3.0 | 1.5 | 9.9 | 8.1 | 11.7 | |
| | | 03-Jul-10 | 4 | 6.42 | 7.29 | 0.87 | A | 152.2 | - | - | 8:34 | 8:46 | 0.0 | 15.5 | inf | 31.8 | 4.0 | 1.6 | 9.8 | 8.1 | 12.4 | |
| | | 03-Jul-10 | 4 | 6.42 | 7.29 | 0.87 | B | 185.8 | - | - | 8:46 | 8:58 | 0.0 | 16.5 | inf | 36.0 | - | 1.7 | 11.0 | 9.0 | 14.0 | |
| | | 03-Jul-10 | 4 | 6.42 | 7.29 | 0.87 | C | 150.1 | - | - | 8:58 | 9:08 | 0.0 | 15.4 | inf | 45.2 | - | 1.6 | 11.0 | 9.0 | 14.6 | |
| | | 03-Jul-10 | 4 | 6.42 | 7.29 | 0.87 | D | 203.5 | 942.0 | 1082.8 | 9:08 | 9:25 | 0.8 | 1.8 | 1.50 | 61.2 | - | 1.7 | 11.6 | 9.8 | 15.2 | |
| | | 05-May-10 | 3 | 8.36 | 9.36 | 1.00 | A* | 71.4 | 71.4 | 71.4 | 0:39 | 1:36 | 2.6 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 9.36 | 13.6 | 4.24 | A* | 210.8 | - | - | 23:32 | 23:58 | 0.2 | 10.1 | 10.21 | 32.0 | - | 1.7 | 23.0 | 16.0 | 22.0 | |
| | | 05-May-10 | 2 | 9.36 | 13.6 | 4.24 | B | 221.5 | 432.3 | 102.0 | 23:58 | 0:33 | 2.6 | 1.3 | 0.11 | 33.0 | 8.0 | 1.7 | - | 16.0 | 24.0 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| Q-30+139.25 | Q | 15-Jul-10 | 4 | 6.85 | 8.35 | 1.50 | MF | 155.0 | - | - | 22:13 | 22:32 | 0.2 | 15.6 | 67.28 | - | - | - | - | - | - | Communicated To Q-30+127.25 |
| | | 15-Jul-10 | 4 | 6.85 | 8.35 | 1.50 | A | 161.1 | - | - | 22:32 | 22:42 | 0.5 | 30.0 | 42.70 | 31.6 | 4.0 | 1.7 | 17.6 | 11.0 | 19.2 | |
| | | 15-Jul-10 | 4 | 6.85 | 8.35 | 1.50 | B | 158.3 | - | - | 22:42 | 22:46 | 0.8 | 39.5 | 35.89 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 6.85 | 8.35 | 1.50 | C | 161.1 | - | - | 22:46 | 22:49 | 2.0 | 59.5 | 19.20 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 6.85 | 8.35 | 1.50 | D | 174.5 | - | - | 22:49 | 22:52 | 2.1 | 53.1 | 19.42 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 6.85 | 8.35 | 1.50 | E | 140.0 | - | - | 22:52 | 22:55 | 2.1 | 49.8 | 15.35 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 6.85 | 8.35 | 1.50 | X | 154.1 | - | - | 22:55 | 22:58 | 2.0 | 33.4 | 11.04 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 6.85 | 8.35 | 1.50 | X+ | 264.9 | 1369.0 | 912.7 | 22:58 | 23:25 | 2.9 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 09-Jul-10 | 3 | 8.97 | 9.97 | 1.00 | MF | 27.3 | 27.3 | 27.3 | 21:35 | 21:55 | 2.7 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 09-Jul-10 | 2 | 9.97 | 14.1 | 4.13 | MF | 48.0 | 48.0 | 11.6 | 21:00 | 21:26 | 2.7 | 0.3 | 0.02 | 33.0 | - | 1.6 | 14.9 | 15.3 | 20.1 | |
| P-30+140 | P | 29-Jun-10 | 4 | 7.07 | 8.57 | 1.50 | A | 160.0 | - | - | 2:05 | 2:26 | 1.6 | 8.6 | 3.49 | - | - | - | - | - | - | |
| | | 29-Jun-10 | 4 | 7.07 | 8.57 | 1.50 | B | 180.0 | - | - | 2:26 | 2:43 | 2.5 | 21.2 | 5.74 | - | - | - | - | - | - | |
| | | 29-Jun-10 | 4 | 7.07 | 8.57 | 1.50 | C | 250.3 | 590.3 | 393.5 | 2:43 | 4:10 | 2.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 22-Apr-10 | 3 | 9.21 | 10.21 | 1.00 | A | 501.6 | 501.6 | 501.6 | 2:10 | 2:48 | 0.0 | 18.6 | inf | 30.2 | 1.0 | 1.6 | 4.0 | 9.0 | 17.4 | |
| | | 22-Apr-10 | 2 | 10.21 | 14.21 | 4.00 | A | 400.0 | - | - | 21:41 | 22:15 | 0.0 | 0.0 | 0.00 | 30.1 | 3.0 | 1.6 | 3.0 | 8.8 | 17.6 | |
| | | 22-Apr-10 | 2 | 10.21 | 14.21 | 4.00 | B | 1619.0 | 2019.0 | 504.8 | 22:15 | 23:42 | 0.0 | 18.3 | inf | 31.0 | 8.0 | 1.6 | 3.6 | 9.0 | 17.2 | |
| T-30+141.5 | T | 03-Jul-10 | 4 | 7.29 | 8.79 | 1.50 | MF | 113.7 | 113.7 | 75.8 | 9:53 | 10:29 | 2.3 | 0.6 | 0.18 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.22 | 10.22 | 1.00 | A* | 508.4 | - | - | 2:26 | 3:22 | 2.6 | 9.9 | 4.00 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.22 | 10.22 | 1.00 | B | 148.1 | 656.5 | 656.5 | 3:22 | 4:09 | 2.5 | 0.0 | 0.01 | 38.0 | 3.0 | 1.6 | 13.0 | 11.0 | 8.0 | |
| | | 05-May-10 | 2 | 10.22 | 14.2 | 3.98 | A* | 24.8 | 24.8 | 6.2 | 2:09 | 2:22 | 2.8 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 05-May-10 | 1 | 14.2 | 19.2 | 5.00 | A* | 49.1 | 49.1 | 9.8 | 1:47 | 2:05 | 5.9 | 1.1 | 0.04 | 31.0 | 2.0 | 1.7 | 20.0 | 16.0 | 23.0 | |
| S-30+143 | S | 23-Jun-10 | 4 | 6.43 | 7.93 | 1.50 | A | 150.9 | - | - | 21:28 | 21:49 | 1.6 | 10.1 | 3.90 | 32.0 | 4.0 | 1.6 | 8.0 | 7.0 | 13.0 | |
| | | 23-Jun-10 | 4 | 6.43 | 7.93 | 1.50 | B | 188.0 | - | - | 21:49 | 22:05 | 1.6 | 8.6 | 2.80 | 36.0 | 4.0 | 1.6 | 8.0 | 7.0 | 15.0 | |
| | | 23-Jun-10 | 4 | 6.43 | 7.93 | 1.50 | C | 183.9 | - | - | 22:05 | 22:39 | 1.8 | 9.4 | 3.25 | 38.9 | - | 1.6 | 8.0 | 7.0 | 18.0 | |
| | | 23-Jun-10 | 4 | 6.43 | 7.93 | 1.50 | D | 477.2 | 1000.0 | 666.7 | 22:39 | 23:40 | 2.6 | 5.3 | 1.36 | 47.0 | - | 1.6 | 8.0 | 7.0 | 20.0 | |
| | | 25-Apr-10 | 3 | 10 | 11 | 1.00 | A | 0.8 | 0.8 | 0.8 | 5:52 | 6:02 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 25-Apr-10 | 2 | 11 | 15 | 4.00 | A | 600.0 | - | - | 2:57 | 3:46 | 0.0 | 0.0 | 0.00 | 30.8 | 5.0 | 1.6 | 3.0 | 12.9 | 19.6 | |
| | | 25-Apr-10 | 2 | 11 | 15 | 4.00 | B | 600.0 | - | - | 3:46 | 4:29 | 0.0 | 0.0 | 0.00 | 36.2 | 5.0 | 1.6 | 2.8 | 12.0 | 11.0 | |
| | | 25-Apr-10 | 2 | 11 | 15 | 4.00 | C | 365.0 | 1565.0 | 391.3 | 4:29 | 5:45 | 2.6 | 1.4 | 0.13 | 45.2 | - | 1.6 | 3.1 | 11.0 | 17.0 | |
| T-30+144.5 | T | 29-Jun-10 | 4 | 7.87 | 9.37 | 1.50 | MF | 50.0 | 50.0 | 33.3 | 4:19 | 4:40 | 1.8 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.87 | 10.87 | 1.00 | A* | 255.1 | - | - | 15:30 | 15:57 | 2.8 | 8.5 | 4.24 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.87 | 10.87 | 1.00 | B | 133.8 | - | - | 15:57 | 16:21 | 2.5 | 5.8 | 2.30 | 37.9 | - | 1.7 | 20.4 | 12.0 | 18.3 | |
| | | 06-May-10 | 3 | 9.87 | 10.87 | 1.00 | C | 27.0 | 415.9 | 415.9 | 16:21 | 16:41 | 2.4 | 0.3 | 0.10 | 47.8 | - | 1.8 | 20.5 | 13.7 | 19.1 | |
| | | 06-May-10 | 2 | 10.87 | 14.9 | 4.03 | A* | 30.1 | 30.1 | 7.5 | 15:19 | 15:20 | - | - | - | - | - | - | - | - | - | Backfill |
| | | 06-May-10 | 1 | 14.9 | 20 | 5.10 | A* | 425.7 | 425.7 | 83.5 | 14:22 | 15:11 | 5.3 | 5.0 | 0.19 | 31.2 | 5.0 | 1.6 | 20.1 | 12.0 | 17.9 | |
| P-30+146 | P | 23-Jun-10 | 4 | 7.33 | 9.33 | 2.00 | A | 147.5 | - | - | 23:49 | 0:12 | 2.0 | 14.4 | 3.29 | - | - | - | - | - | - | |
| | | 23-Jun-10 | 4 | 7.33 | 9.33 | 2.00 | B | 189.5 | - | - | 0:12 | 0:28 | 2.4 | 11.8 | 2.68 | - | - | - | - | - | - | |
| | | 23-Jun-10 | 4 | 7.33 | 9.33 | 2.00 | C | 178.4 | - | - | 0:28 | 0:53 | 2.5 | 9.6 | 1.82 | - | - | - | - | - | - | |
| | | 23-Jun-10 | 4 | 7.33 | 9.33 | 2.00 | D | 10.8 | 526.2 | 263.1 | 0:53 | 1:05 | 2.5 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 22-Apr-10 | 3 | 9.9 | 10.9 | 1.00 | A | 500.1 | 500.1 | 500.1 | 5:52 | 6:32 | 0.5 | 17.2 | 35.00 | 30.4 | - | 1.7 | 3.0 | 8.7 | 17.2 | |
| | | 22-Apr-10 | 2 | 10.9 | 14.9 | 4.00 | A | 400.0 | - | - | 3:02 | 3:36 | 0.0 | 0.0 | 0.00 | 31.0 | 3.0 | 1.6 | 2.8 | 9.1 | 17.5 | |
| | | 22-Apr-10 | 2 | 10.9 | 14.9 | 4.00 | B | 1600.0 | 2000.0 | 500.0 | 3:36 | 5:42 | 0.3 | 18.4 | 15.00 | 30.7 | 3.0 | 1.7 | 2.6 | 9.3 | 17.1 | |
| T-30+147.5 | T | 29-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | MF | 240.0 | - | - | 4:49 | 5:48 | 2.1 | 4.2 | 1.41 | - | - | - | - | - | - | Communicated To T-30+150.5 |
| | | 29-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | A | 160.0 | - | - | 5:48 | 6:15 | 2.1 | 10.8 | 6.32 | - | - | - | - | - | - | |
| | | 29-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | B | 110.1 | 510.1 | 340.1 | 6:15 | 7:00 | 2.0 | 0.5 | 0.18 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.73 | 10.73 | 1.00 | A* | 7.4 | 7.4 | 7.4 | 17:44 | 17:59 | 2.3 | 0.4 | 0.16 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 10.73 | 14.7 | 3.97 | A* | 31.9 | 31.9 | 8.0 | 17:38 | 17:39 | - | - | - | - | - | - | - | - | - | |
| | | 06-May-10 | 1 | 14.7 | 19.9 | 5.20 | A* | 16.9 | 16.9 | 3.3 | 17:17 | 17:33 | 5.0 | 0.0 | 0.01 | - | - | - | - | - | - | Backfill |
| S-30+149 | S | 23-Jun-10 | 4 | 7.47 | 8.97 | 1.50 | A | 28.2 | 28.2 | 18.8 | 3:18 | 3:32 | 2.6 | 0.0 | 0.00 | 32.0 | - | 1.6 | 8.0 | 7.0 | 15.0 | |
| | | 09-May-10 | 3A | 10.8 | 11.8 | 1.00 | A | 24.4 | 24.4 | 24.4 | 23:44 | 23:59 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | Re-Grouted. |
| | | 26-Apr-10 | 3 | 10.8 | 11.8 | 1.00 | A | 20.7 | 20.7 | 20.7 | 8:18 | 8:30 | 3.1 | 0.0 | 0.01 | - | 2.0 | - | - | - | - | Manual Pressure Gauge Reading. |
| | | 26-Apr-10 | 2 | 11.8 | 15.8 | 4.00 | A | 443.0 | - | - | 6:13 | 6:59 | 1.2 | 5.8 | 1.17 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 2 | 11.8 | 15.8 | 4.00 | B | 524.0 | - | - | 6:59 | 6:59 | 0.0 | 0.0 | 0.00 | 36.0 | 3.0 | 1.6 | 2.0 | 10.0 | 12.5 | |
| | | 26-Apr-10 | 2 | 11.8 | 15.8 | 4.00 | C | 170.0 | 1137.0 | 284.3 | 6:59 | 7:40 | 2.7 | 0.1 | 0.01 | 46.0 | 2.0 | 1.7 | 2.0 | 10.0 | 10.0 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+150.5 | T | 30-Jun-10 | 4 | 7.52 | 9.02 | 1.50 | MF | 47.5 | 47.5 | 31.7 | 7:47 | 8:28 | 2.5 | 0.2 | 0.06 | 30.4 | - | 1.4 | 9.0 | 12.1 | 14.7 | |
| | | 06-May-10 | 3 | 9.52 | 10.52 | 1.00 | A* | 81.9 | 81.9 | 81.9 | 0:29 | 1:08 | 2.5 | 0.4 | 0.19 | - | - | - | - | - | - | |
| | | 06-May-10 | 1,2 | 10.52 | 19.8 | 9.28 | A* | 56.0 | 56.0 | 6.0 | 0:19 | 0:22 | - | - | - | - | - | - | - | - | - | Backfill |
| P-30+152 | P | 23-Jun-10 | 4 | 7.22 | 8.72 | 1.50 | A | 214.0 | - | - | 3:39 | 4:18 | 2.7 | 14.3 | 4.84 | - | - | - | - | - | - | By-Pass |
| | | 23-Jun-10 | 4 | 7.22 | 8.72 | 1.50 | B | 187.5 | - | - | 4:18 | 4:37 | 2.5 | 13.0 | 3.72 | 36.1 | - | 1.6 | 8.0 | 7.0 | 19.0 | |
| | | 23-Jun-10 | 4 | 7.22 | 8.72 | 1.50 | C | 92.9 | 494.4 | 329.6 | 4:37 | 5:10 | 2.5 | 0.9 | 0.24 | 44.1 | 3.6 | 1.6 | 8.0 | 7.0 | 15.0 | |
| | | 23-Apr-10 | 3 | 9.3 | 10.3 | 1.00 | A | 6.3 | 6.3 | 6.3 | 8:43 | 8:55 | 3.2 | 6.3 | 0.03 | - | - | - | - | - | - | |
| | | 23-Apr-10 | 2 | 10.3 | 14.3 | 4.00 | A | 500.0 | - | - | 6:44 | 6:32 | 0.0 | 0.0 | 0.00 | 33.0 | 3.0 | 1.7 | 1.0 | 15.0 | 9.0 | |
| | | 23-Apr-10 | 2 | 10.3 | 14.3 | 4.00 | B | 1500.0 | 2000.0 | 500.0 | 6:44 | 8:21 | 1.2 | 36.0 | 7.60 | 35.0 | 2.0 | 1.6 | 4.0 | 6.0 | 10.0 | |
| T-30+153.5 | T | 30-Jun-10 | 4 | 8.44 | 9.94 | 1.50 | MF | 56.1 | 56.1 | 37.4 | 8:34 | 3:50 | 2.3 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 10.44 | 11.44 | 1.00 | A* | 29.7 | 29.7 | 29.7 | 5:59 | 6:17 | 3.0 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 11.44 | 15.4 | 3.96 | A* | 30.9 | 30.9 | 7.8 | 5:41 | 5:56 | 3.8 | 0.7 | 0.05 | - | - | - | - | - | - | |
| | | 06-May-10 | 1 | 15.4 | 20.5 | 5.10 | A* | 80.1 | 80.1 | 15.7 | 5:15 | 5:37 | 5.4 | 2.4 | 0.09 | - | - | - | - | - | - | |
| S-30+155 | S | 24-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | A | 141.9 | - | - | 5:21 | 5:42 | 2.1 | 13.1 | 5.00 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | B | 222.9 | - | - | 5:42 | 6:34 | 2.4 | 8.3 | 4.43 | 48.9 | 4.1 | 1.6 | 8.4 | 7.2 | 20.3 | Communicated To P-30+158 |
| | | 24-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | C | 309.7 | - | - | 6:34 | 7:14 | 2.5 | 12.2 | 2.49 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | D | 339.5 | 1014.0 | 676.0 | 7:14 | 8:11 | 2.6 | 4.1 | 1.08 | 58.9 | 4.0 | 1.6 | 8.4 | 7.2 | 20.3 | |
| | | 09-May-10 | 3A | 9.78 | 11.6 | 1.82 | A | 25.8 | 25.8 | 14.2 | 23:15 | 23:32 | 3.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 3 | 11.6 | 12.6 | 1.00 | A | 21.7 | 21.7 | 21.7 | 10:17 | 10:29 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 2 | 12.6 | 16.6 | 4.00 | A | 455.0 | - | - | 8:38 | 9:18 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 2 | 12.6 | 16.6 | 4.00 | B | 466.0 | - | - | 9:18 | 9:39 | 0.0 | 0.0 | 0.00 | - | - | 1.7 | - | - | - | |
| | | 26-Apr-10 | 2 | 12.6 | 16.6 | 4.00 | C | 141.0 | 1062.0 | 265.5 | 9:39 | 10:13 | 2.6 | 0.0 | 0.00 | - | - | 1.8 | - | - | - | |
| T-30+156.5 | T | 30-Jun-10 | 4 | 8.04 | 9.54 | 1.50 | MF | 250.2 | 250.2 | 166.8 | 14:48 | 16:23 | 2.1 | 0.9 | 0.27 | 31.2 | 1.0 | 1.5 | 11.8 | 11.8 | 16.4 | Communicated To T-30+150.5, T-30+147.5 |
| | | 06-May-10 | 3 | 10.04 | 11.04 | 1.00 | A* | 27.4 | 27.4 | 27.4 | 4:50 | 5:04 | 2.5 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 11.04 | 15 | 3.96 | A* | 26.4 | 26.4 | 6.7 | 4:29 | 4:44 | 2.6 | 0.3 | 0.03 | 32.0 | - | 1.7 | 24.0 | 11.0 | 19.0 | |
| | | 06-May-10 | 1 | 15 | 20.1 | 5.10 | A* | 115.0 | - | - | 3:36 | 3:51 | 1.4 | 12.0 | 1.10 | - | - | - | - | - | - | |
| | | 06-May-10 | 1 | 15 | 20.1 | 5.10 | B | 255.2 | 370.2 | 72.6 | 3:51 | 4:19 | 5.7 | 3.5 | 0.12 | 33.0 | 5.0 | 1.7 | 11.0 | 10.0 | 16.0 | |
| P-30+158 | P | 24-Jun-10 | 4 | 8.18 | 10.18 | 2.00 | A | 186.9 | - | - | 9:57 | 10:21 | 2.4 | 12.8 | 2.90 | 31.2 | 4.0 | 1.6 | 8.9 | 7.8 | 20.6 | Communicated To P-30+152 |
| | | 24-Jun-10 | 4 | 8.18 | 10.18 | 2.00 | B | 165.5 | - | - | 10:21 | 10:32 | 2.4 | 10.0 | 2.47 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 8.18 | 10.18 | 2.00 | C | 253.4 | - | - | 10:32 | 11:00 | 2.6 | 7.2 | 1.46 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 8.18 | 10.18 | 2.00 | D | 80.3 | 686.1 | 343.1 | 11:00 | 11:37 | 2.5 | 1.2 | 0.25 | 59.0 | - | 1.6 | 8.9 | 7.9 | 20.5 | |
| | | 23-Apr-10 | 3 | 10.8 | 11.8 | 1.00 | A | 8.0 | 8.0 | 8.0 | 13:55 | 14:09 | 3.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 23-Apr-10 | 2 | 11.8 | 15.8 | 4.00 | A | 525.8 | 525.8 | 131.5 | 10:24 | 11:55 | 2.6 | 1.9 | 0.18 | - | - | - | - | - | - | |
| T-30+159.5 | T | 30-Jun-10 | 4 | 8.29 | 10.29 | 2.00 | MF | 180.9 | 180.9 | 90.5 | 16:33 | 17:50 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 10.79 | 11.79 | 1.00 | A* | 24.9 | 24.9 | 24.9 | 23:42 | 23:57 | 2.5 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 11.79 | 16.3 | 4.51 | A* | 30.9 | 30.9 | 6.9 | 23:34 | 23:37 | - | - | - | - | - | - | - | - | - | Backfill |
| S-30+161 | S | 24-Jun-10 | 4 | 7.74 | 9.24 | 1.50 | A | 189.3 | - | - | 13:55 | 14:22 | 2.1 | 9.8 | 2.88 | 31.4 | - | 1.6 | 6.9 | 7.4 | 14.7 | |
| | | 24-Jun-10 | 4 | 7.74 | 9.24 | 1.50 | B | 194.3 | - | - | 14:22 | 14:42 | 2.6 | 10.8 | 2.82 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 7.74 | 9.24 | 1.50 | C | 218.7 | - | - | 14:42 | 15:07 | 2.4 | 10.2 | 2.56 | 32.8 | - | 1.6 | 6.9 | 7.5 | 15.9 | |
| | | 24-Jun-10 | 4 | 7.74 | 9.24 | 1.50 | D | 426.7 | 1029.0 | 686.0 | 15:07 | 16:05 | 2.5 | 4.5 | 1.21 | 60.3 | - | 1.6 | 6.9 | 7.8 | 17.8 | |
| | | 26-Apr-10 | 3 | 9.8 | 10.8 | 1.00 | A | 5.5 | 5.5 | 5.5 | 15:38 | 15:51 | 3.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 2 | 10.8 | 14.8 | 4.00 | A | 613.6 | 613.6 | 153.4 | 13:26 | 15:35 | 2.7 | 2.3 | 0.22 | 33.0 | - | 1.6 | 12.0 | 11.0 | 16.0 | |
| T-30+162.5 | T | 30-Jun-10 | 4 | 7.27 | 8.77 | 1.50 | MF | 73.6 | 73.6 | 49.1 | 17:58 | 19:02 | 1.9 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.27 | 10.27 | 1.00 | A* | 26.0 | 36.8 | 36.8 | 23:05 | 23:22 | 2.5 | 0.4 | 0.19 | - | - | - | - | - | - | |
| | | 07-May-10 | 3 | 9.48 | 10.48 | 1.00 | A* | 10.8 | - | - | 9:39 | 9:49 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | Re-Grouted |
| | | 06-May-10 | 2 | 10.27 | 15.7 | 5.43 | A* | 30.1 | - | - | 22:56 | 23:00 | - | - | - | 32.0 | 4.0 | 1.7 | 8.0 | 8.0 | 16.0 | Backfill |
| | | 07-May-10 | 2 | 10.48 | 15.65 | 5.17 | A* | 21.5 | 51.6 | 10.0 | 9:21 | 9:31 | 2.6 | 0.0 | 0.00 | 32.1 | 5.0 | 1.6 | 4.0 | 12.9 | 13.1 | Re-Grouted |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+164 | P | 24-Jun-10 | 4 | 7.38 | 8.88 | 1.50 | A | 175.3 | - | - | 16:31 | 16:43 | 2.1 | 10.4 | 13.28 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 7.38 | 8.88 | 1.50 | B | 202.7 | - | - | 16:43 | 17:16 | 2.4 | 10.6 | 3.45 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 7.38 | 8.88 | 1.50 | C | 225.5 | - | - | 17:16 | 17:40 | 2.5 | 12.8 | 2.94 | 45.0 | - | 1.6 | 6.8 | 7.9 | 18.2 | |
| | | 24-Jun-10 | 4 | 7.38 | 8.88 | 1.50 | D | 96.7 | 700.2 | 466.8 | 17:40 | 18:34 | 2.5 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 23-Apr-10 | 3 | 9.6 | 10.6 | 1.00 | A | 6.1 | 6.1 | 6.1 | 16:41 | 16:52 | 3.2 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 23-Apr-10 | 2 | 10.6 | 14.6 | 4.00 | A | 500.0 | - | - | 14:18 | 14:09 | 0.0 | 0.0 | 0.00 | 32.0 | 1.7 | 1.7 | 2.0 | 9.0 | 12.0 | |
| | | 23-Apr-10 | 2 | 10.6 | 14.6 | 4.00 | B | 500.0 | - | - | 14:18 | 14:09 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Apr-10 | 2 | 10.6 | 14.6 | 4.00 | C | 990.0 | 1990.0 | 497.5 | 14:18 | 16:31 | 2.6 | 6.9 | 0.66 | 44.0 | - | 1.8 | 2.0 | 9.0 | 13.1 | |
| T-30+165.5 | T | 30-Jun-10 | 4 | 7.48 | 8.98 | 1.50 | MF | 116.2 | 116.2 | 77.5 | 19:43 | 20:20 | 2.0 | 0.1 | 0.02 | 31.4 | - | 1.5 | 11.3 | 12.0 | 17.2 | |
| | | 07-May-10 | 3A | 9.48 | 11.09 | 1.61 | A* | 310.0 | - | - | 15:29 | 15:45 | 2.0 | 12.0 | 3.73 | - | - | - | - | - | - | Stage 3A Correctly Grouted. |
| | | 07-May-10 | 3A | 9.48 | 11.09 | 1.61 | B | 211.3 | 521.3 | 323.8 | 15:45 | 16:42 | 2.4 | 0.0 | 0.00 | 36.2 | - | 1.7 | 29.0 | 12.0 | 17.3 | |
| | | 07-May-10 | 3 | 11.09 | 12.09 | 1.00 | A* | 20.7 | 20.7 | 20.7 | 10:16 | 10:29 | 2.7 | 0.4 | 0.15 | - | - | - | - | - | - | Packer Set At Wrong Depth. |
| | | 07-May-10 | 2 | 12.09 | 15.2 | 3.11 | A* | 45.9 | 45.9 | 14.8 | 10:03 | 10:13 | 2.5 | 2.2 | 0.28 | - | - | - | - | - | - | Packer Set At Wrong Depth. |
| S-30+167 | S | 24-Jun-10 | 4 | 8.4 | 9.9 | 1.50 | A | 141.5 | - | - | 20:28 | 20:51 | 2.2 | 9.5 | 3.36 | 32.4 | 3.0 | 1.6 | 8.0 | 7.0 | 14.0 | |
| | | 24-Jun-10 | 4 | 8.4 | 9.9 | 1.50 | B | 203.5 | - | - | 20:51 | 21:08 | 2.6 | 12.9 | 3.55 | 35.9 | 3.6 | 1.6 | 8.0 | 7.0 | 15.5 | Communicated To T-30+165.5 |
| | | 24-Jun-10 | 4 | 8.4 | 9.9 | 1.50 | C | 289.3 | - | - | 21:08 | 21:47 | 2.6 | 7.6 | 2.01 | 47.0 | - | 1.6 | 8.0 | 7.0 | 18.0 | and S-30+164; Outside Casing. |
| | | 24-Jun-10 | 4 | 8.4 | 9.9 | 1.50 | D | 188.7 | 823.0 | 548.7 | 21:47 | 22:17 | 2.5 | 6.8 | 1.80 | 57.0 | - | 1.6 | 8.0 | 7.0 | 20.5 | |
| | | 26-Apr-10 | 3 | 10.5 | 11.5 | 1.00 | A | 17.7 | 17.7 | 17.7 | 17:55 | 18:07 | 3.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 2 | 11.5 | 15.5 | 4.00 | A | 505.2 | 505.2 | 126.3 | 16:03 | 15:51 | 2.7 | 0.8 | 0.07 | - | - | - | - | - | - | |
| T-30+168.5 | T | 30-Jun-10 | 4 | 9.09 | 10.59 | 1.50 | MF | 88.3 | 88.3 | 58.9 | 20:23 | 21:14 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 07-May-10 | 3 | 11.09 | 11.37 | 0.28 | A* | 26.2 | 26.2 | 93.6 | 14:04 | 14:24 | 2.5 | 0.1 | 0.14 | - | - | - | - | - | - | Packer Set At Wrong Depth. |
| | | 07-May-10 | 2 | 11.37 | 17.8 | 6.43 | A* | 340.0 | - | - | 10:39 | 11:22 | 1.7 | 12.6 | 1.17 | - | - | - | - | - | - | Packer Set At Wrong Depth. |
| | | 07-May-10 | 2 | 11.37 | 17.8 | 6.43 | B | 326.2 | 666.2 | 103.6 | 11:22 | 11:57 | 2.5 | 0.0 | 0.00 | 35.7 | - | 1.6 | 6.0 | 12.7 | 13.3 | |
| P-30+170 | P | 24-Jun-10 | 4 | 8.98 | 10.48 | 1.50 | A | 37.0 | 37.0 | 24.7 | 22:27 | 22:40 | 1.4 | 2.3 | 1.14 | - | - | - | - | - | - | Communicated To T-30+165.5 |
| | | 25-Jun-10 | 4 | 8.98 | 10.48 | 1.50 | A | 177.7 | - | - | 11:03 | 11:28 | 2.6 | 10.0 | 3.44 | 32.1 | - | 1.6 | 7.8 | 11.4 | 18.7 | and S-30+164; Outside Casing. |
| | | 25-Jun-10 | 4 | 8.98 | 10.48 | 1.50 | B | 181.3 | - | - | 11:28 | 11:56 | 2.5 | 8.4 | 2.24 | 36.2 | - | 1.6 | 7.8 | 11.4 | 17.9 | Re-Grouted |
| | | 25-Jun-10 | 4 | 8.98 | 10.48 | 1.50 | C | 121.8 | 480.8 | 345.2 | 11:56 | 12:47 | 2.5 | 0.9 | 0.23 | 46.2 | - | 1.6 | 7.8 | 11.4 | 19.2 | Communicated To P-30+176 |
| | | 23-Apr-10 | 3 | 11.3 | 12.3 | 1.00 | A | 25.5 | 25.5 | 25.5 | 17:30 | 17:42 | 3.3 | 0.8 | 0.23 | - | - | - | - | - | - | |
| | | 23-Apr-10 | 2 | 12.3 | 16.3 | 4.00 | A | 89.5 | 89.5 | 22.4 | 17:02 | 17:26 | 2.4 | 0.9 | 0.09 | - | - | - | - | - | - | |
| T-30+171.5 | T | 30-Jun-10 | 4 | 8.37 | 9.87 | 1.50 | MF | 79.3 | 79.3 | 52.8 | 21:16 | 21:51 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 10.37 | 11.37 | 1.00 | A | 373.1 | - | - | 20:17 | 22:24 | 2.9 | 12.0 | 0.36 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 10.37 | 11.37 | 1.00 | B | 6.6 | 379.7 | 379.7 | 22:24 | 22:50 | 2.8 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 09-May-10 | 2 | 11.37 | 16.6 | 5.23 | A | 63.7 | 63.7 | 12.2 | 19:55 | 20:14 | 2.6 | 0.8 | 0.06 | 32.0 | 4.0 | 1.7 | 22.0 | 11.0 | 22.0 | |
| S-30+173 | S | 24-Jun-10 | 4 | 8.2 | 9.7 | 1.50 | A | 152.9 | - | - | 1:49 | 2:16 | 1.8 | 13.5 | 5.36 | 32.1 | - | 1.6 | 6.0 | 6.0 | 11.0 | |
| | | 24-Jun-10 | 4 | 8.2 | 9.7 | 1.50 | B | 193.6 | - | - | 2:16 | 2:33 | 2.3 | 13.1 | 3.88 | 35.9 | - | 1.6 | 6.0 | 6.0 | 13.0 | |
| | | 24-Jun-10 | 4 | 8.2 | 9.7 | 1.50 | C | 285.2 | 631.7 | 421.1 | 2:33 | 3:53 | 2.5 | 0.7 | 0.19 | 46.0 | 3.4 | 1.6 | 6.0 | 6.0 | 15.0 | |
| | | 26-Apr-10 | 3 | 10.3 | 11.3 | 1.00 | A | 17.6 | 17.6 | 17.6 | 19:35 | 20:03 | 3.1 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 2 | 11.3 | 15.3 | 4.00 | A | 197.0 | 197.0 | 49.3 | 18:28 | 19:31 | 2.7 | 1.7 | 0.16 | 31.0 | - | 1.6 | 3.0 | 12.9 | 18.5 | |
| T-30+174.5 | T | 30-Jun-10 | 4 | 7.99 | 9.49 | 1.50 | MF | 244.1 | - | - | 21:55 | 22:37 | 1.8 | 9.7 | 3.61 | - | - | - | - | - | - | |
| | | 30-Jun-10 | 4 | 7.99 | 9.49 | 1.50 | A | 159.9 | - | - | 22:37 | 22:50 | 2.1 | 16.2 | 6.85 | 32.2 | 5.0 | 1.6 | 12.3 | 12.7 | 18.2 | |
| | | 30-Jun-10 | 4 | 7.99 | 9.49 | 1.50 | B | 160.0 | - | - | 22:50 | 23:00 | 2.1 | 15.6 | 6.00 | 37.8 | 4.0 | 1.6 | 12.3 | 12.7 | 19.2 | |
| | | 30-Jun-10 | 4 | 7.99 | 9.49 | 1.50 | C | 185.8 | 749.8 | 499.9 | 23:00 | 23:00 | 1.9 | 0.0 | 0.04 | 45.7 | - | 1.7 | 12.3 | 12.4 | 20.4 | |
| | | 07-May-10 | 3 | 9.99 | 10.99 | 1.00 | A* | 114.1 | 114.1 | 114.1 | 20:06 | 21:25 | 2.6 | 0.6 | 0.16 | - | - | - | - | - | 22.0 | Manual Pressure Gauge Reading. |
| | | 07-May-10 | 2 | 10.99 | 16.5 | 5.51 | A* | 35.7 | 35.7 | 6.5 | 19:41 | 20:00 | 2.6 | 0.8 | 0.04 | 30.3 | 9.0 | 1.7 | 27.0 | 11.0 | 21.0 | Manual Pressure Gauge Reading. |
| P-30+176 | P | 24-Jun-10 | 4 | 7.96 | 9.46 | 1.50 | A | 140.9 | - | - | 4:02 | 4:29 | 2.5 | 15.0 | 3.96 | - | - | - | - | - | - | By-Pass |
| | | 24-Jun-10 | 4 | 7.96 | 9.46 | 1.50 | B | 179.5 | - | - | 4:29 | 4:46 | 2.7 | 12.9 | 3.30 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 7.96 | 9.46 | 1.50 | C | 22.0 | 342.4 | 228.3 | 4:46 | 4:57 | 2.6 | 0.6 | 0.15 | - | - | - | - | - | - | |
| | | 23-Apr-10 | 3 | 10.2 | 11.2 | 1.00 | A | 500.8 | 500.8 | 500.8 | 22:22 | 23:06 | 1.2 | 18.0 | 15.60 | 31.0 | 3.0 | 1.6 | 11.0 | 12.2 | 19.6 | |
| | | 23-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | A | 500.0 | - | - | 20:20 | 21:00 | 0.9 | 17.4 | 5.00 | 31.0 | 8.0 | 1.6 | 10.9 | 12.9 | 19.2 | |
| | | 23-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | B | 500.0 | - | - | 21:00 | 21:28 | 0.0 | 0.0 | 0.00 | 30.5 | 7.0 | 1.6 | 11.0 | 12.3 | 19.9 | |
| | | 23-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | C | 1000.0 | 2000.0 | 500.0 | 21:28 | 22:13 | 1.1 | 22.0 | 4.80 | 31.2 | - | 1.6 | 10.8 | 12.1 | 19.5 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+177.5 | T | 30-Jun-10 | 4 | 8.86 | 10.86 | 2.00 | MF | 143.5 | 143.5 | 71.8 | 1:44 | 2:45 | 2.0 | 0.2 | 0.05 | 34.0 | 2.0 | 1.5 | 14.2 | 13.7 | 17.7 | |
| | | 07-May-10 | 3 | 11.36 | 12.36 | 1.00 | A* | 34.6 | 34.6 | 34.6 | 22:03 | 22:22 | 2.6 | 0.2 | 0.05 | - | - | - | - | - | 26.0 | Manual Pressure Gauge Reading. |
| | | 07-May-10 | 1,2 | 12.36 | 16.2 | 3.84 | A* | 35.3 | 35.3 | 9.2 | 21:36 | 21:58 | 2.6 | 0.3 | 0.03 | 31.6 | 5.1 | 1.7 | 18.0 | 12.4 | 21.5 | Manual Pressure Gauge Reading. |
| S-30+179 | S | 24-Jun-10 | 4 | 8.09 | 9.59 | 1.50 | A | 151.5 | - | - | 5:07 | 5:25 | 1.6 | 12.7 | 5.60 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 8.09 | 9.59 | 1.50 | B | 265.1 | - | - | 5:25 | 5:47 | 1.9 | 12.4 | 4.69 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 8.09 | 9.59 | 1.50 | C | 193.9 | - | - | 5:47 | 6:10 | 2.2 | 10.6 | 3.40 | - | - | - | - | - | - | |
| | | 24-Jun-10 | 4 | 8.09 | 9.59 | 1.50 | D | 152.5 | 763.0 | 508.7 | 6:10 | 7:35 | 2.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 3 | 10.5 | 11.5 | 1.00 | A | 508.2 | - | - | 23:56 | 2:26 | 1.4 | 4.3 | 2.95 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 3 | 10.5 | 11.5 | 1.00 | B | 24.8 | 533.0 | 533.0 | 2:26 | 2:47 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 2 | 11.5 | 15.5 | 4.00 | A | 560.0 | - | - | 21:26 | 21:50 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 2 | 11.5 | 15.5 | 4.00 | B | 705.0 | - | - | 21:50 | 22:52 | 0.0 | 0.0 | 0.00 | 36.1 | 6.0 | 1.6 | 3.0 | 10.1 | 18.4 | |
| | | 26-Apr-10 | 2 | 11.5 | 15.5 | 4.00 | C | 446.0 | 1711.0 | 427.8 | 22:52 | 23:43 | 2.7 | 0.3 | 0.03 | 46.3 | 4.0 | 1.6 | 4.0 | 9.0 | 18.1 | |
| T-30+180.5 | T | 30-Jun-10 | 4 | 8.87 | 10.37 | 1.50 | MF | 51.1 | 51.1 | 34.1 | 2:48 | 3:20 | 2.2 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 07-May-10 | 3 | 10.87 | 11.87 | 1.00 | A* | 24.9 | 24.9 | 24.9 | 23:43 | 23:40 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | 27.0 | Manual Pressure Gauge Reading. |
| | | 07-May-10 | 2 | 11.87 | 14.7 | 2.83 | A* | 23.0 | 23.0 | 8.1 | 23:24 | 23:40 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | 29.0 | Manual Pressure Gauge Reading. |
| | | 07-May-10 | 1 | 14.7 | 19.7 | 5.00 | A* | 23.5 | 23.5 | 4.7 | 23:03 | 23:20 | 5.4 | 0.0 | 0.00 | - | - | - | - | - | 26.0 | Manual Pressure Gauge Reading. |
| P-30+182 | P | 25-Jun-10 | 4 | 7.32 | 8.82 | 1.50 | A | 174.6 | - | - | 8:07 | 8:35 | 1.9 | 11.4 | 4.86 | 32.8 | 4.0 | 1.6 | 7.2 | 8.6 | 14.6 | |
| | | 25-Jun-10 | 4 | 7.32 | 8.82 | 1.50 | B | 90.5 | - | - | 8:35 | 8:49 | 2.2 | 12.6 | 4.53 | 37.4 | 9.0 | 1.7 | 7.2 | 8.8 | 16.3 | |
| | | 25-Jun-10 | 4 | 7.32 | 8.82 | 1.50 | C | 347.3 | - | - | 8:49 | 9:10 | 2.3 | 14.0 | 4.23 | 49.1 | - | 1.6 | 7.2 | 8.8 | 15.3 | |
| | | 25-Jun-10 | 4 | 7.32 | 8.82 | 1.50 | D | 241.6 | 854.0 | 569.3 | 9:10 | 10:22 | 2.5 | 0.6 | 0.16 | 74.0 | - | 1.6 | 8.0 | 8.9 | 17.6 | |
| | | 23-Apr-10 | 3 | 10.2 | 11.2 | 1.00 | A | 0.8 | 0.8 | 0.8 | 4:10 | 4:21 | 3.2 | 0.0 | 0.01 | 32.3 | 6.0 | 1.6 | 3.2 | 12.4 | 12.8 | Communicated To P-30+188 |
| | | 23-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | A | 560.0 | - | - | 2:09 | 2:53 | 0.0 | 0.0 | 0.00 | 31.0 | 5.0 | 1.6 | 3.5 | 12.3 | 13.2 | |
| | | 23-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | B | 500.0 | - | - | 2:53 | 3:13 | 1.6 | 21.0 | 3.30 | 32.1 | 5.0 | 1.7 | 3.3 | 13.0 | 12.9 | |
| | | 23-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | C | 940.0 | 2000.0 | 500.0 | 3:13 | 4:00 | 2.0 | 23.6 | 2.90 | 31.5 | 3.0 | 1.6 | 3.1 | 12.6 | 13.1 | |
| T-30+183.5 | T | 01-Jul-10 | 4 | 7.83 | 9.33 | 1.50 | MF | 164.9 | 164.9 | 109.9 | 9:51 | 11:11 | 2.0 | 0.0 | 0.01 | 31.6 | 2.0 | 1.5 | 7.4 | 6.8 | 11.9 | |
| | | 07-May-10 | 3 | 9.83 | 10.83 | 1.00 | A* | 27.1 | 27.1 | 27.1 | 3:33 | 3:53 | 2.5 | 0.4 | 0.17 | - | - | - | - | - | 21.0 | Manual Pressure Gauge Reading. |
| | | 07-May-10 | 2 | 10.83 | 15 | 4.17 | A* | 27.5 | 27.5 | 6.6 | 3:03 | 3:29 | 2.6 | 0.3 | 0.05 | - | - | - | - | - | 19.0 | Manual Pressure Gauge Reading. |
| | | 07-May-10 | 1 | 15 | 20.1 | 5.10 | A* | 36.2 | 36.2 | 7.1 | 2:42 | 2:58 | 5.4 | 1.3 | 0.04 | 31.3 | - | 1.7 | 20.0 | 11.0 | 19.0 | Manual Pressure Gauge Reading. |
| S-30+185 | S | 25-Jun-10 | 4 | 8.13 | 9.63 | 1.50 | A | 175.0 | - | - | 15:25 | 15:50 | 1.9 | 12.5 | 3.89 | 31.6 | - | 1.6 | 8.9 | 12.6 | 20.9 | |
| | | 25-Jun-10 | 4 | 8.13 | 9.63 | 1.50 | B | 217.0 | - | - | 15:50 | 16:08 | 2.3 | 12.0 | 3.39 | 36.7 | - | 1.6 | 8.9 | 12.7 | 18.2 | |
| | | 25-Jun-10 | 4 | 8.13 | 9.63 | 1.50 | C | 202.4 | - | - | 16:08 | 16:43 | 2.6 | 4.1 | 0.99 | 48.2 | 4.0 | 1.6 | 8.9 | 12.8 | 17.8 | |
| | | 25-Jun-10 | 4 | 8.13 | 9.63 | 1.50 | D | 127.7 | 722.1 | 481.4 | 16:43 | 17:54 | 2.5 | 0.5 | 0.12 | 62.0 | 5.0 | 1.7 | 8.9 | 12.9 | 17.9 | |
| | | 27-Apr-10 | 3 | 10.2 | 11.2 | 1.00 | A | 21.3 | 21.3 | 21.3 | 6:47 | 7:02 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | A | 650.0 | - | - | 5:03 | 5:48 | 0.0 | 0.0 | 0.00 | 30.0 | - | 1.6 | 3.0 | 12.9 | 22.1 | |
| | | 26-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | B | 368.0 | 1018.0 | 254.5 | 5:48 | 6:41 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+186.5 | T | 01-Jul-10 | 4 | 7.94 | 9.94 | 2.00 | MF | 45.2 | 45.2 | 22.6 | 13:29 | 13:54 | 2.4 | 0.9 | 0.19 | - | - | - | - | - | - | |
| | | 07-May-10 | 3 | 10.44 | 11.44 | 1.00 | A* | 300.0 | - | - | 4:30 | 5:04 | 2.2 | 10.4 | 4.89 | - | - | - | - | - | 21.0 | Manual Pressure Gauge Reading. |
| | | 07-May-10 | 3 | 10.44 | 11.44 | 1.00 | B | 153.6 | 453.6 | 453.6 | 5:04 | 5:40 | 2.5 | 0.0 | 0.01 | 32.0 | 6.0 | 1.7 | 13.0 | 11.0 | 18.0 | Manual Pressure Gauge Reading. |
| | | 07-May-10 | 1,2 | 11.44 | 17.2 | 5.76 | A* | 35.3 | 35.3 | 6.1 | 4:04 | 4:23 | 2.6 | 0.2 | 0.01 | - | - | - | - | - | 21.0 | Manual Pressure Gauge Reading. |
| P-30+188 | P | 25-Jun-10 | 4 | 8.38 | 9.88 | 1.50 | A | 105.2 | - | - | 19:59 | 20:23 | 0.6 | 1.1 | 1.17 | 32.0 | 3.0 | 1.6 | 10.0 | 7.0 | 14.0 | Communicated To S-30+185 |
| | | 25-Jun-10 | 4 | 8.38 | 9.88 | 1.50 | B | 236.4 | - | - | 20:23 | 20:56 | 2.5 | 13.1 | 3.97 | 36.4 | 3.0 | 1.6 | 10.0 | 7.0 | 15.0 | |
| | | 25-Jun-10 | 4 | 8.38 | 9.88 | 1.50 | C | 118.2 | 459.8 | 306.5 | 20:56 | 21:23 | 2.6 | 0.5 | 0.14 | 45.8 | - | 1.6 | 10.0 | 7.0 | 18.0 | |
| | | 24-Apr-10 | 3 | 10.4 | 11.4 | 1.00 | A | 528.4 | 528.4 | 528.4 | 8:43 | 9:36 | 2.1 | 12.0 | 5.84 | 30.0 | 4.0 | 1.6 | 2.0 | 12.0 | 14.0 | |
| | | 23-Apr-10 | 2 | 11.4 | 15.4 | 4.00 | A | 703.0 | 703.0 | 175.8 | 4:23 | 5:50 | 0.2 | 18.2 | 0.03 | - | - | - | - | - | - | Communicated To P-30+182 |
| T-30+189.5 | T | 01-Jul-10 | 4 | 7.65 | 9.15 | 1.50 | MF | 181.7 | 181.7 | 121.1 | 13:57 | 15:23 | 2.7 | 0.3 | 0.08 | 31.1 | - | 1.5 | 8.2 | 7.0 | 12.4 | |
| | | 08-May-10 | 3 | 9.65 | 10.65 | 1.00 | A | 18.5 | 18.5 | 18.5 | 10:04 | 10:14 | 2.5 | 0.4 | 0.17 | - | - | - | - | - | - | Manual Pressure Gauge Reading. |
| | | 08-May-10 | 2 | 10.65 | 14.7 | 4.05 | A | 39.3 | 39.3 | 9.7 | 9:40 | 9:56 | 2.6 | 0.6 | 0.05 | - | - | - | - | - | - | Manual Pressure Gauge Reading. |
| | | 08-May-10 | 1 | 14.7 | 20.1 | 5.40 | A | 27.2 | 27.2 | 5.0 | 9:24 | 9:34 | 5.4 | 0.3 | 0.01 | 31.9 | 5.0 | 1.7 | 16.8 | 14.7 | 13.9 | Manual Pressure Gauge Reading. |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+191 | S | 25-Jun-10 | 4 | 7.83 | 9.33 | 1.50 | A | 155.7 | - | - | 21:33 | 21:51 | 1.7 | 13.5 | 5.08 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 4 | 7.83 | 9.33 | 1.50 | B | 208.0 | - | - | 21:51 | 22:09 | 2.7 | 13.7 | 4.64 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 4 | 7.83 | 9.33 | 1.50 | C | 216.8 | 580.5 | 387.0 | 22:09 | 23:06 | 2.3 | 0.7 | 0.20 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 3 | 9.8 | 10.8 | 1.00 | A | 9.6 | 9.6 | 9.6 | 11:49 | 12:04 | 3.5 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 2 | 10.8 | 14.8 | 4.00 | A | 529.0 | - | - | 9:35 | 10:25 | 2.2 | 16.4 | 2.01 | 33.0 | 4.0 | 1.6 | 2.0 | 11.0 | 12.0 | |
| | | 27-Apr-10 | 2 | 10.8 | 14.8 | 4.00 | B | 455.0 | 984.0 | 246.0 | 10:25 | 11:46 | 2.5 | 0.0 | 0.00 | 35.0 | 4.0 | 1.7 | 7.0 | 13.0 | 11.0 | |
| T-30+192.5 | T | 01-Jul-10 | 4 | 7.6 | 9.1 | 1.50 | MF | 244.3 | 244.3 | 162.9 | 15:31 | 17:25 | 2.1 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 9.6 | 10.6 | 1.00 | A | 19.9 | 19.9 | 19.9 | 11:11 | 11:24 | 2.5 | 0.4 | 0.17 | - | - | - | - | - | - | Manual Pressure Gauge Reading. |
| | | 08-May-10 | 2 | 10.6 | 14.6 | 4.00 | A | 32.2 | 32.2 | 8.1 | 10:50 | 11:04 | 2.6 | 0.4 | 0.04 | - | - | - | - | - | - | Manual Pressure Gauge Reading. |
| | | 08-May-10 | 1 | 14.6 | 20.5 | 5.90 | A | 36.6 | 36.6 | 6.2 | 10:31 | 10:46 | 5.4 | 0.4 | 0.01 | - | - | - | - | - | - | Manual Pressure Gauge Reading. |
| P-30+194 | P | 25-Jun-10 | 4 | 7.42 | 8.92 | 1.50 | E | 33.0 | 1000.0 | 666.7 | 1:10 | 1:14 | 2.6 | 8.3 | 2.15 | 53.2 | - | 1.7 | 10.0 | 7.0 | 19.0 | |
| | | 25-Jun-10 | 4 | 7.42 | 8.92 | 1.50 | A | 152.4 | - | - | 23:15 | 23:39 | 1.4 | 11.5 | 4.70 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 4 | 7.42 | 8.92 | 1.50 | B | 207.3 | - | - | 23:39 | 23:59 | 2.0 | 12.9 | 4.58 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 4 | 7.42 | 8.92 | 1.50 | C | 191.6 | - | - | 23:59 | 0:20 | 2.2 | 10.7 | 3.08 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 4 | 7.42 | 8.92 | 1.50 | D | 205.9 | - | - | 0:20 | 0:45 | 2.2 | 8.3 | 2.63 | 63.6 | 0.2 | 1.7 | 10.0 | 7.0 | 19.0 | By-Pass: Outside Casing |
| | | 25-Jun-10 | 4 | 7.42 | 8.92 | 1.50 | D+ | 209.8 | - | - | 0:45 | 1:10 | 2.5 | 10.0 | 2.42 | 59.1 | 0.2 | 1.7 | 10.0 | 7.0 | 19.0 | |
| | | 24-Apr-10 | 3 | 9.5 | 10.5 | 1.00 | A | 87.0 | 87.0 | 87.0 | 11:08 | 11:36 | 3.1 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 10.5 | 14.5 | 4.00 | A | 413.0 | 413.0 | 103.3 | 9:49 | 11:04 | 2.6 | 1.1 | 0.11 | - | - | - | - | - | - | |
| T-30+195.5 | T | 01-Jul-10 | 4 | 7.67 | 9.17 | 1.50 | MF | 353.7 | 353.7 | 235.8 | 17:35 | 19:22 | 2.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 9.67 | 10.67 | 1.00 | A | 7.9 | 7.9 | 7.9 | 12:03 | 12:20 | 2.5 | 0.4 | 0.06 | - | - | - | - | - | - | Manual Pressure Gauge Reading. |
| | | 08-May-10 | 2 | 10.67 | 14.6 | 3.93 | A | 218.0 | 218.0 | 55.5 | 11:34 | 11:58 | 2.7 | 12.4 | 1.15 | - | - | - | - | - | - | By-Pass |
| S-30+197 | S | 25-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | A | 154.9 | - | - | 3:52 | 4:10 | 1.6 | 12.6 | 6.03 | 32.4 | - | 1.6 | 10.0 | 7.0 | 19.0 | Communicated To P-30+194; |
| | | 25-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | B | 102.5 | - | - | 4:10 | 4:26 | 2.1 | 15.3 | 5.27 | 36.5 | - | 1.7 | 5.0 | 8.0 | 14.0 | Outside Casing |
| | | 25-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | C | 268.8 | - | - | 4:26 | 4:46 | 2.4 | 8.8 | 2.55 | 49.0 | 4.0 | 1.6 | 5.0 | 8.0 | 16.0 | |
| | | 25-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | D | 241.6 | - | - | 4:46 | 5:30 | 2.4 | 1.2 | 0.33 | 61.1 | - | 1.6 | 5.0 | 8.0 | 16.0 | |
| | | 25-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | D+ | 113.2 | 881.0 | 587.3 | 5:30 | 6:26 | 2.3 | 0.7 | 0.25 | 78.0 | - | 1.7 | 5.0 | 8.0 | 16.0 | |
| | | 27-Apr-10 | 3 | 10.3 | 11.3 | 1.00 | A | 23.4 | 23.4 | 23.4 | 15:17 | 15:29 | 3.3 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 2 | 11.3 | 15.3 | 4.00 | A | 594.0 | - | - | 13:53 | 14:39 | 2.2 | 17.7 | 2.00 | 32.0 | - | 1.6 | 10.0 | 9.0 | 13.0 | |
| | | 27-Apr-10 | 2 | 11.3 | 15.3 | 4.00 | B | 202.4 | 796.4 | 199.1 | 14:39 | 15:14 | 2.6 | 0.1 | 0.01 | 36.0 | - | 1.7 | - | 10.0 | 12.0 | |
| T-30+198.5 | T | 01-Jul-10 | 4 | 8.15 | 10.15 | 2.00 | MF | 52.6 | 52.6 | 26.3 | 19:30 | 20:02 | 1.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 10.65 | 11.65 | 1.00 | A | 13.1 | 13.1 | 13.1 | 16:54 | 17:13 | 2.2 | 0.2 | 0.10 | - | - | - | - | - | - | |
| | | 08-May-10 | 2 | 11.65 | 15.8 | 4.15 | A | 549.8 | - | - | 15:12 | 15:57 | 1.5 | 20.4 | 2.35 | 32.3 | 3.0 | 1.6 | 26.4 | 10.3 | 23.4 | Pressure Transducer Fixed. |
| | | 08-May-10 | 2 | 11.65 | 15.8 | 4.15 | B | 469.2 | 1019.0 | 245.5 | 15:57 | 16:46 | 2.6 | 0.1 | 0.01 | 37.7 | 4.0 | 1.7 | 10.2 | - | - | |
| P-30+200 | P | 26-Jun-10 | 4 | 7.55 | 9.05 | 1.50 | A | 231.9 | - | - | 6:54 | 7:29 | 2.1 | 12.8 | 4.64 | 31.6 | 4.0 | 1.6 | 7.8 | 9.6 | 13.4 | Communicated To S-30+185 |
| | | 26-Jun-10 | 4 | 7.55 | 9.05 | 1.50 | B | 199.3 | - | - | 7:29 | 7:45 | 2.5 | 11.5 | 3.19 | 36.5 | 7.0 | 1.6 | 7.8 | 9.7 | 14.7 | |
| | | 26-Jun-10 | 4 | 7.55 | 9.05 | 1.50 | C | 187.4 | - | - | 7:45 | 8:07 | 2.5 | 12.1 | 3.34 | 47.9 | - | 1.6 | 7.9 | 9.6 | 13.7 | |
| | | 26-Jun-10 | 4 | 7.55 | 9.05 | 1.50 | D | 201.4 | 820.0 | 546.7 | 8:07 | 9:35 | 2.5 | 0.5 | 0.14 | 66.1 | 0.6 | 1.7 | 7.9 | 9.5 | 14.2 | |
| | | 24-Apr-10 | 3 | 9.6 | 10.6 | 1.00 | A | 30.1 | 30.1 | 30.1 | 14:07 | 14:24 | 3.3 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 10.6 | 14.6 | 4.00 | A | 144.0 | 144.0 | 36.0 | 13:32 | 14:03 | 2.5 | 1.7 | 0.18 | 34.0 | 3.0 | 1.7 | 5.0 | 9.0 | 15.0 | |
| T-30+201.5 | T | 01-Jul-10 | 4 | 7.5 | 9 | 1.50 | MF | 65.6 | 65.6 | 43.7 | 20:06 | 21:00 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 9.5 | 10.5 | 1.00 | A | 302.6 | - | - | 5:13 | 5:30 | 2.5 | 15.2 | 6.50 | - | - | - | - | - | 21.0 | |
| | | 08-May-10 | 3 | 9.5 | 10.5 | 1.00 | B | 199.1 | 501.7 | 501.7 | 5:30 | 6:07 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-May-10 | 2 | 10.5 | 14.8 | 4.30 | A | 27.0 | 27.0 | 6.3 | 4:55 | 5:10 | 3.2 | 0.1 | 0.01 | 31.0 | - | 1.7 | - | - | 19.0 | |
| S-30+203 | S | 26-Jun-10 | 4 | 7.75 | 9.25 | 1.50 | A | 204.8 | - | - | 9:54 | 10:24 | 1.9 | 11.0 | 3.74 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 4 | 7.75 | 9.25 | 1.50 | B | 202.5 | - | - | 10:24 | 10:49 | 2.7 | 9.9 | 2.71 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 4 | 7.75 | 9.25 | 1.50 | C | 233.8 | 641.1 | 427.4 | 10:49 | 12:01 | 2.5 | 0.4 | 0.11 | 47.3 | - | 1.6 | 9.9 | 10.1 | 16.3 | Total Volume: 641.1 L |
| | | 27-Apr-10 | 3 | 10 | 11 | 1.00 | A | 26.1 | 26.1 | 26.1 | 17:07 | 17:21 | 3.4 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 2 | 11 | 15 | 4.00 | A | 518.0 | - | - | 15:36 | 16:36 | 2.5 | 0.9 | 0.89 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 2 | 11 | 15 | 4.00 | B | 137.4 | 655.4 | 163.9 | 16:36 | 17:05 | 2.6 | 0.1 | 0.01 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+204.5 | T | 01-Jul-10 | 4 | 7.86 | 9.36 | 1.50 | MF | 126.0 | 126.0 | 84.0 | 21:05 | 21:54 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 9.86 | 10.86 | 1.00 | A | 310.0 | - | - | 3:51 | 4:11 | 2.0 | 14.5 | 6.00 | - | - | - | - | - | 19.0 | |
| | | 08-May-10 | 3 | 9.86 | 10.86 | 1.00 | B | 240.2 | 550.2 | 550.2 | 4:11 | 4:43 | 2.6 | 0.1 | 0.06 | 35.0 | - | 1.7 | 8.0 | 8.0 | 13.0 | |
| | | 08-May-10 | 2 | 10.86 | 14.8 | 3.94 | A | 27.4 | 27.4 | 7.0 | 3:32 | 3:48 | 2.6 | 0.1 | 0.01 | - | - | - | - | - | 18.0 | |
| P-30+206 | P | 26-Jun-10 | 4 | 7.3 | 8.8 | 1.50 | A | 162.0 | - | - | 14:32 | 14:58 | 2.3 | 12.0 | 3.67 | 31.5 | - | 1.6 | 9.7 | 9.8 | 17.8 | |
| | | 26-Jun-10 | 4 | 7.3 | 8.8 | 1.50 | B | 180.0 | - | - | 14:58 | 15:14 | 2.5 | 10.6 | 2.80 | 35.0 | - | 1.6 | 9.9 | 9.8 | 17.8 | |
| | | 26-Jun-10 | 4 | 7.3 | 8.8 | 1.50 | C | 165.8 | 507.8 | 338.5 | 15:14 | 16:19 | 2.5 | 0.7 | 0.18 | 47.1 | 10.0 | 1.6 | 9.9 | 9.8 | 16.6 | |
| | | 24-Apr-10 | 3 | 9.4 | 10.4 | 1.00 | A | 15.7 | 15.7 | 15.7 | 15:26 | 15:38 | 3.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 10.4 | 14.4 | 4.00 | A | 48.2 | 48.2 | 12.1 | 15:05 | 15:23 | 2.8 | 1.6 | 0.15 | - | - | - | - | - | - | |
| T-30+207.5 | T | 01-Jul-10 | 4 | 7.52 | 9.02 | 1.50 | MF | 211.9 | 211.9 | 141.3 | 21:57 | 22:45 | 2.0 | 0.4 | 0.12 | 32.2 | 2.0 | 1.4 | 10.8 | 12.9 | 17.6 | |
| | | 08-May-10 | 3 | 9.52 | 10.52 | 1.00 | A | 24.3 | 24.3 | 24.3 | 3:05 | 3:21 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | 17.0 | |
| | | 08-May-10 | 2 | 10.52 | 14.5 | 3.98 | A | 26.0 | 26.0 | 6.7 | 2:45 | 3:01 | 2.6 | 0.3 | 0.00 | - | - | - | - | - | 16.0 | |
| | | 08-May-10 | 1 | 14.5 | 20.3 | 5.80 | A | 49.0 | 49.0 | 8.4 | 2:28 | 2:42 | 5.4 | 0.5 | 0.02 | 31.0 | 5.0 | 1.7 | 5.0 | 9.0 | 16.0 | |
| S-30+209 | S | 26-Jun-10 | 4 | 7.97 | 9.47 | 1.50 | A | 200.0 | - | - | 16:33 | 17:01 | 2.2 | 12.5 | 3.16 | - | - | - | - | - | - | Communicated To P-30+212 |
| | | 26-Jun-10 | 4 | 7.97 | 9.47 | 1.50 | B | 235.6 | - | - | 17:01 | 17:19 | 2.2 | 14.8 | 5.73 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 4 | 7.97 | 9.47 | 1.50 | C | 271.9 | - | - | 17:19 | 17:41 | 2.6 | 14.9 | 4.18 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 4 | 7.97 | 9.47 | 1.50 | D | 295.5 | 1003.0 | 668.7 | 17:41 | 18:21 | 2.6 | 9.3 | 2.39 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 3 | 9.9 | 10.9 | 1.00 | A | 11.0 | 11.0 | 11.0 | 22:27 | 22:37 | 3.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 2 | 10.9 | 15.6 | 4.70 | A | 611.0 | - | - | 20:25 | 21:10 | 0.0 | 0.0 | 0.00 | 32.4 | 5.0 | 1.7 | 2.0 | 12.9 | 23.0 | |
| | | 27-Apr-10 | 2 | 10.9 | 15.6 | 4.70 | B | 450.0 | - | - | 21:10 | 21:46 | 0.0 | 0.0 | 0.00 | 36.3 | 6.0 | 1.6 | 3.4 | 11.0 | 21.0 | |
| | | 27-Apr-10 | 2 | 10.9 | 15.6 | 4.70 | C | 465.0 | 1526.0 | 324.7 | 21:46 | 22:37 | 2.6 | 0.1 | 0.01 | 47.1 | 4.0 | 1.6 | 3.5 | 13.2 | 20.8 | |
| T-30+210.5 | T | 01-Jul-10 | 4 | 8.04 | 9.54 | 1.50 | MF | 69.9 | 69.9 | 46.6 | 22:49 | 23:23 | 1.9 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 10.04 | 11.04 | 1.00 | A | 224.1 | - | - | 23:09 | 23:25 | 2.4 | 15.5 | 5.13 | - | - | - | - | - | 17.0 | |
| | | 08-May-10 | 3 | 10.04 | 11.04 | 1.00 | B | 304.3 | - | - | 23:25 | 23:49 | 2.4 | 17.0 | 7.00 | 35.0 | 5.0 | 1.7 | - | - | - | |
| | | 08-May-10 | 3 | 10.04 | 11.04 | 1.00 | C | 18.0 | 546.4 | 546.4 | 23:49 | 0:14 | 2.6 | 0.0 | 0.01 | 44.0 | - | 1.7 | - | - | - | |
| | | 08-May-10 | 2 | 11.04 | 15 | 3.96 | A | 22.7 | 22.7 | 5.7 | 22:50 | 23:06 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | 16.0 | Manual Pressure Gauge Reading. |
| | | 08-May-10 | 1 | 15 | 20.4 | 5.40 | A | 47.9 | 47.9 | 8.9 | 22:34 | 22:48 | 5.7 | 0.7 | 0.02 | 32.0 | - | 1.7 | - | - | 15.0 | |
| P-30+212 | P | 26-Jun-10 | 4 | 8 | 9.5 | 1.50 | A | 162.9 | - | - | 19:55 | 20:19 | 2.0 | 12.3 | 3.76 | 31.8 | 3.0 | 1.6 | 6.0 | 9.0 | 15.0 | Communicate To S-30+203 |
| | | 26-Jun-10 | 4 | 8 | 9.5 | 1.50 | B | 188.8 | - | - | 20:19 | 20:35 | 2.5 | 13.2 | 3.46 | 36.7 | 3.4 | 1.6 | 6.0 | 9.0 | 16.0 | |
| | | 26-Jun-10 | 4 | 8 | 9.5 | 1.50 | C | 179.8 | - | - | 20:35 | 21:45 | 2.5 | 0.9 | 0.36 | 46.8 | - | 1.6 | 6.0 | 9.0 | 18.0 | Communicated To P-30+210; |
| | | 26-Jun-10 | 4 | 8 | 9.5 | 1.50 | D | 6.7 | 538.2 | 358.8 | 21:45 | 21:56 | 2.4 | 0.6 | 0.16 | 61.0 | 0.6 | 1.6 | 6.0 | 9.0 | 21.0 | Outside Casing |
| | | 24-Apr-10 | 3 | 10.2 | 11.2 | 1.00 | A | 11.0 | 11.0 | 11.0 | 19:28 | 19:41 | 3.1 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | A | 500.0 | - | - | 16:53 | 17:50 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | B | 535.0 | - | - | 17:50 | 18:15 | 0.0 | 0.0 | 0.00 | 35.0 | 7.0 | 1.6 | 1.0 | 10.0 | 12.0 | |
| | | 24-Apr-10 | 2 | 11.2 | 15.2 | 4.00 | C | 965.0 | 2000.0 | 500.0 | 18:15 | 19:14 | 2.3 | 11.4 | 1.25 | 48.0 | 2.0 | 1.8 | 1.0 | 10.0 | 10.0 | Total Volume: 2000 L |
| T-30+213.5 | T | 01-Jul-10 | 4 | 7.68 | 9.18 | 1.50 | MF | 100.0 | 100.0 | 66.7 | 1:40 | 2:26 | 2.0 | 0.6 | 0.20 | - | - | - | - | - | - | Communicated To T-30+207.5 |
| | | 08-May-10 | 3 | 9.68 | 10.68 | 1.00 | A | 227.6 | - | - | 20:38 | 20:58 | 2.0 | 16.0 | 10.10 | - | - | - | - | - | 21.0 | |
| | | 08-May-10 | 3 | 9.68 | 10.68 | 1.00 | B | 337.1 | - | - | 20:58 | 21:26 | 2.9 | 18.0 | 7.50 | 36.0 | 8.0 | 1.7 | 8.0 | 10.0 | 17.0 | |
| | | 08-May-10 | 3 | 9.68 | 10.68 | 1.00 | C | 168.3 | 733.0 | 733.0 | 21:26 | 21:42 | 2.5 | 0.2 | 0.06 | 47.0 | 7.5 | 1.7 | 6.0 | 10.0 | 16.0 | |
| | | 08-May-10 | 2 | 10.68 | 14.7 | 4.02 | A | 22.2 | 22.2 | 5.5 | 20:20 | 20:33 | 2.6 | 0.1 | 0.01 | - | - | - | - | - | 21.0 | |
| | | 08-May-10 | 1 | 14.7 | 20.4 | 5.70 | A | 29.0 | 29.0 | 5.1 | 20:01 | 20:16 | 5.4 | 0.0 | 0.00 | 31.0 | 7.0 | 1.6 | 8.0 | 10.0 | 20.0 | |
| S-30+215 | S | 26-Jun-10 | 4 | 7.88 | 9.38 | 1.50 | A | 163.6 | - | - | 0:39 | 0:54 | 2.4 | 12.4 | 3.03 | 32.2 | - | 1.7 | 7.0 | 10.0 | 15.0 | |
| | | 26-Jun-10 | 4 | 7.88 | 9.38 | 1.50 | B | 193.9 | - | - | 0:54 | 1:12 | 2.8 | 13.0 | 3.24 | 36.0 | - | 1.6 | 7.0 | 10.0 | 15.0 | |
| | | 26-Jun-10 | 4 | 7.88 | 9.38 | 1.50 | C | 89.5 | - | - | 1:12 | 1:46 | 2.6 | 1.5 | 0.33 | 49.4 | 3.0 | 1.6 | 7.0 | 9.0 | 18.0 | Communicated ~ 2.1 m South |
| | | 26-Jun-10 | 4 | 7.88 | 9.38 | 1.50 | D | 5.6 | 452.6 | 301.7 | 1:46 | 1:59 | 2.6 | 0.1 | 0.04 | 61.7 | - | 1.6 | 7.0 | 9.0 | 19.0 | of P-30+209 at Ground Surface |
| | | 27-Apr-10 | 3 | 10 | 11 | 1.00 | A | 1.7 | 1.7 | 1.7 | 1:07 | 1:19 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 2 | 11 | 15 | 4.00 | A | 518.0 | - | - | 22:49 | 23:14 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 2 | 11 | 15 | 4.00 | B | 484.0 | - | - | 23:14 | 0:09 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 2 | 11 | 15 | 4.00 | C | 182.0 | 1184.0 | 296.0 | 0:09 | 0:56 | 2.6 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-30+216.5 | T | 01-Jul-10 | 4 | 7.5 | 9 | 1.50 | MF | 101.9 | 101.9 | 67.9 | 2:30 | 3:02 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 9.5 | 10.5 | 1.00 | A | 80.9 | 80.9 | 80.9 | 9:49 | 10:26 | 2.4 | 0.5 | 0.22 | - | - | - | - | - | 19.1 | |
| | | 09-May-10 | 2 | 10.5 | 14.5 | 4.00 | A | 22.6 | 22.6 | 5.7 | 9:28 | 9:43 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | 33.0 | |
| | | 09-May-10 | 1 | 14.5 | 20.5 | 6.00 | A | 80.1 | 80.1 | 13.4 | 8:50 | 9:18 | 5.5 | 0.7 | 0.02 | 30.1 | 5.0 | 1.6 | 14.8 | 11.8 | 23.4 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+218 | P | 26-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | A | 175.8 | - | - | 2:09 | 2:33 | 2.2 | 12.2 | 3.90 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | B | 186.3 | - | - | 2:33 | 2:48 | 2.5 | 13.1 | 3.73 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 4 | 7.73 | 9.23 | 1.50 | C | 126.4 | 488.5 | 325.7 | 2:48 | 3:31 | 2.3 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 3 | 9.8 | 10.8 | 1.00 | A | 2.2 | 2.2 | 2.2 | 22:13 | 22:20 | 3.3 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 10.8 | 14.8 | 4.00 | A | 560.0 | - | - | 19:53 | 20:38 | 1.0 | 20.9 | 5.01 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 10.8 | 14.8 | 4.00 | B | 500.0 | - | - | 20:38 | 21:01 | 1.5 | 21.1 | 0.00 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 10.8 | 14.8 | 4.00 | C | 694.0 | 1754.0 | 438.5 | 21:01 | 22:04 | 2.7 | 0.1 | 0.01 | 42.0 | - | 1.8 | 1.0 | 11.9 | 12.1 | |
| T-30+219.5 | T | 01-Jul-10 | 4 | 8.09 | 9.59 | 1.50 | MF | 78.4 | 78.4 | 52.3 | 3:06 | 3:45 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 10.09 | 11.09 | 1.00 | A | 95.5 | 95.5 | 95.5 | 11:28 | 12:31 | 2.5 | 0.1 | 0.04 | - | - | - | - | - | 17.7 | |
| | | 09-May-10 | 2 | 11.09 | 15.1 | 4.01 | A | 22.2 | 22.2 | 5.5 | 11:03 | 11:17 | 2.5 | 0.1 | 0.01 | - | - | - | - | - | 18.4 | |
| | | 09-May-10 | 1 | 15.1 | 20.5 | 5.40 | A | 48.2 | 48.2 | 8.9 | 10:34 | 10:56 | 5.5 | 0.2 | 0.01 | - | - | - | - | - | 21.3 | |
| S-30+221 | S | 26-Jun-10 | 4 | 7.8 | 9.3 | 1.50 | A | 166.3 | - | - | 3:43 | 4:06 | 2.2 | 12.1 | 3.70 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 4 | 7.8 | 9.3 | 1.50 | B | 184.2 | - | - | 4:06 | 4:22 | 2.6 | 12.6 | 3.20 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 4 | 7.8 | 9.3 | 1.50 | C | 145.9 | 496.4 | 330.9 | 4:22 | 5:16 | 2.3 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 09-May-10 | 3A | 10.14 | 10.3 | 0.16 | A | 22.9 | 22.9 | 143.1 | 5:12 | 5:25 | 3.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 3 | 10.3 | 11.3 | 1.00 | A | 470.0 | - | - | 5:27 | 6:07 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 3 | 10.3 | 11.3 | 1.00 | B | 507.0 | 977.0 | 977.0 | 6:07 | 7:10 | 2.8 | 9.4 | 3.40 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 2 | 11.3 | 15.3 | 4.00 | A | 500.0 | - | - | 3:57 | 4:35 | 0.0 | 0.0 | 0.00 | 33.1 | 6.0 | 1.6 | 3.1 | 11.4 | 21.1 | |
| | | 27-Apr-10 | 2 | 11.3 | 15.3 | 4.00 | B | 495.0 | - | - | 4:35 | 4:57 | 0.0 | 0.0 | 0.00 | 36.1 | - | 1.6 | 3.2 | 13.6 | 19.8 | |
| | | 27-Apr-10 | 2 | 11.3 | 15.3 | 4.00 | C | 163.0 | 1158.0 | 289.5 | 4:57 | 5:19 | 2.5 | 0.1 | 0.01 | 47.1 | - | 1.6 | 3.4 | 13.6 | 21.0 | |
| T-30+222.5 | T | 01-Jul-10 | 4 | 7.72 | 9.22 | 1.50 | MF | 57.4 | 57.4 | 38.3 | 3:47 | 4:16 | 2.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 9.72 | 10.72 | 1.00 | A | 384.9 | - | - | 15:27 | 16:17 | 2.5 | 3.7 | 1.49 | - | - | - | - | - | 18.4 | |
| | | 09-May-10 | 3 | 9.72 | 10.72 | 1.00 | B | 4.1 | 389.0 | 389.0 | 16:17 | 16:30 | 2.4 | 0.1 | 0.03 | 36.1 | - | 1.6 | 8.2 | 13.1 | 18.1 | |
| | | 09-May-10 | 2 | 10.72 | 14.7 | 3.98 | A | 27.3 | 27.3 | 6.9 | 15:08 | 15:22 | 2.5 | 0.4 | 0.04 | - | - | - | - | - | 17.2 | |
| | | 09-May-10 | 1 | 14.7 | 20.6 | 5.90 | A | 65.6 | 65.6 | 11.1 | 14:37 | 15:02 | 5.4 | 1.1 | 0.04 | 32.6 | 5.0 | 1.6 | 13.9 | 12.9 | 23.8 | |
| P-30+224 | P | 27-Jun-10 | 4 | 7.4 | 8.9 | 1.50 | A | 196.7 | - | - | 7:53 | 8:17 | 2.0 | 12.8 | 4.23 | 31.2 | 3.0 | 1.6 | 8.7 | 11.8 | 18.7 | Communicated To P-30+218 |
| | | 27-Jun-10 | 4 | 7.4 | 8.9 | 1.50 | B | 201.3 | - | - | 8:17 | 8:30 | 2.5 | 13.4 | 3.71 | 36.7 | - | 1.6 | 9.2 | 12.1 | 19.4 | |
| | | 27-Jun-10 | 4 | 7.4 | 8.9 | 1.50 | C | 499.1 | - | - | 8:30 | 9:02 | 2.5 | 15.0 | 4.15 | 46.2 | 10.1 | 1.6 | 9.2 | 12.1 | 20.1 | |
| | | 27-Jun-10 | 4 | 7.4 | 8.9 | 1.50 | D | 129.9 | 1027.0 | 684.7 | 9:02 | 9:42 | 2.1 | 27.0 | 8.43 | 63.8 | - | 1.6 | 9.2 | 12.1 | 18.4 | |
| | | 24-Apr-10 | 3 | 9.5 | 10.5 | 1.00 | A | 0.3 | 0.3 | 0.3 | 0:59 | 1:06 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 10.5 | 14.5 | 4.00 | A | 560.0 | - | - | 22:40 | 23:18 | 1.9 | 20.8 | 2.74 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 10.5 | 14.5 | 4.00 | B | 440.0 | - | - | 23:18 | 23:43 | 2.1 | 22.4 | 2.81 | - | - | - | - | - | - | |
| | | 24-Apr-10 | 2 | 10.5 | 14.5 | 4.00 | C | 553.0 | 1553.0 | 388.3 | 23:43 | 0:49 | 2.6 | 0.0 | 0.00 | 45.0 | 1.0 | 1.8 | 3.0 | 11.0 | 11.8 | |
| T-30+225.5 | T | 06-Jul-10 | 4 | 7.65 | 9.15 | 1.50 | MF | 52.9 | 52.9 | 35.3 | 15:24 | 15:51 | 2.0 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 29-May-10 | 3 | 9.65 | 10.65 | 1.00 | A | 160.1 | - | - | 19:48 | 20:13 | 2.3 | 8.4 | 3.97 | - | - | - | - | - | - | |
| | | 29-May-10 | 3 | 9.65 | 10.65 | 1.00 | B | 296.5 | 456.6 | 456.6 | 20:13 | 20:50 | 2.9 | 0.0 | 0.01 | 37.4 | 3.5 | 1.7 | 21.0 | 18.0 | 23.0 | |
| | | 29-May-10 | 2 | 10.65 | 14.7 | 4.05 | A | 30.8 | 30.8 | 7.6 | 19:22 | 19:40 | 2.6 | 0.0 | 0.00 | 31.0 | 4.0 | 1.7 | 21.0 | 18.0 | 20.0 | |
| S-30+227 | S | 01-Jul-10 | 4 | 7.35 | 8.85 | 1.50 | A | 93.3 | 93.3 | 62.2 | 4:25 | 4:58 | 2.5 | 0.7 | 0.19 | 32.2 | 4.0 | 1.7 | 15.8 | 14.2 | 19.6 | |
| | | 26-May-10 | 3 | 9.351 | 10.35 | 1.00 | A | 166.8 | - | - | 3:40 | 4:12 | 1.9 | 9.9 | 5.11 | 30.8 | - | 1.7 | 11.0 | 15.0 | 21.0 | |
| | | 26-May-10 | 3 | 9.351 | 10.35 | 1.00 | B | 183.7 | - | - | 4:12 | 4:29 | 2.1 | 12.4 | 6.19 | - | - | - | - | - | - | |
| | | 26-May-10 | 3 | 9.351 | 10.35 | 1.00 | C | 247.1 | 597.6 | 598.2 | 4:29 | 5:06 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-May-10 | 2 | 10.35 | 14.4 | 4.05 | A | 25.6 | 25.6 | 6.3 | 3:06 | 3:24 | 2.8 | 0.3 | 0.03 | - | - | - | - | - | - | |
| T-30+228.5 | T | 06-Jul-10 | 4 | 6.94 | 8.44 | 1.50 | MF | 117.8 | 117.8 | 78.5 | 14:23 | 15:18 | 2.3 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 29-May-10 | 3 | 8.94 | 9.94 | 1.00 | A | 41.9 | 41.9 | 41.9 | 21:46 | 22:13 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 29-May-10 | 2 | 9.94 | 13.9 | 3.96 | A | 58.7 | 58.7 | 14.8 | 21:04 | 21:40 | 2.6 | 0.7 | 0.08 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+230 | P | 27-Jun-10 | 4 | 7.16 | 8.66 | 1.50 | A | 193.2 | - | - | 9:37 | 10:00 | 1.8 | 13.8 | 5.28 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 7.16 | 8.66 | 1.50 | B | 230.2 | - | - | 10:00 | 10:16 | 2.3 | 11.7 | 3.03 | 37.4 | 9.1 | 1.6 | 9.2 | 12.1 | 18.6 | |
| | | 27-Jun-10 | 4 | 7.16 | 8.66 | 1.50 | C | 205.8 | - | - | 10:16 | 10:33 | 2.5 | 14.2 | 3.92 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 7.16 | 8.66 | 1.50 | D | 170.1 | 799.3 | 532.9 | 10:33 | 11:37 | 2.5 | 0.5 | 0.13 | 65.9 | - | 1.7 | 9.2 | 12.1 | 19.7 | |
| | | 24-May-10 | 3 | 8.82 | 9.92 | 1.10 | A | 153.4 | - | - | 13:12 | 13:31 | 0.8 | 12.1 | 14.50 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 8.82 | 9.92 | 1.10 | B | 281.2 | - | - | 13:31 | 13:47 | 1.7 | 21.1 | 13.35 | 34.5 | 4.0 | 1.6 | 18.7 | 5.1 | 11.3 | |
| | | 24-May-10 | 3 | 8.82 | 9.92 | 1.10 | C | 254.6 | - | - | 13:47 | 13:58 | 2.7 | 24.4 | 9.40 | 42.0 | - | 1.6 | 17.0 | 5.6 | 12.2 | |
| | | 24-May-10 | 3 | 8.82 | 9.92 | 1.10 | D | 237.8 | 927.0 | 842.7 | 13:58 | 14:34 | 2.9 | 0.0 | 0.02 | 57.0 | - | 1.7 | 17.9 | 5.4 | 12.6 | |
| | | 24-May-10 | 2 | 9.92 | 14 | 4.08 | A | 39.1 | 39.1 | 9.6 | 12:51 | 13:05 | 2.5 | 0.3 | 0.02 | 32.0 | 5.0 | 1.6 | 10.4 | 5.1 | 10.4 | |
| T-30+231.5 | T | 06-Jul-10 | 4 | 7.07 | 8.57 | 1.50 | MF | 160.4 | 160.4 | 106.9 | 13:09 | 14:05 | 1.9 | 0.3 | 0.10 | 31.8 | - | 1.5 | 11.9 | 9.6 | 12.9 | |
| | | 29-May-10 | 3 | 9.07 | 10.07 | 1.00 | A | 190.1 | - | - | 22:44 | 23:16 | 2.2 | 9.4 | 4.72 | - | - | - | - | - | - | |
| | | 29-May-10 | 3 | 9.07 | 10.07 | 1.00 | B | 175.0 | 365.1 | 365.1 | 23:16 | 23:50 | 2.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 29-May-10 | 2 | 10.07 | 14.1 | 4.03 | A | 35.5 | 35.5 | 8.8 | 22:19 | 22:40 | 2.6 | 0.2 | 0.02 | - | - | - | - | - | - | |
| S-30+233 | S | 01-Jul-10 | 4 | 7.3 | 8.8 | 1.50 | A | 298.8 | 298.8 | 199.2 | 5:02 | 6:21 | 2.5 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 26-May-10 | 3 | 9.3 | 10.3 | 1.00 | A | 24.6 | 24.6 | 24.6 | 5:40 | 5:47 | 2.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 26-May-10 | 2 | 10.3 | 14.3 | 4.00 | A | 25.4 | 25.4 | 6.4 | 5:16 | 5:37 | 2.9 | 0.6 | 0.05 | - | - | - | - | - | - | |
| T-30+234.5 | T | 06-Jul-10 | 4 | 7.29 | 8.79 | 1.50 | MF | 46.1 | 46.1 | 30.7 | 10:45 | 11:06 | 2.3 | 0.7 | 0.20 | - | - | - | - | - | - | |
| | | 29-May-10 | 3 | 9.29 | 10.29 | 1.00 | A | 30.4 | 30.4 | 30.4 | 2:15 | 2:40 | 2.9 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 29-May-10 | 2 | 10.29 | 14.3 | 4.01 | A | 38.2 | 38.2 | 9.5 | 1:47 | 2:15 | 2.3 | 0.5 | 0.07 | - | - | - | - | - | - | |
| P-30+236 | P | 27-Jun-10 | 4 | 6.95 | 8.45 | 1.50 | A | 189.0 | - | - | 13:48 | 14:14 | 1.9 | 12.1 | 3.51 | 31.4 | - | 1.6 | 7.8 | 12.8 | 18.9 | Communicated To P-30+242 |
| | | 27-Jun-10 | 4 | 6.95 | 8.45 | 1.50 | B | 250.9 | - | - | 14:14 | 14:32 | 2.5 | 10.5 | 3.27 | 36.8 | - | 1.6 | 7.8 | 12.8 | 18.9 | |
| | | 27-Jun-10 | 4 | 6.95 | 8.45 | 1.50 | C | 227.4 | - | - | 14:32 | 15:05 | 2.5 | 5.5 | 1.54 | 47.7 | 3.0 | 1.7 | 7.9 | 12.7 | 18.6 | |
| | | 27-Jun-10 | 4 | 6.95 | 8.45 | 1.50 | D | 215.7 | 883.0 | 588.7 | 15:05 | 16:01 | 2.4 | 0.0 | 0.00 | 60.3 | 2.5 | 1.7 | 8.1 | 12.6 | 21.3 | |
| | | 24-May-10 | 3 | 8.79 | 9.79 | 1.00 | A | 173.3 | - | - | 15:32 | 15:53 | 1.5 | 14.2 | 9.39 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 8.79 | 9.79 | 1.00 | B | 187.1 | - | - | 15:53 | 16:04 | 1.9 | 21.5 | 10.77 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 8.79 | 9.79 | 1.00 | C | 294.9 | - | - | 16:04 | 16:17 | 2.9 | 32.7 | 10.56 | 39.0 | 1.5 | 1.6 | 14.8 | 5.9 | 12.4 | |
| | | 24-May-10 | 3 | 8.79 | 9.79 | 1.00 | D | 316.7 | 972.0 | 972.0 | 16:17 | 17:14 | 3.1 | 0.0 | 0.00 | 59.0 | 1.5 | 1.6 | 15.9 | 5.8 | 11.5 | |
| | | 24-May-10 | 2 | 9.79 | 13.8 | 4.01 | A | 86.1 | 86.1 | 21.5 | 14:55 | 15:26 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+237.5 | T | 06-Jul-10 | 4 | 7.06 | 8.56 | 1.50 | MF | 31.5 | 31.5 | 21.0 | 10:14 | 10:40 | 2.1 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 29-May-10 | 3 | 9.1 | 10.1 | 1.00 | A | 340.7 | 340.7 | 340.7 | 3:17 | 4:53 | 2.6 | 0.1 | 0.02 | 33.5 | 5.0 | 1.7 | 20.0 | 23.0 | 25.0 | |
| | | 29-May-10 | 2 | 10.1 | 14.1 | 4.00 | A | 27.5 | 27.5 | 6.9 | 2:47 | 3:10 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+239 | S | 02-Jul-10 | 4 | 7.3 | 8.8 | 1.50 | A | 205.0 | - | - | 7:59 | 8:28 | 2.2 | 8.8 | 2.52 | 32.4 | - | 1.6 | 14.1 | 10.7 | 15.2 | Communicated To S-30+233 |
| | | 02-Jul-10 | 4 | 7.3 | 8.8 | 1.50 | B | 120.0 | - | - | 8:28 | 8:44 | 2.4 | 11.5 | 2.89 | 36.6 | - | 1.7 | 14.1 | 11.7 | 16.1 | |
| | | 02-Jul-10 | 4 | 7.3 | 8.8 | 1.50 | C | 46.7 | 371.7 | 247.8 | 8:44 | 9:08 | 2.6 | 0.9 | 0.22 | 45.1 | - | 1.7 | 14.1 | 11.4 | 15.8 | |
| | | 27-May-10 | 3 | 9.46 | 10.46 | 1.00 | A | 234.1 | - | - | 8:09 | 8:35 | 2.1 | 15.0 | 7.73 | - | - | - | - | - | - | |
| | | 27-May-10 | 3 | 9.46 | 10.46 | 1.00 | B | 166.8 | - | - | 8:35 | 8:46 | 2.7 | 17.9 | 5.42 | 36.2 | - | 1.7 | 24.0 | 15.0 | 20.0 | |
| | | 27-May-10 | 3 | 9.46 | 10.46 | 1.00 | C | 52.8 | 453.7 | 453.7 | 8:46 | 8:58 | 3.1 | 0.1 | 0.04 | 47.4 | - | 1.6 | 24.0 | 15.0 | 20.3 | |
| | | 27-May-10 | 2 | 10.46 | 14.6 | 4.14 | A | 22.9 | 22.9 | 5.5 | 7:51 | 8:04 | 2.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-30+240.5 | T | 06-Jul-10 | 4 | 7.36 | 8.86 | 1.50 | MF | 219.2 | 219.2 | 146.1 | 8:47 | 10:08 | 2.0 | 0.2 | 0.06 | - | - | - | - | - | - | Communicated To T-30+243.5, T-30+237.5 |
| | | 29-May-10 | 3 | 9.48 | 10.48 | 1.00 | A | 233.2 | - | - | 6:15 | 6:47 | 2.5 | 13.0 | 5.85 | - | - | - | - | - | - | |
| | | 29-May-10 | 3 | 9.48 | 10.48 | 1.00 | B | 120.6 | 353.8 | 353.8 | 6:47 | 7:14 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 29-May-10 | 2 | 10.48 | 14.5 | 4.02 | A | 24.3 | 24.3 | 6.0 | 5:45 | 6:14 | 2.8 | 2.0 | 0.02 | - | - | - | - | - | - | |
| P-30+242 | P | 08-Jul-10 | 5 | 2.12 | 4.12 | 2.00 | A | 44.7 | 44.7 | 22.4 | 23:07 | 23:30 | 0.5 | 0.1 | 0.17 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 27-Jun-10 | 4 | 6.92 | 8.42 | 1.50 | A | 171.3 | - | - | 16:47 | 17:14 | 2.2 | 12.0 | 3.39 | 31.5 | - | 1.6 | 7.8 | 12.9 | 19.6 | |
| | | 27-Jun-10 | 4 | 6.92 | 8.42 | 1.50 | B | 199.1 | - | - | 17:14 | 17:31 | 2.4 | 12.1 | 3.51 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 6.92 | 8.42 | 1.50 | C | 238.9 | 609.3 | 406.2 | 17:31 | 18:31 | 2.4 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 9.01 | 10.01 | 1.00 | A | 202.3 | - | - | 18:41 | 19:07 | 2.5 | 16.0 | 6.41 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 9.01 | 10.01 | 1.00 | B | 143.8 | - | - | 19:07 | 19:16 | 2.6 | 16.6 | 6.17 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 9.01 | 10.01 | 1.00 | C | 277.5 | 623.6 | 623.6 | 19:16 | 20:07 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 24-May-10 | 2 | 10.01 | 14 | 3.99 | A | 153.1 | - | - | 17:33 | 17:51 | 2.2 | 12.1 | 1.41 | - | - | - | - | - | - | |
| | | 24-May-10 | 2 | 10.01 | 14 | 3.99 | B | 171.4 | - | - | 17:51 | 18:04 | 2.7 | 8.3 | 0.78 | - | - | - | - | - | - | |
| | | 24-May-10 | 2 | 10.01 | 14 | 3.99 | C | 36.7 | 361.2 | 90.5 | 18:04 | 18:28 | 2.6 | 0.6 | 0.06 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+243.5 | T | 06-Jul-10 | 4 | 7.57 | 9.07 | 1.50 | MF | 137.8 | 137.8 | 91.9 | 8:14 | 8:44 | 2.3 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 30-May-10 | 3 | 9.65 | 10.65 | 1.00 | A | 328.6 | 328.6 | 328.6 | 19:43 | 21:52 | 2.7 | - | 0.01 | 33.8 | 4.5 | 1.6 | 9.5 | 15.2 | 21.2 | |
| | | 30-May-10 | 2 | 10.65 | 14.7 | 4.05 | A | 16.0 | 16.0 | 4.0 | 19:16 | 19:42 | 2.7 | 0.0 | 0.04 | - | - | - | - | - | - | |
| S-30+245 | S | 08-Jul-10 | 5 | 2.19 | 4.19 | 2.00 | A | 27.9 | 27.9 | 14.0 | 22:40 | 23:05 | 0.4 | 0.0 | 0.03 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 7.85 | 9.35 | 1.50 | A | 144.8 | - | - | 9:43 | 10:03 | 2.3 | 9.0 | 3.10 | 32.5 | 2.0 | 1.6 | 14.2 | 11.5 | 16.2 | |
| | | 02-Jul-10 | 4 | 7.85 | 9.35 | 1.50 | B | 219.8 | 364.6 | 243.1 | 10:03 | 11:18 | 2.5 | 0.8 | 0.21 | 37.4 | 2.0 | 1.7 | 14.1 | 11.4 | 15.8 | |
| | | 27-May-10 | 3 | 9.85 | 10.85 | 1.00 | A | 178.2 | - | - | 13:30 | 13:52 | 2.2 | 12.1 | 4.78 | 30.8 | 4.5 | 1.6 | 15.0 | 13.9 | 16.7 | |
| | | 27-May-10 | 3 | 9.85 | 10.85 | 1.00 | B | 239.9 | - | - | 13:52 | 14:06 | 2.9 | 19.7 | 7.66 | 35.5 | 2.5 | 1.6 | 15.2 | 13.7 | 19.1 | |
| | | 27-May-10 | 3 | 9.85 | 10.85 | 1.00 | C | 75.2 | 493.3 | 493.3 | 14:06 | 14:30 | 3.1 | 0.0 | 0.00 | 46.4 | 1.0 | 1.6 | 12.6 | 13.1 | 18.7 | |
| | | 27-May-10 | 2 | 10.85 | 14.9 | 4.05 | A | 22.1 | 22.1 | 5.5 | 13:12 | 13:25 | 2.6 | 0.4 | 0.04 | - | - | - | - | - | - | |
| T-30+246.5 | T | 06-Jul-10 | 4 | 7.6 | 9.1 | 1.50 | MF | 37.1 | 37.1 | 24.7 | 7:48 | 8:08 | 2.2 | 0.6 | 0.19 | - | - | - | - | - | - | |
| | | 30-May-10 | 3 | 9.77 | 10.77 | 1.00 | A | 88.1 | 88.1 | 88.1 | 22:34 | 23:41 | 2.7 | - | 0.01 | - | - | - | - | - | - | |
| | | 30-May-10 | 2 | 10.77 | 14.8 | 4.03 | A | 25.3 | 25.3 | 6.3 | 22:01 | 22:29 | 3.0 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-30+248 | P | 08-Jul-10 | 5 | 2.2 | 4.2 | 2.00 | A | 72.8 | - | - | 21:53 | 22:20 | 0.1 | 4.1 | 14.31 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 08-Jul-10 | 5 | 2.2 | 4.2 | 2.00 | D | 89.6 | 162.4 | 81.2 | 22:20 | 22:36 | 0.4 | 14.5 | 15.56 | 62.4 | - | 1.6 | 15.4 | 20.2 | 22.9 | |
| | | 28-Jun-10 | 4 | 7.65 | 9.15 | 1.50 | A | 142.0 | - | - | 14:24 | 14:43 | 1.5 | 12.0 | 4.11 | 32.1 | 3.6 | 1.6 | 7.6 | 11.3 | 15.2 | Communicated To P-30+254 |
| | | 28-Jun-10 | 4 | 7.65 | 9.15 | 1.50 | B | 215.0 | - | - | 14:43 | 14:59 | 2.6 | 10.3 | 3.65 | - | - | - | - | - | - | |
| | | 28-Jun-10 | 4 | 7.65 | 9.15 | 1.50 | C | 331.0 | 688.0 | 458.7 | 14:59 | 16:50 | 2.6 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 9.79 | 10.79 | 1.00 | A | 166.2 | - | - | 21:38 | 22:03 | 1.6 | 12.1 | 7.50 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 9.79 | 10.79 | 1.00 | B | 161.3 | - | - | 22:03 | 22:14 | 1.7 | 15.4 | 4.29 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 9.79 | 10.79 | 1.00 | C | 158.6 | - | - | 22:14 | 22:23 | 2.5 | 11.4 | 4.95 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 9.79 | 10.79 | 1.00 | D | 267.0 | 753.1 | 753.1 | 22:23 | 22:57 | 3.0 | 0.0 | 0.01 | 90.0 | 1.5 | 1.7 | 13.0 | 8.0 | 14.0 | |
| | | 24-May-10 | 2 | 10.79 | 14.8 | 4.01 | A | 72.7 | 72.7 | 18.1 | 21:08 | 21:32 | 2.6 | 0.4 | 0.04 | - | - | - | - | - | - | |
| T-30+249.5 | T | 06-Jul-10 | 4 | 6.97 | 8.47 | 1.50 | MF | 170.5 | 170.5 | 113.7 | 7:01 | 7:45 | 2.0 | 0.6 | 0.19 | 31.2 | 0.5 | 1.5 | 16.7 | 9.8 | 12.2 | |
| | | 30-May-10 | 3 | 9.1 | 10.1 | 1.00 | A | 313.5 | 313.5 | 313.5 | 2:10 | 3:34 | 2.8 | 0.0 | 0.00 | 32.3 | 4.5 | 1.6 | 16.8 | 15.4 | 23.0 | |
| | | 30-May-10 | 2 | 10.1 | 14.3 | 4.20 | A | - | - | - | - | - | - | - | - | - | - | - | - | - | - | By-Pass |
| S-30+251 | S | 08-Jul-10 | 5 | 2.17 | 4.17 | 2.00 | A | 40.6 | 40.6 | 20.3 | 21:13 | 21:50 | 0.5 | 0.0 | 0.02 | 31.6 | 5.0 | 1.7 | 14.0 | 13.9 | 18.9 | |
| | | 02-Jul-10 | 4 | 7.85 | 9.35 | 1.50 | A | 130.4 | - | - | 13:48 | 14:07 | 2.3 | 9.6 | 2.79 | 30.4 | - | 1.6 | 14.4 | 11.2 | 15.2 | |
| | | 02-Jul-10 | 4 | 7.85 | 9.35 | 1.50 | B | 185.8 | - | - | 14:07 | 14:22 | 2.3 | 0.2 | 3.58 | 36.2 | - | 1.6 | 14.4 | 11.2 | 15.6 | |
| | | 02-Jul-10 | 4 | 7.85 | 9.35 | 1.50 | C | 135.3 | 451.5 | 301.0 | 14:22 | 15:07 | 2.6 | 0.2 | 0.05 | 45.4 | 1.0 | 1.7 | 14.4 | 11.2 | 15.2 | |
| | | 27-May-10 | 3 | 9.3 | 10.3 | 1.00 | A | 59.3 | 59.3 | 59.3 | 15:13 | 16:05 | 3.5 | 0.7 | 0.20 | - | - | - | - | - | - | |
| | | 27-May-10 | 2 | 10.3 | 14.4 | 4.10 | A | 51.8 | 51.8 | 12.6 | 14:43 | 15:10 | 2.6 | 1.3 | 0.13 | - | - | - | - | - | - | |
| T-30+252.5 | T | 05-Jul-10 | 4 | 7.17 | 8.67 | 1.50 | MF | 145.2 | 145.2 | 96.8 | 4:55 | 5:37 | 1.9 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 30-May-10 | 3 | 9.22 | 10.22 | 1.00 | A | 162.9 | 162.9 | 162.9 | 5:17 | 6:38 | 2.7 | - | 0.01 | - | - | - | - | - | - | |
| | | 30-May-10 | 2 | 10.22 | 14.4 | 4.18 | A | 60.5 | 60.5 | 14.5 | 4:40 | 5:10 | 2.9 | 0.5 | 0.04 | - | - | - | - | - | - | |
| P-30+254 | P | 08-Jul-10 | 5 | 2.16 | 4.16 | 2.00 | A | 38.7 | 38.7 | 19.4 | 20:20 | 21:10 | 0.5 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 6.91 | 8.41 | 1.50 | A | 158.6 | - | - | 19:45 | 20:06 | 1.5 | 15.1 | 8.44 | 32.8 | 4.0 | 1.6 | 11.0 | 11.0 | 17.6 | |
| | | 27-Jun-10 | 4 | 6.91 | 8.41 | 1.50 | B | 192.3 | - | - | 20:06 | 20:21 | 2.0 | 12.9 | 4.82 | 36.5 | 3.6 | 1.6 | 11.0 | 11.0 | 18.0 | |
| | | 27-Jun-10 | 4 | 6.91 | 8.41 | 1.50 | C | 180.9 | 531.8 | 354.5 | 20:21 | 21:39 | 2.5 | 0.3 | 0.09 | 46.0 | - | 1.6 | 11.0 | 11.0 | 18.8 | |
| | | 24-May-10 | 3 | 8.97 | 9.97 | 1.00 | A | 172.5 | - | - | 23:38 | 0:00 | 1.4 | 12.0 | 8.80 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 8.97 | 9.97 | 1.00 | B | 153.5 | - | - | 0:00 | 0:11 | 1.2 | 15.3 | 11.57 | 36.0 | 4.0 | 1.6 | 13.0 | 8.0 | 16.0 | |
| | | 24-May-10 | 3 | 8.97 | 9.97 | 1.00 | C | 182.0 | - | - | 0:11 | 0:21 | 2.6 | 16.6 | 6.31 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 8.97 | 9.97 | 1.00 | D | 317.0 | 825.0 | 825.0 | 0:21 | 1:01 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-May-10 | 2 | 9.97 | 14 | 4.03 | A | 50.9 | 50.9 | 12.6 | 23:16 | 23:32 | 2.6 | 0.5 | 0.04 | - | - | - | - | - | - | |
| T-30+255.5 | T | 05-Jul-10 | 4 | 7.08 | 8.58 | 1.50 | MF | 70.4 | 70.4 | 46.9 | 4:11 | 4:52 | 2.1 | 0.2 | 0.07 | - | - | - | - | - | - | Communicated To T-30+261.5 |
| | | 31-May-10 | 3 | 9.21 | 10.21 | 1.00 | A | 76.3 | 76.3 | 76.3 | 3:15 | 3:46 | 2.6 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 31-May-10 | 2 | 10.21 | 14.3 | 4.09 | A | 77.8 | 77.8 | 19.0 | 2:19 | 3:11 | 2.8 | 1.2 | 0.10 | 33.3 | 4.0 | 1.6 | 9.6 | 12.5 | 19.4 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+257 | S | 08-Jul-10 | 5 | 2.38 | 4.383 | 2.00 | A | 29.6 | 29.6 | 14.8 | 19:49 | 20:18 | 0.7 | 1.6 | 0.21 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 7.4 | 8.9 | 1.50 | A | 161.8 | - | - | 15:13 | 15:35 | 1.7 | 13.0 | 5.18 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 7.4 | 8.9 | 1.50 | B | 158.7 | - | - | 15:35 | 15:46 | 2.4 | 13.8 | 4.10 | 37.2 | - | 1.7 | 14.0 | 11.1 | 15.1 | |
| | | 02-Jul-10 | 4 | 7.4 | 8.9 | 1.50 | C | 215.2 | 535.7 | 357.1 | 15:46 | 16:37 | 2.6 | 0.0 | 0.01 | 47.8 | - | 1.7 | 14.0 | 11.1 | 15.8 | |
| | | 27-May-10 | 3 | 9.4 | 10.4 | 1.00 | A | 217.5 | - | - | 17:11 | 17:38 | 1.8 | 16.1 | 7.41 | - | - | - | - | - | - | |
| | | 27-May-10 | 3 | 9.4 | 10.4 | 1.00 | B | 244.6 | - | - | 17:38 | 17:52 | 2.5 | 21.5 | 8.30 | - | - | - | - | - | - | |
| | | 27-May-10 | 3 | 9.4 | 10.4 | 1.00 | C | 236.1 | 698.2 | 698.2 | 17:52 | 18:30 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 27-May-10 | 2 | 10.4 | 14.8 | 4.40 | A | 196.6 | 196.6 | 44.7 | 16:17 | 17:07 | 2.5 | 0.8 | 0.07 | - | - | - | - | - | - | |
| T-30+258.5 | T | 05-Jul-10 | 4 | 7.27 | 8.77 | 1.50 | MF | 61.3 | 61.3 | 40.9 | 3:37 | 4:06 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 31-May-10 | 3 | 9.21 | 10.21 | 1.00 | A | 166.6 | - | - | 19:45 | 20:06 | 1.9 | 13.0 | 6.63 | - | - | - | - | - | - | |
| | | 31-May-10 | 3 | 9.21 | 10.21 | 1.00 | B | 269.8 | - | - | 20:06 | 20:25 | 2.6 | 14.9 | 6.13 | - | - | - | - | - | - | |
| | | 31-May-10 | 3 | 9.21 | 10.21 | 1.00 | C | 137.5 | 573.9 | 573.9 | 20:25 | 21:40 | 2.6 | - | 0.01 | 51.0 | 2.0 | 1.6 | 9.0 | 11.5 | 19.0 | |
| | | 31-May-10 | 2 | 10.21 | 14.3 | 4.09 | A | 28.8 | 28.8 | 7.0 | 19:28 | 19:41 | 2.5 | 0.3 | 0.03 | 34.3 | 4.0 | 1.7 | 8.4 | 11.5 | 16.2 | |
| Q-30+259.25 | Q | 25-Oct-11 | 3 | 8.44 | 9.44 | 1.00 | A | 76.6 | 76.6 | 76.6 | -- | -- | 3.5 | -- | 0.01 | -- | -- | -- | -- | -- | -- | |
| P-30+260 | P | 08-Jul-10 | 5 | 2.52 | 4.52 | 2.00 | A | 64.6 | - | - | 19:09 | 19:33 | 0.1 | 3.6 | 195.20 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 08-Jul-10 | 5 | 2.52 | 4.52 | 2.00 | D | 43.3 | 107.9 | 54.0 | 19:33 | 19:45 | 0.5 | 4.5 | 4.53 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 7.27 | 8.77 | 1.50 | A | 191.1 | - | - | 21:50 | 22:15 | 1.8 | 12.1 | 3.86 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 7.27 | 8.77 | 1.50 | B | 171.2 | - | - | 22:15 | 22:30 | 2.2 | 11.1 | 2.90 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 7.27 | 8.77 | 1.50 | C | 88.2 | 450.5 | 300.3 | 22:30 | 23:02 | 2.6 | 0.7 | 0.17 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 9.35 | 10.35 | 1.00 | A | 163.9 | - | - | 3:47 | 4:12 | 1.1 | 11.9 | 10.80 | 31.4 | 5.0 | 1.7 | 20.5 | 10.3 | 19.3 | |
| | | 24-May-10 | 3 | 9.35 | 10.35 | 1.00 | B | 161.3 | - | - | 4:12 | 4:57 | 1.8 | 16.4 | 9.59 | - | - | - | - | - | - | |
| | | 24-May-10 | 3 | 9.35 | 10.35 | 1.00 | C | 160.4 | - | - | 4:57 | 5:07 | 2.3 | 16.8 | 7.54 | 49.0 | - | 1.6 | 21.0 | 8.5 | 17.0 | |
| | | 24-May-10 | 3 | 9.35 | 10.35 | 1.00 | D | 542.4 | 1028.0 | 1028.0 | 5:07 | 5:50 | 3.0 | 14.3 | 4.68 | - | - | - | - | - | - | |
| | | 24-May-10 | 2 | 10.35 | 14.4 | 4.05 | A | 43.5 | 43.5 | 10.7 | 3:22 | 3:40 | 2.6 | 0.6 | 0.05 | - | - | - | - | - | - | |
| T-30+261.5 | T | 05-Jul-10 | 4 | 7.58 | 9.08 | 1.50 | MF | 104.8 | 104.8 | 69.9 | 2:35 | 3:31 | 2.0 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 31-May-10 | 3 | 9.41 | 10.41 | 1.00 | A | 312.9 | - | - | 22:09 | 22:53 | 2.6 | 8.2 | 3.02 | - | - | - | - | - | - | |
| | | 31-May-10 | 3 | 9.41 | 10.41 | 1.00 | B | 425.0 | 737.9 | 737.9 | 22:53 | 0:25 | 2.6 | - | 0.01 | - | - | - | - | - | - | |
| | | 31-May-10 | 2 | 10.41 | 14.6 | 4.19 | A | 118.5 | 118.5 | 28.3 | 21:46 | 22:06 | 2.7 | 0.4 | 0.04 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 1 | 14.65 | 19.8 | 5.15 | A | 59.8 | 59.8 | 11.6 | 7:16 | 7:32 | 5.3 | 0.1 | 0.00 | 30.4 | - | 1.6 | 12.4 | 12.9 | 17.9 | |
| S-30+263 | S | 08-Jul-10 | 5 | 2.93 | 4.93 | 2.00 | A | 40.6 | 40.6 | 20.3 | 16:59 | 17:13 | 0.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 7.93 | 9.43 | 1.50 | A | 158.2 | - | - | 16:45 | 17:08 | 2.3 | 12.8 | 3.87 | 31.4 | - | 1.6 | 12.1 | 11.3 | 13.6 | |
| | | 02-Jul-10 | 4 | 7.93 | 9.43 | 1.50 | B | 157.8 | - | - | 17:08 | 17:20 | 2.5 | 15.2 | 3.66 | 37.1 | - | 1.7 | 12.1 | 11.3 | 13.8 | |
| | | 02-Jul-10 | 4 | 7.93 | 9.43 | 1.50 | C | 57.3 | 373.3 | 248.9 | 17:20 | 17:55 | 2.5 | 0.6 | 0.16 | 46.3 | - | 1.7 | 12.1 | 11.3 | 13.5 | |
| | | 27-May-10 | 3 | 9.93 | 10.93 | 1.00 | A | 22.6 | 22.6 | 22.6 | 23:50 | 0:00 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 27-May-10 | 2 | 10.93 | 15.1 | 4.17 | A | 160.1 | - | - | 21:35 | 22:00 | 1.8 | 9.9 | 1.35 | 30.9 | 4.0 | 1.7 | 17.0 | 17.0 | 19.0 | |
| | | 27-May-10 | 2 | 10.93 | 15.1 | 4.17 | B | 290.7 | - | - | 22:00 | 22:21 | 2.1 | 15.7 | 1.65 | 37.2 | 2.5 | 1.6 | 19.0 | 19.0 | 20.0 | |
| | | 27-May-10 | 2 | 10.93 | 15.1 | 4.17 | C | 488.2 | 939.0 | 225.2 | 22:21 | 23:34 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+264.5 | T | 05-Jul-10 | 4 | 7.9 | 9.4 | 1.50 | MF | 64.9 | 64.9 | 43.3 | 2:04 | 2:32 | 2.0 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 31-May-10 | 3 | 9.98 | 10.98 | 1.00 | A | 198.3 | - | - | 5:00 | 5:39 | 2.5 | 7.0 | 2.75 | - | - | - | - | - | - | |
| | | 31-May-10 | 3 | 9.98 | 10.98 | 1.00 | B | 311.5 | 509.8 | 509.8 | 5:39 | 6:50 | 2.5 | - | 0.02 | 36.4 | 1.0 | 1.6 | 19.0 | 13.0 | 24.0 | |
| | | 31-May-10 | 2 | 10.98 | 15 | 4.02 | A | 34.5 | 34.5 | 8.6 | 4:35 | 4:58 | 2.6 | - | 0.01 | - | - | - | - | - | - | |
| | | 31-May-10 | 1 | 15 | 20.2 | 5.20 | A | 30.0 | 30.0 | 5.8 | 4:11 | 4:30 | 5.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| S-30+266 | S | 08-Jul-10 | 5 | 3.08 | 5.08 | 2.00 | A | 28.6 | 28.6 | 14.3 | 16:39 | 16:56 | 0.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 7.74 | 9.24 | 1.50 | A | 160.9 | - | - | 23:12 | 23:35 | 1.6 | 12.9 | 6.88 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 7.74 | 9.24 | 1.50 | B | 180.9 | - | - | 23:35 | 23:50 | 2.1 | 13.1 | 3.90 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 7.74 | 9.24 | 1.50 | C | 117.2 | 459.0 | 306.0 | 23:50 | 0:23 | 2.5 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 25-May-10 | 3 | 9.82 | 10.82 | 1.00 | A | 128.5 | - | - | 8:09 | 8:27 | 1.8 | 12.4 | 6.89 | - | - | - | - | - | - | |
| | | 25-May-10 | 3 | 9.82 | 10.82 | 1.00 | B | 190.6 | - | - | 8:27 | 8:40 | 2.8 | 16.3 | 5.57 | 35.0 | 2.5 | 1.6 | 19.2 | 7.3 | 15.7 | |
| | | 25-May-10 | 3 | 9.82 | 10.82 | 1.00 | C | 150.9 | - | - | 8:40 | 8:57 | 3.2 | 7.5 | 2.65 | 44.0 | - | 1.6 | 14.1 | 7.5 | 16.2 | |
| | | 25-May-10 | 3 | 9.82 | 10.82 | 1.00 | D | 174.3 | 644.3 | 644.3 | 8:57 | 9:54 | 3.0 | 0.0 | 0.01 | 57.0 | - | 1.7 | 12.8 | 7.9 | 17.7 | |
| | | 25-May-10 | 2 | 10.82 | 14.8 | 3.98 | A | 151.3 | 151.3 | 38.0 | 7:33 | 8:04 | 2.5 | 1.0 | 0.10 | 30.0 | 4.5 | 1.6 | 24.4 | 7.2 | 15.2 | |
| Q-30+266.75 | Q | 25-Oct-11 | 3 | 9.29 | 10.29 | 1.00 | A | 2.6 | 2.6 | 2.6 | -- | -- | 3.2 | -- | 0.01 | -- | -- | -- | -- | -- | -- | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+267.5 | T | 05-Jul-10 | 4 | 7.84 | 9.34 | 1.50 | MF | 56.3 | 56.3 | 37.5 | 1:30 | 2:00 | 2.0 | 0.3 | 0.09 | 33.6 | - | 1.5 | 6.9 | 11.7 | 16.5 | |
| | | 01-Jun-10 | 3 | 10 | 11 | 1.00 | A | 219.0 | - | - | 9:15 | 10:09 | 2.0 | 12.2 | 0.91 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 10 | 11 | 1.00 | B | 82.8 | 301.8 | 301.8 | 10:09 | 10:34 | 2.5 | 0.7 | 0.10 | 37.8 | 3.0 | 1.6 | 4.9 | 16.1 | 18.8 | |
| | | 01-Jun-10 | 2 | 11 | 15 | 4.00 | A | 54.7 | 54.7 | 13.7 | 9:35 | 9:35 | 2.6 | 1.2 | 0.11 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 1 | 15 | 20.2 | 5.20 | A | 26.3 | 26.3 | 5.1 | 8:44 | 9:06 | 5.4 | 0.2 | 0.01 | 30.8 | 3.0 | 1.7 | 4.7 | 15.7 | 20.2 | |
| S-30+269 | S | 08-Jul-10 | 5 | 3.35 | 5.35 | 2.00 | A | 34.1 | 34.1 | 17.1 | 16:39 | 16:56 | 0.6 | 0.0 | 0.04 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 8 | 9.5 | 1.50 | A | 226.9 | - | - | 19:09 | 19:42 | 2.6 | 7.8 | 2.05 | 31.4 | 6.0 | 1.6 | 11.1 | 9.8 | 14.6 | Communicated To S-30+263 |
| | | 02-Jul-10 | 4 | 8 | 9.5 | 1.50 | B | 154.0 | 380.9 | 253.9 | 19:42 | 20:30 | 2.5 | 0.1 | 0.03 | 37.9 | 3.0 | 1.7 | 9.8 | 10.0 | 17.0 | |
| | | 27-May-10 | 3 | 10 | 11 | 1.00 | A | 22.0 | 22.0 | 22.0 | 4:10 | 4:28 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-May-10 | 2 | 11 | 15.4 | 4.40 | A | 223.5 | - | - | 2:03 | 2:40 | 1.8 | 9.2 | 1.17 | - | - | - | - | - | - | |
| | | 27-May-10 | 2 | 11 | 15.4 | 4.40 | B | 127.4 | - | - | 2:40 | 2:49 | 2.1 | 15.6 | 1.79 | - | - | - | - | - | - | |
| | | 27-May-10 | 2 | 11 | 15.4 | 4.40 | C | 641.1 | 992.0 | 225.5 | 2:49 | 4:00 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+270.5 | T | 05-Jul-10 | 4 | 8.27 | 9.77 | 1.50 | MF | 89.6 | 89.6 | 59.7 | 22:41 | 23:43 | 1.9 | 0.7 | 0.20 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 10.34 | 11.34 | 1.00 | A | 179.0 | - | - | 11:46 | 12:17 | 2.3 | 6.3 | 2.68 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 10.34 | 11.34 | 1.00 | B | 90.6 | 269.6 | 269.6 | 12:17 | 13:08 | 2.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 2 | 11.34 | 15.3 | 3.96 | A | 27.3 | 27.3 | 6.9 | 11:25 | 11:41 | 2.4 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 1 | 15.3 | 20.5 | 5.20 | A | 39.1 | 39.1 | 7.5 | 10:59 | 11:18 | 5.3 | 0.5 | 0.02 | - | - | - | - | - | - | |
| P-30+272 | P | 08-Jul-10 | 5 | 3.58 | 5.58 | 2.00 | A | 83.9 | - | - | 13:43 | 13:58 | 0.1 | 5.6 | 37.98 | 30.6 | - | 1.6 | 11.0 | 15.7 | 14.8 | By-Pass: Outside Casing |
| | | 08-Jul-10 | 5 | 3.58 | 5.58 | 2.00 | C | 184.4 | - | - | 13:58 | 14:59 | 0.5 | 1.5 | 1.75 | 46.8 | - | 1.7 | 11.0 | 15.7 | 16.1 | |
| | | 08-Jul-10 | 5 | 3.58 | 5.58 | 2.00 | D | 249.0 | - | - | 14:59 | 15:25 | 0.6 | 1.3 | 1.15 | 62.0 | 1.0 | 1.7 | 11.2 | 15.7 | 17.7 | |
| | | 08-Jul-10 | 5 | 3.58 | 5.58 | 2.00 | E | 300.0 | 817.3 | 408.7 | 15:25 | 16:02 | 0.7 | 1.2 | 0.87 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 4 | 7.96 | 9.46 | 1.50 | A | 160.8 | - | - | 2:45 | 3:10 | 1.5 | 9.8 | 4.82 | 32.1 | - | 1.6 | 9.0 | 13.0 | 17.7 | Communicated To P-30+266 |
| | | 27-Jun-10 | 4 | 7.96 | 9.46 | 1.50 | B | 196.6 | - | - | 3:10 | 3:31 | 2.3 | 12.7 | 4.11 | 36.3 | - | 1.6 | 9.0 | 11.0 | 18.1 | |
| | | 27-Jun-10 | 4 | 7.96 | 9.46 | 1.50 | C | 128.2 | 485.6 | 323.7 | 3:31 | 4:19 | 2.5 | 0.7 | 0.19 | 45.5 | 1.6 | 1.6 | 9.0 | 12.0 | 19.8 | |
| | | 25-May-10 | 3 | 10.16 | 11.16 | 1.00 | A | 182.7 | - | - | 13:00 | 13:21 | 1.3 | 15.2 | 12.15 | - | - | - | - | - | - | |
| | | 25-May-10 | 3 | 10.16 | 11.16 | 1.00 | B | 267.1 | - | - | 13:21 | 13:36 | 1.8 | 21.7 | 12.50 | - | - | - | - | - | - | |
| | | 25-May-10 | 3 | 10.16 | 11.16 | 1.00 | C | 175.6 | - | - | 13:36 | 13:43 | 2.3 | 25.4 | 10.28 | 49.0 | 3.0 | 1.6 | 18.5 | 9.6 | 14.5 | |
| | | 25-May-10 | 3 | 10.16 | 11.16 | 1.00 | D | 394.6 | 1020.0 | 1020.0 | 13:43 | 14:07 | 3.0 | 8.4 | 2.67 | 61.0 | 2.5 | 1.6 | 18.8 | 9.5 | 13.9 | |
| | | 25-May-10 | 2 | 11.16 | 15.3 | 4.14 | A | 190.2 | 190.2 | 45.9 | 10:12 | 11:01 | 2.6 | 2.4 | 0.22 | - | - | - | - | - | - | |
| Q-30+272.75 | Q | 25-Oct-11 | 3 | 8.92 | 9.92 | 1.00 | A | 108.1 | 108.1 | 108.1 | -- | -- | 3.1 | -- | 0.00 | -- | -- | -- | -- | -- | -- | |
| T-30+273.5 | T | 05-Jul-10 | 4 | 7.4 | 8.9 | 1.50 | MF | 72.4 | 72.4 | 48.3 | 21:52 | 22:39 | 1.8 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 9.53 | 10.53 | 1.00 | A | 163.1 | - | - | 15:12 | 15:39 | 2.4 | 10.4 | 4.90 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 9.53 | 10.53 | 1.00 | B | 141.5 | 304.6 | 304.6 | 15:39 | 16:14 | 2.7 | 0.1 | 0.02 | 33.1 | 5.0 | 1.6 | 4.7 | 15.1 | 18.1 | |
| | | 01-Jun-10 | 2 | 10.53 | 14.6 | 4.07 | A | 28.0 | 28.0 | 6.9 | 14:48 | 15:06 | 2.6 | - | 0.01 | 30.2 | 4.0 | 1.6 | 4.5 | 15.1 | 18.6 | |
| S-30+275 | S | 08-Jul-10 | 5 | 3.93 | 5.93 | 2.00 | A | 32.0 | 32.0 | 16.0 | 11:04 | 11:23 | 0.8 | 0.1 | 0.08 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 7.62 | 9.12 | 1.50 | A | 102.7 | 102.7 | 68.5 | 20:33 | 21:03 | 2.6 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 27-May-10 | 3 | 9.62 | 10.62 | 1.00 | A | 7.8 | 7.8 | 7.8 | 6:54 | 7:05 | 2.8 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 27-May-10 | 2 | 10.62 | 14.8 | 4.18 | A | 436.7 | - | - | 4:42 | 5:55 | 2.7 | 5.8 | 0.50 | 30.3 | - | 1.7 | 18.0 | 12.0 | 17.0 | |
| | | 27-May-10 | 2 | 10.62 | 14.8 | 4.18 | B | 130.8 | 567.5 | 135.8 | 5:55 | 6:40 | 3.1 | 1.9 | 0.15 | - | - | - | - | - | - | |
| T-30+276.5 | T | 05-Jul-10 | 4 | 6.97 | 8.47 | 1.50 | MF | 70.0 | 70.0 | 46.7 | 21:00 | 21:50 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 9.25 | 10.25 | 1.00 | A | 21.1 | 21.1 | 21.1 | 17:05 | 17:18 | 2.5 | - | 0.01 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 2 | 10.25 | 14.4 | 4.15 | A | 33.1 | 33.1 | 8.0 | 16:28 | 16:48 | 2.6 | 0.7 | 0.06 | - | - | - | - | - | - | |
| P-30+278 | P | 08-Jul-10 | 5 | 4.44 | 6.44 | 2.00 | A | 30.9 | 30.9 | 15.5 | 10:43 | 11:00 | 1.0 | 0.1 | 0.04 | 31.2 | - | 1.6 | 10.4 | 15.6 | 16.3 | |
| | | 25-May-10 | 3 | 9.22 | 10.22 | 1.00 | A | 157.0 | - | - | 16:09 | 16:30 | 1.6 | 12.3 | 8.38 | - | - | - | - | - | - | |
| | | 25-May-10 | 3 | 9.22 | 10.22 | 1.00 | B | 178.7 | - | - | 16:30 | 16:40 | 2.0 | 21.4 | 11.60 | - | - | - | - | - | - | |
| | | 25-May-10 | 3 | 9.22 | 10.22 | 1.00 | C | 238.2 | 573.9 | 573.9 | 16:40 | 17:15 | 3.1 | 0.0 | 0.01 | 47.0 | - | 1.6 | 10.0 | 7.6 | 11.7 | |
| | | 25-May-10 | 2 | 10.22 | 14.4 | 4.18 | A | 177.3 | - | - | 14:46 | 15:07 | 0.2 | 5.6 | 9.54 | - | - | - | - | - | - | |
| | | 25-May-10 | 2 | 10.22 | 14.4 | 4.18 | B | 175.1 | - | - | 15:07 | 15:24 | 1.9 | 18.0 | 2.26 | - | - | - | - | - | - | |
| | | 25-May-10 | 2 | 10.22 | 14.4 | 4.18 | C | 158.6 | - | - | 15:24 | 15:36 | 2.6 | 11.4 | 0.97 | 43.0 | - | 1.6 | 13.2 | 5.2 | 11.3 | |
| | | 25-May-10 | 2 | 10.22 | 14.4 | 4.18 | D | 62.6 | 573.6 | 137.2 | 15:36 | 15:43 | 2.6 | 1.5 | 0.14 | 59.0 | - | 1.7 | 13.1 | 6.2 | 11.7 | |
| Q-30+278.75 | Q | 25-Oct-11 | 3 | 8.61 | 9.61 | 1.00 | A | 4.3 | 4.3 | 4.3 | -- | -- | 3.2 | -- | 0.05 | -- | -- | -- | -- | -- | -- | |
| T-30+279.5 | T | 05-Jul-10 | 4 | 6.91 | 8.41 | 1.50 | MF | 76.6 | 76.6 | 51.1 | 20:20 | 20:57 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 9.25 | 10.25 | 1.00 | A | 168.4 | 168.4 | 168.4 | 17:51 | 18:45 | 2.5 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 2 | 10.25 | 14.4 | 4.15 | A | 22.5 | 22.5 | 5.4 | 17:29 | 17:42 | 2.5 | - | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+281 | S | 08-Jul-10 | 5 | 4.4 | 6.4 | 2.00 | A | 31.3 | 31.3 | 15.7 | 10:22 | 10:39 | 0.8 | 0.3 | 0.18 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 7.24 | 8.74 | 1.50 | A | 188.4 | - | - | 7:51 | 9:11 | 2.6 | 5.1 | 1.26 | 31.4 | 2.0 | 1.6 | 9.4 | 9.8 | 11.0 | |
| | | 04-Jul-10 | 4 | 7.24 | 8.74 | 1.50 | B | 184.8 | - | - | 9:11 | 9:46 | 2.4 | 5.7 | 1.34 | 36.1 | - | 1.6 | 9.4 | 9.8 | 11.9 | |
| | | 04-Jul-10 | 4 | 7.24 | 8.74 | 1.50 | C | 27.1 | 400.3 | 266.9 | 9:46 | 10:03 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-May-10 | 3 | 9.24 | 10.24 | 1.00 | A | 165.5 | - | - | 19:47 | 20:14 | 2.1 | 9.9 | 4.36 | - | - | - | - | - | - | |
| | | 28-May-10 | 3 | 9.24 | 10.24 | 1.00 | B | 226.6 | 392.1 | 392.1 | 20:14 | 20:52 | 3.0 | 0.2 | 0.09 | 34.2 | 4.0 | 1.7 | 20.9 | 13.0 | 18.4 | |
| | | 28-May-10 | 2 | 10.24 | 14.6 | 4.36 | A | 26.3 | 26.3 | 6.0 | 19:20 | 19:42 | 2.5 | 0.0 | 0.00 | 30.8 | 5.0 | 1.6 | 20.9 | 13.0 | 17.6 | |
| T-30+282.5 | T | 05-Jul-10 | 4 | 7.02 | 8.52 | 1.50 | MF | 92.2 | 92.2 | 61.5 | 19:43 | 20:17 | 2.2 | 0.6 | 0.18 | 30.3 | 6.0 | 1.5 | 9.6 | 10.7 | 14.6 | |
| | | 01-Jun-10 | 3 | 9.15 | 10.15 | 1.00 | A | 247.1 | 247.1 | 247.1 | 21:00 | 22:30 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 2 | 10.15 | 14.3 | 4.15 | A | 25.1 | 25.1 | 6.0 | 20:35 | 20:55 | 2.5 | 0.0 | 0.00 | 32.4 | 4.8 | 1.7 | 5.0 | 13.0 | 16.5 | |
| P-30+284 | P | 08-Jul-10 | 5 | 4.63 | 6.63 | 2.00 | A | 130.3 | - | - | 8:57 | 9:14 | 0.2 | 12.9 | 30.79 | 30.8 | - | 1.6 | 10.3 | 15.3 | 16.1 | |
| | | 08-Jul-10 | 5 | 4.63 | 6.63 | 2.00 | B | 158.3 | - | - | 9:14 | 9:42 | 0.4 | 8.6 | 7.21 | 38.5 | - | 1.6 | 10.3 | 15.3 | 16.1 | By-Pass: Outside Casing |
| | | 08-Jul-10 | 5 | 4.63 | 6.63 | 2.00 | C | 31.1 | 319.7 | 159.9 | 9:42 | 10:16 | 0.8 | 0.4 | 0.23 | 46.1 | - | 1.7 | 10.3 | 15.3 | 16.8 | |
| | | 02-Jul-10 | 4 | 7.25 | 8.75 | 1.50 | A | 115.6 | 115.6 | 77.1 | 21:04 | 21:52 | 2.4 | 0.4 | 0.12 | - | - | - | - | - | - | Communicated to S-30+257, S-30+251 and S-30+245 |
| | | 25-May-10 | 3 | 9.25 | 10.25 | 1.00 | A | 168.0 | - | - | 20:52 | 20:57 | 1.4 | 11.9 | 8.11 | 31.9 | 5.0 | 1.7 | 7.0 | 8.2 | 14.0 | |
| | | 25-May-10 | 3 | 9.25 | 10.25 | 1.00 | B | 159.0 | - | - | 20:57 | 21:09 | 1.0 | 11.9 | 6.55 | 40.0 | 4.0 | 1.7 | 7.0 | 8.2 | 16.0 | |
| | | 25-May-10 | 3 | 9.25 | 10.25 | 1.00 | C | 161.0 | - | - | 21:09 | 21:22 | 2.7 | 15.2 | 5.75 | - | - | - | - | - | - | |
| | | 25-May-10 | 3 | 9.25 | 10.25 | 1.00 | D | 142.7 | 630.7 | 630.7 | 21:22 | 21:50 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 25-May-10 | 2 | 10.25 | 14.2 | 3.95 | A | 23.7 | 23.7 | 6.0 | 20:10 | 20:25 | 2.6 | 0.1 | 0.01 | - | - | - | - | - | - | |
| Q-30+284.75 | Q | 25-Oct-11 | 3 | 8.45 | 9.45 | 1.00 | A | 10.5 | 10.5 | 10.5 | -- | -- | 3.1 | -- | 0.00 | -- | -- | -- | -- | -- | -- | |
| T-30+285.5 | T | 05-Jul-10 | 4 | 7.07 | 8.57 | 1.50 | MF | 40.3 | 40.3 | 26.9 | 17:24 | 17:42 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 9.17 | 10.17 | 1.00 | A | 81.9 | 81.9 | 81.9 | 23:06 | 23:44 | 2.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 2 | 10.17 | 14.3 | 4.13 | A | 24.2 | 24.2 | 5.9 | 22:42 | 23:02 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+287 | S | 07-Jul-10 | 5 | 4.91 | 6.91 | 2.00 | A | 31.6 | 31.6 | 15.8 | 3:30 | 3:48 | 0.8 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 7.13 | 8.63 | 1.50 | A | 51.2 | 51.2 | 34.1 | 10:09 | 10:33 | 2.5 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 28-May-10 | 3 | 9.13 | 10.13 | 1.00 | A | 189.5 | - | - | 22:18 | 22:42 | 1.2 | 14.9 | 12.00 | - | - | - | - | - | - | |
| | | 28-May-10 | 3 | 9.13 | 10.13 | 1.00 | B | 164.5 | - | - | 22:42 | 22:53 | 1.2 | 18.5 | 13.31 | - | - | - | - | - | - | |
| | | 28-May-10 | 3 | 9.13 | 10.13 | 1.00 | C | 563.0 | 917.0 | 917.0 | 22:53 | 23:46 | 3.1 | 0.0 | 0.01 | 46.1 | - | 1.7 | 20.6 | 14.0 | 17.3 | |
| | | 28-May-10 | 2 | 10.13 | 14.7 | 4.57 | A | 23.1 | 23.1 | 5.1 | 21:55 | 22:10 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+288.5 | T | 05-Jul-10 | 4 | 7.12 | 8.62 | 1.50 | MF | 97.6 | 97.6 | 65.1 | 16:20 | 16:52 | 2.2 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 9.04 | 10.04 | 1.00 | A | 109.8 | 109.8 | 109.8 | 0:15 | 0:53 | 2.5 | 0.0 | 0.04 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 2 | 10.04 | 14.2 | 4.16 | A | 31.4 | 31.4 | 7.5 | 23:51 | 0:12 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+290 | P | 07-Jul-10 | 5 | 4.5 | 6.5 | 2.00 | A | 35.1 | 35.1 | 17.6 | 2:55 | 3:26 | 1.0 | 0.3 | 0.14 | - | - | - | - | - | - | |
| | | 28-Jun-10 | 4 | 6.88 | 8.38 | 1.50 | A | 160.0 | - | - | 19:44 | 20:03 | 1.2 | 10.7 | 5.05 | 32.5 | 3.5 | 1.6 | 12.2 | 11.5 | 16.5 | |
| | | 28-Jun-10 | 4 | 6.88 | 8.38 | 1.50 | B | 160.2 | - | - | 20:03 | 20:18 | 1.8 | 18.1 | 6.97 | 36.0 | 6.0 | 1.6 | 12.0 | 11.5 | 19.4 | |
| | | 28-Jun-10 | 4 | 6.88 | 8.38 | 1.50 | C | 292.8 | - | - | 20:18 | 20:34 | 2.4 | 16.9 | 4.42 | - | - | - | - | - | - | |
| | | 28-Jun-10 | 4 | 6.88 | 8.38 | 1.50 | D | 179.8 | 792.8 | 528.5 | 20:34 | 21:28 | 2.4 | 0.0 | 0.02 | 54.7 | - | 1.6 | 12.0 | 11.5 | 21.1 | |
| | | 25-May-10 | 3 | 8.99 | 9.99 | 1.00 | A | 170.0 | - | - | 22:48 | 23:14 | 2.2 | 12.0 | 5.26 | - | - | - | - | - | - | |
| | | 25-May-10 | 3 | 8.99 | 9.99 | 1.00 | B | 158.6 | - | - | 23:14 | 23:27 | 2.4 | 11.4 | 4.77 | - | - | - | - | - | - | |
| | | 25-May-10 | 3 | 8.99 | 9.99 | 1.00 | C | 157.2 | - | - | 23:27 | 23:41 | 2.6 | 12.3 | 6.80 | - | - | - | - | - | - | |
| | | 25-May-10 | 3 | 8.99 | 9.99 | 1.00 | D | 540.2 | 1026.0 | 1026.0 | 23:41 | 1:05 | 1.0 | 6.9 | 6.80 | 53.0 | 1.5 | 1.6 | 7.0 | 8.4 | 18.0 | |
| | | 25-May-10 | 2 | 9.99 | 14.1 | 4.11 | A | 22.9 | 22.9 | 5.6 | 22:25 | 22:40 | 2.6 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-30+290.75 | Q | 25-Oct-11 | 3 | 8.05 | 9.05 | 1.00 | A | 13.1 | 13.1 | 13.1 | -- | -- | 3.0 | -- | 0.01 | -- | -- | -- | -- | -- | -- | |
| T-30+291.5 | T | 05-Jul-10 | 4 | 6.96 | 8.46 | 1.50 | MF | 56.0 | 56.0 | 37.3 | 16:54 | 17:22 | 2.1 | 0.5 | 0.15 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 9.06 | 10.06 | 1.00 | A | 294.0 | - | - | 2:10 | 2:47 | 2.6 | 5.5 | 2.06 | 30.5 | 4.0 | 1.7 | 5.0 | 11.3 | 19.7 | |
| | | 01-Jun-10 | 3 | 9.06 | 10.06 | 1.00 | B | 55.8 | 349.8 | 349.8 | 2:47 | 3:19 | 2.4 | 0.0 | 0.01 | 35.0 | 3.5 | 1.6 | 5.0 | 11.3 | 18.7 | |
| | | 01-Jun-10 | 2 | 10.06 | 14.2 | 4.14 | A | 24.3 | 24.3 | 5.9 | 1:48 | 2:06 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+293 | S | 07-Jul-10 | 5 | 4.87 | 6.87 | 2.00 | A | 77.8 | 77.8 | 38.9 | 2:24 | 2:52 | 1.0 | 0.0 | 0.01 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 02-Jul-10 | 4 | 7.07 | 8.57 | 1.50 | A | 81.9 | 81.9 | 54.6 | 21:54 | 22:25 | 2.6 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 28-May-10 | 3 | 9.07 | 10.07 | 1.00 | A | 159.2 | - | - | 2:20 | 2:42 | 2.8 | 9.0 | 3.16 | - | - | - | - | - | - | |
| | | 28-May-10 | 3 | 9.07 | 10.07 | 1.00 | B | 63.4 | 222.6 | 222.6 | 2:42 | 3:07 | 2.8 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-May-10 | 2 | 10.07 | 14.2 | 4.13 | A | 74.3 | 74.3 | 18.0 | 1:43 | 2:10 | 2.9 | 0.6 | 0.05 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+294.5 | T | 05-Jul-10 | 4 | 7.14 | 8.64 | 1.50 | MF | 62.6 | 62.6 | 41.7 | 15:50 | 16:11 | 2.0 | 0.6 | 0.20 | 31.9 | - | 1.5 | 8.4 | 8.9 | 10.2 | |
| | | 01-Jun-10 | 3 | 9.26 | 10.26 | 1.00 | A | 222.3 | - | - | 3:53 | 4:41 | 2.6 | 6.8 | 2.63 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 3 | 9.26 | 10.26 | 1.00 | B | 114.3 | 336.6 | 336.6 | 4:41 | 5:35 | 2.6 | 0.4 | 0.16 | - | - | - | - | - | - | |
| | | 01-Jun-10 | 2 | 10.26 | 14.4 | 4.14 | A | 26.6 | 26.6 | 6.4 | 3:31 | 3:50 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+296 | P | 07-Jul-10 | 5 | 5.14 | 7.14 | 2.00 | A | 68.6 | 68.6 | 34.3 | 1:27 | 2:08 | 0.9 | 0.0 | 0.01 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 28-Jun-10 | 4 | 7.03 | 8.53 | 1.50 | A | 174.2 | - | - | 21:33 | 22:00 | 2.0 | 8.9 | 4.94 | - | - | - | - | - | - | |
| | | 28-Jun-10 | 4 | 7.03 | 8.53 | 1.50 | B | 225.4 | 399.6 | 266.4 | 22:00 | 22:55 | 2.5 | 0.7 | 0.20 | 35.6 | - | 1.6 | 11.7 | 11.5 | 20.1 | |
| | | 26-May-10 | 3 | 9.15 | 10.15 | 1.00 | A | 184.8 | - | - | 15:48 | 16:13 | 2.7 | 13.4 | 5.35 | - | - | - | - | - | - | |
| | | 26-May-10 | 3 | 9.15 | 10.15 | 1.00 | B | 516.5 | 701.3 | 701.3 | 16:13 | 18:00 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-May-10 | 2 | 10.15 | 14.17 | 4.02 | A | 196.0 | - | - | 14:17 | 14:42 | 2.0 | 11.9 | 1.34 | 32.4 | 4.0 | 1.7 | 15.6 | 8.5 | 14.3 | |
| | | 26-May-10 | 2 | 10.15 | 14.17 | 4.02 | B | 160.5 | - | - | 14:42 | 14:53 | 2.4 | 13.3 | 1.16 | 35.6 | 1.0 | 1.7 | 15.6 | 8.5 | 14.2 | |
| | | 26-May-10 | 2 | 10.15 | 14.17 | 4.02 | C | 176.2 | - | - | 14:53 | 15:22 | 2.6 | 4.3 | 0.35 | 45.4 | 1.5 | 1.6 | 15.6 | 8.5 | 14.3 | |
| | | 26-May-10 | 2 | 10.15 | 14.17 | 4.02 | D | 24.0 | 556.7 | 138.5 | 15:22 | 15:35 | 2.6 | 0.2 | 0.02 | 61.2 | - | 1.6 | 15.5 | 8.6 | 14.2 | |
| Q-30+296.75 | Q | 25-Oct-11 | 3 | 7.96 | 8.96 | 1.00 | A | 41.5 | 41.5 | 41.5 | -- | -- | 3.1 | -- | 0.01 | -- | -- | -- | -- | -- | -- | |
| T-30+297.5 | T | 05-Jul-10 | 4 | 7.21 | 9.71 | 2.50 | MF | 30.7 | 30.7 | 12.3 | 10:59 | 11:15 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.35 | 10.35 | 1.00 | A | 202.7 | - | - | 9:10 | 9:35 | 2.6 | 8.1 | 3.44 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.35 | 10.35 | 1.00 | B | 206.3 | 409.0 | 409.0 | 9:35 | 10:39 | 2.5 | - | 0.24 | 35.4 | - | - | 12.9 | 12.9 | 15.9 | |
| | | 02-Jun-10 | 2 | 10.35 | 14.5 | 4.15 | A | 22.9 | 22.9 | 5.5 | 8:52 | 9:07 | 2.6 | 0.1 | 0.01 | 33.8 | 3.0 | 1.6 | 12.7 | 12.8 | 17.3 | |
| S-30+299 | S | 07-Jul-10 | 5 | 5.18 | 7.18 | 2.00 | A | 86.2 | 86.2 | 43.1 | 22:13 | 23:30 | 0.9 | 0.0 | 0.01 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 02-Jul-10 | 4 | 7.18 | 8.68 | 1.50 | A | 86.9 | 86.9 | 57.9 | 22:27 | 23:10 | 2.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-May-10 | 3 | 9.18 | 10.18 | 1.00 | A | 258.7 | - | - | 3:50 | 4:13 | 1.8 | 16.0 | 9.60 | - | - | - | - | - | - | |
| | | 28-May-10 | 3 | 9.18 | 10.18 | 1.00 | B | 232.2 | - | - | 4:13 | 4:30 | 2.2 | 17.5 | 8.16 | 37.4 | 4.0 | 1.7 | 18.2 | 16.8 | 21.5 | |
| | | 28-May-10 | 3 | 9.18 | 10.18 | 1.00 | C | 268.6 | 759.5 | 759.5 | 4:30 | 5:02 | 2.8 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-May-10 | 2 | 10.18 | 14.2 | 4.02 | A | 23.7 | 23.7 | 5.9 | 3:23 | 3:41 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+300.5 | T | 05-Jul-10 | 4 | 7.24 | 8.74 | 1.50 | MF | 58.2 | 58.2 | 38.8 | 9:57 | 10:24 | 2.2 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.38 | 10.38 | 1.00 | A | 162.8 | - | - | 11:17 | 11:36 | 2.3 | 16.0 | 6.97 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.38 | 10.38 | 1.00 | B | 157.3 | - | - | 11:36 | 11:49 | 2.6 | 7.3 | 5.06 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.38 | 10.38 | 1.00 | C | 14.4 | 334.5 | 334.5 | 11:49 | 12:02 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 10.38 | 14.5 | 4.12 | A | 23.6 | 23.6 | 5.7 | 10:51 | 11:05 | 2.6 | 0.0 | 0.00 | 31.2 | - | 1.6 | 12.9 | 12.7 | 16.3 | |
| P-30+302 | P | 07-Jul-10 | 5 | 5.36 | 7.36 | 2.00 | A | 47.2 | 47.2 | 23.6 | 21:51 | 22:10 | 1.0 | 0.2 | 0.11 | - | - | - | - | - | - | |
| | | 28-Jun-10 | 4 | 7.23 | 8.73 | 1.50 | C | 107.1 | 539.5 | 359.7 | 0:08 | 0:40 | 2.6 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 28-Jun-10 | 4 | 7.23 | 8.73 | 1.50 | A | 237.4 | - | - | 23:10 | 23:48 | 2.4 | 8.1 | 2.40 | 31.6 | - | 1.7 | 11.0 | - | 16.8 | |
| | | 28-Jun-10 | 4 | 7.23 | 8.73 | 1.50 | B | 195.0 | - | - | 23:48 | 0:08 | 2.1 | 19.5 | 6.01 | 35.1 | - | 1.6 | 10.6 | - | 17.8 | |
| | | 26-May-10 | 3 | 9.35 | 10.35 | 1.00 | A | 160.8 | - | - | 18:28 | 18:48 | 1.0 | 12.9 | 13.36 | - | - | - | - | - | - | |
| | | 26-May-10 | 3 | 9.35 | 10.35 | 1.00 | B | 348.1 | - | - | 18:48 | 19:15 | 3.9 | 7.3 | 16.80 | - | - | - | - | - | - | |
| | | 26-May-10 | 3 | 9.35 | 10.35 | 1.00 | C | 145.0 | - | - | 19:15 | 19:33 | 1.6 | 19.6 | 12.62 | - | - | - | - | - | - | |
| | | 26-May-10 | 3 | 9.35 | 10.35 | 1.00 | D | 268.2 | 922.1 | 922.1 | 19:33 | 19:48 | 1.2 | 8.1 | 2.88 | - | - | - | - | - | - | Communicated To S-30+305 |
| | | 26-May-10 | 2 | 10.35 | 14.7 | 4.35 | A | 36.3 | 36.3 | 8.3 | 18:12 | 18:26 | 2.7 | 1.4 | 0.12 | - | - | - | - | - | - | |
| Q-30+302.75 | Q | 25-Oct-11 | 3 | 8.59 | 9.59 | 1.00 | A | 187.3 | - | -- | -- | -- | 2.1 | -- | 3.10 | -- | -- | -- | -- | -- | -- | |
| | | | | | | | B | 170.0 | 357.3 | 357.3 | -- | -- | 3.0 | -- | 0.00 | -- | -- | -- | -- | -- | -- | |
| T-30+303.5 | T | 05-Jul-10 | 4 | 7.39 | 8.89 | 1.50 | MF | 35.8 | 35.8 | 23.9 | 9:36 | 9:54 | 2.0 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.53 | 10.53 | 1.00 | A | 129.5 | 129.5 | 129.5 | 15:51 | 17:13 | 2.5 | 0.3 | 0.14 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 10.53 | 14.6 | 4.07 | A | 26.1 | 26.1 | 6.4 | 15:27 | 15:43 | 2.6 | 0.2 | 0.02 | 33.1 | - | 1.7 | 7.8 | 10.4 | 15.9 | |
| S-30+305 | S | 07-Jul-10 | 5 | 5.47 | 7.47 | 2.00 | A | 52.0 | - | - | 20:07 | 21:28 | 1.0 | 0.4 | 1.22 | 31.3 | 6.0 | 1.6 | 7.7 | 12.1 | 17.8 | |
| | | 07-Jul-10 | 5 | 5.47 | 7.47 | 2.00 | B | 1.0 | 53.0 | 26.5 | 21:28 | 21:45 | 1.0 | 0.0 | 0.04 | 37.6 | - | 1.6 | 12.4 | 16.3 | 20.4 | |
| | | 02-Jul-10 | 4 | 7.54 | 9.04 | 1.50 | A | 154.0 | 154.0 | 102.7 | 1:17 | 1:58 | 2.6 | 0.6 | 0.14 | 31.1 | - | 1.6 | 10.6 | 11.7 | 16.6 | |
| | | 28-May-10 | 3 | 9.54 | 10.54 | 1.00 | A | 197.2 | - | - | 7:03 | 7:31 | 2.4 | 7.4 | 3.04 | - | - | - | - | - | - | |
| | | 28-May-10 | 3 | 9.54 | 10.54 | 1.00 | B | 47.3 | 244.5 | 244.5 | 7:31 | 7:55 | 2.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-May-10 | 2 | 10.54 | 14.6 | 4.06 | A | 534.1 | 534.1 | 131.6 | 5:12 | 6:56 | 3.4 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-30+306.5 | T | 05-Jul-10 | 4 | 7.15 | 8.65 | 1.50 | MF | 99.4 | 99.4 | 66.3 | 8:36 | 9:29 | 1.9 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.27 | 10.27 | 1.00 | A | 165.5 | - | - | 17:45 | 18:05 | 2.4 | 10.1 | 4.92 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.27 | 10.27 | 1.00 | B | 256.6 | - | - | 18:05 | 18:22 | 1.1 | 5.7 | 5.02 | 36.2 | 3.0 | 1.7 | 13.0 | 9.0 | 17.0 | |
| | | 02-Jun-10 | 3 | 9.27 | 10.27 | 1.00 | C | 123.2 | 545.3 | 545.3 | 18:22 | 18:50 | 0.5 | - | 0.03 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 10.27 | 14.5 | 4.23 | A | 53.5 | 53.5 | 12.6 | 17:22 | 17:40 | 2.7 | 1.1 | 0.09 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+308 | P | 07-Jul-10 | 5 | 5.47 | 6.97 | 1.50 | A | 51.9 | 51.9 | 34.6 | 19:30 | 19:58 | 0.9 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 28-Jun-10 | 4 | 7.04 | 8.54 | 1.50 | A | 138.6 | - | - | 16:04 | 16:24 | 1.9 | 9.0 | 3.16 | - | - | - | - | - | - | |
| | | 28-Jun-10 | 4 | 7.04 | 8.54 | 1.50 | B | 166.7 | - | - | 16:24 | 16:37 | 2.2 | 5.1 | 1.36 | - | - | - | - | - | - | |
| | | 28-Jun-10 | 4 | 7.04 | 8.54 | 1.50 | C | 34.8 | 340.1 | 226.7 | 16:37 | 16:59 | 2.6 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 26-May-10 | 3 | 9.65 | 10.65 | 1.00 | A | 174.0 | - | - | 20:20 | 20:53 | 2.5 | 9.0 | 5.80 | - | - | - | - | - | - | |
| | | 26-May-10 | 3 | 9.65 | 10.65 | 1.00 | B | 385.0 | - | - | 20:53 | 21:18 | 2.6 | 9.0 | 4.12 | 37.1 | 3.5 | 1.7 | 15.4 | 8.0 | 22.0 | |
| | | 26-May-10 | 3 | 9.65 | 10.65 | 1.00 | C | 640.0 | 1199.0 | 1199.0 | 21:18 | 22:32 | 3.0 | 6.0 | 1.98 | 57.0 | - | 1.7 | 15.0 | 8.0 | 17.0 | |
| | | 26-May-10 | 2 | 10.65 | 14.8 | 4.15 | A | 17.4 | 17.4 | 4.2 | 20:06 | 20:20 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-30+308.75 | Q | 25-Oct-11 | 3 | 8.42 | 9.42 | 1.00 | A | 208.7 | - | -- | -- | -- | 3.0 | -- | 2.02 | -- | -- | -- | -- | -- | -- | |
| | | | | | | | A+ | 52.0 | 260.7 | 260.7 | -- | -- | 3.1 | -- | 0.00 | -- | -- | -- | -- | -- | -- | |
| T-30+309.5 | T | 05-Jul-10 | 4 | 6.95 | 8.45 | 1.50 | MF | 37.6 | 37.6 | 25.1 | 8:11 | 8:24 | 2.4 | 0.3 | 0.09 | 31.5 | 1.0 | 1.5 | 9.7 | 8.7 | 10.7 | |
| | | 05-Jun-10 | 3 | 9.07 | 10.07 | 1.00 | A | 165.6 | 165.6 | 165.6 | 20:48 | 22:13 | 2.7 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 2 | 10.07 | 14.9 | 4.83 | A | 78.7 | 78.7 | 16.3 | 20:17 | 20:24 | 3.1 | 0.7 | 0.05 | 30.7 | 4.0 | 1.7 | 9.0 | 18.2 | 17.9 | |
| S-30+311 | S | 02-Jul-10 | 4 | 6.7 | 8.2 | 1.50 | A | 54.2 | 54.2 | 36.1 | 2:01 | 2:21 | 2.7 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 8.7 | 9.7 | 1.00 | A | 182.9 | - | - | 3:10 | 3:32 | 1.9 | 11.7 | 6.14 | 35.0 | - | 1.6 | 15.0 | 12.7 | 16.8 | |
| | | 03-Jun-10 | 3 | 8.7 | 9.7 | 1.00 | B | 268.8 | - | - | 3:32 | 3:49 | 2.1 | 21.1 | 9.35 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 8.7 | 9.7 | 1.00 | C | 326.0 | 777.7 | 777.7 | 3:49 | 4:15 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 9.7 | 13.8 | 4.10 | A | 38.1 | 38.1 | 9.3 | 2:45 | 3:04 | 3.1 | 0.7 | 0.05 | 31.0 | - | 1.6 | 16.0 | 12.4 | 17.0 | |
| T-30+312.5 | T | 04-Jul-10 | 4 | 7 | 8.5 | 1.50 | MF | 66.2 | 66.2 | 44.1 | 4:48 | 5:27 | 2.5 | 0.0 | 0.01 | 31.8 | - | 1.5 | 9.5 | 8.8 | 14.4 | |
| | | 05-Jun-10 | 3 | 9.17 | 10.17 | 1.00 | A | 168.1 | - | - | 22:45 | 23:12 | 2.3 | 12.0 | 5.22 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 3 | 9.17 | 10.17 | 1.00 | B | 376.4 | 544.5 | 544.5 | 23:12 | 0:25 | 3.3 | 0.0 | 0.00 | 35.3 | 4.0 | 1.7 | 9.0 | 14.0 | 19.0 | |
| | | 05-Jun-10 | 2 | 10.17 | 14.3 | 4.13 | A | 40.4 | 40.4 | 9.8 | 22:22 | 22:40 | 3.5 | 0.9 | 0.06 | - | - | - | - | - | - | |
| P-30+314 | P | 28-Jun-10 | 4 | 6.82 | 8.32 | 1.50 | A | 166.1 | - | - | 14:22 | 14:42 | 2.0 | 11.8 | 3.72 | 30.0 | 4.0 | 1.6 | 12.9 | 13.5 | 19.1 | |
| | | 28-Jun-10 | 4 | 6.82 | 8.32 | 1.50 | B | 231.9 | - | - | 14:42 | 15:00 | 2.4 | 8.6 | 2.72 | 33.5 | 5.0 | 1.6 | 12.9 | 13.6 | 20.1 | |
| | | 28-Jun-10 | 4 | 6.82 | 8.32 | 1.50 | C | 90.6 | 488.6 | 325.7 | 15:00 | 15:52 | 3.0 | 0.1 | 0.01 | 45.4 | 2.0 | 1.7 | 11.1 | 13.6 | 18.4 | |
| | | 02-Jun-10 | 3 | 8.93 | 9.93 | 1.00 | A | 158.7 | - | - | 21:47 | 22:16 | 0.9 | 12.7 | 10.08 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 8.93 | 9.93 | 1.00 | B | 224.1 | - | - | 22:16 | 22:25 | 1.8 | 16.6 | 9.24 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 8.93 | 9.93 | 1.00 | C | 387.2 | - | - | 22:25 | 23:12 | 2.9 | 6.3 | 2.27 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 8.93 | 9.93 | 1.00 | D | 239.0 | 1009.0 | 1009.0 | 23:12 | 23:12 | 3.5 | 3.7 | 1.05 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 9.93 | 13.9 | 3.97 | A | 53.0 | 53.0 | 13.4 | 21:20 | 21:42 | 3.2 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 1 | 13.9 | 19.1 | 5.20 | A | 33.8 | 33.8 | 6.5 | 20:59 | 21:14 | 5.8 | 0.3 | 0.01 | - | - | - | - | - | - | |
| Q-30+314.75 | Q | 25-Oct-11 | 3 | 9.32 | 9.82 | 0.50 | A | 10.0 | 10.0 | 20.0 | -- | -- | 3.3 | -- | 0.00 | -- | -- | -- | -- | -- | -- | |
| T-30+315.5 | T | 04-Jul-10 | 4 | 7.16 | 8.66 | 1.50 | MF | 57.7 | 57.7 | 38.5 | 4:14 | 4:45 | 2.5 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 3 | 9.3 | 10.3 | 1.00 | A | 159.9 | - | - | 3:05 | 3:26 | 3.0 | 9.3 | 2.91 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 3 | 9.3 | 10.3 | 1.00 | B | 252.7 | 412.6 | 412.6 | 3:26 | 4:27 | 2.8 | 0.2 | 0.07 | 36.4 | 4.0 | 1.7 | 9.0 | 14.0 | 19.0 | |
| | | 05-Jun-10 | 2 | 10.3 | 14.3 | 4.00 | A | 28.9 | 28.9 | 7.2 | 2:45 | 3:02 | 2.8 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 1 | 14.3 | 19.3 | 5.00 | A | 29.3 | 29.3 | 5.9 | 2:23 | 2:40 | 5.8 | 0.3 | 0.01 | - | - | - | - | - | - | |
| S-30+317 | S | 02-Jul-10 | 4 | 7.48 | 8.98 | 1.50 | A | 97.2 | 97.2 | 64.8 | 2:23 | 3:01 | 3.1 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 9.48 | 10.48 | 1.00 | A | 23.9 | 23.9 | 23.9 | 5:01 | 5:15 | 3.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 10.48 | 14.5 | 4.02 | A | 24.6 | 24.6 | 6.1 | 4:46 | 4:58 | 3.7 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 14.5 | 19.5 | 5.00 | A | 26.7 | 26.7 | 5.3 | 4:26 | 4:40 | 6.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+318.5 | T | 04-Jul-10 | 4 | 7.16 | 8.66 | 1.50 | MF | 55.7 | 55.7 | 37.1 | 3:39 | 4:11 | 2.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 3 | 9.27 | 10.27 | 1.00 | A | 160.0 | - | - | 5:26 | 7:11 | 3.7 | 26.6 | 7.78 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 3 | 9.27 | 10.27 | 1.00 | B | 594.0 | - | - | 7:11 | 7:25 | 3.2 | 14.1 | 4.44 | 36.4 | 3.0 | 1.6 | 6.7 | 11.4 | 16.1 | |
| | | 06-Jun-10 | 3 | 9.27 | 10.27 | 1.00 | C | 250.0 | 1004.0 | 1004.0 | 7:25 | 7:45 | 2.9 | 14.8 | 5.02 | 46.8 | 1.5 | 1.6 | 6.6 | 11.4 | 16.4 | |
| | | 05-Jun-10 | 2 | 10.27 | 14.3 | 4.03 | A | 45.4 | 45.4 | 11.3 | 5:06 | 5:23 | 3.1 | 1.1 | 0.09 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 1 | 14.3 | 19.4 | 5.10 | A | 111.9 | 111.9 | 21.9 | 4:38 | 5:00 | 6.0 | 2.6 | 0.05 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+320 | P | 28-Jun-10 | 4 | 7.08 | 8.58 | 1.50 | A | 152.5 | - | - | 10:35 | 10:55 | 1.2 | 12.7 | 7.34 | - | - | - | - | - | - | Communicated To P-30+326 |
| | | 28-Jun-10 | 4 | 7.08 | 8.58 | 1.50 | B | 238.8 | - | - | 10:55 | 11:11 | 2.0 | 15.2 | 5.26 | 33.5 | 3.0 | 1.6 | 14.9 | 15.1 | 20.0 | |
| | | 28-Jun-10 | 4 | 7.08 | 8.58 | 1.50 | C | 200.0 | - | - | 11:11 | 11:26 | 3.0 | 16.4 | 3.73 | 42.0 | 1.0 | 1.6 | 15.3 | 15.0 | 20.3 | |
| | | 28-Jun-10 | 4 | 7.08 | 8.58 | 1.50 | D | 68.2 | 659.5 | 439.7 | 11:26 | 11:48 | 3.0 | 0.4 | 0.07 | 79.0 | - | 1.7 | 15.7 | 14.5 | 20.0 | |
| | | 02-Jun-10 | 3 | 9.2 | 10.2 | 1.00 | A | 22.0 | 22.0 | 22.0 | 4:09 | 4:25 | 3.4 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 10.2 | 14.2 | 4.00 | A | 161.5 | - | - | 2:45 | 3:02 | 0.6 | 15.4 | 8.27 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 10.2 | 14.2 | 4.00 | B | 160.6 | - | - | 3:02 | 3:12 | 1.0 | 18.1 | 4.39 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 10.2 | 14.2 | 4.00 | C | 269.9 | - | - | 3:12 | 3:24 | 1.7 | 22.4 | 3.38 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 10.2 | 14.2 | 4.00 | D | 801.0 | 1393.0 | 348.3 | 3:24 | 4:06 | 3.2 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 1 | 14.2 | 19.4 | 5.20 | A | 160.3 | - | - | 2:03 | 2:23 | 4.7 | 9.2 | 0.36 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 1 | 14.2 | 19.4 | 5.20 | B | 57.9 | 218.2 | 42.0 | 2:23 | 2:37 | 6.4 | 0.9 | 0.03 | - | - | - | - | - | - | |
| Q-30+320.75 | Q | 25-Oct-11 | 3 | 8.85 | 9.35 | 0.50 | B | 212.0 | - | -- | -- | -- | 1.9 | -- | 11.43 | -- | -- | -- | -- | -- | -- | |
| | | | | | | | C | 66.6 | 278.6 | 557.2 | -- | -- | 3.0 | -- | 0.02 | -- | -- | -- | -- | -- | -- | |
| T-30+321.5 | T | 04-Jul-10 | 4 | 7.14 | 8.64 | 1.50 | MF | 87.5 | 87.5 | 58.3 | 2:14 | 3:36 | 2.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 9.26 | 10.26 | 1.00 | A | 69.8 | 69.8 | 69.8 | 15:50 | 16:36 | 3.1 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 2 | 10.26 | 14.3 | 4.04 | A | 25.8 | 25.8 | 6.4 | 15:30 | 15:46 | 3.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 1 | 14.3 | 19.3 | 5.00 | A | 25.5 | 25.5 | 5.1 | 15:08 | 15:23 | 6.1 | 0.1 | 0.00 | 31.6 | - | 1.6 | 11.5 | 12.4 | 21.3 | |
| S-30+323 | S | 02-Jul-10 | 4 | 7.51 | 9.01 | 1.50 | A | 148.1 | - | - | 3:02 | 3:24 | 2.2 | 12.7 | 4.39 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 7.51 | 9.01 | 1.50 | B | 171.9 | - | - | 3:24 | 3:36 | 2.7 | 14.5 | 4.70 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 7.51 | 9.01 | 1.50 | C | 157.6 | - | - | 3:36 | 3:47 | 2.5 | 14.9 | 4.06 | 45.6 | 3.0 | 1.7 | 9.1 | 12.8 | 20.1 | |
| | | 02-Jul-10 | 4 | 7.51 | 9.01 | 1.50 | D | 582.4 | 1060.0 | 706.7 | 3:47 | 4:28 | 2.6 | 15.0 | 3.92 | 65.4 | - | 1.7 | 9.1 | 12.8 | 18.1 | |
| | | 04-Jun-10 | 3 | 9.51 | 10.51 | 1.00 | A | 257.0 | - | - | 6:01 | 6:44 | 1.8 | 12.9 | 5.98 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 9.51 | 10.51 | 1.00 | B | 177.5 | - | - | 6:44 | 6:55 | 2.1 | 19.7 | 9.19 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 9.51 | 10.51 | 1.00 | C | 166.3 | - | - | 6:55 | 7:03 | 3.1 | 21.4 | 6.26 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 9.51 | 10.51 | 1.00 | D | 159.9 | 760.7 | 760.7 | 7:03 | 7:42 | 3.6 | 0.2 | 0.05 | 63.4 | - | 1.7 | 18.1 | 14.1 | 18.4 | |
| | | 03-Jun-10 | 2 | 10.51 | 14.5 | 3.99 | A | 23.6 | 23.6 | 5.9 | 5:50 | 6:00 | 3.8 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 14.5 | 19.7 | 5.20 | A | 86.6 | 86.6 | 16.7 | 5:27 | 5:45 | 5.9 | 3.4 | 0.11 | - | - | - | - | - | - | |
| T-30+324.5 | T | 04-Jul-10 | 4 | 7.5 | 9 | 1.50 | MF | 66.5 | 66.5 | 44.3 | 1:33 | 2:10 | 2.4 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 3 | 9.6 | 10.6 | 1.00 | A | 169.6 | - | - | 13:33 | 13:59 | 2.9 | 15.9 | 5.20 | 31.2 | - | 1.6 | 7.2 | 13.2 | 20.3 | |
| | | 06-Jun-10 | 3 | 9.6 | 10.6 | 1.00 | B | 171.2 | - | - | 13:59 | 14:10 | 2.6 | 15.4 | 5.82 | 37.2 | - | 1.7 | 7.2 | 13.0 | 16.5 | |
| | | 06-Jun-10 | 3 | 9.6 | 10.6 | 1.00 | C | 68.0 | 408.8 | 408.8 | 14:10 | 14:32 | 2.9 | 0.3 | 0.09 | 46.1 | - | 1.7 | 7.3 | 13.4 | 17.2 | |
| | | 06-Jun-10 | 2 | 10.6 | 14.6 | 4.00 | A | 26.3 | 26.3 | 6.6 | 10:57 | 11:18 | 3.2 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 1 | 14.6 | 19.7 | 5.10 | A | 36.9 | 36.9 | 7.2 | 10:32 | 10:51 | 6.0 | 0.6 | 0.02 | 31.5 | 3.0 | 1.7 | 5.5 | 13.6 | 18.7 | |
| P-30+326 | P | 28-Jun-10 | 4 | 7.58 | 9.08 | 1.50 | A | 75.1 | 75.1 | 50.1 | 10:00 | 10:25 | 3.1 | 0.2 | 0.04 | 30.8 | 5.0 | 1.6 | 16.5 | 15.4 | 21.1 | |
| | | 02-Jun-10 | 3 | 9.92 | 10.92 | 1.00 | A | 194.8 | - | - | 5:10 | 5:30 | 0.2 | 16.7 | 76.13 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.92 | 10.92 | 1.00 | B | 162.0 | - | - | 5:30 | 5:39 | 0.7 | 25.9 | 37.88 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.92 | 10.92 | 1.00 | C | 359.1 | - | - | 5:39 | 5:51 | 2.0 | 32.0 | 16.88 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 9.92 | 10.92 | 1.00 | D | 412.1 | 1128.0 | 1128.0 | 5:51 | 6:03 | 1.8 | 37.0 | 21.16 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 10.92 | 14.9 | 3.98 | A | 22.3 | 22.3 | 5.6 | 4:55 | 5:06 | 3.2 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 1 | 14.9 | 20 | 5.10 | A | 22.8 | 22.8 | 4.5 | 4:35 | 4:49 | 5.9 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-30+326.75 | Q | 25-Oct-11 | 3 | 9.52 | 10.02 | 0.50 | B | 7.7 | 7.7 | 15.4 | -- | -- | 3.3 | -- | 0.01 | -- | -- | -- | -- | -- | -- | |
| T-30+327.5 | T | 09-Jul-10 | 4 | 7.94 | 9.44 | 1.50 | MF | 49.3 | 49.3 | 32.9 | 13:57 | 14:35 | 2.6 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 3 | 10.25 | 11.25 | 1.00 | A | 213.2 | 213.2 | 213.2 | 16:03 | 17:09 | 3.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 2 | 11.25 | 15.3 | 4.05 | A | 27.4 | 27.4 | 6.8 | 15:39 | 15:54 | 3.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 1 | 15.3 | 20.3 | 5.00 | A | 30.8 | 30.8 | 6.2 | 15:14 | 15:34 | 6.1 | 0.3 | 0.01 | 31.6 | - | 1.6 | 7.4 | 12.6 | 16.0 | |
| S-30+329 | S | 07-Jul-10 | 4 | 7.46 | 9.46 | 2.00 | A | 200.8 | - | - | 16:10 | 16:34 | 2.2 | 12.3 | 2.78 | 30.4 | - | 1.6 | 11.5 | 8.4 | 12.5 | |
| | | 07-Jul-10 | 4 | 7.46 | 9.46 | 2.00 | B | 157.8 | - | - | 16:34 | 16:43 | 2.6 | 18.7 | 3.86 | - | - | - | - | - | - | |
| | | 07-Jul-10 | 4 | 7.46 | 9.46 | 2.00 | C | 254.9 | - | - | 16:43 | 17:09 | 3.2 | 8.7 | 1.34 | - | - | - | - | - | - | |
| | | 07-Jul-10 | 4 | 7.46 | 9.46 | 2.00 | D | 53.9 | 667.4 | 333.7 | 17:09 | 17:35 | 3.0 | 1.0 | 0.17 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 10.37 | 11.37 | 1.00 | A | 203.8 | - | - | 14:15 | 14:40 | 2.1 | 15.6 | 8.47 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 10.37 | 11.37 | 1.00 | B | 201.0 | - | - | 14:40 | 14:52 | 2.5 | 9.8 | 3.57 | 37.8 | 3.0 | 1.6 | 17.9 | 11.4 | 19.1 | |
| | | 04-Jun-10 | 3 | 10.37 | 11.37 | 1.00 | C | 250.1 | - | - | 14:52 | 15:04 | 2.2 | 8.2 | 3.01 | 44.9 | - | 1.6 | 17.9 | 11.6 | 18.9 | |
| | | 04-Jun-10 | 3 | 10.37 | 11.37 | 1.00 | D | 105.5 | 760.4 | 760.4 | 15:04 | 15:42 | 3.6 | 0.0 | 0.00 | 67.4 | - | 1.7 | 17.9 | 11.4 | 18.1 | |
| | | 04-Jun-10 | 2 | 11.37 | 15.4 | 4.03 | A | 76.4 | 76.4 | 19.0 | 13:45 | 14:11 | 3.2 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 1 | 15.4 | 20.4 | 5.00 | A | 27.0 | 27.0 | 5.4 | 13:21 | 13:39 | 6.1 | 0.2 | 0.01 | 31.6 | 1.0 | 1.6 | 17.6 | 11.0 | 18.8 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+330.5 | T | 09-Jul-10 | 4 | 7.82 | 9.82 | 2.00 | MF | 250.2 | - | - | 14:37 | 15:13 | 2.3 | 15.3 | 3.16 | 31.1 | 4.0 | 1.5 | 13.6 | 12.2 | 16.8 | |
| | | 09-Jul-10 | 4 | 7.82 | 9.82 | 2.00 | A | 160.4 | - | - | 15:13 | 15:24 | 2.2 | 14.6 | 3.19 | 32.4 | - | 1.7 | 13.6 | 12.2 | 17.1 | |
| | | 09-Jul-10 | 4 | 7.82 | 9.82 | 2.00 | B | 163.3 | - | - | 15:24 | 15:36 | 2.4 | 13.6 | 2.36 | 38.0 | 4.0 | 1.7 | 13.6 | 12.2 | 17.3 | |
| | | 09-Jul-10 | 4 | 7.82 | 9.82 | 2.00 | C | 270.1 | - | - | 15:36 | 16:08 | 2.4 | 7.4 | 1.61 | 47.2 | 3.0 | 1.7 | 13.6 | 12.2 | 17.2 | |
| | | 09-Jul-10 | 4 | 7.82 | 9.82 | 2.00 | D | 156.0 | 1000.0 | 500.0 | 16:08 | 16:30 | 2.6 | 7.8 | 1.53 | 65.1 | 2.0 | 1.7 | 13.6 | 12.3 | 17.8 | |
| | | 06-Jun-10 | 3 | 10.37 | 11.37 | 1.00 | A | 71.4 | - | - | 19:02 | 19:22 | - | - | - | - | - | - | - | - | - | Pump Seized; Stopped Injection |
| | | 08-Jun-10 | 3 | 10.37 | 11.37 | 1.00 | A | 26.4 | 97.8 | 97.8 | 10:56 | 11:14 | 3.0 | 0.0 | 0.01 | 32.4 | - | 1.6 | 11.8 | 12.6 | 22.5 | |
| | | 06-Jun-10 | 2 | 11.37 | 15.4 | 4.03 | A | 38.4 | 38.4 | 9.5 | 18:36 | 18:58 | 3.2 | 1.0 | 0.08 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 1 | 15.4 | 20.6 | 5.20 | A | 274.3 | 274.3 | 52.8 | 17:24 | 18:17 | 6.1 | 5.5 | 0.17 | - | - | - | - | - | - | |
| P-30+332 | P | 04-Jul-10 | 4 | 8.48 | 9.98 | 1.50 | A | 161.4 | - | - | 22:15 | 22:37 | 1.6 | 11.9 | 5.18 | - | - | - | - | - | - | Communicated To P-30+338 |
| | | 04-Jul-10 | 4 | 8.48 | 9.98 | 1.50 | B | 159.3 | - | - | 22:37 | 22:48 | 2.5 | 15.7 | 4.16 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 8.48 | 9.98 | 1.50 | C | 279.3 | - | - | 22:48 | 23:02 | 2.6 | 24.5 | 6.99 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 8.48 | 9.98 | 1.50 | D | 418.0 | 1018.0 | 678.7 | 23:02 | 23:16 | 3.1 | 35.9 | 7.84 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 10.52 | 11.52 | 1.00 | A | 96.4 | - | - | 9:09 | 9:23 | 3.2 | 9.3 | 3.03 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 10.52 | 11.52 | 1.00 | B | 157.2 | 253.6 | 253.6 | 9:23 | 10:27 | 3.6 | 0.6 | 0.17 | 37.4 | 2.0 | 1.7 | 9.2 | 8.4 | 15.1 | |
| | | 03-Jun-10 | 2 | 11.52 | 15.5 | 3.98 | A | 27.4 | 27.4 | 6.9 | 8:49 | 9:03 | 3.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 15.5 | 20.6 | 5.10 | A | 28.1 | 28.1 | 5.5 | 8:22 | 8:37 | 6.0 | 0.3 | 0.01 | 31.3 | 4.0 | 1.7 | 8.4 | 10.0 | 17.6 | |
| Q-30+332.75 | Q | 25-Oct-11 | 3 | 10.42 | 10.92 | 0.50 | B | 77.6 | 77.6 | 155.2 | -- | -- | 3.2 | -- | 0.01 | -- | -- | -- | -- | -- | -- | |
| T-30+333.5 | T | 09-Jul-10 | 4 | 7.78 | 9.78 | 2.00 | MF | 44.1 | 44.1 | 22.1 | 16:40 | 17:05 | 2.6 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 10.38 | 11.38 | 1.00 | A | 27.8 | 27.8 | 27.8 | 9:41 | 10:03 | 3.1 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 2 | 11.38 | 15.4 | 4.02 | A | 24.0 | 24.0 | 6.0 | 9:11 | 9:34 | 3.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 1 | 15.4 | 20.4 | 5.00 | A | 30.1 | 30.1 | 6.0 | 8:39 | 9:03 | 6.2 | 0.0 | 0.00 | 30.6 | 4.0 | 1.6 | 11.6 | 12.2 | 22.6 | |
| S-30+335 | S | 07-Jul-10 | 4 | 7.75 | 9.75 | 2.00 | A | 179.7 | - | - | 14:43 | 15:04 | 1.8 | 16.6 | 4.82 | 31.2 | - | 1.6 | 11.5 | 8.4 | 10.8 | |
| | | 07-Jul-10 | 4 | 7.75 | 9.75 | 2.00 | B | 229.8 | - | - | 15:04 | 15:17 | 2.5 | 19.8 | 3.68 | 38.4 | - | 1.7 | 11.5 | 8.4 | 11.4 | |
| | | 07-Jul-10 | 4 | 7.75 | 9.75 | 2.00 | C | 176.8 | - | - | 15:17 | 15:27 | 2.8 | 16.9 | 2.88 | 45.8 | - | 1.7 | 11.5 | 8.4 | 11.2 | |
| | | 07-Jul-10 | 4 | 7.75 | 9.75 | 2.00 | D | 375.7 | 962.0 | 481.0 | 15:27 | 15:56 | 3.1 | 3.8 | 0.62 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 9.83 | 10.83 | 1.00 | A | 200.0 | - | - | 17:55 | 18:28 | 1.7 | 3.2 | 1.93 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 9.83 | 10.83 | 1.00 | B | 256.0 | - | - | 18:28 | 18:49 | 3.3 | 13.7 | 5.27 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 9.83 | 10.83 | 1.00 | C | 16.5 | 472.5 | 472.5 | 18:49 | 19:09 | 3.5 | 0.2 | 0.05 | 47.5 | - | 1.7 | 20.5 | 16.3 | 20.7 | |
| | | 04-Jun-10 | 2 | 10.83 | 14.8 | 3.97 | A | 43.0 | 43.0 | 10.8 | 17:30 | 17:46 | 3.2 | 0.7 | 0.06 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 1 | 14.8 | 19.8 | 5.00 | A | 321.4 | - | - | 16:06 | 16:37 | 4.4 | 18.5 | 0.80 | 31.6 | - | 1.6 | 17.8 | 11.4 | 17.9 | |
| | | 04-Jun-10 | 1 | 14.8 | 19.8 | 5.00 | B | 285.3 | - | - | 16:37 | 16:51 | 5.3 | 13.6 | 0.52 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 1 | 14.8 | 19.8 | 5.00 | C | 238.3 | 845.0 | 169.0 | 16:51 | 17:21 | 6.0 | 4.1 | 0.14 | - | - | - | - | - | - | |
| T-30+336.5 | T | 09-Jul-10 | 4 | 7.83 | 9.83 | 2.00 | MF | 55.7 | 55.7 | 27.9 | 17:07 | 17:40 | 2.6 | 0.4 | 0.08 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 10.44 | 11.44 | 1.00 | A | 165.5 | - | - | 11:01 | 11:28 | 1.0 | 8.6 | 8.34 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 10.44 | 11.44 | 1.00 | B | 231.0 | - | - | 11:28 | 11:42 | 2.4 | 15.7 | 6.09 | 34.2 | - | 1.6 | 12.1 | 13.0 | 20.6 | |
| | | 07-Jun-10 | 3 | 10.44 | 11.44 | 1.00 | C | 137.8 | 534.3 | 534.3 | 11:42 | 12:06 | 3.1 | 0.5 | 0.17 | 46.4 | - | 1.7 | 12.1 | 13.2 | 21.4 | |
| | | 07-Jun-10 | 2 | 11.44 | 15.4 | 3.96 | A | 26.3 | 26.3 | 6.6 | 10:40 | 10:55 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 1 | 15.4 | 20.6 | 5.20 | A | 26.2 | 26.2 | 5.0 | 10:17 | 10:35 | 6.1 | 0.1 | 0.00 | - | - | - | - | - | - | |
| P-30+338 | P | 04-Jul-10 | 4 | 8.53 | 10.03 | 1.50 | A | 160.8 | - | - | 21:01 | 21:24 | 1.3 | 12.3 | 6.44 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 8.53 | 10.03 | 1.50 | B | 159.6 | - | - | 21:24 | 21:36 | 1.3 | 14.9 | 7.11 | 35.6 | 7.0 | 1.6 | 8.5 | 9.7 | 16.1 | |
| | | 04-Jul-10 | 4 | 8.53 | 10.03 | 1.50 | C | 161.6 | - | - | 21:36 | 21:44 | 1.9 | 17.7 | 6.91 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 8.53 | 10.03 | 1.50 | D | 518.0 | 1000.0 | 666.7 | 21:44 | 22:12 | 2.0 | 20.5 | 6.74 | 64.9 | - | 1.7 | 7.4 | 9.0 | 16.9 | |
| | | 03-Jun-10 | 3 | 10.24 | 11.24 | 1.00 | A | 165.5 | - | - | 13:28 | 13:50 | 0.5 | 12.8 | 20.08 | 31.7 | - | 1.6 | 10.1 | 9.2 | 16.9 | |
| | | 03-Jun-10 | 3 | 10.24 | 11.24 | 1.00 | B | 160.3 | - | - | 13:50 | 14:01 | 0.8 | 15.6 | 21.29 | 36.5 | - | 1.7 | 10.2 | 9.4 | 17.1 | |
| | | 03-Jun-10 | 3 | 10.24 | 11.24 | 1.00 | C | 276.6 | - | - | 14:01 | 14:14 | 1.8 | 25.9 | 13.46 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 10.24 | 11.24 | 1.00 | D | 405.6 | 1008.0 | 1008.0 | 14:14 | 14:27 | 2.8 | 52.9 | 18.94 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 11.24 | 15.2 | 3.96 | A | 36.0 | 36.0 | 9.1 | 11:12 | 11:25 | 3.5 | 1.3 | 0.10 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 15.2 | 20.3 | 5.10 | A | 27.5 | 27.5 | 5.4 | 10:47 | 11:04 | 6.0 | 0.1 | 0.00 | 36.4 | - | 1.6 | 10.0 | 9.4 | 16.8 | |
| Q-30+338.75 | Q | 25-Oct-11 | 3 | 11.11 | 11.61 | 0.50 | B | 5.4 | 5.4 | 10.8 | -- | -- | 3.2 | -- | 0.01 | -- | -- | -- | -- | -- | -- | |
| T-30+339.5 | T | 09-Jul-10 | 4 | 7.65 | 9.65 | 2.00 | MF | 73.5 | 73.5 | 36.8 | 17:43 | 18:13 | 2.7 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 10.26 | 11.26 | 1.00 | A | 236.3 | - | - | 19:59 | 20:45 | 0.6 | 2.9 | 4.65 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 10.26 | 11.26 | 1.00 | B | 304.4 | - | - | 20:45 | 21:18 | 3.1 | 10.6 | 3.44 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 10.26 | 11.26 | 1.00 | C | 129.6 | 670.3 | 670.3 | 21:18 | 22:01 | 3.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 2 | 11.26 | 15.3 | 4.04 | A | 26.4 | 26.4 | 6.5 | 19:35 | 19:56 | 3.1 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 1 | 15.3 | 20.6 | 5.30 | A | 26.8 | 26.8 | 5.1 | 19:15 | 19:31 | 6.1 | 0.1 | 0.00 | 30.4 | 4.0 | 1.7 | 17.4 | 13.4 | 20.8 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+341 | S | 07-Jul-10 | 4 | 8.08 | 10.08 | 2.00 | A | 126.3 | - | - | 10:52 | 11:08 | 1.4 | 12.4 | 4.52 | 31.9 | - | 1.6 | 10.9 | 12.5 | 14.4 | |
| | | 07-Jul-10 | 4 | 8.08 | 10.08 | 2.00 | B | 183.7 | - | - | 11:08 | 11:21 | 2.6 | 19.9 | 3.76 | 37.8 | - | 1.6 | 10.9 | 12.5 | 15.1 | |
| | | 07-Jul-10 | 4 | 8.08 | 10.08 | 2.00 | C | 247.3 | - | - | 11:21 | 11:51 | 2.8 | 10.3 | 1.85 | 45.2 | - | 1.7 | 10.9 | 12.5 | 15.3 | |
| | | 07-Jul-10 | 4 | 8.08 | 10.08 | 2.00 | D | 199.6 | 756.9 | 378.5 | 11:51 | 12:30 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 10.86 | 11.86 | 1.00 | A | 224.6 | - | - | 20:43 | 21:20 | 1.2 | 11.2 | 8.36 | 30.9 | 0.7 | 1.7 | 18.3 | 17.6 | 19.9 | |
| | | 04-Jun-10 | 3 | 10.86 | 11.86 | 1.00 | B | 183.8 | - | - | 21:20 | 21:39 | 2.1 | 14.3 | 8.05 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 10.86 | 11.86 | 1.00 | C | 250.6 | - | - | 21:39 | 23:53 | 2.7 | 15.3 | 5.90 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 3 | 10.86 | 11.86 | 1.00 | D | 199.0 | 858.0 | 858.0 | 23:53 | 0:31 | 3.1 | 0.0 | 0.01 | 72.0 | 0.9 | 1.7 | 19.0 | 17.4 | 21.0 | |
| | | 04-Jun-10 | 2 | 11.86 | 15.9 | 4.04 | A | 75.9 | 75.9 | 18.8 | 20:18 | 20:39 | 3.2 | 2.0 | 0.15 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 1 | 15.9 | 20.9 | 5.00 | A | 190.0 | - | - | 19:25 | 19:50 | 0.0 | 11.1 | inf | - | - | - | - | - | - | |
| | | 04-Jun-10 | 1 | 15.9 | 20.9 | 5.00 | B | 178.9 | 368.9 | 73.8 | 19:50 | 20:00 | 0.2 | 15.7 | 16.36 | 38.1 | - | 1.6 | 20.0 | 16.3 | 19.4 | |
| T-30+342.5 | T | 09-Jul-10 | 4 | 8.18 | 10.18 | 2.00 | MF | 53.3 | 53.3 | 26.7 | 18:15 | 18:49 | 2.6 | 0.5 | 0.10 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 10.85 | 11.85 | 1.00 | A | 167.7 | - | - | 22:52 | 23:26 | 3.0 | 10.8 | 2.25 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 10.85 | 11.85 | 1.00 | B | 108.4 | 276.1 | 276.1 | 23:26 | 23:56 | 3.1 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 2 | 11.85 | 15.8 | 3.95 | A | 59.5 | 59.5 | 15.1 | 22:38 | 22:48 | - | - | - | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 07-Jun-10 | 1 | 15.8 | 21 | 5.20 | A | 25.6 | 25.6 | 4.9 | 22:10 | 22:34 | 6.5 | 0.3 | 0.01 | - | - | - | - | - | - | |
| P-30+344 | P | 04-Jul-10 | 4 | 8.8 | 10.3 | 1.50 | A | 198.6 | - | - | 17:30 | 18:03 | 1.6 | 12.7 | 5.14 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 8.8 | 10.3 | 1.50 | B | 176.7 | - | - | 18:03 | 18:37 | - | - | - | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 8.8 | 10.3 | 1.50 | C | 197.8 | - | - | 18:37 | 19:08 | 2.8 | 21.7 | 5.16 | 47.2 | - | 1.7 | 8.1 | 9.0 | 11.0 | |
| | | 04-Jul-10 | 4 | 8.8 | 10.3 | 1.50 | D | 341.9 | 915.0 | 610.0 | 19:08 | 20:58 | 2.9 | 1.3 | 0.20 | 64.3 | - | 1.7 | 8.0 | 9.0 | 13.0 | |
| | | 02-Jun-10 | 3 | 10.92 | 11.92 | 1.00 | A | 131.6 | - | - | 8:02 | 8:25 | inf | 9.6 | inf | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 10.92 | 11.92 | 1.00 | B | 218.6 | - | - | 8:25 | 8:38 | 0.1 | 18.3 | 128.20 | 37.0 | 2.0 | 1.6 | 10.1 | 8.9 | 17.7 | |
| | | 02-Jun-10 | 3 | 10.92 | 11.92 | 1.00 | C | 146.3 | - | - | 8:38 | 8:46 | 0.8 | 22.0 | 26.89 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 10.92 | 11.92 | 1.00 | D | 449.5 | 946.0 | 946.0 | 8:46 | 9:02 | 0.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 11.92 | 15.9 | 3.98 | A | 22.8 | 22.8 | 5.7 | 7:47 | 7:59 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 1 | 15.9 | 21 | 5.10 | A | 24.3 | 24.3 | 4.8 | 7:27 | 7:40 | 6.2 | 0.1 | 0.00 | 31.7 | 5.0 | 1.6 | 9.5 | 8.8 | 17.8 | |
| Q-30+344.75 | Q | 25-Oct-11 | 3 | 11.21 | 11.71 | 0.50 | B | 9.7 | 9.7 | 19.4 | -- | -- | 3.0 | -- | 0.20 | -- | -- | -- | -- | -- | -- | |
| T-30+345.5 | T | 10-Jul-10 | 4 | 8.81 | 10.81 | 2.00 | MF | 63.4 | 63.4 | 31.7 | 11:04 | 11:30 | 2.3 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 11.43 | 12.43 | 1.00 | A | 160.3 | - | - | 3:14 | 3:36 | 1.5 | 13.0 | 8.37 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 11.43 | 12.43 | 1.00 | B | 212.1 | - | - | 3:36 | 3:47 | 1.8 | 17.5 | 10.16 | 35.6 | 4.0 | 1.6 | 8.9 | 14.1 | 21.5 | |
| | | 07-Jun-10 | 3 | 11.43 | 12.43 | 1.00 | C | 160.1 | - | - | 3:47 | 3:58 | 2.3 | 17.6 | 7.79 | 45.2 | 1.7 | 2.0 | 8.4 | 14.2 | 20.0 | |
| | | 07-Jun-10 | 3 | 11.43 | 12.43 | 1.00 | D | 81.7 | 614.2 | 614.2 | 3:58 | 4:18 | 2.9 | 0.0 | 0.00 | 64.0 | 1.7 | 2.0 | 8.6 | 14.0 | 20.0 | |
| | | 07-Jun-10 | 2 | 12.43 | 16.4 | 3.97 | A | 20.8 | 20.8 | 5.2 | 2:52 | 3:11 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 1 | 16.4 | 21.6 | 5.20 | A | 22.7 | 22.7 | 4.4 | 2:31 | 2:48 | 6.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| S-30+347 | S | 07-Jul-10 | 4 | 9.23 | 11.23 | 2.00 | A | 161.5 | - | - | 9:31 | 9:51 | 1.8 | 16.5 | 4.61 | 32.6 | - | 1.6 | 10.8 | 12.8 | 13.4 | |
| | | 07-Jul-10 | 4 | 9.23 | 11.23 | 2.00 | B | 167.4 | - | - | 9:51 | 10:00 | 1.5 | 18.2 | 5.33 | 36.4 | - | 1.7 | 10.9 | 12.4 | 12.9 | |
| | | 07-Jul-10 | 4 | 9.23 | 11.23 | 2.00 | C | 165.3 | - | - | 10:00 | 10:09 | 2.4 | 20.7 | 4.40 | 49.5 | - | 1.7 | 10.9 | 12.4 | 13.4 | |
| | | 07-Jul-10 | 4 | 9.23 | 11.23 | 2.00 | D | 517.8 | 1012.0 | 506.0 | 10:09 | 10:42 | 2.2 | 6.6 | 1.52 | 68.0 | 1.0 | 1.7 | 10.9 | 12.5 | 13.5 | |
| | | 03-Jun-10 | 3 | 11.78 | 12.78 | 1.00 | A | 163.9 | - | - | 17:10 | 17:31 | 0.0 | 12.2 | inf | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 11.78 | 12.78 | 1.00 | B | 171.0 | - | - | 17:31 | 17:43 | 0.4 | 17.3 | 61.46 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 11.78 | 12.78 | 1.00 | C | 282.9 | - | - | 17:43 | 17:57 | 1.3 | 21.4 | 18.11 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 11.78 | 12.78 | 1.00 | D | 383.2 | 1001.0 | 1001.0 | 17:57 | 18:12 | 2.6 | 26.8 | 10.22 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 12.78 | 16.8 | 4.02 | A | 32.6 | 32.6 | 8.1 | 16:48 | 17:04 | 3.3 | 0.6 | 0.05 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 16.8 | 21.8 | 5.00 | A | 24.8 | 24.8 | 5.0 | 16:25 | 16:44 | 6.0 | 0.2 | 0.01 | - | - | - | - | - | - | |
| T-30+348.5 | T | 10-Jul-10 | 4 | 9.05 | 11.05 | 2.00 | MF | 55.2 | 55.2 | 27.6 | 10:33 | 10:58 | 3.0 | 0.3 | 0.05 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 3 | 11.69 | 12.69 | 1.00 | A | 183.9 | - | - | 5:24 | 5:53 | 1.8 | 12.1 | 6.90 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 3 | 11.69 | 12.69 | 1.00 | B | 153.1 | - | - | 5:53 | 6:03 | 1.4 | 17.0 | 12.80 | - | - | - | - | - | - | By-Pass: Inside Casing At 889 L |
| | | 08-Jun-10 | 3 | 11.69 | 12.69 | 1.00 | C | 166.5 | - | - | 6:03 | 6:12 | 1.8 | 20.1 | 10.70 | - | - | - | - | - | - | By-Pass: Inside Casing At 910 L |
| | | 08-Jun-10 | 3 | 11.69 | 12.69 | 1.00 | D | 406.5 | 910.0 | 910.0 | 6:12 | 6:58 | 0.4 | 0.0 | 0.04 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 2 | 12.69 | 16.7 | 4.01 | A | 30.2 | 30.2 | 7.5 | 4:54 | 5:20 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 1 | 16.7 | 21.8 | 5.10 | A | 22.4 | 22.4 | 4.4 | 4:31 | 4:49 | 6.3 | 0.1 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+350 | P | 04-Jul-10 | 4 | 9.48 | 10.98 | 1.50 | A | 200.7 | - | - | 16:04 | 16:28 | 1.1 | 12.1 | 6.61 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 9.48 | 10.98 | 1.50 | B | 183.2 | - | - | 16:28 | 16:40 | 1.7 | 17.4 | 6.92 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 9.48 | 10.98 | 1.50 | C | 243.0 | - | - | 16:40 | 16:55 | 2.4 | 16.5 | 4.51 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 9.48 | 10.98 | 1.50 | D | 358.1 | 985.0 | 656.7 | 16:55 | 17:24 | 2.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 11.89 | 12.89 | 1.00 | A | 154.7 | - | - | 10:49 | 11:11 | inf | 12.4 | inf | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 11.89 | 12.89 | 1.00 | B | 186.7 | - | - | 11:11 | 11:23 | 0.4 | 18.7 | 54.80 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 11.89 | 12.89 | 1.00 | C | 160.0 | - | - | 11:23 | 11:31 | 1.5 | 24.7 | 13.83 | 47.3 | - | 1.7 | 10.4 | 8.1 | 14.3 | |
| | | 02-Jun-10 | 3 | 11.89 | 12.89 | 1.00 | D | 499.6 | 1001.0 | 1001.0 | 11:31 | 11:51 | 3.3 | 27.8 | 8.46 | 63.8 | - | 1.7 | 10.4 | 8.3 | 15.8 | |
| | | 02-Jun-10 | 2 | 12.89 | 16.9 | 4.01 | A | 25.0 | 25.0 | 6.2 | 10:30 | 10:46 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 1 | 16.9 | 17.7 | 0.80 | A | 188.0 | 188.0 | 235.0 | 9:26 | 10:25 | 6.1 | 0.5 | 0.10 | - | - | - | - | - | - | |
| Q-30+350.75 | Q | 25-Oct-11 | 3 | 11.28 | 11.78 | 0.50 | B | 200.9 | - | -- | -- | -- | 1.1 | -- | 24.80 | -- | -- | -- | -- | -- | -- | |
| | | | | | | | C | 53.0 | - | - | -- | -- | 2.9 | -- | 1.18 | -- | -- | -- | -- | -- | -- | |
| | | | | | | | C | 8.0 | 261.9 | 523.8 | -- | -- | 3.3 | -- | 0.09 | -- | -- | -- | -- | -- | -- | |
| T-30+351.5 | T | 10-Jul-10 | 4 | 9.08 | 11.08 | 2.00 | MF | 50.3 | 50.3 | 25.2 | 10:07 | 10:27 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 3 | 11.7 | 12.7 | 1.00 | A | 201.4 | - | - | 8:24 | 8:45 | 0.5 | 16.9 | 34.12 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 3 | 11.7 | 12.7 | 1.00 | B | 182.0 | - | - | 8:45 | 8:56 | 0.9 | 18.2 | 19.70 | 36.2 | - | 1.6 | 11.6 | 12.5 | 21.6 | |
| | | 08-Jun-10 | 3 | 11.7 | 12.7 | 1.00 | C | 154.3 | - | - | 8:56 | 9:03 | 3.1 | 23.4 | 8.25 | 48.2 | 8.0 | 1.7 | 11.6 | 12.5 | 21.2 | |
| | | 08-Jun-10 | 3 | 11.7 | 12.7 | 1.00 | D | 464.3 | 1002.0 | 1002.0 | 9:03 | 9:25 | 0.7 | 21.3 | 28.75 | 63.0 | - | 1.7 | 11.2 | 12.5 | 20.4 | |
| | | 08-Jun-10 | 2 | 12.7 | 16.7 | 4.00 | A | 25.6 | 25.6 | 6.4 | 8:06 | 8:20 | 3.3 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 1 | 16.7 | 21.8 | 5.10 | A | 33.7 | 33.7 | 6.6 | 7:37 | 7:59 | 6.1 | 0.3 | 0.01 | 31.4 | 4.0 | 1.6 | 11.4 | 12.4 | 21.7 | |
| S-30+353 | S | 03-Jun-10 | 3 | 11.46 | 12.46 | 1.00 | A | 159.6 | - | - | 21:18 | 21:39 | 1.1 | 15.5 | 14.91 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 11.46 | 12.46 | 1.00 | B | 160.4 | - | - | 21:39 | 21:46 | 1.1 | 23.9 | 19.53 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 11.46 | 12.46 | 1.00 | C | 262.1 | - | - | 21:46 | 21:58 | 1.8 | 29.6 | 16.45 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 11.46 | 12.46 | 1.00 | D | 417.9 | 1000.0 | 1000.0 | 21:58 | 22:13 | 2.3 | 36.3 | 15.93 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 12.46 | 16.5 | 4.04 | A | 162.3 | - | - | 19:05 | 19:26 | 2.2 | 12.4 | 1.35 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 12.46 | 16.5 | 4.04 | B | 265.4 | - | - | 19:26 | 19:43 | 3.1 | 15.5 | 1.20 | 35.1 | - | 1.7 | 20.0 | 14.3 | 19.4 | |
| | | 03-Jun-10 | 2 | 12.46 | 16.5 | 4.04 | C | 580.3 | 1008.0 | 249.5 | 19:43 | 21:15 | 3.1 | 1.7 | 0.14 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 16.5 | 21.6 | 5.10 | A | 25.2 | 25.2 | 4.9 | 18:47 | 19:01 | 6.1 | 0.1 | 0.00 | - | - | - | - | - | - | |
| S-30+353A | S | 09-Jul-10 | 4 | 8.85 | 10.85 | 2.00 | A | 160.4 | - | - | 10:39 | 11:00 | 1.0 | 12.4 | 5.71 | 32.1 | - | 1.6 | 13.4 | 11.5 | 17.8 | |
| | | 09-Jul-10 | 4 | 8.85 | 10.85 | 2.00 | B | 162.1 | - | - | 11:00 | 11:13 | 1.3 | 11.2 | 4.55 | 37.2 | - | 1.7 | 13.4 | 11.5 | 18.0 | |
| | | 09-Jul-10 | 4 | 8.85 | 10.85 | 2.00 | C | 280.5 | - | - | 11:13 | 11:32 | 1.9 | 19.8 | 5.20 | 47.2 | - | 1.7 | 13.4 | 11.5 | 18.2 | |
| | | 09-Jul-10 | 4 | 8.85 | 10.85 | 2.00 | D | 397.0 | 1000.0 | 500.0 | 11:32 | 11:54 | 2.1 | 23.5 | 5.52 | 65.8 | - | 1.7 | 13.4 | 11.5 | 18.1 | |
| | | 11-Jul-10 | 3 | 11.55 | 12.55 | 1.00 | MF | 250.0 | - | - | 14:56 | 16:00 | 3.1 | 2.9 | 0.93 | - | - | - | - | - | - | |
| | | 11-Jul-10 | 3 | 11.55 | 12.55 | 1.00 | A | 55.0 | - | - | 16:00 | 16:20 | 3.1 | 2.5 | 0.82 | - | - | - | - | - | - | |
| | | 11-Jul-10 | 3 | 11.55 | 12.55 | 1.00 | B | 31.6 | 336.6 | 336.6 | 16:20 | 16:45 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Jul-10 | 3 | 11.55 | 12.55 | 1.00 | MF | 21.6 | 21.6 | 21.6 | 20:12 | 20:37 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+354.5 | T | 10-Jul-10 | 4 | 9.16 | 11.16 | 2.00 | MF | 250.7 | - | - | 8:25 | 8:53 | 2.0 | 14.9 | 3.74 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 9.16 | 11.16 | 2.00 | A | 162.0 | - | - | 8:53 | 9:03 | 1.4 | 16.7 | 7.21 | 32.4 | - | 1.6 | 9.0 | 12.1 | 14.6 | |
| | | 10-Jul-10 | 4 | 9.16 | 11.16 | 2.00 | B | 169.6 | - | - | 9:03 | 9:13 | 2.3 | 16.0 | 3.50 | 37.4 | - | 1.6 | 9.0 | 12.1 | 14.9 | |
| | | 10-Jul-10 | 4 | 9.16 | 11.16 | 2.00 | C | 129.3 | 711.6 | 355.8 | 9:13 | 9:45 | 2.7 | 0.1 | 2.68 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 3 | 11.76 | 12.76 | 1.00 | A | 200.3 | - | - | 19:51 | 20:16 | 0.9 | 8.1 | 9.09 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 3 | 11.76 | 12.76 | 1.00 | B | 159.9 | - | - | 20:16 | 20:28 | 1.1 | 14.7 | 12.43 | 35.7 | 3.5 | 1.7 | 19.0 | 14.0 | 21.0 | By-Pass: Outside Casing |
| | | 08-Jun-10 | 3 | 11.76 | 12.76 | 1.00 | C | 219.2 | 579.4 | 579.4 | 20:28 | 20:40 | 1.7 | 23.3 | 13.69 | 47.0 | 2.5 | 1.6 | 19.0 | 14.0 | 22.0 | |
| | | 08-Jun-10 | 2 | 12.76 | 16.8 | 4.04 | A | 27.8 | 27.8 | 6.9 | 19:23 | 19:47 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 1 | 16.8 | 22 | 5.20 | A | 24.9 | 24.9 | 4.8 | 14:05 | 14:21 | 6.0 | 0.3 | 0.01 | 31.6 | - | 1.6 | 8.9 | 12.4 | 21.0 | |
| P-30+356 | P | 04-Jul-10 | 4 | 9.91 | 11.41 | 1.50 | A | 179.7 | - | - | 14:51 | 15:13 | 1.0 | 12.9 | 9.70 | 32.6 | - | 1.6 | 8.8 | 8.9 | 10.8 | |
| | | 04-Jul-10 | 4 | 9.91 | 11.41 | 1.50 | B | 175.7 | - | - | 15:13 | 15:24 | 1.3 | 18.2 | 10.09 | 37.2 | - | 1.7 | 8.8 | 8.9 | 11.2 | |
| | | 04-Jul-10 | 4 | 9.91 | 11.41 | 1.50 | C | 329.1 | - | - | 15:24 | 15:42 | 2.1 | 18.1 | 6.18 | 46.4 | 1.0 | 1.7 | 7.8 | 8.9 | 10.4 | |
| | | 04-Jul-10 | 4 | 9.91 | 11.41 | 1.50 | D | 300.5 | 985.0 | 656.7 | 15:42 | 16:00 | 2.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 11.99 | 12.99 | 1.00 | A | 172.2 | - | - | 19:30 | 19:52 | 0.5 | 18.8 | 35.08 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 11.99 | 12.99 | 1.00 | B | 145.7 | - | - | 19:52 | 20:03 | 0.9 | 11.3 | 12.71 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 11.99 | 12.99 | 1.00 | C | 172.5 | - | - | 20:03 | 20:13 | 2.0 | 14.9 | 5.61 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 3 | 11.99 | 12.99 | 1.00 | D | 509.6 | 1000.0 | 1000.0 | 20:13 | 20:43 | 2.5 | 10.3 | 4.09 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 12.99 | 17 | 4.01 | A | 225.9 | - | - | 17:31 | 17:50 | inf | 14.9 | inf | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 12.99 | 17 | 4.01 | B | 171.6 | - | - | 17:50 | 17:59 | inf | 22.0 | inf | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 12.99 | 17 | 4.01 | C | 204.7 | - | - | 17:59 | 18:08 | 0.5 | 10.4 | 4.50 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 12.99 | 17 | 4.01 | D | 251.8 | 854.0 | 213.0 | 18:08 | 18:35 | 3.4 | 0.7 | 0.05 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 1 | 17 | 22 | 5.00 | A | 147.2 | 147.2 | 29.4 | 17:05 | 17:28 | 6.1 | 4.2 | 0.14 | 32.7 | - | 1.6 | 10.7 | 9.9 | 17.4 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+357.5 | T | 10-Jul-10 | 4 | 9.99 | 11.99 | 2.00 | MF | 66.0 | 66.0 | 33.0 | 7:49 | 8:17 | 3.0 | 0.1 | 0.02 | 31.4 | - | 1.5 | 8.9 | 12.0 | 14.2 | |
| | | 08-Jun-10 | 3 | 12.65 | 13.65 | 1.00 | A | 164.3 | - | - | 21:46 | 22:08 | 1.9 | 9.3 | 5.00 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 3 | 12.65 | 13.65 | 1.00 | B | 159.7 | - | - | 22:08 | 22:21 | 1.8 | 13.0 | 5.20 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 3 | 12.65 | 13.65 | 1.00 | C | 450.9 | - | - | 22:21 | 23:09 | 2.9 | 10.8 | 3.76 | 45.5 | 2.1 | 1.6 | 18.0 | 13.7 | 20.0 | |
| | | 08-Jun-10 | 3 | 12.65 | 13.65 | 1.00 | D | 82.1 | 857.0 | 857.0 | 23:09 | 23:34 | 3.1 | 0.1 | 0.03 | 68.0 | 2.0 | 1.6 | 17.0 | 13.6 | 19.0 | |
| | | 08-Jun-10 | 2 | 13.65 | 17.7 | 4.05 | A | 24.8 | 24.8 | 6.1 | 21:21 | 0:00 | 3.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 1 | 17.7 | 22.7 | 5.00 | A | 24.4 | 24.4 | 4.9 | 20:56 | 21:16 | 6.1 | 0.2 | 0.00 | - | - | - | - | - | - | |
| S-30+359 | S | 07-Jul-10 | 4 | 10.29 | 12.29 | 2.00 | A | 216.4 | - | - | 7:23 | 8:00 | 1.6 | 11.0 | 3.07 | 31.6 | 4.0 | 1.6 | 15.4 | 12.5 | 18.1 | |
| | | 07-Jul-10 | 4 | 10.29 | 12.29 | 2.00 | B | 133.5 | - | - | 8:00 | 8:17 | 1.8 | 17.6 | 4.94 | 37.2 | 1.5 | 1.6 | 15.4 | 12.5 | 16.8 | |
| | | 07-Jul-10 | 4 | 10.29 | 12.29 | 2.00 | C | 337.6 | - | - | 8:17 | 8:40 | 2.6 | 19.3 | 3.45 | 41.4 | - | 1.7 | 15.4 | 12.5 | 17.6 | |
| | | 07-Jul-10 | 4 | 10.29 | 12.29 | 2.00 | D | 92.8 | 780.3 | 390.2 | 8:40 | 9:02 | 3.1 | 0.2 | 0.03 | 63.0 | - | 1.7 | 15.4 | 12.5 | 17.4 | |
| | | 03-Jun-10 | 3 | 13.01 | 14.01 | 1.00 | D | 499.3 | 1044.0 | 1044.0 | 0:02 | 0:15 | 2.4 | 20.3 | 8.44 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 13.01 | 14.01 | 1.00 | A | 173.5 | - | - | 23:26 | 23:47 | 0.4 | 18.8 | 46.60 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 13.01 | 14.01 | 1.00 | B | 170.9 | - | - | 23:47 | 23:56 | 1.6 | 30.9 | 20.81 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 13.01 | 14.01 | 1.00 | C | 200.3 | - | - | 23:56 | 0:02 | 1.4 | 31.3 | 22.31 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 14.01 | 18 | 3.99 | A | 27.0 | 27.0 | 6.8 | 22:45 | 23:20 | 3.3 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 18 | 22.6 | 4.60 | A | 28.4 | 28.4 | 6.2 | 22:29 | 22:41 | 5.9 | 0.4 | 0.01 | 33.0 | 1.0 | 1.7 | 15.0 | 14.0 | 17.2 | |
| T-30+360.5 | T | 08-Jun-10 | 3 | 12.8 | 13.8 | 1.00 | A | 161.7 | - | - | 2:28 | 2:50 | 1.1 | 12.3 | 10.92 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 3 | 12.8 | 13.8 | 1.00 | B | 171.9 | - | - | 2:50 | 3:02 | 1.7 | 15.3 | 9.53 | 36.4 | 4.0 | 1.6 | 8.0 | 12.6 | 19.0 | |
| | | 08-Jun-10 | 3 | 12.8 | 13.8 | 1.00 | C | 172.6 | - | - | 3:02 | 3:12 | 1.9 | 21.5 | 11.16 | 49.0 | - | 1.6 | 8.0 | 12.4 | 21.0 | |
| | | 08-Jun-10 | 3 | 12.8 | 13.8 | 1.00 | D | 248.3 | 754.5 | 754.5 | 3:12 | 3:45 | 2.8 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 2 | 13.8 | 17.8 | 4.00 | A | 21.4 | 21.4 | 5.4 | 2:02 | 2:21 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 1 | 17.8 | 23 | 5.20 | A | 23.9 | 23.9 | 4.6 | 1:37 | 1:56 | 6.1 | 0.4 | 0.01 | 31.3 | 4.0 | 1.6 | 7.0 | 12.6 | 16.7 | |
| P-30+362 | P | 03-Jun-10 | 3 | 13.11 | 14.11 | 1.00 | A | 40.3 | - | - | 15:45 | 16:05 | 3.3 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 13.11 | 14.11 | 1.00 | B | 123.6 | 163.9 | 163.9 | 16:05 | 17:31 | 0.0 | 12.2 | inf | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 14.11 | 18.1 | 3.99 | A | 39.7 | 39.7 | 9.9 | 15:21 | 15:40 | 3.4 | 0.5 | 0.04 | 32.3 | - | 1.6 | 11.1 | 9.6 | 17.6 | |
| | | 02-Jun-10 | 1 | 18.1 | 23.3 | 5.20 | A | 32.0 | 32.0 | 6.2 | 3:56 | 4:09 | 5.9 | 0.1 | - | - | - | - | - | - | - | |
| T-30+363.5 | T | 09-Jun-10 | 3 | 13.19 | 14.19 | 1.00 | A | 162.3 | - | - | 5:03 | 5:33 | 2.1 | 6.5 | 3.19 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 3 | 13.19 | 14.19 | 1.00 | B | 252.2 | - | - | 5:33 | 6:02 | 3.2 | 7.0 | 2.29 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 3 | 13.19 | 14.19 | 1.00 | C | 183.2 | - | - | 6:02 | 6:33 | 3.1 | 5.4 | 1.72 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 3 | 13.19 | 14.19 | 1.00 | D | 81.8 | 679.5 | 679.5 | 6:33 | 7:16 | 3.1 | 0.0 | 0.00 | 61.3 | 1.5 | 1.7 | 4.4 | 12.1 | 20.8 | |
| | | 08-Jun-10 | 2 | 14.19 | 18.2 | 4.01 | A | 24.0 | 24.0 | 6.0 | 4:27 | 4:47 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 1 | 18.2 | 23.3 | 5.10 | A | 26.4 | 26.4 | 5.2 | 3:59 | 4:21 | 6.1 | 0.4 | 0.01 | - | - | - | - | - | - | |
| S-30+365 | S | 05-Jun-10 | 3 | 13.4 | 14.4 | 1.00 | A | 287.8 | - | - | 6:35 | 7:04 | 0.8 | 15.7 | 15.75 | 31.2 | 3.0 | 1.6 | 9.6 | 11.3 | 16.2 | |
| | | 05-Jun-10 | 3 | 13.4 | 14.4 | 1.00 | B | 207.4 | - | - | 7:04 | 7:15 | 1.2 | 21.9 | 17.12 | 40.2 | 0.5 | 1.7 | 9.6 | 11.3 | 16.4 | |
| | | 05-Jun-10 | 3 | 13.4 | 14.4 | 1.00 | C | 176.8 | - | - | 7:15 | 7:22 | 2.1 | 26.8 | 13.29 | 45.4 | - | 1.7 | 9.6 | 11.3 | 16.4 | |
| | | 05-Jun-10 | 3 | 13.4 | 14.4 | 1.00 | D | 348.0 | 1020.0 | 1020.0 | 7:22 | 7:34 | 3.3 | 48.0 | 14.35 | 62.5 | - | 1.7 | 9.7 | 11.2 | 16.8 | |
| | | 04-Jun-10 | 2 | 14.4 | 18.4 | 4.00 | A | 35.8 | 35.8 | 9.0 | 6:06 | 6:19 | 3.5 | 1.0 | 0.08 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 1 | 18.4 | 23.8 | 5.40 | A | 33.1 | 33.1 | 6.1 | 5:49 | 6:02 | 6.1 | 0.2 | 0.01 | - | - | - | - | - | - | |
| T-30+366.5 | T | 09-Jun-10 | 3 | 14 | 15 | 1.00 | A | 22.9 | 22.9 | 22.9 | 9:33 | 9:49 | 3.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 2 | 15 | 19 | 4.00 | A | 271.5 | 271.5 | 67.9 | 8:19 | 9:27 | 3.2 | 2.0 | 0.16 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 1 | 19 | 24 | 5.00 | A | 27.3 | 27.3 | 5.5 | 7:45 | 8:12 | 6.1 | 0.0 | 0.00 | 32.5 | 4.0 | 1.6 | 4.7 | 10.1 | 17.8 | |
| P-30+368 | P | 02-Jun-10 | 3 | 13.78 | 14.78 | 1.00 | A | 151.0 | 151.0 | 151.0 | 1:01 | 1:46 | 3.7 | 0.7 | 0.18 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 2 | 14.78 | 18.8 | 4.02 | A | 127.3 | 127.3 | 31.7 | 0:26 | 0:57 | 4.2 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 02-Jun-10 | 1 | 18.8 | 23.8 | 5.00 | A | 261.1 | 261.1 | 52.2 | 23:43 | 0:19 | 5.7 | 4.6 | 0.16 | - | - | - | - | - | - | |
| T-30+369.5 | T | 11-Jun-10 | 3 | 14.13 | 15.13 | 1.00 | A | 170.0 | - | - | 1:35 | 2:05 | 2.2 | 9.0 | 3.94 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 3 | 14.13 | 15.13 | 1.00 | B | 160.0 | - | - | 2:05 | 2:20 | 2.2 | 12.3 | 5.72 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 3 | 14.13 | 15.13 | 1.00 | C | 244.8 | 574.8 | 574.8 | 2:20 | 3:03 | 3.3 | 0.0 | 0.01 | 45.3 | - | 1.7 | 6.2 | 15.3 | 16.0 | |
| | | 14-Jun-10 | 2 | 15.13 | 19.1 | 3.97 | A | 23.3 | 23.3 | 5.9 | 8:38 | 8:52 | 3.2 | 0.1 | 0.01 | - | - | - | - | - | - | Downstaged. Stage 3 First. |
| | | 14-Jun-10 | 1 | 19.1 | 24.4 | 5.30 | A | 29.5 | 29.5 | 5.6 | 7:54 | 8:11 | 6.2 | 0.1 | 0.00 | 31.2 | 4.0 | 1.6 | 7.9 | 11.4 | 17.6 | Downstaged. Stage 3 First. |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+371 | S | 05-Jun-10 | 3 | 12.7 | 13.7 | 1.00 | A | 189.5 | - | - | 7:57 | 8:28 | 0.0 | 11.6 | inf | - | - | - | - | - | - | |
| | | 05-Jun-10 | 3 | 12.7 | 13.7 | 1.00 | B | 286.3 | - | - | 8:28 | 8:44 | 0.0 | 21.1 | inf | 32.0 | - | 1.6 | 6.4 | 11.4 | 17.4 | |
| | | 05-Jun-10 | 3 | 12.7 | 13.7 | 1.00 | C | 164.1 | - | - | 8:44 | 8:51 | 0.0 | 26.5 | inf | 41.9 | 1.0 | 1.7 | 6.5 | 11.4 | 17.4 | |
| | | 05-Jun-10 | 3 | 12.7 | 13.7 | 1.00 | D | 369.1 | 1009.0 | 1009.0 | 8:51 | 9:06 | 0.0 | 25.5 | inf | 42.5 | 0.5 | - | 6.4 | 11.4 | 17.8 | |
| | | 09-Jun-10 | 2 | 13.7 | 17.7 | 4.00 | A | 64.3 | 64.3 | 16.1 | 13:57 | 14:20 | 3.2 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 1 | 17.7 | 22.8 | 5.10 | A | 74.3 | 74.3 | 14.6 | 13:32 | 13:48 | 6.2 | 0.1 | 0.00 | 31.8 | - | 1.6 | 8.1 | 11.6 | 18.6 | |
| T-30+372.5 | T | 10-Jun-10 | 3 | 13.9 | 14.9 | 1.00 | A | 14.0 | 14.0 | 14.0 | 23:24 | 23:38 | 3.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 2 | 14.9 | 18.9 | 4.00 | A | 48.8 | 48.8 | 12.2 | 22:49 | 23:13 | 3.3 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 1 | 18.9 | 23.9 | 5.00 | A | 94.5 | 94.5 | 18.9 | 22:12 | 22:32 | 5.7 | 0.6 | 0.02 | - | - | - | - | - | - | |
| P-30+374 | P | 03-Jun-10 | 3 | 13.87 | 14.87 | 1.00 | A | 152.8 | - | - | 9:15 | 9:39 | 0.0 | 11.5 | inf | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 13.87 | 14.87 | 1.00 | B | 170.6 | - | - | 9:39 | 9:51 | 0.7 | 13.5 | 15.05 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 13.87 | 14.87 | 1.00 | C | 196.6 | - | - | 9:51 | 10:01 | 1.9 | 23.1 | 12.19 | 47.8 | - | 1.7 | 8.6 | 12.1 | 14.3 | |
| | | 03-Jun-10 | 3 | 13.87 | 14.87 | 1.00 | D | 458.0 | 978.0 | 978.0 | 10:01 | 10:20 | 2.8 | 20.9 | 7.39 | 73.1 | - | 1.7 | 8.6 | 12.1 | 14.5 | |
| | | 03-Jun-10 | 2 | 14.87 | 18.9 | 4.03 | A | 289.0 | 289.0 | 71.7 | 8:07 | 9:13 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 18.9 | 23.9 | 5.00 | A | 26.3 | 26.3 | 5.3 | 7:49 | 8:04 | 6.4 | 0.0 | 0.00 | 32.0 | 3.0 | 1.6 | 8.4 | 11.6 | 12.3 | |
| T-30+375.5 | T | 09-Jun-10 | 3 | 13.85 | 14.85 | 1.00 | A | 154.4 | - | - | 15:57 | 16:24 | 1.5 | 9.9 | 6.78 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 3 | 13.85 | 14.85 | 1.00 | B | 227.1 | - | - | 16:24 | 16:40 | 2.6 | 18.4 | 6.68 | 34.2 | 1.0 | 1.6 | 8.0 | 11.7 | 19.1 | |
| | | 09-Jun-10 | 3 | 13.85 | 14.85 | 1.00 | C | 181.9 | - | - | 16:40 | 16:52 | 3.1 | 11.9 | 3.75 | 44.8 | - | 1.6 | 8.1 | 11.6 | 18.2 | |
| | | 09-Jun-10 | 3 | 13.85 | 14.85 | 1.00 | D | 126.2 | 689.6 | 689.6 | 16:52 | 17:25 | 3.1 | 0.0 | 0.01 | 62.4 | - | 1.7 | 8.1 | 11.6 | 19.1 | |
| | | 09-Jun-10 | 2 | 14.85 | 18.8 | 3.95 | A | 29.2 | 29.2 | 7.4 | 15:38 | 15:54 | 3.2 | 0.4 | 0.03 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 1 | 18.8 | 23.9 | 5.10 | A | 29.2 | 29.2 | 5.7 | 15:09 | 15:28 | 6.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| S-30+377 | S | 05-Jun-10 | 3 | 14.22 | 15.22 | 1.00 | A | 163.5 | - | - | 10:12 | 10:34 | 1.8 | 13.5 | 6.51 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 3 | 14.22 | 15.22 | 1.00 | B | 172.7 | - | - | 10:34 | 10:44 | 2.0 | 21.6 | 12.60 | 31.1 | - | 1.6 | 7.2 | 11.4 | 16.6 | |
| | | 05-Jun-10 | 3 | 14.22 | 15.22 | 1.00 | C | 277.2 | - | - | 10:44 | 10:57 | 2.7 | 23.9 | 9.53 | 45.7 | - | 1.7 | 7.3 | 11.2 | 16.9 | |
| | | 05-Jun-10 | 3 | 14.22 | 15.22 | 1.00 | D | 429.6 | 1043.0 | 1043.0 | 10:57 | 11:16 | 3.1 | 35.9 | 11.56 | 61.3 | - | 1.7 | 7.3 | 11.2 | 16.8 | |
| | | 05-Jun-10 | 2 | 15.22 | 19.2 | 3.98 | A | 25.6 | 25.6 | 6.4 | 9:55 | 10:08 | 3.2 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 1 | 19.2 | 24.4 | 5.20 | A | 37.3 | 37.3 | 7.2 | 9:27 | 9:46 | 6.1 | 0.1 | 0.00 | 32.4 | - | 1.6 | 7.1 | 11.6 | 16.2 | |
| T-30+378.5 | T | 09-Jun-10 | 3 | 14.34 | 15.34 | 1.00 | A | 155.2 | - | - | 18:34 | 19:02 | 1.9 | 8.8 | 4.77 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 3 | 14.34 | 15.34 | 1.00 | B | 169.8 | - | - | 19:02 | 19:16 | 1.5 | 16.4 | 12.80 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 3 | 14.34 | 15.34 | 1.00 | C | 307.8 | 632.8 | 632.8 | 19:16 | 19:52 | 2.8 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 2 | 15.34 | 19.3 | 3.96 | A | 35.0 | 35.0 | 8.8 | 18:12 | 7:26 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 1 | 19.3 | 24.4 | 5.10 | A | 36.5 | 36.5 | 7.2 | 17:50 | 18:04 | 6.0 | 1.0 | 0.03 | - | - | - | - | - | - | |
| P-30+380 | P | 03-Jun-10 | 3 | 14.81 | 15.81 | 1.00 | A | 221.3 | - | - | 13:40 | 14:04 | 0.8 | 14.2 | 17.66 | 32.6 | 5.0 | 1.6 | 10.1 | 13.3 | 16.9 | |
| | | 03-Jun-10 | 3 | 14.81 | 15.81 | 1.00 | B | 83.7 | - | - | 14:04 | 14:10 | 1.6 | 18.8 | 14.18 | 36.1 | 6.0 | 1.7 | 10.4 | 13.3 | 14.7 | |
| | | 03-Jun-10 | 3 | 14.81 | 15.81 | 1.00 | C | 154.8 | - | - | 14:10 | 14:22 | 2.4 | 23.8 | 10.37 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 14.81 | 15.81 | 1.00 | D | 539.2 | 999.0 | 999.0 | 14:22 | 14:50 | 1.6 | 14.8 | 9.45 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 15.81 | 19.8 | 3.99 | A | 23.4 | 23.4 | 5.9 | 10:57 | 11:13 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 19.8 | 24.9 | 5.10 | A | 22.6 | 22.6 | 4.4 | 10:41 | 10:55 | 6.2 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-30+381.5 | T | 10-Jun-10 | 3 | 15.02 | 16.02 | 1.00 | A | 162.8 | - | - | 10:55 | 11:20 | 2.3 | 13.3 | 5.67 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 3 | 15.02 | 16.02 | 1.00 | B | 160.9 | - | - | 11:20 | 11:32 | 3.0 | 15.2 | 5.06 | 36.2 | - | 1.6 | 6.8 | 11.8 | 19.9 | |
| | | 10-Jun-10 | 3 | 15.02 | 16.02 | 1.00 | C | 96.4 | 420.1 | 420.1 | 11:32 | 11:55 | 3.1 | 0.1 | 0.04 | 47.5 | - | 1.7 | 6.8 | 11.9 | 20.2 | |
| | | 09-Jun-10 | 2 | 16.02 | 20 | 3.98 | A | 24.4 | 24.4 | 6.1 | 20:38 | 21:02 | 3.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 1 | 20 | 25.1 | 5.10 | A | 34.0 | 34.0 | 6.7 | 20:13 | 20:33 | 5.0 | 0.2 | 0.01 | - | - | - | - | - | - | |
| S-30+383 | S | 05-Jun-10 | 3 | 13.54 | 14.54 | 1.00 | A | 48.2 | 48.2 | 48.2 | 16:06 | 16:30 | 3.5 | 0.8 | 0.21 | 31.2 | - | 1.6 | 3.8 | 9.4 | 16.0 | |
| | | 05-Jun-10 | 2 | 14.54 | 18.5 | 3.96 | A | 291.9 | - | - | 14:30 | 14:58 | 2.9 | 12.6 | 1.11 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 2 | 14.54 | 18.5 | 3.96 | B | 156.8 | - | - | 14:58 | 15:18 | 3.4 | 6.8 | 0.54 | 36.3 | - | 1.7 | 3.7 | 9.2 | 16.1 | |
| | | 05-Jun-10 | 2 | 14.54 | 18.5 | 3.96 | C | 152.8 | 601.5 | 151.9 | 15:18 | 15:56 | 3.4 | 1.9 | 0.14 | 48.9 | - | 1.7 | 3.9 | 9.3 | 16.2 | |
| | | 05-Jun-10 | 1 | 18.5 | 23.5 | 5.00 | A | 34.4 | 34.4 | 6.9 | 14:10 | 14:24 | 6.2 | 0.4 | 0.01 | 31.6 | - | 1.6 | 3.9 | 9.2 | 15.4 | |
| T-30+384.5 | T | 10-Jun-10 | 3 | 14.77 | 15.77 | 1.00 | A | 43.1 | 43.1 | 43.1 | 8:32 | 9:02 | 3.0 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 2 | 15.77 | 19.8 | 4.03 | A | 23.1 | 23.1 | 5.7 | 8:12 | 8:27 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 1 | 19.8 | 24.8 | 5.00 | A | 24.0 | 24.0 | 4.8 | 7:45 | 8:00 | 6.0 | 0.1 | 0.00 | 31.6 | 3.0 | 1.6 | 6.2 | 11.8 | 19.6 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+386 | P | 03-Jun-10 | 3 | 15.12 | 16.12 | 1.00 | A | 141.7 | 141.7 | 141.7 | 16:03 | 17:24 | 3.6 | 0.8 | 0.22 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 16.12 | 20.1 | 3.98 | A | 21.7 | 21.7 | 5.5 | 15:44 | 16:00 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 20.1 | 25.2 | 5.10 | A | 30.8 | 30.8 | 6.0 | 15:28 | 15:42 | 6.0 | 0.6 | 0.02 | - | - | - | - | - | - | |
| T-30+387.5 | T | 10-Jun-10 | 3 | 14.33 | 15.33 | 1.00 | A | 48.6 | 48.6 | 48.6 | 16:00 | 16:36 | 3.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 2 | 15.33 | 19.3 | 3.97 | A | 33.5 | 33.5 | 8.4 | 15:32 | 15:55 | 3.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 1 | 19.3 | 24.4 | 5.10 | A | 37.4 | 37.4 | 7.3 | 14:55 | 15:18 | 6.2 | 0.1 | 0.00 | - | - | - | - | - | - | |
| S-30+389 | S | 05-Jun-10 | 3 | 15.02 | 16.02 | 1.00 | A | 28.5 | 28.5 | 28.5 | 17:23 | 17:37 | 3.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 2 | 16.02 | 20 | 3.98 | A | 27.9 | 27.9 | 7.0 | 17:05 | 17:20 | 3.3 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 1 | 20 | 25 | 5.00 | A | 29.3 | 29.3 | 5.9 | 16:45 | 17:00 | 6.3 | 0.3 | 0.01 | - | - | - | - | - | - | |
| T-30+390.5 | T | 10-Jun-10 | 3 | 14.71 | 15.71 | 1.00 | A | 26.4 | 26.4 | 26.4 | 10:19 | 10:40 | 3.0 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 2 | 15.71 | 19.7 | 3.99 | A | 24.3 | 24.3 | 6.1 | 9:47 | 10:11 | 6.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 1 | 19.7 | 24.8 | 5.10 | A | 26.7 | 26.7 | 5.2 | 9:19 | 9:34 | 6.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| P-30+392 | P | 03-Jun-10 | 3 | 13.42 | 14.42 | 1.00 | A | 148.9 | - | - | 18:15 | 18:50 | 4.4 | 4.4 | 1.15 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 3 | 13.42 | 14.42 | 1.00 | B | 22.7 | 171.6 | 171.6 | 18:50 | 19:06 | 3.5 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 2 | 14.42 | 18.4 | 3.98 | A | 28.5 | 28.5 | 7.2 | 17:55 | 18:11 | 3.1 | 0.4 | 0.03 | - | - | - | - | - | - | |
| | | 03-Jun-10 | 1 | 18.4 | 23.5 | 5.10 | A | 25.6 | 25.6 | 5.0 | 17:40 | 17:53 | 6.0 | 0.2 | 0.00 | - | - | - | - | - | - | |
| T-30+393.5 | T | 19-Jun-10 | 3 | 13.59 | 14.59 | 1.00 | A | 200.4 | - | - | 7:38 | 8:03 | 2.0 | 11.9 | 7.05 | 32.0 | 10.0 | 1.6 | 13.4 | 14.9 | 22.3 | |
| | | 19-Jun-10 | 3 | 13.59 | 14.59 | 1.00 | B | 219.9 | - | - | 8:03 | 8:20 | 4.0 | 10.2 | 7.50 | 36.6 | 4.0 | 1.6 | 16.4 | 13.4 | 22.8 | |
| | | 19-Jun-10 | 3 | 13.59 | 14.59 | 1.00 | C | 181.8 | - | - | 8:20 | 8:40 | 1.2 | 5.7 | 4.84 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 3 | 13.59 | 14.59 | 1.00 | D | 399.9 | 1002.0 | 1002.0 | 8:40 | 9:08 | 2.9 | 15.6 | 5.35 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 2 | 14.59 | 18.6 | 4.01 | A | 24.9 | 24.9 | 6.2 | 7:20 | 7:34 | 3.2 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 1 | 18.6 | 23.7 | 5.10 | A | 24.4 | 24.4 | 4.8 | 7:00 | 7:13 | 6.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+395 | S | 13-Jun-10 | 3 | 13.62 | 14.62 | 1.00 | A | 22.1 | 22.1 | 22.1 | 23:32 | 23:50 | 3.8 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 2 | 14.62 | 18.6 | 3.98 | A | 25.7 | 25.7 | 6.5 | 23:09 | 23:25 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 1 | 18.6 | 23.7 | 5.10 | A | 30.7 | 30.7 | 6.0 | 22:44 | 23:00 | 5.8 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-30+396.5 | T | 18-Jun-10 | 3 | 14.02 | 15.02 | 1.00 | B | 117.3 | 276.4 | 276.4 | 14:32 | 17:08 | 3.0 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 3 | 14.02 | 15.02 | 1.00 | A | 159.1 | - | - | 16:05 | 14:32 | 3.0 | 8.3 | 2.10 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 2 | 15.02 | 19 | 3.98 | A | 23.1 | 23.1 | 5.8 | 15:44 | 15:56 | 3.3 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 1 | 19 | 24.2 | 5.20 | A | 25.4 | 25.4 | 4.9 | 15:24 | 15:36 | 6.0 | 0.2 | 0.00 | 32.6 | - | 1.7 | 8.9 | 13.6 | 20.4 | |
| P-30+398 | P | 12-Jun-10 | 3 | 13.58 | 14.58 | 1.00 | A | 200.4 | - | - | 7:00 | 7:27 | 0.7 | 9.1 | 13.91 | 31.2 | 4.0 | 1.6 | 7.4 | 11.4 | 21.4 | |
| | | 12-Jun-10 | 3 | 13.58 | 14.58 | 1.00 | B | 164.3 | - | - | 7:27 | 7:39 | 1.8 | 17.7 | 8.97 | 37.0 | 2.0 | 1.7 | 7.4 | 11.2 | 21.2 | |
| | | 12-Jun-10 | 3 | 13.58 | 14.58 | 1.00 | C | 240.7 | - | - | 7:39 | 7:53 | 3.0 | 21.9 | 7.19 | 34.6 | - | 1.7 | 7.5 | 11.2 | 21.3 | |
| | | 12-Jun-10 | 3 | 13.58 | 14.58 | 1.00 | D | 426.6 | 1032.0 | 1032.0 | 7:53 | 8:10 | 3.4 | 29.7 | 8.85 | 61.2 | - | 1.7 | 4.6 | 11.2 | 19.3 | |
| | | 11-Jun-10 | 2 | 14.56 | 18.6 | 4.04 | A | 246.0 | - | - | 4:37 | 5:10 | 1.7 | 11.7 | 1.70 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 2 | 14.56 | 18.6 | 4.04 | B | 181.8 | - | - | 5:10 | 5:22 | 2.3 | 18.7 | 1.94 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 2 | 14.56 | 18.6 | 4.04 | C | 184.2 | - | - | 5:22 | 5:32 | 2.5 | 16.6 | 1.62 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 2 | 14.56 | 18.6 | 4.04 | D | 155.0 | 767.0 | 189.9 | 5:32 | 6:31 | 3.2 | 0.8 | 0.06 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 1 | 18.6 | 23.7 | 5.10 | A | 21.5 | 21.5 | 4.2 | 4:12 | 4:30 | 6.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+399.5 | T | 18-Jun-10 | 3 | 14.35 | 15.35 | 1.00 | A | 24.2 | 24.2 | 24.2 | 14:58 | 15:11 | 3.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 2 | 15.35 | 19.3 | 3.95 | A | 23.3 | 23.3 | 5.9 | 14:40 | 14:55 | 3.4 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 1 | 19.3 | 24.5 | 5.20 | A | 22.7 | 22.7 | 4.4 | 14:24 | 14:36 | 6.2 | 0.0 | 0.00 | 31.2 | - | 1.6 | 8.2 | 12.8 | 19.2 | |
| S-30+401 | S | 13-Jun-10 | 3 | 13.95 | 14.95 | 1.00 | A | 54.9 | 54.9 | 54.9 | 2:35 | 2:56 | 3.4 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 2 | 14.95 | 18.9 | 3.95 | A | 55.5 | 55.5 | 14.1 | 2:14 | 2:32 | 3.7 | 0.8 | 0.06 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 1 | 18.9 | 24 | 5.10 | A | 73.8 | 73.8 | 14.5 | 1:53 | 2:09 | 6.1 | 2.6 | 0.09 | 32.9 | - | 1.7 | 12.0 | 9.0 | 17.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+402.5 | T | 22-Jun-10 | 3 | 13.48 | 14.48 | 1.00 | A | 4.6 | 4.6 | 4.6 | 0:17 | 0:29 | 3.0 | 0.1 | 0.10 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 2 | 14.48 | 18.5 | 4.02 | A | 239.5 | - | - | 21:14 | 21:30 | 0.0 | 5.6 | inf | - | - | - | - | - | - | |
| | | 22-Jun-10 | 2 | 14.48 | 18.5 | 4.02 | B | 169.8 | - | - | 21:30 | 21:47 | 0.5 | 15.5 | 7.03 | 36.1 | 3.6 | 1.6 | 9.0 | 8.0 | 14.0 | |
| | | 22-Jun-10 | 2 | 14.48 | 18.5 | 4.02 | C | 191.6 | - | - | 21:47 | 22:06 | 0.4 | 7.9 | 5.00 | 40.4 | - | 1.6 | 9.0 | 8.0 | 16.7 | |
| | | 22-Jun-10 | 2 | 14.48 | 18.5 | 4.02 | D | 1399.1 | 2000.0 | 497.5 | 22:06 | 0:05 | 2.3 | 12.3 | 1.35 | 41.2 | - | 1.6 | 9.0 | 8.0 | 18.0 | |
| | | 22-Jun-10 | 1 | 18.5 | 23.6 | 5.10 | A | 59.3 | 59.3 | 11.6 | 20:53 | 21:08 | 6.5 | 1.7 | 0.05 | 32.4 | 4.0 | 1.7 | 9.0 | 8.0 | 13.0 | By-Pass. |
| P-30+404 | P | 12-Jun-10 | 3 | 14.3 | 15.3 | 1.00 | A | 171.0 | - | - | 14:41 | 15:05 | 1.1 | 12.7 | 10.63 | 32.4 | - | 1.6 | 9.2 | 8.2 | 18.1 | |
| | | 12-Jun-10 | 3 | 14.3 | 15.3 | 1.00 | B | 269.1 | - | - | 15:05 | 15:21 | 1.3 | 19.1 | 15.00 | 35.2 | - | 1.6 | 9.0 | 8.2 | 19.4 | |
| | | 12-Jun-10 | 3 | 14.3 | 15.3 | 1.00 | C | 176.5 | - | - | 15:21 | 15:30 | 1.7 | 21.5 | 12.44 | 51.7 | - | 1.7 | 9.0 | 8.2 | 15.4 | |
| | | 12-Jun-10 | 3 | 14.3 | 15.3 | 1.00 | D | 405.4 | 1022.0 | 1022.0 | 15:30 | 15:51 | 3.0 | 31.1 | 10.51 | 75.8 | - | 1.7 | 9.0 | 8.2 | 15.3 | |
| | | 12-Jun-10 | 2 | 15.3 | 19.3 | 4.00 | A | 199.2 | - | - | 9:30 | 9:56 | 0.0 | 13.2 | inf | - | - | - | - | - | - | |
| | | 12-Jun-10 | 2 | 15.3 | 19.3 | 4.00 | B | 166.6 | - | - | 9:56 | 10:07 | 0.0 | 17.5 | 96.16 | 36.0 | - | 1.6 | 7.2 | 12.4 | 18.8 | |
| | | 12-Jun-10 | 2 | 15.3 | 19.3 | 4.00 | C | 178.7 | - | - | 10:07 | 10:16 | 1.1 | 25.4 | 5.02 | 46.8 | - | 1.7 | 7.3 | 12.4 | 19.1 | |
| | | 12-Jun-10 | 2 | 15.3 | 19.3 | 4.00 | D | 1456.5 | 2001.0 | 500.3 | 10:16 | 11:20 | 1.2 | 30.4 | 6.48 | 69.8 | - | 1.7 | 7.2 | 12.4 | 20.1 | |
| | | 12-Jun-10 | 1 | 19.3 | 24.6 | 5.30 | A | 164.7 | 164.7 | 31.1 | 8:26 | 8:50 | 0.0 | 0.0 | 0.50 | 32.0 | - | 1.6 | 7.1 | 12.2 | 19.8 | By Pass |
| T-30+405.5 | T | 23-Jun-10 | 3 | 13.57 | 14.57 | 1.00 | A | 185.7 | 185.7 | 185.7 | 17:41 | 0:00 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Jun-10 | 2 | 14.57 | 18.6 | 4.03 | A | 57.2 | 57.2 | 14.2 | 17:21 | 17:33 | 3.2 | 3.1 | 0.24 | - | - | - | - | - | - | |
| | | 23-Jun-10 | 1 | 18.6 | 24 | 5.40 | A | 60.3 | 60.3 | 11.2 | 16:56 | 17:13 | 6.0 | 0.9 | 0.03 | - | - | - | - | - | - | |
| S-30+407 | S | 18-Jun-10 | 3 | 12.86 | 13.86 | 1.00 | A | 22.4 | 22.4 | 22.4 | 11:15 | 11:27 | 3.6 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 2 | 13.86 | 19.9 | 6.04 | A | 218.2 | - | - | 8:27 | 8:52 | 1.4 | 15.7 | 2.41 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 2 | 13.86 | 19.9 | 6.04 | B | 233.2 | - | - | 8:52 | 9:16 | 0.4 | 4.5 | 2.84 | 36.4 | 5.5 | 1.6 | 8.8 | 12.8 | 20.1 | |
| | | 18-Jun-10 | 2 | 13.86 | 19.9 | 6.04 | C | 267.1 | - | - | 9:16 | 9:47 | 3.0 | 20.0 | 1.10 | 46.8 | - | 1.5 | 8.2 | 12.9 | 25.3 | |
| | | 18-Jun-10 | 2 | 13.86 | 19.9 | 6.04 | D | 117.5 | 836.0 | 138.4 | 9:47 | 10:16 | 3.2 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 1 | 17.9 | 23.1 | 5.20 | A | 95.0 | 95.0 | 18.3 | 8:00 | 8:20 | 5.9 | 1.0 | 0.04 | 31.0 | 2.5 | 1.6 | 8.7 | 12.9 | 18.9 | |
| T-30+408.5 | T | 22-Jun-10 | 3 | 13.99 | 14.99 | 1.00 | A | 168.2 | - | - | 14:28 | 14:49 | 1.4 | 9.1 | 7.02 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 3 | 13.99 | 14.99 | 1.00 | B | 173.2 | - | - | 14:49 | 15:03 | 2.2 | 8.8 | 4.05 | 37.8 | - | 1.6 | 10.9 | 13.1 | 19.6 | |
| | | 22-Jun-10 | 3 | 13.99 | 14.99 | 1.00 | C | 221.1 | 562.5 | 562.5 | 15:03 | 16:38 | 3.0 | 0.1 | 0.03 | 49.3 | 4.0 | 1.6 | 10.9 | 12.9 | 21.6 | |
| | | 22-Jun-10 | 2 | 14.99 | 19 | 4.01 | A | 29.7 | 29.7 | 7.4 | 14:12 | 14:25 | 3.2 | 0.5 | 0.04 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 1 | 19 | 24 | 5.00 | A | 24.1 | 24.1 | 4.8 | 13:52 | 14:05 | 6.0 | 0.2 | 0.01 | 32.4 | 3.0 | 1.6 | 10.9 | 12.9 | 19.2 | |
| P-30+410 | P | 05-Jul-10 | 4 | 10.95 | 13.95 | 3.00 | A | 95.6 | 95.6 | 31.9 | 8:25 | 9:04 | 3.1 | 0.9 | 0.10 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 3 | 13.97 | 14.97 | 1.00 | A | 182.0 | - | - | 3:50 | 4:04 | 2.8 | 25.9 | 8.48 | - | - | - | - | - | - | Communicated To T-30+411.5 |
| | | 13-Jun-10 | 3 | 13.97 | 14.97 | 1.00 | B | 183.0 | - | - | 4:04 | 4:18 | 2.7 | 24.9 | 8.81 | 36.0 | - | 1.6 | 11.0 | 9.0 | 19.0 | |
| | | 13-Jun-10 | 3 | 13.97 | 14.97 | 1.00 | C | 186.4 | 551.4 | 551.4 | 4:18 | 5:00 | 3.5 | 0.6 | 0.18 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 2 | 14.97 | 19 | 4.03 | A | 55.9 | 55.9 | 13.9 | 3:30 | 3:47 | 3.2 | 1.2 | 0.10 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 1 | 19 | 24.1 | 5.10 | A | 68.6 | 68.6 | 13.5 | 3:07 | 3:26 | 5.9 | 2.2 | 0.07 | - | - | - | - | - | - | |
| T-30+411.5 | T | 10-Jul-10 | 4 | 10.85 | 13.85 | 3.00 | MF | 135.8 | - | - | 3:51 | 4:20 | 1.5 | 9.8 | 2.12 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.85 | 13.85 | 3.00 | A | 148.8 | - | - | 4:20 | 4:32 | 1.3 | 16.5 | 3.16 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.85 | 13.85 | 3.00 | B | 133.6 | - | - | 4:32 | 4:41 | 1.6 | 16.8 | 3.60 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.85 | 13.85 | 3.00 | C | 212.2 | - | - | 4:41 | 4:52 | 1.9 | 20.0 | 3.39 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.85 | 13.85 | 3.00 | D | 219.6 | - | - | 4:52 | 5:02 | 1.4 | 17.6 | 4.18 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.85 | 13.85 | 3.00 | E | 153.0 | - | - | 5:02 | 5:09 | 1.5 | 10.1 | 1.98 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.85 | 13.85 | 3.00 | X | 100.0 | 1103.0 | 367.7 | 5:09 | 5:25 | 2.4 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 3 | 14.56 | 15.56 | 1.00 | A | 28.7 | 28.7 | 28.7 | 11:00 | 11:14 | 3.1 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 2 | 15.56 | 19.6 | 4.04 | A | 25.3 | 25.3 | 6.3 | 10:39 | 10:53 | 3.4 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 1 | 19.6 | 24.6 | 5.00 | A | 29.1 | 29.1 | 5.8 | 10:15 | 10:29 | 6.1 | 0.5 | 0.02 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+413 | S | 08-Jul-10 | 4 | 10.81 | 13.81 | 3.00 | A | 171.1 | - | - | 10:11 | 10:33 | 1.4 | 13.6 | 3.23 | - | - | - | - | - | - | |
| | | 08-Jul-10 | 4 | 10.81 | 13.81 | 3.00 | B | 149.8 | - | - | 10:33 | 10:43 | 1.0 | 18.9 | 5.29 | - | - | - | - | - | - | |
| | | 08-Jul-10 | 4 | 10.81 | 13.81 | 3.00 | C | 289.4 | - | - | 10:43 | 10:58 | 1.5 | 22.0 | 4.79 | - | - | - | - | - | - | |
| | | 08-Jul-10 | 4 | 10.81 | 13.81 | 3.00 | D | 390.7 | 1001.0 | 333.7 | 10:58 | 11:17 | 1.8 | 27.6 | 5.09 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 3 | 14.43 | 15.43 | 1.00 | A | 179.6 | - | - | 15:20 | 15:42 | 2.0 | 12.7 | 7.26 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 3 | 14.43 | 15.43 | 1.00 | B | 190.6 | - | - | 15:42 | 16:06 | 3.4 | 12.4 | 5.91 | 36.3 | - | 1.6 | 8.8 | 12.3 | 18.9 | |
| | | 17-Jun-10 | 3 | 14.43 | 15.43 | 1.00 | C | 170.3 | - | - | 16:06 | 16:25 | 2.4 | 9.7 | 2.78 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 3 | 14.43 | 15.43 | 1.00 | D | 536.5 | 1077.0 | 1077.0 | 16:25 | 17:06 | 3.5 | 22.5 | 6.43 | 66.0 | - | 1.6 | 8.8 | 12.4 | 23.6 | |
| | | 17-Jun-10 | 2 | 15.43 | 19.4 | 3.97 | A | 37.7 | 37.7 | 9.5 | 15:00 | 15:16 | 3.1 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 1 | 19.4 | 24.6 | 5.20 | A | 123.4 | 123.4 | 23.7 | 14:35 | 14:57 | 6.0 | 5.3 | 0.17 | 30.6 | - | 1.6 | 8.0 | 12.6 | 18.2 | |
| T-30+414.5 | T | 10-Jul-10 | 4 | 10.78 | 13.78 | 3.00 | MF | 119.1 | - | - | 1:26 | 1:52 | 2.0 | 6.9 | 1.57 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.78 | 13.78 | 3.00 | A | 195.6 | - | - | 1:52 | 2:14 | 2.5 | 12.8 | 1.71 | - | - | - | - | - | - | Communicated To T-30+417.5 |
| | | 10-Jul-10 | 4 | 10.78 | 13.78 | 3.00 | B | 196.7 | - | - | 2:14 | 2:29 | 2.0 | 16.5 | 3.51 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.78 | 13.78 | 3.00 | C | 163.7 | - | - | 2:29 | 2:55 | 2.2 | 13.5 | 2.02 | 45.9 | 2.0 | 1.7 | 19.1 | 18.0 | 27.0 | |
| | | 10-Jul-10 | 4 | 10.78 | 13.78 | 3.00 | D | 153.1 | - | - | 2:55 | 3:07 | 2.1 | 18.2 | 2.96 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.78 | 13.78 | 3.00 | E | 120.8 | - | - | 3:07 | 3:14 | 2.7 | 8.8 | 0.59 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.78 | 13.78 | 3.00 | X | 44.0 | 993.0 | 331.0 | 3:14 | 3:25 | 2.6 | 0.6 | 0.08 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 3 | 14.16 | 15.16 | 1.00 | A | 194.9 | - | - | 9:06 | 9:37 | 3.2 | 12.3 | 3.78 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 3 | 14.16 | 15.16 | 1.00 | B | 64.3 | 259.2 | 259.2 | 9:37 | 9:55 | 3.0 | 0.1 | 0.05 | 38.1 | 2.6 | 1.7 | 10.8 | 13.2 | 19.1 | |
| | | 22-Jun-10 | 2 | 15.16 | 19.2 | 4.04 | A | 24.9 | 24.9 | 6.2 | 8:48 | 9:02 | 3.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 1 | 19.2 | 24.6 | 5.40 | A | 121.5 | 121.5 | 22.5 | 8:09 | 8:40 | 6.0 | 0.9 | 0.03 | 32.7 | 5.0 | 1.6 | 10.8 | 13.3 | 18.5 | |
| P-30+416 | P | 05-Jul-10 | 4 | 10.95 | 13.95 | 3.00 | A | 160.8 | - | - | 9:08 | 9:27 | 0.8 | 10.8 | 4.78 | 32.6 | 4.0 | 1.7 | 13.5 | 11.1 | 17.1 | |
| | | 05-Jul-10 | 4 | 10.95 | 13.95 | 3.00 | B | 165.2 | - | - | 9:27 | 9:46 | 1.1 | 10.9 | 3.53 | 36.1 | 8.0 | 1.7 | 13.5 | 11.1 | 19.1 | |
| | | 05-Jul-10 | 4 | 10.95 | 13.95 | 3.00 | C | 268.4 | - | - | 9:46 | 10:08 | 1.1 | 11.4 | 3.25 | 46.9 | - | 1.7 | 13.5 | 11.1 | 18.2 | |
| | | 05-Jul-10 | 4 | 10.95 | 13.95 | 3.00 | D | 411.6 | 1006.0 | 335.3 | 10:08 | 10:45 | 1.7 | 9.9 | 1.92 | 63.4 | - | 1.7 | 13.1 | 11.5 | 18.2 | |
| | | 12-Jun-10 | 3 | 14.56 | 15.56 | 1.00 | A | 160.0 | - | - | 19:36 | 19:56 | 0.3 | 12.0 | 33.13 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 3 | 14.56 | 15.56 | 1.00 | B | 290.0 | - | - | 19:56 | 20:15 | 0.4 | 18.5 | 40.54 | 36.4 | 4.0 | 1.7 | 14.8 | 9.0 | 16.0 | |
| | | 12-Jun-10 | 3 | 14.56 | 15.56 | 1.00 | C | 207.5 | - | - | 20:15 | 20:29 | 0.4 | 15.3 | 37.16 | 47.8 | - | 1.6 | 14.5 | 9.0 | 17.2 | |
| | | 12-Jun-10 | 3 | 14.56 | 15.56 | 1.00 | D | 372.5 | 1030.0 | 1030.0 | 20:29 | 20:53 | 0.9 | 18.9 | 21.73 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 2 | 15.56 | 19.6 | 4.04 | A | 29.4 | 29.4 | 7.3 | 19:18 | 19:33 | 3.4 | 0.5 | 0.03 | 32.4 | 4.1 | 1.7 | 15.0 | 9.4 | 14.8 | |
| | | 12-Jun-10 | 1 | 19.6 | 28.4 | 8.80 | A | 39.0 | 39.0 | 4.4 | 18:33 | 19:13 | 6.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| T-30+417.5 | T | 10-Jul-10 | 4 | 10.92 | 13.92 | 3.00 | MF | 104.6 | - | - | 21:41 | 22:02 | 1.8 | 9.3 | 1.43 | 32.3 | 10.0 | 1.5 | 16.1 | 17.2 | 24.5 | |
| | | 10-Jul-10 | 4 | 10.92 | 13.92 | 3.00 | A | 170.0 | - | - | 22:02 | 22:16 | 1.4 | 12.6 | 2.96 | 31.5 | 8.0 | 1.6 | 16.4 | 15.3 | 23.4 | |
| | | 10-Jul-10 | 4 | 10.92 | 13.92 | 3.00 | B | 158.2 | - | - | 22:16 | 22:28 | 1.6 | 16.1 | 3.22 | 36.0 | 5.5 | 1.6 | 16.1 | 18.3 | 21.8 | |
| | | 10-Jul-10 | 4 | 10.92 | 13.92 | 3.00 | C | 176.9 | - | - | 22:28 | 22:39 | 1.7 | 17.3 | 4.98 | 44.8 | - | 1.6 | 16.4 | 15.8 | 23.5 | |
| | | 10-Jul-10 | 4 | 10.92 | 13.92 | 3.00 | D | 196.3 | - | - | 22:39 | 22:52 | 2.0 | 19.0 | 3.22 | 60.3 | - | 1.8 | - | - | 25.0 | |
| | | 10-Jul-10 | 4 | 10.92 | 13.92 | 3.00 | E | 198.0 | - | - | 22:52 | 23:03 | 2.2 | 11.5 | 1.57 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.92 | 13.92 | 3.00 | X | 167.0 | 1171.0 | 390.3 | 23:03 | 23:14 | 2.4 | 13.7 | 1.91 | - | - | - | - | - | - | |
| | | 21-Jun-10 | 3 | 14.48 | 15.48 | 1.00 | A | 24.1 | 24.1 | 24.1 | 18:26 | 18:38 | 3.1 | - | 0.01 | - | - | - | - | - | - | |
| | | 21-Jun-10 | 2 | 15.48 | 19.5 | 4.02 | A | 204.7 | - | - | 15:50 | 16:22 | 2.5 | 12.0 | 6.31 | - | - | - | - | - | - | |
| | | 21-Jun-10 | 2 | 15.48 | 19.5 | 4.02 | B | 235.0 | - | - | 16:22 | 16:38 | 0.8 | 11.0 | 4.07 | 36.1 | 9.0 | 1.6 | 7.4 | 11.4 | 19.6 | |
| | | 21-Jun-10 | 2 | 15.48 | 19.5 | 4.02 | C | 63.0 | - | - | 16:38 | 16:46 | 1.5 | 7.3 | 1.22 | 44.1 | - | 1.6 | 7.4 | 11.4 | 22.6 | |
| | | 21-Jun-10 | 2 | 15.48 | 19.5 | 4.02 | D | 624.3 | 1127.0 | 280.3 | 16:46 | 18:14 | 3.3 | 2.3 | 0.18 | 55.0 | - | 1.6 | 7.4 | 11.4 | 23.3 | |
| | | 21-Jun-10 | 1 | 19.5 | 24.7 | 5.20 | A | 27.4 | 27.4 | 5.3 | 15:25 | 15:39 | 6.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+419 | S | 08-Jul-10 | 4 | 10.88 | 13.88 | 3.00 | A | 158.4 | - | - | 8:47 | 9:09 | 0.9 | 11.8 | 4.34 | - | - | - | - | - | - | |
| | | 08-Jul-10 | 4 | 10.88 | 13.88 | 3.00 | B | 161.9 | - | - | 9:09 | 9:21 | 0.9 | 15.9 | 6.08 | - | - | - | - | - | - | |
| | | 08-Jul-10 | 4 | 10.88 | 13.88 | 3.00 | C | 279.5 | - | - | 9:21 | 9:39 | 1.4 | 16.7 | 4.41 | - | - | - | - | - | - | |
| | | 08-Jul-10 | 4 | 10.88 | 13.88 | 3.00 | D | 437.2 | 1037.0 | 345.7 | 9:39 | 10:08 | 1.5 | 15.0 | 3.35 | - | - | - | - | - | - | |
| | | 14-Jun-10 | 3 | 14.67 | 15.67 | 1.00 | A | 119.2 | 119.2 | 119.2 | 15:11 | 15:57 | 3.5 | 0.7 | 0.21 | - | - | - | - | - | - | |
| | | 14-Jun-10 | 2 | 15.67 | 19.7 | 4.03 | A | 29.0 | 29.0 | 7.2 | 14:47 | 15:03 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Jun-10 | 1 | 19.7 | 24.7 | 5.00 | A | 30.8 | 30.8 | 6.2 | 14:25 | 14:41 | 5.9 | 0.3 | 0.01 | 31.4 | 6.5 | 1.6 | 7.8 | 12.4 | 18.2 | |
| T-30+420.5 | T | 10-Jul-10 | 4 | 10.58 | 13.58 | 3.00 | A | 159.1 | - | - | 17:48 | 18:20 | 1.1 | 5.0 | 1.49 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.58 | 13.58 | 3.00 | B | 127.9 | 287.0 | 95.7 | 18:20 | 20:28 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-10 | 3 | 14.16 | 15.16 | 1.00 | A | 26.4 | 26.4 | 26.4 | 14:58 | 15:09 | 3.0 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 21-Jun-10 | 2 | 15.16 | 19.2 | 4.04 | A | 24.6 | 24.6 | 6.1 | 14:35 | 14:47 | 3.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 21-Jun-10 | 1 | 19.2 | 24.1 | 4.90 | A | 31.3 | 31.3 | 6.4 | 14:08 | 14:25 | 6.1 | 0.0 | 0.00 | 31.7 | 2.5 | 1.6 | 7.9 | 12.4 | 18.4 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+422 | P | 05-Jul-10 | 4 | 10.39 | 13.39 | 3.00 | A | 167.7 | - | - | 13:56 | 14:21 | 1.5 | 9.8 | 2.47 | - | - | - | - | - | - | |
| | | 05-Jul-10 | 4 | 10.39 | 13.39 | 3.00 | B | 149.7 | - | - | 14:21 | 14:33 | 1.6 | 14.4 | 2.84 | - | - | - | - | - | - | |
| | | 05-Jul-10 | 4 | 10.39 | 13.39 | 3.00 | C | 287.9 | - | - | 14:33 | 14:57 | 1.5 | 11.7 | 2.53 | - | - | - | - | - | - | |
| | | 05-Jul-10 | 4 | 10.39 | 13.39 | 3.00 | D | 402.7 | 1008.0 | 336.0 | 14:57 | 15:33 | 1.4 | 11.7 | 2.77 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 3 | 14.02 | 15.02 | 1.00 | A | 160.1 | - | - | 21:57 | 22:20 | 0.1 | 11.5 | 161.10 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 3 | 14.02 | 15.02 | 1.00 | B | 189.9 | - | - | 22:20 | 22:34 | 0.3 | 18.7 | 67.18 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 3 | 14.02 | 15.02 | 1.00 | C | 160.0 | - | - | 22:34 | 22:42 | 0.6 | 24.8 | 48.42 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 3 | 14.02 | 15.02 | 1.00 | D | 540.0 | 1050.0 | 1050.0 | 22:42 | 23:06 | 1.2 | 4.9 | 4.05 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 2 | 15.02 | 19 | 3.98 | A | 33.5 | 33.5 | 8.4 | 21:32 | 21:50 | 3.3 | 0.4 | 0.03 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 1 | 19 | 24.6 | 5.60 | A | 62.8 | 62.8 | 11.2 | 21:09 | 21:27 | 6.0 | 1.3 | 0.04 | - | - | - | - | - | - | |
| T-30+423.5 | T | 10-Jul-10 | 4 | 10.29 | 13.29 | 3.00 | A | 59.8 | 59.8 | 19.9 | 17:14 | 17:46 | 2.8 | 0.9 | 0.11 | - | - | - | - | - | - | |
| | | 21-Jun-10 | 3 | 14.04 | 15.04 | 1.00 | A | 188.8 | - | - | 11:03 | 11:39 | 3.0 | 4.8 | 1.77 | - | - | - | - | - | - | |
| | | 21-Jun-10 | 3 | 14.04 | 15.04 | 1.00 | B | 55.2 | 244.0 | 244.0 | 11:39 | 12:17 | 3.0 | 0.0 | 0.00 | 35.2 | - | 1.6 | 7.8 | 12.4 | 19.7 | |
| | | 21-Jun-10 | 2 | 15.04 | 19 | 3.96 | A | 25.6 | 25.6 | 6.5 | 10:45 | 10:56 | 3.3 | 0.2 | 0.02 | 31.5 | - | 1.6 | 7.8 | 12.2 | 20.5 | |
| | | 21-Jun-10 | 1 | 19 | 24.7 | 5.70 | A | 111.9 | 111.9 | 19.6 | 10:08 | 10:35 | 6.1 | 0.5 | 0.01 | - | - | - | - | - | - | |
| S-30+425 | S | 08-Jul-10 | 4 | 10.28 | 13.28 | 3.00 | A | 159.6 | - | - | 7:13 | 7:44 | 1.1 | 12.7 | 4.31 | 31.1 | 4.4 | 1.7 | 12.1 | 12.3 | 18.8 | |
| | | 08-Jul-10 | 4 | 10.28 | 13.28 | 3.00 | B | 179.5 | - | - | 7:44 | 7:57 | 0.9 | 15.4 | 4.94 | 37.0 | 5.0 | 1.7 | 12.1 | 12.3 | 19.3 | |
| | | 08-Jul-10 | 4 | 10.28 | 13.28 | 3.00 | C | 265.3 | - | - | 7:57 | 8:15 | 1.4 | 15.1 | 3.51 | 46.9 | 2.0 | 1.7 | 12.1 | 12.3 | 19.2 | |
| | | 08-Jul-10 | 4 | 10.28 | 13.28 | 3.00 | D | 414.6 | 1019.0 | 339.7 | 8:15 | 8:42 | 1.5 | 17.6 | 3.85 | 63.7 | - | 1.6 | 12.1 | 12.3 | 19.4 | |
| | | 15-Jun-10 | 3 | 13.92 | 14.92 | 1.00 | A | 28.7 | 28.7 | 28.7 | 6:57 | 7:19 | 3.6 | 0.0 | 0.01 | 31.8 | - | 1.6 | 7.9 | 11.8 | 18.4 | |
| | | 14-Jun-10 | 2 | 14.92 | 18.9 | 3.98 | A | 38.8 | 38.8 | 9.7 | 17:03 | 17:17 | 3.2 | 0.5 | 0.04 | - | - | - | - | - | - | |
| | | 14-Jun-10 | 1 | 18.9 | 23.9 | 5.00 | A | 34.8 | 34.8 | 7.0 | 16:41 | 16:57 | 6.3 | 0.5 | 0.02 | - | - | - | - | - | - | |
| T-30+426.5 | T | 10-Jul-10 | 4 | 10.06 | 13.06 | 3.00 | A | 51.0 | 51.0 | 17.0 | 16:41 | 17:11 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-10 | 3 | 13.67 | 14.67 | 1.00 | A | 179.8 | - | - | 6:08 | 6:37 | 1.4 | 11.9 | 8.34 | - | - | - | - | - | - | |
| | | 21-Jun-10 | 3 | 13.67 | 14.67 | 1.00 | B | 240.2 | - | - | 6:37 | 6:55 | 1.9 | 9.1 | 5.20 | 37.3 | 11.0 | 1.6 | 9.8 | 12.1 | 21.3 | |
| | | 21-Jun-10 | 3 | 13.67 | 14.67 | 1.00 | C | 229.5 | - | - | 6:55 | 7:22 | 3.2 | 3.6 | 2.71 | 47.8 | 2.5 | 1.6 | 9.9 | 12.1 | 23.8 | |
| | | 21-Jun-10 | 3 | 13.67 | 14.67 | 1.00 | D | 217.5 | 867.0 | 867.0 | 7:22 | 9:10 | 3.1 | - | - | 51.6 | - | 1.6 | 10.1 | 12.3 | 24.7 | |
| | | 21-Jun-10 | 2 | 14.67 | 18.7 | 4.03 | A | 47.6 | 47.6 | 11.8 | 5:49 | 6:02 | 3.2 | 1.3 | 0.10 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 1 | 18.7 | 23.7 | 5.00 | A | 37.1 | 37.1 | 7.4 | 5:32 | 5:44 | 6.4 | 0.5 | 0.01 | - | - | - | - | - | - | |
| P-30+428 | P | 05-Jul-10 | 4 | 9.86 | 12.86 | 3.00 | A | 158.1 | - | - | 16:03 | 16:25 | 1.3 | 11.0 | 2.54 | - | - | - | - | - | - | |
| | | 05-Jul-10 | 4 | 9.86 | 12.86 | 3.00 | B | 162.2 | - | - | 16:25 | 16:38 | 1.6 | 15.0 | 3.12 | - | - | - | - | - | - | |
| | | 05-Jul-10 | 4 | 9.86 | 12.86 | 3.00 | C | 277.2 | - | - | 16:38 | 16:59 | 1.6 | 15.5 | 3.49 | - | - | - | - | - | - | |
| | | 05-Jul-10 | 4 | 9.86 | 12.86 | 3.00 | D | 405.5 | 1003.0 | 334.3 | 16:59 | 17:29 | 1.4 | 16.1 | 3.74 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 3 | 13.57 | 14.57 | 1.00 | A | 37.9 | 37.9 | 37.9 | 2:47 | 3:14 | 3.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 2 | 14.57 | 18.6 | 4.03 | A | 92.2 | 92.2 | 22.9 | 2:20 | 2:44 | 3.4 | 1.5 | 0.12 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 1 | 18.6 | 23.6 | 5.00 | A | 78.2 | 78.2 | 15.6 | 1:56 | 2:14 | 6.5 | 2.5 | 0.08 | 30.2 | - | 1.7 | 11.0 | 9.3 | 16.0 | |
| T-30+429.5 | T | 10-Jul-10 | 4 | 10.11 | 13.11 | 3.00 | A | 142.1 | 142.1 | 47.4 | 15:48 | 16:38 | 2.6 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 3 | 13.69 | 14.69 | 1.00 | A | 202.5 | - | - | 4:03 | 4:21 | 1.9 | 10.9 | 5.39 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 3 | 13.69 | 14.69 | 1.00 | B | 120.0 | - | - | 4:21 | 4:31 | 3.3 | 12.1 | 3.91 | 36.3 | - | 1.6 | 12.0 | 9.0 | 19.0 | |
| | | 20-Jun-10 | 3 | 13.69 | 14.69 | 1.00 | C | 157.9 | 480.4 | 480.4 | 4:31 | 5:11 | 3.0 | 0.1 | 0.04 | 41.4 | - | 1.6 | 12.0 | 9.0 | 20.0 | |
| | | 20-Jun-10 | 2 | 14.69 | 18.7 | 4.01 | A | 31.6 | 31.6 | 7.9 | 3:48 | 4:01 | 3.5 | 0.6 | 0.04 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 1 | 18.7 | 23.8 | 5.10 | A | 29.8 | 29.8 | 5.8 | 3:27 | 3:44 | 6.0 | 0.2 | 0.09 | 32.6 | - | 1.6 | 12.0 | 9.0 | 16.0 | |
| S-30+431 | S | 07-Jul-10 | 4 | 10.88 | 12.52 | 1.64 | A | 160.0 | - | - | 15:39 | 15:58 | 1.7 | 15.3 | 3.22 | - | - | - | - | - | - | |
| | | 07-Jul-10 | 4 | 10.88 | 12.52 | 1.64 | B | 158.7 | - | - | 15:58 | 16:09 | 1.8 | 16.2 | 3.13 | - | - | - | - | - | - | |
| | | 07-Jul-10 | 4 | 10.88 | 12.52 | 1.64 | C | 297.3 | - | - | 16:09 | 16:29 | 1.8 | 15.3 | 2.87 | - | - | - | - | - | - | |
| | | 07-Jul-10 | 4 | 10.88 | 12.52 | 1.64 | D | 384.0 | 1000.0 | 609.8 | 16:29 | 16:56 | 2.0 | 16.0 | 2.74 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 3 | 13.1 | 14.1 | 1.00 | A | 213.6 | 213.6 | 213.6 | 9:12 | 10:21 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 2 | 14.1 | 18.1 | 4.00 | A | 48.4 | 48.4 | 12.1 | 8:52 | 9:07 | 3.3 | 0.2 | 0.16 | 32.3 | - | 1.6 | 7.8 | 12.1 | 21.2 | |
| | | 15-Jun-10 | 1 | 18.1 | 23.1 | 5.00 | A | 343.3 | - | - | 7:34 | 8:13 | 1.1 | 3.8 | 0.69 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 1 | 18.1 | 23.1 | 5.00 | B | 75.4 | 418.7 | 83.7 | 8:13 | 8:44 | 6.0 | 0.7 | 0.02 | 36.1 | 2.0 | 1.6 | 7.9 | 12.1 | 20.0 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+432.5 | T | 10-Jul-10 | 4 | 9.5 | 12.5 | 3.00 | MF | 153.9 | - | - | 13:59 | 14:17 | 1.7 | 12.4 | 2.03 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 9.5 | 12.5 | 3.00 | A | 162.8 | - | - | 14:17 | 14:38 | 1.6 | 17.1 | 3.49 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 9.5 | 12.5 | 3.00 | B | 161.5 | - | - | 14:38 | 14:47 | 1.9 | 17.9 | 3.38 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 9.5 | 12.5 | 3.00 | C | 163.1 | - | - | 14:47 | 14:55 | 2.3 | 27.4 | 4.31 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 9.5 | 12.5 | 3.00 | D | 176.7 | - | - | 14:55 | 15:03 | 1.9 | 14.6 | 2.62 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 9.5 | 12.5 | 3.00 | X | 77.0 | 895.0 | 298.3 | 15:03 | 15:24 | 2.8 | 0.4 | 0.05 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 3 | 13.14 | 14.14 | 1.00 | A | 150.5 | - | - | 21:34 | 21:41 | 0.0 | 18.3 | 137.20 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 3 | 13.14 | 14.14 | 1.00 | B | 165.3 | - | - | 21:41 | 22:02 | 1.0 | 17.2 | 14.24 | 35.8 | 4.0 | 1.6 | 9.0 | 10.0 | 19.0 | |
| | | 20-Jun-10 | 3 | 13.14 | 14.14 | 1.00 | C | 331.5 | - | - | 22:02 | 22:40 | 1.0 | 8.9 | 8.35 | 45.9 | - | 1.6 | 9.0 | 10.0 | 21.0 | |
| | | 20-Jun-10 | 3 | 13.14 | 14.14 | 1.00 | D | 352.7 | 1000.0 | 1000.0 | 22:40 | 23:19 | 3.1 | 16.0 | 5.16 | 40.4 | - | 1.6 | 9.0 | 10.0 | 22.0 | |
| | | 20-Jun-10 | 2 | 14.14 | 18.1 | 3.96 | A | 25.8 | 25.8 | 6.5 | 21:16 | 21:30 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 1 | 18.1 | 23.1 | 5.00 | A | 41.8 | 41.8 | 8.4 | 20:58 | 21:12 | 6.1 | 0.3 | 0.01 | 32.6 | 3.6 | 1.6 | 9.0 | 10.0 | 17.7 | |
| P-30+434 | P | 06-Jul-10 | 4 | 9.5 | 12.5 | 3.00 | A | 160.0 | - | - | 7:45 | 8:06 | 1.3 | 12.6 | 3.57 | 31.4 | 7.1 | 1.7 | 10.8 | 13.1 | 17.6 | |
| | | 06-Jul-10 | 4 | 9.5 | 12.5 | 3.00 | B | 160.3 | - | - | 8:06 | 8:18 | 1.2 | 16.0 | 4.46 | 37.2 | 0.7 | 1.6 | 10.8 | 13.1 | 17.7 | |
| | | 06-Jul-10 | 4 | 9.5 | 12.5 | 3.00 | C | 279.7 | - | - | 8:18 | 8:36 | 1.6 | 15.4 | 3.48 | 47.4 | 3.0 | 1.7 | 10.8 | 13.1 | 17.5 | |
| | | 06-Jul-10 | 4 | 9.5 | 12.5 | 3.00 | D | 415.0 | 1015.0 | 338.3 | 8:36 | 9:03 | 1.5 | 17.8 | 4.05 | 63.5 | - | 1.7 | 10.9 | 13.1 | 17.6 | |
| | | 12-Jun-10 | 3 | 13.16 | 14.16 | 1.00 | A | 38.7 | 38.7 | 38.7 | 4:31 | 4:51 | 3.6 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 2 | 14.16 | 18.2 | 4.04 | A | 196.4 | 196.4 | 48.6 | 4:05 | 4:20 | 3.3 | 1.4 | 0.09 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 1 | 18.2 | 23.2 | 5.00 | A | 66.3 | 66.3 | 13.3 | 3:24 | 3:40 | 6.3 | 1.9 | 0.06 | - | - | - | - | - | - | |
| T-30+435.5 | T | 10-Jul-10 | 4 | 10.95 | 12.45 | 1.50 | MF | 158.2 | - | - | 9:32 | 10:00 | 1.8 | 14.8 | 5.89 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.95 | 12.45 | 1.50 | A | 162.1 | - | - | 10:00 | 10:11 | 1.5 | 15.2 | 7.02 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.95 | 12.45 | 1.50 | B | 160.8 | - | - | 10:11 | 10:22 | 1.7 | 17.6 | 6.94 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.95 | 12.45 | 1.50 | C | 163.6 | - | - | 10:22 | 10:28 | 1.7 | 22.8 | 8.75 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.95 | 12.45 | 1.50 | D | 155.3 | - | - | 10:28 | 10:37 | 1.9 | 19.0 | 6.84 | 66.4 | - | 1.7 | 15.7 | 13.3 | 19.5 | |
| | | 10-Jul-10 | 4 | 10.95 | 12.45 | 1.50 | E | 231.0 | - | - | 10:37 | 10:50 | 1.9 | 17.1 | 6.10 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.95 | 12.45 | 1.50 | X | 96.0 | 1127.0 | 751.3 | 10:50 | 11:39 | 2.7 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 3 | 13.06 | 14.06 | 1.00 | A | 151.2 | - | - | 17:13 | 17:36 | 1.1 | 12.4 | 11.50 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 3 | 13.06 | 14.06 | 1.00 | B | 143.5 | - | - | 17:36 | 17:47 | 1.3 | 12.6 | 9.93 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 3 | 13.06 | 14.06 | 1.00 | C | 183.7 | - | - | 17:47 | 18:00 | 1.6 | 15.6 | 10.08 | 52.5 | - | 1.6 | 15.9 | 11.8 | 21.8 | |
| | | 20-Jun-10 | 3 | 13.06 | 14.06 | 1.00 | D | 521.6 | 1000.0 | 1000.0 | 18:00 | 18:59 | 1.8 | 9.7 | 5.28 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 2 | 14.06 | 18.1 | 4.04 | A | 79.0 | 79.0 | 19.6 | 16:39 | 17:05 | 3.2 | 0.4 | 0.08 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 1 | 18.1 | 23.1 | 5.00 | A | 31.4 | 31.4 | 6.3 | 16:17 | 16:29 | 6.1 | 0.4 | 0.01 | - | - | - | - | - | - | |
| Q-30+436.25 | Q | 15-Jul-10 | 4 | 11.14 | 12.64 | 1.50 | MF | 159.9 | - | - | 8:41 | 9:15 | 2.1 | 17.1 | 4.55 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 11.14 | 12.64 | 1.50 | A | 161.8 | - | - | 9:15 | 9:24 | 1.8 | 18.7 | 9.90 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 11.14 | 12.64 | 1.50 | B | 158.8 | - | - | 9:24 | 9:33 | 2.1 | 17.8 | 5.77 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 11.14 | 12.64 | 1.50 | C | 171.0 | - | - | 9:33 | 9:44 | 2.5 | 17.7 | 4.97 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 11.14 | 12.64 | 1.50 | D | 212.5 | - | - | 9:44 | 9:56 | 2.3 | 15.1 | 4.51 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 11.14 | 12.64 | 1.50 | E | 139.0 | 1003.0 | 668.7 | 9:56 | 10:31 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 13.24 | 14.4 | 1.16 | MF | 160.5 | - | - | 4:29 | 4:49 | 3.0 | 21.9 | 6.31 | - | - | - | - | - | - | Communicated To Q-30+445.25 & Q-30+439.25 |
| | | 13-Jul-10 | 3 | 13.24 | 14.4 | 1.16 | A | 162.3 | - | - | 4:49 | 4:57 | 3.1 | 22.2 | 6.39 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 13.24 | 14.4 | 1.16 | B | 157.6 | - | - | 4:57 | 5:05 | 2.9 | 21.0 | 5.54 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 13.24 | 14.4 | 1.16 | C | 166.4 | - | - | 5:05 | 5:13 | 3.0 | 19.4 | 5.67 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 13.24 | 14.4 | 1.16 | D | 153.2 | - | - | 5:13 | 5:22 | 2.9 | 17.0 | 4.48 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 13.24 | 14.4 | 1.16 | E | 160.0 | - | - | 5:22 | 5:31 | 3.0 | 10.8 | 2.95 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 13.24 | 14.4 | 1.16 | X | 118.0 | 1078.0 | 929.3 | 5:31 | 5:56 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+437 | S | 07-Jul-10 | 4 | 10.28 | 12.45 | 2.17 | A | 155.8 | - | - | 14:16 | 14:37 | 1.4 | 12.2 | 2.53 | 33.1 | - | 1.7 | 10.2 | 12.1 | 16.4 | |
| | | 07-Jul-10 | 4 | 10.28 | 12.45 | 2.17 | B | 164.0 | - | - | 14:37 | 14:49 | 1.7 | 14.9 | 3.12 | 37.0 | - | 1.7 | 10.2 | 12.1 | 16.7 | |
| | | 07-Jul-10 | 4 | 10.28 | 12.45 | 2.17 | C | 280.2 | - | - | 14:49 | 15:07 | 1.9 | 15.7 | 2.71 | 46.5 | 2.0 | 1.7 | 10.2 | 12.1 | 16.9 | |
| | | 07-Jul-10 | 4 | 10.28 | 12.45 | 2.17 | D | 396.0 | - | - | 15:07 | 15:33 | 2.2 | 16.0 | 2.48 | 63.4 | 1.0 | 1.6 | 10.2 | 12.1 | 17.0 | |
| | | 07-Jul-10 | 4 | 10.28 | 12.45 | 2.17 | D+ | 61.0 | 1057.0 | 487.1 | 15:33 | 15:37 | 2.1 | 13.9 | 2.26 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 3 | 13.03 | 14.03 | 1.00 | A | 26.5 | 26.5 | 26.5 | 13:39 | 13:54 | 3.4 | 0.4 | 0.13 | 33.0 | 4.5 | 1.6 | 7.9 | 12.6 | 20.6 | |
| | | 15-Jun-10 | 2 | 14.03 | 18 | 3.97 | A | 25.2 | 25.2 | 6.3 | 11:04 | 11:18 | 3.3 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 1 | 18 | 23 | 5.00 | A | 24.4 | 24.4 | 4.9 | 10:46 | 11:00 | 6.1 | 0.1 | 0.00 | 32.4 | - | 1.6 | 6.9 | 12.5 | 21.7 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| Q-30+437.75 | Q | 18-Jul-10 | 4 | 10.99 | 12.49 | 1.50 | MF | 161.2 | - | - | 20:39 | 20:55 | 2.5 | 44.5 | 10.38 | 31.6 | 3.0 | 1.6 | 17.5 | 15.7 | 20.6 | |
| | | 18-Jul-10 | 4 | 10.99 | 12.49 | 1.50 | A | 159.9 | - | - | 20:55 | 20:59 | 2.4 | 40.4 | 11.05 | 35.3 | 4.0 | 1.6 | 17.4 | 15.6 | 20.3 | |
| | | 18-Jul-10 | 4 | 10.99 | 12.49 | 1.50 | B | 157.4 | - | - | 20:59 | 21:05 | 2.4 | 15.8 | 3.68 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 10.99 | 12.49 | 1.50 | C | 161.1 | - | - | 21:05 | 21:16 | 2.4 | 16.0 | 4.46 | 48.3 | 2.8 | 1.7 | 17.4 | 15.8 | 21.0 | |
| | | 18-Jul-10 | 4 | 10.99 | 12.49 | 1.50 | D | 157.6 | - | - | 21:16 | 21:27 | 2.5 | 20.3 | 5.17 | 65.3 | - | 1.7 | 17.5 | 15.8 | 21.2 | |
| | | 18-Jul-10 | 4 | 10.99 | 12.49 | 1.50 | E | 138.8 | 936.0 | 624.0 | 21:27 | 21:50 | 2.4 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 13.24 | 14.24 | 1.00 | MF | 151.7 | - | - | 21:16 | 21:45 | 3.1 | 5.9 | 1.85 | 31.9 | 4.0 | 1.7 | 17.2 | 15.4 | 19.6 | |
| | | 16-Jul-10 | 3 | 13.24 | 14.24 | 1.00 | A | 72.9 | 224.6 | 224.6 | 21:45 | 22:22 | 3.0 | 0.2 | 0.06 | 32.3 | 3.8 | 1.7 | 17.6 | 15.5 | 19.8 | |
| | | 17-Jul-10 | 3 | 13.24 | 14.24 | 1.00 | MF | 21.9 | 21.9 | 21.9 | 14:44 | 15:03 | 2.7 | 0.0 | 0.06 | - | - | - | - | - | - | |
| | | 17-Jul-10 | 2 | 14.24 | 18.8 | 4.56 | MF | 25.3 | 25.3 | 5.5 | 14:25 | 14:40 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-Jul-10 | 1 | 18.2 | 23.4 | 5.20 | MF | 84.6 | 84.6 | 16.3 | 13:48 | 14:13 | 6.1 | 1.8 | 0.06 | 30.7 | 0.0 | 1.4 | 16.5 | 18.4 | 19.4 | |
| T-30+438.5 | T | 10-Jul-10 | 4 | 10.69 | 12.19 | 1.50 | MF | 250.1 | - | - | 7:59 | 8:35 | 1.6 | 14.2 | 7.13 | 32.3 | 1.0 | 1.5 | 15.9 | 13.3 | 16.1 | |
| | | 10-Jul-10 | 4 | 10.69 | 12.19 | 1.50 | A | 165.8 | - | - | 8:35 | 8:45 | 1.7 | 18.3 | 8.13 | 31.5 | 5.0 | 1.6 | 15.7 | 13.3 | 19.1 | |
| | | 10-Jul-10 | 4 | 10.69 | 12.19 | 1.50 | B | 159.1 | - | - | 8:45 | 8:53 | 1.6 | 21.1 | 8.45 | 36.4 | 5.0 | 1.7 | 15.9 | 13.3 | 19.2 | |
| | | 10-Jul-10 | 4 | 10.69 | 12.19 | 1.50 | C | 159.3 | - | - | 8:53 | 9:00 | 1.9 | 20.8 | 7.84 | 47.3 | - | 1.7 | 15.7 | 13.3 | 19.0 | |
| | | 10-Jul-10 | 4 | 10.69 | 12.19 | 1.50 | D | 277.7 | - | - | 9:00 | 9:15 | 1.9 | 23.9 | 8.64 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 4 | 10.69 | 12.19 | 1.50 | E | 82.0 | 1094.0 | 729.3 | 9:15 | 9:18 | 1.9 | 22.8 | 8.12 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 3 | 12.8 | 13.8 | 1.00 | A | 194.9 | - | - | 14:17 | 14:41 | 1.0 | 14.9 | 16.90 | 31.7 | - | 1.7 | 16.2 | 13.1 | 17.5 | |
| | | 20-Jun-10 | 3 | 12.8 | 13.8 | 1.00 | B | 173.4 | - | - | 14:41 | 14:52 | 1.6 | 18.6 | 9.88 | 35.6 | - | 1.6 | 16.4 | 12.9 | 18.9 | |
| | | 20-Jun-10 | 3 | 12.8 | 13.8 | 1.00 | C | 170.7 | - | - | 14:52 | 15:05 | 1.9 | 11.1 | 5.88 | 60.0 | 2.0 | 1.6 | 16.1 | 11.7 | 26.0 | |
| | | 20-Jun-10 | 3 | 12.8 | 13.8 | 1.00 | D | 467.0 | 1006.0 | 1006.0 | 15:05 | 15:46 | 3.0 | 9.3 | 3.07 | 65.0 | 4.0 | 1.6 | 16.2 | 11.9 | 25.6 | |
| | | 20-Jun-10 | 2 | 13.8 | 17.8 | 4.00 | A | 29.4 | 29.4 | 7.4 | 13:58 | 14:11 | 3.2 | 0.5 | 0.04 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 1 | 17.8 | 23.3 | 5.50 | A | 26.3 | 26.3 | 4.8 | 13:34 | 13:46 | 6.0 | 0.2 | 0.01 | - | - | - | - | - | - | |
| Q-30+439.25 | Q | 15-Jul-10 | 4 | 10.82 | 12.32 | 1.50 | MF | 160.0 | - | - | 7:04 | 7:41 | 2.3 | 10.5 | 3.02 | 30.4 | 0.0 | 1.4 | 17.6 | 13.2 | 15.3 | |
| | | 15-Jul-10 | 4 | 10.82 | 12.32 | 1.50 | A | 161.5 | - | - | 7:41 | 7:51 | 1.9 | 17.5 | 6.26 | 31.2 | 0.4 | 1.6 | 17.9 | 13.2 | 17.3 | |
| | | 15-Jul-10 | 4 | 10.82 | 12.32 | 1.50 | B | 158.5 | - | - | 7:51 | 7:59 | 2.1 | 17.7 | 5.57 | 35.5 | - | 1.6 | 17.9 | 13.2 | 18.1 | |
| | | 15-Jul-10 | 4 | 10.82 | 12.32 | 1.50 | C | 160.4 | - | - | 7:59 | 8:09 | 2.4 | 15.0 | 4.19 | 45.8 | 1.0 | 1.7 | 18.1 | 13.3 | 18.8 | |
| | | 15-Jul-10 | 4 | 10.82 | 12.32 | 1.50 | D | 94.1 | 734.5 | 489.7 | 8:09 | 8:28 | 2.4 | 0.0 | 0.00 | 64.2 | 0.4 | 1.7 | 18.1 | 13.2 | 19.2 | |
| | | 13-Jul-10 | 3 | 12.9 | 14.4 | 1.50 | MF | 171.1 | - | - | 3:12 | 3:35 | 2.0 | 10.6 | 3.62 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 12.9 | 14.4 | 1.50 | A | 177.8 | - | - | 3:35 | 3:43 | 2.2 | 20.6 | 6.28 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 12.9 | 14.4 | 1.50 | B | 135.2 | - | - | 3:43 | 3:50 | 3.1 | 32.9 | 7.33 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 12.9 | 14.4 | 1.50 | C | 167.2 | - | - | 3:50 | 3:56 | 3.0 | 25.2 | 5.59 | 47.2 | - | 1.7 | 15.8 | 10.0 | 18.0 | |
| | | 13-Jul-10 | 3 | 12.9 | 14.4 | 1.50 | D | 153.4 | - | - | 3:56 | 4:02 | 3.1 | 20.5 | 4.25 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 12.9 | 14.4 | 1.50 | E | 155.3 | - | - | 4:02 | 4:10 | 3.1 | 18.8 | 4.08 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 12.9 | 14.4 | 1.50 | X | 160.0 | 1120.0 | 746.7 | 4:10 | 4:23 | 3.0 | 8.6 | 1.91 | - | - | - | - | - | - | |
| P-30+440 | P | 01-Jul-10 | 4 | 10.69 | 12.19 | 1.50 | A | 169.0 | - | - | 14:09 | 14:36 | 0.1 | 9.0 | 23.08 | - | - | - | - | - | - | |
| | | 01-Jul-10 | 4 | 10.69 | 12.19 | 1.50 | B | 181.0 | - | - | 14:36 | 14:51 | 0.8 | 11.9 | 11.66 | - | - | - | - | - | - | |
| | | 01-Jul-10 | 4 | 10.69 | 12.19 | 1.50 | C | 302.0 | - | - | 14:51 | 15:12 | 2.2 | 14.5 | 4.59 | - | - | - | - | - | - | |
| | | 01-Jul-10 | 4 | 10.69 | 12.19 | 1.50 | D | 374.0 | 1026.0 | 684.0 | 15:12 | 15:42 | 1.5 | 10.7 | 4.80 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | A | 267.7 | - | - | 5:56 | 6:31 | 1.4 | 9.5 | 6.71 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | B | 225.6 | - | - | 6:31 | 6:51 | 1.8 | 18.5 | 9.54 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | C | 330.3 | - | - | 6:51 | 7:07 | 3.5 | 21.6 | 5.93 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | D | 179.4 | 1003.0 | 1003.0 | 7:07 | 7:16 | 3.5 | 22.2 | 3.52 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 2 | 12.97 | 17 | 4.03 | A | 145.8 | 145.8 | 36.2 | 5:18 | 5:54 | 3.6 | 1.9 | 0.13 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 1 | 17 | 22.5 | 5.50 | A | 26.2 | 26.2 | 4.8 | 5:00 | 5:15 | 6.1 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-30+440.75 | Q | 18-Jul-10 | 4 | 10.54 | 12.04 | 1.50 | MF | 47.7 | 47.7 | 31.8 | 21:55 | 22:20 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.78 | 13.8 | 1.02 | MF | 168.3 | - | - | 22:27 | 22:53 | 1.9 | 12.3 | 6.43 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.78 | 13.8 | 1.02 | A | 159.6 | - | - | 22:53 | 23:02 | 3.1 | 27.1 | 8.55 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.78 | 13.8 | 1.02 | B | 150.3 | - | - | 23:02 | 23:07 | 3.1 | 26.0 | 8.25 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.78 | 13.8 | 1.02 | C | 151.9 | - | - | 23:07 | 23:14 | 3.3 | 21.9 | 6.58 | 47.9 | - | 1.7 | 18.4 | 15.2 | 20.1 | |
| | | 16-Jul-10 | 3 | 12.78 | 13.8 | 1.02 | D | 178.9 | - | - | 23:14 | 23:25 | 2.7 | 15.3 | 5.63 | 65.2 | - | 1.7 | 18.2 | 15.1 | 20.0 | |
| | | 16-Jul-10 | 3 | 12.78 | 13.8 | 1.02 | E | 156.0 | - | - | 23:25 | 23:36 | 3.0 | 11.3 | 3.82 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.78 | 13.8 | 1.02 | X | 135.0 | - | - | 23:36 | 23:48 | 3.1 | 7.6 | 2.15 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.78 | 13.8 | 1.02 | X+ | 89.0 | 1189.0 | 1165.7 | 23:48 | 0:07 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+441.5 | T | 06-Jul-10 | 4 | 10.4 | 11.9 | 1.50 | MF | 250.0 | - | - | 9:21 | 10:00 | 1.3 | 12.4 | 6.67 | - | - | - | - | - | - | Communicated To P-30+434 |
| | | 06-Jul-10 | 4 | 10.4 | 11.9 | 1.50 | A | 160.2 | - | - | 10:00 | 10:10 | 0.6 | 16.0 | 10.30 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 10.4 | 11.9 | 1.50 | B | 159.2 | - | - | 10:10 | 10:20 | 1.2 | 15.6 | 7.74 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 10.4 | 11.9 | 1.50 | C | 260.6 | - | - | 10:20 | 10:37 | 1.6 | 13.6 | 5.28 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 10.4 | 11.9 | 1.50 | D | 192.0 | 1022.0 | 681.3 | 10:37 | 10:50 | 1.4 | 3.5 | 1.66 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 3 | 12.51 | 12.97 | 0.46 | A | 66.8 | 66.8 | 145.2 | 7:49 | 8:27 | 3.0 | 0.5 | 0.35 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 2 | 12.97 | 17 | 4.03 | A | 24.4 | 24.4 | 6.1 | 7:29 | 7:42 | 3.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 1 | 17 | 22.7 | 5.70 | A | 24.5 | 24.5 | 4.3 | 7:09 | 7:24 | 5.9 | 0.5 | 0.01 | 31.4 | 2.5 | 1.6 | 15.9 | 12.1 | 20.7 | |
| Q-30+442.25 | Q | 14-Jul-10 | 4 | 10.11 | 11.61 | 1.50 | MF | 164.5 | - | - | 3:38 | 4:02 | 2.3 | 11.5 | 3.29 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 10.11 | 11.61 | 1.50 | A | 152.2 | - | - | 4:02 | 4:11 | 2.4 | 31.0 | 9.39 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 10.11 | 11.61 | 1.50 | B | 161.4 | - | - | 4:11 | 4:16 | 2.4 | 34.1 | 9.21 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 10.11 | 11.61 | 1.50 | C | 152.1 | - | - | 4:16 | 4:21 | 2.4 | 16.1 | 4.38 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 10.11 | 11.61 | 1.50 | D | 173.7 | - | - | 4:21 | 4:32 | 2.4 | 11.7 | 3.54 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 10.11 | 11.61 | 1.50 | E | 119.1 | 923.0 | 615.3 | 4:32 | 5:18 | 2.5 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 13.24 | 14.2 | 0.96 | MF | 153.9 | - | - | 1:49 | 2:12 | 1.7 | 12.1 | 6.16 | - | - | - | - | - | - | Communicated To Q-30+445.25 |
| | | 13-Jul-10 | 3 | 13.24 | 14.2 | 0.96 | A | 166.8 | - | - | 2:12 | 2:23 | 1.8 | 20.0 | 11.32 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 13.24 | 14.2 | 0.96 | B | 162.0 | - | - | 2:23 | 2:30 | 2.2 | 25.3 | 12.42 | 37.3 | - | 1.7 | 13.4 | 9.0 | 16.0 | |
| | | 13-Jul-10 | 3 | 13.24 | 14.2 | 0.96 | C | 157.0 | - | - | 2:30 | 2:48 | 3.1 | 2.8 | 0.99 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 13.24 | 14.2 | 0.96 | D | 19.1 | 658.8 | 686.3 | 2:48 | 3:08 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+443 | S | 02-Jul-10 | 4 | 10.36 | 11.86 | 1.50 | A | 159.7 | - | - | 8:23 | 8:47 | 0.8 | 9.1 | 8.34 | 34.2 | 7.0 | 1.7 | 14.5 | 9.5 | 18.3 | |
| | | 02-Jul-10 | 4 | 10.36 | 11.86 | 1.50 | B | 179.3 | - | - | 8:47 | 9:01 | 1.3 | 15.0 | 7.58 | 35.6 | 6.0 | 1.7 | 14.5 | 9.5 | 16.9 | |
| | | 02-Jul-10 | 4 | 10.36 | 11.86 | 1.50 | C | 280.8 | - | - | 9:01 | 9:21 | 1.6 | 14.6 | 6.07 | 44.5 | 3.0 | 1.7 | 14.2 | 10.1 | 18.1 | |
| | | 02-Jul-10 | 4 | 10.36 | 11.86 | 1.50 | D | 429.2 | 1049.0 | 699.3 | 9:21 | 9:51 | 1.7 | 15.0 | 5.82 | 76.0 | - | 1.7 | 13.4 | 9.1 | 15.7 | |
| | | 15-Jun-10 | 3 | 12.3 | 13.3 | 1.00 | A | 156.8 | - | - | 14:51 | 15:12 | 0.4 | 12.2 | 21.11 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 3 | 12.3 | 13.3 | 1.00 | B | 169.7 | - | - | 15:12 | 15:26 | 0.9 | 12.7 | 16.04 | 35.0 | - | 1.7 | 8.1 | 12.7 | 23.3 | |
| | | 15-Jun-10 | 3 | 12.3 | 13.3 | 1.00 | C | 238.6 | - | - | 15:26 | 15:45 | 1.1 | 12.9 | 11.89 | 54.3 | - | 1.6 | 8.1 | 12.6 | 20.2 | |
| | | 15-Jun-10 | 3 | 12.3 | 13.3 | 1.00 | D | 597.9 | 1163.0 | 1163.0 | 15:45 | 16:24 | 2.2 | 21.7 | 9.89 | 75.0 | - | 1.6 | 8.2 | 12.5 | 20.3 | |
| | | 15-Jun-10 | 2 | 13.3 | 17.3 | 4.00 | A | 100.3 | 100.3 | 25.1 | 14:21 | 14:46 | 3.2 | 1.4 | 0.11 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 1 | 17.3 | 22.3 | 5.00 | A | 24.5 | 24.5 | 4.9 | 14:04 | 14:18 | 6.0 | 0.2 | 0.00 | - | - | - | - | - | - | |
| Q-30+443.75 | Q | 18-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | MF | 160.7 | - | - | 22:22 | 22:43 | 2.5 | 41.8 | 10.57 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | A | 185.9 | - | - | 22:43 | 22:48 | 2.6 | 40.6 | 10.06 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | B | 135.6 | - | - | 22:48 | 22:52 | 2.6 | 28.0 | 7.35 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | C | 158.5 | - | - | 22:52 | 22:58 | 2.6 | 23.6 | 6.04 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | D | 159.3 | - | - | 22:58 | 23:05 | 2.6 | 10.0 | 2.66 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | E | 129.0 | - | - | 23:05 | 23:15 | 2.6 | 9.5 | 2.41 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | X | 172.0 | - | - | 23:15 | 23:30 | 3.0 | 15.7 | 3.58 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | X+ | 128.0 | 1229.0 | 819.3 | 23:30 | 23:44 | 3.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.17 | 13.2 | 1.03 | MF | 162.8 | - | - | 1:49 | 2:10 | 3.2 | 18.2 | 5.99 | 32.3 | - | 1.6 | 14.8 | 15.9 | 16.7 | |
| | | 16-Jul-10 | 3 | 12.17 | 13.2 | 1.03 | A | 58.9 | 221.7 | 215.2 | 2:10 | 2:26 | 3.0 | 0.1 | 0.04 | 31.4 | - | 1.7 | 14.9 | 15.7 | 16.9 | |
| T-30+444.5 | T | 06-Jul-10 | 4 | 9.86 | 11.36 | 1.50 | MF | 250.0 | - | - | 13:16 | 13:54 | 1.3 | 15.3 | 5.30 | 31.8 | 3.0 | 1.3 | 14.4 | 10.7 | 15.0 | Communicated To T-30+441.5 |
| | | 06-Jul-10 | 4 | 9.86 | 11.36 | 1.50 | A | 160.0 | - | - | 13:54 | 14:04 | 1.2 | 15.6 | 9.94 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 9.86 | 11.36 | 1.50 | B | 161.5 | - | - | 14:04 | 14:15 | 1.2 | 15.8 | 9.06 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 9.86 | 11.36 | 1.50 | C | 258.5 | - | - | 14:15 | 14:32 | 1.5 | 15.1 | 6.50 | 47.2 | - | 1.6 | 14.4 | 10.7 | 15.6 | |
| | | 06-Jul-10 | 4 | 9.86 | 11.36 | 1.50 | D | 170.0 | 1000.0 | 666.7 | 14:32 | 14:43 | 1.5 | 14.9 | 6.63 | 62.5 | 3.0 | 1.7 | 14.4 | 10.7 | 15.5 | |
| | | 20-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | A | 171.7 | - | - | 9:33 | 9:55 | 0.4 | 15.0 | 34.21 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | B | 161.3 | - | - | 9:55 | 10:04 | 0.8 | 12.9 | 24.01 | 36.3 | 3.0 | 1.6 | 15.6 | 12.6 | 19.7 | |
| | | 20-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | C | 151.6 | - | - | 10:04 | 10:11 | 1.1 | 15.8 | 15.24 | 75.0 | - | 1.6 | 15.6 | 12.5 | 22.6 | |
| | | 20-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | D | 575.4 | 1060.0 | 1060.0 | 10:11 | 10:52 | 1.4 | 17.4 | 12.35 | 42.8 | - | 1.6 | 15.6 | 12.5 | 22.6 | |
| | | 20-Jun-10 | 2 | 12.97 | 17 | 4.03 | A | 23.4 | 23.4 | 5.8 | 9:16 | 9:27 | 3.2 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 20-Jun-10 | 1 | 17 | 22.1 | 5.10 | A | 24.9 | 24.9 | 4.9 | 8:55 | 9:07 | 5.9 | 0.1 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| Q-30+445.25 | Q | 14-Jul-10 | 4 | 10.04 | 11.54 | 1.50 | MF | 159.2 | - | - | 21:37 | 22:00 | 1.6 | 8.8 | 3.67 | 30.6 | 4.0 | 1.7 | 16.9 | 15.5 | 17.5 | |
| | | 14-Jul-10 | 4 | 10.04 | 11.54 | 1.50 | A | 163.3 | - | - | 22:00 | 22:12 | 2.0 | 26.3 | 9.34 | 32.8 | 4.0 | 1.7 | 16.9 | 15.3 | 17.9 | |
| | | 14-Jul-10 | 4 | 10.04 | 11.54 | 1.50 | B | 157.6 | - | - | 22:12 | 22:18 | 2.4 | 33.8 | 9.53 | 36.9 | 3.0 | 1.6 | 16.8 | 15.2 | 18.0 | |
| | | 14-Jul-10 | 4 | 10.04 | 11.54 | 1.50 | C | 159.1 | - | - | 22:18 | 22:23 | 2.3 | 27.8 | 8.40 | 46.3 | - | 1.7 | 16.9 | 15.2 | 18.2 | |
| | | 14-Jul-10 | 4 | 10.04 | 11.54 | 1.50 | D | 161.8 | - | - | 22:23 | 22:35 | 2.3 | 27.5 | 9.13 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 10.04 | 11.54 | 1.50 | E | 159.0 | - | - | 22:35 | 22:40 | 2.5 | 35.4 | 10.18 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 10.04 | 11.54 | 1.50 | X | 242.0 | - | - | 22:40 | 22:49 | 2.4 | 20.3 | 9.26 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 10.04 | 11.54 | 1.50 | X+ | 188.0 | 1390.0 | 926.7 | 22:49 | 23:04 | 2.6 | 13.2 | 3.33 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 1,2,3 | 11.61 | 21.7 | 10.09 | MF | 163.5 | - | - | 23:20 | 23:33 | 1.2 | 15.5 | 11.10 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 13-Jul-10 | 1,2,3 | 11.61 | 21.7 | 10.09 | A | 111.7 | - | - | 23:33 | 23:37 | 1.3 | 17.4 | 14.16 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 1,2,3 | 11.61 | 21.7 | 10.09 | D | 187.3 | 462.5 | 45.8 | 23:37 | 23:49 | 1.3 | 15.1 | 11.73 | - | - | - | - | - | - | |
| P-30+446 | P | 01-Jul-10 | 4 | 9.97 | 11.47 | 1.50 | A | 172.0 | - | - | 9:11 | 9:40 | 0.7 | 11.8 | 10.81 | 34.6 | 7.0 | 1.7 | 6.1 | 12.6 | 16.6 | |
| | | 01-Jul-10 | 4 | 9.97 | 11.47 | 1.50 | B | 170.0 | - | - | 9:40 | 9:55 | 1.1 | 12.2 | 9.79 | 36.3 | 5.0 | 1.7 | 6.1 | 12.6 | 17.6 | |
| | | 01-Jul-10 | 4 | 9.97 | 11.47 | 1.50 | C | 301.9 | - | - | 9:55 | 10:16 | 2.3 | 15.3 | 4.16 | 47.0 | 1.0 | 1.7 | 6.1 | 12.6 | 17.9 | |
| | | 01-Jul-10 | 4 | 9.97 | 11.47 | 1.50 | D | 343.1 | 987.0 | 658.0 | 10:16 | 10:43 | 2.4 | 14.0 | 3.90 | 104.0 | - | 1.7 | 6.1 | 9.8 | 16.6 | |
| | | 13-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | A | 231.8 | - | - | 10:24 | 10:51 | 0.0 | 14.3 | 97.80 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | B | 292.7 | - | - | 10:51 | 11:07 | 0.5 | 22.2 | 42.01 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | C | 108.7 | - | - | 11:07 | 11:14 | 0.5 | 14.9 | 29.95 | 53.1 | - | 1.6 | 12.6 | 10.4 | 17.1 | |
| | | 13-Jun-10 | 3 | 11.97 | 12.97 | 1.00 | D | 431.8 | 1065.0 | 1065.0 | 11:14 | 11:38 | 0.9 | 15.8 | 17.52 | 56.0 | - | 1.7 | 12.6 | 10.4 | 17.6 | |
| | | 13-Jun-10 | 2 | 12.97 | 17 | 4.03 | A | 78.4 | 78.4 | 19.5 | 9:54 | 10:18 | 3.2 | 0.7 | 0.05 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 1 | 17 | 22.5 | 5.50 | A | 24.3 | 24.3 | 4.4 | 9:30 | 9:45 | 5.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-30+446.75 | Q | 18-Jul-10 | 4 | 9.93 | 11.43 | 1.50 | MF | 151.3 | - | - | 1:26 | 1:43 | 2.5 | 22.3 | 6.13 | - | - | - | - | - | - | Communicated to Q-30+443.75 |
| | | 18-Jul-10 | 4 | 9.93 | 11.43 | 1.50 | A | 196.9 | - | - | 1:43 | 1:55 | 2.6 | 24.5 | 6.39 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 9.93 | 11.43 | 1.50 | B | 130.7 | - | - | 1:55 | 2:00 | 2.4 | 26.8 | 7.27 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 9.93 | 11.43 | 1.50 | C | 171.4 | 650.3 | 433.5 | 2:00 | 2:38 | 2.5 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.04 | 13.1 | 1.06 | MF | 163.8 | - | - | 2:29 | 2:41 | 2.7 | 48.8 | 16.90 | - | - | - | - | - | - | Communicated to Outside |
| | | 16-Jul-10 | 3 | 12.04 | 13.1 | 1.06 | A | 163.3 | - | - | 2:41 | 2:44 | 2.9 | 55.5 | 19.75 | - | - | - | - | - | - | of Casing of Q-30+443.75 |
| | | 16-Jul-10 | 3 | 12.04 | 13.1 | 1.06 | B | 153.1 | - | - | 2:44 | 2:48 | 2.8 | 39.6 | 11.77 | 36.7 | - | 1.7 | 15.0 | 15.6 | 17.1 | |
| | | 16-Jul-10 | 3 | 12.04 | 13.1 | 1.06 | C | 154.0 | - | - | 2:48 | 2:51 | 3.1 | 28.9 | 8.78 | 46.1 | - | 1.7 | 15.1 | 15.6 | 17.4 | |
| | | 16-Jul-10 | 3 | 12.04 | 13.1 | 1.06 | D | 175.8 | - | - | 2:51 | 2:58 | 3.2 | 25.7 | 7.75 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.04 | 13.1 | 1.06 | E | 142.3 | - | - | 2:58 | 3:03 | 2.9 | 31.4 | 11.76 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.04 | 13.1 | 1.06 | X | 149.7 | - | - | 3:03 | 3:12 | 3.2 | 11.4 | 3.55 | - | - | - | - | - | - | |
| | | 16-Jul-10 | 3 | 12.04 | 13.1 | 1.06 | X+ | 80.0 | 1182.0 | 1115.1 | 3:12 | 3:29 | 3.3 | 0.5 | 0.15 | - | - | - | - | - | - | |
| T-30+447.5 | T | 06-Jul-10 | 4 | 10.23 | 11.73 | 1.50 | MF | 250.0 | - | - | 14:48 | 16:24 | 0.9 | 12.3 | 9.04 | - | - | - | - | - | - | Communicated To T-30+444.5 |
| | | 06-Jul-10 | 4 | 10.23 | 11.73 | 1.50 | A | 161.8 | - | - | 16:24 | 16:37 | 1.0 | 12.7 | 8.76 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 10.23 | 11.73 | 1.50 | B | 158.2 | - | - | 16:37 | 16:48 | 1.3 | 15.1 | 7.42 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 10.23 | 11.73 | 1.50 | C | 160.0 | - | - | 16:48 | 16:59 | 1.6 | 15.8 | 6.41 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 10.23 | 11.73 | 1.50 | D | 385.0 | 1115.0 | 743.3 | 16:59 | 17:23 | 1.9 | 7.2 | 2.51 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 3 | 12.35 | 13.35 | 1.00 | A | 45.5 | 45.5 | 45.5 | 17:06 | 17:29 | 3.0 | 0.3 | 0.00 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 2 | 13.35 | 17.3 | 3.95 | A | 30.1 | 30.1 | 7.6 | 16:47 | 16:59 | 3.2 | 3.0 | 0.03 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 1 | 17.3 | 22.6 | 5.30 | A | 22.9 | 22.9 | 4.3 | 16:24 | 16:37 | 6.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-30+448.25 | Q | 14-Jul-10 | 4 | 10.28 | 11.78 | 1.50 | MF | 160.8 | - | - | 23:13 | 23:39 | 2.3 | 19.3 | 5.26 | - | - | - | - | - | - | By Pass; Outside Casing |
| | | 14-Jul-10 | 4 | 10.28 | 11.78 | 1.50 | C | 66.0 | 226.8 | 151.2 | 23:39 | 23:44 | 2.6 | 8.7 | 2.25 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 12.41 | 13.7 | 1.29 | MF | 175.4 | - | - | 20:09 | 20:31 | 2.7 | 12.4 | 3.40 | - | - | - | - | - | - | Communicated To Q-30+445.25; |
| | | 13-Jul-10 | 3 | 12.41 | 13.7 | 1.29 | A | 136.4 | - | - | 20:31 | 20:40 | 0.8 | 0.2 | 0.24 | 30.1 | 4.0 | 1.7 | 13.1 | 8.6 | 15.6 | Inside and Outside Casing |
| | | 13-Jul-10 | 3 | 12.41 | 13.7 | 1.29 | B | 168.6 | - | - | 22:32 | 22:49 | 2.0 | 19.6 | 7.49 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 12.41 | 13.7 | 1.29 | C | 47.7 | 528.1 | 409.4 | 22:49 | 23:14 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+449 | S | 02-Jul-10 | 4 | 10.23 | 11.73 | 1.50 | A | 166.0 | - | - | 10:16 | 10:42 | 1.3 | 8.9 | 4.51 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 10.23 | 11.73 | 1.50 | B | 169.8 | - | - | 10:42 | 10:55 | 1.7 | 15.2 | 5.89 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 10.23 | 11.73 | 1.50 | C | 339.2 | - | - | 10:55 | 11:26 | 2.2 | 15.1 | 4.31 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 10.23 | 11.73 | 1.50 | D | 287.0 | 962.0 | 641.3 | 11:26 | 11:44 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 3 | 12.17 | 13.17 | 1.00 | A | 163.4 | - | - | 17:32 | 17:53 | 0.5 | 13.2 | 24.39 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 3 | 12.17 | 13.17 | 1.00 | B | 201.8 | - | - | 17:53 | 18:10 | 3.2 | 8.8 | 2.68 | 37.5 | - | 1.7 | 9.0 | 12.5 | 20.3 | |
| | | 15-Jun-10 | 3 | 12.17 | 13.17 | 1.00 | C | 33.6 | 398.8 | 398.8 | 18:10 | 18:26 | 3.6 | 0.1 | 0.04 | 46.4 | - | 1.6 | 11.8 | 12.7 | 20.6 | |
| | | 15-Jun-10 | 2 | 13.17 | 17.2 | 4.03 | A | 54.9 | 54.9 | 13.6 | 17:12 | 17:30 | 3.2 | 1.2 | 0.10 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 1 | 17.2 | 22.2 | 5.00 | A | 64.1 | 64.1 | 12.8 | 16:48 | 17:06 | 6.1 | 1.6 | 0.05 | 31.2 | - | 1.6 | 8.2 | 12.4 | 20.2 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| Q-30+449.75 | Q | 18-Jul-10 | 4 | 9.87 | 11.37 | 1.50 | MF | 162.7 | - | - | 2:45 | 2:57 | 2.2 | 34.1 | 9.87 | - | - | - | - | - | - | Communicated To Q-30+455.75 |
| | | 18-Jul-10 | 4 | 9.87 | 11.37 | 1.50 | A | 157.9 | - | - | 2:57 | 3:10 | 2.5 | 25.5 | 7.09 | - | - | - | - | - | - | & Q-30+443.75 |
| | | 18-Jul-10 | 4 | 9.87 | 11.37 | 1.50 | B | 58.9 | 379.5 | 253.0 | 3:10 | 3:23 | 2.6 | 0.7 | 0.17 | - | - | - | - | - | - | Communicated to Outside |
| | | 16-Jul-10 | 3 | 11.9 | 13.2 | 1.30 | MF | 73.7 | 73.7 | 56.7 | 3:44 | 4:07 | 3.1 | 0.1 | 0.04 | - | - | - | - | - | - | Casing of Q-30+443.75 |
| T-30+450.5 | T | 07-Jul-10 | 4 | 9.9 | 11.4 | 1.50 | MF | 153.0 | - | - | 8:43 | 9:12 | 2.1 | 12.0 | 3.68 | - | - | - | - | - | - | |
| | | 07-Jul-10 | 4 | 9.9 | 11.4 | 1.50 | A | 163.0 | - | - | 9:12 | 9:23 | 1.9 | 14.8 | 5.08 | - | - | - | - | - | - | |
| | | 07-Jul-10 | 4 | 9.9 | 11.4 | 1.50 | B | 184.0 | - | - | 9:23 | 9:36 | 2.1 | 14.0 | 4.58 | - | - | - | - | - | - | |
| | | 07-Jul-10 | 4 | 9.9 | 11.4 | 1.50 | C | 146.7 | - | - | 9:36 | 9:46 | 1.5 | 14.9 | 7.05 | - | - | - | - | - | - | Communicated To T-30+447.5; |
| | | 07-Jul-10 | 4 | 9.9 | 11.4 | 1.50 | D | 210.3 | - | - | 9:46 | 10:00 | 1.7 | 14.4 | 5.53 | - | - | - | - | - | - | Outside Casing |
| | | 07-Jul-10 | 4 | 9.9 | 11.4 | 1.50 | D+ | 192.0 | 1049.0 | 699.3 | 10:00 | 10:13 | 1.7 | 17.5 | 6.82 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 3 | 11.99 | 12.99 | 1.00 | A | 24.7 | 24.7 | 24.7 | 15:18 | 15:30 | 3.0 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 2 | 12.99 | 17 | 4.01 | A | 192.7 | 192.7 | 48.1 | 14:32 | 14:56 | 3.2 | 0.4 | 0.03 | - | - | - | - | - | - | By-Pass |
| | | 19-Jun-10 | 1 | 17 | 22.4 | 5.40 | A | 32.0 | 32.0 | 5.9 | 14:08 | 14:24 | 6.3 | 0.9 | 0.00 | 32.4 | - | 1.6 | 15.2 | 11.9 | 19.2 | |
| Q-30+451.25 | Q | 14-Jul-10 | 4 | 9.54 | 11.04 | 1.50 | MF | 160.8 | - | - | 1:41 | 2:07 | 1.8 | 12.2 | 4.42 | - | - | - | - | - | - | Communicated To Q-30+445.25 |
| | | 14-Jul-10 | 4 | 9.54 | 11.04 | 1.50 | A | 159.9 | - | - | 2:07 | 2:16 | 2.1 | 15.5 | 5.13 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 9.54 | 11.04 | 1.50 | B | 162.1 | - | - | 2:16 | 2:21 | 2.6 | 30.6 | 8.47 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 9.54 | 11.04 | 1.50 | C | 194.6 | - | - | 2:21 | 2:56 | 2.4 | 6.5 | 1.76 | - | - | - | - | - | - | |
| | | 14-Jul-10 | 4 | 9.54 | 11.04 | 1.50 | D | 92.6 | 770.0 | 513.3 | 2:56 | 3:30 | 2.5 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 3 | 11.65 | 13 | 1.35 | MF | 120.8 | 120.8 | 89.5 | 19:35 | 20:05 | 3.1 | 0.2 | 0.04 | 31.7 | 4.0 | 1.7 | 14.0 | 8.1 | 13.6 | |
| P-30+452 | P | 01-Jul-10 | 4 | 9.46 | 10.96 | 1.50 | A | 177.6 | - | - | 6:36 | 7:11 | 1.3 | 8.9 | 5.49 | - | - | - | - | - | - | |
| | | 01-Jul-10 | 4 | 9.46 | 10.96 | 1.50 | B | 156.0 | - | - | 7:11 | 7:24 | 1.9 | 15.0 | 3.76 | 36.4 | - | 1.6 | 8.2 | 12.9 | 19.1 | |
| | | 01-Jul-10 | 4 | 9.46 | 10.96 | 1.50 | C | 258.6 | - | - | 7:24 | 7:42 | 2.0 | 15.5 | 5.73 | - | - | - | - | - | - | |
| | | 01-Jul-10 | 4 | 9.46 | 10.96 | 1.50 | D | 442.8 | 1035.0 | 690.0 | 7:42 | 8:14 | 1.9 | 12.4 | 4.28 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 3 | 11.46 | 12.46 | 1.00 | A | 166.6 | 166.6 | 166.6 | 14:24 | 15:16 | 3.7 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 2 | 12.46 | 16.5 | 4.04 | A | 25.6 | 25.6 | 6.3 | 14:01 | 14:16 | 3.3 | 0.3 | 0.02 | 32.2 | 4.0 | 1.6 | 12.2 | 15.6 | 22.1 | |
| | | 11-Jun-10 | 1 | 16.5 | 22 | 5.50 | A | 15.5 | 15.5 | 2.8 | 11:07 | 11:42 | 5.9 | 0.5 | 0.01 | 31.2 | - | 1.6 | 10.4 | 15.8 | 21.2 | |
| T-30+453.5 | T | 07-Jul-10 | 4 | 9.56 | 11.06 | 1.50 | MF | 160.0 | - | - | 7:20 | 7:40 | 1.5 | 13.6 | 6.16 | 31.5 | 1.0 | 1.4 | 12.1 | 11.3 | 14.3 | |
| | | 07-Jul-10 | 4 | 9.56 | 11.06 | 1.50 | A | 163.4 | - | - | 7:40 | 7:52 | 1.5 | 15.1 | 5.37 | 32.4 | 5.0 | 1.6 | 10.6 | 11.3 | 17.9 | |
| | | 07-Jul-10 | 4 | 9.56 | 11.06 | 1.50 | B | 156.6 | - | - | 7:52 | 8:02 | 1.9 | 14.9 | 5.63 | 36.7 | 5.0 | 1.7 | 10.6 | 11.3 | 16.4 | |
| | | 07-Jul-10 | 4 | 9.56 | 11.06 | 1.50 | C | 154.7 | - | - | 8:02 | 8:13 | 2.3 | 16.8 | 4.75 | - | - | - | - | - | - | |
| | | 07-Jul-10 | 4 | 9.56 | 11.06 | 1.50 | D | 401.3 | 1036.0 | 690.7 | 8:13 | 8:41 | 2.6 | 12.3 | 3.11 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 3 | 11.69 | 12.69 | 1.00 | A | 236.2 | - | - | 10:48 | 11:42 | 3.3 | 4.3 | 1.18 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 3 | 11.69 | 12.69 | 1.00 | B | 67.4 | 303.6 | 303.6 | 11:42 | 12:18 | 3.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 2 | 12.69 | 16.7 | 4.01 | A | 22.6 | 22.6 | 5.6 | 10:27 | 10:40 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 1 | 16.7 | 21.8 | 5.10 | A | 25.4 | 25.4 | 5.0 | 10:06 | 10:17 | 5.9 | 0.1 | 0.00 | - | - | - | - | - | - | |
| S-30+455 | S | 02-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | A | 156.3 | - | - | 13:57 | 14:21 | 1.3 | 11.6 | 7.61 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | B | 174.7 | - | - | 14:21 | 14:34 | 1.5 | 14.4 | 5.43 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | C | 275.9 | - | - | 14:34 | 14:54 | 1.8 | 14.9 | 5.26 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 10.13 | 11.63 | 1.50 | D | 417.1 | 1024.0 | 682.7 | 14:54 | 15:19 | 2.2 | 17.5 | 4.83 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 3 | 12.02 | 13.02 | 1.00 | A | 155.9 | - | - | 15:00 | 15:27 | 0.2 | 4.0 | 17.04 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 3 | 12.02 | 13.02 | 1.00 | B | 211.9 | - | - | 15:27 | 15:56 | 2.0 | 15.8 | 8.04 | 38.1 | - | 1.6 | 4.6 | 12.8 | 15.2 | |
| | | 13-Jun-10 | 3 | 12.02 | 13.02 | 1.00 | C | 290.6 | - | - | 15:56 | 16:14 | 2.0 | 18.3 | 9.08 | 43.5 | - | 1.7 | 4.6 | 12.8 | 15.6 | |
| | | 13-Jun-10 | 3 | 12.02 | 13.02 | 1.00 | D | 355.6 | 1014.0 | 1014.0 | 16:14 | 16:35 | 1.4 | 15.0 | 10.82 | 61.4 | - | 1.7 | 4.6 | 12.8 | 15.9 | |
| | | 13-Jun-10 | 2 | 13.02 | 17 | 3.98 | A | 31.5 | 31.5 | 7.9 | 14:39 | 14:53 | 3.2 | 0.4 | 0.03 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 1 | 17 | 22 | 5.00 | A | 45.4 | 45.4 | 9.1 | 14:13 | 14:28 | 5.9 | 1.5 | 0.05 | 32.1 | 4.0 | 1.6 | 7.8 | 12.8 | 17.5 | |
| Q-30+455.75 | Q | 18-Jul-10 | 4 | 9.52 | 11.02 | 1.50 | MF | 160.3 | - | - | 17:02 | 17:31 | 2.1 | 11.9 | 4.07 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 9.52 | 11.02 | 1.50 | A | 160.1 | - | - | 17:31 | 17:41 | 1.8 | 20.9 | 7.86 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 9.52 | 11.02 | 1.50 | B | 154.4 | - | - | 17:41 | 17:49 | 1.9 | 18.0 | 6.50 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 9.52 | 11.02 | 1.50 | C | 147.2 | - | - | 17:49 | 17:56 | 2.5 | 21.2 | 5.69 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 9.52 | 11.02 | 1.50 | D | 157.0 | - | - | 17:56 | 18:05 | 2.0 | 12.1 | 4.05 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 9.52 | 11.02 | 1.50 | E | 318.0 | 1097.0 | 731.3 | 18:05 | 19:10 | 2.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 3 | 11.61 | 12.6 | 0.99 | MF | 53.3 | 53.3 | 53.8 | 15:06 | 15:36 | 2.8 | 0.2 | 0.08 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+456.5 | T | 06-Jul-10 | 4 | 9.19 | 10.69 | 1.50 | MF | 171.8 | - | - | 5:06 | 5:32 | 2.1 | 9.2 | 2.92 | - | - | - | - | - | - | Communicated To T-30+447.5 And P-30+434 |
| | | 06-Jul-10 | 4 | 9.19 | 10.69 | 1.50 | A | 135.2 | - | - | 5:32 | 5:42 | 2.1 | 15.5 | 5.32 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 9.19 | 10.69 | 1.50 | B | 181.7 | - | - | 5:42 | 5:53 | 1.8 | 17.4 | 6.54 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 9.19 | 10.69 | 1.50 | C | 178.2 | - | - | 5:53 | 6:02 | 2.0 | 19.1 | 6.47 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 9.19 | 10.69 | 1.50 | D | 375.7 | 1042.6 | 695.1 | 6:02 | 6:20 | 2.0 | 21.2 | 6.98 | - | - | - | - | - | - | |
| | | 23-Jun-10 | 3B | 11.32 | 12.32 | 1.00 | A | 16.1 | 16.1 | 16.1 | 9:32 | 9:45 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Jun-10 | 3A | 12.32 | 14.67 | 3.98 | A | 195.5 | - | - | 8:23 | 8:57 | 3.2 | 6.4 | 0.86 | 32.5 | 4.0 | 1.6 | 10.6 | 9.6 | 19.1 | |
| | | 23-Jun-10 | 3A | 12.32 | 14.67 | 3.98 | B | 67.8 | 263.3 | 66.2 | 8:57 | 9:23 | 3.1 | 0.0 | 0.00 | 38.3 | 5.0 | 1.7 | 9.9 | 9.9 | 19.1 | |
| | | 16-Jun-10 | 3 | 14.67 | 15.67 | 1.00 | A | 25.5 | 25.5 | 25.5 | 8:49 | 9:03 | 3.6 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 16-Jun-10 | 2 | 15.67 | 19.7 | 4.03 | A | 24.6 | 24.6 | 6.1 | 8:29 | 8:44 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jun-10 | 1 | 19.7 | 21.31 | 1.61 | A | 30.8 | 30.8 | 19.1 | 8:05 | 8:21 | 6.0 | 0.1 | 0.01 | 31.6 | 5.0 | 1.6 | 11.7 | 12.6 | 20.4 | |
| Q-30+457.25 | Q | 18-Jul-10 | 4 | 8.5 | 10 | 1.50 | MF | 67.3 | 67.3 | 44.9 | 16:20 | 17:00 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 3 | 10.59 | 12 | 1.41 | MF | 39.2 | 39.2 | 27.8 | 14:38 | 15:02 | 3.2 | 0.2 | 0.04 | - | - | - | - | - | - | |
| P-30+458 | P | 30-Jun-10 | 4 | 8.68 | 10.18 | 1.50 | A | 221.0 | - | - | 4:58 | 5:25 | 0.9 | 10.0 | 7.71 | - | - | - | - | - | - | Communicated To P-30+464 |
| | | 30-Jun-10 | 4 | 8.68 | 10.18 | 1.50 | B | 127.0 | - | - | 5:25 | 5:36 | 1.2 | 12.4 | 6.49 | - | - | - | - | - | - | |
| | | 30-Jun-10 | 4 | 8.68 | 10.18 | 1.50 | C | 132.0 | - | - | 5:36 | 5:47 | 1.6 | 13.2 | 5.44 | - | - | - | - | - | - | |
| | | 30-Jun-10 | 4 | 8.68 | 10.18 | 1.50 | D | 532.0 | 1012.0 | 674.7 | 5:47 | 6:24 | 1.6 | 14.7 | 6.24 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 3 | 10.68 | 11.68 | 1.00 | A | 164.6 | - | - | 16:10 | 16:32 | 0.7 | 12.7 | 17.28 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 3 | 10.68 | 11.68 | 1.00 | B | 158.6 | - | - | 16:32 | 16:42 | 1.8 | 18.6 | 10.35 | 36.1 | - | 1.6 | 7.8 | 12.8 | 21.6 | |
| | | 11-Jun-10 | 3 | 10.68 | 11.68 | 1.00 | C | 267.9 | - | - | 16:42 | 16:55 | 3.5 | 24.3 | 7.58 | 47.3 | - | 1.7 | 7.8 | 12.8 | 21.4 | |
| | | 11-Jun-10 | 3 | 10.68 | 11.68 | 1.00 | D | 428.9 | 1020.0 | 1020.0 | 16:55 | 17:22 | 3.6 | 12.3 | 3.39 | 68.4 | - | 1.7 | 7.9 | 12.8 | 22.1 | |
| | | 11-Jun-10 | 2 | 11.68 | 15.7 | 4.02 | A | 38.2 | 38.2 | 9.5 | 15:52 | 16:08 | 3.3 | 0.6 | 0.05 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 1 | 15.7 | 20.8 | 5.10 | A | 62.0 | 62.0 | 12.2 | 15:29 | 15:48 | 6.0 | 1.7 | 0.06 | - | - | - | - | - | - | |
| Q-30+458.75 | Q | 13-Jul-10 | 4 | 7.92 | 9.92 | 2.00 | MF | 72.4 | 72.4 | 36.2 | 9:58 | 10:32 | 2.7 | 0.2 | 0.04 | 30.2 | 0.0 | 1.4 | 10.0 | 6.0 | 10.5 | |
| | | 11-Jul-10 | 3 | 10.09 | 11.09 | 1.00 | MF | 22.7 | 22.7 | 22.7 | 13:34 | 13:57 | 2.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 11-Jul-10 | 2 | 11.09 | 16.1 | 5.01 | MF | 142.4 | - | - | 10:04 | 10:25 | 1.4 | 10.5 | 2.44 | 31.4 | 2.0 | 1.5 | 18.6 | 15.4 | 17.1 | |
| | | 11-Jul-10 | 2 | 11.09 | 16.1 | 5.01 | A | 158.2 | - | - | 10:25 | 10:37 | 1.9 | 15.4 | 1.96 | 32.7 | 5.0 | 1.7 | 14.4 | 15.4 | 21.7 | |
| | | 11-Jul-10 | 2 | 11.09 | 16.1 | 5.01 | B | 207.7 | - | - | 10:37 | 10:49 | 3.3 | 15.2 | 1.13 | 37.2 | 4.0 | 1.7 | 14.4 | 15.4 | 21.9 | |
| | | 11-Jul-10 | 2 | 11.09 | 16.1 | 5.01 | C | 194.0 | - | - | 10:49 | 11:03 | 3.3 | 14.3 | 1.10 | 48.3 | - | 1.7 | 14.4 | 15.4 | 22.0 | |
| | | 11-Jul-10 | 2 | 11.09 | 16.1 | 5.01 | D | 244.7 | - | - | 11:03 | 11:35 | 3.1 | 4.4 | 0.35 | 69.8 | - | 1.7 | 14.4 | 15.4 | 22.1 | |
| | | 11-Jul-10 | 2 | 11.09 | 16.1 | 5.01 | E | 30.0 | 977.0 | 195.0 | 11:35 | 11:49 | 3.2 | 0.2 | 0.02 | - | - | - | - | - | - | |
| T-30+459.5 | T | 06-Jul-10 | 4 | 8 | 9.5 | 1.50 | MF | 162.0 | - | - | 3:42 | 4:05 | 1.5 | 9.0 | 4.37 | 35.6 | - | 1.5 | 9.6 | 12.4 | 19.7 | |
| | | 06-Jul-10 | 4 | 8 | 9.5 | 1.50 | A | 164.2 | - | - | 4:05 | 4:20 | 1.8 | 17.5 | 6.54 | 32.6 | - | 1.6 | 11.6 | 13.3 | 18.3 | Communicated To T-30+447.5 |
| | | 06-Jul-10 | 4 | 8 | 9.5 | 1.50 | B | 169.0 | - | - | 4:20 | 4:29 | 2.0 | 19.2 | 6.61 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 8 | 9.5 | 1.50 | C | 148.4 | - | - | 4:29 | 4:39 | 2.0 | 15.7 | 5.13 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 8 | 9.5 | 1.50 | D | 397.4 | 1041.0 | 694.0 | 4:39 | 4:59 | 2.3 | 23.6 | 6.89 | 61.6 | 4.0 | 1.6 | 10.8 | 13.3 | 20.5 | |
| | | 16-Jun-10 | 3 | 10.09 | 11.09 | 1.00 | A | 163.0 | - | - | 14:03 | 14:29 | 0.8 | 12.6 | 13.17 | 31.2 | - | 1.6 | 6.2 | 12.7 | 16.4 | |
| | | 16-Jun-10 | 3 | 10.09 | 11.09 | 1.00 | B | 190.4 | - | - | 14:29 | 14:42 | 1.4 | 15.8 | 11.09 | 35.4 | - | 1.6 | 6.8 | 12.7 | 18.9 | |
| | | 16-Jun-10 | 3 | 10.09 | 11.09 | 1.00 | C | 346.5 | - | - | 14:42 | 15:04 | 2.7 | 15.5 | 5.60 | - | - | - | - | - | - | |
| | | 16-Jun-10 | 3 | 10.09 | 11.09 | 1.00 | D | 300.1 | 1000.0 | 1000.0 | 15:04 | 15:18 | 2.6 | 23.9 | 9.06 | - | - | - | - | - | - | |
| | | 16-Jun-10 | 2 | 11.09 | 15.1 | 4.01 | A | 203.1 | - | - | 10:02 | 10:29 | 0.4 | 12.2 | 6.14 | - | - | - | - | - | - | |
| | | 16-Jun-10 | 2 | 11.09 | 15.1 | 4.01 | B | 225.7 | - | - | 10:29 | 10:44 | 1.0 | 16.4 | 4.25 | 36.7 | - | 1.7 | 11.8 | 12.5 | 20.6 | |
| | | 16-Jun-10 | 2 | 11.09 | 15.1 | 4.01 | C | 309.7 | - | - | 10:44 | 11:03 | 1.0 | 15.5 | 4.06 | 45.6 | - | 1.6 | 11.9 | 12.7 | 20.8 | |
| | | 16-Jun-10 | 2 | 11.09 | 15.1 | 4.01 | D | 671.5 | 1410.0 | 351.6 | 11:03 | 11:39 | 1.8 | 10.3 | 1.45 | 62.9 | - | 1.7 | 11.9 | 12.7 | 20.8 | |
| | | 16-Jun-10 | 1 | 15.1 | 20.1 | 5.00 | A | 29.5 | 29.5 | 5.9 | 9:16 | 9:53 | 6.1 | 0.5 | 0.02 | - | - | - | - | - | - | |
| Q-30+460.25 | Q | 13-Jul-10 | 4 | 8.37 | 10.37 | 2.00 | MF | 255.1 | - | - | 10:41 | 11:17 | 2.1 | 7.3 | 2.64 | - | - | - | - | - | - | Communicated To Q-30+458.75 |
| | | 13-Jul-10 | 4 | 8.37 | 10.37 | 2.00 | A | 171.1 | - | - | 11:17 | 11:30 | 2.4 | 9.7 | 2.15 | 31.3 | - | 1.6 | 10.6 | 7.0 | 12.3 | |
| | | 13-Jul-10 | 4 | 8.37 | 10.37 | 2.00 | B | 168.8 | - | - | 11:30 | 11:38 | 2.5 | 18.4 | 4.18 | 36.9 | 0.0 | 1.6 | 10.9 | 7.2 | 19.5 | |
| | | 13-Jul-10 | 4 | 8.37 | 10.37 | 2.00 | C | 168.0 | - | - | 11:38 | 11:44 | 2.3 | 14.0 | 3.40 | 46.4 | - | 1.7 | 10.9 | 12.3 | 20.2 | |
| | | 13-Jul-10 | 4 | 8.37 | 10.37 | 2.00 | D | 150.0 | - | - | 11:44 | 12:02 | 2.3 | 9.1 | 1.78 | - | - | - | - | - | - | |
| | | 13-Jul-10 | 4 | 8.37 | 10.37 | 2.00 | E | 173.0 | - | - | 12:02 | 12:43 | 2.4 | 6.0 | 0.80 | 85.0 | - | 1.7 | 11.2 | 15.6 | 20.2 | |
| | | 13-Jul-10 | 4 | 8.37 | 10.37 | 2.00 | X | 11.0 | 1097.0 | 548.5 | 12:43 | 12:56 | 2.6 | 0.4 | 0.07 | - | - | - | - | - | - | |
| | | 11-Jul-10 | 3 | 10.96 | 11.96 | 1.00 | MF | 85.4 | 85.4 | 85.4 | 14:03 | 14:35 | 3.1 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 12-Jul-10 | 2 | 11.49 | 17.53 | 6.04 | A | 78.1 | 78.1 | 12.9 | 8:15 | 8:40 | 3.2 | 0.3 | 0.02 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+461 | S | 02-Jul-10 | 4 | 9.06 | 10.56 | 1.50 | A | 156.6 | - | - | 15:36 | 16:00 | 1.4 | 11.2 | 5.62 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 9.06 | 10.56 | 1.50 | B | 167.3 | - | - | 16:00 | 16:14 | 1.8 | 15.1 | 6.01 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 9.06 | 10.56 | 1.50 | C | 353.1 | - | - | 16:14 | 16:59 | 2.1 | 14.5 | 4.55 | - | - | - | - | - | - | |
| | | 02-Jul-10 | 4 | 9.06 | 10.56 | 1.50 | D | 340.0 | 1017.0 | 678.0 | 16:36 | 16:59 | 2.1 | 14.5 | 4.55 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 3 | 10.96 | 11.96 | 1.00 | A | 172.8 | - | - | 17:47 | 18:13 | 3.0 | 9.9 | 3.03 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 3 | 10.96 | 11.96 | 1.00 | B | 172.6 | 345.4 | 345.4 | 18:13 | 19:32 | 3.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 2 | 11.96 | 16 | 4.04 | A | 30.5 | 30.5 | 7.5 | 17:29 | 17:43 | 3.1 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 1 | 16 | 21 | 5.00 | A | 25.0 | 25.0 | 5.0 | 17:06 | 17:20 | 6.1 | 0.1 | 0.00 | 33.7 | - | 1.7 | 11.4 | 8.8 | 19.6 | |
| Q-30+461.75 | Q | 18-Jul-10 | 4 | 8.4 | 9.9 | 1.50 | MF | 58.6 | 58.6 | 39.1 | 15:51 | 16:18 | 2.3 | 0.5 | 0.00 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 3 | 10.57 | 11.7 | 1.13 | MF | 39.5 | 39.5 | 35.0 | 14:08 | 14:33 | 3.1 | 0.2 | 0.07 | - | - | - | - | - | - | |
| T-30+462.5 | T | 06-Jul-10 | 4 | 8.83 | 10.33 | 1.50 | MF | 145.5 | - | - | 22:58 | 23:16 | 1.3 | 8.8 | 5.41 | 33.3 | 20.0 | 1.4 | 10.0 | 11.6 | 18.4 | |
| | | 06-Jul-10 | 4 | 8.83 | 10.33 | 1.50 | A | 173.7 | - | - | 23:16 | 23:33 | 1.3 | 15.2 | 6.92 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 8.83 | 10.33 | 1.50 | B | 160.9 | - | - | 23:33 | 23:42 | 1.5 | 18.7 | 6.73 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 8.83 | 10.33 | 1.50 | C | 199.9 | - | - | 23:42 | 23:52 | 2.1 | 24.4 | 6.64 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 8.83 | 10.33 | 1.50 | D | 323.0 | 1003.0 | 668.7 | 23:52 | 0:08 | 1.8 | 2.7 | 0.85 | - | - | - | - | - | - | |
| | | 16-Jun-10 | 3 | 10.94 | 11.94 | 1.00 | A | 23.2 | 23.2 | 23.2 | 16:20 | 16:36 | 3.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 16-Jun-10 | 2 | 11.94 | 15.9 | 3.96 | A | 23.5 | 23.5 | 5.9 | 15:58 | 16:14 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jun-10 | 1 | 15.9 | 21 | 5.10 | A | 25.9 | 25.9 | 5.1 | 15:34 | 15:50 | 6.1 | 0.1 | 0.00 | 32.2 | - | 1.6 | 6.8 | 12.0 | 19.4 | |
| Q-30+463.25 | Q | 18-Jul-10 | 4 | 8.03 | 9.53 | 1.50 | MF | 170.2 | - | - | 13:46 | 14:42 | 1.7 | 7.2 | 2.81 | 31.8 | 1.0 | 1.6 | 15.4 | 18.5 | 17.9 | |
| | | 18-Jul-10 | 4 | 8.03 | 9.53 | 1.50 | A | 150.0 | - | - | 14:12 | 14:23 | 1.6 | 18.9 | 7.03 | 33.2 | 1.0 | 1.6 | 15.4 | 18.5 | 22.3 | |
| | | 18-Jul-10 | 4 | 8.03 | 9.53 | 1.50 | B | 161.8 | - | - | 14:23 | 14:32 | 1.8 | 18.3 | 6.39 | 35.2 | 1.0 | 1.6 | 15.2 | 18.2 | 21.6 | |
| | | 18-Jul-10 | 4 | 8.03 | 9.53 | 1.50 | C | 164.2 | - | - | 14:32 | 14:41 | 2.6 | 18.5 | 4.59 | 46.2 | - | 1.6 | 15.3 | 18.2 | 21.9 | |
| | | 18-Jul-10 | 4 | 8.03 | 9.53 | 1.50 | D | 153.8 | - | - | 14:41 | 14:50 | 2.5 | 14.3 | 4.07 | 63.1 | - | 1.7 | 15.2 | 18.2 | 21.8 | |
| | | 18-Jul-10 | 4 | 8.03 | 9.53 | 1.50 | E | 208.0 | - | - | 14:50 | 15:08 | 2.2 | 18.6 | 5.71 | - | - | - | - | - | - | |
| | | 18-Jul-10 | 4 | 8.03 | 9.53 | 1.50 | X | 61.0 | 1069.0 | 712.7 | 15:08 | 15:31 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 3 | 10.14 | 11.4 | 1.26 | MF | 35.5 | 35.5 | 28.2 | 13:36 | 14:01 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+464 | P | 30-Jun-10 | 4 | 8.42 | 9.92 | 1.50 | A | 213.0 | - | - | 17:30 | 18:03 | 0.9 | 9.1 | 6.46 | - | - | - | - | - | - | |
| | | 30-Jun-10 | 4 | 8.42 | 9.92 | 1.50 | B | 151.8 | - | - | 18:03 | 18:14 | 1.3 | 10.5 | 5.58 | - | - | - | - | - | - | |
| | | 30-Jun-10 | 4 | 8.42 | 9.92 | 1.50 | C | 252.4 | - | - | 18:14 | 18:36 | 1.7 | 10.5 | 6.29 | - | - | - | - | - | - | |
| | | 30-Jun-10 | 4 | 8.42 | 9.92 | 1.50 | D | 401.8 | 1019.0 | 679.3 | 18:36 | 19:03 | 2.3 | 17.1 | 4.90 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 3 | 10.42 | 11.42 | 1.00 | A | 184.4 | - | - | 20:37 | 21:06 | 3.2 | 14.4 | 4.33 | 29.3 | 4.0 | 1.7 | 10.0 | 14.4 | 17.0 | |
| | | 11-Jun-10 | 3 | 10.42 | 11.42 | 1.00 | B | 358.8 | 543.2 | 543.2 | 21:06 | 22:22 | 3.5 | 0.5 | 0.18 | 34.6 | 3.0 | 1.7 | 10.0 | 14.0 | 19.0 | |
| | | 11-Jun-10 | 2 | 11.42 | 15.4 | 3.98 | A | 25.5 | 25.5 | 6.4 | 20:25 | 20:37 | 3.5 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 1 | 15.4 | 20.8 | 5.40 | A | 33.2 | 33.2 | 6.1 | 19:57 | 20:14 | 6.2 | 0.7 | 0.02 | - | - | - | - | - | - | |
| T-30+465.5 | T | 07-Jul-10 | 4 | 8 | 9.5 | 1.50 | MF | 160.0 | - | - | 10:17 | 10:41 | 1.9 | 12.8 | 4.92 | - | - | - | - | - | - | Communicated To T-30+468.5 |
| | | 07-Jul-10 | 4 | 8 | 9.5 | 1.50 | A | 158.5 | - | - | 10:41 | 10:53 | 2.2 | 15.1 | 4.85 | - | - | - | - | - | - | |
| | | 07-Jul-10 | 4 | 8 | 9.5 | 1.50 | B | 161.9 | - | - | 10:53 | 11:04 | 2.0 | 15.5 | 5.12 | - | - | - | - | - | - | Communicated To T-30+447.5; |
| | | 07-Jul-10 | 4 | 8 | 9.5 | 1.50 | C | 158.3 | - | - | 11:04 | 11:14 | 2.3 | 15.2 | 4.39 | - | - | - | - | - | - | Outside Casing |
| | | 07-Jul-10 | 4 | 8 | 9.5 | 1.50 | D+ | 182.3 | - | - | 11:14 | 11:30 | 2.5 | 8.1 | 2.03 | - | - | - | - | - | - | Communicated To T-30+462.5, T-30+453.5 |
| | | 07-Jul-10 | 4 | 8 | 9.5 | 1.50 | E | 85.0 | 906.0 | 604.0 | 11:30 | 12:03 | 2.5 | 0.3 | 0.09 | - | - | - | - | - | - | And T-30+447.5 |
| | | 17-Jun-10 | 3 | 10.16 | 11.16 | 1.00 | A | 216.3 | - | - | 8:06 | 8:32 | 0.9 | 12.9 | 14.07 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 3 | 10.16 | 11.16 | 1.00 | B | 214.1 | - | - | 8:32 | 8:45 | 1.3 | 16.3 | 12.35 | 37.6 | 2.5 | 1.6 | 9.8 | 10.7 | 17.7 | |
| | | 17-Jun-10 | 3 | 10.16 | 11.16 | 1.00 | C | 295.1 | - | - | 8:45 | 9:05 | 1.3 | 15.6 | 12.60 | 39.5 | - | 1.7 | 9.8 | 10.7 | 17.7 | |
| | | 17-Jun-10 | 3 | 10.16 | 11.16 | 1.00 | D | 343.5 | 1069.0 | 1069.0 | 9:05 | 9:28 | 1.3 | 8.3 | 6.37 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 2 | 11.16 | 15.2 | 4.04 | A | 23.6 | 23.6 | 5.8 | 7:45 | 8:00 | 3.2 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 1 | 15.2 | 20.8 | 5.60 | A | 23.7 | 23.7 | 4.2 | 7:25 | 7:40 | 6.3 | 0.1 | 0.00 | 30.6 | 4.0 | 1.6 | 12.7 | 10.6 | 20.5 | |
| S-30+467 | S | 03-Jul-10 | 4 | 7.73 | 9.23 | 1.50 | A | 158.9 | - | - | 14:06 | 14:33 | 1.7 | 12.2 | 5.15 | 34.0 | 6.0 | 1.6 | 12.4 | 12.8 | 17.1 | |
| | | 03-Jul-10 | 4 | 7.73 | 9.23 | 1.50 | B | 163.7 | - | - | 14:33 | 14:46 | 2.2 | 13.9 | 4.04 | 36.2 | 6.0 | 1.6 | 12.6 | 12.5 | 17.6 | |
| | | 03-Jul-10 | 4 | 7.73 | 9.23 | 1.50 | C | 327.6 | - | - | 14:46 | 15:10 | 2.5 | 11.9 | 3.10 | 55.0 | 2.0 | 1.7 | 10.7 | 9.8 | 18.0 | |
| | | 03-Jul-10 | 4 | 7.73 | 9.23 | 1.50 | D | 363.8 | 1014.0 | 676.0 | 15:10 | 15:37 | 2.7 | 13.9 | 3.48 | 80.2 | - | 1.7 | 10.5 | 9.9 | 16.4 | |
| | | 13-Jun-10 | 3 | 9.93 | 10.93 | 1.00 | A | 55.4 | 55.4 | 55.4 | 20:38 | 21:06 | 3.5 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 2 | 10.93 | 14.9 | 3.97 | A | 41.5 | 41.5 | 10.5 | 20:16 | 20:39 | 3.4 | 1.1 | 0.08 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 1 | 14.9 | 20.3 | 5.40 | A | 22.0 | 22.0 | 4.1 | 19:57 | 20:10 | 6.3 | 0.0 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+468.5 | T | 06-Jul-10 | 4 | 7.67 | 9.17 | 1.50 | MF | 190.9 | - | - | 19:55 | 20:20 | 1.6 | 13.0 | 5.43 | - | - | - | - | - | - | |
| | | 06-Jul-10 | 4 | 7.67 | 9.17 | 1.50 | A | 313.1 | - | - | 20:20 | 20:45 | 2.2 | 15.3 | 4.71 | 32.1 | 6.0 | 1.7 | 11.6 | 9.6 | 19.7 | |
| | | 06-Jul-10 | 4 | 7.67 | 9.17 | 1.50 | B | 96.0 | - | - | 20:45 | 20:58 | 2.2 | 3.5 | 1.00 | 36.6 | 6.0 | 1.6 | 9.3 | 10.3 | 18.1 | |
| | | 06-Jul-10 | 4 | 7.67 | 9.17 | 1.50 | C | 405.0 | 1005.0 | 670.0 | 20:58 | 22:52 | 2.5 | 0.9 | 0.24 | 48.9 | 4.0 | 1.6 | 9.4 | 10.8 | 18.9 | |
| | | 17-Jun-10 | 3 | 9.78 | 10.78 | 1.00 | A | 24.6 | 24.6 | 24.6 | 11:04 | 11:16 | 3.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 2 | 10.78 | 14.8 | 4.02 | A | 24.7 | 24.7 | 6.1 | 10:43 | 10:55 | 3.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 1 | 14.8 | 20.4 | 5.60 | A | 32.5 | 32.5 | 5.8 | 10:17 | 10:37 | 6.0 | 0.1 | 0.00 | 30.8 | - | 1.6 | 9.9 | 10.8 | 18.3 | |
| P-30+470 | P | 19-Jun-10 | 4 | 7.2 | 8.7 | 1.50 | A | 163.5 | - | - | 9:00 | 9:26 | 0.9 | 15.0 | 10.01 | 33.2 | 2.0 | 1.7 | 6.5 | 7.8 | 13.5 | |
| | | 19-Jun-10 | 4 | 7.2 | 8.7 | 1.50 | B | 167.3 | - | - | 9:26 | 9:38 | 1.4 | 12.2 | 5.73 | 37.6 | 3.0 | 1.6 | 5.2 | 9.6 | 13.2 | |
| | | 19-Jun-10 | 4 | 7.2 | 8.7 | 1.50 | C | 271.2 | - | - | 9:38 | 9:58 | 2.8 | 16.1 | 3.78 | 53.0 | 1.5 | 1.6 | 6.7 | 9.5 | 15.9 | |
| | | 19-Jun-10 | 4 | 7.2 | 8.7 | 1.50 | D | 382.0 | 984.0 | 656.0 | 9:58 | 10:33 | 3.0 | 9.9 | 2.17 | 76.0 | - | 1.6 | 6.7 | 9.5 | 14.6 | |
| | | 28-Apr-10 | 3 | 9.6 | 10.6 | 1.00 | A | 4.1 | 4.1 | 4.1 | 2:25 | 2:40 | 3.4 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 2 | 10.6 | 14.6 | 4.00 | A | 183.4 | 183.4 | 45.9 | 1:38 | 2:22 | 3.2 | 2.3 | 0.18 | 31.8 | 6.0 | 1.6 | 19.0 | 10.0 | 19.0 | |
| | | 28-Apr-10 | 1 | 14.6 | 19.6 | 5.00 | A | 380.0 | - | - | 20:56 | 21:48 | 0.0 | 0.0 | 0.00 | 31.6 | 4.0 | 1.6 | 30.0 | 13.0 | 21.0 | |
| | | 28-Apr-10 | 1 | 14.6 | 19.6 | 5.00 | B | 272.7 | 652.7 | 130.5 | 21:48 | 23:16 | 5.8 | 2.2 | 0.08 | 35.1 | 6.0 | 1.6 | 10.0 | 13.0 | 20.0 | |
| T-30+471.5 | T | 30-Jun-10 | 4 | 7.62 | 9.12 | 1.50 | MF | 254.2 | - | - | 13:53 | 14:31 | 1.6 | 11.8 | 5.06 | 31.8 | 1.5 | 1.5 | 12.2 | 14.5 | 17.1 | |
| | | 30-Jun-10 | 4 | 7.62 | 9.12 | 1.50 | A | 171.8 | - | - | 14:31 | 14:47 | 0.9 | 9.4 | 6.25 | 32.5 | 7.0 | 1.7 | 15.2 | 14.6 | 19.1 | |
| | | 30-Jun-10 | 4 | 7.62 | 9.12 | 1.50 | B | 209.0 | - | - | 14:47 | 15:08 | 2.1 | 15.7 | 4.62 | 34.0 | 5.0 | 1.7 | 15.1 | 14.4 | 21.1 | |
| | | 30-Jun-10 | 4 | 7.62 | 9.12 | 1.50 | C | 167.0 | 802.0 | 534.7 | 15:08 | 16:54 | 2.5 | 0.5 | 0.13 | 51.2 | - | 1.7 | 15.1 | 14.4 | 21.4 | |
| | | 15-May-10 | 3 | 9.62 | 10.62 | 1.00 | A | 157.3 | - | - | 10:25 | 10:47 | 0.4 | 12.3 | 27.30 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.62 | 10.62 | 1.00 | B | 236.4 | - | - | 10:47 | 11:02 | 0.9 | 21.5 | 29.20 | 36.5 | 5.0 | 1.6 | - | - | 14.7 | |
| | | 15-May-10 | 3 | 9.62 | 10.62 | 1.00 | C | 221.5 | - | - | 11:02 | 11:12 | 1.6 | 24.6 | 14.46 | 47.0 | 4.0 | 1.6 | - | - | 14.5 | |
| | | 15-May-10 | 3 | 9.62 | 10.62 | 1.00 | D | 375.8 | 991.0 | 991.0 | 11:12 | 11:26 | 1.9 | 28.6 | 15.00 | - | - | - | - | - | - | |
| | | 15-May-10 | 2 | 10.62 | 14.6 | 3.98 | A | 26.4 | 26.4 | 6.6 | 10:03 | 10:19 | 3.2 | 0.4 | 0.03 | - | - | - | - | - | 19.3 | |
| | | 15-May-10 | 1 | 14.6 | 19.8 | 5.20 | A | 25.1 | 25.1 | 4.8 | 9:34 | 9:55 | 6.0 | 0.0 | 0.00 | 33.0 | 4.0 | 1.6 | 13.6 | 8.6 | 15.8 | |
| S-30+473 | S | 23-Jun-10 | 4 | 7 | 8.5 | 1.50 | A | 214.7 | - | - | 14:05 | 14:34 | 2.6 | 12.1 | 3.40 | 33.7 | 5.0 | 1.7 | 9.0 | 8.5 | 17.9 | |
| | | 23-Jun-10 | 4 | 7 | 8.5 | 1.50 | B | 161.0 | - | - | 14:34 | 14:45 | 2.9 | 15.3 | 3.63 | 39.0 | 5.0 | 1.7 | 8.9 | 7.8 | 18.2 | |
| | | 23-Jun-10 | 4 | 7 | 8.5 | 1.50 | C | 278.0 | - | - | 14:45 | 15:04 | 3.0 | 14.1 | 3.33 | 51.0 | 2.0 | 1.7 | 8.4 | 7.7 | 18.5 | |
| | | 23-Jun-10 | 4 | 7 | 8.5 | 1.50 | D | 91.3 | 745.0 | 496.7 | 15:04 | 15:44 | 3.0 | 0.2 | 0.04 | 74.4 | - | 1.7 | 10.6 | 7.6 | 14.8 | |
| | | 11-May-10 | 3 | 9.27 | 10.27 | 1.00 | A | 295.7 | - | - | 16:30 | 17:01 | 0.0 | 15.0 | inf | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 9.27 | 10.27 | 1.00 | B | 56.2 | - | - | 17:01 | 17:06 | 0.0 | 18.0 | inf | 37.1 | 3.0 | 1.7 | 14.1 | 13.5 | 16.7 | By-Pass |
| | | 11-May-10 | 3 | 9.27 | 10.27 | 1.00 | B | 31.4 | - | - | 17:06 | 17:12 | 0.9 | 18.7 | 17.10 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 9.27 | 10.27 | 1.00 | C | 304.1 | - | - | 17:12 | 17:26 | 2.1 | 20.4 | 10.04 | 44.3 | 3.0 | 1.6 | 13.4 | 12.4 | 18.4 | |
| | | 11-May-10 | 3 | 9.27 | 10.27 | 1.00 | D | 461.7 | 1149.1 | 1149.1 | 17:26 | 17:41 | 3.5 | 48.9 | 14.60 | - | - | - | - | - | - | |
| | | 11-May-10 | 2 | 10.27 | 14.3 | 4.03 | A | 37.3 | 37.3 | 9.3 | 16:11 | 16:26 | 2.7 | 0.8 | 0.08 | - | - | - | - | - | - | |
| | | 11-May-10 | 1 | 14.3 | 20.3 | 6.00 | A | 134.8 | 134.8 | 22.5 | 15:38 | 16:07 | 5.5 | 3.5 | 0.11 | 33.1 | 5.0 | 1.6 | 13.4 | 13.9 | 23.0 | |
| T-30+474.5 | T | 30-Jun-10 | 4 | 7.4 | 8.9 | 1.50 | MF | 132.5 | 132.5 | 88.3 | 10:25 | 11:26 | 2.2 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.4 | 10.4 | 1.00 | A | 151.5 | - | - | 14:55 | 15:16 | 3.2 | 14.1 | 10.06 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.4 | 10.4 | 1.00 | B | 241.0 | - | - | 15:16 | 15:30 | 2.2 | 17.9 | 8.04 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.4 | 10.4 | 1.00 | C | 264.9 | - | - | 15:30 | 15:46 | 3.0 | 14.6 | 4.75 | 47.0 | 1.5 | 1.7 | - | - | 13.4 | |
| | | 15-May-10 | 3 | 9.4 | 10.4 | 1.00 | D | 343.6 | 1001.0 | 1001.0 | 15:46 | 16:21 | 3.0 | 11.1 | 3.75 | 70.0 | - | 1.6 | - | - | 14.0 | |
| | | 15-May-10 | 2 | 10.4 | 14.4 | 4.00 | A | 25.3 | 25.3 | 6.3 | 14:27 | 14:43 | 3.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 15-May-10 | 1 | 14.4 | 19.5 | 5.10 | A | 27.0 | 27.0 | 5.3 | 13:56 | 14:16 | 6.1 | 0.0 | 0.00 | 33.0 | - | 1.6 | 4.3 | 8.2 | 15.4 | |
| P-30+476 | P | 23-Jun-10 | 4 | 7.08 | 8.58 | 1.50 | A | 183.4 | - | - | 9:04 | 9:28 | 0.5 | 10.4 | 13.30 | - | - | - | - | - | - | Communicated To S-30+473 |
| | | 23-Jun-10 | 4 | 7.08 | 8.58 | 1.50 | B | 166.9 | - | - | 9:28 | 9:42 | 2.1 | 15.0 | 4.70 | - | - | - | - | - | - | |
| | | 23-Jun-10 | 4 | 7.08 | 8.58 | 1.50 | C | 239.0 | - | - | 9:42 | 10:15 | 3.0 | 3.4 | 0.73 | - | - | - | - | - | - | |
| | | 23-Jun-10 | 4 | 7.08 | 8.58 | 1.50 | D | 22.4 | 611.7 | 407.8 | 10:15 | 10:30 | 3.1 | 0.8 | 0.17 | 75.0 | 1.0 | 1.7 | 12.1 | 8.0 | 17.4 | |
| | | 29-Apr-10 | 3 | 9.3 | 10.3 | 1.00 | A | 25.4 | 25.4 | 25.4 | 7:32 | 7:46 | 3.9 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 2 | 10.3 | 14.3 | 4.00 | A | 15.9 | 15.9 | 4.0 | 7:15 | 7:28 | 3.2 | 0.1 | 0.01 | 33.0 | 4.0 | 1.7 | 6.0 | 17.0 | 16.0 | |
| | | 28-Apr-10 | 1 | 14.3 | 19.3 | 5.00 | A | 436.0 | - | - | 2:55 | 3:42 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 1 | 14.3 | 19.3 | 5.00 | B | 474.0 | - | - | 3:42 | 4:10 | 0.0 | 0.0 | 0.00 | 35.6 | - | 1.7 | 8.0 | 10.0 | 17.0 | |
| | | 28-Apr-10 | 1 | 14.3 | 19.3 | 5.00 | C | 1590.0 | 2500.0 | 500.0 | 4:10 | 5:39 | 5.6 | 16.4 | 0.58 | 49.2 | - | 1.7 | 9.0 | 9.0 | 16.0 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+477.5 | T | 30-Jun-10 | 4 | 7.3 | 8.8 | 1.50 | MF | 124.5 | 124.5 | 83.0 | 9:23 | 10:13 | 2.3 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.3 | 10.3 | 1.00 | A | 228.9 | - | - | 17:38 | 19:23 | 3.1 | 1.5 | 0.50 | 33.1 | 4.0 | 1.6 | 3.0 | 9.0 | 16.2 | |
| | | 15-May-10 | 3 | 9.3 | 10.3 | 1.00 | B | 33.5 | 262.4 | 262.4 | 19:23 | 19:56 | 2.9 | 0.6 | 0.20 | 38.0 | 5.6 | 1.6 | 3.0 | 9.0 | 17.9 | |
| | | 15-May-10 | 2 | 10.3 | 14.3 | 4.00 | A | 26.1 | 26.1 | 6.5 | 17:17 | 17:30 | 3.0 | 0.2 | 0.02 | - | - | - | - | - | 15.6 | |
| | | 15-May-10 | 1 | 14.3 | 19.3 | 5.00 | A | 24.0 | 24.0 | 4.8 | 16:47 | 17:07 | 5.5 | 0.1 | 0.00 | - | - | - | - | - | 13.7 | |
| S-30+479 | S | 23-Jun-10 | 4 | 7.3 | 8.8 | 1.50 | A | 174.1 | - | - | 7:23 | 7:59 | 2.3 | 8.9 | 2.57 | 31.8 | 5.0 | 1.7 | 12.3 | 7.2 | 15.5 | By-Pass |
| | | 23-Jun-10 | 4 | 7.3 | 8.8 | 1.50 | B | 201.4 | - | - | 7:59 | 8:14 | 2.9 | 11.8 | 2.58 | 37.4 | 3.0 | 1.6 | 12.6 | 8.3 | 18.2 | |
| | | 23-Jun-10 | 4 | 7.3 | 8.8 | 1.50 | C | 107.1 | 482.6 | 321.7 | 8:14 | 8:42 | 3.0 | 0.9 | 0.19 | 50.2 | 2.0 | 1.6 | 11.5 | 7.5 | 16.5 | |
| | | 11-May-10 | 3 | 9.25 | 10.25 | 1.00 | A | 287.4 | - | - | 20:35 | 21:05 | 0.8 | 12.6 | 14.28 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 9.25 | 10.25 | 1.00 | B | 129.5 | - | - | 21:05 | 21:15 | 1.1 | 9.6 | 8.53 | 34.0 | 7.6 | 1.7 | -3.3 | 8.6 | 12.6 | |
| | | 11-May-10 | 3 | 9.25 | 10.25 | 1.00 | C | 265.3 | - | - | 21:15 | 21:34 | 3.2 | 13.1 | 4.69 | 45.7 | 2.0 | 1.7 | -3.3 | 9.6 | 12.4 | |
| | | 11-May-10 | 3 | 9.25 | 10.25 | 1.00 | D | 170.8 | 853.0 | 853.0 | 21:34 | 22:07 | 3.5 | 0.0 | 0.00 | 72.0 | 1.0 | 1.7 | -4.1 | 9.6 | 12.8 | |
| | | 11-May-10 | 2 | 10.25 | 14.2 | 3.95 | A | 14.1 | 14.1 | 3.6 | 20:20 | 20:32 | 3.7 | 0.8 | 0.05 | - | - | - | - | - | - | |
| | | 11-May-10 | 1 | 14.2 | 20.3 | 6.10 | A | 80.6 | 80.6 | 13.2 | 19:52 | 20:15 | 6.1 | 1.0 | 0.03 | 32.7 | 5.4 | 1.7 | -2.0 | 8.6 | 13.3 | |
| T-30+480.5 | T | 30-Jun-10 | 4 | 7.15 | 8.65 | 1.50 | MF | 254.1 | - | - | 7:22 | 7:58 | 2.4 | 9.6 | 3.20 | 30.4 | 3.0 | 1.4 | 14.9 | 14.8 | 14.1 | |
| | | 30-Jun-10 | 4 | 7.15 | 8.65 | 1.50 | A | 187.8 | - | - | 7:58 | 8:10 | 2.2 | 14.7 | 4.46 | 31.2 | 9.0 | 1.6 | 13.4 | 14.4 | 19.9 | |
| | | 30-Jun-10 | 4 | 7.15 | 8.65 | 1.50 | B | 165.6 | - | - | 8:10 | 8:24 | 2.4 | 15.9 | 2.77 | 36.2 | 10.0 | 1.6 | 13.4 | 14.2 | 20.0 | |
| | | 30-Jun-10 | 4 | 7.15 | 8.65 | 1.50 | C | 53.6 | 661.1 | 440.7 | 8:24 | 8:43 | 2.4 | 0.6 | 0.16 | 48.5 | - | 1.7 | 13.4 | 14.3 | 20.1 | |
| | | 15-May-10 | 3 | 9.15 | 10.15 | 1.00 | A | 414.8 | - | - | 21:39 | 22:04 | 3.1 | 17.2 | 5.58 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.15 | 10.15 | 1.00 | B | 164.7 | - | - | 22:04 | 22:21 | 3.6 | 6.5 | 1.84 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.15 | 10.15 | 1.00 | C | 107.6 | - | - | 22:21 | 22:50 | 3.6 | 6.5 | 1.84 | 50.1 | 2.4 | 1.7 | 2.0 | 9.0 | 15.7 | |
| | | 15-May-10 | 3 | 9.15 | 10.15 | 1.00 | D | 21.5 | 708.6 | 708.6 | 22:50 | 23:13 | 3.8 | 0.0 | 0.01 | 61.0 | 2.0 | 1.6 | 2.0 | 9.0 | 16.5 | |
| | | 15-May-10 | 2 | 10.15 | 14.1 | 3.95 | A | 24.5 | 24.5 | 6.2 | 21:22 | 21:36 | 3.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 15-May-10 | 1 | 14.1 | 19.2 | 5.10 | A | 23.6 | 23.6 | 4.6 | 21:02 | 21:16 | 5.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+482 | P | 19-Jun-10 | 4 | 7.13 | 8.63 | 1.50 | D | 31.9 | 658.6 | 439.1 | 0:18 | 0:32 | 3.0 | 0.7 | 0.15 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 4 | 7.13 | 8.63 | 1.50 | A | 116.6 | - | - | 23:32 | 23:45 | 2.0 | 14.6 | 5.26 | - | - | - | - | - | - | Communicated To P-30+488 |
| | | 19-Jun-10 | 4 | 7.13 | 8.63 | 1.50 | B | 193.2 | - | - | 23:45 | 23:59 | 2.8 | 15.2 | 3.71 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 4 | 7.13 | 8.63 | 1.50 | C | 316.9 | - | - | 23:59 | 0:18 | 3.1 | 18.4 | 3.62 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 3 | 9.2 | 10.2 | 1.00 | A | 15.3 | 15.3 | 15.3 | 8:44 | 8:58 | 3.4 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 2 | 10.2 | 14.2 | 4.00 | A | 22.7 | 22.7 | 5.7 | 8:21 | 8:38 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 1 | 14.2 | 19.2 | 5.00 | A | 63.9 | 63.9 | 12.8 | 7:57 | 8:18 | 6.5 | 0.3 | 0.01 | - | - | - | - | - | - | |
| T-30+483.5 | T | 29-Jun-10 | 4 | 7.07 | 8.57 | 1.50 | MF | 69.9 | 69.9 | 46.6 | 16:24 | 16:54 | 2.5 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.07 | 10.07 | 1.00 | A | 416.0 | - | - | 0:01 | 0:18 | 1.2 | 11.8 | 10.61 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.07 | 10.07 | 1.00 | B | 145.8 | - | - | 0:18 | 0:29 | 2.0 | 16.0 | 8.12 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.07 | 10.07 | 1.00 | C | 169.0 | - | - | 0:29 | 0:39 | 2.6 | 16.8 | 6.48 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.07 | 10.07 | 1.00 | D | 207.2 | 938.0 | 938.0 | 0:39 | 1:10 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 15-May-10 | 2 | 10.07 | 14.4 | 4.33 | A | 23.7 | 23.7 | 5.5 | 23:45 | 23:59 | 3.0 | 0.2 | 0.20 | - | - | - | - | - | - | |
| | | 15-May-10 | 1 | 14.4 | 19.4 | 5.00 | A | 26.4 | 26.4 | 5.3 | 23:29 | 23:42 | 5.8 | 0.3 | 0.01 | - | - | - | - | - | - | |
| S-30+485 | S | 19-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | A | 214.0 | - | - | 9:19 | 10:17 | 0.8 | 9.4 | 8.25 | 33.3 | 3.0 | 1.4 | 7.6 | 9.1 | 15.6 | Communicated To T-30+503 |
| | | 19-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | B | 112.0 | - | - | 10:17 | 10:30 | 1.6 | 10.7 | 4.40 | 38.2 | 2.0 | 1.6 | 7.5 | 9.3 | 17.9 | |
| | | 19-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | C | 161.0 | - | - | 10:30 | 10:45 | 2.8 | 14.0 | 3.10 | 48.8 | 3.0 | 1.7 | 7.1 | 8.5 | 19.1 | |
| | | 19-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | D | 200.3 | 687.3 | 458.2 | 10:45 | 11:41 | 2.9 | 1.0 | 0.22 | 75.0 | - | 1.7 | 6.5 | 7.4 | 15.8 | |
| | | 11-May-10 | 3 | 8.74 | 9.74 | 1.00 | A | 173.1 | - | - | 0:34 | 0:55 | 1.1 | 11.4 | 13.82 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.74 | 9.74 | 1.00 | B | 161.5 | - | - | 0:55 | 1:08 | 1.1 | 13.0 | 11.98 | 35.6 | - | 1.6 | - | - | - | |
| | | 11-May-10 | 3 | 8.74 | 9.74 | 1.00 | C | 216.7 | - | - | 1:08 | 1:24 | 2.9 | 13.4 | 4.44 | 45.4 | - | 1.6 | - | - | - | |
| | | 11-May-10 | 3 | 8.74 | 9.74 | 1.00 | D | 290.7 | 842.0 | 842.0 | 1:24 | 2:30 | 3.5 | 0.1 | 0.03 | 61.5 | - | 1.7 | - | - | - | |
| | | 11-May-10 | 2 | 9.74 | 13.7 | 3.96 | A | 25.4 | 25.4 | 6.4 | 0:16 | 0:29 | 3.6 | 1.4 | 0.10 | 32.2 | 7.0 | 1.7 | -3.5 | 8.2 | 11.1 | |
| | | 11-May-10 | 1 | 13.7 | 19.3 | 5.60 | A | 5.3 | 5.3 | 0.9 | 23:56 | 0:10 | 6.1 | 0.2 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+486.5 | T | 29-Jun-10 | 4 | 6.77 | 8.27 | 1.50 | MF | 211.8 | - | - | 14:26 | 14:59 | 2.0 | 15.4 | 4.29 | 31.2 | 4.0 | 1.4 | 13.0 | 14.4 | 16.0 | |
| | | 29-Jun-10 | 4 | 6.77 | 8.27 | 1.50 | A | 160.5 | - | - | 14:59 | 15:09 | 2.4 | 14.3 | 3.74 | 32.6 | 9.0 | 1.6 | 14.8 | 12.4 | 18.8 | |
| | | 29-Jun-10 | 4 | 6.77 | 8.27 | 1.50 | B | 121.4 | 493.7 | 329.1 | 15:09 | 15:58 | 2.5 | 0.4 | 0.10 | 34.6 | 8.0 | 1.6 | 14.8 | 12.3 | 20.5 | |
| | | 15-May-10 | 3 | 8.77 | 9.77 | 1.00 | A | 313.7 | - | - | 3:48 | 4:01 | 0.6 | 14.9 | 26.04 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.77 | 9.77 | 1.00 | B | 163.2 | - | - | 4:01 | 4:13 | 1.2 | 14.6 | 12.28 | 35.5 | - | 1.6 | 3.0 | 6.0 | 13.9 | |
| | | 15-May-10 | 3 | 8.77 | 9.77 | 1.00 | C | 212.4 | - | - | 4:13 | 4:25 | 2.5 | 16.9 | 6.56 | 45.1 | - | 1.6 | 3.0 | 6.0 | 11.2 | |
| | | 15-May-10 | 3 | 8.77 | 9.77 | 1.00 | D | 45.5 | 734.8 | 734.8 | 4:25 | 4:42 | 2.9 | 0.2 | 0.80 | 60.2 | - | 1.6 | 3.0 | 6.0 | 11.7 | |
| | | 15-May-10 | 2 | 9.77 | 13.8 | 4.03 | A | 25.1 | 25.1 | 6.2 | 3:31 | 3:44 | 3.1 | 0.2 | 0.20 | - | - | - | - | - | - | |
| | | 15-May-10 | 1 | 13.8 | 18.9 | 5.10 | A | 28.6 | 28.6 | 5.6 | 3:12 | 3:27 | 5.8 | 0.0 | 0.00 | 31.4 | - | 1.7 | 3.0 | 6.0 | 12.0 | |
| P-30+488 | P | 19-Jun-10 | 4 | 7.78 | 9.28 | 1.50 | A | 150.0 | - | - | 19:51 | 20:05 | 2.8 | 11.8 | 6.31 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 4 | 7.78 | 9.28 | 1.50 | B | 169.1 | - | - | 20:05 | 20:18 | 2.7 | 15.1 | 3.64 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 4 | 7.78 | 9.28 | 1.50 | C | 183.4 | 502.5 | 335.0 | 20:18 | 20:45 | 3.1 | 1.0 | 0.22 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 3 | 9.8 | 10.8 | 1.00 | A | 6.9 | 6.9 | 6.9 | 14:28 | 14:40 | 3.7 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 2 | 10.8 | 14.8 | 4.00 | A | 18.3 | 18.3 | 4.6 | 14:11 | 14:24 | 3.3 | 0.4 | 0.03 | 32.0 | - | 1.6 | 13.0 | 11.0 | 12.0 | |
| | | 29-Apr-10 | 1 | 14.8 | 19.8 | 5.00 | A | 360.0 | - | - | 10:03 | 10:36 | 0.3 | 17.5 | 16.72 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 1 | 14.8 | 19.8 | 5.00 | B | 575.0 | - | - | 10:36 | 11:01 | 1.3 | 26.0 | 3.99 | 37.0 | 11.0 | 1.7 | 12.0 | 9.0 | 16.0 | |
| | | 29-Apr-10 | 1 | 14.8 | 19.8 | 5.00 | C | 437.0 | - | - | 11:01 | 11:20 | 3.1 | 29.3 | 2.12 | 48.0 | 1.0 | 1.8 | 25.0 | 19.0 | 21.0 | |
| | | 29-Apr-10 | 1 | 14.8 | 19.8 | 5.00 | D | 1071.0 | 2443.0 | 488.6 | 11:20 | 12:07 | 4.9 | 26.3 | 1.08 | 97.0 | 2.0 | 1.6 | - | - | - | |
| T-30+489.5 | T | 22-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | MF | 275.3 | - | - | 16:48 | 17:27 | 2.4 | 12.4 | 3.19 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | A | 100.1 | - | - | 17:27 | 17:35 | 2.6 | 15.7 | 4.40 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | B | 127.3 | 502.7 | 335.1 | 17:35 | 16:06 | 2.4 | 1.0 | 0.26 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 7.85 | 9.35 | 1.50 | MF | 265.6 | - | - | 8:19 | 8:55 | 2.5 | 14.3 | 4.37 | 32.3 | 4.0 | 1.4 | 11.3 | 11.0 | 13.6 | |
| | | 04-Jul-10 | 4 | 7.85 | 9.35 | 1.50 | A | 148.0 | - | - | 8:55 | 9:06 | 2.4 | 9.5 | 3.07 | 33.2 | 5.0 | 1.7 | 11.3 | 14.3 | 11.1 | |
| | | 04-Jul-10 | 4 | 7.85 | 9.35 | 1.50 | B | 154.8 | 568.4 | 378.9 | 9:06 | 10:15 | 2.5 | 0.6 | 0.17 | 36.2 | 6.0 | 1.6 | 11.3 | 14.3 | 17.9 | Stage 4 re-grouted: |
| | | 15-May-10 | 3 | 9.83 | 10.83 | 1.00 | A | 328.4 | - | - | 5:35 | 5:44 | 1.8 | 15.1 | 8.35 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.83 | 10.83 | 1.00 | B | 203.4 | - | - | 5:44 | 6:04 | 2.3 | 15.3 | 7.01 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.83 | 10.83 | 1.00 | C | 146.3 | - | - | 6:04 | 6:11 | 2.9 | 20.9 | 7.14 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 9.83 | 10.83 | 1.00 | D | 39.4 | 717.5 | 717.5 | 6:11 | 6:34 | 3.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 15-May-10 | 2 | 10.83 | 14.8 | 3.97 | A | 24.9 | 24.9 | 6.3 | 5:19 | 5:33 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-May-10 | 1 | 14.8 | 20 | 5.20 | A | 24.0 | 24.0 | 4.6 | 4:58 | 5:15 | 6.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+491 | S | 19-Jun-10 | 4 | 7.63 | 9.13 | 1.50 | A | 153.2 | - | - | 18:22 | 18:49 | 2.6 | 17.0 | 4.37 | 33.3 | 3.5 | 1.6 | 5.4 | 8.1 | 15.6 | |
| | | 19-Jun-10 | 4 | 7.63 | 9.13 | 1.50 | B | 158.7 | - | - | 18:49 | 18:59 | 2.5 | 16.3 | 4.32 | 36.3 | 4.0 | 1.6 | 6.0 | 8.0 | 16.0 | |
| | | 19-Jun-10 | 4 | 7.63 | 9.13 | 1.50 | C | 162.6 | - | - | 18:59 | 19:14 | 2.8 | 12.5 | 1.05 | 47.1 | 1.0 | 1.6 | 6.0 | 8.0 | 16.0 | |
| | | 19-Jun-10 | 4 | 7.63 | 9.13 | 1.50 | D | 84.7 | 559.2 | 372.8 | 19:14 | 19:42 | 3.0 | 0.9 | 0.19 | 77.3 | - | 1.6 | 6.0 | 8.0 | 16.0 | |
| | | 11-May-10 | 3 | 9.81 | 10.81 | 1.00 | A | 66.9 | 66.9 | 66.9 | 5:24 | 5:50 | 3.8 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 11-May-10 | 2 | 10.81 | 14.8 | 3.99 | A | 34.7 | 34.7 | 8.7 | 5:02 | 5:20 | 3.1 | 1.8 | 0.15 | - | - | - | - | - | - | |
| | | 11-May-10 | 1 | 14.8 | 20 | 5.20 | A | 3.1 | 3.1 | 0.6 | 4:50 | 5:02 | 6.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+492.5 | T | 22-Jun-10 | 4 | 7 | 9 | 2.00 | MF | 244.5 | - | - | 14:43 | 15:23 | 2.4 | 8.9 | 1.81 | 33.5 | 4.0 | 1.5 | 6.8 | 7.8 | 10.2 | |
| | | 22-Jun-10 | 4 | 7 | 9 | 2.00 | A | 174.2 | - | - | 15:23 | 15:36 | 2.1 | 6.4 | 1.49 | 32.5 | 3.0 | 1.6 | 11.2 | 7.6 | 16.1 | |
| | | 22-Jun-10 | 4 | 7 | 9 | 2.00 | B | 182.0 | 600.7 | 300.4 | 15:36 | 16:22 | 2.4 | 0.9 | 0.19 | 39.0 | 5.0 | 1.6 | 11.4 | 9.4 | 16.6 | |
| | | 16-May-10 | 3 | 9.5 | 10.5 | 1.00 | A | 12.2 | 12.2 | 12.2 | 8:18 | 8:36 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-10 | 2 | 10.5 | 14.5 | 4.00 | A | 25.2 | 25.2 | 6.3 | 7:51 | 8:11 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-10 | 1 | 14.5 | 19.8 | 5.30 | A | 56.3 | 56.3 | 10.6 | 7:19 | 7:43 | 6.2 | 1.6 | 0.05 | 33.0 | 3.0 | 1.7 | 13.8 | 8.1 | 14.3 | |
| P-30+494 | P | 19-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | A | 164.2 | - | - | 15:50 | 16:25 | 1.8 | 11.4 | 4.57 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | B | 185.8 | - | - | 16:25 | 16:41 | 2.8 | 13.1 | 2.97 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | C | 263.9 | - | - | 16:41 | 17:06 | 2.1 | 15.1 | 4.21 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | D | 151.4 | 765.3 | 510.2 | 17:06 | 17:49 | 3.0 | 0.9 | 0.21 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 3 | 9.2 | 10.2 | 1.00 | A | 22.2 | 22.2 | 22.2 | 15:24 | 15:40 | 3.8 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 2 | 10.2 | 14.2 | 4.00 | A | 25.5 | 25.5 | 6.4 | 15:05 | 15:21 | 3.1 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 1 | 14.2 | 19.2 | 5.00 | A | 37.0 | 37.0 | 7.4 | 14:47 | 15:00 | 5.8 | 0.7 | 0.03 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+495.5 | T | 22-Jun-10 | 4 | 7.17 | 8.67 | 1.50 | MF | 240.0 | - | - | 10:51 | 11:37 | 2.5 | 9.3 | 1.93 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 4 | 7.17 | 8.67 | 1.50 | A | 203.5 | - | - | 11:37 | 11:59 | 2.5 | 13.1 | 3.24 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 4 | 7.17 | 8.67 | 1.50 | B | 115.8 | - | - | 11:59 | 12:12 | 2.6 | 10.3 | 1.56 | - | - | - | - | - | - | |
| | | 22-Jun-10 | 4 | 7.17 | 8.67 | 1.50 | C | 32.1 | 591.4 | 394.3 | 12:12 | 12:32 | 2.4 | 0.6 | 0.17 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 9.17 | 10.17 | 1.00 | A | 144.2 | - | - | 10:23 | 10:49 | 3.1 | 6.2 | 1.98 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 9.17 | 10.17 | 1.00 | B | 160.5 | - | - | 10:49 | 11:25 | 3.0 | 3.7 | 1.26 | 35.0 | 3.5 | 1.6 | 10.2 | 6.1 | 15.2 | |
| | | 16-May-10 | 3 | 9.17 | 10.17 | 1.00 | C | 85.4 | 390.1 | 390.1 | 11:25 | 12:14 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-10 | 2 | 10.17 | 14.2 | 4.03 | A | 34.0 | 34.0 | 8.4 | 9:57 | 10:18 | 3.2 | 0.8 | 0.06 | - | - | - | - | - | - | |
| | | 16-May-10 | 1 | 14.2 | 19 | 4.80 | A | 23.4 | 23.4 | 4.9 | 9:30 | 9:51 | 6.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+497 | S | 19-Jun-10 | 4 | 6.57 | 8.07 | 1.50 | A | 158.0 | - | - | 14:06 | 14:32 | 2.2 | 11.8 | 3.40 | - | - | - | - | - | - | Communicated To T-30+500 |
| | | 19-Jun-10 | 4 | 6.57 | 8.07 | 1.50 | B | 212.0 | - | - | 14:32 | 14:47 | 2.8 | 14.7 | 3.67 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 4 | 6.57 | 8.07 | 1.50 | C | 121.0 | - | - | 14:47 | 15:00 | 3.1 | 5.0 | 1.10 | - | - | - | - | - | - | |
| | | 19-Jun-10 | 4 | 6.57 | 8.07 | 1.50 | D | 31.0 | 522.0 | 348.0 | 15:00 | 15:24 | 3.0 | 0.7 | 0.15 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.82 | 9.82 | 1.00 | A | 184.9 | - | - | 7:50 | 8:18 | 0.8 | 11.4 | 13.80 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.82 | 9.82 | 1.00 | B | 104.8 | - | - | 8:18 | 8:27 | 1.2 | 13.1 | 11.69 | 36.8 | 4.0 | 1.7 | 20.3 | 13.9 | 16.9 | |
| | | 12-May-10 | 3 | 8.82 | 9.82 | 1.00 | C | 251.2 | - | - | 8:27 | 8:45 | 1.9 | 15.4 | 13.97 | 47.3 | 4.0 | 1.7 | 20.4 | 14.1 | 17.3 | |
| | | 12-May-10 | 3 | 8.82 | 9.82 | 1.00 | D | 628.1 | 1169.0 | 1169.0 | 8:45 | 9:09 | 3.3 | 31.7 | 9.61 | - | - | - | - | - | - | |
| | | 12-May-10 | 2 | 9.82 | 13.8 | 3.98 | A | 31.1 | 31.1 | 7.8 | 7:28 | 7:43 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | - | 1 | 13.8 | 18.3 | 5.00 | A | 28.5 | 28.5 | 5.7 | - | - | 6.1 | - | - | - | - | - | - | - | - | |
| T-30+498.5 | T | 22-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | MF | 259.9 | - | - | 8:51 | 9:26 | 1.6 | 9.2 | 3.16 | 37.0 | - | 1.5 | 6.4 | 7.4 | 10.2 | Communicated To 30+504.5; 30+507.5 And 30+510.5 |
| | | 22-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | A | 180.0 | - | - | 9:26 | 9:41 | 2.6 | 15.7 | 4.58 | 37.0 | - | 1.6 | 11.4 | 7.5 | 14.9 | |
| | | 22-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | B | 133.4 | - | - | 9:41 | 9:53 | 2.5 | 10.5 | 3.28 | 40.2 | - | 1.7 | 11.7 | 7.9 | 15.9 | |
| | | 22-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | C | 74.5 | 647.8 | 431.9 | 9:53 | 10:29 | 2.4 | 0.5 | 0.15 | 46.4 | - | 1.6 | - | - | 16.1 | |
| | | 16-May-10 | 3 | 8.4 | 9.4 | 1.00 | A | 136.4 | - | - | 15:27 | 15:47 | 3.0 | 11.6 | 3.94 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.4 | 9.4 | 1.00 | B | 167.0 | - | - | 15:47 | 16:10 | 2.8 | 4.3 | 1.46 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.4 | 9.4 | 1.00 | C | 57.5 | 360.9 | 360.9 | 16:10 | 16:47 | 2.9 | 0.2 | 0.08 | 46.7 | 2.0 | 1.6 | 5.4 | 9.3 | 13.0 | |
| | | 16-May-10 | 2 | 9.4 | 13.4 | 4.00 | A | 24.8 | 24.8 | 6.2 | 14:59 | 15:19 | 3.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 16-May-10 | 1 | 13.4 | 18.4 | 5.00 | A | 53.2 | 53.2 | 10.6 | 14:33 | 14:52 | 5.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+500 | P | 18-Jun-10 | 4 | 6.51 | 8.01 | 1.50 | A | 135.7 | - | - | 3:06 | 3:26 | 1.9 | 8.4 | 2.98 | 31.5 | - | 1.7 | 6.0 | 7.0 | 11.0 | Communicated To S-30+497 |
| | | 18-Jun-10 | 4 | 6.51 | 8.01 | 1.50 | C | 172.0 | - | - | 3:26 | 3:45 | 2.8 | 18.9 | 4.25 | 48.8 | - | 1.6 | 6.0 | 7.0 | 15.0 | |
| | | 18-Jun-10 | 4 | 6.51 | 8.01 | 1.50 | D | 113.0 | 420.7 | 280.5 | 3:45 | 4:11 | 2.9 | 1.1 | 0.25 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 3 | 8.6 | 9.6 | 1.00 | A | 25.2 | 25.2 | 25.2 | 17:27 | 17:41 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 2 | 9.6 | 13.6 | 4.00 | A | 21.5 | 21.5 | 5.4 | 17:07 | 17:23 | 3.2 | 2.3 | 0.18 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 1 | 13.6 | 18.6 | 5.00 | A | 390.0 | - | - | 15:50 | 16:28 | 5.5 | 18.6 | 0.65 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 1 | 13.6 | 18.6 | 5.00 | B | 412.0 | 802.0 | 160.4 | 16:28 | 17:04 | 6.4 | 4.8 | 0.15 | 37.0 | - | 1.7 | 18.0 | 6.0 | 15.0 | |
| T-30+501.5 | T | 21-Jun-10 | 4 | 7.83 | 9.33 | 1.50 | MF | 11.6 | 11.6 | 7.7 | 5:23 | 5:38 | 2.6 | - | - | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 6.54 | 8.04 | 1.50 | MF | 249.7 | - | - | 10:46 | 11:31 | 2.2 | 14.2 | 4.31 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 6.54 | 8.04 | 1.50 | A | 159.0 | - | - | 11:31 | 11:43 | 2.5 | 14.5 | 3.71 | - | - | - | - | - | - | |
| | | 04-Jul-10 | 4 | 6.54 | 8.04 | 1.50 | B | 143.1 | 551.8 | 367.9 | 11:43 | 12:37 | 2.5 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.52 | 9.52 | 1.00 | A | 139.3 | - | - | 20:26 | 20:35 | 1.8 | 10.3 | 5.85 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.52 | 9.52 | 1.00 | B | 200.2 | - | - | 20:35 | 20:49 | 2.3 | 16.6 | 7.16 | 38.0 | 5.0 | 1.6 | 5.0 | 5.0 | 14.6 | |
| | | 16-May-10 | 3 | 8.52 | 9.52 | 1.00 | C | 152.6 | - | - | 20:49 | 21:00 | 3.0 | 16.6 | 5.47 | 59.6 | - | 1.7 | 5.0 | 5.0 | 13.3 | |
| | | 16-May-10 | 3 | 8.52 | 9.52 | 1.00 | D | 127.2 | 619.3 | 619.3 | 21:00 | 22:00 | 2.7 | 0.0 | 0.00 | 51.9 | - | 1.6 | 5.0 | 5.0 | 17.2 | |
| | | 16-May-10 | 2 | 9.52 | 13.6 | 4.08 | A | 23.6 | 23.6 | 5.8 | 20:05 | 20:24 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-10 | 1 | 13.6 | 18.6 | 5.00 | A | 35.0 | 35.0 | 7.0 | 10:04 | 20:01 | 6.0 | 0.1 | 0.00 | 33.2 | 4.0 | 1.7 | 5.0 | 5.0 | 13.3 | |
| S-30+503 | S | 18-Jun-10 | 4 | 6.41 | 7.91 | 1.50 | A | 158.7 | - | - | 0:01 | 0:14 | 2.2 | 14.4 | 4.41 | - | - | - | - | - | - | Communicated To P-30+506 |
| | | 18-Jun-10 | 4 | 6.41 | 7.91 | 1.50 | B | 173.1 | - | - | 0:14 | 0:22 | 2.6 | 19.6 | 5.38 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 4 | 6.41 | 7.91 | 1.50 | C | 208.7 | - | - | 0:22 | 0:33 | 3.6 | 12.5 | 3.40 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 4 | 6.41 | 7.91 | 1.50 | D | 119.1 | 659.6 | 439.7 | 0:33 | 0:53 | 2.9 | 0.9 | 0.20 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.61 | 9.61 | 1.00 | A | 129.0 | - | - | 15:21 | 15:39 | 1.9 | 12.0 | 6.60 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.61 | 9.61 | 1.00 | B | 154.5 | - | - | 15:39 | 15:51 | 2.5 | 19.9 | 6.87 | 35.3 | 4.0 | 1.6 | 35.0 | 9.3 | 21.2 | |
| | | 12-May-10 | 3 | 8.61 | 9.61 | 1.00 | C | 283.7 | - | - | 15:51 | 15:58 | 3.2 | 26.2 | 7.53 | 46.3 | 3.0 | 1.7 | 36.0 | 9.3 | 21.0 | |
| | | 12-May-10 | 3 | 8.61 | 9.61 | 1.00 | D | 315.8 | 883.0 | 883.0 | 15:58 | 17:30 | 3.5 | 0.8 | 0.23 | - | - | - | - | - | - | |
| | | 12-May-10 | 2 | 9.61 | 13.6 | 3.99 | A | 23.7 | 23.7 | 5.9 | 15:01 | 15:15 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-10 | 1 | 13.6 | 18.5 | 4.90 | A | 24.9 | 24.9 | 5.1 | 14:43 | 14:56 | 6.1 | 0.0 | 0.00 | 32.6 | 3.0 | 1.6 | 35.5 | 8.8 | 24.2 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+504.5 | T | 21-Jun-10 | 4 | 6.16 | 7.66 | 1.50 | MF | 153.8 | 153.8 | 102.5 | 4:46 | 5:14 | 2.0 | 0.6 | 0.27 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.16 | 9.16 | 1.00 | A | 23.2 | 23.2 | 23.2 | 22:58 | 23:18 | 3.1 | 0.0 | 0.01 | - | - | - | - | - | 24.3 | |
| | | 16-May-10 | 2 | 9.16 | 13.2 | 4.04 | A | 27.5 | 27.5 | 6.8 | 22:41 | 22:55 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | 23.8 | |
| | | 16-May-10 | 1 | 13.2 | 18.4 | 5.20 | A | 33.1 | 33.1 | 6.4 | 22:11 | 22:24 | 7.1 | 0.2 | 0.00 | - | - | - | - | - | 16.0 | |
| P-30+506 | P | 18-Jun-10 | 4 | 6.02 | 7.52 | 1.50 | A | 141.2 | - | - | 22:56 | 23:10 | 2.1 | 17.4 | 6.46 | 32.5 | 3.6 | 1.6 | 9.0 | 7.0 | 12.0 | Communicated To S-30+503, S-30+509, And S-30+515 |
| | | 18-Jun-10 | 4 | 6.02 | 7.52 | 1.50 | C | 152.5 | - | - | 23:10 | 23:21 | 3.0 | 8.9 | 2.04 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 4 | 6.02 | 7.52 | 1.50 | D | 239.9 | 533.6 | 355.7 | 23:21 | 23:54 | 3.1 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 08-May-10 | 3A | 8.16 | 8.8 | 0.64 | A | 21.2 | 21.2 | 33.1 | 4:14 | 4:45 | 3.6 | 0.0 | 0.00 | 32.7 | - | 1.7 | 21.0 | 8.0 | 15.8 | |
| | | 29-Apr-10 | 3 | 8.8 | 9.8 | 1.00 | A | 399.0 | - | - | 2:50 | 3:32 | 0.0 | 0.0 | 0.00 | 32.0 | 5.0 | 1.6 | 21.0 | 12.0 | 18.0 | |
| | | 29-Apr-10 | 3 | 8.8 | 9.8 | 1.00 | B | 603.0 | 1002.0 | 1002.0 | 3:32 | 4:04 | 1.0 | 18.5 | 18.09 | 35.0 | 6.0 | 1.6 | 16.0 | 11.0 | 19.0 | |
| | | 29-Apr-10 | 2 | 9.8 | 13.8 | 4.00 | A | 382.0 | - | - | 21:46 | 22:23 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 2 | 9.8 | 13.8 | 4.00 | B | 545.0 | - | - | 22:23 | 22:51 | 0.0 | 0.0 | 0.00 | 37.3 | 4.0 | 1.6 | 14.0 | 10.0 | 20.0 | |
| | | 29-Apr-10 | 2 | 9.8 | 13.8 | 4.00 | C | 361.0 | - | - | 22:51 | 23:35 | 0.0 | 0.0 | 0.00 | 53.0 | 2.0 | 1.8 | 31.0 | 10.0 | 22.0 | |
| | | 29-Apr-10 | 2 | 9.8 | 13.8 | 4.00 | D | 712.0 | 2000.0 | 500.0 | 23:35 | 0:27 | 3.0 | 12.4 | 1.03 | 74.9 | 1.0 | 1.7 | 27.0 | 10.0 | 21.0 | |
| | | 29-Apr-10 | 1 | 13.8 | 18.8 | 5.00 | A | 203.5 | 203.5 | 40.7 | 21:05 | 21:35 | 6.7 | 1.8 | 0.08 | 32.6 | 3.0 | 1.7 | 9.0 | 10.0 | 20.0 | |
| T-30+507.5 | T | 21-Jun-10 | 4 | 6.36 | 7.86 | 1.50 | MF | 295.6 | 295.6 | 197.1 | 3:53 | 4:35 | 2.4 | 0.2 | 0.06 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 16-May-10 | 3 | 8.36 | 9.36 | 1.00 | A | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | 16-May-10 | 2 | 9.36 | 13.4 | 4.04 | A | 23.4 | 23.4 | 5.8 | 23:46 | 0:04 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | 25.8 | |
| | | 16-May-10 | 1 | 13.4 | 18.4 | 5.00 | A | 23.6 | 23.6 | 4.7 | 23:27 | 23:41 | 6.0 | 0.0 | 0.00 | - | - | - | - | - | 25.8 | |
| S-30+509 | S | 18-Jun-10 | 4 | 6.12 | 7.62 | 1.50 | A | 180.6 | - | - | 17:41 | 18:15 | 1.9 | 9.4 | 3.38 | - | - | - | - | - | - | Communicated To P-30+512, S-30+513.5 And S-30+521 |
| | | 18-Jun-10 | 4 | 6.12 | 7.62 | 1.50 | B | 213.1 | - | - | 18:15 | 18:44 | 1.9 | 18.9 | 6.72 | 36.2 | 3.0 | 1.6 | 7.0 | 9.0 | 15.0 | |
| | | 18-Jun-10 | 4 | 6.12 | 7.62 | 1.50 | C | 156.2 | - | - | 18:44 | 19:39 | 3.0 | 7.9 | 1.79 | 47.3 | 3.4 | 1.7 | 7.0 | 9.0 | 15.0 | |
| | | 18-Jun-10 | 4 | 6.12 | 7.62 | 1.50 | D | 23.5 | 573.4 | 382.3 | 19:39 | 20:00 | 2.5 | 0.4 | 0.11 | 66.3 | 2.0 | 1.6 | 7.0 | 9.0 | 16.0 | |
| | | 12-May-10 | 3 | 8.37 | 9.37 | 1.00 | A | 145.5 | - | - | 20:33 | 20:57 | 1.8 | 12.9 | 7.60 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.37 | 9.37 | 1.00 | B | 164.0 | - | - | 20:57 | 21:16 | 2.2 | 12.9 | 7.77 | 35.7 | 5.0 | 1.7 | 32.1 | 8.7 | 16.8 | |
| | | 12-May-10 | 3 | 8.37 | 9.37 | 1.00 | C | 260.4 | - | - | 21:16 | 21:38 | 3.4 | 15.7 | 5.18 | 45.6 | 2.0 | 1.7 | 20.2 | 8.6 | 16.4 | |
| | | 12-May-10 | 3 | 8.37 | 9.37 | 1.00 | D | 93.0 | 662.9 | 662.9 | 21:38 | 22:01 | 3.3 | 0.0 | 3.25 | 54.6 | 2.0 | 1.7 | 17.9 | 8.6 | 14.6 | |
| | | 12-May-10 | 2 | 9.37 | 13.4 | 4.03 | A | 45.2 | 45.2 | 11.2 | 20:07 | 20:31 | 3.6 | 0.2 | 0.10 | - | - | - | - | - | - | |
| | | 12-May-10 | 1 | 13.4 | 18.5 | 5.10 | A | 24.0 | 24.0 | 4.7 | 19:47 | 20:04 | 6.2 | 0.3 | 0.07 | 30.9 | 5.0 | 1.7 | 26.4 | 8.1 | 19.4 | |
| T-30+510.5 | T | 21-Jun-10 | 4 | 6.16 | 7.66 | 1.50 | MF | 128.8 | 128.8 | 85.9 | 3:24 | 3:51 | 2.6 | 0.7 | 0.18 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.16 | 9.16 | 1.00 | A | 159.1 | - | - | 5:23 | 5:36 | 1.8 | 17.8 | 9.20 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.16 | 9.16 | 1.00 | B | 162.1 | - | - | 5:36 | 5:46 | 2.4 | 24.3 | 10.50 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.16 | 9.16 | 1.00 | C | 171.9 | - | - | 5:46 | 5:54 | 3.3 | 25.5 | 7.87 | 48.8 | - | 1.7 | 17.0 | 6.0 | 16.3 | |
| | | 16-May-10 | 3 | 8.16 | 9.16 | 1.00 | D | 57.9 | 551.0 | 551.0 | 5:54 | 6:20 | 3.0 | 0.0 | 0.01 | 60.0 | - | 1.6 | 17.0 | 6.0 | 16.1 | |
| | | 16-May-10 | 2 | 9.16 | 13.2 | 4.04 | A | 28.1 | 28.1 | 7.0 | 5:01 | 5:22 | 3.4 | 0.1 | 0.00 | 38.5 | - | 1.6 | 8.0 | 6.0 | 16.8 | |
| | | 16-May-10 | 1 | 13.2 | 18.4 | 5.20 | A | 28.4 | 28.4 | 5.5 | 4:43 | 4:58 | 6.0 | 0.0 | 0.00 | 32.3 | - | 1.6 | 8.0 | 6.0 | 14.4 | |
| P-30+512 | P | 17-Jun-10 | 4 | 5.92 | 7.42 | 1.50 | A | 150.2 | - | - | 3:47 | 3:59 | 1.7 | 21.1 | 7.82 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 4 | 5.92 | 7.42 | 1.50 | B | 163.8 | - | - | 3:59 | 4:07 | 2.6 | 12.9 | 6.77 | - | - | - | - | - | - | |
| | | 17-Jun-10 | 4 | 5.92 | 7.42 | 1.50 | C | 76.2 | 390.2 | 260.1 | 4:07 | 4:22 | 2.5 | 0.9 | 0.24 | - | - | - | - | - | - | |
| | | 08-May-10 | 3A | 8.16 | 8.8 | 0.64 | A | 19.4 | 19.4 | 30.3 | 5:20 | 5:37 | 3.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 8.8 | 9.8 | 1.00 | B | 193.0 | - | - | 8:00 | 8:43 | 0.0 | 0.0 | 0.00 | 36.0 | 2.0 | 1.6 | 28.0 | 10.0 | 19.0 | |
| | | 30-Apr-10 | 3 | 8.8 | 9.8 | 1.00 | A | 230.0 | - | - | 8:07 | 8:30 | 0.0 | 0.0 | 0.00 | 32.0 | 4.0 | 1.6 | 28.0 | 10.0 | 17.0 | |
| | | 30-Apr-10 | 3 | 8.8 | 9.8 | 1.00 | C | 316.3 | 739.3 | 739.3 | 8:43 | 9:24 | 3.5 | 0.0 | 0.01 | 49.0 | 2.0 | 1.7 | 24.0 | 11.0 | 18.0 | |
| | | 29-Apr-10 | 2 | 9.8 | 13.8 | 4.00 | A | 419.6 | - | - | 4:45 | 5:25 | 1.0 | 18.8 | 4.95 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 2 | 9.8 | 13.8 | 4.00 | B | 520.4 | - | - | 5:25 | 5:53 | - | - | - | 36.6 | - | - | 2.0 | 7.0 | 13.0 | |
| | | 29-Apr-10 | 2 | 9.8 | 13.8 | 4.00 | C | 428.0 | - | - | 5:53 | 6:25 | - | - | - | 51.0 | - | - | - | - | - | |
| | | 29-Apr-10 | 2 | 9.8 | 13.8 | 4.00 | D | 615.0 | 1983.0 | 495.8 | 6:25 | 7:29 | 2.8 | 7.6 | 0.68 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 1 | 13.8 | 18.8 | 5.00 | A | 97.1 | 97.1 | 19.4 | 4:04 | 4:41 | 6.2 | 4.2 | 0.14 | 31.7 | - | 1.6 | 1.0 | 7.0 | 14.0 | |
| T-30+513.5 | T | 21-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | MF | 53.0 | 53.0 | 35.3 | 3:03 | 3:22 | 2.6 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.4 | 9.4 | 1.00 | A | 16.5 | 16.5 | 16.5 | 8:11 | 8:30 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | 21.5 | |
| | | 17-May-10 | 2 | 9.4 | 13.4 | 4.00 | A | 41.2 | 41.2 | 10.3 | 7:41 | 8:04 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | 19.8 | |
| | | 17-May-10 | 1 | 13.4 | 18.5 | 5.10 | A | 36.1 | 36.1 | 7.1 | 7:12 | 7:33 | 6.0 | 0.0 | 0.00 | 33.0 | - | 1.6 | 14.9 | 7.3 | 15.6 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+515 | S | 18-Jun-10 | 4 | 6.21 | 7.71 | 1.50 | A | 185.5 | - | - | 15:12 | 15:47 | 2.8 | 12.1 | 2.89 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 4 | 6.21 | 7.71 | 1.50 | B | 174.5 | - | - | 15:47 | 16:03 | 3.0 | 12.5 | 3.11 | - | - | - | - | - | - | |
| | | 18-Jun-10 | 4 | 6.21 | 7.71 | 1.50 | C | 234.0 | 594.0 | 396.0 | 16:03 | 17:12 | 3.0 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.31 | 9.31 | 1.00 | D | 336.8 | 994.0 | 994.0 | 0:19 | 1:30 | 3.5 | 0.1 | 0.03 | 67.0 | - | 1.6 | - | - | - | |
| | | 12-May-10 | 3 | 8.31 | 9.31 | 1.00 | A | 250.8 | - | - | 23:32 | 23:50 | 1.5 | 13.7 | 13.08 | 32.1 | - | 1.7 | - | - | - | |
| | | 12-May-10 | 3 | 8.31 | 9.31 | 1.00 | B | 152.0 | - | - | 23:50 | 23:59 | 1.9 | 10.8 | 5.59 | 34.8 | - | 1.6 | - | - | - | |
| | | 12-May-10 | 3 | 8.31 | 9.31 | 1.00 | C | 254.4 | - | - | 23:59 | 0:19 | 3.4 | 18.0 | 4.47 | 45.2 | - | 1.7 | - | - | - | |
| | | 12-May-10 | 2 | 9.31 | 13.3 | 3.99 | A | 23.2 | 23.2 | 5.8 | 23:07 | 23:32 | 3.6 | 23.2 | 0.10 | - | - | - | - | - | - | |
| | | 12-May-10 | 1 | 13.3 | 18.4 | 5.10 | A | 23.9 | 23.9 | 4.7 | 22:41 | 23:00 | 5.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+516.5 | T | 21-Jun-10 | 4 | 6.37 | 7.87 | 1.50 | MF | 136.3 | 136.3 | 90.9 | 2:32 | 3:00 | 2.1 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.37 | 9.37 | 1.00 | A | 204.9 | - | - | 9:31 | 9:58 | 1.7 | 15.4 | 8.12 | - | - | - | - | - | 20.8 | |
| | | 17-May-10 | 3 | 8.37 | 9.37 | 1.00 | B | 103.6 | - | - | 9:58 | 10:05 | 2.0 | 18.4 | 9.11 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.37 | 9.37 | 1.00 | C | 164.7 | - | - | 10:05 | 10:20 | 2.4 | 5.1 | 5.15 | 50.0 | 6.0 | 1.6 | 11.4 | 7.6 | 14.4 | |
| | | 17-May-10 | 3 | 8.37 | 9.37 | 1.00 | D | 35.8 | 509.0 | 509.0 | 10:20 | 10:50 | 2.5 | 0.0 | 0.01 | 61.0 | - | 1.7 | 11.3 | 7.8 | 16.9 | |
| | | 17-May-10 | 2 | 9.37 | 13.4 | 4.03 | A | 22.6 | 22.6 | 5.6 | 9:07 | 9:25 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | 18.8 | |
| | | 17-May-10 | 1 | 13.4 | 18.5 | 5.10 | A | 22.3 | 22.3 | 4.4 | 8:42 | 9:01 | 4.8 | 0.0 | 0.00 | - | - | - | - | - | 15.9 | |
| P-30+518 | P | 18-Jun-10 | 4 | 7.36 | 8.86 | 1.50 | A | 200.2 | - | - | 8:56 | 9:15 | 1.9 | 11.8 | 4.12 | 33.0 | - | 1.7 | 6.4 | 7.4 | 13.7 | Communicated To P-30+512, 30+513.5 And S-30+521 |
| | | 18-Jun-10 | 4 | 7.36 | 8.86 | 1.50 | B | 174.8 | - | - | 10:38 | 11:18 | 1.3 | 3.1 | 1.92 | 39.7 | 4.0 | 1.6 | 6.5 | 7.4 | 14.9 | |
| | | 18-Jun-10 | 4 | 7.36 | 8.86 | 1.50 | C | 204.6 | 579.6 | 386.4 | 11:18 | 12:55 | 2.5 | 0.0 | 0.00 | 51.0 | - | 1.6 | 5.1 | 7.7 | 14.9 | |
| | | 30-Apr-10 | 3 | 9.5 | 10.5 | 1.00 | A | 400.0 | - | - | 13:27 | 14:00 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 9.5 | 10.5 | 1.00 | B | 447.0 | - | - | 14:00 | 14:18 | 0.0 | 0.0 | 0.00 | 35.0 | - | 1.6 | 27.0 | 15.0 | 16.0 | |
| | | 30-Apr-10 | 3 | 9.5 | 10.5 | 1.00 | C | 117.0 | 964.0 | 964.0 | 14:18 | 14:24 | 2.5 | 26.3 | 10.39 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 2 | 10.5 | 14.5 | 4.00 | A | 28.6 | 28.6 | 7.2 | 13:09 | 13:24 | 2.1 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 1 | 14.5 | 19.5 | 5.00 | A | 22.3 | 22.3 | 4.5 | 12:55 | 13:07 | 2.2 | 0.0 | 0.00 | 31.0 | - | 1.6 | 27.0 | 15.0 | 15.0 | |
| T-30+519.5 | T | 21-Jun-10 | 4 | 7.17 | 8.67 | 1.50 | MF | 11.7 | 11.7 | 7.8 | 2:17 | 2:28 | 2.0 | - | - | 30.8 | - | 1.5 | 8.0 | 7.0 | 11.0 | |
| | | 17-May-10 | 3 | 9.02 | 10.02 | 1.00 | A | 144.3 | - | - | 14:59 | 15:23 | 1.9 | 12.3 | 6.24 | - | - | - | - | - | 19.1 | |
| | | 17-May-10 | 3 | 9.02 | 10.02 | 1.00 | B | 177.1 | - | - | 15:23 | 15:34 | 2.4 | 16.6 | 6.81 | 36.0 | 3.5 | 1.6 | 11.4 | 8.3 | 17.2 | |
| | | 17-May-10 | 3 | 9.02 | 10.02 | 1.00 | C | 123.3 | 444.7 | 444.7 | 15:34 | 16:12 | 2.4 | 0.0 | 0.00 | 49.0 | 2.0 | 1.6 | 14.4 | 8.3 | 17.4 | |
| | | 17-May-10 | 2 | 10.02 | 14.4 | 4.38 | A | 25.6 | 25.6 | 5.8 | 14:35 | 14:55 | 2.0 | 0.2 | 0.02 | 31.0 | - | 1.6 | 5.8 | 8.3 | 17.1 | |
| S-30+521 | S | 17-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | A | 142.9 | - | - | 2:54 | 3:10 | 1.6 | 20.4 | 7.41 | 31.9 | 5.0 | 1.6 | 12.0 | 7.0 | 13.0 | |
| | | 17-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | B | 171.6 | - | - | 3:10 | 3:22 | 2.2 | 6.3 | 4.69 | 36.8 | 4.6 | 1.6 | 12.0 | 7.0 | 13.0 | |
| | | 17-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | C | 106.7 | 421.2 | 280.8 | 3:22 | 3:42 | 2.5 | 0.8 | 0.22 | 48.8 | 0.6 | 1.6 | 12.0 | 7.0 | 15.0 | |
| | | 12-May-10 | 3 | 9.17 | 10.17 | 1.00 | A | 168.7 | - | - | 3:38 | 3:59 | 1.4 | 3.4 | 10.41 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 9.17 | 10.17 | 1.00 | B | 223.7 | - | - | 3:59 | 4:14 | 2.4 | 15.8 | 7.38 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 9.17 | 10.17 | 1.00 | C | 187.6 | - | - | 4:14 | 4:30 | 3.0 | 13.5 | 5.72 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 9.17 | 10.17 | 1.00 | D | 28.4 | 608.4 | 608.4 | 4:30 | 4:42 | 3.0 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 12-May-10 | 2 | 10.17 | 14.5 | 4.33 | A | 27.6 | 27.6 | 6.4 | 3:19 | 3:34 | 3.3 | 27.6 | 0.03 | - | - | - | - | - | - | |
| T-30+522.5 | T | 21-Jun-10 | 4 | 7.17 | 8.67 | 1.50 | MF | 43.7 | 43.7 | 29.1 | 23:39 | 0:15 | 1.9 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 9.17 | 10.17 | 1.00 | A | 26.0 | 26.0 | 26.0 | 19:53 | 20:08 | 3.0 | 0.6 | 0.21 | 33.4 | 4.0 | 1.7 | 15.5 | 10.0 | 16.3 | |
| | | 17-May-10 | 2 | 10.17 | 14.4 | 4.23 | A | 29.5 | 29.5 | 7.0 | 16:35 | 16:54 | 1.9 | 0.2 | 0.02 | - | - | - | - | - | 12.4 | |
| P-30+524 | P | 11-Jun-10 | 4 | 7.13 | 8.63 | 1.50 | A | 158.0 | - | - | 4:17 | 4:32 | 2.2 | 12.3 | 5.34 | - | - | - | - | - | - | Communicated To S-30+527 |
| | | 11-Jun-10 | 4 | 7.13 | 8.63 | 1.50 | B | 153.4 | - | - | 4:32 | 4:42 | 2.6 | 14.2 | 3.90 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 4 | 7.13 | 8.63 | 1.50 | C | 97.0 | 408.4 | 272.3 | 4:42 | 5:24 | 2.5 | 0.9 | 0.22 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 9.25 | 10.25 | 1.00 | A | 116.8 | 116.8 | 116.8 | 15:14 | 16:12 | 3.0 | 0.5 | 0.16 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 2 | 10.25 | 14.2 | 3.95 | A | 22.1 | 22.1 | 5.6 | 14:56 | 15:11 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 1 | 14.2 | 19.4 | 5.20 | A | 22.6 | 22.6 | 4.3 | 14:37 | 14:51 | 6.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-30+524.75 | Q | 15-Jul-10 | 4 | 6.8 | 8.3 | 1.50 | MF | 88.7 | 88.7 | 59.1 | 21:25 | 21:55 | 2.5 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 11-Jul-10 | 3 | 8.82 | 9.82 | 1.00 | A | 163.6 | - | - | 14:20 | 14:42 | 1.7 | 12.5 | 7.99 | - | - | - | - | - | - | Communicated To 30+525.5 |
| | | 11-Jul-10 | 3 | 8.82 | 9.82 | 1.00 | B | 179.3 | - | - | 14:42 | 14:52 | 2.1 | 16.0 | 7.14 | - | - | - | - | - | - | Communicated Outside Of Casing |
| | | 11-Jul-10 | 3 | 8.82 | 9.82 | 1.00 | C | 189.5 | 532.4 | 532.4 | 14:52 | 15:26 | 2.5 | 0.1 | 0.02 | - | - | - | - | - | - | |
| T-30+525.5 | T | 21-Jun-10 | 4 | 5.9 | 7.4 | 1.50 | MF | 33.8 | 33.8 | 22.5 | 23:39 | 23:58 | 2.2 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 7.9 | 8.9 | 1.00 | A | 22.4 | 22.4 | 22.4 | 20:38 | 20:52 | 3.1 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 17-May-10 | 2 | 8.9 | 13 | 4.10 | A | 28.4 | 28.4 | 6.9 | 20:18 | 20:34 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| Q-30+526.25 | Q | 15-Jul-10 | 4 | 6.76 | 8.26 | 1.50 | MF | 23.0 | 23.0 | 15.3 | 21:00 | 21:19 | 2.4 | 0.0 | 0.00 | 30.1 | 4.0 | 1.7 | 17.3 | 11.0 | 18.0 | |
| | | 11-Jul-10 | 3 | 8.99 | 10 | 1.01 | A | 192.8 | - | - | 9:09 | 9:32 | 1.3 | 16.0 | 12.28 | 30.4 | - | 1.6 | 14.7 | 12.0 | 15.6 | |
| | | 11-Jul-10 | 3 | 8.99 | 10 | 1.01 | B | 175.3 | - | - | 9:32 | 9:42 | 2.0 | 19.0 | 10.87 | 37.8 | - | 1.6 | 14.7 | 12.1 | 15.9 | |
| | | 11-Jul-10 | 3 | 8.99 | 10 | 1.01 | C | 184.9 | - | - | 9:42 | 9:51 | 2.2 | 19.0 | 5.14 | - | - | - | - | - | - | |
| | | 11-Jul-10 | 3 | 8.99 | 10 | 1.01 | D | 305.0 | - | - | 9:51 | 10:13 | 2.3 | 12.5 | 5.14 | - | - | - | - | - | - | Communicated To 30+525.5 |
| | | 11-Jul-10 | 3 | 8.99 | 10 | 1.01 | E | 121.0 | 979.0 | 969.3 | 10:13 | 10:24 | 1.9 | 4.6 | 2.65 | - | - | - | - | - | - | |
| S-30+527 | S | 11-Jun-10 | 4 | 7 | 8.5 | 1.50 | A | 140.3 | - | - | 3:16 | 3:30 | 1.9 | 15.8 | 5.30 | 32.7 | - | 1.7 | 4.0 | 7.0 | 15.0 | |
| | | 11-Jun-10 | 4 | 7 | 8.5 | 1.50 | B | 164.5 | - | - | 3:30 | 3:40 | 2.6 | 18.0 | 4.20 | 36.2 | - | 1.6 | 4.0 | 7.0 | 16.0 | |
| | | 11-Jun-10 | 4 | 7 | 8.5 | 1.50 | C | 68.1 | 372.9 | 248.6 | 3:40 | 4:07 | 2.5 | 0.4 | 0.11 | 48.5 | - | 1.7 | 4.0 | 7.0 | 16.0 | |
| | | 12-May-10 | 3 | 9.17 | 10.17 | 1.00 | A | 184.0 | - | - | 5:26 | 5:46 | 1.3 | 15.5 | 11.68 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 9.17 | 10.17 | 1.00 | B | 160.0 | - | - | 5:46 | 5:57 | 1.8 | 11.7 | 6.40 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 9.17 | 10.17 | 1.00 | C | 203.0 | - | - | 5:57 | 6:18 | 3.0 | 8.3 | 2.59 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 9.17 | 10.17 | 1.00 | D | 159.2 | 706.2 | 706.2 | 6:18 | 6:52 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-10 | 2 | 10.17 | 14.7 | 4.53 | A | 21.9 | 21.9 | 4.8 | 5:10 | 5:22 | 2.1 | 0.0 | 0.00 | 31.4 | - | 1.7 | 25.1 | 8.1 | 15.7 | |
| T-30+528.5 | T | 21-Jun-10 | 4 | 6.71 | 8.21 | 1.50 | MF | 106.4 | 106.4 | 70.9 | 23:01 | 23:36 | 2.0 | 0.4 | 0.13 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.71 | 9.71 | 1.00 | A | 27.4 | 27.4 | 27.4 | 21:28 | 21:42 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 17-May-10 | 2 | 9.71 | 13.8 | 4.09 | A | 42.3 | 42.3 | 10.3 | 21:04 | 21:18 | 2.0 | 0.2 | 0.02 | - | - | - | - | - | - | |
| P-30+530 | P | 11-Jun-10 | 4 | 6.39 | 7.89 | 1.50 | A | 152.7 | - | - | 23:39 | 23:52 | 2.3 | 16.3 | 4.78 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 4 | 6.39 | 7.89 | 1.50 | B | 163.5 | - | - | 23:52 | 0:02 | 2.5 | 16.4 | 4.30 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 4 | 6.39 | 7.89 | 1.50 | C | 117.3 | 433.5 | 289.0 | 0:02 | 0:44 | 2.4 | 1.0 | 0.20 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 8.51 | 9.51 | 1.00 | A | 190.0 | - | - | 17:32 | 17:55 | 0.5 | 13.2 | 26.84 | 31.0 | - | 1.6 | 17.0 | 13.0 | 16.0 | |
| | | 30-Apr-10 | 3 | 8.51 | 9.51 | 1.00 | B | 195.0 | 385.0 | 385.0 | 17:55 | 18:10 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 2 | 9.51 | 13.5 | 3.99 | A | 27.1 | 27.1 | 6.8 | 17:15 | 17:30 | 2.1 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 1 | 13.5 | 18.9 | 5.40 | A | 329.7 | 329.7 | 61.1 | 16:25 | 17:13 | 4.9 | 3.3 | 0.13 | - | - | - | - | - | - | |
| T-30+531.5 | T | 21-Jun-10 | 4 | 7.83 | 9.33 | 1.50 | MF | 61.0 | - | - | 22:34 | 22:57 | 2.1 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 03-Jul-10 | 4 | 6.2 | 7.7 | 1.50 | MF | 151.0 | 212.0 | 141.3 | 4:16 | 5:27 | 2.0 | 0.5 | 0.15 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.18 | 9.18 | 1.00 | A | 165.2 | - | - | 22:12 | 22:24 | 1.6 | 14.5 | 9.38 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.18 | 9.18 | 1.00 | B | 161.8 | - | - | 22:24 | 22:35 | 2.0 | 16.4 | 8.55 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.18 | 9.18 | 1.00 | C | 156.5 | - | - | 22:35 | 22:46 | 2.5 | 4.1 | 1.60 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.18 | 9.18 | 1.00 | D | 76.7 | 560.2 | 560.2 | 22:46 | 23:23 | 2.6 | 0.6 | 0.25 | 60.6 | - | 1.7 | 13.0 | 8.0 | 15.0 | |
| | | 17-May-10 | 2 | 9.18 | 13.3 | 4.12 | A | 30.1 | 30.1 | 7.3 | 21:54 | 22:07 | 2.2 | 0.1 | 0.01 | - | - | - | - | - | - | |
| S-30+533 | S | 11-Jun-10 | 4 | 5.76 | 7.26 | 1.50 | A | 165.5 | - | - | 22:52 | 23:06 | 2.1 | 19.9 | 7.73 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 4 | 5.76 | 7.26 | 1.50 | B | 155.4 | - | - | 23:06 | 23:14 | 2.1 | 18.4 | 6.00 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 4 | 5.76 | 7.26 | 1.50 | C | 104.6 | 425.5 | 283.7 | 23:14 | 23:33 | 2.5 | 0.6 | 0.15 | - | - | - | - | - | - | |
| | | 13-May-10 | 3 | 7.88 | 8.88 | 1.00 | A | 167.8 | - | - | 2:16 | 2:39 | 1.4 | 18.2 | 0.50 | - | - | - | - | - | - | |
| | | 13-May-10 | 3 | 7.88 | 8.88 | 1.00 | B | 201.8 | - | - | 2:39 | 2:48 | 2.2 | 18.1 | 8.46 | 36.4 | 3.0 | 1.7 | 9.6 | 2.7 | 11.7 | |
| | | 13-May-10 | 3 | 7.88 | 8.88 | 1.00 | C | 231.6 | - | - | 2:48 | 3:50 | 3.0 | 13.1 | 5.61 | 45.7 | 2.0 | 1.6 | 3.9 | 4.1 | 11.4 | |
| | | 13-May-10 | 3 | 7.88 | 8.88 | 1.00 | D | 189.8 | 791.0 | 791.0 | 3:50 | 4:13 | 2.9 | 7.0 | 0.24 | 61.0 | - | 1.6 | - | 4.4 | 9.1 | |
| | | 13-May-10 | 2 | 8.88 | 13.3 | 4.42 | A | 37.9 | 37.9 | 8.6 | 1:55 | 2:13 | 2.0 | 0.2 | 0.02 | 37.4 | 3.6 | 1.7 | 12.1 | 2.6 | 12.6 | |
| T-30+534.5 | T | 21-Jun-10 | 4 | 6.92 | 8.42 | 1.50 | MF | 56.5 | - | - | 22:03 | 22:24 | 2.1 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 03-Jul-10 | 4 | 6.42 | 7.92 | 1.50 | MF | 136.4 | 192.9 | 128.6 | 2:58 | 4:10 | 2.1 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.41 | 9.41 | 1.00 | A | 22.9 | 22.9 | 22.9 | 23:43 | 0:12 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 17-May-10 | 2 | 9.41 | 13.5 | 4.09 | A | 28.8 | 28.8 | 7.0 | 23:43 | 23:56 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+536 | P | 11-Jun-10 | 4 | 5.69 | 7.19 | 1.50 | A | 130.2 | - | - | 21:54 | 22:12 | 1.7 | 15.7 | 7.19 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 4 | 5.69 | 7.19 | 1.50 | B | 167.1 | - | - | 22:12 | 22:22 | 2.1 | 17.8 | 6.25 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 4 | 5.69 | 7.19 | 1.50 | C | 87.5 | 384.8 | 256.5 | 22:22 | 22:45 | 2.5 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 8.08 | 9.08 | 1.00 | A | 255.4 | - | - | 20:39 | 21:08 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 8.08 | 9.08 | 1.00 | B | 211.6 | - | - | 21:08 | 21:21 | 0.0 | 0.0 | 0.00 | 35.1 | 6.0 | 1.6 | 2.0 | 7.0 | 15.0 | |
| | | 30-Apr-10 | 3 | 8.08 | 9.08 | 1.00 | C | 533.0 | 1000.0 | 1000.0 | 21:21 | 21:47 | 2.9 | 21.9 | 7.58 | 49.5 | 2.0 | 1.8 | 2.0 | 7.0 | 15.0 | |
| | | 30-Apr-10 | 2 | 9.08 | 13.1 | 4.02 | A | 3.3 | 3.3 | 0.8 | 20:22 | 20:35 | 2.0 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 1 | 13.1 | 18.2 | 5.10 | A | 24.9 | 24.9 | 4.9 | 20:02 | 20:17 | 5.0 | 0.3 | 0.01 | 32.9 | 4.0 | 1.7 | 1.0 | 7.0 | 14.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+537.5 | T | 21-Jun-10 | 4 | 6.18 | 7.68 | 1.50 | MF | 134.7 | 134.7 | 89.8 | 21:23 | 21:57 | 1.8 | 0.3 | 0.09 | - | - | - | - | - | - | Communicated To T-30+540.5 |
| | | 17-May-10 | 3 | 7.9 | 8.9 | 1.00 | A | 156.2 | - | - | 2:12 | 2:24 | 1.6 | 15.6 | 9.32 | 36.3 | 4.0 | 1.7 | 13.0 | 8.0 | 14.4 | |
| | | 17-May-10 | 3 | 7.9 | 8.9 | 1.00 | B | 174.5 | - | - | 2:24 | 2:33 | 2.6 | 14.5 | 5.61 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 7.9 | 8.9 | 1.00 | C | 73.1 | 403.8 | 403.8 | 2:33 | 2:57 | 2.6 | 0.0 | 0.00 | 46.8 | 3.0 | 8.0 | 8.0 | 1.7 | 14.9 | |
| | | 17-May-10 | 2 | 8.9 | 12.9 | 4.00 | A | 25.4 | 25.4 | 6.4 | 1:55 | 2:07 | 1.9 | 0.0 | 0.00 | 31.6 | - | 1.6 | 14.0 | 8.0 | 14.9 | |
| S-30+539 | S | 11-Jun-10 | 4 | 5.66 | 7.16 | 1.50 | A | 150.9 | - | - | 18:52 | 19:08 | 1.8 | 10.2 | 3.91 | 30.9 | 3.6 | 1.7 | 4.0 | 9.0 | 17.0 | Communicated To S-30+533 |
| | | 11-Jun-10 | 4 | 5.66 | 7.16 | 1.50 | B | 168.0 | - | - | 19:08 | 19:20 | 2.3 | 13.6 | 5.25 | 37.1 | 5.0 | 1.7 | 4.0 | 9.0 | 17.0 | |
| | | 11-Jun-10 | 4 | 5.66 | 7.16 | 1.50 | C | 101.3 | 420.2 | 280.1 | 19:20 | 19:42 | 2.5 | 0.8 | 0.50 | 48.6 | 2.0 | 1.7 | 3.0 | 8.0 | 16.0 | |
| | | 13-May-10 | 3 | 7.8 | 8.8 | 1.00 | A | 187.1 | - | - | 5:02 | 5:23 | 1.3 | 6.7 | 9.04 | - | - | - | - | - | - | |
| | | 13-May-10 | 3 | 7.8 | 8.8 | 1.00 | B | 203.9 | - | - | 5:23 | 5:36 | 1.6 | 15.2 | 9.06 | - | - | - | - | - | - | |
| | | 13-May-10 | 3 | 7.8 | 8.8 | 1.00 | C | 166.2 | - | - | 5:36 | 5:49 | 3.1 | 3.1 | 4.74 | - | - | - | - | - | - | Communicated To S-30+545. |
| | | 13-May-10 | 3 | 7.8 | 8.8 | 1.00 | D | 49.4 | 606.6 | 606.6 | 5:49 | 5:58 | 3.1 | 1.7 | 0.60 | - | - | - | - | - | - | Outside of casing. |
| | | 13-May-10 | 2 | 8.8 | 12.9 | 4.10 | A | 24.6 | 24.6 | 6.0 | 4:43 | 5:00 | 1.8 | 0.1 | 0.02 | - | - | - | - | - | - | |
| T-30+540.5 | T | 21-Jun-10 | 4 | 6.2 | 7.7 | 1.50 | MF | 111.6 | 111.6 | 74.4 | 20:42 | 21:15 | 2.1 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 7.7 | 8.7 | 1.00 | A | 166.3 | - | - | 3:25 | 3:36 | 2.5 | 5.6 | 2.16 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 7.7 | 8.7 | 1.00 | B | 124.8 | 291.1 | 291.1 | 3:36 | 4:26 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-10 | 2 | 8.7 | 12.7 | 4.00 | A | 40.3 | 40.3 | 10.1 | 3:06 | 3:19 | 2.1 | 1.6 | 0.19 | - | - | - | - | - | - | |
| P-30+542 | P | 11-Jun-10 | 4 | 5.4 | 6.9 | 1.50 | A | 92.4 | - | - | 16:59 | 17:16 | 1.2 | 4.5 | 2.47 | - | - | - | - | - | - | Communicated To and |
| | | 11-Jun-10 | 4 | 5.4 | 6.9 | 1.50 | C | 65.6 | - | - | 17:16 | 17:34 | 1.8 | 4.1 | 1.49 | - | - | - | - | - | - | Around Casing S-30+551 |
| | | 11-Jun-10 | 4 | 5.4 | 6.9 | 1.50 | D | 76.8 | 234.8 | 156.5 | 17:34 | 18:34 | 2.6 | 0.6 | 0.16 | - | - | - | - | - | - | Communicated Around Casing S-30+551 |
| | | 30-Apr-10 | 3 | 7.52 | 8.52 | 1.00 | A | 15.1 | 15.1 | 15.1 | 22:39 | 22:52 | 3.2 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 2 | 8.52 | 12.5 | 3.98 | A | 8.3 | 8.3 | 2.1 | 22:23 | 22:35 | 2.1 | 0.4 | 0.05 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 1 | 12.5 | 17.8 | 5.30 | A | 22.1 | 22.1 | 4.2 | 22:04 | 22:17 | 4.8 | 0.2 | 0.01 | 32.8 | - | 1.6 | 1.0 | 7.0 | 14.0 | |
| T-30+543.5 | T | 17-Jun-10 | 4 | 5.2 | 6.7 | 1.50 | MF | 152.3 | 152.3 | 101.5 | 23:24 | 23:42 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 7.34 | 8.34 | 1.00 | A | 152.9 | 152.9 | 152.9 | 4:47 | 5:47 | 2.4 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 17-May-10 | 2 | 8.34 | 12.3 | 3.96 | A | 22.2 | 22.2 | 5.6 | 4:35 | 4:43 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+545 | S | 11-Jun-10 | 4 | 5.17 | 6.67 | 1.50 | D | 75.2 | 75.2 | 50.1 | 16:16 | 16:58 | 2.7 | 0.0 | 0.00 | 75.1 | - | 1.7 | 5.3 | 8.1 | 11.7 | By-Pass: Beside Casing S-30+551 |
| | | - | 3 | 7.27 | 8.27 | 1.00 | A | 23.5 | 23.5 | 23.5 | - | - | 2.5 | - | - | - | - | - | - | - | - | |
| | | | 2 | 8.27 | 12.27 | 4.00 | A | 32.6 | 32.6 | 8.2 | - | - | 2.0 | - | - | - | - | - | - | - | - | |
| T-30+546.5 | T | 17-Jun-10 | 4 | 5.19 | 6.69 | 1.50 | MF | 95.3 | 95.3 | 63.5 | 21:52 | 22:10 | 1.9 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 7.32 | 8.32 | 1.00 | A | 178.0 | - | - | 19:52 | 20:14 | 2.5 | 13.1 | 5.00 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 7.32 | 8.32 | 1.00 | B | 57.7 | 235.7 | 235.7 | 20:14 | 20:37 | 2.2 | 0.2 | 0.10 | - | - | - | - | - | - | |
| | | 18-May-10 | 2 | 8.32 | 12.4 | 4.08 | A | 62.5 | 62.5 | 15.3 | 19:43 | 19:49 | 0.0 | - | inf | - | - | - | - | - | - | By-Pass |
| P-30+548 | P | 11-Jun-10 | 4 | 5.12 | 6.62 | 1.50 | A | 72.8 | - | - | 15:57 | 16:10 | 0.5 | 5.8 | 7.61 | - | - | - | - | - | - | By-Pass: Beside Casing S-30+551 |
| | | 11-Jun-10 | 4 | 5.12 | 6.62 | 1.50 | D | 10.4 | 83.2 | 55.5 | 16:10 | 16:14 | 0.1 | 0.8 | 4.74 | - | - | - | - | - | - | By-Pass. |
| | | 30-Apr-10 | 3 | 7.24 | 8.24 | 1.00 | B | 177.3 | - | - | 0:01 | 0:12 | 0.0 | 0.0 | 0.00 | 36.7 | 5.0 | 1.6 | 7.0 | 5.0 | 13.0 | |
| | | 30-Apr-10 | 3 | 7.24 | 8.24 | 1.00 | C | 649.8 | 1000.0 | 1000.0 | 0:12 | 0:43 | 2.1 | 22.0 | 10.62 | 50.0 | 2.0 | 1.8 | 7.0 | 5.0 | 13.0 | |
| | | 30-Apr-10 | 3 | 7.24 | 8.24 | 1.00 | A | 172.9 | - | - | 23:38 | 0:01 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 2 | 8.24 | 12.2 | 3.96 | A | 16.2 | 16.2 | 4.1 | 23:23 | 23:35 | 2.2 | 0.4 | 0.05 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 1 | 12.2 | 17.4 | 5.20 | A | 25.9 | 25.9 | 5.0 | 23:06 | 23:18 | 4.8 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-30+549.5 | T | 17-Jun-10 | 4 | 5.22 | 6.72 | 1.50 | MF | 91.4 | 91.4 | 60.9 | 21:17 | 21:49 | 2.0 | 0.4 | 0.13 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 7.34 | 8.34 | 1.00 | A | 163.0 | - | - | 21:04 | 21:15 | 2.2 | 16.3 | 7.84 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 7.34 | 8.34 | 1.00 | B | 161.7 | - | - | 21:15 | 21:24 | 2.5 | 15.5 | 5.70 | 36.7 | 3.0 | 1.7 | 13.0 | 10.0 | 17.0 | |
| | | 18-May-10 | 3 | 7.34 | 8.34 | 1.00 | C | 94.3 | 419.0 | 419.0 | 21:24 | 21:51 | 2.5 | 0.0 | 0.01 | 47.5 | - | 1.7 | 12.0 | 10.0 | 16.0 | |
| | | 18-May-10 | 2 | 8.34 | 12.4 | 4.06 | A | 24.4 | 24.4 | 6.0 | 20:46 | 20:59 | 2.1 | 0.2 | 0.03 | 32.3 | 4.0 | 1.7 | 13.0 | 11.0 | 18.0 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+551 | S | 11-Jun-10 | 4 | 5.22 | 6.72 | 1.50 | A | 191.0 | - | - | 14:21 | 14:44 | 2.5 | 11.5 | 3.38 | 31.7 | - | 1.6 | 5.0 | 11.4 | 8.5 | Communicated To P-30+548 |
| | | 11-Jun-10 | 4 | 5.22 | 6.72 | 1.50 | B | 248.8 | - | - | 14:44 | 15:02 | 0.6 | 16.2 | 15.33 | - | - | - | - | - | - | Communicat To Casing S-30+545 |
| | | 11-Jun-10 | 4 | 5.22 | 6.72 | 1.50 | C | 51.2 | - | - | 15:02 | 15:12 | 0.4 | 3.5 | 4.52 | - | - | - | - | - | - | Continued By-Pass |
| | | 11-Jun-10 | 4 | 5.22 | 6.72 | 1.50 | D | 76.0 | - | - | 15:12 | 15:34 | 1.1 | 3.0 | 1.79 | - | - | - | - | - | - | Outside Casing S-30+551 |
| | | 11-Jun-10 | 4 | 5.22 | 6.72 | 1.50 | D+ | 48.3 | 615.3 | 410.2 | 15:34 | 15:47 | 1.6 | 2.2 | 0.92 | - | - | - | - | - | - | Continued By-Pass |
| | | 14-May-10 | 3 | 7.37 | 8.37 | 1.00 | A | 148.9 | - | - | 8:17 | 8:37 | 2.0 | 11.5 | 6.02 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 7.37 | 8.37 | 1.00 | B | 149.1 | - | - | 8:37 | 8:45 | 2.7 | 19.3 | 7.19 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 7.37 | 8.37 | 1.00 | C | 313.0 | - | - | 8:45 | 9:19 | 3.1 | 6.1 | 1.90 | 59.3 | 2.0 | 1.6 | 10.4 | 7.6 | 18.6 | |
| | | 14-May-10 | 3 | 7.37 | 8.37 | 1.00 | D | 62.9 | 673.9 | 673.9 | 9:19 | 10:09 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-May-10 | 2 | 8.37 | 12.6 | 4.23 | A | 36.7 | 36.7 | 8.7 | 7:56 | 8:12 | 2.0 | 0.0 | 0.00 | 30.1 | 9.0 | 1.6 | 10.8 | 5.4 | 17.2 | |
| Q-30+551.75 | Q | 15-Jul-10 | 4 | 5.32 | 6.82 | 1.50 | MF | 76.4 | 76.4 | 50.9 | 19:23 | 19:50 | 2.5 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 3 | 7.52 | 8.6 | 1.08 | A | 129.0 | - | - | 17:12 | 17:30 | 2.1 | 12.0 | 4.46 | - | - | - | - | - | - | |
| | | 10-Jul-10 | 3 | 7.52 | 8.6 | 1.08 | B | 149.7 | 278.7 | 258.1 | 17:30 | 18:00 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+552.5 | T | 17-Jun-10 | 4 | 4.82 | 6.82 | 2.00 | MF | 131.2 | 131.2 | 65.6 | 20:42 | 21:11 | 2.0 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 8.59 | 9.59 | 1.00 | A | 21.3 | 21.3 | 21.3 | 22:15 | 22:25 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 18-May-10 | 2 | 9.59 | 13.6 | 4.01 | A | 20.3 | 20.3 | 5.1 | 22:01 | 22:13 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-30+553.25 | Q | 15-Jul-10 | 4 | 5.44 | 6.94 | 1.50 | MF | 190.6 | - | - | 15:54 | 16:37 | 1.1 | 9.4 | 5.99 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 5.44 | 6.94 | 1.50 | A | 159.7 | - | - | 16:37 | 16:48 | 1.8 | 16.5 | 6.66 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 5.44 | 6.94 | 1.50 | B | 160.2 | - | - | 16:48 | 16:57 | 1.6 | 17.6 | 7.16 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 5.44 | 6.94 | 1.50 | C | 159.6 | - | - | 16:57 | 17:06 | 2.1 | 19.1 | 5.99 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 5.44 | 6.94 | 1.50 | D | 137.9 | - | - | 17:06 | 17:15 | 1.9 | 12.6 | 4.34 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 5.44 | 6.94 | 1.50 | E | 208.0 | - | - | 17:15 | 17:46 | 2.2 | 5.2 | 1.60 | - | - | - | - | - | - | |
| | | 15-Jul-10 | 4 | 5.44 | 6.94 | 1.50 | X | 15.5 | 1031.5 | 687.7 | 17:46 | 18:32 | 2.7 | 0.3 | 0.06 | - | - | - | - | - | - | Communicated To Surface |
| | | 10-Jul-10 | 3 | 7.66 | 9 | 1.34 | A | 75.9 | 75.9 | 56.6 | 16:35 | 17:06 | 2.9 | 0.6 | 0.14 | - | - | - | - | - | - | |
| P-30+554 | P | 11-Jun-10 | 4 | 4.82 | 6.82 | 2.00 | A | 174.5 | - | - | 10:33 | 10:57 | 2.4 | 11.8 | 2.38 | - | - | - | - | - | - | |
| | | 11-Jun-10 | 4 | 4.82 | 6.82 | 2.00 | B | 106.2 | 280.7 | 140.4 | 10:57 | 11:45 | 2.5 | 1.1 | 0.22 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 7.55 | 8.55 | 1.00 | A | 123.2 | - | - | 3:51 | 4:12 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 7.55 | 8.55 | 1.00 | B | 177.0 | - | - | 4:12 | 4:24 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 7.55 | 8.55 | 1.00 | C | 671.8 | 972.0 | 972.0 | 4:24 | 4:55 | 2.4 | 26.3 | 11.32 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 2 | 8.55 | 12.5 | 3.95 | A | 19.1 | 19.1 | 4.8 | 3:34 | 3:47 | 2.0 | 1.3 | 0.16 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 1 | 12.5 | 18.2 | 5.70 | A | 30.8 | 30.8 | 5.4 | 3:16 | 3:30 | 5.0 | 0.5 | 0.02 | - | - | - | - | - | - | |
| T-30+555.5 | T | 17-Jun-10 | 4 | 5.06 | 6.56 | 1.50 | MF | 64.8 | 64.8 | 43.2 | 20:17 | 20:39 | 2.2 | 0.4 | 0.12 | - | - | - | - | - | - | Communicated To T-30+558.5 |
| | | 18-May-10 | 3 | 7.01 | 8.01 | 1.00 | A | 165.0 | - | - | 22:50 | 23:00 | 2.6 | 17.3 | 4.97 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 7.01 | 8.01 | 1.00 | B | 123.2 | 288.2 | 288.2 | 23:00 | 23:37 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 18-May-10 | 2 | 8.01 | 12.1 | 4.09 | A | 28.4 | 28.4 | 6.9 | 22:31 | 22:47 | 2.1 | 0.3 | 0.03 | - | - | - | - | - | - | |
| S-30+557 | S | 11-Jun-10 | 4 | 5.22 | 6.72 | 1.50 | A | 89.0 | - | - | 9:19 | 9:45 | 1.9 | 5.7 | 1.98 | - | - | - | - | - | - | Communicated Beside Casing P-30+560 |
| | | 11-Jun-10 | 4 | 5.22 | 6.72 | 1.50 | C | 119.3 | 208.3 | 138.9 | 9:45 | 10:33 | 2.7 | 0.5 | 0.13 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 7.32 | 8.32 | 1.00 | A | 222.5 | - | - | 11:00 | 11:25 | 0.9 | 11.5 | 13.47 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 7.32 | 8.32 | 1.00 | B | 107.5 | - | - | 11:25 | 11:33 | 1.4 | 15.6 | 12.01 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 7.32 | 8.32 | 1.00 | C | 213.0 | - | - | 11:33 | 11:44 | 1.9 | 13.8 | 6.98 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 7.32 | 8.32 | 1.00 | D | 458.0 | 1001.0 | 1001.0 | 11:44 | 12:16 | 3.2 | 12.6 | 3.99 | - | - | - | - | - | - | |
| | | 14-May-10 | 2 | 8.32 | 12.4 | 4.08 | A | 24.1 | 24.1 | 5.9 | 10:40 | 10:57 | 2.0 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-30+558.5 | T | 17-Jun-10 | 4 | 5.58 | 7.08 | 1.50 | MF | 147.0 | 147.0 | 98.0 | 19:51 | 20:14 | 2.2 | 0.0 | 0.00 | 30.7 | 0.6 | 1.4 | 9.0 | 7.0 | 11.0 | |
| | | 18-May-10 | 3 | 7.83 | 8.83 | 1.00 | A | 99.5 | - | - | 0:15 | 0:40 | 2.0 | 13.0 | 4.00 | - | - | - | - | - | - | Pump Broke Down. Stopped Injection. |
| | | 22-May-10 | 3 | 7.83 | 8.83 | 1.00 | A | 22.7 | 122.2 | 122.2 | 17:10 | 17:22 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | Re-Grouted |
| | | 18-May-10 | 2 | 8.83 | 12.9 | 4.07 | A | 25.2 | 25.2 | 6.2 | 23:51 | 0:05 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+560 | P | 11-Jun-10 | 4 | 6.29 | 7.79 | 1.50 | A | 205.0 | - | - | 7:57 | 8:23 | 2.0 | 11.5 | 4.04 | 31.2 | 4.0 | 1.6 | 9.7 | 11.3 | 13.9 | |
| | | 11-Jun-10 | 4 | 6.29 | 7.79 | 1.50 | B | 175.0 | - | - | 8:23 | 8:36 | 1.9 | 13.6 | 5.32 | 37.3 | 3.0 | 1.6 | 9.8 | 11.3 | 15.1 | By-Pass: Beside Casing |
| | | 11-Jun-10 | 4 | 6.29 | 7.79 | 1.50 | C | 221.0 | - | - | 8:36 | 8:57 | 2.2 | 9.1 | 3.10 | 47.1 | 3.0 | 1.6 | 9.5 | 11.5 | 13.7 | By-Pass: Beside Casing |
| | | 11-Jun-10 | 4 | 6.29 | 7.79 | 1.50 | D | 88.3 | 689.3 | 459.5 | 8:57 | 9:20 | 2.4 | 4.6 | 1.25 | 72.0 | - | 1.7 | 9.5 | 11.5 | 16.1 | Continued By-Pass |
| | | 30-Apr-10 | 3 | 8.38 | 9.38 | 1.00 | A | 156.3 | - | - | 6:00 | 6:22 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 8.38 | 9.38 | 1.00 | B | 173.7 | - | - | 6:22 | 6:36 | 1.6 | 15.0 | 9.15 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 8.38 | 9.38 | 1.00 | C | 724.0 | 1054.0 | 1054.0 | 6:36 | 7:31 | 1.9 | 17.2 | 8.90 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 2 | 9.38 | 13.4 | 4.02 | A | 2.1 | 2.1 | 0.5 | 5:46 | 5:57 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 1 | 13.4 | 18.7 | 5.30 | A | 21.8 | 21.8 | 4.1 | 5:28 | 5:42 | 5.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+561.5 | T | 17-Jun-10 | 4 | 6.12 | 7.62 | 1.50 | MF | 98.8 | 98.8 | 65.9 | 17:43 | 18:33 | 2.1 | 0.4 | 0.13 | 33.0 | 2.0 | 1.4 | 10.6 | 11.1 | 16.6 | |
| | | 18-May-10 | 3 | 8.31 | 9.31 | 1.00 | A | 181.7 | 181.7 | 181.7 | 3:48 | 4:40 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 18-May-10 | 2 | 9.31 | 13.3 | 3.99 | A | 25.6 | 25.6 | 6.4 | 3:31 | 3:44 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+563 | S | 10-Jun-10 | 4 | 6.31 | 7.81 | 1.50 | A | 140.2 | - | - | 2:43 | 2:57 | 2.2 | 12.6 | 3.73 | - | - | - | - | - | - | Communicate To S-30+569, P-30+560 |
| | | 10-Jun-10 | 4 | 6.31 | 7.81 | 1.50 | B | 162.7 | - | - | 2:57 | 3:15 | 2.7 | 3.5 | 0.94 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 4 | 6.31 | 7.81 | 1.50 | C | 32.1 | 335.0 | 223.3 | 3:15 | 3:36 | 2.5 | 0.6 | 0.15 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.46 | 9.46 | 1.00 | A | 142.8 | - | - | 15:53 | 16:15 | 1.4 | 9.7 | 7.24 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.46 | 9.46 | 1.00 | B | 204.2 | - | - | 16:15 | 16:28 | 2.3 | 20.6 | 9.41 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.46 | 9.46 | 1.00 | C | 145.1 | - | - | 16:28 | 16:35 | 2.8 | 21.8 | 8.51 | 46.7 | - | 1.6 | 11.2 | 10.4 | 15.1 | |
| | | 14-May-10 | 3 | 8.46 | 9.46 | 1.00 | D | 196.9 | 689.0 | 689.0 | 16:35 | 12:16 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 14-May-10 | 2 | 9.46 | 13.5 | 4.04 | A | 25.6 | 25.6 | 6.3 | 15:36 | 15:48 | 2.2 | 0.0 | 0.00 | 32.7 | 6.0 | 1.6 | 9.8 | 8.1 | 14.9 | |
| T-30+564.5 | T | 17-Jun-10 | 4 | 6.53 | 8.03 | 1.50 | MF | 80.8 | 80.8 | 53.9 | 16:50 | 17:35 | 2.1 | 0.5 | 0.14 | 33.0 | - | 1.4 | 10.6 | 11.1 | 16.6 | |
| | | 18-May-10 | 3 | 8.64 | 9.64 | 1.00 | A | 28.2 | 28.2 | 28.2 | 5:06 | 5:21 | 2.5 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 18-May-10 | 2 | 9.64 | 13.7 | 4.06 | A | 27.7 | 27.7 | 6.8 | 4:48 | 5:03 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+566 | P | 10-Jun-10 | 4 | 6.36 | 7.86 | 1.50 | A | 130.2 | - | - | 1:15 | 1:32 | 1.9 | 15.9 | 6.05 | 31.1 | 4.0 | 1.7 | 6.0 | 8.0 | 15.0 | Communicated To S-30+569 |
| | | 10-Jun-10 | 4 | 6.36 | 7.86 | 1.50 | B | 171.4 | - | - | 1:32 | 1:41 | 2.3 | 16.1 | 5.55 | 36.4 | 5.0 | 1.7 | 6.0 | 8.0 | 16.0 | |
| | | 10-Jun-10 | 4 | 6.36 | 7.86 | 1.50 | C | 247.0 | 548.6 | 365.7 | 1:41 | 2:34 | 2.5 | 1.2 | 0.32 | 48.4 | - | 1.7 | 5.0 | 8.0 | 15.0 | |
| | | 01-May-10 | 3 | 8.46 | 9.46 | 1.00 | A | 235.0 | - | - | 8:34 | 9:00 | 0.0 | 13.1 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-10 | 3 | 8.46 | 9.46 | 1.00 | B | 208.0 | - | - | 9:00 | 9:15 | 0.0 | 19.3 | 0.00 | 33.0 | 4.0 | 1.6 | 15.0 | 10.0 | 14.0 | |
| | | 01-May-10 | 3 | 8.46 | 9.46 | 1.00 | C | 560.0 | 1003.0 | 1003.0 | 9:15 | 9:41 | 2.1 | 23.7 | 11.50 | 46.0 | 2.0 | 1.7 | 15.0 | 10.0 | 15.0 | |
| | | 01-May-10 | 2 | 9.46 | 13.7 | 4.24 | A | 32.9 | 32.9 | 7.8 | 8:14 | 8:29 | 2.1 | 0.4 | 0.04 | 31.0 | 4.0 | 1.6 | 15.0 | 8.0 | 12.0 | |
| T-30+567.5 | T | 17-Jun-10 | 4 | 6.58 | 8.08 | 1.50 | MF | 67.7 | 67.7 | 45.1 | 15:24 | 16:15 | 2.0 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.69 | 9.69 | 1.00 | A | 198.0 | - | - | 7:24 | 7:54 | 1.3 | 12.2 | 9.23 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.69 | 9.69 | 1.00 | B | 184.2 | - | - | 7:54 | 8:05 | 1.9 | 18.3 | 9.46 | 34.0 | 5.0 | 1.6 | 13.4 | 8.6 | 14.9 | |
| | | 19-May-10 | 3 | 8.69 | 9.69 | 1.00 | C | 127.9 | 510.1 | 510.1 | 8:05 | 8:33 | 2.6 | 0.3 | 0.10 | 44.5 | 3.5 | 1.6 | 13.2 | 8.9 | 15.4 | |
| | | 19-May-10 | 2 | 9.69 | 13.7 | 4.01 | A | 30.0 | 30.0 | 7.5 | 6:58 | 7:12 | 2.1 | 0.0 | 0.00 | 30.0 | - | 1.6 | 13.4 | 8.6 | 14.6 | |
| S-30+569 | S | 10-Jun-10 | 4 | 6.41 | 7.91 | 1.50 | A | 156.0 | - | - | 17:41 | 18:05 | 2.2 | 10.0 | 2.85 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 4 | 6.41 | 7.91 | 1.50 | B | 144.7 | - | - | 18:05 | 18:41 | 2.4 | 7.8 | 2.18 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 4 | 6.41 | 7.91 | 1.50 | C | 91.3 | 392.0 | 261.3 | 18:41 | 19:20 | 2.7 | 0.9 | 0.22 | 42.7 | 4.0 | 1.7 | 3.0 | 7.0 | 14.0 | |
| | | 14-May-10 | 3 | 8.56 | 9.56 | 1.00 | A | 159.3 | - | - | 20:27 | 20:53 | 1.9 | 12.4 | 6.38 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.56 | 9.56 | 1.00 | B | 173.9 | - | - | 20:53 | 21:10 | 2.2 | 8.3 | 3.80 | 40.0 | 2.0 | 1.7 | - | 7.1 | 15.2 | |
| | | 14-May-10 | 3 | 8.56 | 9.56 | 1.00 | C | 220.2 | - | - | 21:10 | 21:34 | 3.2 | 7.0 | 2.20 | 46.9 | 1.0 | 1.7 | 0.8 | 7.4 | 16.1 | |
| | | 14-May-10 | 3 | 8.56 | 9.56 | 1.00 | D | 36.0 | 589.4 | 589.4 | 21:34 | 22:04 | 3.0 | 0.0 | 0.00 | 61.0 | - | 1.6 | 0.2 | 6.1 | 18.6 | |
| | | 14-May-10 | 2 | 9.56 | 13.7 | 4.14 | A | 26.9 | 26.9 | 6.5 | 20:07 | 20:21 | 2.2 | 0.0 | 0.00 | 31.6 | 5.0 | 1.6 | 8.1 | 8.8 | 18.3 | |
| T-30+570.5 | T | 17-Jun-10 | 4 | 6.33 | 7.83 | 1.50 | MF | 255.4 | 255.4 | 170.3 | 14:14 | 15:12 | 2.0 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.43 | 9.43 | 1.00 | A | 146.7 | - | - | 9:21 | 9:47 | 1.5 | 11.9 | 8.43 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.43 | 9.43 | 1.00 | B | 299.6 | - | - | 9:47 | 10:04 | 2.3 | 21.0 | 9.20 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.43 | 9.43 | 1.00 | C | 120.9 | 567.2 | 567.2 | 10:04 | 10:41 | 2.5 | 0.0 | 0.01 | 44.5 | 2.0 | 1.6 | 13.1 | 8.7 | 15.7 | |
| | | 19-May-10 | 2 | 9.43 | 13.5 | 4.07 | A | 22.8 | 22.8 | 5.6 | 8:57 | 9:15 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+572 | P | 10-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | A | 192.0 | - | - | 16:10 | 16:33 | 2.5 | 12.2 | 3.38 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | B | 159.1 | - | - | 16:33 | 16:45 | 2.6 | 10.4 | 2.80 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | C | 104.5 | 455.6 | 303.7 | 16:45 | 17:30 | 2.6 | 0.8 | 0.20 | - | - | - | - | - | - | |
| | | 01-May-10 | 3 | 8.82 | 9.82 | 1.00 | A | 297.5 | - | - | 17:45 | 19:24 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-10 | 3 | 8.82 | 9.82 | 1.00 | B | 205.7 | - | - | 19:24 | 19:40 | 0.0 | 0.0 | 0.00 | 35.0 | 4.0 | 1.6 | 9.0 | 9.0 | 14.0 | |
| | | 01-May-10 | 3 | 8.82 | 9.82 | 1.00 | C | 146.8 | - | - | 19:40 | 19:49 | 0.0 | 0.0 | 0.00 | 50.0 | 2.0 | - | 1.0 | 8.5 | 15.0 | |
| | | 01-May-10 | 3 | 8.82 | 9.82 | 1.00 | D | 350.0 | 1000.0 | 1000.0 | 19:49 | 20:09 | 0.5 | 17.8 | 37.12 | 49.0 | - | - | 1.0 | 8.0 | - | |
| | | 01-May-10 | 2 | 9.82 | 14.4 | 4.58 | A | 22.2 | 22.2 | 4.8 | 17:30 | 17:42 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+573.5 | T | 17-Jun-10 | 4 | 7.06 | 8.56 | 1.50 | MF | 80.3 | 80.3 | 53.5 | 13:36 | 14:10 | 2.0 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.97 | 9.97 | 1.00 | A | 17.1 | 17.1 | 17.1 | 14:03 | 14:21 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 9.97 | 14.3 | 4.33 | A | 32.3 | 32.3 | 7.5 | 11:00 | 11:18 | 1.9 | 0.4 | 0.04 | - | - | - | - | - | - | |
| S-30+575 | S | 10-Jun-10 | 4 | 6.31 | 7.81 | 1.50 | A | 192.0 | - | - | 14:11 | 14:39 | 1.5 | 12.6 | 5.58 | 30.4 | 5.0 | 1.6 | 7.0 | 8.1 | 11.5 | |
| | | 10-Jun-10 | 4 | 6.31 | 7.81 | 1.50 | B | 157.0 | - | - | 14:39 | 14:51 | 2.1 | 9.3 | 3.14 | 36.7 | 5.0 | 1.6 | 7.1 | 8.1 | 12.9 | |
| | | 10-Jun-10 | 4 | 6.31 | 7.81 | 1.50 | C | 289.2 | 638.2 | 425.5 | 14:51 | 16:03 | 2.5 | 0.6 | 0.17 | 45.1 | 1.0 | 1.6 | 7.1 | 8.1 | 13.4 | |
| | | 14-May-10 | 3 | 8.43 | 9.43 | 1.00 | A | 189.0 | - | - | 22:54 | 23:10 | 1.9 | 12.6 | 6.05 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.43 | 9.43 | 1.00 | B | 156.7 | - | - | 23:10 | 23:20 | 2.4 | 15.7 | 5.04 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.43 | 9.43 | 1.00 | C | 219.2 | - | - | 23:20 | 23:37 | 3.1 | 12.1 | 4.14 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.43 | 9.43 | 1.00 | D | 21.7 | 586.6 | 586.6 | 23:37 | 23:50 | 3.2 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 14-May-10 | 2 | 9.43 | 13.7 | 4.27 | A | 30.6 | 30.6 | 7.2 | 22:35 | 22:50 | 2.5 | 0.3 | 0.03 | - | - | - | - | - | - | |
| T-30+576.5 | T | 17-Jun-10 | 4 | 6.31 | 7.81 | 1.50 | MF | 25.4 | 25.4 | 16.9 | 10:12 | 10:36 | 2.1 | 0.3 | 0.08 | - | - | - | - | - | - | Communicated To T-30+588.5 |
| | | 19-May-10 | 3 | 8.41 | 9.41 | 1.00 | A | 144.7 | - | - | 14:53 | 15:14 | 1.6 | 11.5 | 7.52 | - | - | - | - | - | - | And 30+594.5 |
| | | 19-May-10 | 3 | 8.41 | 9.41 | 1.00 | B | 185.3 | - | - | 15:14 | 15:25 | 2.3 | 21.1 | 9.11 | 35.5 | 5.0 | 1.6 | 9.5 | 7.4 | 12.4 | |
| | | 19-May-10 | 3 | 8.41 | 9.41 | 1.00 | C | 153.3 | - | - | 15:25 | 15:41 | 2.5 | 5.3 | 2.11 | 44.5 | - | 1.6 | 9.6 | 7.5 | 12.2 | |
| | | 19-May-10 | 3 | 8.41 | 9.41 | 1.00 | D | 14.3 | 497.6 | 497.6 | 15:41 | 15:59 | 2.5 | 0.0 | 0.01 | 63.0 | 2.0 | 1.7 | 23.4 | 7.5 | 17.2 | |
| | | 19-May-10 | 2 | 9.41 | 13.5 | 4.09 | A | 25.2 | 25.2 | 6.2 | 14:29 | 14:47 | 2.1 | 0.0 | 0.00 | 31.0 | - | 1.6 | 11.5 | 6.9 | 13.3 | |
| P-30+578 | P | 10-Jun-10 | 4 | 6.04 | 7.54 | 1.50 | A | 109.2 | - | - | 10:51 | 11:07 | 1.6 | 9.1 | 3.74 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 4 | 6.04 | 7.54 | 1.50 | B | 176.5 | - | - | 11:07 | 11:20 | 2.7 | 12.7 | 3.15 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 4 | 6.04 | 7.54 | 1.50 | C | 52.5 | 338.2 | 225.5 | 11:20 | 11:49 | 2.6 | 0.7 | 0.17 | - | - | - | - | - | - | |
| | | 01-May-10 | 2,3 | 8.16 | 13.2 | 5.04 | B | 170.1 | - | - | 20:32 | 20:56 | - | - | - | - | - | - | - | - | - | |
| | | 01-May-10 | 2,3 | 8.16 | 13.2 | 5.04 | C | 140.6 | - | - | 20:56 | 21:04 | - | - | - | - | - | - | - | - | - | |
| | | 01-May-10 | 2,3 | 8.16 | 13.2 | 5.04 | D | 700.3 | 1011.0 | 200.6 | 21:04 | 21:39 | 1.9 | 26.5 | 5.11 | 61.7 | - | 1.8 | 2.0 | 9.0 | 14.0 | |
| | | 03-May-10 | 2 | 9.16 | 13.2 | 4.04 | A | 25.9 | 25.9 | 6.4 | 19:36 | 20:04 | 2.1 | 0.5 | 0.06 | 30.9 | 4.0 | 1.6 | 13.0 | 8.0 | 16.0 | Re-Grouted |
| T-30+579.5 | T | 17-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | MF | 110.9 | 110.9 | 73.9 | 8:57 | 9:58 | 2.0 | 1.0 | 0.33 | - | - | - | - | - | - | Communicated To T-30+588.5 |
| | | 19-May-10 | 3 | 8.44 | 9.44 | 1.00 | A | 152.4 | - | - | 16:44 | 17:08 | 2.0 | 12.0 | 6.01 | - | - | - | - | - | - | And 30+594.5 |
| | | 19-May-10 | 3 | 8.44 | 9.44 | 1.00 | B | 184.3 | - | - | 17:08 | 17:21 | 2.5 | 15.6 | 6.19 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.44 | 9.44 | 1.00 | C | 78.2 | 414.9 | 414.9 | 17:21 | 17:53 | 2.5 | 0.6 | 0.25 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 9.44 | 13.5 | 4.06 | A | 23.5 | 23.5 | 5.8 | 16:21 | 16:38 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+581 | S | 14-May-10 | 3 | 8.51 | 9.51 | 1.00 | A | 163.2 | - | - | 0:36 | 1:00 | 1.9 | 11.8 | 6.60 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.51 | 9.51 | 1.00 | B | 175.9 | - | - | 1:00 | 1:17 | 2.7 | 9.4 | 2.81 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.51 | 9.51 | 1.00 | C | 205.5 | - | - | 1:17 | 1:42 | 3.2 | 10.5 | 3.44 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.51 | 9.51 | 1.00 | D | 112.9 | 657.5 | 657.5 | 1:42 | 2:14 | 3.1 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 14-May-10 | 2 | 9.51 | 13.8 | 4.29 | A | 35.7 | 35.7 | 8.3 | 0:21 | 0:33 | 1.9 | 0.7 | 0.09 | - | - | - | - | - | - | |
| T-30+582.5 | T | 17-Jun-10 | 4 | 6.73 | 8.23 | 1.50 | MF | 162.4 | 162.4 | 108.3 | 7:46 | 8:52 | 2.0 | 6.8 | 0.26 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.56 | 9.56 | 1.00 | A | 169.5 | - | - | 19:45 | 20:08 | 2.5 | 3.9 | 1.86 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.56 | 9.56 | 1.00 | B | 31.0 | 200.5 | 200.5 | 20:08 | 20:31 | 2.7 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 9.56 | 13.7 | 4.14 | A | 29.9 | 29.9 | 7.2 | 19:24 | 19:36 | 2.0 | 0.6 | 0.07 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+584 | P | 10-Jun-10 | 4 | 6.74 | 8.24 | 1.50 | A | 171.4 | - | - | 9:27 | 9:49 | 2.2 | 12.0 | 3.70 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 4 | 6.74 | 8.24 | 1.50 | B | 165.6 | - | - | 9:49 | 10:03 | 2.5 | 12.1 | 3.05 | - | - | - | - | - | - | |
| | | 10-Jun-10 | 4 | 6.74 | 8.24 | 1.50 | C | 122.6 | 459.6 | 306.4 | 10:03 | 10:42 | 2.7 | 0.7 | 0.16 | 45.0 | - | 1.6 | 8.0 | 12.0 | 13.0 | |
| | | 03-May-10 | 3 | 8.61 | 9.61 | 1.00 | A | 9.3 | 9.3 | 9.3 | 21:14 | 21:31 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | Re-Grouted |
| | | 01-May-10 | 2,3 | 8.61 | 14.1 | 5.49 | B | 71.9 | 71.9 | 13.1 | 21:55 | 22:16 | 0.3 | 9.1 | 5.25 | 37.1 | - | 1.7 | 1.0 | 8.0 | 14.0 | Communicated To P-30+578 |
| | | 03-May-10 | 2 | 9.61 | 14.1 | 4.49 | A | 31.1 | 31.1 | 6.9 | 20:13 | 20:32 | 2.2 | 0.2 | 0.02 | - | - | - | - | - | - | Re-Grouted |
| | | 17-Jun-10 | 4 | 6.54 | 8.04 | 1.50 | MF | 31.6 | 31.6 | 21.1 | 7:13 | 7:40 | 2.1 | 0.0 | 0.00 | 32.7 | 2.0 | 1.4 | 8.2 | 6.7 | 9.3 | |
| | | 19-May-10 | 3 | 8.77 | 9.77 | 1.00 | A | 159.7 | 159.7 | 159.7 | 21:03 | 22:03 | 2.5 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 9.77 | 13.7 | 3.93 | A | 34.4 | 34.4 | 8.8 | 20:47 | 20:59 | 2.0 | 1.6 | 0.20 | - | - | - | - | - | - | |
| T-30+585.5 | T | 17-Jun-10 | 4 | 6.54 | 8.04 | 1.5 | MF | 31.6 | 31.6 | 21.1 | 7:13 | 7:40 | 2.1 | 0.0 | 0.00 | 32.7 | 2.0 | 1.4 | 8.2 | 6.7 | 9.3 | |
| | | 19-May-10 | 3 | 8.77 | 9.77 | 1 | A | 159.7 | 159.7 | 159.7 | 21:03 | 22:03 | 2.5 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 9.77 | 13.7 | 3.93 | A | 34.4 | 34.4 | 8.8 | 20:47 | 20:59 | 2.0 | 1.6 | 0.20 | - | - | - | - | - | - | |
| S-30+587 | S | 10-Jun-10 | 4 | 6.72 | 8.22 | 1.50 | A | 200.0 | - | - | 7:20 | 7:49 | 1.2 | 9.0 | 5.70 | 31.6 | 3.0 | 1.6 | 9.1 | 11.4 | 13.7 | Communication To S-30+593 |
| | | 10-Jun-10 | 4 | 6.72 | 8.22 | 1.50 | B | 172.0 | - | - | 7:49 | 8:02 | 1.6 | 13.2 | 5.77 | 37.4 | 4.0 | 1.6 | 8.3 | 11.2 | 13.3 | Communication To S-30+581 |
| | | 10-Jun-10 | 4 | 6.72 | 8.22 | 1.50 | C | 301.2 | 673.2 | 448.8 | 8:02 | 9:12 | 2.6 | 0.9 | 0.23 | 47.7 | 2.0 | 1.6 | 8.7 | 11.2 | 13.9 | |
| | | 14-May-10 | 3 | 8.87 | 9.87 | 1.00 | A | 162.8 | - | - | 4:21 | 4:40 | 1.7 | 11.9 | 6.03 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 8.87 | 9.87 | 1.00 | B | 168.8 | - | - | 4:40 | 4:53 | 2.7 | 19.4 | 5.95 | 38.9 | 4.0 | 1.7 | -5.7 | 6.4 | 12.7 | |
| | | 14-May-10 | 3 | 8.87 | 9.87 | 1.00 | C | 185.1 | 516.7 | 516.7 | 4:53 | 5:47 | 2.9 | 0.0 | 0.00 | 49.0 | 3.0 | 1.7 | -4.1 | 5.9 | 13.4 | |
| | | 14-May-10 | 2 | 9.87 | 14.3 | 4.43 | A | 26.6 | 26.6 | 6.0 | 4:04 | 4:18 | 2.1 | 0.0 | 0.00 | 33.2 | 3.0 | 1.7 | -2.3 | 6.7 | 14.6 | |
| Q-30+587.75 | Q | 03-Jul-10 | 4 | 7.08 | 8.58 | 1.50 | MF | 44.7 | 44.7 | 29.8 | 2:12 | 2:47 | 2.1 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 28-Jun-10 | 3 | 9.02 | 10.1 | 1.08 | MF | 54.0 | - | - | 7:20 | 7:40 | 2.5 | 3.4 | 1.06 | - | - | - | - | - | - | Communicated To Q-30+589.25; |
| | | 28-Jun-10 | 3 | 9.02 | 10.1 | 1.08 | A | 46.9 | - | - | 7:40 | 8:04 | 2.4 | 1.4 | 0.49 | - | - | - | - | - | - | Outside Casing. |
| | | 28-Jun-10 | 3 | 9.02 | 10.1 | 1.08 | B | 25.6 | 126.5 | 117.1 | 8:04 | 8:36 | 2.6 | 0.1 | 0.03 | - | - | - | - | - | - | |
| T-30+588.5 | T | 16-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | MF | 262.9 | - | - | 5:24 | 5:48 | 2.7 | 10.1 | 5.55 | - | - | - | - | - | - | Communicated To T-30+594.5 |
| | | 16-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | A | 204.4 | - | - | 5:48 | 5:58 | 1.5 | 33.5 | 2.54 | 32.8 | - | 1.6 | 8.0 | 6.0 | 11.0 | |
| | | 16-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | B | 241.5 | - | - | 5:58 | 6:23 | 2.7 | 51.2 | 9.83 | 36.6 | - | 1.6 | 8.0 | 6.0 | 12.0 | |
| | | 16-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | C | 25.7 | 734.5 | 489.7 | 6:23 | 6:34 | 2.0 | 0.0 | 0.01 | 47.7 | - | 1.6 | 8.0 | 6.0 | 14.0 | |
| | | 19-May-10 | 3 | 8.89 | 9.89 | 1.00 | A | 165.3 | - | - | 22:46 | 23:20 | 2.5 | 8.1 | 3.07 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.89 | 9.89 | 1.00 | B | 107.4 | 272.7 | 272.7 | 23:20 | 0:00 | 2.6 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 9.89 | 14 | 4.11 | A | 24.3 | 24.3 | 5.9 | 22:25 | 22:38 | 2.1 | 0.2 | 0.02 | 32.0 | - | 1.6 | 12.0 | 6.6 | 14.3 | |
| Q-30+589.25 | Q | 03-Jul-10 | 4 | 6.66 | 8.16 | 1.50 | MF | 186.4 | 186.4 | 124.3 | 20:44 | 23:57 | 2.0 | 0.1 | 0.04 | 35.3 | - | 1.5 | 11.1 | 10.4 | 17.1 | Communicated To Q-30+587.75 |
| | | 27-Jun-10 | 3 | 8.59 | 9.59 | 1.00 | MF | 250.0 | - | - | 15:03 | 15:33 | 1.7 | 15.3 | 9.51 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 27-Jun-10 | 3 | 8.59 | 9.59 | 1.00 | A | 164.0 | - | - | 15:33 | 15:45 | 1.8 | 11.7 | 6.72 | 31.4 | 5.0 | 1.6 | 14.0 | 12.8 | 16.5 | |
| | | 27-Jun-10 | 3 | 8.59 | 9.59 | 1.00 | B | 166.5 | - | - | 15:45 | 16:01 | 1.8 | 0.0 | 0.01 | 35.0 | 7.0 | 1.6 | 14.2 | 12.7 | 19.0 | |
| | | 27-Jun-10 | 3 | 8.59 | 9.59 | 1.00 | C | 83.4 | 663.9 | 663.9 | 16:01 | 16:46 | 2.4 | 0.2 | 0.07 | 52.5 | - | 1.7 | 14.9 | 12.5 | 19.2 | |
| | | 27-Jun-10 | 2 | 9.59 | 13.6 | 4.01 | MF | 15.1 | 15.1 | 3.8 | 14:44 | 14:46 | 2.1 | 0.1 | 0.01 | 30.0 | 8.0 | 1.4 | 11.9 | 12.7 | 14.9 | |
| P-30+590 | P | 09-Jun-10 | 4 | 6.46 | 7.96 | 1.50 | A | 150.1 | - | - | 4:16 | 4:30 | 1.6 | 12.8 | 5.85 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.46 | 7.96 | 1.50 | B | 176.9 | - | - | 4:30 | 4:42 | 2.5 | 17.9 | 4.99 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.46 | 7.96 | 1.50 | C | 90.3 | 417.3 | 278.2 | 4:42 | 4:59 | 2.5 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 01-May-10 | 2,3 | 8.61 | 13.9 | 5.29 | B | 130.9 | - | - | 23:27 | 23:46 | 0.0 | 0.0 | 0.00 | 35.3 | - | 1.7 | 3.0 | 5.0 | 14.0 | |
| | | 01-May-10 | 2,3 | 8.61 | 13.9 | 5.29 | C | 153.0 | - | - | 23:46 | 23:57 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-10 | 2,3 | 8.61 | 13.9 | 5.29 | D | 716.1 | 1000.0 | 189.0 | 23:57 | 0:52 | 3.4 | 11.6 | 0.46 | - | - | - | - | - | - | |
| | | 03-May-10 | 2 | 9.61 | 13.9 | 4.29 | A | 23.8 | 23.8 | 5.5 | 20:48 | 21:08 | 2.1 | 0.2 | 0.02 | - | - | - | - | - | - | Re-Grouted |
| T-30+591.5 | T | 29-Jun-10 | 4 | 6.5 | 8 | 1.50 | MF | 242.0 | - | - | 9:17 | 9:39 | 2.0 | 8.4 | 3.09 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 29-Jun-10 | 4 | 6.5 | 8 | 1.50 | A | 190.5 | - | - | 9:39 | 10:18 | 1.0 | 13.3 | 8.72 | 33.1 | 4.0 | 1.6 | 17.3 | 12.6 | 16.1 | |
| | | 29-Jun-10 | 4 | 6.5 | 8 | 1.50 | B | 163.9 | - | - | 10:18 | 10:29 | 1.2 | 14.3 | 8.04 | 35.9 | 3.0 | 1.6 | 16.1 | 12.6 | 23.1 | |
| | | 29-Jun-10 | 4 | 6.5 | 8 | 1.50 | C | 103.6 | - | - | 10:29 | 10:40 | 1.2 | 3.9 | 7.58 | - | - | - | - | - | - | |
| | | 29-Jun-10 | 4 | 6.5 | 8 | 1.50 | D | 47.2 | 747.2 | 498.1 | 10:40 | 11:14 | 2.0 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.14 | 10.14 | 1.00 | A | 172.4 | - | - | 2:39 | 3:08 | 2.3 | 11.0 | 5.70 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.14 | 10.14 | 1.00 | B | 167.6 | - | - | 3:08 | 3:20 | 2.4 | 8.4 | 3.61 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.14 | 10.14 | 1.00 | C | 112.0 | 452.0 | 452.0 | 3:20 | 3:52 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 10.14 | 14.13 | 3.99 | A | 23.8 | 23.8 | 6.0 | 2:20 | 2:32 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+593 | S | 09-Jun-10 | 4 | 6.85 | 8.35 | 1.50 | A | 151.8 | - | - | 3:00 | 3:16 | 2.2 | 15.2 | 4.44 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.85 | 8.35 | 1.50 | B | 167.8 | - | - | 3:16 | 3:26 | 2.5 | 10.7 | 3.04 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.85 | 8.35 | 1.50 | C | 95.3 | 414.9 | 276.6 | 3:26 | 4:02 | 2.5 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.97 | 9.97 | 1.00 | A | 206.1 | - | - | 8:49 | 9:12 | 1.5 | 15.4 | 10.03 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.97 | 9.97 | 1.00 | B | 214.9 | - | - | 9:12 | 9:25 | 1.4 | 18.7 | 10.08 | 36.7 | 4.0 | 1.6 | 17.1 | 8.3 | 14.5 | |
| | | 15-May-10 | 3 | 8.97 | 9.97 | 1.00 | C | 219.0 | - | - | 9:25 | 9:36 | 2.3 | 19.3 | 7.87 | 46.1 | 3.0 | 1.7 | 17.2 | 8.3 | 14.7 | |
| | | 15-May-10 | 3 | 8.97 | 9.97 | 1.00 | D | 360.0 | 1000.0 | 1000.0 | 9:36 | 9:59 | 3.1 | 9.4 | 2.99 | 102.6 | 3.0 | 1.6 | - | - | - | |
| | | 15-May-10 | 2 | 9.97 | 15.1 | 5.13 | A | 35.8 | 35.8 | 7.0 | 8:29 | 8:46 | 2.6 | 0.0 | 0.00 | 31.2 | 3.0 | 1.6 | 16.4 | 7.9 | 13.8 | |
| T-30+594.5 | T | 16-Jun-10 | 4 | 6.58 | 8.08 | 1.50 | MF | 170.8 | 170.8 | 113.9 | 2:36 | 3:09 | 2.0 | 0.5 | 0.16 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.79 | 9.79 | 1.00 | A | 176.0 | - | - | 4:28 | 4:30 | 2.4 | 11.1 | 4.71 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.79 | 9.79 | 1.00 | B | 110.4 | 286.4 | 286.4 | 4:30 | 5:23 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 9.79 | 13.8 | 4.01 | A | 30.8 | 30.8 | 7.7 | 4:04 | 4:20 | 2.1 | 0.2 | 0.02 | - | - | - | - | - | - | |
| P-30+596 | P | 09-Jun-10 | 4 | 5.69 | 7.19 | 1.50 | A | 140.0 | - | - | 2:01 | 2:22 | 1.3 | 10.7 | 4.62 | 31.0 | - | 1.7 | 7.0 | 9.0 | 15.0 | Communicated To S-0+599, P-30+602. |
| | | 09-Jun-10 | 4 | 5.69 | 7.19 | 1.50 | B | 167.6 | - | - | 2:22 | 2:40 | 2.6 | 9.3 | 1.74 | 37.2 | - | 1.7 | 7.0 | 9.0 | 16.0 | |
| | | 09-Jun-10 | 4 | 5.69 | 7.19 | 1.50 | C | 10.7 | 318.3 | 212.2 | 2:40 | 2:50 | 2.5 | 0.9 | 0.22 | 49.8 | - | 1.7 | 6.0 | 8.0 | 15.0 | |
| | | 01-May-10 | 3 | 8.08 | 9.08 | 1.00 | A | 65.2 | - | - | 5:37 | 5:55 | 1.1 | 6.8 | 6.42 | - | - | - | - | - | - | By-Pass |
| | | 03-May-10 | 3 | 8.08 | 9.08 | 1.00 | A | 10.9 | 76.1 | 76.1 | 22:12 | 22:12 | 2.8 | 0.0 | 0.01 | - | - | - | - | - | - | Re-Grouted |
| | | 01-May-10 | 2 | 9.08 | 13.5 | 4.42 | A | 241.0 | - | - | 3:18 | 3:50 | 0.0 | 0.0 | 0.00 | 32.0 | - | 1.6 | 12.0 | 6.0 | 14.0 | |
| | | 01-May-10 | 2 | 9.08 | 13.5 | 4.42 | B | 360.0 | - | - | 3:50 | 4:12 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-10 | 2 | 9.08 | 13.5 | 4.42 | C | 266.0 | - | - | 4:12 | 4:27 | 0.0 | 0.0 | 0.00 | 50.0 | - | - | 16.0 | 6.0 | 14.0 | |
| | | 01-May-10 | 2 | 9.08 | 13.5 | 4.42 | D | 1134.0 | 2001.0 | 452.7 | 4:27 | 5:27 | 0.0 | 0.0 | 0.00 | 62.0 | - | - | 12.0 | 6.0 | 14.0 | By-Pass |
| T-30+597.5 | T | 16-Jun-10 | 4 | 6.03 | 7.53 | 1.50 | MF | 251.4 | 251.4 | 167.6 | 2:04 | 2:33 | 1.9 | 0.5 | 0.17 | 30.8 | 2.9 | 1.4 | 7.0 | 6.0 | 11.1 | Communicated To T-30+603.5 |
| | | 20-May-10 | 3 | 8.13 | 9.13 | 1.00 | A | 16.6 | 16.6 | 16.6 | 8:00 | 8:18 | 2.4 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 9.13 | 13.3 | 4.17 | A | 24.8 | 24.8 | 5.9 | 7:35 | 7:53 | 2.1 | 0.1 | 0.01 | 30.5 | 5.0 | 1.6 | 21.4 | 7.4 | 14.3 | |
| S-30+599 | S | 09-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | A | 152.4 | - | - | 21:54 | 22:04 | 2.0 | 13.1 | 3.68 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | B | 183.1 | - | - | 22:04 | 22:18 | 2.5 | 12.5 | 3.16 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | C | 90.3 | 425.8 | 283.9 | 22:18 | 22:48 | 2.4 | 0.9 | 0.24 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.38 | 9.38 | 1.00 | A | 160.9 | - | - | 10:42 | 11:05 | 1.8 | 12.7 | 7.41 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.38 | 9.38 | 1.00 | B | 209.8 | - | - | 11:05 | 11:18 | 2.4 | 19.1 | 9.10 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.38 | 9.38 | 1.00 | C | 188.3 | - | - | 11:18 | 11:27 | 2.7 | 21.0 | 6.47 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.38 | 9.38 | 1.00 | D | 105.1 | - | - | 11:27 | 11:33 | 3.2 | 18.1 | 5.60 | - | - | - | - | - | - | Communicated To S-30+593 |
| | | 15-May-10 | 3 | 8.38 | 9.38 | 1.00 | D | 335.9 | 1000.0 | 1000.0 | 12:39 | 13:11 | 3.1 | 33.8 | 11.00 | - | - | - | - | - | - | |
| | | 15-May-10 | 2 | 9.38 | 13.5 | 4.12 | A | 26.3 | 26.3 | 6.4 | 10:23 | 10:38 | 2.3 | 0.0 | 0.01 | - | - | - | - | - | - | |
| T-30+600.5 | T | 16-Jun-10 | 4 | 6.97 | 8.47 | 1.50 | MF | 133.0 | 133.0 | 88.7 | 23:35 | 23:59 | 2.0 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 9.07 | 10.07 | 1.00 | A | 176.8 | - | - | 8:50 | 9:17 | 2.6 | 10.2 | 4.07 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 9.07 | 10.07 | 1.00 | B | 245.0 | 421.8 | 421.8 | 9:17 | 10:19 | 2.5 | 0.1 | 0.06 | 35.0 | 5.5 | 1.6 | 17.3 | 7.4 | 16.5 | |
| | | 20-May-10 | 2 | 10.07 | 14.1 | 4.03 | A | 26.3 | 26.3 | 6.5 | 8:30 | 8:45 | 2.0 | 0.4 | 0.05 | - | - | - | - | - | - | |
| P-30+602 | P | 09-Jun-10 | 4 | 6.92 | 8.42 | 1.50 | A | 167.2 | - | - | 20:13 | 20:33 | 2.6 | 10.9 | 6.03 | 31.4 | 4.4 | 1.7 | 5.0 | 8.0 | 15.0 | Communicate To S-30+605 |
| | | 09-Jun-10 | 4 | 6.92 | 8.42 | 1.50 | B | 153.4 | - | - | 20:33 | 20:56 | 2.0 | 15.5 | 5.22 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.92 | 8.42 | 1.50 | C | 92.4 | 413.0 | 275.3 | 20:56 | 21:31 | 2.5 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 9.06 | 10.06 | 1.00 | A | 167.0 | - | - | 6:58 | 7:22 | 0.8 | 16.7 | 20.00 | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 9.06 | 10.06 | 1.00 | B | 232.0 | - | - | 7:22 | 7:36 | 1.8 | 19.0 | 10.00 | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 9.06 | 10.06 | 1.00 | C | 88.4 | 487.4 | 487.4 | 7:36 | 8:01 | 3.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 10.06 | 14.8 | 4.74 | A | 145.8 | 145.8 | 30.8 | 6:14 | 6:55 | 2.2 | 1.8 | 0.17 | - | - | - | - | - | - | |
| T-30+603.5 | T | 16-Jun-10 | 4 | 7.05 | 8.55 | 1.50 | MF | 247.5 | 247.5 | 165.0 | 22:52 | 23:32 | 1.9 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 9.17 | 10.17 | 1.00 | A | 4.9 | 4.9 | 4.9 | 19:27 | 19:43 | 2.6 | 0.1 | 0.03 | 33.0 | 5.0 | 1.6 | 21.0 | 8.2 | 15.6 | |
| | | 20-May-10 | 2 | 10.17 | 14.3 | 4.13 | A | 160.3 | - | - | 11:04 | 11:33 | 2.0 | 3.5 | 0.44 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 10.17 | 14.3 | 4.13 | B | 47.7 | 208.0 | 50.4 | 11:33 | 12:04 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+605 | S | 09-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | A | 137.1 | - | - | 18:03 | 18:41 | 2.4 | 4.8 | 1.75 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | B | 164.1 | - | - | 18:41 | 19:38 | 2.7 | 2.2 | 0.73 | 36.0 | 4.4 | 1.7 | 5.0 | 8.0 | 15.0 | |
| | | 09-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | C | 8.3 | 309.5 | 206.3 | 19:38 | 19:50 | 2.5 | 0.1 | 0.03 | 48.9 | 1.4 | 1.7 | 5.0 | 8.0 | 17.0 | |
| | | 15-May-10 | 3 | 8.89 | 9.89 | 1.00 | A | 166.4 | - | - | 15:36 | 15:58 | 2.7 | 14.4 | 6.98 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.89 | 9.89 | 1.00 | B | 138.0 | - | - | 15:58 | 16:06 | 2.8 | 26.6 | 10.21 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.89 | 9.89 | 1.00 | C | 276.2 | - | - | 16:06 | 16:33 | 3.0 | 7.1 | 2.54 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.89 | 9.89 | 1.00 | D | 89.4 | 670.0 | 670.0 | 16:33 | 17:38 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-May-10 | 2 | 9.89 | 14 | 4.11 | A | 27.2 | 27.2 | 6.6 | 15:11 | 15:31 | 2.1 | 0.0 | 0.00 | 32.4 | 4.0 | 1.6 | 18.0 | 11.9 | 16.5 | |
| T-30+606.5 | T | 16-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | MF | 171.7 | 171.7 | 114.5 | 22:18 | 20:48 | 2.0 | 0.3 | 0.11 | - | - | - | - | - | - | Communicated To T-30+612.5 |
| | | 20-May-10 | 3 | 8.77 | 9.77 | 1.00 | A | 150.6 | 150.6 | 150.6 | 20:25 | 21:12 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 9.77 | 13.7 | 3.93 | A | 167.8 | 167.8 | 42.7 | 19:54 | 20:13 | 0.6 | 13.8 | 6.00 | - | - | - | - | - | - | By-Pass |
| P-30+608 | P | 09-Jun-10 | 4 | 6.93 | 8.43 | 1.50 | A | 216.6 | - | - | 16:27 | 16:57 | 1.9 | 12.6 | 4.23 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.93 | 8.43 | 1.50 | B | 148.3 | - | - | 16:57 | 17:09 | 2.5 | 14.8 | 3.83 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.93 | 8.43 | 1.50 | C | 107.4 | 472.3 | 314.9 | 17:09 | 17:54 | 2.5 | 1.0 | 0.26 | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 8.99 | 9.99 | 1.00 | A | 170.0 | - | - | 14:31 | 14:52 | 0.2 | 13.2 | 82.80 | 32.0 | - | 1.6 | 16.0 | 14.0 | 15.0 | |
| | | 02-May-10 | 3 | 8.99 | 9.99 | 1.00 | B | 165.0 | - | - | 14:52 | 15:19 | 0.3 | 5.3 | 18.50 | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 8.99 | 9.99 | 1.00 | C | 144.0 | - | - | 15:19 | 15:35 | 1.0 | 17.0 | 18.29 | 48.0 | - | 1.7 | 19.0 | 12.0 | 18.0 | |
| | | 02-May-10 | 3 | 8.99 | 9.99 | 1.00 | D | 448.0 | 927.0 | 927.0 | 15:35 | 16:21 | 3.1 | 0.0 | 0.01 | 58.0 | - | 1.6 | 17.0 | 12.0 | 16.0 | |
| | | 02-May-10 | 2 | 9.99 | 13.8 | 3.81 | A | 245.0 | - | - | 10:08 | 10:38 | 1.4 | 19.8 | 3.62 | 33.0 | 3.0 | 1.6 | 7.0 | 10.0 | 15.0 | |
| | | 02-May-10 | 2 | 9.99 | 13.8 | 3.81 | B | 352.0 | - | - | 10:38 | 11:10 | 2.0 | 5.1 | 0.68 | 37.0 | 2.0 | 1.7 | 8.0 | 10.0 | 15.0 | |
| | | 02-May-10 | 2 | 9.99 | 13.8 | 3.81 | C | 27.2 | 624.2 | 163.8 | 11:10 | 11:27 | 2.0 | 0.4 | 0.05 | 49.0 | 1.0 | 1.7 | 8.0 | 11.0 | 18.0 | |
| T-30+609.5 | T | 16-Jun-10 | 4 | 5.95 | 7.45 | 1.50 | MF | 109.3 | 109.3 | 72.9 | 19:16 | 19:39 | 2.1 | 0.6 | 0.19 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.08 | 9.08 | 1.00 | A | 198.0 | - | - | 21:46 | 22:11 | 2.6 | 11.5 | 4.42 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.08 | 9.08 | 1.00 | B | 265.5 | 463.5 | 463.5 | 22:11 | 23:11 | 2.6 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 9.08 | 13.1 | 4.02 | A | 25.4 | 25.4 | 6.3 | 21:27 | 21:41 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+611 | S | 09-Jun-10 | 4 | 5.62 | 7.12 | 1.50 | A | 125.0 | - | - | 15:08 | 15:29 | 1.6 | 8.8 | 4.07 | - | - | - | - | - | - | Communicated Around Casing P-30+614 and S-30+617 |
| | | 09-Jun-10 | 4 | 5.62 | 7.12 | 1.50 | C | 71.4 | - | - | 15:29 | 15:38 | 1.7 | 5.8 | 2.18 | 45.1 | - | 1.6 | 6.7 | 11.3 | 11.9 | |
| | | 09-Jun-10 | 4 | 5.62 | 7.12 | 1.50 | D | 88.9 | 285.3 | 190.2 | 15:38 | 16:20 | 2.7 | 0.5 | 0.11 | 64.7 | 2.0 | 1.6 | 6.7 | 11.3 | 12.2 | |
| | | 15-May-10 | 3 | 7.85 | 8.85 | 1.00 | A | 167.6 | - | - | 20:03 | 20:27 | 2.3 | 8.9 | 3.58 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 7.85 | 8.85 | 1.00 | B | 161.7 | - | - | 20:27 | 20:39 | 2.4 | 18.3 | 8.97 | 37.0 | 3.0 | 1.7 | 1.8 | 5.9 | 13.7 | |
| | | 15-May-10 | 3 | 7.85 | 8.85 | 1.00 | C | 255.6 | - | - | 20:39 | 21:00 | 3.1 | 9.5 | 2.84 | 49.8 | 2.0 | 1.7 | 0.9 | 6.9 | - | |
| | | 15-May-10 | 3 | 7.85 | 8.85 | 1.00 | D | 178.4 | 763.3 | 763.3 | 21:00 | 21:54 | 3.2 | 0.0 | 0.00 | - | - | 1.6 | 7.8 | 7.0 | 16.8 | |
| | | 15-May-10 | 2 | 8.85 | 13.2 | 4.35 | A | 34.7 | 34.7 | 8.0 | 19:42 | 20:00 | 2.1 | 0.0 | 0.00 | 32.4 | - | 1.7 | 2.6 | 6.9 | 16.2 | |
| T-30+612.5 | T | 16-Jun-10 | 4 | 5.32 | 6.82 | 1.50 | MF | 277.5 | 277.5 | 185.0 | 17:43 | 19:13 | 2.2 | 0.5 | 0.14 | 30.9 | - | 1.5 | 9.0 | 10.0 | 14.0 | |
| | | 20-May-10 | 3 | 7.62 | 8.62 | 1.00 | A | 139.5 | 139.5 | 139.5 | 1:50 | 2:46 | 2.5 | 0.5 | 0.21 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 8.62 | 12.7 | 4.08 | A | 24.4 | 24.4 | 6.0 | 1:30 | 1:43 | 2.0 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-30+614 | P | 09-Jun-10 | 4 | 5.46 | 6.96 | 1.50 | A | 125.0 | - | - | 10:15 | 10:35 | 2.3 | 12.2 | 3.51 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 5.46 | 6.96 | 1.50 | B | 126.0 | - | - | 10:35 | 10:44 | 2.1 | 13.5 | 4.09 | 37.4 | 4.0 | 1.6 | 5.3 | 10.3 | 13.4 | Communicated Around Casing S-30+617 |
| | | 09-Jun-10 | 4 | 5.46 | 6.96 | 1.50 | C | 143.0 | - | - | 10:44 | 11:01 | 2.1 | 7.4 | 2.45 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 5.46 | 6.96 | 1.50 | D | 64.0 | - | - | 11:01 | 11:16 | 2.1 | 3.2 | 0.98 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 5.46 | 6.96 | 1.50 | D+ | 47.0 | 505.0 | 336.7 | 11:16 | 11:16 | 2.4 | 1.0 | 0.28 | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 7.7 | 8.7 | 1.00 | A | 160.2 | - | - | 18:52 | 19:15 | 0.7 | 11.8 | 17.80 | 32.8 | 2.0 | 1.7 | 19.0 | 11.0 | 18.0 | |
| | | 02-May-10 | 3 | 7.7 | 8.7 | 1.00 | B | 198.7 | - | - | 19:15 | 19:30 | 1.8 | 16.2 | 9.17 | 37.8 | 3.0 | 1.7 | 22.0 | 10.0 | 19.0 | |
| | | 02-May-10 | 3 | 7.7 | 8.7 | 1.00 | C | 267.3 | - | - | 19:30 | 19:44 | 2.5 | 16.1 | 6.40 | 49.5 | 2.0 | 1.8 | 18.0 | 11.0 | 19.0 | |
| | | 02-May-10 | 3 | 7.7 | 8.7 | 1.00 | D | 375.8 | 1002.0 | 1002.0 | 19:44 | 20:01 | 2.9 | 27.9 | 9.80 | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 8.7 | 13.2 | 4.50 | A | 239.0 | - | - | 16:45 | 17:13 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 8.7 | 13.2 | 4.50 | B | 373.0 | - | - | 17:13 | 17:33 | 0.6 | 19.0 | 12.30 | 36.0 | - | - | - | - | - | |
| | | 02-May-10 | 2 | 8.7 | 13.2 | 4.50 | C | 439.0 | 1051.0 | 233.6 | 17:33 | 18:41 | 2.1 | 0.0 | 0.00 | 48.0 | - | 1.8 | - | - | - | |
| Q-30+614.75 | Q | 04-Jul-10 | 4 | 5.72 | 7.22 | 1.50 | MF | 78.8 | 78.8 | 52.5 | 16:41 | 17:31 | 2.1 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 3 | 7.74 | 8.8 | 1.06 | MF | 171.3 | 171.3 | 161.6 | 9:19 | 10:27 | 2.5 | 0.2 | 0.08 | - | - | - | - | - | - | Communicated To Q-30+617.25 |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+615.5 | T | 16-Jun-10 | 4 | 5.32 | 6.82 | 1.50 | MF | 112.2 | - | - | 13:42 | 14:15 | 1.3 | 5.9 | 3.00 | - | - | - | - | - | - | Communicated To T-30+624.5; Outside Casing |
| | | 16-Jun-10 | 4 | 5.32 | 6.82 | 1.50 | A | 167.7 | - | - | 16:08 | 16:33 | 2.0 | 6.8 | 1.66 | - | - | - | - | - | - | |
| | | 16-Jun-10 | 4 | 5.32 | 6.82 | 1.50 | C | 37.1 | 317.0 | 211.3 | 16:33 | 16:57 | 2.0 | 0.6 | 0.20 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 7.42 | 8.42 | 1.00 | A | 167.0 | - | - | 4:08 | 4:32 | 2.3 | 10.9 | 4.43 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 7.42 | 8.42 | 1.00 | B | 176.0 | 343.0 | 343.0 | 4:32 | 5:15 | 2.5 | 0.2 | 0.06 | 37.0 | 5.5 | 1.6 | 18.0 | 7.0 | 14.5 | |
| | | 20-May-10 | 2 | 8.42 | 12.5 | 4.08 | A | 20.7 | 20.7 | 5.1 | 3:51 | 4:04 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-30+616.25 | Q | 04-Jul-10 | 4 | 5.82 | 7.32 | 1.50 | MF | 76.2 | 76.2 | 50.8 | 15:54 | 16:27 | 2.1 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 3 | 7.81 | 8.81 | 1.00 | A | 68.3 | 68.3 | 68.3 | 15:21 | 15:58 | 2.6 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 2 | 8.81 | 12.8 | 3.99 | A | 32.3 | 32.3 | 8.1 | 15:07 | 15:08 | - | - | - | - | - | - | - | - | - | Backfilled |
| S-30+617 | S | 09-Jun-10 | 4 | 5.65 | 7.15 | 1.50 | A | 151.7 | - | - | 8:51 | 9:16 | 2.2 | 12.1 | 3.89 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 5.65 | 7.15 | 1.50 | B | 183.3 | - | - | 9:16 | 9:47 | 2.8 | 7.4 | 1.68 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 5.65 | 7.15 | 1.50 | C | 17.8 | 352.8 | 235.2 | 9:47 | 10:06 | 2.6 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 7.88 | 8.88 | 1.00 | A | 163.8 | - | - | 22:34 | 22:56 | 2.3 | 12.4 | 6.36 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 7.88 | 8.88 | 1.00 | B | 174.1 | - | - | 22:56 | 23:10 | 2.4 | 12.3 | 4.45 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 7.88 | 8.88 | 1.00 | C | 233.0 | - | - | 23:10 | 23:27 | 3.2 | 14.5 | 4.24 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 7.88 | 8.88 | 1.00 | D | 14.0 | 584.9 | 584.9 | 23:27 | 23:39 | 3.0 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 15-May-10 | 2 | 8.88 | 12.9 | 4.02 | A | 31.7 | 31.7 | 7.9 | 22:17 | 22:31 | 2.0 | 0.5 | 0.07 | - | - | - | - | - | - | |
| Q-30+617.75 | Q | 03-Jul-10 | 4 | 6.2 | 7.7 | 1.50 | MF | 25.3 | 25.3 | 16.9 | 17:01 | 17:20 | 2.0 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 3 | 8.09 | 9.3 | 1.21 | MF | 260.8 | - | - | 7:53 | 8:28 | 2.2 | 14.4 | 5.68 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 3 | 8.09 | 9.3 | 1.21 | A | 121.4 | 382.2 | 315.9 | 8:28 | 8:55 | 2.5 | 0.0 | 0.00 | 34.5 | 10.0 | 1.7 | 17.6 | 14.6 | 17.8 | |
| T-30+618.5 | T | 16-Jun-10 | 4 | 6.02 | 7.52 | 1.50 | MF | 245.7 | - | - | 8:54 | 9:55 | 1.3 | 12.1 | 6.00 | 33.5 | 1.6 | 1.5 | 9.4 | 8.8 | 12.1 | Communicated To T-30+624.5; Outside Casing |
| | | 16-Jun-10 | 4 | 6.02 | 7.52 | 1.50 | A | 173.2 | - | - | 9:55 | 10:11 | 1.6 | 12.2 | 5.02 | 33.1 | 5.0 | 1.6 | 9.7 | 9.3 | 15.6 | |
| | | 16-Jun-10 | 4 | 6.02 | 7.52 | 1.50 | B | 155.1 | - | - | 10:11 | 10:26 | 2.0 | 8.2 | 2.86 | 36.7 | 2.6 | 1.6 | 9.6 | 9.4 | 17.1 | |
| | | 16-Jun-10 | 4 | 6.02 | 7.52 | 1.50 | C | 83.2 | 657.2 | 438.1 | 10:26 | 10:53 | 1.9 | 1.0 | 0.34 | 47.9 | - | 1.7 | 9.7 | 9.5 | 18.2 | |
| | | 20-May-10 | 3 | 8.26 | 9.26 | 1.00 | A | 246.9 | - | - | 5:48 | 6:35 | 2.2 | 5.0 | 2.45 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.26 | 9.26 | 1.00 | B | 147.9 | - | - | 6:35 | 6:51 | 2.5 | 9.0 | 3.20 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.26 | 9.26 | 1.00 | C | 79.0 | 473.8 | 473.8 | 6:51 | 7:31 | 2.4 | 0.4 | 0.18 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 9.26 | 13.3 | 4.04 | A | 27.8 | 27.8 | 6.9 | 5:28 | 5:41 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-30+619.25 | Q | 03-Jul-10 | 4 | 6.73 | 8.23 | 1.50 | MF | 119.2 | 119.2 | 79.5 | 16:15 | 16:55 | 2.1 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 27-Jun-10 | 3 | 8.68 | 9.7 | 1.02 | MF | 15.5 | 15.5 | 15.2 | 7:33 | 7:46 | 2.5 | 0.1 | 0.03 | 30.2 | 8.0 | 1.5 | 14.1 | 14.8 | 15.4 | |
| P-30+620 | P | 09-Jun-10 | 4 | 6.73 | 8.23 | 1.50 | A | 197.0 | - | - | 7:02 | 7:24 | 2.1 | 15.4 | 4.92 | 36.7 | - | 1.7 | 4.7 | 11.4 | 13.8 | |
| | | 09-Jun-10 | 4 | 6.73 | 8.23 | 1.50 | B | 223.0 | - | - | 7:24 | 8:00 | 2.1 | 12.1 | 3.84 | - | - | - | - | - | - | |
| | | 09-Jun-10 | 4 | 6.73 | 8.23 | 1.50 | C | 130.0 | - | - | 8:00 | 8:30 | 2.7 | 4.6 | 1.76 | 50.0 | 2.0 | 1.6 | 5.0 | 9.0 | 10.6 | Communicated To S-30+323 |
| | | 09-Jun-10 | 4 | 6.73 | 8.23 | 1.50 | D | 8.9 | 558.9 | 372.6 | 8:30 | 8:43 | 2.5 | 0.3 | 0.07 | 68.0 | 2.0 | 1.7 | 5.2 | 10.1 | 10.7 | |
| | | 02-May-10 | 3 | 8.82 | 9.82 | 1.00 | A | 163.0 | - | - | 22:37 | 22:58 | - | - | - | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 8.82 | 9.82 | 1.00 | B | 174.0 | - | - | 22:58 | 23:10 | - | - | - | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 8.82 | 9.82 | 1.00 | C | 157.2 | - | - | 23:10 | 23:31 | - | - | - | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 8.82 | 9.82 | 1.00 | D | 507.8 | 1002.0 | 1002.0 | 23:31 | 23:51 | 2.8 | 29.2 | 10.40 | 68.9 | 1.0 | 1.7 | 9.0 | 7.0 | 16.0 | |
| | | 02-May-10 | 2 | 9.82 | 13.8 | 3.98 | A | 398.4 | - | - | 21:21 | 21:59 | - | - | - | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 9.82 | 13.8 | 3.98 | B | 212.0 | - | - | 21:59 | 22:15 | - | - | - | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 9.82 | 13.8 | 3.98 | C | 46.2 | 656.6 | 165.0 | 22:15 | 22:31 | 1.9 | 0.9 | 0.13 | - | - | - | - | - | - | |
| | | 02-May-10 | 1 | 13.8 | 18.9 | 5.10 | A | 21.9 | 21.9 | 4.3 | 20:58 | 21:15 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+621.5 | T | 16-Jun-10 | 4 | 7.97 | 9.47 | 1.50 | MF | 13.6 | - | - | 17:14 | 17:34 | 1.9 | - | - | - | - | - | - | - | - | |
| | | 29-Jun-10 | 4 | 7.27 | 8.77 | 1.50 | MF | 79.2 | 92.8 | 61.9 | 7:53 | 8:35 | 2.0 | 0.0 | 0.01 | 30.3 | 4.0 | 1.4 | 15.1 | 12.1 | 15.7 | By-Pass |
| | | 21-May-10 | 3 | 9.27 | 10.27 | 1.00 | A | 153.3 | - | - | 9:33 | 9:58 | 2.5 | 15.9 | 6.32 | 32.0 | 3.0 | 1.6 | 10.9 | 6.9 | 12.3 | |
| | | 21-May-10 | 3 | 9.27 | 10.27 | 1.00 | B | 237.3 | 390.6 | 390.6 | 9:58 | 10:50 | 2.4 | 0.1 | 0.05 | 35.0 | 3.0 | 1.7 | 10.9 | 6.9 | 14.3 | |
| | | 21-May-10 | 2 | 10.27 | 14.5 | 4.23 | A | 27.8 | 27.8 | 6.6 | 9:16 | 9:29 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+623 | S | - | 4 | 7.84 | 6.34 | 1.50 | A | 210.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | - | 4 | 7.84 | 6.34 | 1.50 | B | 183.3 | 393.3 | 262.2 | - | - | 2.5 | - | - | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.97 | 9.97 | 1.00 | A | 175.5 | - | - | 0:16 | 0:40 | 2.3 | 10.3 | 4.81 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.97 | 9.97 | 1.00 | B | 146.6 | - | - | 0:40 | 0:51 | 3.0 | 16.6 | 4.16 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.97 | 9.97 | 1.00 | C | 182.7 | - | - | 0:51 | 1:07 | 3.0 | 1.7 | 0.55 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.97 | 9.97 | 1.00 | D | 7.0 | 511.8 | 511.8 | 1:07 | 1:18 | 3.3 | 0.5 | 0.15 | - | - | - | - | - | - | |
| | | 15-May-10 | 2 | 9.97 | 14.3 | 4.33 | A | 42.3 | 42.3 | 9.8 | 23:57 | 0:14 | 2.4 | 0.5 | 0.04 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| Q-30+623.75 | Q | 03-Jul-10 | 4 | 6.96 | 8.46 | 1.50 | MF | 37.7 | 37.7 | 25.1 | 11:14 | 11:40 | 2.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 3 | 8.92 | 10 | 1.08 | MF | 232.0 | - | - | 16:20 | 16:45 | 1.5 | 12.1 | 7.47 | 34.0 | 3.0 | 1.4 | 13.3 | 11.2 | 15.0 | |
| | | 26-Jun-10 | 3 | 8.92 | 10 | 1.08 | A | 156.9 | - | - | 16:45 | 16:56 | 2.5 | 15.2 | 5.75 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 3 | 8.92 | 10 | 1.08 | B | 73.9 | 462.8 | 428.5 | 16:56 | 17:24 | 2.6 | 0.0 | 0.00 | 39.0 | 1.0 | 1.7 | 13.2 | 11.2 | 20.0 | |
| T-30+624.5 | T | 15-Jun-10 | 4 | 6.66 | 8.16 | 1.50 | MF | 260.8 | - | - | 5:12 | 5:36 | 1.8 | 4.9 | 1.67 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 4 | 6.66 | 8.16 | 1.50 | A | 160.9 | - | - | 5:36 | 5:45 | 1.9 | 19.7 | 5.05 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 4 | 6.66 | 8.16 | 1.50 | B | 167.5 | - | - | 5:45 | 6:06 | 2.2 | 3.9 | 1.51 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 4 | 6.66 | 8.16 | 1.50 | C | 11.1 | 600.3 | 400.2 | 6:06 | 6:21 | 2.0 | 0.6 | 0.19 | - | - | - | - | - | - | |
| | | 21-May-10 | 3 | 8.75 | 9.75 | 1.00 | A | 148.0 | - | - | 13:36 | 14:02 | 2.1 | 12.4 | 5.94 | - | - | - | - | - | - | |
| | | 21-May-10 | 3 | 8.75 | 9.75 | 1.00 | B | 202.3 | 350.3 | 350.3 | 14:02 | 14:59 | 2.4 | 0.2 | 0.09 | 35.0 | - | 1.6 | 6.9 | 9.8 | 13.8 | |
| | | 21-May-10 | 2 | 9.75 | 13.9 | 4.15 | A | 29.4 | 29.4 | 7.1 | 13:16 | 13:30 | 2.1 | 0.4 | 0.04 | 30.0 | - | 1.6 | 12.3 | 9.8 | 16.1 | |
| Q-30+625.25 | Q | 03-Jul-10 | 4 | 6.7 | 8.2 | 1.50 | MF | 66.1 | 66.1 | 44.1 | 10:28 | 11:08 | 2.3 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 26-Jun-10 | 3 | 8.76 | 9.76 | 1.00 | A | 27.4 | 27.4 | 27.4 | 14:29 | 14:57 | 2.5 | 0.1 | 0.06 | 34.2 | 5.0 | 1.7 | 13.3 | 11.5 | 20.5 | |
| | | 26-Jun-10 | 2 | 9.76 | 13.8 | 4.04 | A | 32.1 | 32.1 | 7.9 | 14:21 | 14:22 | - | - | - | - | - | - | - | - | - | Backfilled |
| P-30+626 | P | 08-Jun-10 | 4 | 5.6 | 7.1 | 1.50 | A | 150.4 | - | - | 21:38 | 21:58 | 2.1 | 12.7 | 4.05 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 4 | 5.6 | 7.1 | 1.50 | B | 167.3 | - | - | 21:58 | 22:12 | 2.6 | 16.1 | 7.30 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 4 | 5.6 | 7.1 | 1.50 | C | 88.2 | 405.9 | 270.6 | 22:12 | 22:43 | 2.4 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 02-May-10 | 3 | 8 | 9 | 1.00 | A | 3.6 | 3.6 | 3.6 | 5:08 | 5:23 | 3.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 9 | 13 | 4.00 | A | 230.1 | - | - | 3:05 | 3:33 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 9 | 13 | 4.00 | B | 240.2 | - | - | 3:33 | 3:44 | 0.0 | 0.0 | 0.00 | 36.3 | - | 1.6 | 15.0 | 8.0 | 17.0 | |
| | | 02-May-10 | 2 | 9 | 13 | 4.00 | C | 232.2 | - | - | 3:44 | 3:58 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-10 | 2 | 9 | 13 | 4.00 | D | 511.5 | 1214.0 | 303.5 | 3:58 | 4:58 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-10 | 1 | 13 | 18.3 | 5.30 | A | 27.5 | 27.5 | 5.2 | 2:46 | 3:03 | 5.0 | 0.2 | 0.01 | 33.3 | 2.0 | 1.7 | 14.0 | 8.0 | 16.0 | |
| T-30+627.5 | T | 15-Jun-10 | 4 | 6.88 | 8.38 | 1.50 | MF | 173.1 | 173.1 | 115.4 | 4:35 | 5:10 | 1.8 | 0.5 | 0.21 | - | - | - | - | - | - | Communicated With T-30+642.5 and T-30+645.5 |
| | | 21-May-10 | 3 | 8.99 | 9.99 | 1.00 | A | 133.8 | - | - | 15:32 | 15:58 | 2.5 | 11.3 | 4.52 | - | - | - | - | - | - | |
| | | 21-May-10 | 3 | 8.99 | 9.99 | 1.00 | B | 175.0 | 308.8 | 308.8 | 15:58 | 16:43 | 2.5 | 0.2 | 0.07 | 36.0 | - | 1.7 | 10.1 | 6.3 | 12.1 | |
| | | 21-May-10 | 2 | 9.99 | 14.4 | 4.41 | A | 22.4 | 22.4 | 5.1 | 15:16 | 15:28 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+629 | S | 08-Jun-10 | 4 | 6.84 | 8.34 | 1.50 | A | 150.0 | - | - | 4:36 | 4:52 | 2.1 | 13.5 | 4.22 | 31.7 | - | 1.7 | 3.0 | 7.0 | 14.0 | |
| | | 08-Jun-10 | 4 | 6.84 | 8.34 | 1.50 | B | 166.1 | - | - | 4:52 | 5:07 | 2.6 | 14.6 | 3.32 | 36.0 | - | 1.7 | 3.0 | 7.0 | 15.0 | |
| | | 08-Jun-10 | 4 | 6.84 | 8.34 | 1.50 | C | 77.2 | - | - | 5:07 | 5:38 | 2.6 | 0.2 | 0.05 | 48.5 | - | 1.6 | 3.0 | 7.0 | 15.0 | |
| | | 08-Jun-10 | 4 | 6.8 | 8.3 | 1.50 | A | 168.0 | - | - | 20:29 | 20:43 | 1.8 | 13.8 | 5.56 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 4 | 6.8 | 8.3 | 1.50 | B | 166.2 | - | - | 20:43 | 20:55 | 2.4 | 16.3 | 4.03 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 4 | 6.8 | 8.3 | 1.50 | C | 89.3 | 816.8 | 544.5 | 20:55 | 21:27 | 2.6 | 0.6 | 0.15 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.93 | 9.93 | 1.00 | A | 191.2 | - | - | 3:28 | 3:51 | 1.9 | 12.6 | 6.32 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.93 | 9.93 | 1.00 | B | 143.5 | - | - | 3:51 | 4:01 | 2.6 | 13.6 | 8.21 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.93 | 9.93 | 1.00 | C | 169.1 | - | - | 4:01 | 4:16 | 3.0 | 2.6 | 4.66 | - | - | - | - | - | - | |
| | | 15-May-10 | 3 | 8.93 | 9.93 | 1.00 | D | 148.9 | 652.7 | 652.7 | 4:16 | 5:20 | 3.0 | 0.6 | 0.20 | - | - | - | - | - | - | |
| | | 15-May-10 | 2 | 9.93 | 14.3 | 4.37 | A | 24.3 | 24.3 | 5.6 | 3:13 | 3:25 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+630.5 | T | 15-Jun-10 | 4 | 6.69 | 8.19 | 1.50 | MF | 132.9 | 132.9 | 88.6 | 4:06 | 4:28 | 1.9 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 21-May-10 | 3 | 8.79 | 9.79 | 1.00 | A | 193.5 | 193.5 | 193.5 | 20:29 | 21:36 | 2.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 9.79 | 13.9 | 4.11 | A | 24.5 | 24.5 | 6.0 | 20:09 | 20:22 | 2.0 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-30+632 | P | 08-Jun-10 | 4 | 6.59 | 8.09 | 1.50 | A | 141.7 | - | - | 20:07 | 20:25 | 1.1 | 0.0 | 0.00 | - | - | - | - | - | - | Communicated Around Casing S-30+647 Re-Injected With Mix C To Avoid Communication |
| | | 08-Jun-10 | 4 | 6.59 | 8.09 | 1.50 | C | 73.6 | 215.3 | 143.5 | 22:53 | 23:13 | 2.5 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 03-May-10 | 3 | 8.74 | 9.74 | 1.00 | A | 4.1 | 4.1 | 4.1 | 10:37 | 10:49 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 03-May-10 | 2 | 9.74 | 13.7 | 3.96 | A | 280.0 | - | - | 9:12 | 9:44 | 0.8 | 15.4 | 5.01 | - | - | - | - | - | - | |
| | | 03-May-10 | 2 | 9.74 | 13.7 | 3.96 | B | 456.0 | - | - | 9:44 | 10:14 | 2.0 | 23.4 | 3.65 | 36.0 | 4.0 | 1.7 | 7.0 | 9.0 | 13.0 | |
| | | 03-May-10 | 2 | 9.74 | 13.7 | 3.96 | C | 125.0 | 861.0 | 217.4 | 10:14 | 10:35 | 2.1 | 0.0 | 0.00 | 46.0 | 1.0 | 1.7 | 17.0 | 9.0 | 20.0 | |
| | | 03-May-10 | 1 | 13.7 | 18.9 | 5.20 | A | 20.1 | 20.1 | 3.9 | 8:56 | 9:09 | 4.8 | 0.2 | 0.01 | 32.0 | 4.0 | 1.6 | 5.0 | 8.0 | 12.0 | |
| T-30+633.5 | T | 15-Jun-10 | 4 | 6.9 | 8.4 | 1.50 | MF | 25.0 | 25.0 | 16.7 | 3:45 | 4:02 | 2.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 21-May-10 | 3 | 9.02 | 10.02 | 1.00 | A | 23.9 | 23.9 | 23.9 | 22:05 | 22:20 | 2.0 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 10.02 | 14.2 | 4.18 | A | 20.6 | 20.6 | 4.9 | 21:46 | 22:00 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+635 | S | 08-Jun-10 | 4 | 6.77 | 8.27 | 1.50 | C | 86.3 | 86.3 | 57.5 | 23:48 | 0:14 | 2.4 | 0.3 | 0.08 | - | - | - | - | - | - | Re-Injected With Mix C |
| | | 16-May-10 | 3 | 8.92 | 9.92 | 1.00 | A | 140.2 | - | - | 8:23 | 8:49 | 2.3 | 10.1 | 7.20 | - | - | - | - | - | - | To Avoid Communication |
| | | 16-May-10 | 3 | 8.92 | 9.92 | 1.00 | B | 213.7 | - | - | 8:49 | 9:13 | 2.9 | 35.2 | 10.99 | 38.1 | 3.0 | 1.7 | 13.7 | 8.5 | 17.0 | |
| | | 16-May-10 | 3 | 8.92 | 9.92 | 1.00 | C | 113.9 | - | - | 9:13 | 9:19 | 3.1 | 6.0 | 2.27 | 50.4 | 2.0 | 1.6 | 13.9 | 8.7 | 16.3 | |
| | | 16-May-10 | 3 | 8.92 | 9.92 | 1.00 | D | 74.1 | 541.9 | 541.9 | 9:19 | 10:05 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-10 | 2 | 9.92 | 14.2 | 4.28 | A | 24.8 | 24.8 | 5.8 | 8:02 | 8:20 | 2.0 | 0.0 | 0.00 | 32.2 | 4.0 | 1.6 | 13.3 | 7.0 | 10.3 | |
| T-30+636.5 | T | 15-Jun-10 | 4 | 6.84 | 8.34 | 1.50 | MF | 234.2 | 234.2 | 156.1 | 3:09 | 3:42 | 2.2 | 0.2 | 0.05 | 30.5 | 4.0 | 1.4 | 11.0 | 9.0 | 14.0 | Communicated To T-30+642.5, T-30+645.5 |
| | | 21-May-10 | 3 | 8.94 | 9.94 | 1.00 | A | 170.5 | - | - | 22:52 | 23:12 | 2.1 | 8.3 | 3.74 | - | - | - | - | - | - | |
| | | 21-May-10 | 3 | 8.94 | 9.94 | 1.00 | B | 193.2 | - | - | 23:12 | 0:04 | 2.2 | 10.4 | 4.50 | - | - | - | - | - | - | |
| | | 21-May-10 | 3 | 8.94 | 9.94 | 1.00 | C | 110.8 | 474.5 | 474.5 | 0:04 | 0:41 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 9.94 | 14.1 | 4.16 | A | 24.5 | 24.5 | 5.9 | 22:34 | 22:47 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+638 | P | 08-Jun-10 | 4 | 6.81 | 8.31 | 1.50 | C | 107.9 | 107.9 | 71.9 | 0:20 | 0:55 | 2.5 | 0.3 | 0.07 | - | - | - | - | - | - | Re-Injected With Mix C |
| | | 03-May-10 | 3 | 8.92 | 9.92 | 1.00 | A | 334.0 | - | - | 14:21 | 15:34 | 3.1 | 2.4 | 0.85 | - | - | - | - | - | - | To Avoid Communication |
| | | 03-May-10 | 3 | 8.92 | 9.92 | 1.00 | B | 21.8 | 355.8 | 355.8 | 15:34 | 16:20 | 3.0 | 0.6 | 0.19 | - | - | - | - | - | - | |
| | | 03-May-10 | 2 | 9.92 | 13.9 | 3.98 | A | 10.6 | 10.6 | 2.7 | 14:03 | 14:16 | 2.0 | 0.0 | 0.00 | 31.0 | - | 1.6 | 11.0 | 10.0 | 16.0 | |
| | | 03-May-10 | 1 | 13.9 | 18.9 | 5.00 | A | 24.6 | 24.6 | 4.9 | 10:58 | 11:10 | 4.6 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-30+639.5 | T | 15-Jun-10 | 4 | 6.65 | 8.15 | 1.50 | MF | 19.8 | 19.8 | 13.2 | 0:29 | 0:43 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 21-May-10 | 3 | 8.74 | 9.74 | 1.00 | A | 170.0 | - | - | 3:14 | 3:40 | 2.5 | 5.7 | 2.14 | - | - | - | - | - | - | |
| | | 21-May-10 | 3 | 8.74 | 9.74 | 1.00 | B | 270.0 | 440.0 | 440.0 | 3:40 | 4:40 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 9.74 | 13.9 | 4.16 | A | 22.2 | 22.2 | 5.3 | 2:55 | 3:08 | 2.1 | 0.2 | 0.02 | - | - | - | - | - | - | |
| S-30+641 | S | 08-Jun-10 | 4 | 6.58 | 8.08 | 1.50 | C | 81.6 | 154.6 | 103.1 | 1:00 | 1:25 | 2.5 | 0.5 | 0.13 | - | - | - | - | - | - | Re-Injected With Mix C |
| | | 08-Jun-10 | 4 | 6.58 | 8.08 | 1.50 | A | 73.0 | - | - | 17:40 | 17:54 | 1.2 | 3.7 | 2.10 | - | - | - | - | - | - | To Avoid Communication |
| | | 16-May-10 | 3 | 8.69 | 9.69 | 1.00 | A | 163.3 | - | - | 10:53 | 11:17 | 2.5 | 13.9 | 5.07 | - | - | - | - | - | - | Communicated To Surface |
| | | 16-May-10 | 3 | 8.69 | 9.69 | 1.00 | B | 60.6 | 223.9 | 223.9 | 11:17 | 11:37 | 2.8 | 0.0 | 0.01 | - | - | - | - | - | - | Near S-30+647 at 73.0 L |
| | | 16-May-10 | 2 | 9.69 | 14 | 4.31 | A | 25.7 | 25.7 | 6.0 | 10:29 | 10:47 | 1.8 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-30+642.5 | T | 15-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | MF | 254.9 | - | - | 22:34 | 23:04 | 1.8 | 3.5 | 1.09 | - | - | - | - | - | - | |
| | | 15-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | A | 174.2 | - | - | 23:04 | 23:29 | 2.0 | 0.5 | 0.64 | 32.5 | 3.4 | 1.7 | 11.0 | 9.0 | 16.0 | |
| | | 15-Jun-10 | 4 | 6.4 | 7.9 | 1.50 | B | 44.9 | 474.0 | 316.0 | 23:29 | 0:21 | 1.8 | 0.2 | 0.08 | 37.6 | 4.4 | 1.6 | 11.0 | 9.0 | 17.0 | |
| | | 21-May-10 | 3 | 8.49 | 9.49 | 1.00 | A | 49.8 | 49.8 | 49.8 | 5:17 | 5:48 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 9.49 | 13.5 | 4.01 | A | 20.1 | 20.1 | 5.0 | 4:55 | 5:10 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-30+643.25 | Q | 03-Jul-10 | 4 | 6.32 | 7.82 | 1.50 | MF | 108.9 | 108.9 | 72.6 | 9:46 | 10:22 | 2.2 | 0.0 | 0.00 | 31.3 | 6.0 | 1.5 | 12.8 | 8.9 | 12.0 | |
| | | 25-Jun-10 | 3 | 8.69 | 9.8 | 1.11 | MF | 236.1 | - | - | 16:29 | 17:04 | 1.8 | 13.6 | 6.10 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 3 | 8.69 | 9.8 | 1.11 | A | 167.8 | - | - | 17:04 | 17:15 | 2.1 | 14.0 | 7.37 | 34.1 | - | 1.6 | 7.9 | 6.0 | 17.3 | |
| | | 25-Jun-10 | 3 | 8.69 | 9.8 | 1.11 | B | 151.1 | - | - | 17:15 | 17:53 | 2.5 | 2.3 | 0.86 | 39.0 | - | 1.7 | 7.8 | 6.2 | 17.2 | |
| | | 25-Jun-10 | 3 | 8.69 | 9.8 | 1.11 | C | 92.4 | - | - | 17:53 | 18:29 | 2.7 | 7.3 | 1.84 | 44.2 | - | - | - | - | - | |
| | | 25-Jun-10 | 3 | 8.69 | 9.8 | 1.11 | D | 26.2 | 673.6 | 606.8 | 18:29 | 18:47 | 2.5 | 0.1 | 0.05 | 58.7 | - | - | - | - | - | |
| P-30+644 | P | 08-Jun-10 | 4 | 6.32 | 7.82 | 1.50 | A | 195.2 | - | - | 16:25 | 16:52 | 2.7 | 15.1 | 4.40 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 4 | 6.32 | 7.82 | 1.50 | B | 201.6 | - | - | 16:52 | 17:20 | 2.6 | 11.5 | 2.40 | 37.4 | - | 1.7 | 10.3 | 10.1 | 15.3 | Communicated Around |
| | | 08-Jun-10 | 4 | 6.32 | 7.82 | 1.50 | C | 103.0 | 499.8 | 333.2 | 17:20 | 17:29 | 1.7 | 18.2 | 7.07 | - | - | - | - | - | - | Casing S-30+647 at 499.8 L |
| | | 09-Jun-10 | 4 | 6.32 | 7.82 | 1.50 | C | 75.9 | - | - | 1:30 | 1:43 | 2.6 | 5.5 | 1.39 | - | - | - | - | - | - | Re-Injected With Mix C |
| | | 09-Jun-10 | 4 | 6.32 | 7.82 | 1.50 | D | 21.0 | 96.9 | 64.6 | 1:43 | 2:01 | 2.5 | 0.4 | 0.10 | - | - | - | - | - | - | To Avoid Communication |
| | | 03-May-10 | 3 | 8.64 | 9.64 | 1.00 | A | 34.7 | 34.7 | 34.7 | 17:09 | 17:30 | 3.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 03-May-10 | 2 | 9.64 | 13.6 | 3.96 | A | 28.3 | 28.3 | 7.1 | 16:51 | 17:06 | 2.1 | 0.5 | 0.06 | - | - | - | - | - | - | |
| | | 03-May-10 | 1 | 13.6 | 18.8 | 5.20 | A | 21.8 | 21.8 | 4.2 | 16:34 | 16:47 | 4.8 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-30+645.5 | T | 15-Jun-10 | 4 | 6.66 | 8.16 | 1.50 | MF | 180.3 | 180.3 | 120.2 | 21:41 | 22:23 | 1.9 | 0.4 | 0.13 | - | - | - | - | - | - | Communicated To T-30+648.5 |
| | | 22-May-10 | 3 | 8.46 | 9.46 | 1.00 | A | 160.6 | - | - | 8:03 | 8:49 | 1.7 | 2.7 | 1.72 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 8.46 | 9.46 | 1.00 | B | 128.7 | 289.3 | 289.3 | 8:49 | 10:02 | 2.4 | 0.1 | 0.07 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 9.46 | 13.5 | 4.04 | A | 23.6 | 23.6 | 5.8 | 7:44 | 7:56 | 2.0 | 0.0 | 0.00 | 32.0 | 4.5 | 1.6 | 11.9 | 6.7 | 9.8 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+647 | S | 08-Jun-10 | 4 | 6.61 | 8.11 | 1.50 | A | 222.0 | - | - | 14:28 | 14:52 | 2.3 | 14.8 | 4.28 | 32.3 | - | 1.6 | 13.0 | 12.0 | 15.0 | |
| | | 08-Jun-10 | 4 | 6.61 | 8.11 | 1.50 | B | 327.8 | 549.8 | 366.5 | 14:52 | 16:19 | 2.4 | 0.4 | 0.10 | 33.0 | 4.0 | 1.7 | 10.4 | 9.8 | 14.5 | |
| | | 16-May-10 | 3 | 8.71 | 9.71 | 1.00 | A | 161.8 | - | - | 16:17 | 16:37 | 1.9 | 15.5 | 6.69 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.71 | 9.71 | 1.00 | B | 213.1 | - | - | 16:37 | 16:49 | 2.8 | 18.6 | 7.30 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.71 | 9.71 | 1.00 | C | 206.2 | 581.1 | 581.1 | 16:49 | 17:48 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-10 | 2 | 9.71 | 14.8 | 5.09 | A | 28.5 | 28.5 | 5.6 | 15:28 | 16:13 | 1.6 | 0.1 | 0.01 | - | - | - | - | - | - | |
| Q-20+647.75 | Q | 25-Oct-12 | 3 | 7.76 | 8.76 | 1.00 | A | 104.5 | 104.5 | 104.5 | -- | -- | 3.0 | -- | 0.00 | -- | -- | -- | -- | -- | -- | |
| T-30+648.5 | T | 15-Jun-10 | 4 | 6.38 | 7.88 | 1.50 | MF | 141.9 | 141.9 | 94.6 | 21:14 | 21:39 | 1.9 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 8.71 | 9.71 | 1.00 | A | 164.9 | - | - | 10:45 | 11:10 | 2.5 | 12.6 | 4.83 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 8.71 | 9.71 | 1.00 | B | 227.5 | - | - | 11:10 | 12:09 | 2.6 | 1.0 | 0.42 | 34.5 | 2.0 | 1.7 | 14.5 | 6.9 | 13.0 | |
| | | 22-May-10 | 3 | 8.71 | 9.71 | 1.00 | C | 10.2 | 402.6 | 402.6 | 12:09 | 12:36 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 9.71 | 13.8 | 4.09 | A | 20.8 | 20.8 | 5.1 | 10:26 | 10:38 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+650 | P | 08-Jun-10 | 4 | 6.54 | 8.04 | 1.50 | A | 281.9 | - | - | 10:39 | 11:11 | 2.1 | 15.8 | 4.93 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 4 | 6.54 | 8.04 | 1.50 | B | 96.7 | - | - | 11:11 | 11:17 | 2.5 | 19.1 | 5.06 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 4 | 6.54 | 8.04 | 1.50 | C | 112.6 | 491.2 | 327.5 | 11:17 | 11:55 | 2.6 | 0.8 | 0.20 | - | - | - | - | - | - | |
| | | 03-May-10 | 3 | 8.45 | 9.45 | 1.00 | A | 160.4 | - | - | 0:12 | 0:40 | - | - | - | - | - | - | - | - | - | Communicated To P-30+656 |
| | | 03-May-10 | 3 | 8.45 | 9.45 | 1.00 | B | 200.3 | - | - | 0:40 | 0:55 | - | - | - | 35.5 | 2.0 | 1.6 | 15.0 | 10.0 | 17.0 | |
| | | 03-May-10 | 3 | 8.45 | 9.45 | 1.00 | C | 159.6 | - | - | 0:55 | 1:06 | - | - | - | 45.6 | 2.0 | 1.8 | 14.0 | 10.0 | 18.0 | |
| | | 03-May-10 | 3 | 8.45 | 9.45 | 1.00 | D | 479.7 | 1000.0 | 1000.0 | 1:06 | 1:30 | 3.1 | 23.5 | 7.47 | 66.1 | 1.0 | 1.7 | 2.0 | 10.0 | 15.0 | |
| | | 03-May-10 | 2 | 9.45 | 13.4 | 3.95 | A | 7.4 | 7.4 | 1.9 | 23:59 | 0:08 | 2.0 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 03-May-10 | 1 | 13.4 | 18.6 | 5.20 | A | 23.7 | 23.7 | 4.6 | 23:36 | 23:50 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-20+650.75 | Q | 25-Oct-12 | 3 | 7.76 | 8.76 | 1.00 | A | 2.6 | 2.6 | 2.6 | -- | -- | 3.1 | -- | 0.01 | -- | -- | -- | -- | -- | -- | |
| T-30+651.5 | T | 15-Jun-10 | 4 | 6.42 | 7.92 | 1.50 | MF | 105.7 | 105.7 | 70.5 | 20:42 | 21:06 | 2.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 8.51 | 9.51 | 1.00 | A | 15.3 | 15.3 | 15.3 | 14:55 | 15:14 | 2.6 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 9.51 | 13.6 | 4.09 | A | 24.5 | 24.5 | 6.0 | 14:36 | 14:48 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+653 | S | 21-Jun-10 | 4 | 5.97 | 7.47 | 1.50 | MF | 101.2 | 101.2 | 67.5 | 19:58 | 20:19 | 2.7 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.21 | 9.21 | 1.00 | A | 23.8 | 23.8 | 23.8 | 19:51 | 20:09 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-10 | 2 | 9.21 | 13.7 | 4.49 | A | 28.8 | 28.8 | 6.4 | 19:33 | 19:49 | 1.9 | 0.0 | 0.00 | 31.7 | - | 1.7 | -3.5 | 8.3 | 15.1 | |
| Q-20+653.75 | Q | 25-Oct-12 | 3 | 7.31 | 8.31 | 1.00 | A | 74.8 | 74.8 | 74.8 | -- | -- | 3.0 | -- | 0.01 | -- | -- | -- | -- | -- | -- | |
| T-30+654.5 | T | 15-Jun-10 | 4 | 5.82 | 7.32 | 1.50 | MF | 85.1 | 85.1 | 56.7 | 19:09 | 19:33 | 2.0 | 0.0 | 0.00 | 30.8 | - | 1.5 | 8.0 | 11.0 | 15.0 | |
| | | 22-May-10 | 3 | 8.05 | 9.05 | 4.25 | A | 15.0 | 15.0 | 3.5 | 15:42 | 15:59 | 2.4 | - | 0.02 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 9.05 | 13.3 | 4.25 | A | 14.3 | 14.3 | 3.4 | 15:24 | 15:37 | 2.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-30+656 | P | 08-Jun-10 | 4 | 5.5 | 7 | 1.50 | A | 168.7 | - | - | 9:46 | 10:16 | 2.2 | 11.3 | 3.30 | - | - | - | - | - | - | |
| | | 08-Jun-10 | 4 | 5.5 | 7 | 1.50 | B | 42.5 | 211.2 | 140.8 | 10:16 | 10:20 | 2.1 | 10.3 | 3.21 | - | - | - | - | - | - | By-Pass Around Casing S-30+659 at 211.2 L |
| | | 03-May-10 | 3 | 7.67 | 8.67 | 1.00 | A | 184.1 | - | - | 3:30 | 4:13 | - | - | - | - | - | - | - | - | - | |
| | | 03-May-10 | 3 | 7.67 | 8.67 | 1.00 | B | 295.2 | - | - | 4:13 | 4:31 | - | - | - | 37.3 | - | 1.6 | 1.0 | 10.0 | 15.0 | |
| | | 03-May-10 | 3 | 7.67 | 8.67 | 1.00 | C | 150.9 | - | - | 4:31 | 4:39 | - | - | - | - | - | - | - | - | - | |
| | | 03-May-10 | 3 | 7.67 | 8.67 | 1.00 | D | 369.8 | 1000.0 | 1000.0 | 4:39 | 5:25 | 2.7 | 7.8 | 2.84 | 65.7 | - | 1.7 | 2.0 | 10.0 | 16.0 | |
| | | 03-May-10 | 2 | 8.67 | 17.8 | 9.13 | A | 0.9 | 0.9 | 0.1 | 3:36 | 3:48 | 2.2 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-30+657.5 | T | 15-Jun-10 | 4 | 5.32 | 6.82 | 1.50 | MF | 73.2 | 73.2 | 48.8 | 17:18 | 18:08 | 2.0 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 7.61 | 8.61 | 1.00 | A | 12.8 | 12.8 | 12.8 | 17:00 | 17:18 | 2.5 | 0.0 | 0.00 | 30.0 | 2.0 | 1.6 | 13.7 | 7.3 | 11.9 | |
| | | 22-May-10 | 2 | 8.61 | 12.7 | 4.09 | A | 23.9 | 23.9 | 5.8 | 16:18 | 16:30 | 2.0 | 0.6 | 0.07 | - | - | - | - | - | - | |
| S-30+659 | S | 08-Jun-10 | 4 | 5.95 | 7.45 | 1.50 | A | 188.2 | - | - | 7:18 | 7:48 | 2.4 | 8.4 | 2.54 | 31.4 | 4.0 | 1.6 | 10.5 | 11.0 | 13.2 | |
| | | 08-Jun-10 | 4 | 5.95 | 7.45 | 1.50 | B | 351.8 | - | - | 7:48 | 9:04 | 2.6 | 8.5 | 2.36 | 38.0 | 3.0 | 1.6 | 10.5 | 11.2 | 14.1 | |
| | | 08-Jun-10 | 4 | 5.95 | 7.45 | 1.50 | C | 43.0 | 583.0 | 388.7 | 9:04 | 9:35 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.07 | 9.07 | 1.00 | A | 143.8 | - | - | 20:35 | 20:54 | 1.9 | 12.7 | 6.03 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.07 | 9.07 | 1.00 | B | 178.0 | - | - | 20:54 | 21:08 | 3.0 | 12.2 | 3.86 | 35.5 | 5.0 | 1.7 | -3.3 | 8.1 | 13.2 | |
| | | 16-May-10 | 3 | 8.07 | 9.07 | 1.00 | C | 67.1 | 388.9 | 388.9 | 21:08 | 21:36 | 3.1 | 0.0 | 0.01 | 41.3 | 3.0 | 1.6 | -3.1 | 8.1 | 12.6 | |
| | | 16-May-10 | 2 | 9.07 | 12.7 | 3.63 | A | 22.0 | 22.0 | 6.1 | 20:20 | 20:31 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+660.5 | T | 15-Jun-10 | 4 | 5.68 | 7.18 | 1.50 | MF | 78.0 | 78.0 | 52.0 | 16:44 | 17:13 | 2.0 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 7.91 | 8.91 | 1.00 | A | 161.7 | - | - | 17:56 | 18:24 | 2.1 | 12.2 | 5.49 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 7.91 | 8.91 | 1.00 | B | 335.2 | 496.9 | 496.9 | 18:24 | 19:45 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 8.91 | 13.9 | 4.99 | A | 22.1 | 22.1 | 4.4 | 17:36 | 17:48 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+662 | P | 07-Jun-10 | 4 | 5.65 | 7.15 | 1.50 | A | 142.1 | - | - | 4:48 | 5:05 | 2.5 | 20.0 | 3.80 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 5.65 | 7.15 | 1.50 | B | 123.5 | 265.6 | 177.1 | 5:05 | 5:43 | 2.6 | 1.1 | 0.25 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 7.89 | 8.89 | 1.00 | A | 190.0 | - | - | 6:24 | 7:10 | 0.0 | 14.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 7.89 | 8.89 | 1.00 | B | 144.0 | - | - | 7:10 | 7:20 | 0.0 | 10.0 | 0.00 | 34.0 | 5.0 | 1.6 | 2.0 | 17.0 | 12.0 | |
| | | 04-May-10 | 3 | 7.89 | 8.89 | 1.00 | C | 231.0 | - | - | 7:20 | 7:33 | 0.0 | 10.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 7.89 | 8.89 | 1.00 | D | 443.0 | 1008.0 | 1008.0 | 7:33 | 7:55 | 2.4 | 21.6 | 9.12 | - | - | - | - | - | - | |
| | | 04-May-10 | 2 | 8.89 | 12.9 | 4.01 | A | 2.0 | 2.0 | 0.5 | 6:09 | 6:20 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-10 | 1 | 12.9 | 18 | 5.10 | A | 23.2 | 23.2 | 4.5 | 5:47 | 6:01 | 4.4 | 0.0 | 0.00 | 32.1 | - | 1.6 | 3.0 | 10.0 | 15.0 | |
| T-30+663.5 | T | 15-Jun-10 | 4 | 5.86 | 7.36 | 1.50 | MF | 20.1 | 20.1 | 13.4 | 16:17 | 16:39 | 2.0 | 0.5 | 0.18 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 8.08 | 9.08 | 1.00 | A | 159.0 | 159.0 | 159.0 | 20:46 | 22:00 | 2.5 | 0.6 | 0.23 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 9.08 | 13.1 | 4.02 | A | 21.4 | 21.4 | 5.3 | 20:23 | 20:38 | 2.1 | 0.0 | 0.00 | 30.2 | 5.0 | 1.6 | 12.0 | 7.8 | 17.3 | |
| S-30+665 | S | 07-Jun-10 | 4 | 5.99 | 7.49 | 1.50 | A | 153.5 | - | - | 3:32 | 3:53 | 2.5 | 11.9 | 2.75 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 5.99 | 7.49 | 1.50 | B | 107.6 | 261.1 | 174.1 | 3:53 | 4:42 | 2.5 | 0.9 | 0.24 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.13 | 9.13 | 1.00 | A | 169.9 | - | - | 22:21 | 22:49 | 0.0 | 13.6 | inf | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.13 | 9.13 | 1.00 | B | 170.9 | - | - | 22:49 | 23:03 | 2.8 | 18.9 | 2.84 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.13 | 9.13 | 1.00 | C | 114.2 | 455.0 | 455.0 | 23:03 | 23:43 | 3.4 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 16-May-10 | 2 | 9.13 | 13.5 | 4.37 | A | 22.0 | 22.0 | 5.0 | 22:03 | 22:18 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+666.5 | T | 15-Jun-10 | 4 | 5.98 | 7.48 | 1.50 | MF | 123.6 | 123.6 | 82.4 | 14:50 | 16:11 | 2.0 | 0.2 | 0.06 | 33.3 | 3.0 | 1.4 | 9.4 | 13.4 | 14.9 | |
| | | 22-May-10 | 3 | 8.13 | 9.13 | 1.00 | A | 165.2 | - | - | 22:41 | 22:54 | 1.4 | 11.3 | 7.87 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 8.13 | 9.13 | 1.00 | B | 170.3 | - | - | 22:54 | 23:09 | 2.4 | 14.7 | 6.43 | 36.0 | 2.0 | 1.7 | 12.0 | 8.0 | 19.0 | |
| | | 22-May-10 | 3 | 8.13 | 9.13 | 1.00 | C | 321.1 | 656.6 | 656.6 | 23:09 | 0:06 | 2.5 | 0.0 | 0.01 | 47.0 | 2.0 | 1.7 | 12.0 | 8.0 | 18.4 | |
| | | 22-May-10 | 2 | 9.13 | 13.2 | 4.07 | A | 22.9 | 22.9 | 5.6 | 22:17 | 22:32 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+668 | P | 07-Jun-10 | 4 | 6.33 | 7.83 | 1.50 | A | 29.5 | 29.5 | 19.7 | 3:14 | 3:26 | 2.4 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.42 | 9.42 | 1.00 | A | 194.0 | - | - | 9:56 | 10:20 | 1.1 | 16.8 | 16.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.42 | 9.42 | 1.00 | B | 142.0 | - | - | 10:20 | 10:30 | 1.4 | 15.3 | 10.74 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.42 | 9.42 | 1.00 | C | 105.0 | - | - | 10:30 | 10:36 | 1.7 | 17.5 | 9.06 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.42 | 9.42 | 1.00 | D | 277.0 | 718.0 | 718.0 | 10:36 | 11:33 | 3.1 | 0.0 | 0.01 | 46.0 | 2.0 | 1.7 | 6.0 | 10.0 | 15.0 | |
| | | 04-May-10 | 2 | 9.42 | 13.4 | 3.98 | A | 22.4 | 22.4 | 5.6 | 9:39 | 9:53 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 1 | 13.4 | 18.8 | 5.40 | A | 20.8 | 20.8 | 3.9 | 9:22 | 9:36 | 4.8 | 0.0 | 0.00 | 33.0 | 4.0 | 1.6 | 4.0 | 10.0 | 11.0 | |
| T-30+669.5 | T | 15-Jun-10 | 4 | 7.11 | 8.61 | 1.50 | MF | 53.8 | 53.8 | 35.9 | 10:46 | 11:28 | 2.0 | 0.8 | 0.27 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 9.12 | 10.12 | 1.00 | A | 85.5 | 85.5 | 85.5 | 2:55 | 3:38 | 2.5 | 0.5 | 0.20 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 10.12 | 14.4 | 4.28 | A | 24.8 | 24.8 | 5.8 | 2:00 | 2:47 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+671 | S | 07-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | A | 156.8 | - | - | 2:10 | 2:27 | 2.7 | 10.9 | 2.72 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | B | 89.9 | 246.7 | 164.5 | 2:27 | 3:07 | 2.5 | 0.6 | 0.16 | 36.2 | - | 1.7 | 4.0 | 9.0 | 15.0 | |
| | | 12-May-10 | 3 | 8.31 | 9.31 | 1.00 | A | 120.5 | - | - | 7:37 | 7:55 | 2.2 | 12.8 | 5.75 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.31 | 9.31 | 1.00 | B | 272.2 | - | - | 7:55 | 8:11 | 2.7 | 21.2 | 7.18 | 37.0 | 4.5 | 1.6 | 12.3 | 6.8 | 13.9 | |
| | | 12-May-10 | 3 | 8.31 | 9.31 | 1.00 | C | 210.4 | 603.1 | 603.1 | 8:11 | 8:41 | 2.9 | 0.8 | 0.29 | 45.0 | - | 1.7 | 18.8 | 6.9 | 15.1 | |
| | | 12-May-10 | 2 | 9.31 | 13.8 | 4.49 | A | 29.5 | 29.5 | 6.6 | 7:13 | 7:27 | 2.0 | 0.2 | 0.02 | 32.0 | 5.5 | 1.6 | 12.2 | 6.9 | 14.4 | |
| T-30+672.5 | T | 15-Jun-10 | 4 | 6.22 | 8.22 | 2.00 | MF | 63.2 | 63.2 | 31.6 | 10:02 | 10:41 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 8.79 | 9.79 | 1.00 | A | 176.1 | 176.1 | 176.1 | 4:17 | 5:06 | 2.6 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 9.79 | 13.8 | 4.01 | A | 23.5 | 23.5 | 5.9 | 3:55 | 4:09 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+674 | P | 07-Jun-10 | 4 | 6.48 | 8.48 | 2.00 | A | 141.7 | 141.7 | 70.9 | 1:24 | 2:05 | 2.5 | 0.0 | 0.00 | 33.0 | - | 1.7 | 5.0 | 9.0 | 15.0 | |
| | | 04-May-10 | 3 | 9.12 | 10.12 | 1.00 | A | 88.2 | 88.2 | 88.2 | 13:54 | 14:27 | 3.3 | 0.0 | 0.01 | 32.0 | - | 1.6 | 4.0 | 8.0 | 12.0 | |
| | | 04-May-10 | 2 | 10.12 | 14.6 | 4.48 | A | 20.8 | 20.8 | 4.6 | 13:37 | 13:51 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+675.5 | T | 15-Jun-10 | 4 | 6.41 | 8.41 | 2.00 | MF | 66.6 | 66.6 | 33.3 | 8:47 | 9:40 | 2.0 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 22-May-10 | 3 | 9.04 | 10.04 | 1.00 | A | 24.5 | 24.5 | 24.5 | 5:43 | 5:58 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 10.04 | 14.4 | 4.36 | A | 27.4 | 27.4 | 6.3 | 5:23 | 5:36 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+677 | S | 07-Jun-10 | 4 | 6.83 | 8.33 | 1.50 | A | 197.2 | - | - | 21:38 | 22:15 | 2.5 | 8.5 | 2.16 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 6.83 | 8.33 | 1.50 | B | 103.0 | 300.2 | 200.1 | 22:15 | 22:57 | 2.5 | 0.9 | 0.23 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.97 | 9.97 | 1.00 | A | 139.4 | - | - | 4:34 | 4:54 | 2.1 | 11.3 | 5.63 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.97 | 9.97 | 1.00 | B | 174.7 | - | - | 4:54 | 5:07 | 2.4 | 15.2 | 6.41 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.97 | 9.97 | 1.00 | C | 187.3 | - | - | 5:07 | 5:22 | 3.0 | 17.6 | 6.09 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.97 | 9.97 | 1.00 | D | 257.4 | 758.8 | 758.8 | 5:22 | 6:44 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 11-May-10 | 2 | 9.97 | 14.3 | 4.33 | A | 4.7 | 4.7 | 1.1 | 4:17 | 4:31 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+678.5 | T | 15-Jun-10 | 4 | 6.7 | 8.2 | 1.50 | MF | 56.7 | 56.7 | 37.8 | 7:56 | 8:40 | 2.1 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 23-May-10 | 3 | 8.82 | 9.82 | 1.00 | A | 151.3 | - | - | 8:17 | 8:46 | 2.5 | 7.0 | 2.64 | - | - | - | - | - | - | |
| | | 23-May-10 | 3 | 8.82 | 9.82 | 1.00 | B | 169.0 | 320.3 | 320.3 | 8:46 | 9:51 | 2.4 | 0.3 | 0.14 | 34.0 | 4.5 | 1.6 | 15.3 | 10.9 | 15.1 | |
| | | 23-May-10 | 2 | 9.82 | 14 | 4.18 | A | 23.1 | 23.1 | 5.5 | 7:58 | 8:10 | 2.0 | 0.0 | 0.00 | 30.0 | 4.5 | 1.6 | 15.3 | 10.9 | 14.1 | |
| P-30+680 | P | 07-Jun-10 | 4 | 6.78 | 8.28 | 1.50 | A | 18.8 | 18.8 | 12.5 | 21:16 | 21:32 | 2.8 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.92 | 9.92 | 1.00 | A | 235.0 | - | - | 14:52 | 15:20 | 1.4 | 18.0 | 12.49 | 36.0 | - | - | - | - | 12.0 | |
| | | 04-May-10 | 3 | 8.92 | 9.92 | 1.00 | B | 190.0 | - | - | 15:20 | 15:29 | 1.8 | 23.1 | 12.63 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.92 | 9.92 | 1.00 | C | 175.0 | - | - | 15:29 | 15:37 | 1.9 | 21.0 | 10.65 | 38.0 | 4.0 | 1.7 | 4.0 | 8.0 | 11.0 | |
| | | 04-May-10 | 3 | 8.92 | 9.92 | 1.00 | D | 355.0 | 955.0 | 955.0 | 15:37 | 15:54 | 3.0 | 22.0 | 7.33 | - | - | - | - | - | - | |
| | | 04-May-10 | 2 | 9.92 | 14.4 | 4.48 | A | 21.5 | 21.5 | 4.8 | 14:37 | 14:49 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+681.5 | T | 15-Jun-10 | 4 | 6.58 | 8.08 | 1.50 | MF | 115.4 | 115.4 | 76.9 | 7:09 | 7:52 | 2.0 | 0.2 | 0.07 | 33.0 | 2.4 | 1.4 | 7.6 | 10.4 | 12.6 | Communicated To T-30+684.5 |
| | | 16-May-10 | 3 | 8.71 | 9.71 | 1.00 | A | 161.5 | - | - | 2:13 | 2:37 | 1.5 | 10.3 | 6.70 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.71 | 9.71 | 1.00 | B | 203.9 | - | - | 2:37 | 2:50 | 3.1 | 15.3 | 3.94 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.71 | 9.71 | 1.00 | C | 48.4 | 413.8 | 413.8 | 2:50 | 3:18 | 3.1 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 16-May-10 | 2 | 9.71 | 14 | 4.29 | A | 23.3 | 23.3 | 5.4 | 1:53 | 2:04 | 2.5 | 0.2 | 0.02 | - | - | - | - | - | - | |
| S-30+683 | S | 07-Jun-10 | 4 | 6.9 | 8.4 | 1.50 | A | 135.4 | - | - | 20:08 | 20:29 | 2.5 | 5.5 | 3.21 | 32.7 | 4.4 | 1.6 | 12.0 | 8.0 | 15.0 | |
| | | 07-Jun-10 | 4 | 6.9 | 8.4 | 1.50 | B | 90.5 | 225.9 | 150.6 | 20:29 | 21:06 | 2.5 | 0.6 | 0.17 | 35.8 | 7.0 | 1.6 | 13.0 | 8.0 | 16.0 | |
| | | 11-May-10 | 3 | 9.02 | 10.02 | 1.00 | A | 172.6 | - | - | 2:58 | 3:22 | 0.0 | 13.4 | 7.59 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 9.02 | 10.02 | 1.00 | B | 168.0 | - | - | 3:22 | 3:34 | 2.4 | 15.0 | 7.16 | 35.8 | - | 1.6 | 24.0 | 6.0 | 14.2 | |
| | | 11-May-10 | 3 | 9.02 | 10.02 | 1.00 | C | 163.9 | - | - | 3:34 | 3:46 | 3.0 | 6.5 | 4.33 | 44.2 | 2.4 | 1.6 | 24.0 | 6.0 | 14.3 | |
| | | 11-May-10 | 3 | 9.02 | 10.02 | 1.00 | D | 42.7 | 547.2 | 547.2 | 3:46 | 4:06 | 3.0 | 0.0 | 0.06 | 60.0 | 2.4 | 1.6 | 22.0 | 6.0 | 13.7 | |
| | | 11-May-10 | 2 | 10.02 | 14.4 | 4.38 | A | 5.0 | 5.0 | 1.1 | 2:42 | 2:56 | 2.1 | 0.2 | 0.02 | 31.8 | - | 1.6 | 17.0 | 6.0 | 14.3 | |
| T-30+684.5 | T | 14-Jun-10 | 4 | 6.83 | 8.33 | 1.50 | MF | 171.1 | 171.1 | 114.1 | 4:33 | 4:57 | 2.2 | 0.6 | 0.17 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.96 | 9.96 | 1.00 | A | 160.6 | - | - | 4:00 | 4:16 | 2.0 | 12.3 | 10.20 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.96 | 9.96 | 1.00 | B | 165.3 | - | - | 4:16 | 4:28 | 2.5 | 17.0 | 3.99 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.96 | 9.96 | 1.00 | C | 28.0 | 353.9 | 353.9 | 4:28 | 4:40 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-10 | 2 | 9.96 | 14.4 | 4.44 | A | 29.9 | 29.9 | 6.7 | 3:12 | 3:47 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+686 | P | 07-Jun-10 | 4 | 6.69 | 8.19 | 1.50 | A | 175.0 | - | - | 17:32 | 18:04 | 2.5 | 5.8 | 1.50 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 6.69 | 8.19 | 1.50 | B | 51.9 | 226.9 | 151.3 | 18:04 | 18:39 | 2.7 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.8 | 9.8 | 1.00 | A | 154.9 | - | - | 19:16 | 19:37 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.8 | 9.8 | 1.00 | B | 181.5 | - | - | 19:37 | 19:49 | 0.0 | 0.0 | 0.00 | 36.4 | 5.0 | 1.6 | 4.0 | 6.0 | 14.0 | |
| | | 04-May-10 | 3 | 8.8 | 9.8 | 1.00 | C | 219.2 | - | - | 19:49 | 20:04 | 0.0 | 0.0 | 0.00 | 46.4 | 2.0 | 1.7 | 4.0 | 6.0 | 14.0 | |
| | | 04-May-10 | 3 | 8.8 | 9.8 | 1.00 | D | 444.4 | 1000.0 | 1000.0 | 20:04 | 20:28 | 3.1 | 36.7 | 11.72 | 61.0 | - | 1.7 | 4.0 | 6.0 | 15.0 | |
| | | 04-May-10 | 2 | 9.8 | 14.3 | 4.50 | A | 4.0 | 4.0 | 0.9 | 18:58 | 19:12 | 2.1 | 0.2 | 0.02 | 31.2 | 4.0 | 1.6 | 5.0 | 6.0 | 14.0 | |
| T-30+687.5 | T | 14-Jun-10 | 4 | 6.35 | 7.85 | 1.50 | MF | 35.0 | 35.0 | 23.3 | 4:10 | 4:28 | 2.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 16-May-10 | 3 | 8.51 | 9.51 | 1.00 | A | 26.1 | 26.1 | 26.1 | 5:15 | 5:30 | 3.2 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 16-May-10 | 2 | 9.51 | 13.6 | 4.09 | A | 37.0 | 37.0 | 9.0 | 5:00 | 5:13 | 2.1 | 0.3 | 0.04 | - | - | - | - | - | - | |
| S-30+689 | S | 07-Jun-10 | 4 | 6.31 | 7.81 | 1.50 | A | 141.7 | - | - | 15:59 | 16:22 | 2.4 | 12.4 | 3.58 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 6.31 | 7.81 | 1.50 | B | 235.2 | 376.9 | 251.3 | 16:22 | 17:29 | 2.5 | 0.1 | 0.02 | 35.0 | - | 1.6 | 10.0 | 11.0 | 13.8 | |
| | | 11-May-10 | 3 | 8.35 | 9.35 | 1.00 | A | 175.4 | - | - | 22:58 | 23:25 | 1.5 | 12.5 | 7.95 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.35 | 9.35 | 1.00 | B | 163.2 | - | - | 23:25 | 23:37 | 1.9 | 15.0 | 7.70 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.35 | 9.35 | 1.00 | C | 161.4 | - | - | 23:37 | 23:48 | 2.8 | 16.7 | 6.18 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.35 | 9.35 | 1.00 | D | 140.1 | 640.1 | 640.1 | 23:48 | 0:20 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 11-May-10 | 2 | 9.35 | 13.8 | 4.45 | A | 7.2 | 7.2 | 1.6 | 22:38 | 22:47 | 2.3 | 0.1 | 0.01 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+690.5 | T | 14-Jun-10 | 4 | 6.38 | 7.88 | 1.50 | MF | 20.0 | 20.0 | 13.3 | 3:51 | 4:05 | 2.2 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.54 | 9.54 | 1.00 | A | 162.9 | 162.9 | 162.9 | 20:56 | 21:56 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-10 | 2 | 9.54 | 13.6 | 4.06 | A | 29.3 | 29.3 | 7.2 | 20:05 | 20:48 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+692 | P | 07-Jun-10 | 4 | 6.28 | 7.78 | 1.50 | A | 130.8 | - | - | 14:50 | 15:10 | 2.6 | 11.7 | 1.48 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 6.28 | 7.78 | 1.50 | B | 20.8 | 151.6 | 101.1 | 15:10 | 15:25 | 2.6 | 0.8 | 0.21 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.38 | 9.38 | 1.00 | A | 166.4 | - | - | 22:17 | 22:33 | 0.0 | 0.0 | 0.00 | 32.7 | - | 1.7 | 1.0 | 10.0 | 15.0 | |
| | | 04-May-10 | 3 | 8.38 | 9.38 | 1.00 | B | 189.0 | - | - | 22:33 | 22:44 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.38 | 9.38 | 1.00 | C | 142.2 | - | - | 22:44 | 22:54 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.38 | 9.38 | 1.00 | D | 93.6 | 591.2 | 591.2 | 22:54 | 23:16 | 3.0 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 04-May-10 | 2 | 9.38 | 13.6 | 4.22 | A | 250.4 | - | - | 20:47 | 21:12 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 2 | 9.38 | 13.6 | 4.22 | B | 501.0 | 751.4 | 178.1 | 21:12 | 22:09 | 2.1 | 0.9 | 0.10 | - | - | - | - | - | - | |
| T-30+693.5 | T | 14-Jun-10 | 4 | 5.98 | 7.48 | 1.50 | MF | 113.2 | 113.2 | 75.5 | 3:29 | 3:49 | 2.2 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.23 | 9.23 | 1.00 | A | 118.2 | 118.2 | 118.2 | 22:24 | 23:22 | 2.5 | 0.4 | 0.18 | - | - | - | - | - | - | |
| | | 17-May-10 | 2 | 9.23 | 13.2 | 3.97 | A | 22.5 | 22.5 | 5.7 | 22:04 | 22:16 | 2.0 | 0.0 | 0.00 | - | 2.0 | 1.6 | 28.1 | 16.3 | 26.6 | |
| S-30+695 | S | 07-Jun-10 | 4 | 5.87 | 7.37 | 1.50 | A | 28.1 | 28.1 | 18.7 | 14:22 | 14:47 | 2.7 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8 | 9 | 1.00 | A | 226.0 | - | - | 20:37 | 21:06 | 1.6 | 15.8 | 12.05 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8 | 9 | 1.00 | B | 170.0 | - | - | 21:06 | 21:18 | 2.0 | 12.6 | 6.54 | 35.4 | 5.0 | 1.7 | 28.0 | 6.0 | 16.0 | |
| | | 11-May-10 | 3 | 8 | 9 | 1.00 | C | 167.9 | - | - | 21:18 | 21:30 | 2.8 | 15.6 | 5.00 | 45.5 | - | 1.6 | 27.0 | 6.0 | 16.0 | |
| | | 11-May-10 | 3 | 8 | 9 | 1.00 | D | 214.2 | 778.1 | 778.1 | 21:30 | 22:23 | 3.0 | 0.0 | 0.01 | 59.3 | - | 1.6 | 26.0 | 6.0 | 15.0 | |
| | | 11-May-10 | 2 | 9 | 13.2 | 4.20 | A | 17.5 | 17.5 | 4.2 | 20:22 | 20:35 | 2.1 | 0.1 | 0.06 | - | - | - | - | - | - | |
| T-30+696.5 | T | 14-Jun-10 | 4 | 5.85 | 7.35 | 1.50 | MF | 130.4 | 130.4 | 86.9 | 2:46 | 3:27 | 1.9 | 0.4 | 0.14 | 30.7 | - | 1.4 | 7.0 | 8.0 | 13.0 | |
| | | 17-May-10 | 3 | 8.08 | 9.08 | 1.00 | A | 149.3 | 149.3 | 149.3 | 23:52 | 1:00 | 2.3 | 0.5 | 0.20 | - | - | - | - | - | - | |
| | | 17-May-10 | 2 | 9.08 | 13.2 | 4.12 | A | 28.1 | 28.1 | 6.8 | 23:34 | 23:48 | 2.1 | 0.2 | 0.02 | - | - | - | - | - | - | |
| P-30+698 | P | 07-Jun-10 | 4 | 6.22 | 7.72 | 1.50 | A | 155.4 | 155.4 | 103.6 | 13:26 | 14:17 | 2.5 | 0.7 | 0.19 | 31.7 | 5.0 | 1.6 | 9.7 | 13.8 | 14.2 | |
| | | 04-May-10 | 3 | 8.33 | 9.33 | 1.00 | B | 160.7 | - | - | 0:27 | 0:41 | 0.0 | 0.0 | 0.00 | 37.7 | - | 1.6 | 12.0 | 9.0 | 16.0 | |
| | | 04-May-10 | 3 | 8.33 | 9.33 | 1.00 | C | 226.2 | - | - | 0:41 | 0:53 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.33 | 9.33 | 1.00 | D | 452.5 | 1000.0 | 1000.0 | 0:53 | 1:25 | 2.9 | 14.0 | 4.78 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.33 | 9.33 | 1.00 | A | 160.6 | - | - | 0:05 | 0:27 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 2 | 9.33 | 13.6 | 4.27 | A | 22.0 | 22.0 | 5.2 | 23:44 | 0:00 | 2.1 | 0.4 | 0.05 | - | - | - | - | - | - | |
| T-30+699.5 | T | 14-Jun-10 | 4 | 6 | 7.5 | 1.50 | MF | 67.7 | 67.7 | 45.1 | 22:09 | 22:27 | 2.4 | 0.3 | 0.06 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.23 | 9.23 | 1.00 | A | 159.0 | - | - | 3:28 | 4:05 | 2.5 | 2.2 | 0.89 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.23 | 9.23 | 1.00 | B | 12.5 | 171.5 | 171.5 | 4:05 | 4:28 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-10 | 2 | 9.23 | 13.4 | 4.17 | A | 28.3 | 28.3 | 6.8 | 3:10 | 3:25 | 1.9 | 0.0 | 0.02 | - | - | - | - | - | - | |
| S-30+701 | S | 07-Jun-10 | 4 | 5.98 | 7.48 | 1.50 | A | 187.9 | - | - | 10:02 | 10:35 | 2.3 | 10.0 | 2.91 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 5.98 | 7.48 | 1.50 | B | 145.5 | 333.4 | 222.3 | 10:35 | 11:23 | 2.6 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.08 | 9.08 | 1.00 | A | 8.4 | 8.4 | 8.4 | 19:56 | 20:14 | 2.4 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 11-May-10 | 2 | 9.08 | 13.1 | 4.02 | A | 21.1 | 21.1 | 5.2 | 19:33 | 19:56 | 1.9 | 0.5 | 0.06 | 31.6 | 5.0 | 1.7 | 26.0 | 5.0 | 14.0 | |
| T-30+702.5 | T | 14-Jun-10 | 4 | 5.98 | 7.48 | 1.50 | MF | 18.5 | 18.5 | 12.3 | 21:54 | 22:07 | 2.0 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.18 | 9.18 | 1.00 | A | 149.8 | - | - | 5:04 | 5:22 | 2.1 | 15.4 | 11.20 | - | - | - | - | - | - | |
| | | 17-May-10 | 3 | 8.18 | 9.18 | 1.00 | B | 94.2 | 244.0 | 244.0 | 5:22 | 5:50 | 2.6 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 17-May-10 | 2 | 9.18 | 13.3 | 4.12 | A | 51.0 | 51.0 | 12.4 | 4:36 | 4:58 | 1.8 | 0.8 | 0.11 | - | - | - | - | - | - | |
| P-30+704 | P | 07-Jun-10 | 4 | 6.16 | 7.66 | 1.50 | A | 186.0 | - | - | 8:32 | 8:54 | 2.2 | 12.3 | 4.07 | 30.4 | 5.0 | 1.6 | 6.6 | 11.3 | 12.2 | |
| | | 07-Jun-10 | 4 | 6.16 | 7.66 | 1.50 | B | 240.1 | 426.1 | 284.1 | 8:54 | 9:55 | 2.6 | 0.5 | 0.13 | 36.1 | 2.0 | 1.6 | 6.6 | 11.4 | 13.0 | |
| | | 04-May-10 | 3 | 8.23 | 9.23 | 1.00 | A | 192.1 | - | - | 4:12 | 4:35 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.23 | 9.23 | 1.00 | B | 260.0 | - | - | 4:35 | 4:51 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.23 | 9.23 | 1.00 | C | 206.1 | - | - | 4:51 | 5:00 | 0.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-10 | 3 | 8.23 | 9.23 | 1.00 | D | 341.8 | 1000.0 | 1000.0 | 5:00 | 5:15 | 3.0 | 29.7 | 9.97 | - | - | - | - | - | - | |
| | | 04-May-10 | 2 | 9.23 | 13.5 | 4.27 | A | 102.9 | 102.9 | 24.1 | 3:37 | 4:05 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+705.5 | T | 14-Jun-10 | 4 | 6.56 | 8.06 | 1.50 | MF | 191.0 | 191.0 | 127.3 | 21:00 | 21:51 | 2.4 | 0.3 | 0.06 | 30.5 | 1.0 | 1.5 | 9.0 | 9.0 | 13.6 | |
| | | 18-May-10 | 3 | 8.7 | 9.7 | 1.00 | A | 30.2 | 30.2 | 30.2 | 9:40 | 9:54 | 2.8 | 0.1 | 0.03 | - | - | - | - | - | 18.3 | |
| | | 18-May-10 | 2 | 9.7 | 13.8 | 4.10 | A | 26.1 | 26.1 | 6.4 | 9:16 | 9:32 | 2.0 | 0.1 | 0.01 | - | - | - | - | - | 16.9 | |
| S-30+707 | S | 07-Jun-10 | 4 | 6.74 | 8.24 | 1.50 | A | 155.3 | - | - | 6:00 | 6:14 | 2.1 | 13.5 | 4.56 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 6.74 | 8.24 | 1.50 | B | 213.7 | - | - | 6:14 | 6:50 | 1.7 | 15.0 | 5.84 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 6.74 | 8.24 | 1.50 | C | 145.7 | 514.7 | 343.1 | 6:50 | 7:28 | 2.6 | 0.8 | 0.19 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.89 | 9.89 | 1.00 | A | 158.9 | - | - | 14:42 | 15:04 | 0.1 | 12.8 | 51.23 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.89 | 9.89 | 1.00 | B | 191.4 | - | - | 15:04 | 15:15 | 1.4 | 21.3 | 14.40 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 8.89 | 9.89 | 1.00 | C | 175.5 | - | - | 15:15 | 15:24 | 2.0 | 15.9 | 7.48 | 45.5 | 6.5 | 1.6 | - | - | 13.9 | |
| | | 11-May-10 | 3 | 8.89 | 9.89 | 1.00 | D | 380.2 | 906.0 | 906.0 | 15:24 | 16:11 | 3.2 | 0.0 | 0.00 | 57.8 | 1.5 | 1.6 | - | - | 13.9 | |
| | | 11-May-10 | 2 | 9.89 | 14.3 | 4.41 | A | 31.5 | 31.5 | 7.1 | 14:25 | 14:37 | 2.1 | 0.8 | 0.08 | 32.0 | 4.1 | 1.6 | 14.1 | 7.4 | 15.2 | |
| Q-30+707.75 | Q | 25-Jun-10 | 3 | 9.25 | 10.5 | 1.25 | MF | 17.3 | 17.3 | 13.8 | 14:41 | 14:57 | 2.5 | 0.2 | 0.05 | 33.4 | 3.0 | 1.4 | 9.5 | 8.9 | 13.7 | |
| T-30+708.5 | T | 14-Jun-10 | 4 | 7.44 | 8.94 | 1.50 | MF | 266.7 | - | - | 16:41 | 17:23 | 2.1 | 11.0 | 3.35 | 31.5 | 1.0 | 1.5 | 9.2 | 9.8 | 15.6 | |
| | | 14-Jun-10 | 4 | 7.44 | 8.94 | 1.50 | A | 155.3 | - | - | 17:23 | 17:45 | 2.0 | 5.1 | 2.46 | 32.8 | - | 1.6 | 10.2 | 9.9 | 16.2 | |
| | | 14-Jun-10 | 4 | 7.44 | 8.94 | 1.50 | B | 58.7 | 480.7 | 320.5 | 17:45 | 18:25 | 1.9 | 0.6 | 0.20 | 37.3 | - | 1.7 | 9.8 | 10.4 | 18.3 | |
| | | 18-May-10 | 3 | 9.58 | 10.58 | 1.00 | A | 93.3 | 93.3 | 93.3 | 15:25 | 16:25 | 2.5 | 0.4 | 0.15 | - | - | - | - | - | 17.1 | |
| | | 18-May-10 | 2 | 10.58 | 14.7 | 4.12 | A | 30.5 | 30.5 | 7.4 | 15:05 | 15:20 | 2.0 | 0.1 | 0.01 | 31.0 | - | 1.6 | 7.6 | 11.6 | 16.7 | |
| Q-30+709.25 | Q | 25-Jun-10 | 3 | 10.06 | 11.6 | 1.54 | MF | 250.4 | - | - | 10:57 | 11:30 | 2.3 | 15.2 | 7.94 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 3 | 10.06 | 11.6 | 1.54 | A | 159.8 | - | - | 11:30 | 11:45 | 2.4 | 14.4 | 6.53 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 3 | 10.06 | 11.6 | 1.54 | B | 177.5 | - | - | 11:45 | 12:01 | 2.5 | 6.6 | 2.85 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 3 | 10.06 | 11.6 | 1.54 | C | 23.0 | 610.7 | 396.6 | 12:01 | 12:18 | 2.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 2 | 11.6 | 15.01 | 3.41 | MF | 15.3 | 15.3 | 4.5 | 10:33 | 10:50 | 2.0 | 0.1 | 0.02 | - | - | - | - | - | - | |
| P-30+710 | P | 06-Jun-10 | 4 | 7.83 | 9.33 | 1.50 | A | 147.9 | - | - | 5:14 | 5:29 | 1.9 | 12.1 | 4.54 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 7.83 | 9.33 | 1.50 | B | 172.0 | - | - | 5:29 | 5:40 | 2.9 | 2.8 | 0.54 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 7.83 | 9.33 | 1.50 | C | 14.3 | 334.2 | 222.8 | 5:40 | 5:53 | 2.7 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.96 | 10.96 | 1.00 | A | 130.0 | - | - | 8:58 | 9:18 | 1.4 | 16.9 | 12.41 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.96 | 10.96 | 1.00 | B | 228.0 | - | - | 9:18 | 9:29 | 1.8 | 27.6 | 14.65 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.96 | 10.96 | 1.00 | C | 222.0 | - | - | 9:29 | 9:39 | 2.7 | 15.3 | 5.61 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.96 | 10.96 | 1.00 | D | 399.0 | 979.0 | 979.0 | 9:39 | 10:02 | 2.3 | 23.0 | 10.22 | 60.0 | 2.0 | 1.7 | 2.0 | 11.0 | 13.0 | |
| | | 05-May-10 | 2 | 10.96 | 15 | 4.04 | A | 134.0 | - | - | 7:44 | 8:02 | 0.7 | 12.8 | 4.60 | 32.0 | 3.0 | 1.6 | 3.0 | 10.0 | 13.0 | |
| | | 05-May-10 | 2 | 10.96 | 15 | 4.04 | B | 186.0 | - | - | 8:02 | 8:14 | 1.4 | 19.5 | 3.66 | 35.0 | 2.0 | 1.6 | 3.0 | 10.0 | 13.0 | |
| | | 05-May-10 | 2 | 10.96 | 15 | 4.04 | C | 136.6 | 456.6 | 113.0 | 8:14 | 8:54 | 2.2 | 0.4 | 0.05 | 47.0 | 2.0 | 1.7 | 2.0 | 10.0 | 11.0 | |
| T-30+711.5 | T | 14-Jun-10 | 4 | 7.83 | 9.33 | 1.50 | MF | 128.3 | 128.3 | 85.5 | 5:37 | 6:28 | 1.8 | 0.3 | 0.10 | 30.9 | - | 1.5 | 7.0 | 9.0 | 12.0 | |
| | | 18-May-10 | 3 | 9.96 | 10.96 | 1.00 | A | 190.7 | - | - | 10:41 | 10:57 | 1.5 | 11.3 | 8.50 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 9.96 | 10.96 | 1.00 | B | 124.3 | - | - | 10:57 | 11:08 | 2.1 | 12.1 | 5.30 | 35.6 | 2.0 | 1.6 | - | - | 18.9 | |
| | | 18-May-10 | 3 | 9.96 | 10.96 | 1.00 | C | 220.7 | 535.7 | 535.7 | 11:08 | 12:17 | 2.5 | 0.0 | 0.00 | 45.1 | 2.0 | 1.6 | 10.0 | 12.6 | 16.6 | |
| | | 18-May-10 | 2 | 10.96 | 15 | 4.04 | A | 21.5 | 21.5 | 5.3 | 10:21 | 10:33 | 1.9 | 0.1 | 0.01 | - | - | - | - | - | - | |
| S-30+713 | S | 06-Jun-10 | 4 | 8.26 | 9.76 | 1.50 | A | 144.0 | - | - | 3:38 | 3:56 | 1.8 | 8.6 | 3.06 | 33.3 | - | 1.7 | 4.0 | 7.0 | 13.0 | |
| | | 06-Jun-10 | 4 | 8.26 | 9.76 | 1.50 | B | 168.6 | - | - | 3:56 | 4:09 | 2.3 | 12.1 | 3.28 | 36.6 | - | 1.7 | 4.0 | 7.0 | 13.0 | |
| | | 06-Jun-10 | 4 | 8.26 | 9.76 | 1.50 | C | 105.1 | 417.7 | 278.5 | 4:09 | 5:02 | 2.5 | 0.6 | 0.16 | 50.0 | - | 1.7 | 4.0 | 7.0 | 15.9 | |
| | | 11-May-10 | 3 | 10.24 | 11.24 | 1.00 | A | 132.1 | - | - | 10:43 | 11:00 | 1.5 | 12.1 | 7.54 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 10.24 | 11.24 | 1.00 | B | 210.4 | - | - | 11:00 | 11:13 | 2.0 | 21.1 | 10.74 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 10.24 | 11.24 | 1.00 | C | 258.7 | - | - | 11:13 | 11:24 | 2.8 | 37.3 | 13.91 | 43.0 | 4.0 | 1.6 | 6.7 | 11.3 | 17.1 | |
| | | 11-May-10 | 3 | 10.24 | 11.24 | 1.00 | D | 441.8 | 1043.0 | 1043.0 | 11:24 | 12:01 | 2.9 | 6.1 | 2.09 | - | - | - | - | - | - | |
| | | 11-May-10 | 2 | 11.24 | 15.6 | 4.36 | A | 22.2 | 22.2 | 5.1 | 10:19 | 10:31 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+714.5 | T | 21-Jun-10 | 4 | 8.59 | 10.09 | 1.50 | MF | 22.6 | 22.6 | 15.1 | 18:40 | 18:54 | 1.9 | 0.3 | 0.11 | 30.8 | 2.0 | 1.7 | 7.0 | 8.0 | 13.0 | |
| | | 18-May-10 | 3 | 10.42 | 11.42 | 1.00 | A | 127.0 | - | - | 16:56 | 17:11 | 2.0 | 12.0 | 5.56 | - | - | - | - | - | 19.1 | |
| | | 18-May-10 | 3 | 10.42 | 11.42 | 1.00 | B | 173.8 | - | - | 17:11 | 17:22 | 2.1 | 18.2 | 8.55 | 31.0 | - | 1.7 | 7.6 | 11.6 | 16.4 | |
| | | 18-May-10 | 3 | 10.42 | 11.42 | 1.00 | C | 207.5 | 508.3 | 508.3 | 17:22 | 18:15 | 2.6 | 0.0 | 0.00 | 50.0 | 1.0 | 1.7 | 7.6 | 11.6 | 15.7 | |
| | | 18-May-10 | 2 | 11.42 | 15.5 | 4.08 | A | 29.0 | 29.0 | 7.1 | 16:36 | 16:50 | 2.1 | 0.3 | 0.03 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+716 | P | 06-Jun-10 | 4 | 8.78 | 10.28 | 1.50 | A | 163.8 | - | - | 0:38 | 0:56 | 2.0 | 14.4 | 4.65 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 8.78 | 10.28 | 1.50 | B | 157.8 | - | - | 0:56 | 1:09 | 2.5 | 13.9 | 3.69 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 8.78 | 10.28 | 1.50 | C | 28.3 | 349.9 | 233.3 | 1:09 | 1:30 | 2.5 | 1.2 | 0.22 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 10.9 | 11.9 | 1.00 | A | 140.0 | - | - | 10:41 | 10:51 | 1.0 | 16.0 | 16.00 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 10.9 | 11.9 | 1.00 | B | 186.0 | - | - | 10:51 | 11:07 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 10.9 | 11.9 | 1.00 | C | 140.0 | - | - | 11:07 | 11:11 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 10.9 | 11.9 | 1.00 | D | 511.0 | 977.0 | 977.0 | 11:11 | 11:37 | 2.8 | 19.5 | 6.96 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 11.9 | 16.2 | 4.30 | A | 21.0 | 21.0 | 4.9 | 10:24 | 10:37 | 2.2 | 0.0 | 0.02 | - | - | - | - | - | - | |
| T-30+717.5 | T | 13-Jun-10 | 4 | 8.35 | 9.85 | 1.50 | MF | 68.4 | 68.4 | 45.6 | 23:35 | 0:04 | 1.7 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 10.42 | 11.42 | 1.00 | A | 166.7 | - | - | 19:29 | 19:52 | 2.5 | 9.1 | 3.58 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 10.42 | 11.42 | 1.00 | B | 112.8 | 279.5 | 279.5 | 19:52 | 20:47 | 2.4 | 0.3 | 0.12 | 36.9 | 2.0 | 1.6 | 5.7 | 14.2 | 21.6 | |
| | | 18-May-10 | 2 | 11.42 | 15.5 | 4.08 | A | 24.1 | 24.1 | 5.9 | 19:06 | 19:25 | 2.3 | 0.0 | 0.00 | 32.2 | 2.0 | 1.6 | 3.2 | 12.6 | 19.1 | |
| S-30+719 | S | 06-Jun-10 | 4 | 8.23 | 9.73 | 1.50 | A | 151.8 | - | - | 23:23 | 23:43 | 2.0 | 9.1 | 3.99 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 8.23 | 9.73 | 1.50 | B | 170.9 | - | - | 23:43 | 23:57 | 2.9 | 12.5 | 2.77 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 8.23 | 9.73 | 1.50 | C | 65.6 | 388.3 | 258.9 | 23:57 | 0:33 | 2.4 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 10.34 | 11.34 | 1.00 | A* | 122.8 | - | - | 8:53 | 8:57 | 0.0 | 2.8 | 86.40 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 10.34 | 11.34 | 1.00 | A | 124.1 | - | - | 8:57 | 9:18 | 1.8 | 18.1 | 10.19 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 10.34 | 11.34 | 1.00 | B | 280.0 | - | - | 9:18 | 9:32 | 2.1 | 24.0 | 11.47 | 37.0 | 5.0 | 1.6 | 6.3 | 11.2 | 12.7 | |
| | | 11-May-10 | 3 | 10.34 | 11.34 | 1.00 | C | 252.3 | - | - | 9:32 | 9:43 | 2.3 | 24.1 | 10.62 | - | - | - | - | - | - | |
| | | 11-May-10 | 3 | 10.34 | 11.34 | 1.00 | D | 217.8 | 997.0 | 997.0 | 9:43 | 9:51 | 2.9 | 29.8 | 10.35 | - | - | - | - | - | - | |
| | | 11-May-10 | 2 | 11.34 | 19 | 7.66 | A* | 71.6 | 71.6 | 9.3 | 8:29 | 8:48 | 2.0 | 2.3 | 0.16 | 32.0 | 4.5 | 1.6 | 6.5 | 11.4 | 16.3 | |
| T-30+720.5 | T | 13-Jun-10 | 4 | 7.96 | 9.46 | 1.50 | MF | 148.2 | 148.2 | 98.8 | 23:07 | 23:32 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 10.15 | 11.15 | 1.00 | A | 161.8 | - | - | 21:25 | 21:51 | 2.2 | 3.4 | 1.13 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 10.15 | 11.15 | 1.00 | B | 46.8 | 208.6 | 208.6 | 21:51 | 22:17 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 18-May-10 | 2 | 11.15 | 15.2 | 4.05 | A | 63.8 | 63.8 | 15.8 | 21:00 | 21:22 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+722 | P | 06-Jun-10 | 4 | 7.78 | 9.28 | 1.50 | A | 159.2 | - | - | 21:15 | 21:32 | 2.0 | 17.9 | 6.24 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 7.78 | 9.28 | 1.50 | B | 161.6 | - | - | 21:32 | 21:46 | 2.3 | 15.3 | 4.10 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 7.78 | 9.28 | 1.50 | C | 87.1 | 407.9 | 271.9 | 21:46 | 22:21 | 2.4 | 0.7 | 0.21 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.63 | 10.63 | 1.00 | A | 179.9 | - | - | 20:36 | 21:01 | 0.9 | 11.4 | 11.23 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.63 | 10.63 | 1.00 | B | 172.1 | - | - | 21:01 | 21:12 | 1.8 | 18.2 | 10.27 | 37.9 | - | 1.7 | 2.0 | 8.0 | 17.0 | |
| | | 05-May-10 | 3 | 9.63 | 10.63 | 1.00 | C | 211.2 | - | - | 21:12 | 21:24 | 2.9 | 18.2 | 6.29 | 48.3 | - | 1.8 | 2.0 | 8.0 | 17.0 | |
| | | 05-May-10 | 3 | 9.63 | 10.63 | 1.00 | D | 109.3 | 672.5 | 672.5 | 21:24 | 21:52 | 3.1 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 10.63 | 15.1 | 4.47 | A | 19.8 | 19.8 | 4.4 | 20:16 | 20:21 | 2.0 | 0.4 | 0.05 | 33.2 | - | 1.7 | 3.0 | 9.0 | 17.0 | |
| Q-30+722.75 | Q | 25-Jun-10 | 3 | 9.6 | 10.7 | 1.10 | MF | 273.1 | - | - | 8:42 | 9:17 | 2.4 | 1.5 | 5.63 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 3 | 9.6 | 10.7 | 1.10 | A | 253.7 | - | - | 9:17 | 9:37 | 2.4 | 15.2 | 5.92 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 3 | 9.6 | 10.7 | 1.10 | B | 136.7 | - | - | 9:37 | 9:48 | 2.4 | 9.6 | 3.61 | 38.9 | 9.0 | 1.7 | 12.4 | 9.3 | 18.1 | |
| | | 25-Jun-10 | 3 | 9.6 | 10.7 | 1.10 | C | 25.8 | 689.3 | 626.6 | 9:48 | 10:05 | 2.5 | 0.0 | 0.01 | 54.9 | 2.0 | 1.7 | 10.7 | 9.3 | 18.8 | |
| T-30+723.5 | T | 13-Jun-10 | 4 | 7.54 | 9.04 | 1.50 | MF | 267.7 | - | - | 21:24 | 22:00 | 2.3 | 2.4 | 1.44 | 30.5 | 2.0 | 1.4 | 9.0 | 10.0 | 13.2 | |
| | | 13-Jun-10 | 4 | 7.54 | 9.04 | 1.50 | A | 177.2 | - | - | 22:00 | 22:29 | 2.2 | 6.1 | 1.83 | 33.4 | 4.0 | 1.6 | 8.0 | 9.0 | 15.0 | |
| | | 13-Jun-10 | 4 | 7.54 | 9.04 | 1.50 | B | 8.7 | 453.6 | 302.4 | 22:49 | 23:00 | 1.9 | 0.6 | 0.22 | 35.8 | 4.0 | 1.6 | 8.0 | 9.0 | 19.0 | |
| | | 18-May-10 | 3 | 9.65 | 10.65 | 1.00 | A | 54.3 | 54.3 | 54.3 | 1:20 | 1:47 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-May-10 | 2 | 10.65 | 14.7 | 4.05 | A | 39.7 | 39.7 | 9.8 | 1:02 | 1:18 | 2.1 | 0.0 | 0.00 | 32.9 | 2.0 | 1.7 | - | - | 22.8 | |
| Q-30+724.25 | Q | 25-Jun-10 | 3 | 9.83 | 10.83 | 1.00 | MF | 246.7 | - | - | 7:30 | 7:47 | 1.8 | 15.6 | 8.83 | - | - | - | - | - | - | |
| | | 25-Jun-10 | 3 | 9.83 | 10.83 | 1.00 | A | 114.1 | 360.8 | 360.8 | 7:47 | 8:19 | 2.4 | 0.0 | 0.00 | 34.1 | 3.0 | 1.64 | 11.2 | 8.6 | 17.5 | |
| | | 25-Jun-10 | 2 | 10.83 | 14.4 | 3.57 | MF | 10.3 | 10.3 | 2.9 | 7:14 | 7:26 | 2.0 | 8.8 | 0.01 | 33.8 | 4.0 | 1.4 | 13.2 | 8.1 | 13.1 | |
| S-30+725 | S | 06-Jun-10 | 4 | 7.28 | 8.78 | 1.50 | A | 158.7 | - | - | 20:08 | 20:26 | 2.2 | 16.2 | 4.81 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 7.28 | 8.78 | 1.50 | B | 159.2 | - | - | 20:26 | 20:37 | 2.1 | 15.9 | 3.63 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 7.28 | 8.78 | 1.50 | C | 89.0 | 406.9 | 271.3 | 20:37 | 21:07 | 2.5 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 9.45 | 10.45 | 1.00 | A | 193.5 | 193.5 | 193.5 | 4:08 | 5:32 | 3.2 | 0.7 | 0.23 | - | - | - | - | - | - | |
| | | 10-May-10 | 2 | 10.45 | 14.6 | 4.15 | A | 35.0 | 35.0 | 8.4 | 3:52 | 4:04 | 2.1 | 0.1 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+726.5 | T | 21-Jun-10 | 4 | 7.38 | 8.48 | 1.10 | MF | 260.0 | - | - | 16:56 | 17:39 | 2.1 | 3.3 | 1.88 | 34.4 | 1.0 | 1.5 | 4.1 | 7.4 | 10.1 | |
| | | 21-Jun-10 | 4 | 7.38 | 8.48 | 1.10 | A | 72.7 | 332.7 | 302.5 | 17:39 | 18:23 | 1.9 | 0.4 | 0.19 | 34.1 | 1.5 | 1.6 | 8.1 | 7.9 | 12.4 | |
| | | 18-May-10 | 3 | 9.1 | 10.1 | 1.00 | A | 163.0 | - | - | 2:10 | 2:29 | 2.1 | 12.0 | 5.62 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 9.1 | 10.1 | 1.00 | B | 320.9 | - | - | 2:29 | 2:45 | 2.4 | 5.2 | 2.29 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 9.1 | 10.1 | 1.00 | C | 360.1 | 844.0 | 844.0 | 2:45 | 3:25 | 2.5 | 0.3 | 0.12 | - | - | - | - | - | - | |
| | | 18-May-10 | 2 | 10.1 | 14.3 | 4.20 | A | 21.8 | 21.8 | 5.2 | 1:55 | 2:08 | 1.9 | 0.3 | 0.03 | - | - | - | - | - | - | |
| P-30+728 | P | 06-Jun-10 | 4 | 7.46 | 8.96 | 1.50 | A | 151.2 | - | - | 18:57 | 19:19 | 2.6 | 11.4 | 3.11 | 31.9 | 4.0 | 1.7 | 11.0 | 9.0 | 16.0 | |
| | | 06-Jun-10 | 4 | 7.46 | 8.96 | 1.50 | B | 147.9 | - | - | 19:19 | 19:28 | 2.5 | 15.7 | 4.43 | 35.9 | 4.4 | 1.6 | 12.0 | 9.0 | 17.0 | |
| | | 06-Jun-10 | 4 | 7.46 | 8.96 | 1.50 | C | 80.5 | 379.6 | 253.1 | 19:28 | 20:00 | 2.5 | 0.1 | 0.03 | 49.1 | 2.0 | 1.7 | 12.0 | 9.0 | 17.0 | |
| | | 05-May-10 | 3 | 9.6 | 10.6 | 1.00 | A | 175.6 | - | - | 0:03 | 0:37 | 2.6 | 12.8 | 4.98 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.6 | 10.6 | 1.00 | B | 188.2 | - | - | 0:37 | 0:40 | 2.7 | 15.7 | 5.82 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.6 | 10.6 | 1.00 | C | 242.6 | - | - | 0:40 | 0:57 | 2.4 | 16.2 | 3.21 | 58.5 | - | 1.6 | 3.0 | 7.0 | 18.0 | |
| | | 05-May-10 | 3 | 9.6 | 10.6 | 1.00 | D | 88.9 | 695.3 | 695.3 | 0:57 | 1:21 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 10.6 | 15.1 | 4.50 | A | 18.1 | 18.1 | 4.0 | 23:38 | 23:53 | 2.1 | 0.8 | 0.08 | - | - | - | - | - | - | |
| T-30+729.5 | T | 14-Jun-10 | 4 | 7.27 | 8.77 | 1.50 | MF | 243.4 | 243.4 | 162.3 | 23:46 | 0:22 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 9.37 | 10.37 | 1.00 | A | 22.7 | 22.7 | 22.7 | 4:02 | 4:20 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-May-10 | 2 | 10.37 | 14.5 | 4.13 | A | 24.2 | 24.2 | 5.9 | 3:44 | 4:00 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+731 | S | 06-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | A | 165.7 | - | - | 15:11 | 15:32 | 2.4 | 8.7 | 3.73 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | B | 252.4 | - | - | 15:32 | 16:13 | 2.5 | 4.7 | 1.10 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 6.75 | 8.25 | 1.50 | C | 113.3 | 531.4 | 354.3 | 16:13 | 17:08 | 2.6 | 0.0 | 0.00 | 50.6 | - | 1.6 | 12.1 | 13.4 | 16.4 | |
| | | 10-May-10 | 3 | 8.87 | 9.87 | 1.00 | A | 156.7 | - | - | 2:22 | 2:45 | 1.3 | 11.9 | 10.37 | 31.8 | - | 1.6 | 1.0 | 5.0 | 11.4 | |
| | | 10-May-10 | 3 | 8.87 | 9.87 | 1.00 | B | 176.7 | - | - | 2:45 | 2:58 | 1.5 | 12.9 | 9.55 | 33.8 | - | 1.7 | 3.0 | 6.0 | 14.0 | |
| | | 10-May-10 | 3 | 8.87 | 9.87 | 1.00 | C | 170.1 | - | - | 2:58 | 3:10 | 2.0 | 15.2 | 7.80 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 8.87 | 9.87 | 1.00 | D | 496.5 | 1000.0 | 1000.0 | 3:10 | 3:42 | 3.0 | 12.9 | 4.75 | 62.0 | 4.4 | 1.7 | 2.0 | 6.0 | 12.0 | |
| | | 10-May-10 | 2 | 9.87 | 13.7 | 3.83 | A | 2.7 | 2.7 | 0.7 | 2:04 | 2:17 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+732.5 | T | 13-Jun-10 | 4 | 6.78 | 8.28 | 1.50 | MF | 48.9 | 48.9 | 32.6 | 17:33 | 18:04 | 2.0 | 0.3 | 0.12 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 9.02 | 10.02 | 1.00 | A | 56.2 | - | - | 4:42 | 5:01 | 2.5 | 17.6 | 8.25 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 9.02 | 10.02 | 1.00 | B | 311.6 | - | - | 5:01 | 5:17 | 2.5 | 5.5 | 1.36 | - | - | - | - | - | - | |
| | | 18-May-10 | 3 | 9.02 | 10.02 | 1.00 | C | 317.0 | 684.8 | 684.8 | 5:17 | 5:30 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-May-10 | 2 | 10.02 | 14.1 | 4.08 | A | 23.0 | 23.0 | 5.6 | 4:27 | 4:40 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+734 | P | 06-Jun-10 | 4 | 6.92 | 8.42 | 1.50 | A | 172.9 | - | - | 13:43 | 14:06 | 2.5 | 12.1 | 3.18 | 33.4 | 5.0 | 1.6 | 11.4 | 10.7 | 15.5 | |
| | | 06-Jun-10 | 4 | 6.92 | 8.42 | 1.50 | B | 156.3 | 329.2 | 219.5 | 14:06 | 15:03 | 2.5 | 0.5 | 0.13 | 37.7 | 3.0 | 1.6 | 11.3 | 10.8 | 13.0 | |
| | | 05-May-10 | 3 | 9.07 | 10.07 | 1.00 | A | 169.6 | - | - | 3:43 | 4:10 | 2.4 | 0.0 | 5.26 | - | - | - | - | - | - | |
| | | 05-May-10 | 3 | 9.07 | 10.07 | 1.00 | B | 162.4 | - | - | 4:10 | 4:22 | 3.1 | 12.7 | 4.19 | 37.0 | - | 1.7 | 3.0 | 8.0 | 16.3 | |
| | | 05-May-10 | 3 | 9.07 | 10.07 | 1.00 | C | 202.6 | 534.6 | 534.6 | 4:22 | 5:27 | 3.2 | 0.0 | 0.00 | 50.1 | - | 1.7 | 3.0 | 8.0 | 16.3 | |
| | | 05-May-10 | 2 | 10.07 | 14.6 | 4.53 | A | 11.4 | 11.4 | 2.5 | 3:30 | 3:43 | 2.0 | 0.2 | 0.03 | 33.7 | - | 1.7 | 2.0 | 9.0 | 16.0 | |
| T-30+735.5 | T | 13-Jun-10 | 4 | 6.32 | 7.82 | 1.50 | MF | 33.5 | 33.5 | 22.3 | 10:35 | 11:03 | 2.0 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 7.99 | 8.99 | 1.00 | A | 172.9 | - | - | 9:00 | 9:24 | 2.3 | 5.5 | 2.36 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 7.99 | 8.99 | 1.00 | B | 95.6 | - | - | 9:24 | 9:40 | 2.4 | 5.2 | 2.50 | 34.4 | 4.0 | 1.7 | 29.1 | 12.3 | 14.4 | |
| | | 19-May-10 | 3 | 7.99 | 8.99 | 1.00 | C | 29.0 | 297.5 | 297.5 | 9:40 | 10:08 | 2.6 | 0.0 | 0.00 | 38.0 | 3.0 | 1.7 | 29.2 | 12.3 | 19.0 | |
| | | 19-May-10 | 2 | 8.99 | 13.2 | 4.21 | A | 227.5 | - | - | 7:42 | 8:12 | 2.0 | 8.8 | 1.01 | 32.0 | 2.5 | 1.6 | 14.4 | 11.0 | 16.5 | |
| | | 19-May-10 | 2 | 8.99 | 13.2 | 4.21 | B | 146.0 | 373.5 | 88.7 | 8:12 | 8:56 | 2.1 | 1.4 | 0.16 | - | - | - | - | - | - | |
| S-30+737 | S | 06-Jun-10 | 4 | 6.23 | 7.73 | 1.50 | A | 132.6 | - | - | 9:41 | 10:00 | 2.4 | 8.0 | 2.20 | - | - | - | - | - | - | |
| | | 06-Jun-10 | 4 | 6.23 | 7.73 | 1.50 | B | 204.9 | 337.5 | 225.0 | 10:00 | 11:15 | 2.6 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 8.33 | 9.33 | 1.00 | A | 159.9 | - | - | 22:39 | 23:01 | 0.0 | 12.3 | inf | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 8.33 | 9.33 | 1.00 | B | 176.6 | - | - | 23:01 | 23:14 | 1.4 | 15.0 | 10.82 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 8.33 | 9.33 | 1.00 | C | 205.4 | 541.9 | 541.9 | 23:14 | 23:42 | 2.9 | 2.9 | 0.03 | 48.0 | 4.0 | 1.7 | 3.0 | 7.0 | 13.0 | |
| | | 10-May-10 | 2 | 9.33 | 13.6 | 4.27 | A | 24.3 | 24.3 | 5.7 | 22:14 | 22:32 | 2.2 | 0.8 | 0.08 | - | - | - | - | - | - | |
| T-30+738.5 | T | 13-Jun-10 | 4 | 6.01 | 7.51 | 1.50 | MF | 73.0 | 73.0 | 48.7 | 9:49 | 10:29 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.28 | 9.28 | 1.00 | A | 148.0 | - | - | 10:39 | 11:44 | 2.2 | 3.7 | 1.92 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.28 | 9.28 | 1.00 | B | 42.9 | 190.9 | 190.9 | 11:44 | 12:08 | 2.6 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 9.28 | 13.4 | 4.12 | A | 24.4 | 24.4 | 5.9 | 10:21 | 10:33 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+740 | P | 06-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | A | 197.9 | - | - | 7:19 | 7:45 | 2.3 | 8.0 | 2.57 | 31.7 | 4.0 | 1.6 | 7.2 | 7.0 | 12.3 | |
| | | 06-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | B | 251.1 | - | - | 7:45 | 8:05 | 2.5 | 8.0 | 1.50 | 36.2 | 4.0 | 1.6 | 7.2 | 7.1 | 12.7 | |
| | | 06-Jun-10 | 4 | 6.62 | 8.12 | 1.50 | C | 118.9 | 567.9 | 378.6 | 8:05 | 9:38 | 2.7 | 0.8 | 0.21 | 47.3 | 2.0 | 1.7 | 7.6 | 7.4 | 14.5 | |
| | | 06-May-10 | 3 | 8.75 | 9.75 | 1.00 | A | 260.0 | - | - | 7:55 | 8:15 | 1.8 | 15.6 | 8.67 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 8.75 | 9.75 | 1.00 | B | 358.9 | - | - | 8:15 | 8:35 | 2.5 | 17.5 | 7.00 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 8.75 | 9.75 | 1.00 | C | 214.1 | 833.0 | 833.0 | 8:35 | 9:15 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-10 | 2 | 9.75 | 14.7 | 4.95 | A | 20.1 | 20.1 | 4.1 | 5:57 | 6:10 | 2.0 | 1.0 | 0.09 | - | - | - | - | - | - | |
| Q-30+740.75 | Q | 23-Jun-10 | 3 | 9.83 | 10.84 | 1.01 | MF | 18.6 | 18.6 | 18.4 | 14:07 | 14:38 | 2.6 | 0.0 | 0.01 | 33.6 | 4.0 | 1.5 | 12.8 | 10.9 | 14.1 | |
| T-30+741.5 | T | 13-Jun-10 | 4 | 6.76 | 8.26 | 1.50 | MF | 274.9 | - | - | 15:06 | 15:26 | 0.2 | 11.9 | 41.96 | - | - | - | - | - | - | |
| | | 13-Jun-10 | 4 | 6.76 | 8.26 | 1.50 | A | 165.8 | - | - | 15:26 | 15:55 | 1.9 | 8.7 | 2.95 | 32.7 | 2.0 | 1.7 | 5.4 | 8.1 | 14.6 | |
| | | 13-Jun-10 | 4 | 6.76 | 8.26 | 1.50 | B | 223.9 | 664.6 | 443.1 | 15:55 | 17:03 | 2.2 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.98 | 9.98 | 1.00 | A | 186.0 | - | - | 14:37 | 15:29 | 2.5 | 1.9 | 0.80 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.98 | 9.98 | 1.00 | B | 24.8 | 210.8 | 210.8 | 15:29 | 15:55 | 2.6 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 9.98 | 14.1 | 4.12 | A | 112.2 | 112.2 | 27.2 | 14:06 | 14:34 | 1.9 | 0.8 | 0.11 | 33.3 | - | 1.7 | 26.2 | 11.2 | 19.3 | |
| S-30+743 | S | 05-Jun-10 | 4 | 6.82 | 8.32 | 1.50 | A | 21.4 | 21.4 | 14.3 | 16:18 | 16:36 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 9.02 | 10.02 | 1.00 | A | 176.9 | - | - | 20:20 | 20:43 | 2.0 | 12.9 | 5.63 | 32.8 | 3.0 | 1.7 | 3.0 | 5.0 | 12.0 | |
| | | 10-May-10 | 3 | 9.02 | 10.02 | 1.00 | B | 184.4 | - | - | 20:43 | 20:56 | 2.6 | 16.0 | 6.38 | 37.4 | 4.0 | 1.6 | 4.0 | 6.0 | 14.0 | |
| | | 10-May-10 | 3 | 9.02 | 10.02 | 1.00 | C | 177.9 | - | - | 20:56 | 21:06 | 2.8 | 18.6 | 6.76 | 47.8 | - | 1.7 | 4.0 | 6.0 | 14.0 | |
| | | 10-May-10 | 3 | 9.02 | 10.02 | 1.00 | D | 158.8 | 698.0 | 698.0 | 21:06 | 21:52 | 2.8 | 0.0 | 0.01 | 62.0 | - | 1.7 | 2.0 | 6.0 | 13.0 | |
| | | 10-May-10 | 2 | 10.02 | 14.5 | 4.48 | A | 91.1 | 91.1 | 20.3 | 19:43 | 20:16 | 2.1 | 1.5 | 0.15 | - | - | - | - | - | - | |
| T-30+744.5 | T | 13-Jun-10 | 4 | 6.28 | 7.78 | 1.50 | MF | 82.8 | 82.8 | 55.2 | 14:28 | 15:00 | 2.2 | 0.0 | 0.00 | 33.2 | - | 1.5 | 9.5 | 8.8 | 11.6 | |
| | | 19-May-10 | 3 | 8.54 | 9.54 | 1.00 | A | 151.4 | - | - | 16:22 | 16:38 | 2.3 | 12.1 | 4.66 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 8.54 | 9.54 | 1.00 | B | 34.5 | 185.9 | 185.9 | 16:38 | 16:55 | 2.9 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 9.54 | 13.7 | 4.16 | A | 22.9 | 22.9 | 5.5 | 16:03 | 16:18 | 2.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-30+746 | P | 05-Jun-10 | 4 | 7.28 | 8.78 | 1.50 | A | 15.6 | 15.6 | 10.4 | 16:00 | 16:15 | 2.6 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.45 | 10.45 | 1.00 | A | 235.0 | 235.0 | 235.0 | 11:39 | 13:07 | 3.0 | 0.0 | 0.00 | 31.2 | 2.0 | 1.6 | 19.8 | 10.7 | 17.2 | |
| | | 06-May-10 | 2 | 10.45 | 14.4 | 3.95 | A | 49.2 | 49.2 | 12.5 | 11:10 | 11:30 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+747.5 | T | 13-Jun-10 | 4 | 7.66 | 9.16 | 1.50 | MF | 108.0 | 108.0 | 72.0 | 7:19 | 8:22 | 2.0 | 0.2 | 0.08 | 32.1 | 4.0 | 1.5 | 7.4 | 8.3 | 10.6 | |
| | | 19-May-10 | 3 | 9.76 | 10.76 | 1.00 | A | 11.2 | 11.2 | 11.2 | 17:55 | 18:07 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 10.76 | 14.8 | 4.04 | A | 22.2 | 22.2 | 5.5 | 17:39 | 17:52 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+749 | S | 05-Jun-10 | 4 | 7.54 | 9.04 | 1.50 | A | 215.2 | - | - | 14:04 | 15:00 | 2.4 | 9.8 | 2.74 | 33.0 | 1.7 | 3.0 | 9.0 | 8.1 | 14.6 | |
| | | 05-Jun-10 | 4 | 7.54 | 9.04 | 1.50 | B | 195.6 | 410.8 | 273.9 | 15:00 | 15:48 | 2.5 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 9.65 | 10.65 | 1.00 | A* | 154.6 | - | - | 16:23 | 16:43 | 1.6 | 12.2 | 7.30 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 9.65 | 10.65 | 1.00 | B | 202.9 | - | - | 16:43 | 16:55 | 2.4 | 19.3 | 9.13 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 9.65 | 10.65 | 1.00 | C | 185.1 | - | - | 16:55 | 17:03 | 3.2 | 22.9 | 7.02 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 9.65 | 10.65 | 1.00 | D | 11.0 | 553.6 | 553.6 | 17:03 | 17:14 | 3.1 | 0.6 | 0.18 | - | - | - | - | - | - | |
| | | 10-May-10 | 2 | 10.65 | 14.8 | 4.15 | A* | 23.5 | 23.5 | 5.7 | 16:03 | 16:15 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+750.5 | T | 12-Jun-10 | 4 | 7.38 | 8.88 | 1.50 | MF | 194.6 | 194.6 | 129.7 | 3:41 | 4:20 | 2.1 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.49 | 10.49 | 1.00 | A | 171.3 | - | - | 20:34 | 21:06 | 2.2 | 10.1 | 4.38 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.49 | 10.49 | 1.00 | B | 147.0 | - | - | 21:06 | 21:17 | 2.6 | 4.4 | 1.67 | 38.0 | 5.0 | 1.7 | 20.7 | 12.5 | 28.1 | |
| | | 19-May-10 | 3 | 9.49 | 10.49 | 1.00 | C | 44.2 | 362.5 | 362.5 | 21:17 | 22:13 | 2.5 | 0.1 | 0.04 | 45.8 | 2.0 | 1.7 | 24.0 | - | 21.2 | |
| | | 19-May-10 | 2 | 10.49 | 14.7 | 4.21 | A | 29.2 | 29.2 | 6.9 | 20:17 | 20:30 | 2.0 | 0.0 | 0.00 | 32.1 | 4.0 | 1.6 | 18.9 | 12.7 | 22.6 | |
| P-30+752 | P | 05-Jun-10 | 4 | 7.48 | 8.98 | 1.50 | A | 222.1 | - | - | 9:45 | 10:18 | 2.0 | 12.1 | 4.37 | - | - | - | - | - | - | |
| | | 05-Jun-10 | 4 | 7.48 | 8.98 | 1.50 | B | 146.1 | - | - | 10:18 | 10:30 | 2.4 | 10.4 | 2.92 | 37.4 | 3.0 | 1.6 | 11.9 | 12.1 | 14.4 | |
| | | 05-Jun-10 | 4 | 7.48 | 8.98 | 1.50 | C | 138.8 | 507.0 | 338.0 | 10:30 | 11:44 | 2.6 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.63 | 10.63 | 1.00 | A | 240.0 | - | - | 16:00 | 16:23 | 1.7 | 18.0 | 11.20 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.63 | 10.63 | 1.00 | B | 200.0 | - | - | 16:23 | 16:33 | 2.0 | 20.8 | 10.00 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.63 | 10.63 | 1.00 | C | 200.0 | - | - | 16:33 | 16:42 | 3.0 | 26.0 | 8.72 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.63 | 10.63 | 1.00 | D | 360.0 | 1000.0 | 1000.0 | 16:42 | 17:00 | 3.0 | 26.0 | 9.00 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 10.63 | 14.6 | 3.97 | A | 280.0 | - | - | 14:37 | 15:04 | 2.0 | 10.0 | 1.20 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 10.63 | 14.6 | 3.97 | B | 200.0 | - | - | 15:04 | 15:30 | 2.0 | 2.0 | 1.10 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 10.63 | 14.6 | 3.97 | C | 6.0 | 486.0 | 122.4 | 15:30 | 15:34 | 2.0 | 2.0 | 0.25 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+753.5 | T | 12-Jun-10 | 4 | 7.52 | 9.02 | 1.50 | MF | 182.3 | 182.3 | 121.5 | 3:08 | 3:32 | 2.0 | 0.7 | 0.20 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.27 | 10.27 | 1.00 | A | 162.1 | - | - | 22:53 | 23:10 | 2.2 | 15.7 | 7.36 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.27 | 10.27 | 1.00 | B | 158.1 | - | - | 23:10 | 23:28 | 2.2 | 2.5 | 1.14 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.27 | 10.27 | 1.00 | C | 68.6 | 388.8 | 388.8 | 23:28 | 0:30 | 2.7 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 10.27 | 14.6 | 4.33 | A | 27.9 | 27.9 | 6.4 | 22:36 | 22:50 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+755 | S | 05-Jun-10 | 4 | 7.33 | 8.83 | 1.50 | A | 293.8 | - | - | 7:35 | 8:30 | 1.5 | 4.5 | 2.03 | 32.4 | 9.0 | 1.6 | 11.5 | 12.3 | 13.5 | Communicated To P-30+758; Plugged |
| | | 05-Jun-10 | 4 | 7.33 | 8.83 | 1.50 | B | 177.2 | - | - | 8:30 | 9:00 | 2.4 | 2.1 | 0.53 | - | - | - | - | - | - | Communicated To S-30+761; Plugged |
| | | 05-Jun-10 | 4 | 7.33 | 8.83 | 1.50 | C | 102.4 | 573.4 | 382.3 | 9:00 | 9:41 | 2.5 | 0.7 | 0.17 | 46.3 | 5.0 | 1.6 | 12.7 | 12.5 | 14.1 | |
| | | 10-May-10 | 3 | 9.49 | 10.49 | 1.00 | A* | 185.6 | - | - | 13:45 | 14:06 | 1.9 | 15.3 | 8.13 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 9.49 | 10.49 | 1.00 | B | 264.0 | - | - | 14:06 | 14:20 | 2.4 | 23.9 | 9.69 | 36.3 | 5.0 | 1.7 | 10.1 | 6.9 | 11.5 | |
| | | 10-May-10 | 3 | 9.49 | 10.49 | 1.00 | C | 329.7 | - | - | 14:20 | 14:49 | 3.0 | 7.5 | 2.72 | 46.7 | - | 1.7 | 12.1 | 6.8 | 13.7 | |
| | | 10-May-10 | 3 | 9.49 | 10.49 | 1.00 | D | 69.7 | 849.0 | 849.0 | 14:49 | 15:32 | 2.9 | 0.8 | 2.60 | 62.0 | - | 1.7 | 11.9 | 6.9 | 13.9 | |
| | | 10-May-10 | 2 | 10.49 | 14.8 | 4.31 | A* | 24.7 | 24.7 | 5.7 | 13:25 | 13:38 | 2.1 | 0.0 | 0.00 | 32.3 | 5.0 | 1.6 | 11.0 | 7.3 | 15.2 | |
| T-30+756.5 | T | 12-Jun-10 | 4 | 7.38 | 8.88 | 1.50 | MF | 134.8 | 134.8 | 89.9 | 2:37 | 3:06 | 1.9 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.51 | 10.51 | 1.00 | A | 161.1 | - | - | 3:12 | 3:40 | 2.1 | 4.8 | 2.36 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.51 | 10.51 | 1.00 | B | 133.3 | 294.4 | 294.4 | 3:40 | 4:34 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 10.51 | 14.7 | 4.19 | A | 25.4 | 25.4 | 6.1 | 2:54 | 3:09 | 2.3 | 0.0 | 0.00 | 31.6 | - | 1.6 | - | - | - | |
| P-30+758 | P | 04-Jun-10 | 4 | 7.16 | 8.66 | 1.50 | A | 154.5 | - | - | 2:48 | 3:24 | 2.7 | 2.1 | 0.68 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 4 | 7.16 | 8.66 | 1.50 | B | 22.5 | 177.0 | 118.0 | 3:24 | 3:47 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.61 | 10.61 | 1.00 | A | 151.0 | - | - | 21:03 | 21:28 | 1.2 | 12.1 | 10.52 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.61 | 10.61 | 1.00 | B | 169.2 | - | - | 21:28 | 21:40 | 1.8 | 15.0 | 8.76 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.61 | 10.61 | 1.00 | C | 292.9 | - | - | 21:40 | 21:56 | 2.6 | 18.5 | 7.52 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 9.61 | 10.61 | 1.00 | D | 169.4 | 782.5 | 782.5 | 21:56 | 23:12 | 2.8 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 10.61 | 14.6 | 3.99 | A | 154.4 | - | - | 19:24 | 19:50 | 0.0 | 12.7 | inf | 32.9 | 5.0 | 1.7 | 28.0 | 8.0 | 18.0 | |
| | | 06-May-10 | 2 | 10.61 | 14.6 | 3.99 | B | 206.6 | - | - | 19:50 | 20:03 | 0.0 | 12.7 | inf | 26.9 | 5.0 | 1.6 | 21.0 | 8.0 | 18.0 | |
| | | 06-May-10 | 2 | 10.61 | 14.6 | 3.99 | C | 255.1 | - | - | 20:03 | 20:19 | 1.5 | 16.2 | 2.71 | 46.7 | 1.6 | 1.7 | 20.0 | 8.0 | 18.0 | |
| | | 06-May-10 | 2 | 10.61 | 14.6 | 3.99 | D | 91.8 | 707.9 | 177.4 | 20:19 | 20:42 | 1.9 | 0.3 | 0.03 | - | - | - | - | - | - | |
| T-30+759.5 | T | 12-Jun-10 | 4 | 7.01 | 8.51 | 1.50 | MF | 129.2 | 129.2 | 86.1 | 2:10 | 2:35 | 2.0 | 0.0 | 0.00 | 30.9 | - | 1.4 | 9.0 | 9.0 | 14.0 | Communicated To T-30+762.5 |
| | | 19-May-10 | 3 | 9.12 | 10.12 | 1.00 | A | 165.0 | - | - | 5:00 | 5:30 | 2.2 | 7.5 | 3.65 | - | - | - | - | - | - | |
| | | 19-May-10 | 3 | 9.12 | 10.12 | 1.00 | B | 143.4 | 308.4 | 308.4 | 5:30 | 6:15 | 2.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 19-May-10 | 2 | 10.12 | 14.1 | 3.98 | A | 22.5 | 22.5 | 5.7 | 4:44 | 4:58 | 2.4 | 0.3 | 0.03 | - | - | - | - | - | - | |
| S-30+761 | S | 04-Jun-10 | 4 | 6.8 | 8.3 | 1.50 | A | 137.4 | - | - | 1:50 | 2:11 | 2.8 | 6.9 | 1.75 | - | - | - | - | - | - | |
| | | 04-Jun-10 | 4 | 6.8 | 8.3 | 1.50 | B | 45.8 | 183.2 | 122.1 | 2:11 | 2:40 | 2.6 | 0.5 | 0.14 | - | - | - | - | - | - | Communicated To P-30+764 |
| | | 10-May-10 | 3 | 8.94 | 9.94 | 1.00 | A* | 157.7 | - | - | 9:45 | 10:04 | 1.2 | 1.3 | 10.58 | - | - | - | - | - | - | |
| | | 10-May-10 | 3 | 8.94 | 9.94 | 1.00 | B | 340.3 | - | - | 10:04 | 10:20 | 2.5 | 24.0 | 9.83 | 34.7 | 5.0 | 1.6 | 10.1 | 7.2 | 13.5 | |
| | | 10-May-10 | 3 | 8.94 | 9.94 | 1.00 | C | 225.5 | 723.5 | 723.5 | 10:20 | 10:35 | 3.1 | 20.0 | 6.40 | - | - | - | - | - | - | By-Pass |
| | | 10-May-10 | 2 | 9.94 | 14.3 | 4.36 | A* | 22.5 | 22.5 | 5.2 | 9:28 | 9:40 | 2.0 | 0.0 | 0.00 | 32.0 | 5.5 | 1.6 | 10.2 | 7.4 | 14.5 | |
| T-30+762.5 | T | 12-Jun-10 | 4 | 6.66 | 8.16 | 1.50 | MF | 69.6 | 69.6 | 46.4 | 22:56 | 23:18 | 1.9 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.77 | 9.77 | 1.00 | A | 16.1 | 16.1 | 16.1 | 6:51 | 7:04 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 9.77 | 14 | 4.23 | A | 26.1 | 26.1 | 6.2 | 6:28 | 6:42 | 2.5 | 0.4 | 0.03 | 33.0 | 2.5 | 1.6 | 21.6 | 6.6 | 14.8 | |
| P-30+764 | P | 04-Jun-10 | 4 | 6.78 | 8.28 | 1.50 | A | 165.8 | - | - | 0:55 | 1:12 | 2.5 | 8.4 | 3.08 | 31.8 | - | 1.6 | 17.0 | 7.0 | 16.0 | |
| | | 04-Jun-10 | 4 | 6.78 | 8.28 | 1.50 | B | 99.2 | 265.0 | 176.7 | 1:12 | 1:47 | 2.6 | 0.9 | 0.22 | 34.0 | 3.0 | 1.7 | 16.0 | 7.0 | 16.0 | Communicated To S-30+767 |
| | | 06-May-10 | 3 | 8.94 | 9.94 | 1.00 | A | 159.8 | - | - | 3:49 | 4:14 | 1.3 | 13.0 | 9.46 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 8.94 | 9.94 | 1.00 | B | 175.9 | - | - | 4:14 | 4:29 | 1.9 | 16.2 | 6.75 | - | - | - | - | - | - | |
| | | 06-May-10 | 3 | 8.94 | 9.94 | 1.00 | C | 662.3 | 998.0 | 998.0 | 4:29 | 6:28 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 9.94 | 14.1 | 4.16 | A | 204.8 | - | - | 2:11 | 2:30 | 0.3 | 12.0 | 15.34 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 9.94 | 14.1 | 4.16 | B | 328.9 | - | - | 2:30 | 3:01 | 2.0 | 12.0 | 1.45 | - | - | - | - | - | - | |
| | | 06-May-10 | 2 | 9.94 | 14.1 | 4.16 | C | 162.1 | 695.8 | 167.3 | 3:01 | 3:41 | 2.0 | 0.2 | 0.03 | - | - | - | - | - | - | |
| T-30+765.5 | T | 12-Jun-10 | 4 | 6.77 | 8.27 | 1.50 | MF | 122.1 | 122.1 | 81.4 | 22:03 | 22:34 | 1.8 | 0.2 | 0.12 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.87 | 9.87 | 1.00 | A | 134.9 | 134.9 | 134.9 | 9:14 | 9:58 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 9.87 | 14 | 4.13 | A | 32.5 | 32.5 | 7.9 | 8:56 | 9:09 | 2.4 | 0.1 | 0.01 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| S-30+767 | S | 04-Jun-10 | 4 | 6.64 | 8.14 | 1.50 | A | 230.7 | 230.7 | 153.8 | 21:06 | 21:57 | 2.5 | 0.6 | 0.16 | - | - | - | - | - | - | Communication With 30+770 |
| | | 12-May-10 | 3 | 8.77 | 9.77 | 1.00 | A | 16.6 | 16.6 | 16.6 | 15:05 | 15:21 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-10 | 2 | 9.77 | 13.8 | 4.03 | A | 27.2 | 27.2 | 6.7 | 14:47 | 15:01 | 2.0 | 0.0 | 0.00 | 32.0 | - | 1.6 | 19.5 | 6.9 | 14.0 | |
| T-30+768.5 | T | 12-Jun-10 | 4 | 6.1 | 7.6 | 1.50 | MF | 140.0 | 140.0 | 93.3 | 21:23 | 22:01 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.49 | 9.49 | 1.00 | A | 257.7 | 257.7 | 257.7 | 10:23 | 11:49 | 2.4 | 0.1 | 0.06 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 9.49 | 13.8 | 4.31 | A | 23.8 | 23.8 | 5.5 | 10:07 | 10:19 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+770 | P | 04-Jun-10 | 4 | 6.31 | 7.81 | 1.50 | A | 89.8 | 89.8 | 59.9 | 20:37 | 21:02 | 2.6 | 0.8 | 0.19 | - | - | - | - | - | - | Communicated To S-30+773 |
| | | 07-May-10 | 3 | 8.43 | 9.43 | 1.00 | A | 280.0 | - | - | 15:45 | 16:12 | 1.5 | 15.0 | 9.80 | - | - | - | - | - | - | |
| | | 07-May-10 | 3 | 8.43 | 9.43 | 1.00 | B | 156.0 | - | - | 16:12 | 16:22 | 2.5 | 18.0 | 7.90 | - | - | - | - | - | - | |
| | | 07-May-10 | 3 | 8.43 | 9.43 | 1.00 | C | 231.0 | 667.0 | 667.0 | 16:22 | 17:05 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 07-May-10 | 2 | 9.43 | 13.5 | 4.07 | A | 80.0 | - | - | 14:54 | 15:25 | 2.0 | 1.9 | 0.28 | 32.1 | 5.0 | 1.4 | - | 10.1 | 20.4 | |
| | | 07-May-10 | 2 | 9.43 | 13.5 | 4.07 | B | 12.0 | 92.0 | 22.6 | 15:25 | 15:35 | 2.0 | 1.0 | 0.09 | - | - | - | - | - | - | |
| T-30+771.5 | T | 12-Jun-10 | 4 | 6.16 | 7.66 | 1.50 | MF | 144.0 | 144.0 | 96.0 | 20:29 | 21:29 | 2.3 | 0.2 | 0.07 | 31.2 | 0.4 | 1.4 | 4.0 | 9.0 | 12.0 | |
| | | 20-May-10 | 3 | 8.28 | 9.28 | 1.00 | A | 144.2 | - | - | 14:17 | 14:36 | 1.5 | 11.7 | 6.11 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.28 | 9.28 | 1.00 | B | 175.9 | - | - | 14:36 | 14:54 | 2.3 | 5.4 | 2.53 | 35.6 | 4.0 | 1.7 | 15.0 | 7.3 | 12.4 | |
| | | 20-May-10 | 3 | 8.28 | 9.28 | 1.00 | C | 49.4 | 369.5 | 369.5 | 14:54 | 15:32 | 2.5 | 0.4 | 0.16 | 44.8 | 4.0 | 1.6 | 12.4 | 7.0 | 12.3 | |
| | | 20-May-10 | 2 | 9.28 | 13.6 | 4.32 | A | 24.1 | 24.1 | 5.6 | 14:00 | 14:13 | 2.6 | 0.2 | 0.02 | 31.0 | - | 1.7 | 17.3 | 8.1 | 14.2 | |
| S-30+773 | S | 04-Jun-10 | 4 | 6.11 | 7.61 | 1.50 | A | 171.8 | 171.8 | 114.5 | 19:02 | 19:48 | 2.6 | 0.7 | 0.18 | 31.3 | 3.0 | 1.7 | 21.0 | 7.0 | 17.0 | Plugged After Injection |
| | | 12-May-10 | 3 | 8.23 | 9.23 | 1.00 | A | 152.6 | - | - | 16:10 | 16:30 | 1.1 | 12.1 | 11.10 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.23 | 9.23 | 1.00 | B | 180.7 | - | - | 16:30 | 16:42 | 2.2 | 15.1 | 6.86 | 36.6 | 3.0 | 1.7 | 18.8 | 6.7 | 13.9 | |
| | | 12-May-10 | 3 | 8.23 | 9.23 | 1.00 | C | 220.0 | 553.3 | 553.3 | 16:42 | 17:22 | 3.0 | 0.2 | 0.05 | 41.0 | 5.0 | 1.6 | 18.7 | 6.7 | 13.0 | |
| | | 12-May-10 | 2 | 9.23 | 13.7 | 4.47 | A | 119.2 | 119.2 | 26.7 | 15:32 | 16:05 | 2.0 | 2.0 | 0.22 | - | - | - | - | - | - | |
| T-30+774.5 | T | 12-Jun-10 | 4 | 6.54 | 8.04 | 1.50 | MF | 108.0 | 108.0 | 72.0 | 17:54 | 18:58 | 1.8 | 0.1 | 0.08 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.66 | 9.66 | 1.00 | A | 22.9 | 22.9 | 22.9 | 16:08 | 16:29 | 2.5 | 0.4 | 0.15 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 9.66 | 13.9 | 4.24 | A | 32.9 | 32.9 | 7.8 | 15:50 | 16:03 | 1.8 | 0.8 | 0.10 | 32.1 | - | 1.6 | 12.1 | 7.5 | 11.4 | |
| P-30+776 | P | 04-Jun-10 | 4 | 6.2 | 7.7 | 1.50 | A | 444.0 | 444.0 | 296.0 | 16:13 | 18:51 | 2.5 | 0.6 | 0.17 | - | - | - | - | - | - | Plugged After Injection - Plug Broke Twice |
| | | 07-May-10 | 3 | 8.46 | 9.46 | 1.00 | A | 162.4 | - | - | 23:57 | 0:21 | 1.5 | 11.1 | 7.55 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 8.46 | 9.46 | 1.00 | B | 175.0 | - | - | 0:21 | 0:32 | 2.1 | 14.9 | 7.11 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 8.46 | 9.46 | 1.00 | C | 26.6 | - | - | 0:32 | 1:06 | 3.1 | 11.7 | 4.94 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 8.46 | 9.46 | 1.00 | D | 77.1 | 441.1 | 904.0 | 1:06 | 1:31 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 07-May-10 | 2 | 9.46 | 13.3 | 3.84 | A | 73.8 | 73.8 | 19.2 | 23:15 | 23:52 | 2.0 | 0.2 | 0.02 | 31.7 | - | 1.6 | 2.0 | 7.0 | 14.0 | |
| T-30+777.5 | T | 21-Jun-10 | 4 | 6.46 | 7.96 | 1.50 | MF | 192.0 | 192.0 | 128.0 | 9:28 | 10:27 | 2.0 | 0.0 | 0.00 | 35.8 | 2.0 | - | 4.1 | 7.4 | 10.1 | |
| | | 20-May-10 | 3 | 8.46 | 9.46 | 1.00 | A | 135.9 | - | - | 17:00 | 17:24 | 0.5 | 5.9 | 2.67 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.46 | 9.46 | 1.00 | B | 35.9 | 171.8 | 171.8 | 17:24 | 17:57 | 2.4 | 0.4 | 0.15 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 9.46 | 13.8 | 4.34 | A | 51.6 | 51.6 | 11.9 | 16:38 | 16:54 | 2.3 | 1.2 | 0.13 | - | - | - | - | - | - | |
| S-30+779 | S | 04-Jun-10 | 4 | 6.67 | 8.17 | 1.50 | A* | 288.0 | 288.0 | 192.0 | 14:17 | 16:06 | 2.5 | 0.8 | 0.22 | 33.2 | 4.0 | 1.7 | 14.7 | 13.6 | 15.4 | Plugged After Injection |
| | | 12-May-10 | 3 | 8.77 | 9.77 | 1.00 | A | 151.7 | - | - | 18:15 | 18:45 | 2.6 | 8.6 | 3.58 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.77 | 9.77 | 1.00 | B | 161.0 | - | - | 18:45 | 19:04 | 3.0 | 7.8 | 2.65 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.77 | 9.77 | 1.00 | C | 57.8 | 370.5 | 370.5 | 19:04 | 19:35 | 3.1 | 0.0 | 0.00 | 45.1 | 3.6 | 1.6 | 18.0 | 8.0 | 13.0 | |
| | | 12-May-10 | 2 | 9.77 | 13.9 | 4.13 | A | 62.7 | 62.7 | 15.2 | 17:40 | 18:05 | 2.1 | 1.8 | 0.02 | - | - | - | - | - | - | |
| T-30+780.5 | T | 12-Jun-10 | 4 | 6.29 | 7.79 | 1.50 | MF | 73.9 | 73.9 | 49.3 | 16:50 | 17:39 | 2.0 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.41 | 9.41 | 1.00 | A | 156.0 | - | - | 20:32 | 21:06 | 2.6 | 1.6 | 0.82 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.41 | 9.41 | 1.00 | B | 54.6 | 210.6 | 210.6 | 21:06 | 21:40 | 2.6 | 0.5 | 0.20 | 36.6 | 4.0 | 1.6 | 8.7 | 10.4 | 17.8 | |
| | | 20-May-10 | 2 | 9.41 | 13.8 | 4.39 | A | 29.2 | 29.2 | 6.7 | 19:48 | 20:25 | 1.9 | 2.0 | 0.04 | 31.4 | 4.0 | 1.6 | 15.4 | 11.8 | 19.2 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| P-30+782 | P | 04-Jun-10 | 4 | 6.26 | 7.76 | 1.50 | A* | 159.8 | - | - | 11:09 | 11:47 | 2.3 | 9.6 | 2.78 | - | - | - | - | - | - | Plugged After Injection |
| | | 04-Jun-10 | 4 | 6.26 | 7.76 | 1.50 | B | 37.0 | 196.8 | 131.2 | 11:47 | 12:06 | 2.5 | 1.0 | 0.17 | - | - | - | - | - | - | |
| | | 07-May-10 | 3 | 8.38 | 9.38 | 1.00 | A | 160.8 | - | - | 18:31 | 18:57 | 1.4 | 10.4 | 6.90 | - | - | - | - | - | - | |
| | | 07-May-10 | 3 | 8.38 | 9.38 | 1.00 | B | 383.2 | - | - | 18:57 | 19:23 | 2.5 | 21.4 | 8.60 | 37.7 | 4.0 | 1.6 | 14.0 | 12.0 | 19.0 | |
| | | 07-May-10 | 3 | 8.38 | 9.38 | 1.00 | C | 259.0 | - | - | 19:23 | 19:40 | 3.0 | 21.4 | 7.30 | 48.1 | 2.0 | 1.8 | 13.0 | 10.0 | 18.0 | |
| | | 07-May-10 | 3 | 8.38 | 9.38 | 1.00 | D | 87.0 | 890.0 | 890.0 | 19:40 | 20:15 | 2.9 | 0.0 | 0.01 | 65.9 | 1.4 | 1.7 | 13.0 | 10.0 | 17.0 | |
| | | 07-May-10 | 2 | 9.38 | 14.1 | 4.72 | A | 21.1 | 21.1 | 4.5 | 18:05 | 18:22 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+783.5 | T | 12-Jun-10 | 4 | 6.11 | 7.61 | 1.50 | MF | 55.3 | 55.3 | 36.9 | 16:01 | 16:42 | 2.3 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 20-May-10 | 3 | 8.26 | 9.26 | 1.00 | A | 75.3 | 75.3 | 75.3 | 22:27 | 23:10 | 2.4 | 0.1 | 0.06 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 9.26 | 13.6 | 4.34 | A | 77.7 | 77.7 | 17.9 | 22:00 | 22:20 | 1.9 | 1.5 | 0.18 | - | - | - | - | - | - | |
| S-30+785 | S | 04-Jun-10 | 4 | 5.87 | 7.37 | 1.50 | A* | 196.6 | 196.6 | 131.1 | 10:07 | 10:59 | 2.5 | 0.5 | 0.14 | - | - | - | - | - | - | Plugged After Injection |
| | | 12-May-10 | 3 | 8.1 | 9.1 | 1.00 | A | 219.7 | - | - | 21:22 | 21:50 | 2.6 | 11.5 | 4.17 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.1 | 9.1 | 1.00 | B | 150.4 | - | - | 21:50 | 22:03 | 2.8 | 15.2 | 7.30 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 8.1 | 9.1 | 1.00 | C | 100.5 | 470.6 | 470.6 | 22:03 | 22:40 | 3.0 | 0.0 | 0.10 | - | - | - | - | - | - | |
| | | 12-May-10 | 2 | 9.1 | 13.4 | 4.30 | A | 178.9 | - | - | 20:42 | 21:14 | 0.9 | 8.8 | 2.16 | 32.0 | 4.0 | 1.7 | 20.0 | 6.0 | 13.0 | |
| | | 12-May-10 | 2 | 9.1 | 13.4 | 4.30 | B | 30.8 | 209.7 | 48.8 | 21:14 | 22:40 | 1.7 | 8.7 | 1.20 | 35.3 | 4.0 | 1.6 | 22.0 | 6.0 | 15.4 | |
| T-30+786.5 | T | 12-Jun-10 | 4 | 5.79 | 7.29 | 1.50 | MF | 53.5 | 53.5 | 35.7 | 15:24 | 15:58 | 1.8 | 0.7 | 0.25 | 30.5 | 3.0 | 1.5 | 9.4 | 7.9 | 12.3 | |
| | | 20-May-10 | 3 | 7.93 | 8.93 | 1.00 | A | 53.8 | 53.8 | 53.8 | 23:50 | 0:00 | 3.2 | 0.5 | 0.15 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 8.93 | 13.4 | 4.47 | A | 26.2 | 26.2 | 5.9 | 23:20 | 23:40 | 2.8 | 0.3 | 0.02 | - | - | - | - | - | - | |
| P-30+788 | P | 04-Jun-10 | 4 | 5.27 | 6.77 | 1.50 | A* | 21.1 | 21.1 | 14.1 | 9:37 | 9:53 | 2.2 | 0.0 | 0.00 | 33.4 | 5.0 | 1.6 | 12.1 | 10.1 | 14.3 | |
| | | 07-May-10 | 3 | 7.57 | 8.57 | 1.00 | A | 152.6 | - | - | 4:14 | 4:30 | 2.1 | 11.8 | 6.00 | - | - | - | - | - | - | |
| | | 07-May-10 | 3 | 7.57 | 8.57 | 1.00 | B | 172.5 | - | - | 4:30 | 4:40 | 3.0 | 15.1 | 5.70 | 35.7 | - | 1.7 | 4.0 | 7.0 | 12.4 | |
| | | 07-May-10 | 3 | 7.57 | 8.57 | 1.00 | C | 582.9 | 908.0 | 874.9 | 4:40 | 7:00 | 3.0 | 0.0 | 0.01 | 47.2 | - | 1.8 | 6.0 | 7.0 | 14.0 | |
| | | 07-May-10 | 2 | 8.57 | 12.7 | 4.13 | A | 33.1 | 33.1 | 8.0 | 3:48 | 4:01 | 2.1 | 0.0 | 0.00 | 31.5 | 4.0 | 1.6 | 2.0 | 7.0 | 12.0 | |
| T-30+789.5 | T | 20-May-10 | 3 | 7.37 | 8.37 | 1.00 | A | 22.7 | 22.7 | 22.7 | 2:58 | 3:16 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 8.37 | 13.6 | 5.23 | A | 30.8 | 30.8 | 5.9 | 2:35 | 2:51 | 2.9 | 0.6 | 0.05 | 31.4 | - | 1.7 | - | - | 18.3 | |
| S-30+791 | S | 05-Jun-10 | 4 | 5.62 | 7.12 | 1.50 | A* | 59.7 | 59.7 | 39.8 | 19:32 | 19:57 | 2.5 | 0.4 | 0.11 | 32.1 | 3.0 | 1.7 | 14.0 | 7.0 | 16.0 | |
| | | 12-May-10 | 3 | 7.72 | 8.72 | 1.00 | A | 137.8 | - | - | 23:08 | 23:38 | 3.1 | 4.2 | 1.64 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 7.72 | 8.72 | 1.00 | B | 112.3 | 250.1 | 250.1 | 23:38 | 0:30 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 12-May-10 | 2 | 8.72 | 13 | 4.28 | A | 1.6 | 1.6 | 0.4 | 22:52 | 23:05 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+792.5 | T | 20-May-10 | 3 | 7.57 | 8.57 | 1.00 | A | 78.8 | 78.8 | 78.8 | 3:47 | 4:15 | 2.5 | 0.0 | 0.03 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 8.57 | 12.8 | 4.23 | A | 22.4 | 22.4 | 5.3 | 3:16 | 3:45 | 2.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-30+794 | P | 05-Jun-10 | 4 | 5.44 | 6.94 | 1.50 | A* | 44.4 | 44.4 | 29.6 | 19:59 | 20:21 | 2.1 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 7.57 | 8.57 | 1.00 | A | 346.0 | - | - | 8:29 | 9:10 | 2.6 | 0.6 | 0.20 | 32.1 | 5.0 | 1.7 | 10.0 | 9.1 | 13.9 | |
| | | 08-May-10 | 3 | 7.57 | 8.57 | 1.00 | B | 100.0 | 446.0 | 446.0 | 9:10 | 10:15 | 2.6 | 0.6 | 0.22 | 35.0 | 7.0 | 1.7 | 10.0 | 9.1 | 12.4 | |
| | | 08-May-10 | 2 | 8.57 | 12.7 | 4.13 | A | 125.7 | 125.7 | 30.4 | 7:43 | 8:18 | 2.0 | 1.3 | 0.16 | - | - | - | - | - | - | |
| T-30+795.5 | T | 20-May-10 | 3 | 7.55 | 8.55 | 1.00 | A | 161.3 | - | - | 5:02 | 5:31 | 1.8 | 2.5 | 0.94 | - | - | - | - | - | - | Communicated To T-30+798.5 |
| | | 20-May-10 | 3 | 7.55 | 8.55 | 1.00 | B | 63.2 | 224.5 | 224.5 | 5:31 | 6:02 | 2.6 | 1.5 | 0.58 | - | - | - | - | - | - | |
| | | 20-May-10 | 2 | 8.55 | 12.6 | 4.05 | A | 25.8 | 25.8 | 6.4 | 4:39 | 4:50 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+797 | S | 05-Jun-10 | 4 | 5.42 | 6.92 | 1.50 | A* | 34.1 | 34.1 | 22.7 | 20:24 | 20:45 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 7.55 | 8.55 | 1.00 | A | 145.3 | - | - | 0:57 | 1:41 | 3.0 | 2.9 | 1.04 | - | - | - | - | - | - | |
| | | 12-May-10 | 3 | 7.55 | 8.55 | 1.00 | B | 77.4 | 222.7 | 222.7 | 1:41 | 2:24 | 2.9 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 12-May-10 | 2 | 8.55 | 12.7 | 4.15 | A | 3.2 | 3.2 | 0.8 | 0:42 | 0:54 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+798.5 | T | 21-May-10 | 3 | 7.57 | 8.57 | 1.00 | A* | 65.7 | 65.7 | 65.7 | 15:52 | 16:24 | 2.1 | 0.3 | 0.15 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 8.57 | 12.7 | 4.13 | A* | 22.5 | 22.5 | 5.4 | 15:35 | 15:48 | 1.7 | 0.0 | 0.00 | 31.8 | 3.0 | 1.7 | 17.0 | 12.1 | 18.4 | |
| P-30+800 | P | 05-Jun-10 | 4 | 5.36 | 6.86 | 1.50 | A* | 70.2 | 70.2 | 46.8 | 20:47 | 21:18 | 2.6 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 7.52 | 8.52 | 1.00 | A | 182.7 | 182.7 | 182.7 | 11:14 | 12:34 | 2.5 | 0.0 | 0.01 | 32.7 | 7.0 | 1.7 | 10.0 | 9.1 | 15.4 | |
| | | 08-May-10 | 2 | 8.52 | 12.6 | 4.08 | A | 55.8 | 55.8 | 13.7 | 10:40 | 11:05 | 1.9 | 0.8 | 0.10 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+801.5 | T | 12-Jun-10 | 3 | 7.04 | 8.04 | 1.00 | A | 38.9 | 38.9 | 38.9 | 9:34 | 10:09 | 1.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 12-Jun-10 | 2 | 8.04 | 12.3 | 4.26 | A | 36.1 | 36.1 | 8.5 | 9:17 | 9:30 | 2.0 | 0.0 | 0.00 | 31.7 | 3.0 | 1.6 | 6.0 | 11.3 | 9.8 | |
| S-30+803 | S | 05-Jun-10 | 4 | 4.88 | 6.38 | 1.50 | A* | 79.2 | 79.2 | 52.8 | 21:16 | 21:36 | 0.6 | 9.6 | 10.51 | - | - | - | - | - | - | By-Pass: Outside Casing |
| | | 12-May-10 | 3 | 7.01 | 8.01 | 1.00 | A | 73.5 | 73.5 | 73.5 | 5:09 | 5:57 | 2.9 | 0.5 | 0.19 | - | - | - | - | - | - | |
| | | 12-May-10 | 2 | 8.01 | 12.5 | 4.49 | A | 26.0 | 26.0 | 5.8 | 4:45 | 5:05 | 2.0 | 0.0 | 0.04 | - | - | - | - | - | - | |
| T-30+804.5 | T | 21-May-10 | 3 | 6.9 | 7.9 | 1.00 | A* | 110.3 | 110.3 | 110.3 | 16:57 | 17:54 | 2.1 | 0.5 | 0.22 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 7.9 | 11.9 | 4.00 | A* | 29.5 | 29.5 | 7.4 | 16:35 | 16:53 | 1.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+806 | P | 05-Jun-10 | 4 | 4.55 | 6.05 | 1.50 | A* | 25.0 | 25.0 | 16.7 | 22:38 | 22:50 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 7.04 | 8.04 | 1.00 | A | 46.0 | - | - | 15:46 | 16:01 | 2.0 | 6.0 | 3.10 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 7.04 | 8.04 | 1.00 | A* | 263.7 | 309.7 | 309.7 | 16:01 | 17:25 | 2.4 | 0.5 | 0.16 | - | - | - | - | - | - | |
| | | 08-May-10 | 2 | 8.04 | 12.4 | 4.36 | A | 33.5 | 33.5 | 7.7 | 15:21 | 15:36 | 1.9 | 0.2 | 0.03 | 32.4 | 4.0 | 1.7 | 10.0 | 9.1 | 14.8 | |
| T-30+807.5 | T | 21-May-10 | 3 | 7.22 | 8.22 | 1.00 | A* | 0.7 | 0.7 | 0.7 | 18:45 | 19:00 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 8.22 | 12.2 | 3.98 | A* | 21.1 | 21.1 | 5.3 | 18:02 | 18:15 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+809 | S | 05-Jun-10 | 4 | 5.32 | 6.82 | 1.50 | A* | 25.5 | 25.5 | 17.0 | 22:54 | 23:07 | 2.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 13-May-10 | 3 | 7.41 | 8.41 | 1.00 | A | 47.6 | 47.6 | 47.6 | 2:53 | 3:25 | 2.6 | 0.3 | 0.12 | - | - | - | - | - | - | |
| | | 13-May-10 | 2 | 8.41 | 12.6 | 4.19 | A | 143.0 | 143.0 | 34.1 | 2:16 | 2:50 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+810.5 | T | 21-May-10 | 3 | 7.93 | 8.93 | 1.00 | A* | 26.1 | 26.1 | 26.1 | 20:02 | 20:25 | 2.0 | 0.3 | 0.17 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 8.93 | 12.5 | 3.57 | A* | 190.4 | 190.4 | 53.3 | 19:20 | 19:50 | 2.0 | 0.0 | 0.00 | 33.6 | 5.0 | 1.7 | 17.0 | 8.7 | 19.7 | |
| P-30+812 | P | 05-Jun-10 | 4 | 5.54 | 7.04 | 1.50 | A* | 49.0 | 49.0 | 32.7 | 23:09 | 23:28 | 2.1 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 7.57 | 8.57 | 1.00 | A | 281.5 | - | - | 20:45 | 22:13 | 2.9 | 1.5 | 0.56 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 7.57 | 8.57 | 1.00 | B | 32.3 | 313.8 | 313.8 | 22:13 | 22:50 | 2.5 | 0.4 | 0.18 | 35.8 | 5.0 | 1.6 | 33.0 | 8.0 | 21.0 | |
| | | 08-May-10 | 2 | 8.57 | 12.7 | 4.13 | A | 102.4 | 102.4 | 24.8 | 19:54 | 20:40 | 1.8 | 0.2 | 0.09 | 31.5 | 4.0 | 1.7 | 12.0 | 8.0 | 17.0 | |
| T-30+813.5 | T | 21-May-10 | 3 | 7.44 | 8.44 | 1.00 | A* | 60.0 | 60.0 | 60.0 | 21:20 | 21:50 | 2.0 | 0.2 | 0.10 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 8.44 | 12.5 | 4.06 | A* | 22.9 | 22.9 | 5.6 | 20:54 | 21:15 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+815 | S | 05-Jun-10 | 4 | 5.32 | 6.82 | 1.50 | A* | 45.9 | 45.9 | 30.6 | 23:30 | 23:55 | 2.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 7.39 | 8.39 | 1.00 | A | 101.3 | 101.3 | 101.3 | 8:05 | 8:35 | 2.4 | 0.6 | 0.25 | - | - | - | - | - | - | |
| | | 14-May-10 | 2 | 8.39 | 12.4 | 4.01 | A | 34.5 | 34.5 | 8.6 | 7:39 | 7:59 | 1.8 | 0.0 | 0.00 | 33.0 | 3.5 | 1.7 | 11.6 | 6.7 | 13.5 | |
| T-30+816.5 | T | 21-May-10 | 3 | 7.65 | 8.65 | 1.00 | A* | 35.9 | 35.9 | 35.9 | 22:28 | 22:58 | 2.0 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 8.65 | 12.8 | 4.15 | A* | 32.7 | 32.7 | 7.9 | 21:56 | 22:25 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+818 | P | 05-Jun-10 | 4 | 5.16 | 6.66 | 1.50 | A* | 32.0 | 32.0 | 21.3 | 23:58 | 0:14 | 1.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 08-May-10 | 3 | 7.28 | 8.28 | 1.00 | A | 103.3 | - | - | 23:47 | 0:20 | 2.5 | 2.6 | 0.81 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 7.28 | 8.28 | 1.00 | B | 63.5 | 166.8 | 166.8 | 0:20 | 1:32 | 2.6 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 08-May-10 | 2 | 8.28 | 12.3 | 4.02 | A | 61.4 | 61.4 | 15.3 | 23:09 | 23:24 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+819.5 | T | 21-May-10 | 3 | 7.65 | 8.65 | 1.00 | A* | 55.2 | 55.2 | 55.2 | 23:35 | 0:00 | 2.1 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 8.65 | 12.8 | 4.15 | A* | 34.1 | 34.1 | 8.2 | 23:08 | 23:30 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+821 | S | 05-Jun-10 | 4 | 5.38 | 6.88 | 1.50 | A* | 38.8 | 38.8 | 25.9 | 2:43 | 2:58 | 2.0 | 0.4 | 0.13 | 32.6 | - | 1.7 | 10.0 | 7.0 | 15.0 | |
| | | 14-May-10 | 3 | 7.5 | 8.5 | 1.00 | A | 88.9 | 88.9 | 88.9 | 9:16 | 9:49 | 2.5 | 0.4 | 0.16 | - | - | - | - | - | - | |
| | | 14-May-10 | 2 | 8.5 | 12.6 | 4.10 | A | 59.8 | 59.8 | 14.6 | 8:48 | 9:11 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+822.5 | T | 21-May-10 | 3 | 7.11 | 8.11 | 1.00 | A* | 34.8 | 34.8 | 34.8 | 3:10 | 3:30 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 8.11 | 12.5 | 4.39 | A* | 35.9 | 35.9 | 8.2 | 2:35 | 3:00 | 1.7 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-30+824 | P | 05-Jun-10 | 4 | 4.78 | 6.28 | 1.50 | A* | 23.1 | 23.1 | 15.4 | 3:00 | 3:14 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 6.85 | 7.85 | 1.00 | A* | 222.0 | - | - | 10:59 | 11:23 | 2.1 | 18.0 | 9.50 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 6.85 | 7.85 | 1.00 | B | 173.3 | - | - | 11:23 | 11:31 | 2.6 | 21.0 | 8.60 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 6.85 | 7.85 | 1.00 | C | 288.3 | - | - | 11:31 | 12:00 | 2.6 | 12.7 | 4.96 | 43.6 | 2.0 | 1.6 | 15.1 | 9.6 | 16.3 | |
| | | 09-May-10 | 3 | 6.85 | 7.85 | 1.00 | D | 92.7 | 776.3 | 776.3 | 12:00 | 12:35 | 2.4 | 0.0 | 0.01 | 43.0 | 1.0 | 1.7 | 15.3 | 9.6 | 16.1 | |
| | | 09-May-10 | 2 | 7.85 | 11.8 | 3.95 | A* | 161.6 | 161.6 | 40.9 | 9:52 | 10:49 | 1.8 | 0.0 | 0.00 | 32.0 | 3.0 | 1.6 | 16.1 | 9.1 | 17.1 | By-Pass |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | | (Celcius) | (Celcius) | (Celcius) | |
| T-30+825.5 | T | 21-May-10 | 3 | 7.11 | 8.11 | 1.00 | A* | 6.0 | 6.0 | 6.0 | 4:10 | 4:30 | 2.4 | 0.2 | 0.10 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 8.11 | 12.3 | 4.19 | A* | 113.2 | 113.2 | 27.0 | 3:35 | 4:05 | 2.0 | 0.2 | 0.03 | - | - | - | - | - | - | |
| S-30+827 | S | 05-Jun-10 | 4 | 4.78 | 6.28 | 1.50 | A* | 25.1 | 25.1 | 16.7 | 3:17 | 3:31 | 2.0 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 6.94 | 7.94 | 1.00 | A* | 154.0 | 154.0 | 154.0 | 13:32 | 14:21 | 2.5 | 0.4 | 0.17 | - | - | - | - | - | - | |
| | | 14-May-10 | 2 | 7.94 | 11.9 | 3.96 | A* | 28.0 | 28.0 | 7.1 | 11:01 | 11:15 | 1.7 | 1.1 | 0.16 | 33.5 | 3.5 | 1.7 | 10.7 | 6.9 | 14.6 | |
| T-30+828.5 | T | 21-May-10 | 3 | 6.87 | 7.87 | 1.00 | A* | 34.8 | 34.8 | 34.8 | 5:10 | 5:35 | 2.0 | 0.1 | 0.07 | - | - | - | - | - | - | |
| | | 21-May-10 | 2 | 7.87 | 11.9 | 4.03 | A* | 34.0 | 34.0 | 8.4 | 4:45 | 5:05 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+830 | P | 09-May-10 | 3 | 6.96 | 7.96 | 1.00 | A* | 270.0 | - | - | 15:00 | 15:27 | 2.7 | 14.4 | 5.75 | 31.0 | 5.0 | 1.6 | 17.4 | 11.4 | 14.2 | |
| | | 09-May-10 | 3 | 6.96 | 7.96 | 1.00 | B | 245.7 | - | - | 15:27 | 15:57 | 2.5 | 5.8 | 2.32 | 35.0 | 5.0 | 1.7 | 16.8 | 11.1 | 14.7 | |
| | | 09-May-10 | 3 | 6.96 | 7.96 | 1.00 | C | 162.5 | - | - | 15:57 | 16:48 | 2.6 | 3.7 | 1.30 | 44.0 | 2.5 | 1.7 | 16.9 | 11.4 | 16.8 | |
| | | 09-May-10 | 3 | 6.96 | 7.96 | 1.00 | C+ | 48.2 | - | - | 16:48 | 17:24 | 2.4 | 2.9 | 1.15 | 38.0 | - | - | - | - | - | |
| | | 09-May-10 | 3 | 6.96 | 7.96 | 1.00 | D | 28.4 | 754.8 | 754.8 | 17:24 | 17:49 | 2.4 | 1.3 | 0.53 | - | - | - | - | - | - | |
| | | 09-May-10 | 2 | 7.96 | 12.1 | 4.14 | A* | 53.5 | 53.5 | 12.9 | 14:33 | 14:51 | 1.9 | 0.8 | 0.10 | - | - | - | - | - | - | |
| T-30+831.5 | T | 22-May-10 | 3 | 6.89 | 7.89 | 1.00 | A* | 30.9 | 30.9 | 30.9 | 8:06 | 8:20 | 2.6 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 7.89 | 12 | 4.11 | A* | 34.2 | 34.2 | 8.3 | 7:48 | 8:01 | 1.9 | 0.6 | 0.08 | - | - | - | - | - | - | |
| S-30+833 | S | 05-Jun-10 | 4 | 4.78 | 6.28 | 1.50 | A* | 28.4 | 28.4 | 18.9 | 3:40 | 3:50 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 6.89 | 7.89 | 1.00 | A* | 93.2 | 147.7 | 147.7 | 1:13 | 2:13 | 2.3 | 0.4 | 0.19 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 6.89 | 7.89 | 1.00 | A* | 54.5 | - | - | 16:33 | 17:05 | 0.2 | - | - | - | - | - | - | - | - | Pump Broke Down. Stopped Injection. |
| | | 14-May-10 | 2 | 7.89 | 12 | 4.11 | A* | 27.9 | 27.9 | 6.8 | 16:11 | 16:25 | 1.8 | 0.0 | 0.00 | 31.0 | - | 1.7 | - | - | 13.3 | |
| T-30+834.5 | T | 22-May-10 | 3 | 6.99 | 7.99 | 1.00 | A* | 28.3 | 28.3 | 28.3 | 8:42 | 8:57 | 2.6 | 0.1 | 0.06 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 7.99 | 12.1 | 4.11 | A* | 32.5 | 32.5 | 7.9 | 8:26 | 8:39 | 1.9 | 0.2 | 0.04 | - | - | - | - | - | - | |
| P-30+836 | P | 05-Jun-10 | 4 | 4.97 | 6.47 | 1.50 | A* | 22.7 | 22.7 | 15.1 | 4:00 | 4:12 | 2.0 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 7.06 | 8.6 | 1.00 | A | 142.6 | - | - | 20:20 | 20:48 | 1.8 | 10.4 | 3.99 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 7.06 | 8.6 | 1.00 | B | 122.0 | - | - | 20:48 | 21:01 | 2.4 | 2.6 | 1.10 | 36.0 | 6.0 | 1.6 | 14.0 | 7.0 | 15.1 | |
| | | 09-May-10 | 3 | 7.06 | 8.6 | 1.00 | C | 387.5 | 652.1 | 652.1 | 21:01 | 23:17 | 2.3 | 0.1 | 0.30 | 45.7 | - | 1.7 | 14.0 | 7.0 | 16.0 | |
| | | 09-May-10 | 2 | 8.6 | 13.1 | 4.50 | A | 54.3 | 54.3 | 12.1 | 19:47 | 20:16 | 1.8 | 0.0 | 0.00 | 32.1 | 4.0 | 1.7 | 13.0 | 7.0 | 14.0 | |
| T-30+837.5 | T | 22-May-10 | 3 | 7.16 | 8.16 | 1.00 | A* | 26.9 | 26.9 | 26.9 | 9:25 | 9:44 | 2.1 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 22-May-10 | 2 | 8.16 | 12.3 | 4.14 | A* | 37.6 | 37.6 | 9.1 | 9:05 | 9:20 | 1.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+839 | S | 05-Jun-10 | 4 | 5.1 | 6.6 | 1.50 | A* | 25.0 | 25.0 | 16.7 | 4:15 | 4:27 | 2.3 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 14-May-10 | 3 | 7.19 | 8.19 | 1.00 | A* | 109.8 | 109.8 | 109.8 | 2:55 | 3:45 | 2.6 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 14-May-10 | 2 | 8.19 | 12.3 | 4.11 | A* | 52.0 | 52.0 | 12.7 | 2:26 | 2:43 | 1.9 | 1.4 | 0.18 | - | - | - | - | - | - | |
| T-30+840.5 | T | 23-May-10 | 3 | 7.24 | 8.24 | 1.00 | A | 48.4 | 48.4 | 48.4 | 13:48 | 14:42 | 1.9 | 0.1 | 0.06 | - | - | - | - | - | - | |
| | | 23-May-10 | 2 | 8.24 | 12.4 | 4.16 | A | 31.1 | 31.1 | 7.5 | 13:29 | 13:43 | 1.8 | 0.0 | 0.00 | 33.0 | 3.5 | 1.6 | 10.9 | 7.2 | 14.1 | |
| P-30+842 | P | 05-Jun-10 | 4 | 5.2 | 6.7 | 1.50 | A* | 25.6 | 25.6 | 17.1 | 4:29 | 4:42 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 09-May-10 | 3 | 7.06 | 8.06 | 1.00 | A | 16.1 | 16.1 | 16.1 | 3:51 | 4:48 | 2.6 | 0.3 | 0.13 | - | - | - | - | - | - | |
| | | 09-May-10 | 2 | 8.06 | 13.6 | 5.54 | A | 133.6 | 133.6 | 24.1 | 3:02 | 3:38 | 0.0 | 0.0 | inf | 31.3 | - | 1.6 | 21.0 | 7.0 | 14.0 | By-Pass |
| T-30+843.5 | T | 23-May-10 | 3 | 7.22 | 8.22 | 1.00 | A* | 23.9 | 23.9 | 23.9 | 15:13 | 15:34 | 2.1 | 0.2 | 0.11 | - | - | - | - | - | - | |
| | | 23-May-10 | 2 | 8.22 | 12.5 | 4.28 | A* | 34.2 | 34.2 | 8.0 | 14:52 | 15:07 | 1.8 | 0.0 | 0.00 | 31.0 | - | 1.6 | 9.9 | 8.3 | 16.3 | |
| S-30+845 | S | 14-May-10 | 3 | 7.24 | 8.24 | 1.00 | A* | 4.8 | 4.8 | 4.8 | 4:34 | 4:47 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 14-May-10 | 2 | 8.24 | 12.3 | 4.06 | A* | 52.7 | 52.7 | 13.0 | 4:04 | 4:28 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+846.5 | T | 23-May-10 | 3 | 7.27 | 8.27 | 1.00 | A* | 15.4 | 15.4 | 15.4 | 16:09 | 16:28 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 23-May-10 | 2 | 8.27 | 12.4 | 4.13 | A* | 31.0 | 31.0 | 7.5 | 15:48 | 16:02 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+848 | P | 09-May-10 | 3 | 7.44 | 8.44 | 1.00 | A | 8.9 | 8.9 | 8.9 | 5:15 | 5:30 | 2.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 09-May-10 | 2 | 8.44 | 13.1 | 4.66 | A | 37.7 | 37.7 | 8.1 | 4:52 | 5:13 | 1.8 | 0.6 | 0.07 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-30+851 | S | 07-Dec-10 | 4 | 5.83 | 7.33 | 1.50 | B | 48.5 | 48.5 | 32.3 | 14:22 | 14:56 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 7.83 | 8.83 | 1.00 | A* | 22.3 | 22.3 | 22.3 | 15:30 | 15:44 | 3.1 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 2 | 8.83 | 12.60 | 3.77 | A* | 39.8 | 39.8 | 10.6 | 15:05 | 15:26 | 2.1 | 0.8 | 0.10 | 32.8 | - | 1.60 | 6.7 | 6.4 | 12.9 | |
| T-30+852.5 | T | 23-Jun-11 | 4 | 5.70 | 7.20 | 1.50 | MF | 54.0 | 54.0 | 36.0 | 7:22 | 7:45 | 2.0 | 0.0 | 0.00 | 30.2 | 2.0 | 1.41 | 11.8 | 8.5 | 14.6 | |
| | | 12-Nov-10 | 3 | 7.70 | 8.70 | 1.00 | B | 15.4 | 15.4 | 15.4 | 21:27 | 21:41 | 2.2 | 0.2 | 0.07 | 37.8 | 9.0 | 1.64 | 6.6 | 7.1 | 16.9 | |
| | | 12-Nov-10 | 2 | 8.70 | 12.80 | 4.10 | A* | 26.6 | 26.6 | 6.5 | 21:03 | 21:19 | 2.0 | 0.0 | 0.00 | 33.6 | 5.0 | 1.60 | 6.6 | 7.1 | 19.0 | |
| P-30+854 | P | 28-Nov-10 | 4 | 5.55 | 7.05 | 1.50 | B | 47.3 | 47.3 | 31.5 | 21:10 | 21:49 | 2.7 | 0.1 | 0.02 | 32.9 | 4.0 | 1.54 | -7.4 | 6.9 | 12.4 | By-Pass. Raised packer. |
| | | 09-Oct-10 | 3 | 7.55 | 8.55 | 1.00 | A* | 17.2 | 17.2 | 17.2 | 13:57 | 14:11 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 2 | 8.55 | 12.50 | 3.95 | A* | 33.5 | 33.5 | 8.5 | 13:31 | 13:54 | 2.1 | 0.0 | 0.00 | 32.0 | 7.0 | 1.63 | 4.9 | 12.3 | 18.5 | |
| T-30+855.5 | T | 15-Dec-10 | 4 | 4.89 | 6.39 | 1.50 | MF | 64.7 | 64.7 | 43.1 | 13:28 | 14:07 | 2.1 | 0.3 | 0.10 | 29.5 | - | 1.49 | 22.1 | 8.4 | 18.4 | |
| | | 12-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | A | 13.4 | 13.4 | 13.4 | 22:12 | 22:29 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 7.89 | 12.50 | 4.61 | A | 34.6 | 34.6 | 7.5 | 21:48 | 22:05 | 2.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| S-30+857 | S | 07-Dec-10 | 4 | 4.00 | 5.50 | 1.50 | B | 171.7 | - | - | 10:22 | 10:49 | 2.5 | 15.0 | 10.44 | - | - | - | - | - | - | |
| | | 07-Dec-10 | 4 | 4.00 | 5.50 | 1.50 | C | 142.8 | - | - | 10:49 | 11:00 | 2.4 | 11.7 | 3.30 | - | - | - | - | - | - | |
| | | 07-Dec-10 | 4 | 4.00 | 5.50 | 1.50 | D | 128.7 | 443.2 | 295.5 | 11:00 | 11:45 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 6.00 | 7.00 | 1.00 | A* | 89.2 | 89.2 | 89.2 | 16:08 | 16:56 | 3.5 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 2 | 7.00 | 11.20 | 4.20 | A* | 33.8 | 33.8 | 8.0 | 15:51 | 16:06 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+858.5 | T | 23-Jun-11 | 4 | 3.84 | 5.34 | 1.50 | MF | 32.9 | 32.9 | 21.9 | 7:47 | 8:06 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.84 | 6.84 | 1.00 | A | 157.8 | - | - | 23:01 | 23:34 | 1.0 | 12.5 | 12.32 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.84 | 6.84 | 1.00 | B | 171.7 | - | - | 23:34 | 23:45 | 1.2 | 18.4 | 11.59 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.84 | 6.84 | 1.00 | C | 185.9 | - | - | 23:45 | 23:54 | 1.9 | 15.9 | 8.44 | 49.5 | - | 1.68 | 1.2 | 7.9 | 13.7 | |
| | | 12-Nov-10 | 3 | 5.84 | 6.84 | 1.00 | D | 106.1 | 621.5 | 621.5 | 23:54 | 0:00 | 2.7 | 18.1 | 6.61 | 77.2 | - | 1.70 | 1.2 | 7.9 | 12.9 | |
| | | 12-Nov-10 | 2 | 6.84 | 11.20 | 4.36 | A | 29.6 | 29.6 | 6.8 | 22:37 | 22:53 | 1.9 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-30+860 | P | 28-Nov-10 | 4 | 3.61 | 5.11 | 1.50 | B | 174.8 | - | - | 17:38 | 18:00 | 1.1 | 11.5 | 6.01 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 4 | 3.61 | 5.11 | 1.50 | C | 259.3 | - | - | 18:00 | 18:29 | 1.6 | 11.2 | 5.48 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 4 | 3.61 | 5.11 | 1.50 | D | 279.1 | 713.2 | 475.5 | 18:29 | 20:18 | 2.4 | 0.3 | 0.08 | 66.0 | 1.0 | 1.68 | -7.1 | 9.7 | 15.0 | |
| | | 09-Oct-10 | 3 | 5.61 | 6.61 | 1.00 | A* | 191.9 | - | - | 14:40 | 15:04 | 0.4 | 15.9 | 45.24 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.61 | 6.61 | 1.00 | B | 202.1 | - | - | 15:04 | 15:17 | 0.5 | 15.3 | 29.49 | 35.0 | 7.0 | 1.69 | 4.5 | 9.2 | 17.1 | |
| | | 09-Oct-10 | 3 | 5.61 | 6.61 | 1.00 | C | 207.9 | - | - | 15:17 | 15:30 | 0.6 | 16.1 | 28.64 | 45.0 | - | 1.71 | 4.9 | 9.4 | 17.3 | |
| | | 09-Oct-10 | 3 | 5.61 | 6.61 | 1.00 | D | 97.7 | 699.6 | 699.6 | 15:30 | 15:38 | 1.0 | 11.7 | 11.24 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 2 | 6.61 | 10.90 | 4.29 | A* | 26.1 | 26.1 | 6.1 | 14:20 | 14:35 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+861.5 | T | 15-Dec-10 | 4 | 3.36 | 4.86 | 1.50 | MF | 111.0 | 111.0 | 74.0 | 14:11 | 15:03 | 2.2 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | A | 112.4 | - | - | 3:03 | 3:21 | 1.2 | 13.0 | 10.77 | 33.4 | - | 1.65 | 3.3 | 6.9 | - | |
| | | 12-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | B | 166.6 | - | - | 3:21 | 3:34 | 1.2 | 2.5 | 2.09 | 48.3 | - | 1.69 | 3.3 | 6.9 | 13.9 | |
| | | 12-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | C | 204.1 | - | - | 3:34 | 3:55 | 2.5 | 9.7 | 5.51 | 62.8 | 1.0 | 1.73 | 3.3 | 6.9 | 14.9 | |
| | | 12-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | D | 133.8 | 616.9 | 616.9 | 3:55 | 4:07 | 1.8 | 18.9 | 10.48 | 73.0 | 1.0 | 1.70 | 3.3 | 6.9 | 15.1 | |
| | | 12-Nov-10 | 2 | 6.36 | 10.50 | 4.14 | A | 28.5 | 28.5 | 6.9 | 2:43 | 2:58 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+863 | S | 07-Dec-10 | 4 | 3.34 | 4.84 | 1.50 | A* | 202.8 | - | - | 8:04 | 8:51 | 1.7 | 12.5 | 4.93 | - | - | - | - | - | - | |
| | | 07-Dec-10 | 4 | 3.34 | 4.84 | 1.50 | B* | 123.4 | - | - | 8:51 | 8:58 | 1.8 | 7.8 | 1.95 | 36.3 | 3.0 | 1.62 | 19.2 | 14.0 | 21.2 | |
| | | 07-Dec-10 | 4 | 3.34 | 4.84 | 1.50 | C | 147.0 | - | - | 8:58 | 9:17 | 2.5 | 0.3 | 0.21 | 48.2 | - | 1.67 | 19.4 | 14.2 | 22.0 | |
| | | 07-Dec-10 | 4 | 3.34 | 4.84 | 1.50 | D | 182.0 | - | - | 9:17 | 9:35 | 2.5 | 7.5 | 1.89 | 68.2 | - | 1.66 | 21.2 | 14.8 | 22.3 | |
| | | 07-Dec-10 | 4 | 3.34 | 4.84 | 1.50 | X | 36.9 | 692.1 | 461.4 | 9:35 | 9:42 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 5.34 | 6.34 | 1.00 | A* | 179.4 | - | - | 17:23 | 17:44 | 0.0 | 10.7 | inf | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 5.34 | 6.34 | 1.00 | B | 189.1 | - | - | 17:44 | 17:57 | 0.2 | 18.9 | 59.20 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 5.34 | 6.34 | 1.00 | C | 165.5 | - | - | 17:57 | 18:06 | 1.1 | 17.5 | 16.24 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 5.34 | 6.34 | 1.00 | D | 114.7 | 648.7 | 648.7 | 18:06 | 18:13 | 1.0 | 17.3 | 17.52 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 2 | 6.34 | 10.80 | 4.46 | A* | 40.9 | 40.9 | 9.2 | 17:02 | 17:20 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-30+864.5 | T | 23-Jun-11 | 4 | 3.31 | 4.81 | 1.50 | MF | 28.3 | 28.3 | 18.9 | 8:08 | 8:26 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.31 | 6.31 | 1.00 | A | 158.4 | - | - | 5:00 | 5:21 | 1.3 | 12.2 | 9.20 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.31 | 6.31 | 1.00 | B | 160.5 | - | - | 5:21 | 5:32 | 1.6 | 18.1 | 11.22 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.31 | 6.31 | 1.00 | C | 159.2 | - | - | 5:32 | 5:39 | 1.8 | 22.3 | 14.04 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.31 | 6.31 | 1.00 | D | 123.2 | 601.3 | 601.3 | 5:39 | 5:47 | 2.3 | 21.8 | 9.58 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 6.31 | 10.60 | 4.29 | A | 29.5 | 29.5 | 6.9 | 4:40 | 4:56 | 2.2 | 0.2 | 0.02 | - | - | - | - | - | - | |
| P-30+866 | P | 28-Nov-10 | 4 | 3.31 | 4.81 | 1.50 | B | 25.4 | 25.4 | 16.9 | 17:14 | 17:29 | 2.6 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.31 | 6.31 | 1.00 | A* | 19.4 | 19.4 | 19.4 | 16:08 | 16:22 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 2 | 6.31 | 10.30 | 3.99 | A* | 27.8 | 27.8 | 7.0 | 15:49 | 16:04 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+867.5 | T | 15-Dec-10 | 4 | 3.72 | 5.22 | 1.50 | MF | 93.9 | 93.9 | 62.6 | 15:11 | 15:50 | 2.0 | 0.9 | 0.22 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.72 | 6.72 | 1.00 | A* | 41.5 | - | - | 7:54 | 8:04 | 0.4 | 6.9 | 18.39 | 30.6 | 5.0 | 1.61 | 7.4 | 6.3 | 12.5 | |
| | | 13-Nov-10 | 3 | 5.72 | 6.72 | 1.00 | B | 216.8 | - | - | 8:04 | 8:24 | 1.1 | 14.5 | 19.69 | 34.7 | 2.0 | 1.60 | 7.4 | 6.3 | 13.6 | |
| | | 13-Nov-10 | 3 | 5.72 | 6.72 | 1.00 | C | 122.6 | - | - | 8:24 | 8:32 | 1.6 | 15.9 | 11.37 | 52.2 | - | 1.63 | 7.9 | 6.3 | 14.6 | |
| | | 13-Nov-10 | 3 | 5.72 | 6.72 | 1.00 | D | 220.5 | 601.4 | 601.4 | 8:32 | 9:15 | 1.4 | 3.8 | 2.68 | 76.8 | - | 1.65 | 8.0 | 6.1 | 14.8 | |
| | | 13-Nov-10 | 2 | 6.72 | 11.00 | 4.28 | A* | 41.0 | 41.0 | 9.6 | 7:36 | 7:50 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+869 | S | 07-Dec-10 | 4 | 3.72 | 4.66 | 0.94 | A* | 70.3 | 70.3 | 74.8 | 7:10 | 7:55 | 1.9 | 0.1 | 0.04 | 30.1 | 5.0 | 1.63 | 20.1 | 17.1 | 23.3 | |
| | | 09-Nov-10 | 3 | 5.16 | 6.16 | 1.00 | B | 191.1 | - | - | 20:56 | 21:22 | 1.0 | 15.0 | 15.79 | 32.8 | 8.0 | 1.65 | 5.4 | 6.9 | 15.4 | |
| | | 09-Nov-10 | 3 | 5.16 | 6.16 | 1.00 | C | 183.1 | - | - | 21:22 | 21:33 | 1.2 | 16.5 | 13.51 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 5.16 | 6.16 | 1.00 | D | 223.7 | 597.9 | 597.9 | 21:33 | 21:49 | 1.3 | 2.0 | 1.58 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 2 | 6.16 | 10.40 | 4.24 | A* | 32.4 | 32.4 | 7.6 | 20:32 | 20:50 | 1.8 | 0.3 | 0.04 | 31.2 | 4.0 | 1.60 | 11.6 | 7.4 | 13.4 | |
| T-30+870.5 | T | 23-Jun-11 | 4 | 3.61 | 5.11 | 1.50 | MF | 33.4 | 33.4 | 22.3 | 8:28 | 8:44 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.61 | 6.61 | 1.00 | A* | 133.4 | - | - | 9:42 | 10:03 | 1.1 | 9.3 | 7.75 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.61 | 6.61 | 1.00 | B | 146.6 | - | - | 10:03 | 10:14 | 1.4 | 16.1 | 11.79 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.61 | 6.61 | 1.00 | C | 153.1 | - | - | 10:14 | 10:24 | 2.1 | 16.5 | 8.71 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.61 | 6.61 | 1.00 | D | 171.1 | 604.2 | 604.2 | 10:24 | 10:45 | 2.5 | 5.2 | 2.32 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 6.61 | 11.00 | 4.39 | A* | 32.8 | 32.8 | 7.5 | 9:21 | 9:35 | 1.9 | 0.2 | 0.03 | - | - | - | - | - | - | |
| P-30+872 | P | 28-Nov-10 | 4 | 3.61 | 5.11 | 1.50 | B | 177.6 | - | - | 14:57 | 15:21 | 1.6 | 12.8 | 4.62 | 36.4 | - | 1.62 | -16.0 | 21.0 | 18.9 | |
| | | 28-Nov-10 | 4 | 3.61 | 5.11 | 1.50 | C | 176.8 | - | - | 15:21 | 15:38 | 2.2 | 10.6 | 3.59 | 44.2 | - | 1.63 | 16.0 | 19.2 | 18.2 | |
| | | 28-Nov-10 | 4 | 3.61 | 5.11 | 1.50 | D | 156.3 | - | - | 15:38 | 16:49 | 2.7 | 2.5 | 0.58 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 4 | 3.61 | 5.11 | 1.50 | X | 4.8 | 515.5 | 343.7 | 16:49 | 17:04 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.61 | 6.61 | 1.00 | A* | 102.5 | - | - | 18:55 | 19:12 | 0.3 | 9.0 | 24.21 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.61 | 6.61 | 1.00 | B | 211.4 | - | - | 19:12 | 19:26 | 1.2 | 18.0 | 10.66 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.61 | 6.61 | 1.00 | C | 213.9 | - | - | 19:26 | 19:37 | 3.0 | 11.6 | 22.46 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.61 | 6.61 | 1.00 | D | 52.6 | 580.4 | 580.4 | 19:37 | 19:43 | 1.6 | 6.9 | 4.37 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 2 | 6.61 | 10.90 | 4.29 | A* | 34.5 | 34.5 | 8.0 | 18:03 | 18:20 | 2.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-30+873.5 | T | 15-Dec-10 | 4 | 3.61 | 5.11 | 1.50 | MF | 178.3 | - | - | 16:22 | 16:52 | 2.0 | 7.2 | 2.38 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 3.61 | 5.11 | 1.50 | B | 47.5 | 225.8 | 150.5 | 16:52 | 17:16 | 1.9 | 0.5 | 0.18 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.51 | 6.61 | 1.10 | A* | 38.1 | - | - | 11:31 | 11:40 | 1.3 | 6.8 | 4.81 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.51 | 6.61 | 1.10 | B | 171.8 | - | - | 11:40 | 11:58 | 1.6 | 13.1 | 8.25 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.51 | 6.61 | 1.10 | C | 182.2 | - | - | 11:58 | 12:10 | 2.4 | 16.6 | 6.03 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.51 | 6.61 | 1.10 | D | 125.0 | 517.1 | 470.1 | 12:10 | 12:32 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 6.61 | 11.00 | 4.39 | A* | 90.2 | 90.2 | 20.5 | 10:53 | 11:23 | 2.3 | 0.1 | 0.01 | 32.0 | - | 1.61 | 9.6 | 6.4 | 15.7 | |
| S-30+875 | S | 06-Dec-10 | 4 | 3.36 | 4.86 | 1.50 | A* | 162.5 | - | - | 14:03 | 14:28 | 2.1 | 11.0 | 3.67 | 31.2 | 4.0 | 1.65 | 4.1 | 12.3 | 17.3 | |
| | | 06-Dec-10 | 4 | 3.36 | 4.86 | 1.50 | B* | 163.5 | 326.0 | 217.3 | 14:28 | 15:20 | 2.1 | 0.6 | 0.19 | 34.4 | 1.0 | 1.64 | 4.3 | 12.1 | 16.1 | |
| | | 09-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | B | 153.6 | - | - | 22:44 | 23:05 | 1.6 | 13.0 | 9.27 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | C | 171.8 | - | - | 23:05 | 23:15 | 1.9 | 17.5 | 9.46 | 44.9 | 3.0 | 1.63 | 19.3 | 7.5 | 17.4 | |
| | | 09-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | D | 170.2 | - | - | 23:15 | 23:26 | 1.7 | 14.8 | 8.22 | 64.0 | 0.0 | 1.64 | - | - | - | |
| | | 09-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | E | 105.5 | 601.1 | 601.1 | 23:26 | 23:33 | 1.9 | 14.4 | 7.65 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 2 | 6.36 | 10.60 | 4.24 | A* | 23.8 | 23.8 | 5.6 | 22:14 | 22:28 | 1.9 | 0.8 | 0.10 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-30+876.5 | T | 23-Jun-11 | 4 | 3.26 | 4.76 | 1.50 | MF | 27.7 | 27.7 | 18.5 | 8:47 | 9:03 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | A* | 166.7 | - | - | 14:52 | 15:16 | 2.0 | 12.9 | 6.64 | 35.6 | - | 1.60 | 5.6 | 6.5 | 13.6 | |
| | | 13-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | B | 198.6 | - | - | 15:16 | 15:30 | 1.7 | 16.3 | 8.41 | 36.8 | - | 1.62 | 5.9 | 6.7 | 13.8 | |
| | | 13-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | C | 139.5 | - | - | 15:30 | 15:39 | 2.1 | 16.0 | 7.92 | 45.7 | 1.0 | 1.64 | 6.5 | 6.9 | 16.4 | |
| | | 13-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | D | 98.4 | 603.2 | 603.2 | 15:39 | 15:48 | 2.6 | 10.0 | 3.94 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 6.26 | 10.70 | 4.44 | A* | 24.8 | 24.8 | 5.6 | 14:33 | 14:47 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+878 | P | 28-Nov-10 | 4 | 3.31 | 4.81 | 1.50 | B | 198.4 | - | - | 9:55 | 10:25 | 2.3 | 8.9 | 2.40 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 4 | 3.31 | 4.81 | 1.50 | C | 180.2 | - | - | 10:25 | 10:50 | 2.0 | 10.8 | 4.21 | - | - | - | - | - | - | Communicated to P30+884 |
| | | 28-Nov-10 | 4 | 3.31 | 4.81 | 1.50 | D | 95.1 | 473.7 | 315.8 | 10:50 | 11:29 | 2.6 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.31 | 6.31 | 1.00 | A* | 147.8 | - | - | 20:25 | 20:47 | 0.8 | 10.5 | 16.70 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.31 | 6.31 | 1.00 | B | 171.7 | - | - | 20:47 | 20:58 | 0.6 | 18.1 | 30.62 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.31 | 6.31 | 1.00 | C | 177.3 | - | - | 20:58 | 21:27 | 2.1 | 15.3 | 22.15 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.31 | 6.31 | 1.00 | D | 84.5 | 581.3 | 581.3 | 21:27 | 21:33 | 1.3 | 5.4 | 3.60 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 2 | 6.31 | 11.00 | 4.69 | A* | 22.5 | 22.5 | 4.8 | 20:01 | 20:15 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+879.5 | T | 16-Dec-10 | 4 | 3.54 | 5.04 | 1.50 | MF | 124.4 | 124.4 | 82.9 | 6:44 | 7:23 | 2.0 | 0.2 | 0.07 | 31.3 | 4.0 | 1.42 | - | - | 18.9 | |
| | | 13-Nov-10 | 3 | 5.54 | 6.54 | 1.00 | A* | 17.8 | 17.8 | 17.8 | 16:21 | 16:33 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 6.54 | 10.80 | 4.26 | A* | 26.9 | 26.9 | 6.3 | 15:59 | 16:12 | 2.4 | 0.9 | 0.09 | - | - | - | - | - | - | |
| S-30+881 | S | 06-Dec-10 | 4 | 3.56 | 5.06 | 1.50 | A* | 170.4 | - | - | 10:28 | 10:59 | 1.9 | 5.8 | 2.05 | - | - | - | - | - | - | |
| | | 06-Dec-10 | 4 | 3.56 | 5.06 | 1.50 | B* | 147.9 | 318.3 | 212.2 | 10:59 | 11:45 | 2.0 | 0.2 | 0.06 | 34.6 | 3.0 | 1.62 | -0.3 | 11.2 | 17.1 | |
| | | 09-Nov-10 | 3 | 5.56 | 6.56 | 1.00 | B | 17.2 | 17.2 | 17.2 | 2:20 | 2:45 | 2.8 | 0.0 | 0.00 | 32.3 | - | 1.60 | 6.0 | 8.4 | 21.1 | |
| | | 09-Nov-10 | 2 | 6.56 | 10.60 | 4.04 | A* | 27.3 | 27.3 | 6.8 | 2:00 | 2:15 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+882.5 | T | 23-Jun-11 | 4 | 3.54 | 5.04 | 1.50 | MF | 30.5 | 30.5 | 20.3 | 9:05 | 9:21 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.54 | 6.54 | 1.00 | A* | 175.9 | - | - | 17:21 | 17:42 | 1.6 | 13.2 | 7.45 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.54 | 6.54 | 1.00 | B | 205.3 | - | - | 17:42 | 17:56 | 1.8 | 18.3 | 10.64 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.54 | 6.54 | 1.00 | C | 147.6 | - | - | 17:56 | 18:07 | 2.0 | 11.4 | 5.87 | - | - | - | - | - | - | Communicated to T-30+885.5 |
| | | 13-Nov-10 | 3 | 5.54 | 6.54 | 1.00 | D | 73.9 | 602.7 | 602.7 | 18:07 | 18:24 | 2.3 | 8.3 | 3.62 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 6.54 | 10.70 | 4.16 | A* | 23.5 | 23.5 | 5.6 | 17:05 | 17:17 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+884 | P | 28-Nov-10 | 4 | 3.36 | 4.86 | 1.50 | B | 176.3 | - | - | 8:21 | 8:45 | 2.1 | 12.6 | 3.92 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 4 | 3.36 | 4.86 | 1.50 | C | 207.4 | - | - | 8:45 | 9:01 | 2.3 | 16.4 | 4.78 | 46.7 | 0.5 | 1.63 | 11.5 | 14.2 | 19.4 | |
| | | 28-Nov-10 | 4 | 3.36 | 4.86 | 1.50 | D | 150.1 | - | - | 9:01 | 9:16 | 2.4 | 12.0 | 3.76 | 71.3 | - | 1.64 | -8.2 | 14.6 | 16.1 | Communicated to P-30+890 |
| | | 28-Nov-10 | 4 | 3.36 | 4.86 | 1.50 | X | 53.4 | 587.2 | 391.5 | 9:16 | 9:43 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.36 | 6.36 | 1.00 | B | 131.2 | - | - | 23:02 | 23:22 | 1.4 | 12.8 | 9.70 | 33.2 | 3.0 | 1.68 | 2.0 | 11.0 | 19.0 | |
| | | 09-Oct-10 | 3 | 5.36 | 6.36 | 1.00 | C | 218.4 | - | - | 23:22 | 23:37 | 3.2 | 20.4 | 6.51 | 44.1 | 1.6 | 1.72 | 2.0 | 11.0 | 18.0 | |
| | | 09-Oct-10 | 3 | 5.36 | 6.36 | 1.00 | D | 182.6 | - | - | 23:37 | 23:48 | 3.2 | 19.4 | 6.51 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.36 | 6.36 | 1.00 | D+ | 68.3 | 600.5 | 600.5 | 23:48 | 23:53 | 2.0 | 11.0 | 5.61 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 2 | 6.36 | 10.80 | 4.44 | A* | 184.0 | - | - | 21:50 | 22:20 | 2.4 | 10.4 | 1.47 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 2 | 6.36 | 10.80 | 4.44 | B | 93.0 | 277.0 | 62.4 | 22:20 | 22:53 | 2.0 | 1.7 | 0.19 | - | - | - | - | - | - | |
| T-30+885.5 | T | 16-Dec-10 | 4 | 3.31 | 4.81 | 1.50 | MF | 34.7 | 34.7 | 23.1 | 7:45 | 8:11 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.31 | 6.31 | 1.00 | A | 0.3 | 0.3 | 0.3 | 19:34 | 19:40 | 2.3 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 6.31 | 10.50 | 4.19 | A | 19.9 | 19.9 | 4.7 | 19:17 | 19:30 | 1.9 | 0.1 | 0.02 | 32.1 | 4.0 | 1.60 | 3.2 | 8.1 | 16.6 | |
| S-30+887 | S | 07-Dec-10 | 4 | 3.49 | 4.99 | 1.50 | B | 24.4 | 24.4 | 16.3 | 15:32 | 15:52 | 2.6 | 0.7 | 0.18 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | B | 155.1 | - | - | 4:17 | 4:41 | 1.1 | 11.4 | 13.34 | 31.6 | - | 1.60 | 20.7 | 8.2 | 20.0 | |
| | | 09-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | C | 192.0 | - | - | 4:41 | 4:55 | 1.6 | 9.3 | 7.69 | 44.3 | - | 1.62 | - | 8.2 | 18.3 | |
| | | 09-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | D | 134.0 | - | - | 4:55 | 5:05 | 1.6 | 15.8 | 9.39 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | E | 130.6 | 611.7 | 611.7 | 5:05 | 5:14 | 1.8 | 14.9 | 8.14 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 2 | 6.49 | 10.60 | 4.11 | A* | 22.4 | 22.4 | 5.5 | 3:52 | 4:11 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-30+888.5 | T | 23-Jun-11 | 4 | 3.36 | 4.86 | 1.50 | MF | 25.8 | 25.8 | 17.2 | 9:24 | 9:40 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | A | 129.5 | - | - | 21:17 | 21:37 | 1.5 | 12.8 | 9.95 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | B | 143.2 | - | - | 21:37 | 21:47 | 1.4 | 15.3 | 11.39 | 37.4 | 15.0 | 1.40 | 7.2 | 7.6 | 13.7 | |
| | | 13-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | C | 153.9 | - | - | 21:47 | 21:58 | 2.6 | 16.8 | 5.22 | 51.1 | - | 1.65 | 7.2 | 7.6 | 15.2 | |
| | | 13-Nov-10 | 3 | 5.36 | 6.36 | 1.00 | D | 146.9 | 573.5 | 573.5 | 21:58 | 22:12 | 2.2 | 12.5 | 5.71 | 63.0 | - | 1.69 | 7.2 | 7.6 | 15.5 | |
| | | 13-Nov-10 | 2 | 6.36 | 10.60 | 4.24 | A | 22.1 | 22.1 | 5.2 | 2:57 | 21:01 | 1.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| P-30+890 | P | 28-Nov-10 | 4 | 3.56 | 5.04 | 1.48 | B | 150.7 | - | - | 6:52 | 7:17 | 2.1 | 7.5 | 2.39 | 38.8 | 3.0 | 1.61 | 14.2 | 14.1 | 21.4 | |
| | | 28-Nov-10 | 4 | 3.56 | 5.04 | 1.48 | C | 180.4 | - | - | 7:17 | 7:44 | 2.5 | 3.3 | 0.79 | 49.7 | - | 1.64 | 14.9 | 14.3 | 22.5 | |
| | | 28-Nov-10 | 4 | 3.56 | 5.04 | 1.48 | D | 35.1 | 366.2 | 247.4 | 7:44 | 8:10 | 2.6 | 0.7 | 0.18 | 71.3 | - | 1.66 | 14.9 | 14.3 | 23.0 | |
| | | 09-Oct-10 | 3 | 5.56 | 6.56 | 1.00 | B | 181.3 | - | - | 4:56 | 5:19 | 1.2 | 12.4 | 10.29 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 3 | 5.56 | 6.56 | 1.00 | C | 239.5 | 420.8 | 420.8 | 5:19 | 6:00 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Oct-10 | 2 | 6.56 | 10.90 | 4.34 | A* | 23.0 | 23.0 | 5.3 | 4:39 | 4:53 | 1.9 | 0.0 | 0.00 | 31.4 | 4.0 | 1.64 | 2.0 | 11.0 | 19.0 | |
| T-30+891.5 | T | 16-Dec-10 | 4 | 3.51 | 5.01 | 1.50 | MF | 150.8 | 150.8 | 100.5 | 8:24 | 9:22 | 2.2 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.51 | 6.51 | 1.00 | A* | 132.6 | - | - | 22:56 | 23:16 | 1.2 | 12.4 | 7.16 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.51 | 6.51 | 1.00 | B | 181.8 | - | - | 23:16 | 23:28 | 1.9 | 9.5 | 7.64 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.51 | 6.51 | 1.00 | C | 146.2 | - | - | 23:28 | 23:40 | 2.0 | 9.6 | 4.54 | - | 2.0 | 1.67 | 7.6 | 8.2 | - | |
| | | 13-Nov-10 | 3 | 5.51 | 6.51 | 1.00 | D | 119.8 | 580.4 | 580.4 | 23:40 | 0:02 | 2.3 | 9.5 | 4.18 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 6.51 | 10.70 | 4.19 | A* | 24.3 | 24.3 | 5.8 | 22:33 | 22:47 | 1.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+893 | S | 06-Dec-10 | 4 | 3.51 | 5.01 | 1.50 | A* | 173.6 | 173.6 | 115.7 | 8:46 | 9:30 | 2.2 | 0.5 | 0.15 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 5.61 | 6.61 | 1.00 | A* | 177.2 | - | - | 7:17 | 7:39 | 0.7 | 12.7 | 17.42 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 5.61 | 6.61 | 1.00 | B | 202.8 | - | - | 7:39 | 7:52 | 1.3 | 18.8 | 13.53 | 34.9 | 2.0 | 1.62 | 17.4 | 12.8 | 13.2 | |
| | | 10-Nov-10 | 3 | 5.61 | 6.61 | 1.00 | C | 144.2 | - | - | 7:52 | 8:01 | 1.3 | 19.4 | 15.68 | 43.6 | - | 1.61 | 16.7 | 10.9 | 15.6 | |
| | | 10-Nov-10 | 3 | 5.61 | 6.61 | 1.00 | D | 107.4 | 631.6 | 631.6 | 8:01 | 8:06 | 1.3 | 18.1 | 13.75 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 6.61 | 10.70 | 4.09 | A* | 29.1 | 29.1 | 7.1 | 6:55 | 7:12 | 3.2 | 0.7 | 0.05 | 30.4 | 5.0 | 1.61 | 19.4 | 12.6 | 14.1 | |
| T-30+894.5 | T | 23-Jun-11 | 4 | 3.26 | 4.76 | 1.50 | MF | 27.3 | 27.3 | 18.2 | 9:46 | 10:02 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | A* | 148.5 | - | - | 3:42 | 4:03 | 1.6 | 12.8 | 6.68 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | B | 173.0 | - | - | 4:03 | 4:14 | 2.1 | 18.8 | 8.79 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | C | 143.4 | - | - | 4:14 | 4:21 | 2.7 | 23.5 | 8.05 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | D | 127.2 | 592.1 | 592.1 | 4:21 | 4:33 | 2.4 | 7.3 | 3.05 | 69.5 | 1.0 | 1.71 | 19.9 | 5.9 | 15.6 | |
| | | 13-Nov-10 | 2 | 6.26 | 10.40 | 4.14 | A* | 142.1 | - | - | 2:18 | 2:39 | 1.7 | 12.3 | 1.62 | 38.3 | - | 1.67 | 17.4 | 6.2 | 19.6 | |
| | | 13-Nov-10 | 2 | 6.26 | 10.40 | 4.14 | B | 238.8 | - | - | 2:39 | 3:09 | 2.1 | 8.3 | 0.87 | 42.3 | - | 1.67 | 17.4 | 6.2 | 18.4 | |
| | | 13-Nov-10 | 2 | 6.26 | 10.40 | 4.14 | C | 30.7 | 411.6 | 99.4 | 3:09 | 3:27 | 1.8 | 1.0 | 0.14 | 50.9 | - | 1.70 | 17.4 | 6.2 | 16.9 | |
| P-30+896 | P | 27-Nov-10 | 4 | 3.23 | 4.73 | 1.50 | B | 153.2 | - | - | 3:56 | 4:19 | 2.4 | 11.7 | 4.71 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 4 | 3.23 | 4.73 | 1.50 | C | 47.6 | 200.8 | 133.9 | 4:19 | 4:53 | 2.3 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 5.23 | 6.23 | 1.00 | B | 197.8 | - | - | 10:23 | 10:46 | 0.6 | 16.2 | 25.52 | 35.0 | 2.0 | 1.54 | 3.0 | 5.9 | 13.2 | |
| | | 10-Oct-10 | 3 | 5.23 | 6.23 | 1.00 | C | 122.2 | - | - | 10:46 | 10:54 | 0.5 | 17.0 | 40.73 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 5.23 | 6.23 | 1.00 | D | 273.9 | 593.9 | 593.9 | 10:54 | 11:11 | 0.9 | 1.0 | 1.13 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 6.23 | 11.10 | 4.87 | A* | 203.0 | - | - | 6:14 | 6:43 | 0.0 | 11.6 | inf | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 6.23 | 11.10 | 4.87 | B | 206.9 | - | - | 6:43 | 6:57 | 0.1 | 15.1 | 20.09 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 6.23 | 11.10 | 4.87 | C | 367.9 | - | - | 6:57 | 7:24 | 0.9 | 15.5 | 3.08 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 6.23 | 11.10 | 4.87 | D | 742.2 | - | - | 7:24 | 8:35 | 1.6 | 5.1 | 0.55 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 6.23 | 11.10 | 4.87 | E | 412.0 | 1932.0 | 396.7 | 8:35 | 10:07 | 2.1 | 1.6 | 0.19 | - | - | - | - | - | - | |
| T-30+897.5 | T | 16-Dec-10 | 4 | 3.59 | 5.09 | 1.50 | MF | 108.5 | 108.5 | 72.3 | 9:26 | 9:58 | 2.0 | 0.4 | 0.13 | 30.9 | - | 1.46 | -10.0 | 15.3 | 21.9 | |
| | | 14-Nov-10 | 3 | 5.59 | 6.59 | 1.00 | A* | 14.2 | 14.2 | 14.2 | 6:25 | 6:41 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 6.59 | 10.80 | 4.21 | A* | 28.7 | 28.7 | 6.8 | 6:03 | 6:18 | 1.9 | 0.3 | 0.04 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-30+899 | S | 06-Dec-10 | 4 | 3.49 | 4.99 | 1.50 | A* | 181.7 | - | - | 7:31 | 7:59 | 2.0 | 4.3 | 1.27 | 31.2 | 4.0 | 1.65 | -7.7 | 9.8 | 15.4 | |
| | | 06-Dec-10 | 4 | 3.49 | 4.99 | 1.50 | B | 35.1 | 216.8 | 144.5 | 7:59 | 8:31 | 2.0 | 0.5 | 0.16 | 37.6 | - | 1.64 | -7.0 | 10.0 | 16.3 | |
| | | 10-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | A* | 183.0 | - | - | 8:37 | 9:00 | 1.0 | 12.7 | 13.70 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | B | 146.0 | - | - | 9:00 | 9:09 | 1.2 | 18.5 | 15.42 | 35.9 | - | 1.60 | 16.9 | 10.6 | 15.5 | |
| | | 10-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | C | 193.1 | - | - | 9:09 | 9:20 | 1.4 | 19.0 | 12.41 | 38.1 | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | D | 122.4 | 644.5 | 644.5 | 9:20 | 9:28 | 1.4 | 10.3 | 7.49 | 42.7 | 1.0 | - | - | - | - | |
| | | 10-Nov-10 | 2 | 6.49 | 10.70 | 4.21 | A* | 30.0 | 30.0 | 7.1 | 8:18 | 8:33 | 2.0 | 0.7 | 0.09 | - | - | - | - | - | - | |
| T-30+900.5 | T | 14-Nov-10 | 3 | 5.89 | 6.89 | 1.00 | A* | 12.9 | 12.9 | 12.9 | 7:23 | 7:36 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 6.89 | 11.20 | 4.31 | A* | 38.3 | 38.3 | 8.9 | 7:03 | 7:20 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+902 | P | 27-Nov-10 | 4 | 3.54 | 5.04 | 1.50 | B | 151.6 | - | - | 2:28 | 2:50 | 2.0 | 8.4 | 4.79 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 4 | 3.54 | 5.04 | 1.50 | C | 101.4 | 253.0 | 168.7 | 2:50 | 3:42 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 5.54 | 6.54 | 1.00 | A* | 26.0 | - | - | 14:11 | 14:17 | 0.0 | 2.9 | inf | 33.0 | - | 1.64 | 5.6 | 8.5 | 14.9 | |
| | | 10-Oct-10 | 3 | 5.54 | 6.54 | 1.00 | B | 93.7 | - | - | 14:17 | 14:29 | 0.0 | 9.1 | inf | 36.0 | - | 1.65 | 5.8 | 7.0 | 13.3 | |
| | | 10-Oct-10 | 3 | 5.54 | 6.54 | 1.00 | C | 256.3 | - | - | 14:29 | 14:46 | 0.5 | 14.5 | 26.92 | 49.0 | - | 1.70 | 5.9 | 7.1 | 13.6 | Communicated to T30+900.5 |
| | | 10-Oct-10 | 3 | 5.54 | 6.54 | 1.00 | D | 236.1 | 612.1 | 612.1 | 14:46 | 15:00 | 1.0 | 18.4 | 18.23 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 6.54 | 10.90 | 4.36 | A* | 117.2 | 117.2 | 26.9 | 13:35 | 14:06 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+903.5 | T | 16-Dec-10 | 4 | 3.06 | 4.56 | 1.50 | MF | 229.1 | - | - | 10:06 | 11:00 | 1.3 | 5.6 | 2.89 | 30.2 | - | 1.39 | -9.8 | 15.6 | 20.2 | |
| | | 16-Dec-10 | 4 | 3.06 | 4.56 | 1.50 | B | 154.7 | - | - | 11:00 | 11:22 | 1.4 | 3.3 | 1.61 | 32.0 | - | 1.52 | - | 15.2 | 22.2 | Communicated to T30+909.5 within |
| | | 16-Dec-10 | 4 | 3.06 | 4.56 | 1.50 | C | 43.9 | 427.7 | 285.1 | 11:22 | 11:50 | 1.9 | 0.0 | 0.01 | 40.9 | - | 1.63 | -8.1 | - | 22.5 | and around casing |
| | | 14-Nov-10 | 3 | 5.06 | 6.06 | 1.00 | A* | 220.2 | - | - | 9:41 | 10:07 | 1.8 | 14.5 | 8.50 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 5.06 | 6.06 | 1.00 | B | 155.2 | - | - | 10:07 | 10:17 | 1.5 | 15.0 | 10.22 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 5.06 | 6.06 | 1.00 | C | 192.1 | - | - | 10:17 | 10:31 | 2.2 | 14.0 | 6.87 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 5.06 | 6.06 | 1.00 | D | 94.2 | 661.7 | 661.7 | 10:31 | 10:38 | 2.2 | 10.5 | 4.79 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 6.06 | 10.10 | 4.04 | A* | 205.1 | - | - | 7:46 | 8:27 | 0.9 | 9.1 | 2.23 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 6.06 | 10.10 | 4.04 | B | 236.2 | - | - | 8:27 | 8:45 | 1.4 | 17.4 | 2.82 | 35.2 | - | 1.61 | 11.6 | 8.1 | 13.4 | |
| | | 14-Nov-10 | 2 | 6.06 | 10.10 | 4.04 | C | 169.7 | - | - | 8:45 | 8:54 | 2.3 | 19.6 | 1.92 | 49.5 | - | 1.64 | 11.6 | 8.1 | 14.8 | ByPass |
| | | 14-Nov-10 | 2 | 6.06 | 10.10 | 4.04 | D | 133.8 | 744.8 | 184.4 | 8:54 | 9:36 | 2.1 | 0.6 | 0.07 | 74.1 | 0.5 | 1.65 | 11.6 | 8.1 | 16.2 | |
| S-30+905 | S | 05-Dec-10 | 4 | 2.52 | 4.02 | 1.50 | A* | 103.8 | 103.8 | 69.2 | 23:02 | 23:34 | 1.9 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 4.52 | 5.52 | 1.00 | A* | 175.7 | - | - | 10:22 | 10:46 | 1.0 | 12.9 | 11.94 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 4.52 | 5.52 | 1.00 | B | 152.4 | - | - | 10:46 | 10:56 | 1.3 | 15.6 | 11.66 | 34.6 | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 4.52 | 5.52 | 1.00 | C | 190.3 | - | - | 10:56 | 11:08 | 1.5 | 15.8 | 11.47 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 4.52 | 5.52 | 1.00 | D | 49.9 | - | - | 11:08 | 11:13 | 1.6 | 17.2 | 11.86 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 4.52 | 5.52 | 1.00 | X | 72.7 | 641.0 | 641.0 | 11:13 | 11:16 | 1.6 | 13.5 | 8.67 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 5.52 | 10.00 | 4.48 | A* | 29.9 | 29.9 | 6.7 | 10:02 | 10:18 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+906.5 | T | 23-Jun-11 | 4 | 2.29 | 3.79 | 1.50 | MF | 22.3 | 22.3 | 14.9 | 10:04 | 10:19 | 2.0 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 4.29 | 5.29 | 1.00 | A* | 170.1 | - | - | 11:15 | 11:39 | 1.2 | 12.4 | 10.77 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 4.29 | 5.29 | 1.00 | B | 168.9 | - | - | 11:39 | 11:52 | 1.5 | 14.9 | 9.90 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 4.29 | 5.29 | 1.00 | C | 229.7 | - | - | 11:52 | 12:05 | 1.6 | 18.1 | 11.88 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 4.29 | 5.29 | 1.00 | D | 83.4 | 652.1 | 652.1 | 12:05 | 12:10 | 1.9 | 18.3 | 9.53 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 5.29 | 9.50 | 4.21 | A* | 25.7 | 25.7 | 6.1 | 10:55 | 11:11 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+908 | P | 27-Nov-10 | 4 | 2.07 | 3.57 | 1.50 | B | 147.7 | - | - | 23:12 | 23:23 | 2.2 | 11.7 | 4.54 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 4 | 2.07 | 3.57 | 1.50 | C | 171.8 | - | - | 23:23 | 23:44 | 2.1 | 14.3 | 4.21 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 4 | 2.07 | 3.57 | 1.50 | D | 57.3 | 376.8 | 251.2 | 23:44 | 0:04 | 2.2 | 0.7 | 0.20 | 76.0 | 0.0 | 1.71 | -9.9 | 13.2 | 18.6 | |
| | | 10-Oct-10 | 3 | 4.07 | 5.07 | 1.00 | B | 193.0 | - | - | 16:12 | 16:36 | 0.8 | 16.2 | 18.83 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 4.07 | 5.07 | 1.00 | C | 184.0 | - | - | 16:36 | 16:47 | 0.6 | 18.4 | 23.66 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 4.07 | 5.07 | 1.00 | D | 272.5 | 649.5 | 649.5 | 16:47 | 17:01 | 1.2 | 20.6 | 17.32 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 5.07 | 10.10 | 5.03 | A* | 211.7 | 211.7 | 42.1 | 15:14 | 16:03 | 2.3 | 1.5 | 0.14 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-30+909.5 | T | 16-Dec-10 | 4 | 2.07 | 3.57 | 1.50 | B | 56.7 | 56.7 | 37.8 | 12:10 | 12:36 | 2.2 | 0.3 | 0.12 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 4.07 | 5.07 | 1.00 | A* | 140.3 | - | - | 16:05 | 16:43 | 2.4 | 3.3 | 1.51 | 34.2 | - | 1.61 | 10.0 | 8.4 | 14.6 | |
| | | 14-Nov-10 | 3 | 4.07 | 5.07 | 1.00 | D | 77.8 | 418.1 | 418.1 | 18:39 | 19:07 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 4.07 | 5.07 | 1.00 | B | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 4.07 | 5.07 | 1.00 | C | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 5.07 | 9.20 | 4.13 | A* | 38.2 | 38.2 | 9.2 | 15:44 | 16:00 | 2.1 | 1.9 | 0.21 | 33.6 | 5.0 | 1.61 | 17.0 | 7.9 | 16.1 | |
| S-30+911 | S | 05-Dec-10 | 4 | 1.99 | 3.49 | 1.50 | A* | 109.7 | 109.7 | 73.1 | 22:17 | 22:48 | 2.0 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.99 | 4.99 | 1.00 | A* | 140.3 | - | - | 14:00 | 14:19 | 0.6 | 12.4 | 19.66 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.99 | 4.99 | 1.00 | B | 188.6 | - | - | 14:19 | 14:31 | 1.0 | 18.1 | 20.51 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.99 | 4.99 | 1.00 | D | 168.7 | - | - | 14:31 | 14:41 | 1.2 | 15.9 | 12.35 | 63.0 | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.99 | 4.99 | 1.00 | E | 84.2 | - | - | 14:41 | 14:47 | 1.1 | 15.3 | 13.13 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.99 | 4.99 | 1.00 | X | 45.4 | 627.2 | 627.2 | 14:47 | 14:50 | 0.9 | 12.9 | 14.89 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 4.99 | 9.10 | 4.11 | A* | 71.0 | 71.0 | 17.3 | 13:30 | 13:55 | 2.2 | 1.2 | 0.14 | 30.6 | - | 1.60 | 15.9 | 14.0 | 18.2 | |
| T-30+912.5 | T | 14-Nov-10 | 3 | 4.19 | 5.19 | 1.00 | A* | 59.7 | 59.7 | 59.7 | 20:00 | 20:30 | 1.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 5.19 | 9.40 | 4.21 | A* | 37.0 | 37.0 | 8.8 | 19:40 | 19:55 | 1.5 | 0.0 | 0.00 | 31.0 | 9.0 | 1.66 | 5.6 | 8.7 | 19.1 | |
| P-30+914 | P | 27-Nov-10 | 4 | 1.81 | 3.31 | 1.50 | B | 141.9 | - | - | 20:48 | 21:04 | 1.5 | 8.8 | 4.78 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 4 | 1.81 | 3.31 | 1.50 | C | 189.2 | 331.1 | 220.7 | 21:04 | 21:53 | 1.9 | 0.4 | 0.16 | 39.0 | 0.8 | 1.68 | 7.7 | 13.7 | 23.1 | |
| | | 10-Oct-10 | 3 | 3.81 | 4.81 | 1.00 | A* | 19.0 | 19.0 | 19.0 | 17:54 | 18:05 | 3.4 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 4.81 | 9.80 | 4.99 | A* | 49.3 | 49.3 | 9.9 | 17:09 | 17:37 | 2.1 | 0.9 | 0.08 | - | - | - | - | - | - | |
| T-30+915.5 | T | 10-Nov-10 | 3 | 3.86 | 4.86 | 1.00 | A* | 156.9 | - | - | 15:29 | 15:48 | 0.9 | 13.1 | 15.95 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.86 | 4.86 | 1.00 | B | 212.2 | - | - | 15:48 | 16:02 | 1.3 | 17.8 | 14.52 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.86 | 4.86 | 1.00 | C | 255.7 | 624.8 | 624.8 | 16:02 | 16:20 | 1.1 | 15.9 | 15.15 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 4.86 | 8.90 | 4.04 | A* | 41.8 | 41.8 | 10.3 | 15:05 | 15:24 | 1.7 | 0.9 | 0.13 | - | - | - | - | - | - | |
| S-30+917 | S | 05-Dec-10 | 4 | 2.17 | 3.67 | 1.50 | A* | 62.0 | 62.0 | 41.3 | 21:38 | 22:04 | 2.0 | 0.3 | 0.11 | 31.4 | 4.0 | 1.66 | -10.2 | 10.0 | 15.8 | |
| | | 10-Oct-10 | 3 | 4.17 | 5.17 | 1.00 | B | 164.5 | - | - | 20:49 | 21:12 | 0.5 | 12.9 | 25.40 | 35.7 | 7.0 | 1.62 | 3.0 | 8.0 | 16.0 | |
| | | 10-Oct-10 | 3 | 4.17 | 5.17 | 1.00 | C | 161.5 | - | - | 21:12 | 21:23 | 1.1 | 17.3 | 11.00 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 4.17 | 5.17 | 1.00 | D | 169.8 | - | - | 21:23 | 21:33 | 0.9 | 17.2 | 22.15 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 4.17 | 5.17 | 1.00 | D+ | 160.6 | 656.4 | 656.4 | 21:33 | 21:42 | 1.3 | 32.8 | 24.65 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 5.17 | 9.60 | 4.43 | A* | 36.0 | 36.0 | 8.1 | 20:26 | 20:41 | 1.6 | 0.6 | 0.08 | 30.6 | 4.0 | 1.63 | 3.0 | 8.0 | 14.0 | |
| T-30+918.5 | T | 10-Nov-10 | 3 | 4.19 | 5.19 | 1.00 | A* | 152.4 | - | - | 17:29 | 17:50 | 1.0 | 8.8 | 8.26 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 4.19 | 5.19 | 1.00 | B | 190.4 | - | - | 17:50 | 18:04 | 1.5 | 15.0 | 10.75 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 4.19 | 5.19 | 1.00 | C | 135.8 | - | - | 18:04 | 18:13 | 1.7 | 18.2 | 10.12 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 4.19 | 5.19 | 1.00 | D | 143.3 | 621.9 | 621.9 | 18:13 | 19:32 | 1.7 | 15.2 | 9.10 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 5.19 | 9.50 | 4.31 | A* | 26.4 | 26.4 | 6.1 | 17:09 | 17:25 | 1.7 | 0.7 | 0.09 | 30.6 | - | 1.62 | 6.7 | 7.9 | 15.5 | |
| P-30+920 | P | 27-Nov-10 | 4 | 1.89 | 3.39 | 1.50 | B | 151.3 | - | - | 19:29 | 19:51 | 1.5 | 8.4 | 3.70 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 4 | 1.89 | 3.39 | 1.50 | C | 103.3 | 254.6 | 169.7 | 19:51 | 19:27 | 2.2 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 3.89 | 4.89 | 1.00 | B | 163.4 | - | - | 22:22 | 22:46 | 0.4 | 12.7 | 18.29 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 3.89 | 4.89 | 1.00 | C | 174.1 | - | - | 22:46 | 22:57 | 1.1 | 15.9 | 14.89 | 46.2 | 1.0 | 1.77 | 3.0 | 8.0 | 18.0 | |
| | | 10-Oct-10 | 3 | 3.89 | 4.89 | 1.00 | D | 161.2 | - | - | 22:57 | 23:07 | 0.7 | 15.5 | 18.59 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 3.89 | 4.89 | 1.00 | D+ | 107.6 | 606.3 | 606.3 | 23:07 | 23:14 | 0.7 | 18.0 | 24.81 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 4.89 | 9.40 | 4.51 | A* | 43.4 | 43.4 | 9.6 | 21:57 | 22:13 | 1.6 | 1.3 | 0.19 | - | - | - | - | - | - | |
| T-30+921.5 | T | 10-Nov-10 | 3 | 3.96 | 4.96 | 1.00 | B | 11.8 | 11.8 | 11.8 | 19:59 | 20:15 | 1.7 | 0.0 | 0.00 | 37.1 | 3.0 | 1.63 | 1.4 | 7.4 | 15.8 | |
| | | 10-Nov-10 | 2 | 4.96 | 9.20 | 4.24 | A* | 22.4 | 22.4 | 5.3 | 19:21 | 19:37 | 1.7 | 0.4 | 0.05 | 29.6 | 5.5 | 1.59 | 1.4 | 7.4 | 16.3 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-30+923 | S | 05-Dec-10 | 4 | 1.20 | 2.70 | 1.50 | A* | 38.6 | 38.6 | 25.7 | 20:33 | 20:54 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 3.20 | 4.20 | 1.00 | B | 162.2 | - | - | 4:35 | 4:54 | 0.6 | 12.5 | 14.94 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 3.20 | 4.20 | 1.00 | C | 144.5 | - | - | 4:54 | 5:05 | 0.7 | 8.6 | 11.61 | 36.7 | - | 1.68 | 4.0 | 9.0 | 21.0 | |
| | | 10-Oct-10 | 3 | 3.20 | 4.20 | 1.00 | D | 89.0 | - | - | 5:05 | 5:12 | 1.0 | 5.5 | 5.19 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 3.20 | 4.20 | 1.00 | D+ | 92.6 | - | - | 5:12 | 5:18 | 1.0 | 11.6 | 11.42 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 3 | 3.20 | 4.20 | 1.00 | E | 170.0 | 658.3 | 658.3 | 5:18 | 5:28 | 0.8 | 0.3 | 0.44 | - | - | - | - | - | - | Total Volume: 658.3 L |
| | | 10-Oct-10 | 2 | 4.20 | 8.50 | 4.30 | A* | 206.2 | - | - | 2:32 | 3:07 | 1.5 | 4.1 | 0.61 | - | - | - | - | - | - | |
| | | 10-Oct-10 | 2 | 4.20 | 8.50 | 4.30 | B | 66.7 | 272.9 | 63.5 | 3:07 | 3:37 | 1.5 | 1.3 | 0.20 | - | - | - | - | - | - | |
| T-30+924.5 | T | 14-Nov-10 | 3 | 3.68 | 4.68 | 1.00 | A* | 34.7 | 34.7 | 34.7 | 22:25 | 22:50 | 1.7 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 4.68 | 9.00 | 4.32 | A* | 31.9 | 31.9 | 7.4 | 22:02 | 22:19 | 1.4 | 0.5 | 0.09 | - | - | - | - | - | - | |
| P-30+926 | P | 27-Nov-10 | 4 | 1.56 | 3.06 | 1.50 | B | 87.3 | 87.3 | 58.2 | 18:55 | 19:25 | 1.9 | 0.3 | 0.12 | 35.3 | 6.0 | 1.58 | 11.1 | 16.0 | 23.1 | |
| | | 11-Oct-10 | 3 | 3.56 | 4.56 | 1.00 | B | 194.1 | - | - | 8:10 | 8:34 | 0.2 | 15.7 | 111.70 | 35.0 | 4.0 | 1.65 | -1.6 | 7.7 | 14.4 | |
| | | 11-Oct-10 | 3 | 3.56 | 4.56 | 1.00 | C | 240.9 | - | - | 8:34 | 8:48 | 0.7 | 14.4 | 19.07 | 45.0 | 0.0 | 1.66 | -1.0 | 7.5 | 14.4 | |
| | | 11-Oct-10 | 3 | 3.56 | 4.56 | 1.00 | D | 196.8 | 631.8 | 679.0 | 8:48 | 9:01 | 0.6 | 14.3 | 22.62 | 67.0 | - | 1.67 | -1.0 | 7.5 | 14.3 | |
| | | 10-Nov-10 | 3 | 3.56 | 4.56 | 1.00 | B | 47.2 | 47.2 | 47.2 | 20:54 | 21:25 | 2.4 | 0.4 | 0.15 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 4.56 | 9.10 | 4.54 | A* | 22.6 | 22.6 | 5.0 | 20:35 | 20:49 | 1.5 | 0.2 | 0.04 | - | - | - | - | - | - | Stage 2 injected after Stage 3 |
| T-30+927.5 | T | 14-Nov-10 | 3 | 3.61 | 4.61 | 1.00 | A* | 13.3 | 13.3 | 13.3 | 23:43 | 23:55 | 1.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 4.61 | 8.90 | 4.29 | A* | 35.6 | 35.6 | 8.3 | 23:23 | 23:39 | 1.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| S-30+929 | S | 05-Dec-10 | 4 | 1.73 | 3.23 | 1.50 | A* | 42.4 | 42.4 | 28.3 | 20:05 | 20:26 | 2.0 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.73 | 4.73 | 1.00 | B | 190.0 | - | - | 6:18 | 6:50 | 1.2 | 9.5 | 6.06 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.73 | 4.73 | 1.00 | C | 84.0 | - | - | 6:50 | 7:11 | 1.1 | 9.1 | 8.39 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.73 | 4.73 | 1.00 | D | 345.0 | 619.0 | 619.0 | 7:11 | 7:35 | 1.6 | 10.1 | 6.48 | - | - | - | - | - | - | Communicated to P30+926 |
| | | 11-Oct-10 | 2 | 4.73 | 9.30 | 4.57 | A* | 46.7 | 46.7 | 10.2 | 5:53 | 6:12 | 1.6 | 0.7 | 0.09 | - | - | - | - | - | - | |
| T-30+930.5 | T | 10-Nov-10 | 3 | 3.43 | 4.43 | 1.00 | B | 142.5 | - | - | 22:00 | 22:22 | 1.7 | 1.2 | 0.67 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.43 | 4.43 | 1.00 | C | 174.3 | - | - | 22:22 | 22:41 | 1.6 | 13.5 | 7.39 | 50.3 | 2.5 | 1.63 | -3.4 | 8.7 | 19.2 | |
| | | 10-Nov-10 | 3 | 3.43 | 4.43 | 1.00 | D | 169.4 | - | - | 22:41 | 22:52 | 1.8 | 18.3 | 11.71 | 70.9 | 2.0 | 1.65 | -3.4 | 8.7 | 17.8 | |
| | | 10-Nov-10 | 3 | 3.43 | 4.43 | 1.00 | E | 112.3 | 598.5 | 598.5 | 22:52 | 23:02 | 0.3 | 0.0 | 0.04 | 70.2 | - | 1.64 | -3.3 | 8.6 | 16.9 | |
| | | 10-Nov-10 | 2 | 4.43 | 8.60 | 4.17 | A* | 21.3 | 21.3 | 5.1 | 21:34 | 21:55 | 1.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+932 | P | 27-Nov-10 | 4 | 1.51 | 3.01 | 1.50 | B | 211.1 | 211.1 | 140.7 | 16:21 | 17:22 | 2.1 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.51 | 4.51 | 1.00 | B | 152.0 | - | - | 10:28 | 10:49 | 0.1 | 12.3 | 34.81 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.51 | 4.51 | 1.00 | C | 177.4 | - | - | 10:49 | 11:00 | 0.7 | 19.1 | 28.62 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.51 | 4.51 | 1.00 | D | 277.4 | 606.8 | 606.8 | 11:00 | 11:14 | 0.6 | 12.6 | 19.63 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 2 | 4.51 | 9.30 | 4.79 | A* | 32.1 | 32.1 | 6.7 | 10:08 | 10:22 | 2.1 | 0.2 | 0.02 | - | - | - | - | - | - | |
| T-30+933.5 | T | 10-Nov-10 | 3 | 3.91 | 4.91 | 1.00 | A* | 11.4 | 11.4 | 11.4 | 2:13 | 2:27 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 4.91 | 9.00 | 4.09 | A* | 21.7 | 21.7 | 5.3 | 1:56 | 2:09 | 1.6 | 0.1 | 0.01 | 32.6 | - | 1.58 | - | - | - | |
| S-30+935 | S | 05-Dec-10 | 4 | 2.09 | 3.59 | 1.50 | B | 114.5 | 114.5 | 76.3 | 19:07 | 19:42 | 1.8 | 0.0 | 0.00 | 36.7 | 3.5 | 1.67 | -9.8 | 10.1 | 15.3 | |
| | | 11-Oct-10 | 3 | 4.09 | 5.09 | 1.00 | B | 143.9 | - | - | 14:05 | 14:24 | 0.0 | 11.5 | inf | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 4.09 | 5.09 | 1.00 | C | 150.6 | - | - | 14:24 | 14:34 | 0.1 | 17.9 | 409.30 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 4.09 | 5.09 | 1.00 | D | 328.2 | 622.7 | 622.7 | 14:34 | 14:59 | 1.1 | 19.0 | 16.86 | 64.0 | 0.0 | 1.65 | 1.9 | 8.4 | 11.8 | Communicated to T30+936.5 |
| | | 11-Oct-10 | 2 | 5.09 | 9.40 | 4.31 | A* | 172.0 | - | - | 13:19 | 13:42 | 1.9 | 9.0 | 1.20 | 32.6 | 5.0 | 1.56 | 2.5 | 8.4 | 18.4 | |
| | | 11-Oct-10 | 2 | 5.09 | 9.40 | 4.31 | B | 40.7 | 212.7 | 49.4 | 13:42 | 14:00 | 2.2 | 0.0 | 0.00 | 35.0 | - | 1.60 | 2.0 | 8.4 | 14.7 | |
| T-30+936.5 | T | 10-Nov-10 | 3 | 4.01 | 5.01 | 1.00 | A* | 39.5 | 39.5 | 39.5 | 2:54 | 3:20 | 2.2 | 0.4 | 0.18 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 5.01 | 9.30 | 4.29 | A* | 24.7 | 24.7 | 5.8 | 2:32 | 2:48 | 1.6 | 0.2 | 0.03 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-30+938 | P | 27-Nov-10 | 4 | 1.86 | 3.36 | 1.50 | B | 156.6 | 156.6 | 104.4 | 15:19 | 16:18 | 2.0 | 0.6 | 0.20 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.86 | 4.86 | 1.00 | A* | 69.8 | - | - | 15:29 | 15:41 | 0.6 | 9.5 | 15.67 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.86 | 4.86 | 1.00 | B | 86.7 | - | - | 15:41 | 15:49 | 0.7 | 14.4 | 20.01 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.86 | 4.86 | 1.00 | C | 219.7 | - | - | 15:49 | 16:02 | 1.7 | 23.5 | 13.54 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.86 | 4.86 | 1.00 | D | 231.5 | 607.7 | 607.7 | 16:02 | 16:14 | 1.4 | 17.6 | 12.54 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 2 | 4.86 | 9.90 | 5.04 | A* | 22.1 | 22.1 | 4.4 | 15:10 | 15:23 | 2.4 | 0.7 | 0.06 | - | - | - | - | - | - | |
| T-30+939.5 | T | 10-Nov-10 | 3 | 4.12 | 5.12 | 1.00 | A* | 34.7 | - | - | 3:45 | 3:52 | 0.7 | 6.6 | 7.83 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 4.12 | 5.12 | 1.00 | B | 125.8 | - | - | 3:52 | 4:13 | 1.4 | 9.8 | 10.08 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 4.12 | 5.12 | 1.00 | C | 181.9 | - | - | 4:13 | 4:26 | 1.4 | 9.1 | 5.05 | 48.1 | - | 1.62 | 2.4 | 7.0 | - | |
| | | 10-Nov-10 | 3 | 4.12 | 5.12 | 1.00 | D | 260.4 | 602.8 | 602.8 | 4:26 | 4:45 | 1.8 | 14.0 | 7.67 | 78.3 | - | 1.69 | 2.4 | 7.0 | 17.6 | |
| | | 10-Nov-10 | 2 | 5.12 | 9.40 | 4.28 | A* | 22.4 | 22.4 | 5.2 | 3:26 | 3:40 | 1.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+941 | S | 05-Dec-10 | 4 | 1.99 | 3.49 | 1.50 | A* | 69.7 | 69.7 | 46.5 | 16:35 | 17:01 | 2.1 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.99 | 4.99 | 1.00 | B | 213.8 | - | - | 17:35 | 17:58 | 0.4 | 14.8 | 25.27 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.99 | 4.99 | 1.00 | C | 118.7 | - | - | 17:58 | 18:05 | 0.7 | 20.1 | 35.10 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.99 | 4.99 | 1.00 | D | 312.1 | 644.6 | 644.6 | 18:05 | 18:32 | 1.2 | 31.4 | 27.04 | 65.3 | 0.0 | 1.66 | 2.0 | 8.0 | 17.0 | |
| | | 11-Oct-10 | 2 | 4.99 | 10.00 | 5.01 | A | 184.5 | - | - | 16:34 | 17:12 | 1.5 | 2.6 | 0.34 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 2 | 4.99 | 10.00 | 5.01 | B | 44.0 | 228.5 | 45.6 | 17:12 | 17:33 | 1.9 | 1.7 | 0.19 | - | - | - | - | - | - | |
| T-30+942.5 | T | 10-Nov-10 | 3 | 3.86 | 4.86 | 1.00 | A* | 28.5 | - | - | 6:08 | 6:15 | 1.1 | 3.5 | 2.45 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.86 | 4.86 | 1.00 | B | 150.4 | - | - | 6:15 | 6:37 | 1.8 | 10.2 | 7.02 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.86 | 4.86 | 1.00 | C | 192.2 | - | - | 6:37 | 6:52 | 1.5 | 12.7 | 11.69 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 3.86 | 4.86 | 1.00 | D | 249.5 | 620.6 | 620.6 | 6:52 | 7:11 | 1.3 | 15.5 | 12.37 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 4.86 | 8.90 | 4.04 | A* | 24.4 | 24.4 | 6.0 | 5:44 | 6:00 | 1.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+944 | P | 27-Nov-10 | 4 | 1.44 | 2.94 | 1.50 | B | 212.3 | 212.3 | 141.5 | 13:44 | 15:12 | 2.3 | 0.5 | 0.14 | 38.3 | 1.5 | 1.62 | 14.9 | 13.6 | 19.1 | |
| | | 11-Oct-10 | 3 | 3.48 | 4.48 | 1.00 | B | 185.5 | - | - | 20:42 | 21:32 | 2.6 | 2.6 | 1.66 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.48 | 4.48 | 1.00 | C | 72.4 | 257.9 | 257.9 | 21:32 | 22:40 | 2.5 | 0.4 | 0.15 | 46.3 | 1.4 | 1.77 | 1.0 | 8.0 | 16.0 | |
| | | 11-Oct-10 | 2 | 4.48 | 9.80 | 5.32 | A* | 165.5 | - | - | 18:50 | 19:22 | 0.7 | 9.4 | 1.99 | 31.2 | 4.0 | 1.64 | 2.0 | 8.0 | 18.0 | |
| | | 11-Oct-10 | 2 | 4.48 | 9.80 | 5.32 | B | 330.3 | 495.8 | 93.2 | 19:22 | 20:35 | 1.6 | 1.5 | 0.18 | 36.0 | - | 1.65 | 2.0 | 8.0 | 12.0 | |
| T-30+945.5 | T | 11-Nov-10 | 3 | 3.73 | 4.73 | 1.00 | A* | 14.6 | 14.6 | 14.6 | 7:39 | 7:52 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 4.73 | 8.70 | 3.97 | A* | 23.9 | 23.9 | 6.0 | 7:22 | 7:35 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+947 | S | 05-Dec-10 | 4 | 1.56 | 3.06 | 1.50 | A* | 77.4 | 77.4 | 51.6 | 15:55 | 16:23 | 2.3 | 0.3 | 0.10 | 32.0 | - | 1.65 | 3.0 | 15.0 | 17.3 | |
| | | 11-Oct-10 | 3 | 3.56 | 4.56 | 1.00 | B | 194.7 | - | - | 2:44 | 3:11 | 0.4 | 9.4 | 22.59 | 35.8 | 3.0 | 1.59 | 5.0 | 9.0 | 19.0 | |
| | | 11-Oct-10 | 3 | 3.56 | 4.56 | 1.00 | C | 153.6 | - | - | 3:11 | 3:25 | 0.7 | 8.8 | 15.27 | 45.9 | - | 1.77 | 5.0 | 9.0 | 19.0 | |
| | | 11-Oct-10 | 3 | 3.56 | 4.56 | 1.00 | D | 174.1 | - | - | 3:25 | 3:40 | 0.5 | 9.3 | 20.84 | 41.0 | - | 1.62 | 5.0 | 9.0 | 18.0 | |
| | | 11-Oct-10 | 3 | 3.56 | 4.56 | 1.00 | D+ | 95.0 | 617.4 | 617.4 | 3:40 | 3:46 | 1.0 | 9.3 | 9.66 | 55.9 | 0.0 | 1.61 | 5.0 | 9.0 | 18.0 | |
| | | 11-Oct-10 | 2 | 4.56 | 10.90 | 6.34 | A* | 32.7 | 32.7 | 5.2 | 2:21 | 2:36 | 1.6 | 0.9 | 0.09 | 32.1 | - | 1.62 | 5.0 | 9.0 | 15.0 | |
| T-30+948.5 | T | 11-Nov-10 | 3 | 3.51 | 4.51 | 1.00 | A* | 16.6 | 16.6 | 16.6 | 8:41 | 8:54 | 2.0 | 0.2 | 0.10 | 33.5 | 5.0 | 1.62 | 16.5 | 11.3 | 19.2 | |
| | | 11-Nov-10 | 2 | 4.51 | 8.60 | 4.09 | A* | 22.8 | 22.8 | 5.6 | 8:22 | 8:36 | 1.9 | 0.3 | 0.04 | - | - | - | - | - | - | |
| P-30+950 | P | 26-Nov-10 | 4 | 1.51 | 3.01 | 1.50 | B | 73.9 | 73.9 | 49.3 | 6:16 | 6:41 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.51 | 4.51 | 1.00 | A* | 97.1 | - | - | 4:47 | 5:04 | 0.2 | 9.3 | 32.67 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.51 | 4.51 | 1.00 | B | 168.9 | - | - | 5:04 | 5:16 | 0.4 | 14.9 | 32.11 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.51 | 4.51 | 1.00 | C | 174.3 | - | - | 5:16 | 5:27 | 0.8 | 14.5 | 18.71 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 3 | 3.51 | 4.51 | 1.00 | D | 167.7 | 608.0 | 608.0 | 5:27 | 5:38 | 0.5 | 15.3 | 30.91 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 2 | 4.51 | 10.00 | 5.49 | A* | 135.5 | 135.5 | 24.7 | 4:01 | 4:40 | 1.6 | 1.2 | 0.14 | - | - | - | - | - | - | |
| T-30+951.5 | T | 11-Nov-10 | 3 | 4.04 | 5.04 | 1.00 | A* | 166.5 | - | - | 9:41 | 10:02 | 1.1 | 11.8 | 11.14 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 4.04 | 5.04 | 1.00 | B | 181.2 | - | - | 10:02 | 10:15 | 1.0 | 14.5 | 14.97 | 39.2 | - | 1.64 | 14.6 | 11.4 | 16.2 | |
| | | 11-Nov-10 | 3 | 4.04 | 5.04 | 1.00 | C | 160.6 | - | - | 10:15 | 10:26 | 1.2 | 13.1 | 10.76 | 58.3 | - | 1.64 | 14.6 | 11.4 | 17.1 | |
| | | 11-Nov-10 | 3 | 4.04 | 5.04 | 1.00 | D | 138.3 | 646.6 | 646.6 | 10:26 | 10:36 | 1.4 | 18.9 | 13.55 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 5.04 | 9.40 | 4.36 | A* | 106.4 | 106.4 | 24.4 | 9:02 | 9:34 | 1.9 | 0.4 | 0.05 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-30+953 | S | 05-Dec-10 | 4 | 2.32 | 3.82 | 1.50 | A* | 123.9 | 123.9 | 82.6 | 14:54 | 15:46 | 2.3 | 0.4 | 0.13 | 33.0 | 2.0 | 1.62 | 11.5 | 8.3 | 14.7 | |
| | | 11-Oct-10 | 3 | 4.32 | 5.32 | 1.00 | B | 19.3 | 19.3 | 19.3 | 6:19 | 6:32 | 2.7 | 0.4 | 0.04 | - | - | - | - | - | - | |
| | | 11-Oct-10 | 2 | 5.32 | 9.50 | 4.18 | A | 50.1 | 50.1 | 12.0 | 5:50 | 6:13 | 1.6 | 0.6 | 0.10 | - | - | - | - | - | - | |
| T-30+954.5 | T | 11-Nov-10 | 3 | 4.22 | 5.22 | 1.00 | A* | 201.1 | - | - | 11:03 | 11:32 | 1.6 | 15.1 | 9.71 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 4.22 | 5.22 | 1.00 | B | 145.5 | - | - | 11:32 | 11:42 | 1.7 | 13.4 | 8.19 | - | - | - | - | - | - | Communicated to T30+960.5 |
| | | 11-Nov-10 | 3 | 4.22 | 5.22 | 1.00 | C | 135.0 | 481.6 | 481.6 | 11:42 | 11:55 | 1.7 | 8.6 | 8.18 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 5.22 | 9.60 | 4.38 | A* | 28.2 | 28.2 | 6.4 | 10:46 | 10:59 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+956 | P | 26-Nov-10 | 4 | 1.96 | 3.46 | 1.50 | B | 124.3 | 124.3 | 82.9 | 4:34 | 5:35 | 1.6 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.96 | 4.96 | 1.00 | B | 175.2 | - | - | 7:49 | 8:15 | 2.5 | 10.0 | 3.83 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.96 | 4.96 | 1.00 | C | 158.8 | - | - | 8:15 | 8:32 | 2.5 | 10.1 | 4.07 | 45.6 | - | 1.65 | 1.1 | 7.2 | 13.6 | |
| | | 12-Oct-10 | 3 | 3.96 | 4.96 | 1.00 | D | 274.7 | 608.7 | 608.7 | 8:32 | 9:02 | 1.5 | 3.8 | 2.52 | 61.3 | - | 1.66 | 1.1 | 7.3 | 11.4 | |
| | | 12-Oct-10 | 2 | 4.96 | 9.20 | 4.24 | A | 201.3 | - | - | 6:40 | 7:22 | 1.6 | 2.7 | 0.39 | 33.2 | 4.0 | 1.60 | 1.0 | 6.8 | 16.5 | |
| | | 12-Oct-10 | 2 | 4.96 | 9.20 | 4.24 | B | 38.0 | 239.3 | 56.4 | 7:22 | 7:43 | 1.7 | 1.7 | 0.24 | 37.0 | 4.0 | 1.64 | 1.1 | 6.6 | 15.3 | |
| T-30+957.5 | T | 11-Nov-10 | 3 | 3.63 | 4.63 | 1.00 | A* | 182.9 | - | - | 15:15 | 15:40 | 1.4 | 11.2 | 9.24 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 3.63 | 4.63 | 1.00 | B | 187.1 | - | - | 15:40 | 16:00 | 1.7 | 10.8 | 6.91 | 35.1 | - | 1.61 | 21.7 | 6.8 | 17.2 | |
| | | 11-Nov-10 | 3 | 3.63 | 4.63 | 1.00 | C | 161.6 | - | - | 16:00 | 16:13 | 1.7 | 12.3 | 8.50 | 50.2 | - | 1.64 | 20.4 | 6.8 | 18.5 | |
| | | 11-Nov-10 | 3 | 3.63 | 4.63 | 1.00 | D | 105.8 | 637.4 | 637.4 | 16:13 | 16:23 | 1.9 | 11.1 | 5.91 | 56.3 | - | 1.64 | 20.4 | 6.6 | 16.6 | |
| | | 11-Nov-10 | 2 | 4.63 | 8.70 | 4.07 | A* | 30.7 | 30.7 | 7.5 | 14:57 | 15:10 | 1.8 | 0.6 | 0.08 | 30.4 | - | 1.61 | 21.7 | 6.4 | 16.8 | |
| S-30+959 | S | 05-Dec-10 | 4 | 1.13 | 2.63 | 1.50 | B | 45.2 | 45.2 | 30.1 | 10:57 | 11:19 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.14 | 4.14 | 1.00 | B | 162.5 | - | - | 10:37 | 10:58 | 2.4 | 11.3 | 4.43 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.14 | 4.14 | 1.00 | C | 157.1 | - | - | 10:58 | 11:29 | 2.5 | 3.7 | 1.93 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.14 | 4.14 | 1.00 | D | 119.4 | 439.0 | 439.0 | 11:29 | 12:24 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 2 | 4.14 | 8.40 | 4.26 | A | 205.2 | - | - | 9:09 | 9:32 | 2.4 | 15.6 | 1.77 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 2 | 4.14 | 8.40 | 4.26 | B | 197.8 | - | - | 9:32 | 9:46 | 2.2 | 15.1 | 1.77 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 2 | 4.14 | 8.40 | 4.26 | C | 303.1 | - | - | 9:46 | 10:11 | 1.4 | 11.6 | 1.96 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 2 | 4.14 | 8.40 | 4.26 | D | 66.7 | 772.8 | 181.4 | 10:11 | 10:34 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+960.5 | T | 11-Nov-10 | 2, 3 | 3.13 | 8.20 | 5.07 | B | 9.1 | 9.1 | 1.8 | 12:16 | 12:28 | 1.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-30+962 | P | 26-Nov-10 | 4 | 1.02 | 2.52 | 1.50 | B | 29.3 | 29.3 | 19.5 | 5:46 | 6:05 | 1.6 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.02 | 4.02 | 1.00 | A | 67.7 | - | - | 15:58 | 16:12 | 0.4 | 6.6 | 19.14 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.02 | 4.02 | 1.00 | B | 88.7 | - | - | 16:12 | 16:21 | 1.5 | 11.3 | 6.96 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.02 | 4.02 | 1.00 | C | 252.2 | - | - | 16:21 | 16:39 | 2.0 | 14.9 | 7.63 | 47.0 | - | 1.65 | 3.5 | 7.3 | 14.9 | |
| | | 12-Oct-10 | 3 | 3.02 | 4.02 | 1.00 | D | 208.5 | 617.1 | 617.1 | 16:39 | 16:54 | 2.2 | 13.6 | 6.35 | 68.6 | - | 1.66 | 3.5 | 7.3 | 13.4 | |
| | | 12-Oct-10 | 2 | 4.02 | 8.04 | 4.02 | A | 50.0 | 50.0 | 12.4 | 15:30 | 15:55 | 1.8 | 0.0 | 0.00 | 33.0 | - | 1.61 | 6.1 | 8.6 | 13.4 | |
| T-30+963.5 | T | 11-Nov-10 | 3 | 3.13 | 4.13 | 1.00 | A* | 16.1 | - | - | 19:05 | 19:10 | 0.8 | 2.3 | 2.62 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 3.13 | 4.13 | 1.00 | B | 148.0 | - | - | 19:10 | 19:31 | 1.6 | 12.6 | 7.48 | 39.3 | 8.0 | 1.60 | 13.6 | 9.2 | 18.8 | |
| | | 11-Nov-10 | 3 | 3.13 | 4.13 | 1.00 | C | 162.8 | - | - | 19:31 | 19:40 | 1.4 | 11.2 | 7.72 | 45.6 | 3.0 | 1.59 | 13.6 | 9.2 | 17.5 | |
| | | 11-Nov-10 | 3 | 3.13 | 4.13 | 1.00 | D | 155.2 | - | - | 19:40 | 19:53 | 1.6 | 10.6 | 6.56 | 75.4 | 1.0 | 1.65 | 21.4 | 9.3 | 17.3 | |
| | | 11-Nov-10 | 3 | 3.13 | 4.13 | 1.00 | E | 119.2 | 601.3 | 601.3 | 19:53 | 20:04 | 1.5 | 6.1 | 4.20 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 4.13 | 8.20 | 4.07 | A | 231.4 | 231.4 | 56.9 | 16:59 | 18:07 | 1.7 | 0.2 | 0.03 | - | - | - | - | - | - | |
| S-30+965 | S | 05-Dec-10 | 4 | 1.00 | 2.50 | 1.50 | B | 21.2 | 21.2 | 14.1 | 10:35 | 10:49 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.00 | 4.00 | 1.00 | A | 79.8 | - | - | 17:19 | 17:33 | 0.8 | 10.0 | 17.33 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.00 | 4.00 | 1.00 | B | 74.2 | - | - | 17:33 | 17:45 | 1.7 | 15.2 | 9.20 | 36.2 | - | 1.64 | 3.1 | 7.8 | 13.0 | |
| | | 12-Oct-10 | 3 | 3.00 | 4.00 | 1.00 | C | 193.0 | - | - | 17:45 | 17:53 | 2.8 | 16.3 | 6.61 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.00 | 4.00 | 1.00 | D | 254.6 | 601.6 | 601.6 | 17:53 | 18:14 | 1.8 | 9.6 | 5.23 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 2 | 4.00 | 8.60 | 4.60 | A | 42.4 | 42.4 | 9.2 | 17:01 | 17:16 | 1.7 | 1.1 | 0.14 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-30+966.5 | T | 11-Nov-10 | 3 | 2.97 | 3.97 | 1.00 | B | 163.0 | - | - | 20:44 | 21:06 | 2.1 | 13.5 | 6.53 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 2.97 | 3.97 | 1.00 | C | 164.6 | - | - | 21:06 | 21:19 | 2.2 | 16.7 | 7.27 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 2.97 | 3.97 | 1.00 | D | 156.5 | - | - | 21:19 | 21:38 | 1.8 | 9.2 | 5.00 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 2.97 | 3.97 | 1.00 | E | 116.6 | 600.7 | 600.7 | 21:38 | 21:52 | 2.2 | 8.7 | 3.96 | 117.0 | - | 1.66 | 1.7 | 9.3 | 17.5 | |
| | | 11-Nov-10 | 2 | 3.97 | 8.00 | 4.03 | A* | 36.7 | 36.7 | 9.1 | 20:22 | 20:37 | 1.6 | 1.4 | 0.22 | - | - | - | - | - | - | |
| P-30+968 | P | 26-Nov-10 | 4 | 1.25 | 2.75 | 1.50 | B | 32.0 | 32.0 | 21.3 | 3:32 | 3:52 | 2.2 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.25 | 4.25 | 1.00 | A | 192.9 | - | - | 18:39 | 19:04 | 2.4 | 5.5 | 2.42 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.25 | 4.25 | 1.00 | B | 94.2 | - | - | 19:04 | 19:35 | 2.5 | 2.7 | 1.00 | 35.7 | 7.0 | 1.62 | 1.0 | 9.0 | 16.0 | |
| | | 12-Oct-10 | 3 | 3.25 | 4.25 | 1.00 | C | 48.1 | - | - | 19:35 | 19:58 | 2.5 | 1.8 | 0.73 | 47.7 | 0.2 | 1.76 | 1.0 | 9.0 | 18.0 | |
| | | 12-Oct-10 | 3 | 3.25 | 4.25 | 1.00 | D | 47.3 | - | - | 19:58 | 20:35 | 2.4 | 1.0 | 0.42 | 48.5 | - | 1.62 | 1.0 | 9.0 | 21.0 | |
| | | 12-Oct-10 | 3 | 3.25 | 4.25 | 1.00 | D+ | 43.8 | 426.3 | 426.3 | 20:35 | 21:35 | 2.5 | 0.5 | 0.19 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 2 | 4.25 | 8.80 | 4.55 | A | 28.8 | 28.8 | 6.3 | 18:20 | 18:33 | 1.6 | 0.2 | 0.02 | - | - | - | - | - | - | |
| T-30+969.5 | T | 11-Nov-10 | 3 | 3.38 | 4.38 | 1.00 | B | 167.5 | - | - | 22:32 | 23:04 | 1.5 | 11.6 | 7.30 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 3.38 | 4.38 | 1.00 | C | 152.8 | - | - | 23:04 | 23:15 | 2.1 | 11.5 | 5.74 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 3.38 | 4.38 | 1.00 | D | 164.2 | - | - | 23:15 | 23:57 | 2.2 | 4.5 | 1.93 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 3.38 | 4.38 | 1.00 | E | 32.8 | 517.3 | 517.3 | 23:57 | 0:17 | 1.2 | 0.0 | 0.03 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 4.38 | 8.40 | 4.02 | A* | 24.2 | 24.2 | 6.0 | 22:11 | 22:24 | 1.5 | 0.0 | 0.00 | 31.6 | 8.0 | 1.59 | 1.7 | 9.3 | 14.6 | |
| S-30+971 | S | 05-Dec-10 | 4 | 1.43 | 2.93 | 1.50 | B | 26.3 | 26.3 | 17.5 | 10:09 | 10:25 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.43 | 4.43 | 1.00 | A | 63.2 | - | - | 1:44 | 1:56 | 0.2 | 6.4 | 31.10 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.43 | 4.43 | 1.00 | B | 187.7 | - | - | 1:56 | 2:13 | 0.6 | 12.5 | 21.59 | 35.7 | - | 1.62 | 5.0 | 9.0 | 17.0 | |
| | | 12-Oct-10 | 3 | 3.43 | 4.43 | 1.00 | C | 140.4 | - | - | 2:13 | 2:25 | 1.1 | 10.3 | 12.81 | 47.9 | - | 1.75 | 5.0 | 9.0 | 19.0 | |
| | | 12-Oct-10 | 3 | 3.43 | 4.43 | 1.00 | D | 180.6 | - | - | 2:25 | 2:37 | 0.8 | 10.4 | 25.06 | 68.9 | 1.0 | 1.63 | 5.0 | 9.0 | 16.0 | |
| | | 12-Oct-10 | 3 | 3.43 | 4.43 | 1.00 | D+ | 79.2 | 651.1 | 651.1 | 2:37 | 2:42 | 0.6 | 16.9 | 30.27 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 2 | 4.43 | 8.90 | 4.47 | A | 63.3 | 63.3 | 14.2 | 1:11 | 1:38 | 1.7 | 1.3 | 0.17 | 30.9 | 4.0 | 1.63 | 5.0 | 9.0 | 16.0 | |
| T-30+972.5 | T | 11-Nov-10 | 3 | 3.18 | 4.18 | 1.00 | B | 157.8 | - | - | 2:41 | 3:00 | 1.9 | 16.3 | 8.10 | 39.1 | - | 1.65 | 14.2 | 7.2 | 14.8 | |
| | | 11-Nov-10 | 3 | 3.18 | 4.18 | 1.00 | C | 179.2 | - | - | 3:00 | 3:17 | 1.6 | 15.3 | 6.27 | 54.9 | - | 1.64 | 14.2 | 5.7 | 13.5 | |
| | | 11-Nov-10 | 3 | 3.18 | 4.18 | 1.00 | D | 143.6 | - | - | 3:17 | 3:40 | 1.9 | 7.4 | 3.86 | 123.7 | - | 1.68 | 14.2 | 5.7 | 15.0 | |
| | | 11-Nov-10 | 3 | 3.18 | 4.18 | 1.00 | E | 120.9 | 601.5 | 601.5 | 3:40 | 3:56 | 2.0 | 14.1 | 7.22 | 78.9 | 0.0 | 1.67 | 20.4 | 6.8 | 17.3 | |
| | | 11-Nov-10 | 2 | 4.18 | 8.20 | 4.02 | A* | 21.9 | 21.9 | 5.4 | 2:21 | 2:34 | 1.6 | 0.1 | 0.01 | 33.4 | - | 1.65 | 14.2 | 7.2 | 15.2 | |
| P-30+974 | P | 26-Nov-10 | 4 | 1.18 | 2.68 | 1.50 | B | 30.8 | 30.8 | 20.5 | 22:44 | 23:04 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 3 | 3.18 | 4.18 | 1.00 | B | 13.6 | 13.6 | 13.6 | 3:52 | 4:08 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 2 | 4.18 | 8.80 | 4.62 | A | 131.0 | 131.0 | 28.4 | 3:00 | 3:46 | 1.6 | 1.4 | 0.19 | - | - | - | - | - | - | |
| T-30+975.5 | T | 11-Nov-10 | 3 | 3.18 | 4.18 | 1.00 | B | 159.4 | - | - | 4:36 | 4:57 | 2.1 | 13.4 | 6.54 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 3.18 | 4.18 | 1.00 | C | 169.0 | - | - | 4:57 | 5:06 | 2.1 | 28.1 | 13.48 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 3.18 | 4.18 | 1.00 | D | 153.0 | - | - | 5:06 | 5:11 | 1.9 | 23.2 | 12.74 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 3.18 | 4.18 | 1.00 | E | 119.4 | 600.8 | 600.8 | 5:11 | 5:19 | 2.1 | 21.9 | 10.54 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 4.18 | 8.20 | 4.02 | A* | 21.4 | 21.4 | 5.3 | 4:17 | 4:30 | 2.2 | 0.2 | 0.02 | - | - | - | - | - | - | |
| S-30+977 | S | 05-Dec-10 | 4 | 1.13 | 2.63 | 1.50 | B | 49.1 | 49.1 | 32.7 | 7:40 | 8:04 | 2.1 | 0.7 | 0.22 | 37.2 | 2.0 | 1.59 | 7.1 | 7.9 | 7.0 | |
| | | 13-Oct-10 | 3 | 3.13 | 4.13 | 1.00 | B | 120.7 | - | - | 6:43 | 7:03 | 0.5 | 9.8 | 24.81 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.13 | 4.13 | 1.00 | C | 201.2 | - | - | 7:03 | 7:17 | 0.7 | 18.5 | 29.02 | 60.1 | - | 1.65 | 1.2 | 7.2 | 11.7 | |
| | | 13-Oct-10 | 3 | 3.13 | 4.13 | 1.00 | D | 279.0 | 600.9 | 600.9 | 7:17 | 7:33 | 0.4 | 25.9 | 65.76 | 58.3 | - | 1.64 | 1.2 | 7.2 | 10.8 | |
| | | 12-Oct-10 | 2 | 4.13 | 8.50 | 4.37 | A | 203.5 | - | - | 5:15 | 5:44 | 1.6 | 7.3 | 1.07 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 2 | 4.13 | 8.50 | 4.37 | B | 174.5 | - | - | 5:44 | 6:20 | 1.6 | 3.2 | 0.44 | - | - | - | - | - | - | |
| | | 12-Oct-10 | 2 | 4.13 | 8.50 | 4.37 | C | 23.4 | 401.4 | 91.9 | 6:20 | 6:37 | 1.6 | 0.5 | 0.08 | - | - | - | - | - | - | |
| T-30+978.5 | T | 12-Nov-10 | 3 | 3.07 | 4.07 | 1.00 | A* | 176.9 | - | - | 7:57 | 8:20 | 1.3 | 12.9 | 10.42 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 3.07 | 4.07 | 1.00 | B | 210.0 | - | - | 8:20 | 8:33 | 1.2 | 19.2 | 15.34 | 34.7 | 1.0 | 1.61 | 16.6 | 14.4 | 14.1 | |
| | | 12-Nov-10 | 3 | 3.07 | 4.07 | 1.00 | C | 172.2 | - | - | 8:33 | 8:41 | 1.2 | 21.7 | 16.66 | 44.2 | - | 1.63 | 16.6 | 14.9 | 15.2 | |
| | | 12-Nov-10 | 3 | 3.07 | 4.07 | 1.00 | D | 96.7 | 655.8 | 655.8 | 8:41 | 8:48 | 1.6 | 16.6 | 10.21 | 87.7 | - | 1.64 | 16.6 | 14.9 | 16.1 | |
| | | 12-Nov-10 | 2 | 4.07 | 8.10 | 4.03 | A* | 24.9 | 24.9 | 6.2 | 7:39 | 7:53 | 1.6 | 0.2 | 0.04 | 31.6 | - | 1.61 | 16.6 | 14.6 | 14.8 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-30+980 | P | 26-Nov-10 | 4 | 1.18 | 2.68 | 1.50 | B | 96.6 | 96.6 | 64.4 | 21:53 | 22:28 | 1.7 | 0.1 | 0.06 | - | - | - | - | - | - | Communicated to P31+974 |
| | | 13-Oct-10 | 3 | 3.18 | 4.18 | 1.00 | A* | 78.2 | - | - | 8:13 | 8:27 | 0.3 | 9.8 | 32.58 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.18 | 4.18 | 1.00 | B | 130.2 | - | - | 8:27 | 8:39 | 0.4 | 12.1 | 25.83 | 34.4 | 5.0 | 1.61 | 0.6 | 7.2 | 12.0 | |
| | | 13-Oct-10 | 3 | 3.18 | 4.18 | 1.00 | C | 108.0 | - | - | 8:39 | 8:45 | 0.6 | 14.7 | 22.94 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.18 | 4.18 | 1.00 | D | 192.2 | - | - | 8:45 | 8:57 | 0.9 | 16.5 | 16.95 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.18 | 4.18 | 1.00 | D+ | 96.9 | 605.5 | 605.5 | 8:57 | 9:03 | 1.0 | 16.9 | 17.43 | 87.3 | - | 1.71 | 0.8 | 7.3 | 12.6 | |
| | | 13-Oct-10 | 2 | 4.18 | 8.50 | 4.32 | A* | 96.2 | 96.2 | 22.3 | 7:39 | 8:01 | 1.7 | 1.4 | 0.18 | 33.5 | 4.0 | 1.65 | 1.2 | 6.9 | 10.9 | |
| T-30+981.5 | T | 12-Nov-10 | 3 | 3.07 | 4.07 | 1.00 | A* | 190.9 | - | - | 9:11 | 9:34 | 1.3 | 11.3 | 8.88 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 3.07 | 4.07 | 1.00 | B | 171.0 | - | - | 9:34 | 9:45 | 1.5 | 17.1 | 11.37 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 3.07 | 4.07 | 1.00 | C | 182.5 | - | - | 9:45 | 9:55 | 1.5 | 17.6 | 11.81 | 58.2 | - | 1.65 | 17.6 | 15.1 | 18.6 | |
| | | 12-Nov-10 | 3 | 3.07 | 4.07 | 1.00 | D | 106.6 | 651.0 | 651.0 | 9:55 | 10:01 | 1.3 | 16.4 | 12.70 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 4.07 | 8.10 | 4.03 | A* | 21.2 | 21.2 | 5.3 | 8:57 | 9:08 | 1.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-30+983 | S | 05-Dec-10 | 4 | 1.15 | 2.65 | 1.50 | B | 41.8 | 41.8 | 27.9 | 8:14 | 8:35 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.15 | 4.15 | 1.00 | B | 147.0 | - | - | 10:13 | 10:35 | 0.4 | 9.7 | 31.02 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.15 | 4.15 | 1.00 | C | 171.0 | - | - | 10:35 | 10:47 | 0.6 | 15.6 | 24.69 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.15 | 4.15 | 1.00 | D | 142.7 | - | - | 10:47 | 10:56 | 1.1 | 18.2 | 15.39 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.15 | 4.15 | 1.00 | D+ | 146.4 | 607.1 | 607.1 | 10:56 | 11:04 | 0.4 | 21.3 | 55.52 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 2 | 4.15 | 8.60 | 4.45 | A* | 207.5 | 207.5 | 46.6 | 9:10 | 10:09 | 1.6 | 0.8 | 0.11 | - | - | - | - | - | - | |
| T-30+984.5 | T | 12-Nov-10 | 3 | 3.46 | 4.46 | 1.00 | A* | 128.6 | - | - | 10:34 | 10:53 | 0.9 | 10.3 | 10.67 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 3.46 | 4.46 | 1.00 | B | 223.1 | - | - | 10:53 | 11:11 | 1.4 | 12.1 | 10.02 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 3.46 | 4.46 | 1.00 | C | 147.8 | - | - | 11:11 | 11:23 | 1.5 | 12.9 | 8.91 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 3.46 | 4.46 | 1.00 | D | 101.3 | 600.8 | 600.8 | 11:23 | 11:31 | 1.9 | 12.2 | 6.43 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 4.46 | 8.60 | 4.14 | A* | 22.0 | 22.0 | 5.3 | 10:14 | 10:27 | 1.8 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-30+986 | P | 26-Nov-10 | 4 | 1.84 | 3.34 | 1.50 | B | 65.4 | 65.4 | 43.6 | 20:51 | 21:25 | 1.9 | 0.4 | 0.13 | 39.4 | 4.0 | 1.61 | -8.7 | 11.1 | 21.3 | |
| | | 13-Oct-10 | 3 | 3.84 | 4.84 | 1.00 | A* | 5.9 | 5.9 | 5.9 | 15:46 | 16:03 | 2.7 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 2 | 4.84 | 9.00 | 4.16 | A* | 208.3 | - | - | 13:31 | 14:03 | 0.7 | 12.6 | 6.08 | 32.2 | 4.0 | 1.64 | 1.3 | 7.5 | 13.8 | |
| | | 13-Oct-10 | 2 | 4.84 | 9.00 | 4.16 | B | 222.4 | - | - | 14:03 | 14:16 | 0.6 | 18.5 | 6.00 | 37.6 | 3.0 | 1.65 | 1.4 | 7.5 | 11.7 | |
| | | 13-Oct-10 | 2 | 4.84 | 9.00 | 4.16 | C | 217.5 | - | - | 14:16 | 14:27 | 1.2 | 22.6 | 4.44 | 48.4 | - | 1.65 | 2.9 | 7.0 | 10.6 | |
| | | 13-Oct-10 | 2 | 4.84 | 9.00 | 4.16 | D | 212.8 | - | - | 14:27 | 14:39 | 1.4 | 18.5 | 2.99 | 74.0 | - | 1.65 | 2.9 | 7.0 | 11.2 | |
| | | 13-Oct-10 | 2 | 4.84 | 9.00 | 4.16 | E | 442.0 | 1303.0 | 313.2 | 14:39 | 15:39 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+987.5 | T | 12-Nov-10 | 3 | 4.32 | 5.32 | 1.00 | A* | 135.5 | - | - | 16:06 | 16:26 | 1.7 | 12.6 | 7.64 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 4.32 | 5.32 | 1.00 | B | 185.5 | - | - | 16:26 | 16:46 | 1.7 | 9.0 | 5.69 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 4.32 | 5.32 | 1.00 | C | 172.4 | - | - | 16:46 | 17:08 | 1.6 | 5.3 | 3.23 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 4.32 | 5.32 | 1.00 | D | 115.1 | 608.5 | 608.5 | 17:08 | 18:07 | 2.0 | 4.0 | 2.02 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 5.32 | 9.50 | 4.18 | A* | 203.1 | - | - | 14:08 | 14:36 | 0.9 | 12.7 | 2.63 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 5.32 | 9.50 | 4.18 | B | 168.1 | - | - | 14:36 | 14:47 | 1.2 | 15.8 | 3.22 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 5.32 | 9.50 | 4.18 | C | 237.8 | - | - | 14:47 | 15:19 | 1.6 | 3.5 | 0.53 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 5.32 | 9.50 | 4.18 | D | 97.2 | 706.2 | 168.9 | 15:19 | 16:01 | 1.7 | 1.5 | 0.22 | 76.6 | 0.5 | 1.64 | 15.6 | 15.0 | 17.4 | |
| S-30+989 | S | 05-Dec-10 | 4 | 1.71 | 3.21 | 1.50 | B | 133.9 | 133.9 | 89.3 | 8:50 | 9:27 | 2.0 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.71 | 4.71 | 1.00 | B | 192.5 | - | - | 16:30 | 16:55 | 0.7 | 14.0 | 4.57 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.71 | 4.71 | 1.00 | C | 102.9 | - | - | 16:55 | 17:01 | 0.7 | 16.4 | 4.10 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.71 | 4.71 | 1.00 | D | 112.1 | - | - | 17:01 | 17:08 | 1.2 | 17.2 | 3.46 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.71 | 4.71 | 1.00 | D+ | 199.5 | 607.0 | 607.0 | 17:08 | 17:18 | 1.4 | 19.6 | 3.31 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 2 | 4.71 | 9.10 | 4.39 | A* | 26.8 | 26.8 | 6.1 | 16:12 | 16:26 | 1.7 | 0.5 | 0.07 | - | - | - | - | - | - | |
| T-30+990.5 | T | 23-Oct-10 | 3 | 3.68 | 4.68 | 1.00 | A | 12.5 | 12.5 | 12.5 | 23:26 | 23:40 | 2.5 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 4.68 | 8.70 | 4.02 | A | 36.6 | 36.6 | 9.1 | 23:08 | 23:20 | 2.9 | 1.6 | 0.14 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 1 | 8.70 | 13.70 | 5.00 | A | 63.8 | 63.8 | 12.8 | 22:45 | 23:03 | 5.7 | 2.0 | 0.07 | 31.8 | 4.0 | 1.63 | 20.0 | 8.0 | 14.5 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-30+992 | P | 29-Oct-10 | 4 | 1.68 | 3.18 | 1.50 | B | 285.8 | - | - | 17:58 | 18:35 | 1.3 | 15.7 | 4.46 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 1.68 | 3.18 | 1.50 | C | 158.1 | - | - | 18:35 | 18:54 | 0.8 | 4.8 | 2.44 | 55.2 | 0.0 | 1.63 | 7.0 | 5.0 | 15.0 | |
| | | 29-Oct-10 | 4 | 1.68 | 3.18 | 1.50 | D | 181.1 | - | - | 18:54 | 19:13 | 1.1 | 11.6 | 5.88 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 1.68 | 3.18 | 1.50 | E | 198.0 | 823.0 | 548.7 | 19:13 | 19:19 | 0.9 | 12.9 | 9.11 | 65.8 | 0.0 | 1.63 | 7.0 | 5.0 | 12.0 | |
| | | 13-Oct-10 | 3 | 3.68 | 4.68 | 1.00 | A | 49.3 | - | - | 21:07 | 21:17 | 0.2 | 5.7 | 16.92 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 3.68 | 4.68 | 1.00 | B | 103.5 | - | - | 21:17 | 21:28 | 0.4 | 12.0 | 32.42 | 36.0 | 3.0 | 1.61 | 3.0 | 6.0 | 18.0 | |
| | | 13-Oct-10 | 3 | 3.68 | 4.68 | 1.00 | C | 129.8 | - | - | 21:28 | 21:39 | 1.3 | 2.0 | 6.84 | 49.3 | - | 1.77 | 3.0 | 6.0 | 17.0 | |
| | | 13-Oct-10 | 3 | 3.68 | 4.68 | 1.00 | D | 161.5 | - | - | 21:39 | 21:52 | 0.8 | 13.5 | 13.76 | 116.6 | - | 1.66 | 3.0 | 6.0 | 16.0 | |
| | | 13-Oct-10 | 3 | 3.68 | 4.68 | 1.00 | D+ | 98.5 | - | - | 21:52 | 22:03 | 1.0 | 10.6 | 14.59 | 71.6 | - | 1.63 | 3.0 | 6.0 | 16.0 | |
| | | 13-Oct-10 | 3 | 3.68 | 4.68 | 1.00 | E | 63.7 | 606.3 | 606.3 | 22:03 | 22:13 | 0.8 | 6.8 | 8.06 | 66.7 | - | 1.65 | 3.0 | 6.0 | 16.0 | |
| | | 13-Oct-10 | 2 | 4.68 | 8.70 | 4.02 | A | 149.5 | 149.5 | 37.2 | 20:16 | 21:00 | 2.7 | 2.0 | 0.19 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 1 | 8.70 | 13.80 | 5.10 | A | 21.9 | 21.9 | 4.3 | 19:53 | 20:08 | 5.1 | 0.0 | 0.00 | 31.7 | 3.0 | 1.63 | 3.0 | 6.0 | 12.0 | |
| Q-30+992.75 | Q | 19-Jun-11 | 4 | 1.68 | 3.18 | 1.50 | MF | 20.6 | 20.60 | 13.73 | 22:23 | 22:37 | 2.6 | 0.0 | 0.00 | 30.4 | 2.0 | 1.5 | 11.6 | 10.0 | 10.5 | |
| | | 02-Mar-11 | 3 | 3.68 | 4.7 | 1.02 | A | 24.4 | 24.40 | 23.92 | 8:34 | 8:49 | 3.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| T-30+993.5 | T | 08-Dec-10 | 4 | 1.84 | 3.34 | 1.50 | MF | 9.0 | 9.0 | 6.0 | 13:29 | 13:44 | 2.5 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 3.84 | 4.84 | 1.00 | A | 53.9 | - | - | 2:19 | 2:29 | 0.5 | 6.2 | 15.67 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 3.84 | 4.84 | 1.00 | B | 102.6 | - | - | 2:29 | 2:40 | 0.7 | 13.1 | 18.36 | 35.8 | 2.0 | 1.63 | 9.0 | 9.0 | 18.0 | |
| | | 23-Oct-10 | 3 | 3.84 | 4.84 | 1.00 | C | 168.1 | - | - | 2:40 | 2:51 | 0.9 | 19.4 | 21.03 | 64.9 | 0.4 | 1.63 | 9.0 | 9.0 | 16.0 | |
| | | 23-Oct-10 | 3 | 3.84 | 4.84 | 1.00 | D | 276.5 | 601.1 | 601.1 | 2:51 | 3:04 | 1.3 | 21.8 | 17.02 | 143.0 | - | 1.68 | 9.0 | 9.0 | 16.0 | |
| | | 23-Oct-10 | 2 | 4.84 | 8.80 | 3.96 | A | 23.1 | 23.1 | 5.8 | 2:03 | 2:15 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 1 | 8.80 | 13.90 | 5.10 | A | 55.7 | 55.7 | 10.9 | 1:45 | 1:58 | 5.3 | 3.3 | 0.12 | 31.8 | - | 1.62 | 9.0 | 9.0 | 17.0 | |
| Q-30+994.25 | Q | 14-Jun-11 | 4 | 2.07 | 3.57 | 1.50 | MF | 168.9 | 168.90 | 112.60 | 23:09 | 23:35 | 0.5 | 10.5 | 14.43 | - | - | - | - | - | - | By-pass between ground and casing. |
| | | 09-Mar-11 | 3 | 4.07 | 5.1 | 1.03 | A | 15.7 | 15.70 | 15.24 | 20:15 | 20:31 | 2.8 | 0.0 | 0.00 | 33.4 | 4.0 | 1.6 | -5.0 | 11.2 | 17.2 | |
| S-30+995 | S | 04-Nov-10 | 4 | 2.19 | 3.69 | 1.50 | A | 201.9 | - | - | 20:21 | 20:45 | 1.1 | 12.3 | 7.66 | 30.1 | 5.0 | 1.59 | 3.8 | 4.9 | 14.6 | |
| | | 04-Nov-10 | 4 | 2.19 | 3.69 | 1.50 | B | 199.3 | - | - | 20:45 | 20:59 | 1.1 | 12.4 | 5.13 | 34.5 | 4.0 | 1.60 | 3.7 | 3.4 | 14.8 | |
| | | 04-Nov-10 | 4 | 2.19 | 3.69 | 1.50 | C | 201.4 | - | - | 20:59 | 21:16 | 0.5 | 13.0 | 14.15 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 4 | 2.19 | 3.69 | 1.50 | D | 218.2 | 820.8 | 547.2 | 21:16 | 21:33 | 0.9 | 12.1 | 8.87 | 63.0 | - | 1.63 | - | 3.5 | 13.7 | |
| | | 13-Oct-10 | 3 | 4.19 | 5.19 | 1.00 | A | 13.2 | 13.2 | 13.2 | 23:14 | 23:29 | 3.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 2 | 5.19 | 9.20 | 4.01 | A | 22.4 | 22.4 | 5.6 | 22:55 | 23:09 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 1 | 9.20 | 14.50 | 5.30 | A | 21.6 | 21.6 | 4.1 | 22:35 | 22:49 | 5.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-30+995.75 | Q | 19-Jun-11 | 4 | 2.31 | 3.81 | 1.50 | MF | 19.8 | 19.80 | 13.20 | 22:38 | 22:51 | 2.6 | 0.0 | 0.00 | 29.6 | - | - | - | - | - | |
| | | 02-Mar-11 | 3 | 4.31 | 5.31 | 1.00 | A | 27.7 | - | - | 9:47 | 9:53 | 0.2 | 3.3 | 23.14 | - | - | - | - | - | - | Communicated to Ground Surface. |
| | | 02-Mar-11 | 3 | 4.31 | 5.31 | 1.00 | B | 52.3 | 80.00 | 80.00 | 9:53 | 10:14 | 2.9 | 0.6 | 0.21 | - | - | - | - | - | - | |
| | | 02-Mar-11 | 2 | 5.31 | 9.3 | 3.99 | A | 35.8 | 35.80 | 8.97 | 9:25 | 9:42 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+996.5 | T | 04-Dec-10 | 4 | 2.19 | 3.69 | 1.50 | MF | 203.3 | - | - | 3:29 | 3:52 | 2.4 | 17.1 | 5.66 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 2.19 | 3.69 | 1.50 | B | 142.4 | - | - | 3:52 | 4:35 | 2.2 | 0.8 | 0.28 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 2.19 | 3.69 | 1.50 | C | 9.0 | 354.7 | 236.5 | 4:35 | 4:53 | 2.4 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 4.19 | 5.19 | 1.00 | B | 158.8 | - | - | 6:46 | 7:05 | 1.0 | 10.5 | 10.22 | 35.7 | 4.0 | 1.65 | 9.7 | 9.9 | 16.1 | |
| | | 24-Oct-10 | 3 | 4.19 | 5.19 | 1.00 | C | 217.3 | - | - | 7:05 | 7:16 | 1.1 | 15.1 | 12.87 | 43.1 | - | 1.63 | 9.7 | 9.9 | 14.7 | |
| | | 24-Oct-10 | 3 | 4.19 | 5.19 | 1.00 | D | 199.7 | - | - | 7:16 | 7:24 | 1.4 | 17.6 | 12.49 | 69.4 | - | 1.68 | 9.7 | 9.9 | 13.7 | |
| | | 24-Oct-10 | 3 | 4.19 | 5.19 | 1.00 | E | 48.4 | 624.2 | 624.2 | 7:24 | 7:30 | 0.5 | 8.7 | 19.33 | 80.4 | - | 1.67 | 9.5 | 8.7 | 14.0 | |
| | | 23-Oct-10 | 2 | 5.19 | 9.20 | 4.01 | A | 206.6 | - | - | 3:42 | 4:08 | 2.0 | 19.6 | 2.45 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 5.19 | 9.20 | 4.01 | B | 209.0 | - | - | 4:08 | 4:19 | 2.0 | 21.1 | 2.41 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 5.19 | 9.20 | 4.01 | C | 206.6 | - | - | 4:19 | 4:29 | 2.3 | 21.4 | 2.36 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 5.19 | 9.20 | 4.01 | D | 593.8 | - | - | 4:29 | 5:19 | 2.8 | 13.1 | 1.22 | 69.1 | - | 1.70 | 13.0 | 9.0 | 17.5 | |
| | | 23-Oct-10 | 2 | 5.19 | 9.20 | 4.01 | E | 784.0 | 2000.0 | 498.8 | 5:19 | 6:31 | 2.4 | 10.7 | 1.10 | 79.0 | - | 1.70 | 13.0 | 9.0 | 17.0 | |
| | | 23-Oct-10 | 1 | 9.20 | 14.30 | 5.10 | A | 24.0 | 24.0 | 4.7 | 3:24 | 3:37 | 5.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-30+997.25 | Q | 14-Jun-11 | 4 | 2.22 | 3.72 | 1.50 | MF | 29.8 | 29.80 | 19.87 | 1:34 | 1:48 | 2.9 | 0.2 | 0.04 | 37.2 | - | 1.4 | 8.2 | 7.3 | 14.4 | |
| | | 09-Mar-11 | 3 | 4.22 | 5.22 | 1.00 | A | 1.7 | 1.70 | 1.70 | 23:29 | 23:44 | 3.3 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 2 | 5.22 | 9.5 | 4.28 | A | 22 | 22.00 | 5.14 | 23:10 | 23:24 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-30+998 | P | 29-Oct-10 | 4 | 2.12 | 3.62 | 1.50 | B | 159.9 | - | - | 20:02 | 20:26 | 1.2 | 12.9 | 7.39 | 36.4 | - | 1.62 | -3.0 | 5.0 | 10.0 | |
| | | 29-Oct-10 | 4 | 2.12 | 3.62 | 1.50 | C | 169.0 | - | - | 20:26 | 20:40 | 1.4 | 10.9 | 5.50 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 2.12 | 3.62 | 1.50 | D | 177.5 | - | - | 20:40 | 20:54 | 0.9 | 12.7 | 8.96 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 2.12 | 3.62 | 1.50 | E | 193.8 | - | - | 20:54 | 21:10 | 1.4 | 13.4 | 5.72 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 2.12 | 3.62 | 1.50 | X | 105.8 | 806.0 | 537.3 | 21:10 | 21:19 | 0.8 | 12.3 | 10.24 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 3 | 4.12 | 5.12 | 1.00 | B | 48.7 | 48.7 | 48.7 | 3:23 | 3:58 | 3.6 | 0.9 | 0.25 | 35.9 | - | 1.62 | 2.0 | 7.0 | 18.0 | |
| | | 13-Oct-10 | 2 | 5.12 | 9.10 | 3.98 | A | 44.8 | 44.8 | 11.3 | 3:02 | 3:16 | 2.5 | 1.9 | 0.19 | - | - | - | - | - | - | |
| | | 13-Oct-10 | 1 | 9.10 | 14.80 | 5.70 | A | 247.0 | 247.0 | 43.3 | 2:13 | 2:43 | 5.6 | 5.8 | 0.18 | 32.2 | - | 1.63 | 2.0 | 7.0 | 14.0 | |
| Q-30+998.75 | Q | 19-Jun-11 | 4 | 2.12 | 3.62 | 1.50 | MF | 22.5 | 22.50 | 15.00 | 22:52 | 23:06 | 2.8 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 02-Mar-11 | 3 | 4.12 | 5.1 | 0.98 | A | 20.3 | 20.30 | 20.71 | 10:34 | 10:49 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-30+999.5 | T | 08-Dec-10 | 4 | 1.96 | 3.46 | 1.50 | MF | 185.2 | - | - | 13:50 | 14:17 | 2.2 | 9.7 | 2.92 | 30.4 | 4.0 | 1.48 | 17.0 | 9.8 | 16.8 | |
| | | 08-Dec-10 | 4 | 1.96 | 3.46 | 1.50 | B | 144.9 | - | - | 14:17 | 14:35 | 2.5 | 6.2 | 1.56 | 36.2 | 4.0 | 1.65 | 7.0 | 10.1 | 17.5 | |
| | | 08-Dec-10 | 4 | 1.96 | 3.46 | 1.50 | C | 154.9 | 485.0 | 323.3 | 14:35 | 15:20 | 2.4 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 3.96 | 4.96 | 1.00 | A | 51.1 | - | - | 8:21 | 8:30 | 0.4 | 7.0 | 13.05 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 3.96 | 4.96 | 1.00 | B | 144.9 | - | - | 8:30 | 8:44 | 0.9 | 14.6 | 16.49 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 3.96 | 4.96 | 1.00 | C | 158.5 | - | - | 8:44 | 9:03 | 0.8 | 23.2 | 32.75 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 3.96 | 4.96 | 1.00 | D | 288.7 | 643.2 | 643.2 | 9:03 | 9:09 | 0.9 | 19.2 | 21.91 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 4.96 | 9.00 | 4.04 | A | 25.3 | 25.3 | 6.3 | 8:04 | 8:16 | 3.0 | 0.5 | 0.04 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 1 | 9.00 | 14.10 | 5.10 | A | 32.4 | 32.4 | 6.4 | 7:43 | 7:57 | 5.6 | 0.7 | 0.02 | - | - | - | - | - | - | |
| Q-31+000.25 | Q | 14-Jun-11 | 4 | 2.29 | 3.79 | 1.50 | MF | 26.7 | 26.70 | 17.80 | 1:49 | 2:04 | 2.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 4.29 | 5.5 | 1.21 | A | 23 | 23.00 | 19.01 | 1:37 | 1:51 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+001 | S | 04-Nov-10 | 4 | 2.29 | 3.79 | 1.50 | A | 200.1 | - | - | 21:50 | 22:14 | 0.8 | 13.0 | 10.69 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 4 | 2.29 | 3.79 | 1.50 | B | 204.1 | - | - | 22:14 | 22:32 | 0.7 | 11.8 | 9.78 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 4 | 2.29 | 3.79 | 1.50 | C | 203.2 | - | - | 22:32 | 22:49 | 0.7 | 12.2 | 11.35 | 42.0 | - | 1.61 | 10.9 | 3.6 | 13.4 | |
| | | 04-Nov-10 | 4 | 2.29 | 3.79 | 1.50 | D | 212.6 | 820.0 | 546.7 | 22:49 | 23:08 | 0.5 | 9.9 | 14.25 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 4.29 | 5.29 | 1.00 | A | 19.8 | 19.8 | 19.8 | 7:21 | 7:38 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 2 | 5.29 | 9.30 | 4.01 | A | 33.7 | 33.7 | 8.4 | 7:05 | 7:18 | 2.9 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 1 | 9.30 | 14.60 | 5.30 | A | 19.9 | 19.9 | 3.8 | 6:45 | 6:58 | 6.1 | 0.0 | 0.00 | 34.2 | 5.0 | 1.64 | 0.6 | 9.5 | 12.8 | |
| Q-31+001.75 | Q | 19-Jun-11 | 4 | 2.87 | 4.37 | 1.50 | MF | 27.8 | 27.80 | 18.53 | 23:07 | 23:23 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Mar-11 | 3 | 4.87 | 5.9 | 1.03 | A | 22.9 | 22.90 | 22.23 | 11:29 | 11:42 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+002.5 | T | 04-Dec-10 | 4 | 2.85 | 4.35 | 1.50 | MF | 180.9 | - | - | 22:20 | 22:43 | 1.7 | 15.2 | 5.80 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 2.85 | 4.35 | 1.50 | B | 159.9 | - | - | 22:43 | 22:56 | 2.6 | 11.5 | 2.98 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 2.85 | 4.35 | 1.50 | C | 100.1 | 440.9 | 293.9 | 22:56 | 23:34 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 4.85 | 5.85 | 1.00 | A | 39.1 | - | - | 9:49 | 9:57 | 0.7 | 6.5 | 9.68 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 4.85 | 5.85 | 1.00 | B | 124.3 | - | - | 9:57 | 10:11 | 1.0 | 12.0 | 13.54 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 4.85 | 5.85 | 1.00 | C | 239.4 | - | - | 10:11 | 10:25 | 1.4 | 21.7 | 13.40 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 4.85 | 5.85 | 1.00 | D | 122.3 | - | - | 10:25 | 10:31 | 1.6 | 22.6 | 15.08 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 4.85 | 5.85 | 1.00 | E | 83.0 | 608.1 | 608.1 | 10:31 | 10:35 | 1.6 | 22.3 | 14.35 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 5.85 | 9.90 | 4.05 | A | 21.8 | 21.8 | 5.4 | 9:28 | 9:46 | 2.9 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 1 | 9.90 | 15.10 | 5.20 | A | 31.4 | 31.4 | 6.0 | 9:17 | 9:28 | 5.6 | 0.5 | 0.02 | - | - | - | - | - | - | |
| Q-31+003.25 | Q | 14-Jun-11 | 4 | 3.34 | 4.84 | 1.50 | MF | 30.5 | 30.50 | 20.33 | 2:05 | 2:20 | 2.6 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 5.34 | 6.3 | 0.96 | A | 16.4 | 16.40 | 17.08 | 4:48 | 5:02 | 3.0 | 0.1 | 0.02 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+004 | P | 29-Oct-10 | 4 | 2.90 | 4.40 | 1.50 | B | 198.3 | - | - | 21:42 | 22:04 | 0.2 | 15.4 | 45.27 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 2.90 | 4.40 | 1.50 | C | 210.6 | - | - | 22:04 | 22:21 | 0.6 | 12.8 | 13.68 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 2.90 | 4.40 | 1.50 | D | 216.7 | - | - | 22:21 | 22:38 | 0.5 | 12.9 | 19.64 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 2.90 | 4.40 | 1.50 | E | 179.4 | 805.0 | 536.7 | 22:38 | 22:53 | 0.4 | 12.6 | 20.88 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 4.90 | 5.90 | 1.00 | B | 104.1 | - | - | 8:37 | 8:55 | 1.4 | 8.8 | 6.09 | 37.1 | 5.0 | 1.65 | 1.5 | 11.7 | 14.2 | |
| | | 14-Oct-10 | 3 | 4.90 | 5.90 | 1.00 | C | 184.1 | - | - | 8:55 | 9:09 | 2.2 | 16.1 | 7.70 | 50.1 | - | 1.66 | 1.7 | 8.5 | 16.6 | |
| | | 14-Oct-10 | 3 | 4.90 | 5.90 | 1.00 | D | 201.9 | - | - | 9:09 | 9:21 | 3.3 | 13.3 | 4.29 | 61.5 | - | 1.67 | 1.7 | 8.6 | 14.3 | |
| | | 14-Oct-10 | 3 | 4.90 | 5.90 | 1.00 | D+ | 23.5 | 513.6 | 513.6 | 9:21 | 9:36 | 3.7 | 0.0 | 0.00 | 100.2 | - | 1.67 | 1.8 | 8.6 | 15.3 | |
| | | 14-Oct-10 | 2 | 5.90 | 9.90 | 4.00 | A | 36.3 | 36.3 | 9.1 | 8:17 | 8:32 | 3.0 | 0.5 | 0.04 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 1 | 9.90 | 15.50 | 5.60 | A | 142.5 | 142.5 | 25.4 | 7:46 | 8:12 | 5.6 | 2.3 | 0.07 | - | - | - | - | - | - | |
| Q-31+004.75 | Q | 19-Jun-11 | 4 | 3.26 | 4.76 | 1.50 | MF | 29.2 | 29.20 | 19.47 | 23:24 | 23:40 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Mar-11 | 3 | 5.26 | 6.3 | 1.04 | A | 23.6 | 23.60 | 22.69 | 11:48 | 12:00 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+005.5 | T | 08-Dec-10 | 4 | 2.70 | 4.20 | 1.50 | MF | 178.8 | - | - | 15:53 | 16:19 | 1.9 | 14.6 | 5.12 | - | - | - | - | - | - | |
| | | 08-Dec-10 | 4 | 2.70 | 4.20 | 1.50 | B | 161.2 | - | - | 16:19 | 16:30 | 2.5 | 15.2 | 5.16 | - | - | - | - | - | - | |
| | | 08-Dec-10 | 4 | 2.70 | 4.20 | 1.50 | C | 120.8 | 460.8 | 307.2 | 16:30 | 17:17 | 2.4 | 1.2 | 0.20 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 4.90 | 5.90 | 1.00 | A | 61.4 | - | - | 13:49 | 14:01 | 0.6 | 5.7 | 8.02 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 4.90 | 5.90 | 1.00 | B | 85.6 | - | - | 14:01 | 14:10 | 0.7 | 12.6 | 16.79 | 35.9 | - | 1.61 | 2.5 | 9.6 | 19.7 | |
| | | 24-Oct-10 | 3 | 4.90 | 5.90 | 1.00 | C | 141.8 | - | - | 14:10 | 14:20 | 1.0 | 15.3 | 15.04 | 52.4 | - | 1.65 | 2.5 | 9.6 | 14.3 | |
| | | 24-Oct-10 | 3 | 4.90 | 5.90 | 1.00 | D | 221.5 | - | - | 14:20 | 14:31 | 1.3 | 20.3 | 15.65 | 55.2 | - | 1.65 | 2.5 | 9.6 | 13.6 | |
| | | 24-Oct-10 | 3 | 4.90 | 5.90 | 1.00 | E | 96.5 | 606.8 | 606.8 | 14:31 | 14:36 | 1.5 | 22.8 | 15.18 | 80.4 | - | - | 2.6 | 7.5 | 14.7 | |
| | | 24-Oct-10 | 2 | 5.90 | 9.70 | 3.80 | A | 26.1 | 26.1 | 6.9 | 13:33 | 13:47 | 2.9 | 0.5 | 0.04 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 1 | 9.70 | 14.80 | 5.10 | A | 25.9 | 25.9 | 5.1 | 13:15 | 13:28 | 6.1 | 0.2 | 0.00 | 33.3 | 5.0 | 1.62 | 2.1 | 11.0 | 19.6 | |
| Q-31+006.25 | Q | 14-Jun-11 | 4 | 3.35 | 4.85 | 1.50 | MF | 42.4 | 42.40 | 28.27 | 2:22 | 2:44 | 2.6 | 0.4 | 0.09 | - | - | - | - | - | - | By-pass between ground and casing. |
| | | 09-Mar-11 | 3 | 5.35 | 6.4 | 1.05 | A | 16 | - | - | 5:12 | 5:29 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 13-Apr-11 | 3 | 5.35 | 6.4 | 1.05 | A | 18 | 34.00 | 32.38 | 16:23 | 16:37 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+007 | S | 04-Nov-10 | 4 | 3.03 | 4.53 | 1.50 | B | 212.5 | - | - | 0:05 | 0:22 | 1.0 | 12.6 | 8.35 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 4 | 3.03 | 4.53 | 1.50 | C | 198.6 | - | - | 0:22 | 0:37 | 1.0 | 12.8 | 8.58 | 38.0 | - | 1.62 | -1.5 | 4.1 | 10.7 | |
| | | 04-Nov-10 | 4 | 3.03 | 4.53 | 1.50 | D | 205.7 | 820.0 | 546.7 | 0:37 | 0:52 | 1.5 | 11.9 | 5.47 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 4 | 3.03 | 4.53 | 1.50 | A | 203.2 | - | - | 23:36 | 0:05 | 1.1 | 13.8 | 10.00 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 5.03 | 6.03 | 1.00 | B | 123.7 | - | - | 10:46 | 11:04 | 0.7 | 12.6 | 17.41 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 5.03 | 6.03 | 1.00 | C | 252.9 | - | - | 11:04 | 11:20 | 1.9 | 26.1 | 11.87 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 5.03 | 6.03 | 1.00 | D | 78.9 | - | - | 11:20 | 11:24 | 2.1 | 18.7 | 8.63 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 5.03 | 6.03 | 1.00 | D+ | 159.5 | 615.0 | 615.0 | 11:24 | 11:31 | 2.2 | 20.8 | 9.31 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 2 | 6.03 | 10.00 | 3.97 | A | 98.0 | 98.0 | 24.7 | 10:15 | 10:40 | 2.8 | 2.0 | 0.19 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 1 | 10.00 | 15.20 | 5.20 | A | 76.4 | 76.4 | 14.7 | 9:48 | 10:10 | 6.0 | 2.0 | 0.06 | - | - | - | - | - | - | |
| Q-31+007.75 | Q | 19-Jun-11 | 4 | 3.23 | 4.73 | 1.50 | MF | 78.7 | - | - | 1:31 | 1:49 | 2.8 | 5.4 | 1.48 | 29.6 | - | 1.5 | - | - | - | By-pass outside casing |
| | | 19-Jun-11 | 4 | 3.23 | 4.73 | 1.50 | C | 102.2 | 180.90 | 120.60 | 1:49 | 2:35 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Mar-11 | 3 | 5.23 | 6.2 | 0.97 | A | 45 | 45.00 | 46.39 | 14:45 | 15:06 | 2.8 | 0.3 | 0.13 | 29.0 | - | 1.6 | 11.0 | 19.9 | 15.7 | |
| T-31+008.5 | T | 04-Dec-10 | 4 | 3.34 | 4.84 | 1.50 | MF | 160.1 | - | - | 20:03 | 20:31 | 1.2 | 12.1 | 6.00 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 3.34 | 4.84 | 1.50 | B | 189.0 | - | - | 20:31 | 20:55 | 1.7 | 15.9 | 4.78 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 3.34 | 4.84 | 1.50 | C | 191.4 | - | - | 20:55 | 21:07 | 2.3 | 13.4 | 3.93 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 3.34 | 4.84 | 1.50 | D | 93.5 | 634.0 | 422.7 | 21:07 | 21:38 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 5.30 | 6.30 | 1.00 | A | 50.5 | - | - | 15:23 | 15:30 | 0.4 | 4.1 | 10.33 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 5.30 | 6.30 | 1.00 | B | 92.0 | - | - | 15:30 | 15:44 | 0.7 | 13.1 | 17.80 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 5.30 | 6.30 | 1.00 | C | 175.5 | - | - | 15:44 | 15:56 | 0.9 | 19.0 | 19.35 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 5.30 | 6.30 | 1.00 | D | 111.9 | - | - | 15:56 | 16:04 | 1.3 | 24.5 | 20.06 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 5.30 | 6.30 | 1.00 | E | 184.3 | 614.2 | 614.2 | 16:04 | 16:10 | 1.5 | 22.3 | 14.88 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 6.30 | 10.30 | 4.00 | A | 28.7 | 28.7 | 7.2 | 15:07 | 15:20 | 2.8 | 0.5 | 0.05 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 1 | 10.30 | 15.40 | 5.10 | A | 76.9 | 76.9 | 15.1 | 14:48 | 15:04 | 5.6 | 2.3 | 0.08 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+009.25 | Q | 14-Jun-11 | 4 | 3.25 | 4.75 | 1.50 | MF | 31 | 31.00 | 20.67 | 2:45 | 2:59 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Apr-11 | 3 | 5.25 | 6.4 | 1.15 | A | 13.7 | 13.70 | 11.91 | 16:44 | 16:57 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+010 | P | 29-Oct-10 | 4 | 3.01 | 4.51 | 1.50 | B | 176.9 | - | - | 1:39 | 2:05 | 0.9 | 16.3 | 11.01 | 36.4 | 2.8 | 1.64 | 10.0 | 8.0 | 15.0 | |
| | | 29-Oct-10 | 4 | 3.01 | 4.51 | 1.50 | C | 234.6 | - | - | 2:05 | 2:18 | 0.9 | 10.6 | 7.80 | 38.0 | - | 1.64 | 10.0 | 8.0 | 14.0 | |
| | | 29-Oct-10 | 4 | 3.01 | 4.51 | 1.50 | D | 199.5 | - | - | 2:18 | 2:29 | 0.3 | 18.8 | 84.30 | 39.3 | 1.0 | 1.65 | 10.0 | 8.0 | 11.5 | |
| | | 29-Oct-10 | 4 | 3.01 | 4.51 | 1.50 | E | 191.0 | 802.0 | 534.7 | 2:29 | 2:40 | 0.2 | 17.9 | 54.11 | 38.2 | - | 1.64 | 10.0 | 8.0 | 10.5 | |
| | | 14-Oct-10 | 3 | 5.01 | 6.01 | 1.00 | A | 13.0 | 13.0 | 13.0 | 14:15 | 14:28 | 3.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 2 | 6.01 | 10.00 | 3.99 | A | 16.5 | 16.5 | 4.1 | 13:57 | 14:10 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 1 | 10.00 | 15.50 | 5.50 | A | 18.4 | 18.4 | 3.3 | 13:30 | 13:51 | 6.0 | 0.2 | 0.01 | 32.9 | 3.0 | 1.60 | 5.0 | 9.4 | 15.2 | |
| Q-31+010.75 | Q | 19-Jun-11 | 4 | 3.09 | 4.59 | 1.50 | MF | 30 | 30.00 | 20.00 | 2:40 | 2:54 | 2.6 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 02-Mar-11 | 3 | 5.01 | 6.01 | 1.00 | A | 31 | 31.00 | 31.00 | 15:44 | 16:01 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Mar-11 | 2 | 6.01 | 10.1 | 4.09 | A | 28.9 | 28.90 | 7.07 | 15:19 | 15:35 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+011.5 | T | 04-Dec-10 | 4A | 3.39 | 4.89 | 1.50 | MF | 102.0 | - | - | 17:02 | 17:28 | 1.0 | 12.4 | 9.64 | - | - | - | - | - | - | Communicated to T31+014.5 |
| | | 04-Dec-10 | 4A | 3.39 | 4.89 | 1.50 | B | 25.3 | - | - | 17:28 | 17:31 | 1.0 | 14.9 | 10.47 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4A | 3.39 | 4.89 | 1.50 | C | 48.0 | - | - | 17:31 | 17:38 | 1.3 | 13.9 | 7.49 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4A | 3.39 | 4.89 | 1.50 | D | 39.7 | - | - | 17:38 | 17:46 | 1.6 | 11.2 | 5.11 | - | - | - | - | - | - | Spilt Quantities. |
| | | 04-Dec-10 | 4A | 3.39 | 4.89 | 1.50 | X | 187.1 | 402.0 | 268.0 | 17:46 | 18:45 | 2.5 | 0.8 | 0.22 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 5.39 | 6.39 | 1.00 | B | 165.9 | - | - | 18:48 | 19:08 | 0.6 | 13.0 | 19.69 | 36.3 | 6.0 | 1.63 | 8.0 | 8.0 | 15.0 | |
| | | 24-Oct-10 | 3 | 5.39 | 6.39 | 1.00 | C | 163.6 | - | - | 19:08 | 19:19 | 0.8 | 19.0 | 25.47 | 46.9 | 0.0 | 1.62 | 8.0 | 8.0 | 14.0 | |
| | | 24-Oct-10 | 3 | 5.39 | 6.39 | 1.00 | D | 157.8 | - | - | 19:19 | 19:26 | 1.2 | 21.4 | 19.22 | 67.9 | - | 1.69 | 8.0 | 8.0 | 15.0 | |
| | | 24-Oct-10 | 3 | 5.39 | 6.39 | 1.00 | E | 115.1 | 602.4 | 602.4 | 19:26 | 19:31 | 1.6 | 24.2 | 14.84 | 81.7 | - | 1.70 | 8.0 | 8.0 | 15.0 | |
| | | 24-Oct-10 | 2 | 6.39 | 10.40 | 4.01 | A | 181.3 | - | - | 17:00 | 17:21 | 0.6 | 15.5 | 6.43 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 6.39 | 10.40 | 4.01 | B | 322.8 | - | - | 17:21 | 17:38 | 1.1 | 24.2 | 5.79 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 6.39 | 10.40 | 4.01 | C | 215.4 | - | - | 17:38 | 17:47 | 1.3 | 23.3 | 4.59 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 6.39 | 10.40 | 4.01 | D | 274.2 | - | - | 17:47 | 17:58 | 1.5 | 24.2 | 4.27 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 6.39 | 10.40 | 4.01 | E | 1014.3 | 2008.0 | 500.7 | 17:58 | 18:38 | 0.8 | 30.1 | 8.93 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 1 | 10.40 | 15.90 | 5.50 | A | 87.5 | 87.5 | 15.9 | 16:21 | 16:39 | 5.8 | 1.8 | 0.05 | - | - | - | - | - | - | |
| Q-31+012.25 | Q | 14-Jun-11 | 4 | 3.61 | 5.11 | 1.50 | MF | 49.9 | 49.90 | 33.27 | 3:00 | 3:13 | 2.6 | 2.6 | 0.68 | - | - | - | - | - | - | By-pass between ground and casing. |
| | | 09-Mar-11 | 3 | 5.61 | 6.61 | 1.00 | A | 22.7 | 22.70 | 22.70 | 4:24 | 4:40 | 3.2 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 2 | 6.61 | 10.7 | 4.09 | A | 24.7 | 24.70 | 6.04 | 4:07 | 4:20 | 2.7 | 0.1 | 0.01 | 32.8 | 5.0 | 1.6 | -5.0 | 11.4 | 18.1 | |
| S-31+013 | S | 04-Nov-10 | 4 | 3.79 | 5.29 | 1.50 | A | 233.4 | - | - | 3:27 | 3:53 | 0.9 | 16.4 | 11.77 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 4 | 3.79 | 5.29 | 1.50 | B | 181.5 | - | - | 3:53 | 4:05 | 1.2 | 15.5 | 8.30 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 4 | 3.79 | 5.29 | 1.50 | C | 198.0 | - | - | 4:05 | 4:18 | 1.3 | 16.6 | 9.55 | - | - | - | - | - | - | Communicated to S31+007 |
| | | 04-Nov-10 | 4 | 3.79 | 5.29 | 1.50 | D | 208.1 | 821.0 | 547.3 | 4:18 | 4:31 | 1.4 | 16.1 | 7.92 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 5.79 | 6.79 | 1.00 | B | 119.4 | - | - | 17:55 | 18:13 | 2.2 | 10.3 | 4.67 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 5.79 | 6.79 | 1.00 | C | 204.9 | - | - | 18:13 | 18:29 | 3.5 | 14.2 | 3.95 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 5.79 | 6.79 | 1.00 | D | 165.8 | - | - | 18:29 | 18:42 | 3.4 | 12.5 | 3.57 | 69.2 | 3.0 | 1.63 | 2.0 | 9.0 | 18.0 | |
| | | 14-Oct-10 | 3 | 5.79 | 6.79 | 1.00 | D+ | 159.4 | 649.5 | 649.5 | 18:42 | 18:56 | 3.5 | 12.1 | 3.51 | 72.3 | 0.2 | 1.64 | 2.0 | 9.0 | 19.0 | |
| | | 14-Oct-10 | 2 | 6.79 | 10.80 | 4.01 | A | 210.9 | - | - | 15:16 | 15:43 | 0.6 | 11.9 | 3.91 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 2 | 6.79 | 10.80 | 4.01 | B | 236.0 | - | - | 15:43 | 15:55 | 1.6 | 20.8 | 3.26 | 36.1 | 3.0 | 1.64 | 2.0 | 11.7 | 16.0 | |
| | | 14-Oct-10 | 2 | 6.79 | 10.80 | 4.01 | C | 268.6 | - | - | 15:55 | 16:06 | 1.3 | 18.0 | 3.25 | 41.5 | - | 1.65 | 2.0 | 11.7 | 14.2 | |
| | | 14-Oct-10 | 2 | 6.79 | 10.80 | 4.01 | D | 135.7 | - | - | 16:06 | 16:12 | 1.8 | 26.2 | 3.61 | 69.1 | - | 1.68 | 2.0 | 11.7 | 19.8 | |
| | | 14-Oct-10 | 2 | 6.79 | 10.80 | 4.01 | D+ | 280.8 | - | - | 16:12 | 16:26 | 1.5 | 20.1 | 2.98 | - | - | - | - | - | - | ByPass; Packer Raised 0.3m |
| | | 14-Oct-10 | 2 | 6.79 | 10.80 | 4.01 | E | 869.0 | 2001.0 | 499.0 | 16:26 | 17:48 | 1.7 | 8.7 | 1.29 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 1 | 10.80 | 26.10 | 15.30 | A | 176.1 | 176.1 | 11.5 | 14:40 | 15:08 | 5.6 | 3.4 | 0.11 | - | - | - | - | - | - | |
| Q-31+013.75 | Q | 19-Jun-11 | 4 | 3.72 | 5.22 | 1.50 | MF | 31 | 31.00 | 20.67 | 2:55 | 3:13 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-Mar-11 | 3 | 5.72 | 6.7 | 0.98 | A | 52.2 | 52.20 | 53.27 | 10:47 | 11:17 | 3.4 | 0.3 | 0.09 | 29.0 | 1.0 | 1.6 | 24.5 | 12.7 | 15.2 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+014.5 | T | 04-Dec-10 | 4 | 4.05 | 5.55 | 1.50 | MF | 102.0 | - | - | 17:02 | 17:28 | 1.0 | 12.4 | 9.64 | - | - | - | - | - | - | Communicated to T31+011.5 |
| | | 04-Dec-10 | 4 | 4.05 | 5.55 | 1.50 | B | 25.3 | - | - | 17:28 | 17:31 | 1.0 | 14.9 | 10.47 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 4.05 | 5.55 | 1.50 | C | 48.0 | - | - | 17:31 | 17:38 | 1.3 | 13.9 | 7.49 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 4.05 | 5.55 | 1.50 | D | 39.7 | - | - | 17:38 | 17:46 | 1.6 | 11.2 | 5.11 | - | - | - | - | - | - | Spilt Quantities. |
| | | 04-Dec-10 | 4 | 4.05 | 5.55 | 1.50 | X | 187.1 | 402.0 | 268.0 | 17:46 | 18:45 | 2.5 | 0.8 | 0.22 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.05 | 7.05 | 1.00 | A | 100.4 | - | - | 20:45 | 21:01 | 0.7 | 9.0 | 13.91 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.05 | 7.05 | 1.00 | B | 84.4 | - | - | 21:01 | 21:08 | 0.9 | 15.1 | 17.93 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.05 | 7.05 | 1.00 | C | 157.0 | - | - | 21:08 | 21:18 | 0.9 | 18.8 | 19.31 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.05 | 7.05 | 1.00 | D | 141.9 | - | - | 21:18 | 21:24 | 1.5 | 24.8 | 16.80 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.05 | 7.05 | 1.00 | E | 122.2 | 605.9 | 605.9 | 21:24 | 21:29 | 1.9 | 27.6 | 14.72 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 7.05 | 11.00 | 3.95 | A | 21.1 | 21.1 | 5.3 | 20:27 | 20:40 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 1 | 11.00 | 16.20 | 5.20 | A | 87.2 | 87.2 | 16.8 | 19:59 | 20:15 | 5.6 | 0.9 | 0.03 | 31.9 | - | 1.63 | 8.0 | 8.0 | 16.0 | |
| Q-31+015.25 | Q | 14-Jun-11 | 4 | 4.63 | 6.13 | 1.50 | MF | 34.6 | 34.60 | 23.07 | 3:17 | 3:33 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Apr-11 | 3 | 6.63 | 7.8 | 1.17 | A | 14.2 | 14.20 | 12.14 | 17:04 | 17:18 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+016 | P | 29-Oct-10 | 4 | 3.84 | 5.34 | 1.50 | B | 199.3 | - | - | 2:55 | 3:21 | 1.1 | 13.9 | 7.60 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 3.84 | 5.34 | 1.50 | C | 204.6 | - | - | 3:21 | 3:37 | 0.4 | 12.4 | 29.97 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 3.84 | 5.34 | 1.50 | D | 200.6 | - | - | 3:37 | 3:53 | 0.3 | 13.3 | 22.62 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 3.84 | 5.34 | 1.50 | E | 203.5 | 808.0 | 538.7 | 3:53 | 4:10 | 0.6 | 13.0 | 13.78 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 5.84 | 6.84 | 1.00 | B | 15.4 | 15.4 | 15.4 | 10:16 | 10:30 | 3.6 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 2 | 6.84 | 10.80 | 3.96 | A | 235.8 | - | - | 20:44 | 21:11 | 0.8 | 14.5 | 5.54 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 2 | 6.84 | 10.80 | 3.96 | B | 172.0 | - | - | 21:11 | 21:23 | 1.1 | 16.3 | 3.38 | 36.9 | 5.0 | 1.62 | 2.0 | 9.0 | 13.8 | |
| | | 14-Oct-10 | 2 | 6.84 | 10.80 | 3.96 | C | 194.9 | - | - | 21:23 | 21:38 | 1.9 | 0.0 | 0.75 | 46.4 | 2.0 | 1.74 | 2.0 | 9.0 | 15.1 | |
| | | 14-Oct-10 | 2 | 6.84 | 10.80 | 3.96 | D | 223.3 | - | - | 21:38 | 22:47 | 1.7 | 21.9 | 3.22 | - | - | - | - | - | - | Cement clumped; pump/hoses blocked |
| | | 14-Oct-10 | 2 | 6.84 | 10.80 | 3.96 | D+ | 250.0 | - | - | 22:47 | 22:59 | 2.0 | 10.5 | 2.17 | - | - | - | - | - | - | Hole not completed, will re-inject |
| | | 14-Oct-10 | 2 | 6.84 | 10.80 | 3.96 | E | 163.0 | 1239.0 | 312.9 | 22:59 | 23:12 | 0.7 | 0.0 | 0.00 | 83.5 | - | 1.65 | 2.0 | 9.0 | 13.9 | |
| | | 15-Oct-10 | 2 | 6.84 | 10.80 | 3.96 | B | 1.1 | 1.1 | 0.3 | 10:00 | 10:12 | 2.8 | 0.3 | 0.03 | - | - | - | - | - | - | Re-grouted |
| | | 14-Oct-10 | 1 | 10.80 | 16.10 | 5.30 | A | 53.4 | 53.4 | 10.1 | 20:21 | 20:37 | 5.5 | 1.7 | 0.06 | 32.5 | - | 1.64 | 2.0 | 9.0 | 12.3 | |
| Q-31+016.75 | Q | 19-Jun-11 | 4 | 4.94 | 6.44 | 1.50 | MF | 123.3 | - | - | 3:14 | 3:36 | 2.0 | 10.4 | 3.92 | - | - | - | - | - | - | By-pass outside casing |
| | | 19-Jun-11 | 4 | 4.94 | 6.44 | 1.50 | C | 79.5 | 202.80 | 135.20 | 3:36 | 3:58 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-Mar-11 | 3 | 6.94 | 8 | 1.06 | A | 107.1 | - | - | 11:41 | 11:55 | 1.7 | 10.7 | 5.76 | - | - | - | - | - | - | |
| | | 04-Mar-11 | 3 | 6.94 | 8 | 1.06 | B | 177.5 | - | - | 11:55 | 12:12 | 2.7 | 12.1 | 4.15 | - | - | - | - | - | - | |
| | | 04-Mar-11 | 3 | 6.94 | 8 | 1.06 | C | 99.9 | - | - | 12:12 | 12:19 | 2.6 | 12.8 | 3.90 | - | - | - | - | - | - | |
| | | 04-Mar-11 | 3 | 6.94 | 8 | 1.06 | D | 39 | 423.50 | 399.53 | 12:19 | 12:45 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+017.5 | T | 09-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | MF | 10.3 | 10.3 | 6.9 | 6:57 | 7:12 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | A | 46.7 | - | - | 22:24 | 22:33 | 1.0 | 6.2 | 7.80 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | B | 116.0 | - | - | 22:33 | 22:46 | 1.6 | 14.0 | 7.24 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | C | 162.3 | - | - | 22:46 | 22:56 | 2.7 | 18.6 | 7.03 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | D | 155.9 | - | - | 22:56 | 23:06 | 2.7 | 15.5 | 5.91 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | E | 125.9 | 606.8 | 606.8 | 23:06 | 23:15 | 3.0 | 15.1 | 5.02 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 8.24 | 12.20 | 3.96 | A | 42.8 | 42.8 | 10.8 | 22:03 | 22:20 | 2.4 | 0.5 | 0.05 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 1 | 12.20 | 17.40 | 5.20 | A | 27.6 | 27.6 | 5.3 | 21:46 | 22:00 | 5.4 | 0.4 | 0.01 | - | - | - | - | - | - | |
| Q-31+018.25 | Q | 14-Jun-11 | 4 | 5.24 | 6.74 | 1.50 | MF | 41.1 | 41.10 | 27.40 | 3:34 | 3:50 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 14-Apr-11 | 3 | 7.24 | 8.2 | 0.96 | A | 18.8 | 18.80 | 19.58 | 8:53 | 9:07 | 3.2 | 0.0 | 0.00 | 31.6 | - | 1.6 | 12.4 | 8.4 | 16.9 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+019 | S | 04-Nov-10 | 4 | 5.09 | 6.59 | 1.50 | A | 201.5 | - | - | 4:46 | 5:06 | 1.0 | 15.8 | 8.71 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 4 | 5.09 | 6.59 | 1.50 | B | 253.4 | - | - | 5:06 | 5:21 | 1.0 | 15.6 | 17.02 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 4 | 5.09 | 6.59 | 1.50 | C | 213.4 | - | - | 5:21 | 5:34 | 1.4 | 14.3 | 8.36 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 4 | 5.09 | 6.59 | 1.50 | D | 153.7 | 822.0 | 548.0 | 5:34 | 5:39 | 1.7 | 36.7 | 14.79 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | B | 166.7 | - | - | 4:18 | 4:39 | 1.1 | 12.4 | 11.51 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | C | 197.8 | - | - | 4:39 | 4:51 | 1.9 | 18.8 | 9.36 | 60.3 | - | 1.80 | 3.0 | 7.0 | 14.2 | |
| | | 14-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | D | 160.0 | - | - | 4:51 | 4:58 | 1.2 | 22.5 | 20.70 | 79.1 | - | 1.66 | 3.0 | 7.0 | 12.4 | |
| | | 14-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | D+ | 136.9 | 661.4 | 661.4 | 4:58 | 5:05 | 1.5 | 24.4 | 16.24 | 100.8 | - | 1.65 | 3.0 | 7.0 | 11.4 | |
| | | 14-Oct-10 | 2 | 8.09 | 12.10 | 4.01 | A | 280.4 | - | - | 2:55 | 3:32 | 2.5 | 6.1 | 0.60 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 2 | 8.09 | 12.10 | 4.01 | B | 139.6 | 420.0 | 104.7 | 3:32 | 4:12 | 2.7 | 1.5 | 0.14 | 34.3 | - | 1.61 | 3.0 | 6.0 | 16.1 | |
| | | 14-Oct-10 | 1 | 12.10 | 18.10 | 6.00 | A | 49.8 | 49.8 | 8.3 | 2:35 | 2:50 | 5.4 | 2.7 | 0.08 | 32.3 | - | 1.63 | 3.0 | 6.0 | 12.5 | |
| Q-31+019.75 | Q | 19-Jun-11 | 4 | 5.2 | 6.7 | 1.50 | MF | 45.5 | 45.50 | 30.33 | 4:04 | 4:24 | 2.5 | 0.9 | 0.23 | - | - | - | - | - | - | |
| | | 04-Mar-11 | 3 | 7.2 | 8.2 | 1.00 | A | 23.4 | 23.40 | 23.40 | 14:45 | 14:59 | 2.8 | 0.0 | 0.00 | 29.0 | - | 1.6 | 14.8 | 23.2 | 17.6 | |
| T-31+020.5 | T | 04-Dec-10 | 4A | 4.94 | 6.44 | 1.50 | MF | 102.2 | - | - | 14:56 | 15:25 | 1.2 | 12.2 | 8.20 | - | - | - | - | - | - | Casing plugged. |
| | | 04-Dec-10 | 4A | 4.94 | 6.44 | 1.50 | B | 81.1 | - | - | 15:25 | 15:36 | 1.4 | 19.7 | 8.94 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4A | 4.94 | 6.44 | 1.50 | C | 107.6 | - | - | 15:36 | 15:47 | 2.0 | 20.1 | 6.29 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4A | 4.94 | 6.44 | 1.50 | D | 76.3 | - | - | 15:47 | 15:59 | 2.2 | 12.0 | 4.17 | - | - | - | - | - | - | Communicated to T-31+026.5. Split quantities. |
| | | 04-Dec-10 | 4A | 4.94 | 6.44 | 1.50 | X | 30.5 | 397.6 | 265.1 | 15:59 | 16:17 | 2.9 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.94 | 7.94 | 1.00 | A | 62.1 | - | - | 2:36 | 2:48 | 0.7 | 9.2 | 15.48 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.94 | 7.94 | 1.00 | B | 99.5 | - | - | 2:48 | 2:58 | 1.0 | 9.2 | 9.33 | 35.6 | - | 1.64 | 25.0 | 7.0 | 16.5 | |
| | | 24-Oct-10 | 3 | 6.94 | 7.94 | 1.00 | C | 156.6 | - | - | 2:58 | 3:10 | 1.2 | 15.6 | 13.66 | 48.6 | - | 1.64 | 25.0 | 7.0 | 16.0 | |
| | | 24-Oct-10 | 3 | 6.94 | 7.94 | 1.00 | D | 168.7 | - | - | 3:10 | 3:18 | 1.7 | 21.6 | 12.37 | 67.1 | 0.0 | 1.69 | 25.0 | 7.0 | 15.5 | |
| | | 24-Oct-10 | 3 | 6.94 | 7.94 | 1.00 | E | 117.1 | 604.0 | 604.0 | 3:18 | 3:24 | 1.9 | 24.6 | 13.02 | 65.0 | - | 1.65 | 25.0 | 7.0 | 15.0 | |
| | | 24-Oct-10 | 2 | 7.94 | 11.90 | 3.96 | A | 23.5 | 23.5 | 5.9 | 2:21 | 2:33 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 1 | 11.90 | 17.10 | 5.20 | A | 31.4 | 31.4 | 6.0 | 2:05 | 2:18 | 5.5 | 1.1 | 0.04 | 31.8 | 4.0 | 1.62 | 25.0 | 7.0 | 16.0 | |
| Q-31+021.25 | Q | 14-Jun-11 | 4 | 5.5 | 7 | 1.50 | MF | 42 | 42.00 | 28.00 | 3:51 | 4:09 | 2.6 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 14-Apr-11 | 3 | 7.5 | 8.5 | 1.00 | A | 21.2 | 21.20 | 21.20 | 9:16 | 9:31 | 3.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| P-31+022 | P | 29-Oct-10 | 4 | 4.86 | 6.36 | 1.50 | B | 196.7 | - | - | 4:29 | 4:53 | 0.6 | 12.9 | 8.95 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 4.86 | 6.36 | 1.50 | C | 211.7 | - | - | 4:53 | 5:10 | 0.1 | 12.3 | 25.09 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 4.86 | 6.36 | 1.50 | D | 207.9 | - | - | 5:10 | 5:27 | 0.4 | 11.9 | 22.18 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 4.86 | 6.36 | 1.50 | E | 192.7 | 809.0 | 539.3 | 5:27 | 5:43 | 0.4 | 12.5 | 20.74 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 6.86 | 7.86 | 1.00 | A | 63.2 | - | - | 6:43 | 6:57 | 0.9 | 7.0 | 7.67 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 6.86 | 7.86 | 1.00 | B | 139.8 | - | - | 6:57 | 7:09 | 0.8 | 13.4 | 16.11 | 38.4 | 4.0 | 1.60 | 1.1 | 6.8 | 12.4 | |
| | | 15-Oct-10 | 3 | 6.86 | 7.86 | 1.00 | C | 209.2 | - | - | 7:09 | 7:21 | 1.1 | 20.5 | 18.36 | 45.6 | 2.0 | 1.61 | 1.1 | 6.8 | 11.1 | |
| | | 15-Oct-10 | 3 | 6.86 | 7.86 | 1.00 | D | 199.5 | 611.7 | 611.7 | 7:21 | 7:30 | 1.8 | 4.7 | 2.57 | 61.5 | - | 1.61 | 1.1 | 6.8 | 9.5 | |
| | | 14-Oct-10 | 2 | 7.86 | 11.90 | 4.04 | A | 36.6 | 36.6 | 9.1 | 6:19 | 6:32 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 1 | 11.90 | 17.30 | 5.40 | A | 200.4 | - | - | 5:22 | 5:48 | 4.5 | 11.6 | 0.40 | - | - | - | - | - | - | |
| | | 14-Oct-10 | 1 | 11.90 | 17.30 | 5.40 | B | 153.5 | 353.9 | 65.5 | 5:48 | 6:11 | 5.7 | 3.6 | 0.12 | - | - | - | - | - | - | |
| Q-31+022.75 | Q | 19-Jun-11 | 4 | 4.89 | 6.39 | 1.50 | MF | 36.2 | 36.20 | 24.13 | 4:26 | 4:45 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-Mar-11 | 3 | 6.89 | 7.9 | 1.01 | B | 31.1 | 31.10 | 30.79 | 14:14 | 14:34 | 2.9 | 0.0 | 0.00 | 37.1 | 0.8 | 1.6 | -4.0 | 24.8 | 13.1 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+023.5 | T | 09-Dec-10 | 4 | 4.81 | 6.31 | 1.50 | MF | 191.7 | - | - | 7:17 | 7:43 | 1.7 | 15.2 | 6.49 | 30.7 | 10.0 | 1.48 | -3.7 | 8.7 | 14.5 | |
| | | 09-Dec-10 | 4 | 4.81 | 6.31 | 1.50 | B | 160.5 | - | - | 7:43 | 7:53 | 2.3 | 17.9 | 6.09 | 37.8 | 2.0 | 1.65 | -4.2 | 8.9 | 13.6 | |
| | | 09-Dec-10 | 4 | 4.81 | 6.31 | 1.50 | C | 173.7 | - | - | 7:53 | 8:02 | 2.5 | 18.8 | 5.09 | 45.3 | - | 1.66 | -3.8 | 8.7 | 14.2 | |
| | | 09-Dec-10 | 4 | 4.81 | 6.31 | 1.50 | D | 137.7 | - | - | 8:02 | 8:21 | 2.2 | 8.4 | 2.02 | 67.2 | - | 1.64 | -3.6 | 8.6 | 13.1 | |
| | | 09-Dec-10 | 4 | 4.81 | 6.31 | 1.50 | X | 72.6 | 736.2 | 490.8 | 8:21 | 8:47 | 2.4 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.81 | 7.81 | 1.00 | A | 39.3 | - | - | 4:15 | 4:22 | 0.9 | 5.6 | 7.66 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.81 | 7.81 | 1.00 | B | 128.4 | - | - | 4:22 | 4:35 | 1.1 | 13.4 | 11.17 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.81 | 7.81 | 1.00 | C | 160.0 | - | - | 4:35 | 4:45 | 1.5 | 18.6 | 11.36 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.81 | 7.81 | 1.00 | D | 160.2 | - | - | 4:45 | 4:53 | 2.6 | 24.9 | 10.20 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 6.81 | 7.81 | 1.00 | E | 114.0 | 601.9 | 601.9 | 4:53 | 4:58 | 3.0 | 24.5 | 8.14 | 88.8 | - | 1.70 | 25.0 | 5.5 | 15.5 | |
| | | 24-Oct-10 | 2 | 7.81 | 11.80 | 3.99 | A | 21.7 | 21.7 | 5.4 | 4:00 | 4:12 | 3.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 1 | 11.80 | 16.90 | 5.10 | A | 57.3 | 57.3 | 11.2 | 3:41 | 3:54 | 5.7 | 3.3 | 0.11 | - | - | - | - | - | - | |
| Q-31+024.25 | Q | 14-Jun-11 | 4 | 4.89 | 6.39 | 1.50 | MF | 42.2 | 42.20 | 28.13 | 4:10 | 4:27 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Apr-11 | 3 | 6.89 | 8 | 1.11 | A | 20.1 | 20.10 | 18.11 | 13:20 | 13:36 | 3.0 | 0.1 | 0.02 | - | - | - | - | - | - | |
| S-31+025 | S | 05-Nov-10 | 4 | 4.63 | 6.13 | 1.50 | B | 204.1 | - | - | 7:28 | 7:56 | 1.3 | 12.0 | 6.40 | 36.0 | 2.0 | 1.63 | 4.6 | 6.2 | 14.1 | |
| | | 05-Nov-10 | 4 | 4.63 | 6.13 | 1.50 | C | 215.5 | - | - | 7:56 | 8:15 | 1.1 | 12.0 | 7.48 | 46.0 | - | 1.64 | 3.8 | 6.1 | 13.9 | |
| | | 05-Nov-10 | 4 | 4.63 | 6.13 | 1.50 | D | 206.2 | - | - | 8:15 | 8:31 | 1.0 | 12.1 | 8.03 | 51.6 | 0.0 | 1.64 | 3.8 | 5.8 | 12.6 | |
| | | 05-Nov-10 | 4 | 4.63 | 6.13 | 1.50 | E | 80.0 | - | - | 8:31 | 8:37 | 1.5 | 11.8 | 5.21 | >120 | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 4.63 | 6.13 | 1.50 | X | 98.2 | 804.0 | 536.0 | 8:37 | 8:44 | 1.9 | 23.4 | 8.31 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 6.63 | 7.63 | 1.00 | A | 132.5 | 132.5 | 132.5 | 13:46 | 13:59 | 3.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 2 | 7.63 | 11.60 | 3.97 | A | 24.0 | 24.0 | 6.0 | 13:27 | 13:41 | 2.8 | 0.5 | 0.04 | 30.9 | - | 1.59 | 3.0 | 7.1 | 13.4 | |
| | | 15-Oct-10 | 1 | 11.60 | 16.60 | 5.00 | A | 104.8 | 104.8 | 21.0 | 10:44 | 10:58 | 5.4 | 2.8 | 0.10 | - | - | - | - | - | - | |
| Q-31+025.75 | Q | 19-Jun-11 | 4 | 4.56 | 6.06 | 1.50 | MF | 37.6 | 37.60 | 25.07 | 4:46 | 5:05 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-Mar-11 | 3 | 6.56 | 7.6 | 1.04 | A | 153.1 | - | - | 15:19 | 15:40 | 2.7 | 12.4 | 4.18 | - | - | - | - | - | - | |
| | | 04-Mar-11 | 3 | 6.56 | 7.6 | 1.04 | B | 172.2 | - | - | 15:40 | 17:00 | 2.9 | 2.2 | 0.73 | 37.0 | - | 1.6 | 14.9 | 23.1 | 18.2 | |
| | | 04-Mar-11 | 3 | 6.56 | 7.6 | 1.04 | C | 20.4 | 345.70 | 332.40 | 17:00 | 17:24 | 3.0 | 0.5 | 0.17 | - | - | - | - | - | - | |
| T-31+026.5 | T | 04-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | MF | 102.2 | - | - | 14:56 | 15:25 | 1.2 | 12.2 | 8.20 | 30.3 | - | 1.62 | 4.0 | 11.6 | 14.8 | |
| | | 04-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | B | 81.1 | - | - | 15:25 | 15:36 | 1.4 | 19.7 | 8.94 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | C | 107.6 | - | - | 15:36 | 15:47 | 2.0 | 20.1 | 6.29 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | D | 76.3 | - | - | 15:47 | 15:59 | 2.2 | 12.0 | 4.17 | - | - | - | - | - | - | Communicated to T31+020.5. Split quantities. |
| | | 04-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | X | 30.5 | 397.6 | 265.1 | 15:59 | 16:17 | 2.9 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | - | 3 | 6.83 | 7.83 | 1.00 | A | 225.3 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | - | 3 | 6.83 | 7.83 | 1.00 | B | 395.9 | 621.2 | 621.2 | - | - | 1.6 | - | - | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 7.83 | 11.80 | 3.97 | A | 25.0 | 25.0 | 6.3 | 5:31 | 5:44 | 2.5 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 1 | 11.80 | 17.00 | 5.20 | A | 22.4 | 22.4 | 4.3 | 5:13 | 5:26 | 5.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+027.25 | Q | 14-Jun-11 | 4 | 5.14 | 6.64 | 1.50 | MF | 40.3 | 40.30 | 26.87 | 4:29 | 4:47 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Apr-11 | 3 | 7.14 | 8.2 | 1.06 | A | 25.5 | 25.50 | 24.06 | 13:48 | 13:59 | 3.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| P-31+028 | P | 30-Oct-10 | 4 | 4.83 | 6.33 | 1.50 | B | 189.9 | - | - | 6:17 | 6:47 | 0.8 | 8.8 | 7.56 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 4.83 | 6.33 | 1.50 | C | 197.9 | - | - | 6:47 | 6:59 | 0.6 | 9.8 | 14.28 | 44.7 | 2.0 | 1.64 | 10.5 | 4.8 | 12.7 | |
| | | 30-Oct-10 | 4 | 4.83 | 6.33 | 1.50 | D | 175.7 | - | - | 6:59 | 7:28 | 1.0 | 8.9 | 5.74 | 55.1 | 2.0 | 1.69 | 10.5 | 4.5 | 12.3 | |
| | | 30-Oct-10 | 4 | 4.83 | 6.33 | 1.50 | E | 259.5 | 823.0 | 548.7 | 7:28 | 7:50 | 0.9 | 10.9 | 7.84 | 46.0 | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 6.83 | 7.83 | 1.00 | B | 14.2 | 14.2 | 14.2 | 15:40 | 15:55 | 3.6 | 0.5 | 0.15 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 2 | 7.83 | 11.80 | 3.97 | A | 202.4 | - | - | 14:25 | 14:49 | 1.0 | 13.2 | 3.45 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 2 | 7.83 | 11.80 | 3.97 | C | 177.1 | - | - | 15:01 | 15:09 | 2.3 | 19.7 | 2.44 | 49.4 | - | 1.66 | 4.6 | 7.7 | 13.5 | |
| | | 15-Oct-10 | 2 | 7.83 | 11.80 | 3.97 | D | 125.0 | 698.3 | 175.9 | 15:09 | 15:33 | 3.2 | 0.8 | 0.06 | 60.3 | - | 1.66 | 3.4 | 7.2 | 12.7 | |
| | | 15-Oct-10 | 2 | 7.83 | 11.80 | 3.97 | B | 193.8 | - | - | 14;49 | 15:01 | 1.3 | 16.5 | 3.16 | 37.8 | 4.0 | 1.64 | 4.6 | 7.7 | 14.7 | |
| | | 15-Oct-10 | 1 | 11.80 | 17.10 | 5.30 | A | 30.1 | 30.1 | 5.7 | 14:07 | 14:20 | 6.2 | 0.5 | 0.01 | - | - | - | - | - | - | |
| Q-31+028.75 | Q | 19-Jun-11 | 4 | 5.04 | 6.54 | 1.50 | MF | 39.4 | 39.40 | 26.27 | 5:07 | 5:27 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-Mar-11 | 3 | 7.04 | 8 | 0.96 | A | 42.3 | 42.30 | 44.06 | 10:15 | 10:37 | 2.7 | 0.3 | 0.11 | 31.6 | - | 1.6 | 18.8 | 11.6 | 14.7 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+029.5 | T | 04-Dec-10 | 4A | 5.14 | 6.64 | 1.50 | MF | 107.1 | - | - | 8:04 | 8:33 | 1.1 | 13.1 | 9.32 | - | - | - | - | - | - | Packer Frozen in Hole. |
| | | 04-Dec-10 | 4A | 5.14 | 6.64 | 1.50 | B | 111.0 | - | - | 8:33 | 8:47 | 1.5 | 19.0 | 8.22 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4A | 5.14 | 6.64 | 1.50 | C | 33.5 | - | - | 8:47 | 8:51 | 1.9 | 13.8 | 4.81 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4A | 5.14 | 6.64 | 1.50 | D | 106.8 | - | - | 8:51 | 9:13 | 2.5 | 4.4 | 1.13 | 47.0 | 0.0 | - | -10.5 | 14.9 | 20.3 | Communicated to T31+032.5. Split quantities. |
| | | 04-Dec-10 | 4A | 5.14 | 6.64 | 1.50 | X | 42.9 | 401.2 | 267.5 | 9:13 | 9:43 | 2.5 | 2.6 | 0.70 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | A | 57.7 | - | - | 7:29 | 7:40 | 0.8 | 6.4 | 7.60 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | B | 74.6 | - | - | 7:40 | 7:49 | 1.0 | 12.9 | 14.04 | 34.0 | 4.0 | 1.62 | 9.8 | 6.9 | 16.2 | |
| | | 25-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | C | 170.8 | - | - | 7:49 | 8:00 | 1.1 | 15.4 | 13.03 | 51.4 | - | 1.58 | 9.8 | 6.9 | 14.0 | |
| | | 25-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | D | 178.0 | - | - | 8:00 | 8:10 | 1.3 | 18.8 | 13.99 | 78.5 | - | 1.66 | 9.8 | 6.9 | 11.4 | |
| | | 25-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | E | 124.4 | 605.5 | 605.5 | 8:10 | 8:16 | 1.3 | 22.5 | 18.07 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 8.14 | 12.10 | 3.96 | A | 24.0 | 24.0 | 6.1 | 7:10 | 7:23 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 12.10 | 17.40 | 5.30 | A | 12.9 | 12.9 | 2.4 | 6:50 | 7:04 | 5.7 | 0.0 | 0.00 | 33.0 | 5.0 | 1.61 | 20.1 | 10.7 | 19.0 | |
| Q-31+030.25 | Q | 14-Jun-11 | 4 | 4.86 | 6.36 | 1.50 | MF | 47.2 | 47.20 | 31.47 | 4:48 | 4:56 | 1.7 | 8.9 | 3.45 | - | - | - | - | - | - | By-pass between ground and casing. |
| | | 14-Apr-11 | 3 | 6.88 | 7.9 | 1.02 | A | 33.6 | 33.60 | 32.94 | 14:07 | 14:23 | 3.0 | 0.1 | 0.04 | - | - | - | - | - | - | |
| S-31+031 | S | 05-Nov-10 | 4 | 5.29 | 6.79 | 1.50 | B | 57.5 | - | - | 9:02 | 9:47 | - | - | - | - | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 5.29 | 6.79 | 1.50 | B | 159.8 | - | - | 13:57 | 14:26 | 1.5 | 11.8 | 5.41 | 35.9 | - | 1.64 | 15.5 | 7.7 | 13.3 | |
| | | 05-Nov-10 | 4 | 5.29 | 6.79 | 1.50 | C | 189.5 | - | - | 14:26 | 14:43 | 2.4 | 12.0 | 3.40 | 49.8 | 1.0 | 1.63 | 15.3 | 6.2 | 16.1 | |
| | | 05-Nov-10 | 4 | 5.29 | 6.79 | 1.50 | D | 173.8 | - | - | 14:43 | 14:57 | 2.2 | 12.2 | 3.72 | 47.4 | - | 1.64 | - | 4.2 | 14.2 | |
| | | 05-Nov-10 | 4 | 5.29 | 6.79 | 1.50 | E | 128.4 | - | - | 14:57 | 15:08 | 1.5 | 12.0 | 5.42 | 57.7 | 2.0 | 1.65 | 13.7 | 4.7 | 14.1 | |
| | | 05-Nov-10 | 4 | 5.29 | 6.79 | 1.50 | X | 201.5 | 910.5 | 607.0 | 15:08 | 15:20 | 1.4 | 10.4 | 4.88 | >150 | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.29 | 8.29 | 1.00 | A | 60.3 | - | - | 2:12 | 2:22 | 0.5 | 6.2 | 13.70 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.29 | 8.29 | 1.00 | B | 98.2 | - | - | 2:22 | 2:32 | 0.7 | 12.9 | 17.90 | 35.0 | - | 1.63 | 7.0 | 9.0 | 15.0 | |
| | | 15-Oct-10 | 3 | 7.29 | 8.29 | 1.00 | C | 130.4 | - | - | 2:32 | 2:40 | 1.2 | 17.4 | 13.90 | 48.5 | 1.0 | 1.79 | 7.0 | 9.0 | 15.7 | |
| | | 15-Oct-10 | 3 | 7.29 | 8.29 | 1.00 | D | 182.4 | - | - | 2:40 | 2:49 | 1.3 | 21.9 | 13.64 | 99.2 | 1.4 | 1.65 | 7.0 | 9.0 | 13.8 | |
| | | 15-Oct-10 | 3 | 7.29 | 8.29 | 1.00 | D+ | 150.4 | 621.7 | 621.7 | 2:49 | 2:56 | 1.2 | 26.7 | 22.72 | 83.8 | - | 1.63 | 7.0 | 9.0 | 13.3 | |
| | | 15-Oct-10 | 2 | 8.29 | 12.30 | 4.01 | A | 33.4 | 33.4 | 8.3 | 1:55 | 2:07 | 2.6 | 0.6 | 0.05 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 1 | 12.30 | 17.40 | 5.10 | A | 22.4 | 22.4 | 4.4 | 1:37 | 1:50 | 5.3 | 0.2 | 0.01 | 33.8 | - | 1.62 | 7.0 | 9.0 | 13.8 | |
| T-31+032.5 | T | 04-Dec-10 | 4 | 5.52 | 7.02 | 1.50 | MF | 107.1 | - | - | 8:04 | 8:33 | 1.1 | 13.1 | 9.32 | 27.4 | 5.0 | 1.38 | 0.3 | 14.9 | 12.2 | |
| | | 04-Dec-10 | 4 | 5.52 | 7.02 | 1.50 | B | 111.0 | - | - | 8:33 | 8:47 | 1.5 | 19.0 | 8.22 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 5.52 | 7.02 | 1.50 | C | 33.5 | - | - | 8:47 | 8:51 | 1.9 | 13.8 | 4.81 | 44.3 | - | 1.69 | -12.8 | 14.9 | 14.4 | |
| | | 04-Dec-10 | 4 | 5.52 | 7.02 | 1.50 | D | 106.8 | - | - | 8:51 | 9:13 | 2.5 | 4.4 | 1.13 | 120.3 | - | 1.73 | -10.5 | 14.9 | 12.9 | Communicated to T-31+029.5. Split quantities. |
| | | 04-Dec-10 | 4 | 5.52 | 7.02 | 1.50 | X | 42.9 | 401.2 | 267.5 | 9:13 | 9:43 | 2.5 | 2.6 | 0.70 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.52 | 8.52 | 1.00 | B | 36.0 | 36.0 | 36.0 | 9:05 | 9:27 | 3.0 | 0.8 | 0.25 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 8.52 | 12.50 | 3.98 | A | 23.8 | 23.8 | 6.0 | 8:49 | 9:03 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 12.50 | 18.50 | 6.00 | A | 29.8 | 29.8 | 5.0 | 8:24 | 8:36 | 5.6 | 0.6 | 0.02 | - | - | - | - | - | - | |
| P-31+034 | P | 30-Oct-10 | 4 | 5.42 | 6.92 | 1.50 | B | 215.7 | - | - | 8:10 | 8:42 | 1.1 | 12.1 | 7.42 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.42 | 6.92 | 1.50 | C | 178.8 | - | - | 8:42 | 8:57 | 0.9 | 11.9 | 9.21 | - | - | - | - | - | - | Communicated to P-31+028 |
| | | 30-Oct-10 | 4 | 5.42 | 6.92 | 1.50 | D | 172.5 | - | - | 8:57 | 9:12 | 1.3 | 8.4 | 7.22 | 60.0 | - | - | 12.2 | 5.4 | 12.3 | |
| | | 30-Oct-10 | 4 | 5.42 | 6.92 | 1.50 | E | 252.0 | 819.0 | 546.0 | 9:12 | 9:33 | 1.6 | 11.1 | 4.56 | 55.0 | 1.0 | 1.67 | 12.2 | 5.4 | 9.8 | |
| | | 15-Oct-10 | 3 | 7.42 | 8.42 | 1.00 | A | 67.3 | 67.3 | 67.3 | 17:07 | 17:43 | 3.6 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 2 | 8.42 | 12.40 | 3.98 | A | 23.0 | 23.0 | 5.8 | 16:55 | 17:05 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 1 | 12.40 | 17.40 | 5.00 | A | 21.3 | 21.3 | 4.3 | 16:38 | 16:51 | 5.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+034.75 | Q | 20-Jun-11 | 4 | 5.77 | 7.27 | 1.50 | MF | 62.4 | 62.40 | 41.60 | 6:32 | 7:12 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-Mar-11 | 3 | 7.77 | 8 | 0.23 | A | 21.2 | 21.20 | 92.17 | 10:52 | 11:05 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+035.5 | T | 09-Dec-10 | 4 | 5.83 | 7.33 | 1.50 | MF | 199.9 | - | - | 9:39 | 10:08 | 2.3 | 13.1 | 3.40 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 5.83 | 7.33 | 1.50 | B | 144.5 | - | - | 10:08 | 10:18 | 2.0 | 18.0 | 6.39 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 5.83 | 7.33 | 1.50 | C | 152.6 | - | - | 10:18 | 10:26 | 2.3 | 17.9 | 5.79 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 5.83 | 7.33 | 1.50 | D | 107.9 | 604.9 | 403.3 | 10:26 | 11:02 | 2.4 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.83 | 8.83 | 1.00 | B | 168.1 | - | - | 11:01 | 11:23 | 1.0 | 13.0 | 12.60 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.83 | 8.83 | 1.00 | C | 215.7 | - | - | 11:23 | 11:37 | 1.4 | 18.4 | 12.58 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.83 | 8.83 | 1.00 | D | 171.0 | - | - | 11:37 | 11:45 | 1.7 | 21.1 | 12.62 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.83 | 8.83 | 1.00 | E | 82.2 | 637.0 | 637.0 | 11:45 | 11:49 | 1.6 | 23.4 | 15.04 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 8.83 | 12.80 | 3.97 | A | 30.0 | 30.0 | 7.6 | 10:39 | 10:56 | 2.9 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 12.80 | 18.20 | 5.40 | A | 64.8 | 64.8 | 12.0 | 10:01 | 10:32 | 5.6 | 0.3 | 0.01 | - | - | - | - | - | - | |
| Q-31+036.25 | Q | 14-Jun-11 | 4 | 6.49 | 7.99 | 1.50 | MF | 55.3 | 55.30 | 36.87 | 4:59 | 5:19 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 14-Apr-11 | 3+D1302 | 8.49 | 9.49 | 1.00 | A | 41.9 | 41.90 | 41.90 | 15:20 | 15:44 | 2.7 | 0.4 | 0.15 | - | - | - | - | - | - | |
| | | 14-Apr-11 | 2 | 9.49 | 12 | 2.51 | A | 13.7 | 13.70 | 5.46 | 15:00 | 15:15 | 2.9 | 0.0 | 0.00 | 32.4 | 4.0 | 1.6 | 13.7 | 8.3 | 18.0 | |
| S-31+037 | S | 05-Nov-10 | 4 | 7.02 | 8.52 | 1.50 | B | 255.1 | - | - | 15:39 | 16:10 | 1.6 | 15.9 | 5.88 | 37.2 | - | 1.64 | 10.7 | 7.0 | 14.9 | |
| | | 05-Nov-10 | 4 | 7.02 | 8.52 | 1.50 | C | 156.8 | - | - | 16:10 | 16:21 | 1.8 | 14.1 | 4.73 | 42.9 | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 7.02 | 8.52 | 1.50 | D | 176.7 | - | - | 16:21 | 16:33 | 1.6 | 15.6 | 6.51 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 7.02 | 8.52 | 1.50 | E | 141.3 | - | - | 16:33 | 16:43 | 2.5 | 15.4 | 4.20 | 134.3 | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 7.02 | 8.52 | 1.50 | X | 77.1 | 807.0 | 538.0 | 16:43 | 16:48 | 3.5 | 17.3 | 3.32 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 9.02 | 10.02 | 1.00 | A | 81.5 | - | - | 20:08 | 20:21 | 0.8 | 9.2 | 12.80 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 9.02 | 10.02 | 1.00 | B | 102.4 | - | - | 20:21 | 20:30 | 1.6 | 15.6 | 10.10 | 36.3 | 4.0 | 1.62 | -2.0 | 9.0 | 14.2 | |
| | | 15-Oct-10 | 3 | 9.02 | 10.02 | 1.00 | C | 128.3 | - | - | 20:30 | 20:37 | 3.5 | 17.4 | 4.99 | 48.3 | - | 1.76 | -2.0 | 9.0 | 14.4 | |
| | | 15-Oct-10 | 3 | 9.02 | 10.02 | 1.00 | D | 164.6 | - | - | 20:37 | 20:51 | 3.4 | 10.4 | 3.26 | 131.0 | - | 1.65 | -2.0 | 9.0 | 13.8 | |
| | | 15-Oct-10 | 3 | 9.02 | 10.02 | 1.00 | D+ | 42.3 | 519.1 | 519.1 | 20:51 | 21:12 | 3.6 | 0.0 | 0.00 | 126.8 | - | 1.65 | -2.0 | 9.0 | 13.4 | |
| | | 15-Oct-10 | 2 | 10.02 | 14.00 | 3.98 | A | 93.4 | 93.4 | 23.5 | 19:30 | 19:59 | 2.6 | 0.5 | 0.05 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 1 | 14.00 | 19.30 | 5.30 | A | 23.1 | 23.1 | 4.4 | 19:10 | 19:24 | 5.8 | 0.0 | 0.00 | 34.2 | 4.0 | 1.64 | -2.0 | 9.0 | 15.7 | |
| Q-31+037.75 | Q | 20-Jun-11 | 4 | 7.41 | 8.91 | 1.50 | MF | 163.7 | - | - | 7:14 | 7:37 | 2.6 | 6.3 | 1.63 | - | - | - | - | - | - | By-pass outside casing |
| | | 20-Jun-11 | 4 | 7.41 | 8.91 | 1.50 | C | 108.9 | - | - | 7:37 | 8:00 | 2.6 | 5.3 | 1.30 | - | - | - | - | - | - | |
| | | 20-Jun-11 | 4 | 7.41 | 8.91 | 1.50 | D | 84.6 | - | - | 8:00 | 8:26 | 2.7 | 2.6 | 0.67 | - | - | - | - | - | - | |
| | | 20-Jun-11 | 4 | 7.41 | 8.91 | 1.50 | X | 30.9 | 388.10 | 258.73 | 8:26 | 8:48 | 2.6 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 05-Mar-11 | 3 | 9.41 | 10.4 | 0.99 | B | 150.7 | - | - | 11:17 | 11:35 | 2.3 | 13.5 | 5.94 | - | - | - | - | - | - | |
| | | 05-Mar-11 | 3 | 9.41 | 10.4 | 0.99 | C | 159.1 | - | - | 11:35 | 11:48 | 3.1 | 8.3 | 2.85 | - | - | - | - | - | - | |
| | | 05-Mar-11 | 3 | 9.41 | 10.4 | 0.99 | D | 23.7 | 333.50 | 336.87 | 11:48 | 12:07 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+038.5 | T | 03-Dec-10 | 4 | 7.78 | 9.28 | 1.50 | MF | 170.2 | - | - | 3:52 | 4:12 | 1.6 | 16.0 | 6.74 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 7.78 | 9.28 | 1.50 | B | 151.9 | - | - | 4:12 | 4:22 | 1.8 | 18.5 | 6.61 | 38.8 | - | 1.64 | -9.0 | 9.0 | 16.0 | |
| | | 03-Dec-10 | 4 | 7.78 | 9.28 | 1.50 | C | 178.7 | - | - | 4:22 | 4:32 | 2.6 | 17.2 | 4.96 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 7.78 | 9.28 | 1.50 | D | 161.5 | - | - | 4:32 | 4:55 | 2.7 | 3.6 | 0.63 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 7.78 | 9.28 | 1.50 | E | 77.1 | 739.4 | 492.9 | 4:55 | 6:06 | 2.6 | 1.1 | 0.28 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 9.78 | 10.78 | 1.00 | B | 137.1 | - | - | 14:57 | 15:18 | 1.2 | 9.6 | 7.92 | 39.5 | - | 1.63 | 21.5 | 10.4 | 12.9 | |
| | | 25-Oct-10 | 3 | 9.78 | 10.78 | 1.00 | C | 191.6 | - | - | 15:18 | 15:34 | 1.5 | 13.1 | 8.49 | 47.0 | - | 1.62 | 21.0 | 10.4 | 12.1 | |
| | | 25-Oct-10 | 3 | 9.78 | 10.78 | 1.00 | D | 220.5 | - | - | 15:34 | 15:47 | 1.7 | 20.3 | 11.97 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 9.78 | 10.78 | 1.00 | E | 74.3 | 623.5 | 623.5 | 15:47 | 15:51 | 1.5 | 20.1 | 13.36 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 10.78 | 14.80 | 4.02 | A | 95.8 | 95.8 | 23.8 | 14:21 | 14:47 | 3.0 | 2.3 | 0.19 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 14.80 | 19.80 | 5.00 | A | 23.8 | 23.8 | 4.8 | 14:01 | 14:14 | 5.8 | 0.0 | 0.00 | 31.8 | - | 1.63 | 10.3 | 7.9 | 15.6 | |
| Q-31+039.25 | Q | 14-Jun-11 | 4 | 7.51 | 9.01 | 1.50 | MF | 119.7 | 119.70 | 79.80 | 5:22 | 6:01 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Apr-11 | 3 | 9.51 | 10.6 | 1.09 | A | 23 | 23.00 | 21.10 | 16:28 | 16:41 | 3.0 | 0.3 | 0.09 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+040 | P | 30-Oct-10 | 4 | 6.87 | 8.37 | 1.50 | B | 174.8 | - | - | 9:52 | 10:20 | 0.9 | 12.5 | 6.24 | 33.3 | 5.0 | 1.62 | 9.3 | 5.4 | 9.8 | |
| | | 30-Oct-10 | 4 | 6.87 | 8.37 | 1.50 | C | 234.3 | - | - | 10:20 | 10:39 | 1.4 | 12.8 | 4.99 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 6.87 | 8.37 | 1.50 | D | 182.9 | - | - | 10:39 | 10:54 | 1.7 | 12.1 | 4.37 | 63.0 | - | 1.66 | - | - | - | |
| | | 30-Oct-10 | 4 | 6.87 | 8.37 | 1.50 | E | 242.0 | 834.0 | 556.0 | 10:54 | 11:12 | 1.9 | 15.1 | 5.24 | 98.7 | - | 1.68 | 2.5 | 6.8 | 11.6 | |
| | | 15-Oct-10 | 3 | 8.87 | 9.87 | 1.00 | A | 37.5 | - | - | 22:16 | 22:35 | 0.0 | 6.3 | inf | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 8.87 | 9.87 | 1.00 | B | 115.9 | - | - | 22:35 | 22:46 | 0.2 | 1.1 | 11.02 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 8.87 | 9.87 | 1.00 | C | 82.2 | 235.6 | 235.6 | 22:46 | 23:16 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 2 | 9.87 | 13.90 | 4.03 | A | 61.2 | 61.2 | 15.2 | 21:50 | 22:10 | 2.8 | 0.7 | 0.06 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 1 | 13.90 | 18.70 | 4.80 | A | 23.3 | 23.3 | 4.9 | 21:32 | 21:45 | 5.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+041.5 | T | 15-Dec-10 | 4 | 6.59 | 8.09 | 1.50 | MF | 32.1 | 32.1 | 21.4 | 10:44 | 11:03 | 2.5 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.59 | 9.59 | 1.00 | A | 16.7 | 16.7 | 16.7 | 16:36 | 16:47 | 3.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 9.59 | 13.60 | 4.01 | A | 26.0 | 26.0 | 6.5 | 16:21 | 16:33 | 3.1 | 0.8 | 0.07 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 13.60 | 18.80 | 5.20 | A | 24.7 | 24.7 | 4.8 | 16:03 | 16:16 | 5.9 | 0.3 | 0.01 | - | - | - | - | - | - | |
| S-31+043 | S | 05-Nov-10 | 4 | 5.98 | 7.48 | 1.50 | A | 200.1 | - | - | 2:05 | 2:32 | 1.4 | 11.4 | 5.51 | 31.2 | 4.0 | 1.60 | 14.7 | 6.6 | 14.9 | |
| | | 05-Nov-10 | 4 | 5.98 | 7.48 | 1.50 | B | 202.8 | - | - | 2:32 | 2:48 | 1.6 | 13.4 | 5.14 | 33.8 | 11.0 | 1.61 | 14.7 | 6.6 | 16.3 | |
| | | 05-Nov-10 | 4 | 5.98 | 7.48 | 1.50 | C | 147.4 | - | - | 2:48 | 2:59 | 1.5 | 12.9 | 5.27 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 5.98 | 7.48 | 1.50 | D | 178.6 | - | - | 2:59 | 3:12 | 1.7 | 12.6 | 5.27 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 5.98 | 7.48 | 1.50 | E | 94.1 | 823.0 | 548.7 | 3:12 | 3:19 | 1.5 | 13.0 | 5.72 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | B | 190.8 | - | - | 4:43 | 5:08 | 0.7 | 12.6 | 17.66 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | C | 127.1 | - | - | 5:08 | 5:17 | 1.3 | 18.2 | 14.11 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | D | 173.3 | - | - | 5:17 | 5:25 | 1.3 | 21.7 | 17.26 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | D+ | 142.7 | 633.9 | 633.9 | 5:25 | 5:32 | 1.3 | 25.0 | 19.08 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 2 | 8.98 | 13.00 | 4.02 | A | 71.1 | 71.1 | 17.7 | 4:17 | 4:37 | 2.8 | 1.9 | 0.17 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 1 | 13.00 | 18.50 | 5.50 | A | 402.4 | 402.4 | 73.2 | 3:19 | 4:08 | 5.6 | 6.2 | 0.20 | - | - | - | - | - | - | |
| Q-31+043.75 | Q | 20-Jun-11 | 4 | 6 | 7.5 | 1.50 | MF | 55 | 55.00 | 36.67 | 15:51 | 16:18 | 2.4 | 0.0 | 0.00 | 31.8 | 4.0 | 1.4 | 14.5 | 10.0 | 17.2 | |
| | | 05-Mar-11 | 3 | 8 | 9 | 1.00 | B | 171.3 | 171.30 | 171.30 | 15:42 | 16:42 | 2.8 | 0.4 | 0.14 | - | - | - | - | - | - | |
| T-31+044.5 | T | 03-Dec-10 | 4 | 5.88 | 7.38 | 1.50 | MF | 182.8 | - | - | 2:05 | 2:29 | 1.9 | 11.3 | 3.98 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 5.88 | 7.38 | 1.50 | B | 163.3 | - | - | 2:29 | 2:41 | 2.2 | 12.6 | 3.92 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 5.88 | 7.38 | 1.50 | C | 168.0 | - | - | 2:42 | 2:55 | 2.7 | 6.6 | 1.68 | 45.6 | 1.0 | 1.68 | -7.0 | 8.0 | 19.0 | |
| | | 03-Dec-10 | 4 | 5.88 | 7.38 | 1.50 | D | 59.4 | 573.5 | 382.3 | 2:55 | 3:26 | 2.4 | 0.5 | 0.14 | 68.9 | - | 1.67 | -7.0 | 8.0 | 17.6 | |
| | | 25-Oct-10 | 3 | 7.88 | 8.88 | 1.00 | B | 131.2 | - | - | 17:58 | 18:17 | 0.8 | 12.4 | 16.13 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.88 | 8.88 | 1.00 | C | 190.5 | - | - | 18:17 | 18:28 | 1.8 | 18.5 | 9.85 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.88 | 8.88 | 1.00 | D | 167.3 | - | - | 18:28 | 18:35 | 1.7 | 25.8 | 14.35 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.88 | 8.88 | 1.00 | E | 114.1 | 603.1 | 603.1 | 18:35 | 18:40 | 1.9 | 29.0 | 15.37 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 8.88 | 12.90 | 4.02 | A | 22.4 | 22.4 | 5.6 | 17:44 | 17:56 | 2.8 | 0.4 | 0.04 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 12.90 | 18.20 | 5.30 | A | 236.1 | - | - | 16:56 | 17:22 | 3.5 | 12.8 | 0.68 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 12.90 | 18.20 | 5.30 | B | 84.7 | 320.8 | 60.5 | 17:22 | 17:37 | 5.9 | 1.7 | 0.05 | - | - | - | - | - | - | |
| Q-31+045.25 | Q | 15-Jun-11 | 4 | 5.8 | 7.3 | 1.50 | MF | 57.9 | 57.90 | 38.60 | 6:33 | 6:56 | 2.6 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 14-Apr-11 | 3 | 7.8 | 9 | 1.20 | A | 46.1 | 46.10 | 38.42 | 16:50 | 17:15 | 2.7 | 0.1 | 0.03 | - | - | - | - | - | - | |
| P-31+046 | P | 30-Oct-10 | 4 | 6.03 | 7.53 | 1.50 | B | 209.4 | - | - | 13:35 | 14:05 | 1.0 | 11.9 | 9.80 | 34.2 | - | 1.60 | 4.2 | 14.1 | 15.5 | |
| | | 30-Oct-10 | 4 | 6.03 | 7.53 | 1.50 | C | 181.4 | - | - | 14:05 | 14:20 | 1.6 | 12.1 | 5.05 | 53.6 | - | 1.66 | 4.9 | 8.9 | 11.1 | |
| | | 30-Oct-10 | 4 | 6.03 | 7.53 | 1.50 | D | 163.2 | - | - | 14:20 | 14:33 | 1.8 | 11.9 | 4.43 | 70.0 | 1.0 | 1.62 | - | 5.9 | 14.3 | |
| | | 30-Oct-10 | 4 | 6.03 | 7.53 | 1.50 | E | 253.0 | 807.0 | 538.0 | 14:33 | 14:54 | 1.6 | 6.0 | 2.46 | 64.2 | 1.0 | 1.67 | 6.6 | 5.9 | 14.4 | |
| | | 16-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | B | 168.0 | - | - | 7:43 | 8:08 | 1.0 | 12.0 | 9.35 | 37.3 | 3.0 | 1.65 | 0.9 | 10.1 | 14.2 | |
| | | 16-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | C | 168.8 | - | - | 8:08 | 8:19 | 1.4 | 16.6 | 11.81 | 46.0 | - | 1.65 | 0.9 | 10.1 | 14.4 | |
| | | 16-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | D | 114.4 | - | - | 8:19 | 8:25 | 1.6 | 21.5 | 13.45 | 57.0 | - | 1.66 | 0.7 | 9.4 | 15.3 | |
| | | 16-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | D+ | 149.2 | 600.4 | 600.4 | 8:25 | 8:32 | 1.7 | 18.6 | 10.69 | 61.8 | - | 1.66 | 0.7 | 9.4 | 13.4 | |
| | | 16-Oct-10 | 2 | 9.03 | 13.00 | 3.97 | A | 27.0 | 27.0 | 6.8 | 7:25 | 7:38 | 2.7 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 1 | 13.00 | 18.50 | 5.50 | A | 31.1 | 31.1 | 5.7 | 7:04 | 7:18 | 5.7 | 0.3 | 0.02 | 32.4 | 4.0 | 1.64 | -0.6 | 10.4 | 14.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+046.75 | Q | 20-Jun-11 | 4 | 5.9 | 7.4 | 1.50 | MF | 42.5 | 42.50 | 28.33 | 16:23 | 16:46 | 2.5 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 05-Mar-11 | 3 | 7.9 | 8.9 | 1.00 | A | 194.8 | - | - | 16:59 | 17:22 | 2.2 | 15.6 | 7.26 | - | - | - | - | - | - | |
| | | 05-Mar-11 | 3 | 7.9 | 8.9 | 1.00 | B | 191.7 | - | - | 17:22 | 17:33 | 2.6 | 19.1 | 8.03 | - | - | - | - | - | - | |
| | | 05-Mar-11 | 3 | 7.9 | 8.9 | 1.00 | C | 214.1 | 600.60 | 600.60 | 17:33 | 17:58 | 2.7 | 4.2 | 1.55 | - | - | - | - | - | - | |
| T-31+047.5 | T | 03-Dec-10 | 4 | 5.85 | 7.35 | 1.50 | D | 161.5 | - | - | 22:12 | 22:34 | 2.4 | 15.6 | 4.81 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 5.85 | 7.35 | 1.50 | E | 88.9 | 250.4 | 166.9 | 22:34 | 23:05 | 2.3 | 0.5 | 0.16 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | A | 45.5 | - | - | 20:08 | 20:16 | 0.5 | 6.5 | 12.06 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | B | 112.9 | - | - | 20:16 | 20:27 | 1.0 | 12.0 | 13.11 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | C | 172.6 | - | - | 20:27 | 20:39 | 1.1 | 19.2 | 10.73 | 58.3 | - | 1.62 | 10.0 | 6.6 | 13.5 | |
| | | 25-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | D | 166.7 | - | - | 20:39 | 20:50 | 1.4 | 20.7 | 13.27 | 67.2 | - | 1.64 | 9.0 | 6.6 | 13.0 | |
| | | 25-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | E | 104.3 | 602.0 | 602.0 | 20:50 | 20:58 | 3.2 | 38.8 | 12.11 | 79.2 | - | 1.65 | 8.0 | 6.6 | 13.0 | |
| | | 25-Oct-10 | 2 | 8.85 | 12.90 | 4.05 | A | 26.8 | 26.8 | 6.6 | 19:51 | 20:04 | 2.9 | 0.5 | 0.05 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 12.90 | 18.30 | 5.40 | A | 202.7 | - | - | 19:02 | 19:27 | 3.9 | 16.0 | 0.79 | 32.7 | 4.0 | 1.62 | 10.0 | 6.6 | 14.0 | |
| | | 25-Oct-10 | 1 | 12.90 | 18.30 | 5.40 | B | 127.1 | 329.8 | 61.1 | 19:27 | 19:46 | 5.8 | 2.8 | 0.09 | 35.7 | 3.6 | 1.61 | 10.0 | 6.6 | 13.0 | |
| Q-31+048.25 | Q | 15-Jun-11 | 4 | 5.75 | 7.25 | 1.50 | MF | 66.6 | 66.60 | 44.40 | 7:01 | 7:23 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Apr-11 | 3 | 7.75 | 8.7 | 0.95 | A | 87.3 | 87.30 | 91.89 | 10:36 | 11:00 | 3.1 | 0.3 | 0.11 | 30.4 | 2.0 | 1.6 | 14.4 | 8.4 | 19.6 | |
| S-31+049 | S | 05-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | B | 157.0 | - | - | 3:52 | 4:15 | 1.7 | 18.5 | 7.21 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | C | 173.5 | - | - | 4:15 | 4:27 | 1.6 | 11.2 | 6.58 | 39.5 | 2.0 | 1.59 | 8.8 | 4.9 | 13.9 | |
| | | 05-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | D | 153.4 | - | - | 4:27 | 4:37 | 1.7 | 16.0 | 6.55 | 47.6 | - | 1.61 | 5.9 | 5.0 | 12.6 | |
| | | 05-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | E | 164.9 | - | - | 4:37 | 4:50 | 1.4 | 7.6 | 3.32 | 73.0 | - | 1.63 | 5.9 | 5.0 | 13.0 | |
| | | 05-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | X | 174.2 | 823.0 | 548.7 | 4:50 | 5:02 | 1.6 | 17.3 | 7.38 | 66.0 | - | 1.62 | 3.4 | 5.2 | 13.4 | |
| | | 16-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | B | 166.7 | - | - | 9:18 | 9:41 | 1.2 | 16.1 | 8.43 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | C | 151.0 | - | - | 9:41 | 9:52 | 1.4 | 15.7 | 11.28 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | D | 303.5 | 621.2 | 621.2 | 9:52 | 10:16 | 1.3 | 18.1 | 14.39 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 8.90 | 12.90 | 4.00 | A | 22.3 | 22.3 | 5.6 | 9:04 | 9:18 | 2.8 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 1 | 12.90 | 18.30 | 5.40 | A | 74.3 | 74.3 | 13.8 | 8:46 | 8:59 | 6.1 | 3.6 | 0.11 | - | - | - | - | - | - | |
| Q-31+049.75 | Q | 20-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 114.9 | - | - | 16:54 | 17:14 | 1.0 | 6.5 | 4.66 | - | - | - | - | - | - | |
| | | 20-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | B | 92.6 | - | - | 17:14 | 17:28 | 1.1 | 2.1 | 2.62 | 32.5 | - | 1.4 | 13.0 | 10.0 | 15.0 | |
| | | 20-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | D | 92.2 | - | - | 17:28 | 17:38 | 1.3 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 20-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | X | 6.5 | 306.20 | 204.13 | 17:38 | 17:52 | 2.5 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 06-Mar-11 | 3 | 8.16 | 9.2 | 1.04 | A | 185.4 | - | - | 6:48 | 7:08 | 2.0 | 15.2 | 6.41 | - | - | - | - | - | - | |
| | | 06-Mar-11 | 3 | 8.16 | 9.2 | 1.04 | B | 178.3 | - | - | 7:08 | 7:19 | 2.6 | 11.7 | 3.75 | - | - | - | - | - | - | |
| | | 06-Mar-11 | 3 | 8.16 | 9.2 | 1.04 | C | 106.5 | 470.20 | 452.12 | 7:19 | 8:05 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+050.5 | T | 03-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | MF | 181.1 | - | - | 19:10 | 19:58 | 1.3 | 12.1 | 5.63 | 27.8 | - | 1.54 | -2.4 | 7.0 | 10.3 | Communicated to T-31+047.5 |
| | | 03-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 115.4 | - | - | 19:58 | 20:06 | 1.5 | 12.4 | 5.71 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 69.6 | - | - | 20:06 | 20:13 | 1.8 | 12.7 | 5.62 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | D | 138.0 | - | - | 20:13 | 20:22 | 1.9 | 15.4 | 5.23 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | E | 153.3 | - | - | 20:22 | 21:11 | 2.5 | 1.7 | 0.49 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | X | 5.4 | 662.8 | 441.9 | 21:11 | 21:24 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 70.8 | - | - | 22:03 | 22:15 | 1.1 | 9.6 | 8.06 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | B | 120.1 | - | - | 22:15 | 22:25 | 1.5 | 15.6 | 9.97 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | C | 143.1 | - | - | 22:25 | 22:33 | 1.7 | 21.7 | 11.58 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | D | 153.7 | - | - | 22:33 | 22:40 | 2.6 | 24.3 | 8.83 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | E | 127.2 | 614.9 | 614.9 | 22:40 | 22:46 | 3.0 | 22.6 | 7.62 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 9.16 | 13.20 | 4.04 | A | 33.9 | 33.9 | 8.4 | 21:44 | 21:57 | 2.8 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 13.20 | 18.50 | 5.30 | A | 27.1 | 27.1 | 5.1 | 21:26 | 21:39 | 5.5 | 0.3 | 0.01 | - | - | - | - | - | - | |
| Q-31+051.25 | Q | 15-Jun-11 | 4 | 6.18 | 7.68 | 1.50 | MF | 49.1 | 49.10 | 32.73 | 7:29 | 7:50 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Apr-11 | 3 | 8.18 | 9.3 | 1.12 | A | 56.8 | 56.80 | 50.71 | 11:06 | 11:29 | 3.0 | 0.8 | 0.23 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+052 | P | 30-Oct-10 | 4 | 6.05 | 7.55 | 1.50 | B | 199.0 | - | - | 15:09 | 15:38 | 1.1 | 11.9 | 7.10 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 6.05 | 7.55 | 1.50 | C | 190.1 | - | - | 15:38 | 15:51 | 1.4 | 13.1 | 5.68 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 6.05 | 7.55 | 1.50 | D | 186.7 | - | - | 15:51 | 16:04 | 2.4 | 15.3 | 3.99 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 6.05 | 7.55 | 1.50 | E | 225.2 | 801.0 | 534.0 | 16:04 | 16:19 | 1.9 | 7.0 | 2.45 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 8.05 | 9.05 | 1.00 | B | 57.8 | 57.8 | 57.8 | 11:19 | 11:46 | 3.8 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 9.05 | 13.10 | 4.05 | A | 29.8 | 29.8 | 7.4 | 10:50 | 11:05 | 2.7 | 0.4 | 0.03 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 1 | 13.10 | 18.60 | 5.50 | A | 24.9 | 24.9 | 4.5 | 10:29 | 10:43 | 6.0 | 0.2 | 0.00 | - | - | - | - | - | - | |
| Q-31+052.75 | Q | 20-Jun-11 | 4 | 5.96 | 7.46 | 1.50 | MF | 53.9 | 53.90 | 35.93 | 18:04 | 18:24 | 2.6 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 06-Mar-11 | 3 | 7.96 | 9 | 1.04 | A | 169.1 | 169.10 | 162.60 | 8:34 | 10:06 | 2.6 | 0.5 | 0.19 | 29.0 | 5.0 | 1.5 | 4.9 | 16.9 | 20.2 | |
| T-31+053.5 | T | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | MF | 180.1 | - | - | 13:50 | 14:16 | 1.5 | 11.8 | 5.16 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 118.8 | - | - | 14:16 | 14:26 | 1.7 | 12.0 | 4.83 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 216.4 | - | - | 14:26 | 14:40 | 2.1 | 20.0 | 6.49 | - | - | - | - | - | - | Communicated to T-31+059.5 |
| | | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | D | 121.3 | - | - | 14:40 | 14:55 | 2.5 | 0.6 | 0.14 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | X | 2.3 | 638.9 | 425.9 | 14:55 | 15:05 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | E | 100.8 | 608.3 | 608.3 | 0:06 | 0:10 | 3.0 | 28.3 | 9.43 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 41.6 | - | - | 23:29 | 23:37 | 1.1 | 6.8 | 6.15 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | B | 124.6 | - | - | 23:37 | 23:49 | 1.4 | 15.9 | 8.96 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | C | 160.7 | - | - | 23:49 | 23:59 | 1.7 | 20.0 | 10.39 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | D | 180.6 | - | - | 23:59 | 0:06 | 2.6 | 28.6 | 13.74 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 9.16 | 13.20 | 4.04 | A | 20.4 | 20.4 | 5.0 | 23:14 | 23:26 | 3.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 13.20 | 18.40 | 5.20 | A | 34.1 | 34.1 | 6.6 | 22:58 | 23:11 | 5.5 | 0.2 | 0.01 | - | - | - | - | - | - | |
| Q-31+054.25 | Q | 15-Jun-11 | 4 | 5.95 | 7.45 | 1.50 | MF | 50.3 | 50.30 | 33.53 | 7:53 | 8:13 | 2.5 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 15-Apr-11 | 3 | 7.95 | 9 | 1.05 | A | 44.4 | 44.40 | 42.29 | 13:14 | 13:35 | 3.1 | 0.6 | 0.20 | - | - | - | - | - | - | |
| S-31+055 | S | 05-Nov-10 | 4 | 6.03 | 7.53 | 1.50 | B | 168.9 | - | - | 5:23 | 5:47 | 1.6 | 12.3 | 5.30 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 6.03 | 7.53 | 1.50 | C | 155.3 | - | - | 5:47 | 6:00 | 1.9 | 13.6 | 4.70 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 6.03 | 7.53 | 1.50 | D | 160.1 | - | - | 6:00 | 6:10 | 2.0 | 17.0 | 5.55 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 6.03 | 7.53 | 1.50 | E | 313.7 | - | - | 6:10 | 6:30 | 2.5 | 30.9 | 8.24 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 6.03 | 7.53 | 1.50 | X | 123.0 | 921.0 | 614.0 | 6:30 | 6:35 | 3.1 | 11.9 | 2.56 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | A | 29.3 | - | - | 14:28 | 14:35 | 0.3 | 7.3 | 0.25 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | B | 134.4 | - | - | 14:35 | 14:50 | 0.7 | 13.4 | 10.70 | 35.5 | - | 1.64 | 2.2 | 10.6 | 19.4 | |
| | | 16-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | C | 196.4 | - | - | 14:50 | 15:01 | 1.8 | 16.3 | 10.58 | 50.0 | - | 1.65 | 2.2 | 10.6 | 15.4 | |
| | | 16-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | D | 133.3 | - | - | 15:01 | 15:08 | 1.6 | 21.1 | 13.01 | 57.4 | - | 1.64 | 2.5 | 10.6 | 22.7 | |
| | | 16-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | D+ | 116.2 | 609.6 | 609.6 | 15:08 | 15:15 | 1.1 | 22.0 | 20.21 | 80.4 | - | 1.66 | 2.5 | 10.6 | 13.7 | |
| | | 16-Oct-10 | 2 | 9.03 | 13.00 | 3.97 | A | 24.3 | 24.3 | 6.1 | 14:06 | 14:20 | 3.0 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 1 | 13.00 | 18.30 | 5.30 | A | 37.2 | 37.2 | 7.0 | 13:30 | 13:59 | 5.6 | 1.2 | 0.04 | 33.0 | - | 1.64 | 2.4 | 11.0 | 16.6 | |
| Q-31+055.75 | Q | 20-Jun-11 | 4 | 5.93 | 7.43 | 1.50 | MF | 43.8 | 43.80 | 29.20 | 18:29 | 18:48 | 2.6 | 0.2 | 0.06 | 29.8 | 7.0 | 1.4 | 13.3 | 15.2 | 15.0 | |
| | | 06-Mar-11 | 3 | 7.93 | 8.9 | 0.97 | A | 77.8 | 77.80 | 80.21 | 13:10 | 14:11 | 3.0 | 0.5 | 0.16 | 29.6 | 9.0 | 1.5 | 0.5 | 15.6 | 17.4 | |
| T-31+056.5 | T | 03-Dec-10 | 4 | 5.90 | 7.40 | 1.50 | MF | 211.5 | - | - | 17:06 | 17:33 | 1.1 | 13.1 | 9.93 | 30.3 | - | - | 9.2 | 10.0 | 14.8 | |
| | | 03-Dec-10 | 4 | 5.90 | 7.40 | 1.50 | B | 146.1 | - | - | 17:33 | 17:42 | 1.1 | 19.5 | 13.53 | 34.7 | - | 1.57 | 9.2 | 12.9 | 14.9 | |
| | | 03-Dec-10 | 4 | 5.90 | 7.40 | 1.50 | C | 171.2 | - | - | 17:42 | 17:52 | 1.3 | 19.0 | 9.84 | 39.9 | - | 1.62 | 9.2 | 12.9 | 13.8 | |
| | | 03-Dec-10 | 4 | 5.90 | 7.40 | 1.50 | D | 216.1 | - | - | 17:52 | 18:09 | 2.0 | 11.4 | 4.13 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 5.90 | 7.40 | 1.50 | E | 68.1 | 813.0 | 542.0 | 18:09 | 18:27 | 2.3 | 3.3 | 1.13 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | A | 89.8 | - | - | 3:23 | 3:38 | 1.0 | 9.3 | 11.99 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | B | 71.3 | - | - | 3:38 | 3:44 | 1.3 | 12.5 | 9.29 | 35.7 | - | 1.62 | 18.0 | 7.0 | 18.0 | |
| | | 25-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | C | 175.7 | - | - | 3:44 | 3:56 | 1.7 | 18.5 | 10.03 | 47.6 | 0.0 | 1.62 | 18.0 | 7.0 | 16.0 | |
| | | 25-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | D | 174.7 | - | - | 3:56 | 4:05 | 2.8 | 22.3 | 7.17 | 70.3 | 0.0 | 1.71 | 18.0 | 7.0 | 17.0 | |
| | | 25-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | E | 93.3 | 604.8 | 604.8 | 4:05 | 4:10 | 3.0 | 18.6 | 6.32 | 75.4 | - | 1.72 | 18.0 | 7.0 | 17.0 | |
| | | 25-Oct-10 | 2 | 8.90 | 12.90 | 4.00 | A | 102.0 | 102.0 | 25.5 | 2:56 | 3:19 | 0.1 | 0.0 | 0.01 | - | - | - | - | - | - | By-Pass |
| | | 25-Oct-10 | 1 | 12.90 | 18.30 | 5.40 | A | 32.4 | 32.4 | 6.0 | 2:36 | 2:50 | 5.4 | 0.3 | 0.01 | 31.5 | - | 1.63 | 18.0 | 7.0 | 17.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+057.25 | Q | 15-Jun-11 | 4 | 5.88 | 7.38 | 1.50 | MF | 46.2 | 46.20 | 30.80 | 8:19 | 8:39 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Apr-11 | 3 | 7.88 | 8.88 | 1.00 | A | 16.1 | 16.10 | 16.10 | 10:08 | 10:20 | 3.2 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 15-Apr-11 | 2 | 8.88 | 13 | 4.12 | A | 18.8 | 18.80 | 4.56 | 9:52 | 10:04 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+058 | P | 30-Oct-10 | 4 | 5.90 | 7.40 | 1.50 | B | 215.9 | - | - | 16:45 | 17:14 | 1.3 | 12.2 | 6.12 | 34.4 | - | 1.64 | 6.2 | 5.8 | 10.5 | |
| | | 30-Oct-10 | 4 | 5.90 | 7.40 | 1.50 | C | 184.3 | - | - | 17:14 | 17:27 | 2.2 | 15.1 | 4.44 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.90 | 7.40 | 1.50 | D | 186.4 | - | - | 17:27 | 17:38 | 2.5 | 15.1 | 4.28 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.90 | 7.40 | 1.50 | E | 225.4 | 812.0 | 541.3 | 17:38 | 17:54 | 2.2 | 12.8 | 3.84 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | B | 146.9 | - | - | 18:37 | 18:59 | 0.8 | 9.6 | 12.17 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | C | 133.1 | - | - | 18:59 | 19:09 | 1.6 | 15.5 | 9.66 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | D | 180.2 | - | - | 19:09 | 19:20 | 1.8 | 18.1 | 6.78 | 140.0 | 1.4 | 1.65 | -2.0 | 9.0 | 12.7 | |
| | | 16-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | D+ | 164.2 | 624.4 | 624.4 | 19:20 | 19:28 | 1.6 | 11.9 | 7.57 | 81.0 | 2.0 | 1.62 | -2.0 | 9.0 | 12.3 | |
| | | 16-Oct-10 | 2 | 8.90 | 12.90 | 4.00 | A | 209.0 | - | - | 15:55 | 16:19 | 0.8 | 14.5 | 4.53 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 8.90 | 12.90 | 4.00 | B | 229.0 | - | - | 16:19 | 16:32 | 1.2 | 22.5 | 4.99 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 8.90 | 12.90 | 4.00 | C | 145.8 | - | - | 16:32 | 16:40 | 1.1 | 19.0 | 4.09 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 8.90 | 12.90 | 4.00 | D | 244.2 | - | - | 16:40 | 16:53 | 1.4 | 20.5 | 4.57 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 8.90 | 12.90 | 4.00 | D+ | 258.0 | - | - | 16:53 | 17:07 | 1.8 | 16.1 | 2.42 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 8.90 | 12.90 | 4.00 | E | 931.0 | 2017.0 | 504.3 | 17:08 | 18:26 | 2.6 | 19.5 | 1.90 | 83.9 | - | 1.73 | -0.7 | 9.3 | 11.7 | |
| | | 16-Oct-10 | 1 | 12.90 | 18.20 | 5.30 | A | 95.3 | 95.3 | 18.0 | 15:27 | 15:49 | 5.9 | 2.2 | 0.07 | - | - | - | - | - | - | |
| Q-31+058.75 | Q | 20-Jun-11 | 4 | 6.38 | 7.88 | 1.50 | MF | 42.2 | 42.20 | 28.13 | 18:50 | 19:12 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 06-Mar-11 | 3 | 8.38 | 9.4 | 1.02 | A | 45.2 | 45.20 | 44.31 | 14:21 | 14:56 | 2.8 | 0.2 | 0.08 | - | - | - | - | - | - | |
| T-31+059.5 | T | 09-Dec-10 | 4 | 6.00 | 7.50 | 1.50 | B | 174.5 | - | - | 15:25 | 15:55 | 2.3 | 12.3 | 3.63 | 38.2 | 3.0 | 1.65 | 6.7 | 9.2 | 16.4 | |
| | | 09-Dec-10 | 4 | 6.00 | 7.50 | 1.50 | C | 143.0 | - | - | 15:55 | 16:16 | 2.4 | 8.9 | 2.06 | 47.2 | 3.2 | 1.66 | 6.9 | 9.1 | 17.2 | |
| | | 09-Dec-10 | 4 | 6.00 | 7.50 | 1.50 | D | 39.7 | 357.2 | 238.1 | 16:16 | 16:55 | 2.5 | 0.7 | 0.18 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.00 | 9.00 | 1.00 | A | 63.1 | - | - | 5:04 | 5:16 | 0.6 | 6.5 | 7.65 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.00 | 9.00 | 1.00 | B | 101.7 | - | - | 5:16 | 5:27 | 1.2 | 13.7 | 10.96 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.00 | 9.00 | 1.00 | C | 169.1 | - | - | 5:27 | 5:37 | 1.3 | 18.6 | 12.88 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.00 | 9.00 | 1.00 | D | 150.4 | - | - | 5:37 | 5:44 | 2.0 | 21.6 | 10.27 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.00 | 9.00 | 1.00 | E | 120.4 | 604.7 | 604.7 | 5:44 | 5:49 | 3.0 | 30.3 | 10.18 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 9.00 | 13.00 | 4.00 | A | 24.3 | 24.3 | 6.1 | 4:49 | 5:01 | 2.8 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 13.00 | 18.00 | 5.00 | A | 22.0 | 22.0 | 4.4 | 4:32 | 4:45 | 5.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+060.25 | Q | 15-Jun-11 | 4 | 5.75 | 7.25 | 1.50 | MF | 43.9 | 43.90 | 29.27 | 8:43 | 9:03 | 2.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 15-Apr-11 | 3 | 7.75 | 8.9 | 1.15 | A | 68.9 | 68.90 | 59.91 | 13:43 | 14:15 | 3.0 | 0.3 | 0.10 | - | - | - | - | - | - | |
| S-31+061 | S | 06-Nov-10 | 4 | 5.83 | 7.33 | 1.50 | B | 231.0 | - | - | 7:24 | 7:56 | 1.5 | 12.1 | 5.25 | 35.3 | 4.0 | 1.61 | 10.8 | 6.8 | 15.2 | |
| | | 06-Nov-10 | 4 | 5.83 | 7.33 | 1.50 | C | 198.8 | - | - | 7:56 | 8:12 | 1.4 | 12.4 | 5.81 | 38.7 | 3.0 | 1.62 | 10.7 | 6.8 | 15.8 | |
| | | 06-Nov-10 | 4 | 5.83 | 7.33 | 1.50 | D | 172.2 | - | - | 8:12 | 8:27 | 2.2 | 12.1 | 3.68 | 49.7 | - | 1.61 | 12.0 | 7.4 | 16.4 | |
| | | 06-Nov-10 | 4 | 5.83 | 7.33 | 1.50 | E | 102.6 | - | - | 8:27 | 8:35 | 1.9 | 12.9 | 4.44 | 93.3 | - | 1.63 | 12.1 | 8.5 | 16.9 | |
| | | 06-Nov-10 | 4 | 5.83 | 7.33 | 1.50 | X | 155.4 | 860.0 | 573.3 | 8:35 | 8:48 | 1.9 | 11.9 | 4.21 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.83 | 8.83 | 1.00 | A | 47.7 | 47.7 | 47.7 | 21:47 | 22:40 | 3.1 | 0.7 | 0.22 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 8.83 | 12.80 | 3.97 | A | 33.7 | 33.7 | 8.5 | 21:26 | 21:41 | 2.8 | 1.4 | 0.12 | 35.0 | 9.0 | 1.62 | -2.0 | 9.0 | 15.9 | |
| | | 16-Oct-10 | 1 | 12.80 | 18.00 | 5.20 | A | 190.2 | - | - | 20:37 | 21:02 | 4.7 | 11.0 | 0.45 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 1 | 12.80 | 18.00 | 5.20 | B | 86.6 | 276.8 | 53.2 | 21:02 | 21:19 | 5.6 | 1.1 | 0.04 | 44.8 | - | 1.62 | -2.0 | 9.0 | 12.5 | |
| T-31+062.5 | T | 03-Dec-10 | 4A | 5.22 | 6.72 | 1.50 | MF | 89.5 | - | - | 11:00 | 11:21 | 1.1 | 13.4 | 7.32 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4A | 5.22 | 6.72 | 1.50 | B | 99.0 | - | - | 11:21 | 11:33 | 1.8 | 21.2 | 8.41 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4A | 5.22 | 6.72 | 1.50 | C | 80.0 | - | - | 11:33 | 12:00 | 1.5 | 12.1 | 5.41 | - | - | - | - | - | - | Packer Frozen in Hole. |
| | | 03-Dec-10 | 4A | 5.22 | 6.72 | 1.50 | D | 105.2 | - | - | 12:00 | 12:15 | 2.1 | 20.3 | 7.02 | - | - | - | - | - | - | Communicated to T31+068.5. Split quantities. |
| | | 03-Dec-10 | 4A | 5.22 | 6.72 | 1.50 | X | 31.4 | 405.0 | 270.0 | 12:15 | 12:23 | 2.8 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.22 | 8.22 | 1.00 | B | 14.4 | 14.4 | 14.4 | 6:41 | 6:56 | 3.5 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 8.22 | 12.22 | 4.00 | A | 22.4 | 22.4 | 5.6 | 6:22 | 6:34 | 3.0 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 1 | 12.22 | 18.10 | 5.88 | A | 23.8 | 23.8 | 4.0 | 6:02 | 6:15 | 5.5 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+064 | P | 30-Oct-10 | 4 | 5.14 | 6.64 | 1.50 | B | 172.5 | - | - | 20:06 | 20:26 | 1.3 | 12.8 | 7.67 | 37.5 | 8.0 | 1.63 | 12.0 | 6.0 | 15.0 | |
| | | 30-Oct-10 | 4 | 5.14 | 6.64 | 1.50 | C | 176.7 | - | - | 20:26 | 20:37 | 1.5 | 13.7 | 4.93 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.14 | 6.64 | 1.50 | D | 172.6 | - | - | 20:37 | 20:51 | 1.9 | 14.5 | 4.13 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.14 | 6.64 | 1.50 | E | 279.2 | 801.0 | 534.0 | 20:51 | 21:09 | 3.0 | 20.4 | 4.60 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | A | 74.8 | - | - | 4:16 | 4:30 | 0.5 | 9.0 | 20.18 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | B | 103.3 | - | - | 4:30 | 4:39 | 1.1 | 12.7 | 10.10 | 34.5 | - | 1.63 | 13.0 | 7.0 | 16.0 | |
| | | 20-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | C | 144.0 | - | - | 4:39 | 4:48 | 1.2 | 18.3 | 16.04 | 54.3 | - | 1.65 | 13.0 | 7.0 | 15.0 | |
| | | 20-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | D | 159.2 | - | - | 4:48 | 4:56 | 1.6 | 24.3 | 14.13 | 58.6 | - | 1.67 | 13.0 | 7.0 | 14.0 | |
| | | 20-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | D+ | 139.1 | 620.4 | 620.4 | 4:56 | 5:01 | 1.6 | 24.5 | 15.80 | 67.6 | - | 1.68 | 13.0 | 7.0 | 13.6 | |
| | | 20-Oct-10 | 2 | 8.14 | 12.10 | 3.96 | A | 22.8 | 22.8 | 5.8 | 3:57 | 4:12 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 1 | 12.10 | 17.50 | 5.40 | A | 2.3 | 2.3 | 0.4 | 3:27 | 3:52 | 5.3 | 0.3 | 0.01 | 31.1 | 4.0 | 1.62 | 13.0 | 7.0 | 15.0 | |
| Q-31+064.75 | Q | 20-Jun-11 | 4 | 4.94 | 6.44 | 1.50 | MF | 40.3 | 40.30 | 26.87 | 19:16 | 19:35 | 2.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 06-Mar-11 | 3 | 6.94 | 7.9 | 0.96 | A | 179 | - | - | 15:12 | 15:33 | 2.1 | 15.4 | 8.18 | - | - | - | - | - | - | |
| | | 06-Mar-11 | 3 | 6.94 | 7.9 | 0.96 | B | 207.7 | - | - | 15:33 | 15:45 | 2.8 | 17.0 | 6.86 | 37.8 | - | 1.5 | 5.6 | 15.9 | 19.4 | |
| | | 06-Mar-11 | 3 | 6.94 | 7.9 | 0.96 | C | 131.2 | - | - | 15:45 | 16:12 | 2.8 | 1.4 | 0.51 | 46.4 | - | 1.5 | 5.6 | 15.9 | 19.4 | |
| | | 06-Mar-11 | 3 | 6.94 | 7.9 | 0.96 | D | 64.9 | 582.80 | 607.08 | 16:12 | 17:18 | 2.8 | 0.3 | 0.13 | - | - | - | - | - | - | |
| T-31+065.5 | T | 10-Dec-10 | 4 | 5.11 | 6.61 | 1.50 | MF | 187.4 | - | - | 6:51 | 7:19 | 1.0 | 15.1 | 9.76 | 32.4 | - | 1.48 | 20.2 | 9.6 | 21.3 | |
| | | 10-Dec-10 | 4 | 5.11 | 6.61 | 1.50 | B | 162.1 | - | - | 7:19 | 7:29 | 1.9 | 20.3 | 6.10 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 5.11 | 6.61 | 1.50 | C | 186.8 | 536.3 | 357.5 | 7:29 | 8:12 | 2.4 | 0.4 | 0.12 | 49.1 | 1.5 | 1.67 | 0.5 | 8.5 | 18.8 | |
| | | 26-Oct-10 | 3 | 7.11 | 8.11 | 1.00 | A | 67.6 | - | - | 8:10 | 8:23 | 1.0 | 7.4 | 8.07 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.11 | 8.11 | 1.00 | B | 85.2 | - | - | 8:23 | 8:34 | 1.3 | 10.5 | 8.71 | 33.5 | 5.0 | 1.61 | 3.1 | 7.2 | 19.4 | |
| | | 26-Oct-10 | 3 | 7.11 | 8.11 | 1.00 | C | 211.8 | - | - | 8:34 | 8:48 | 1.6 | 18.9 | 11.57 | 45.2 | 2.0 | 1.61 | 3.1 | 7.2 | 15.0 | |
| | | 26-Oct-10 | 3 | 7.11 | 8.11 | 1.00 | D | 150.6 | - | - | 8:48 | 8:56 | 1.7 | 21.5 | 11.57 | 60.2 | - | 1.63 | 3.1 | 7.2 | 13.9 | |
| | | 26-Oct-10 | 3 | 7.11 | 8.11 | 1.00 | E | 107.2 | 622.4 | 622.4 | 8:56 | 9:01 | 1.7 | 22.4 | 13.54 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.11 | 12.10 | 3.99 | A | 23.0 | 23.0 | 5.8 | 7:54 | 8:06 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.10 | 17.50 | 5.40 | A | 33.8 | 33.8 | 6.3 | 7:35 | 7:49 | 5.9 | 0.6 | 0.02 | - | - | - | - | - | - | |
| Q-31+066.25 | Q | 15-Jun-11 | 4 | 5.14 | 6.64 | 1.50 | MF | 35.6 | 35.60 | 23.73 | 9:05 | 9:38 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 15-Apr-11 | 3 | 7.14 | 8.2 | 1.06 | A | 21.8 | 21.80 | 20.57 | 14:32 | 14:46 | 3.0 | 0.3 | 0.10 | - | - | - | - | - | - | |
| S-31+067 | S | 06-Nov-10 | 4 | 5.14 | 6.61 | 1.47 | B | 239.0 | - | - | 9:07 | 9:37 | 1.5 | 15.6 | 6.94 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.14 | 6.61 | 1.47 | C | 175.5 | - | - | 9:37 | 9:51 | 1.9 | 14.7 | 5.16 | 44.3 | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.14 | 6.61 | 1.47 | D | 157.0 | - | - | 9:51 | 10:02 | 2.0 | 15.3 | 5.15 | 52.4 | 1.0 | 1.63 | 4.1 | 7.4 | 13.9 | |
| | | 06-Nov-10 | 4 | 5.14 | 6.61 | 1.47 | E | 131.8 | - | - | 10:02 | 10:11 | 2.0 | 14.8 | 5.08 | 78.6 | 0.0 | 1.67 | - | - | 13.7 | |
| | | 06-Nov-10 | 4 | 5.14 | 6.61 | 1.47 | X | 102.7 | 806.0 | 548.3 | 10:11 | 10:18 | 2.2 | 11.6 | 3.50 | 103.2 | - | 1.68 | 12.1 | 8.7 | 14.7 | |
| | | 16-Oct-10 | 3 | 7.34 | 8.34 | 1.00 | B | 88.5 | 88.5 | 88.5 | 23:59 | 0:47 | 3.5 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 8.34 | 12.30 | 3.96 | A | 106.1 | 106.1 | 26.8 | 23:13 | 23:48 | 2.8 | 2.3 | 0.20 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 1 | 12.30 | 17.50 | 5.20 | A | 21.1 | 21.1 | 4.1 | 22:53 | 23:07 | 5.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+068.5 | T | 03-Dec-10 | 4 | 5.11 | 6.61 | 1.50 | MF | 89.5 | - | - | 11:00 | 11:21 | 1.1 | 13.4 | 7.32 | 28.9 | - | 1.39 | -2.0 | 7.2 | 9.0 | |
| | | 03-Dec-10 | 4 | 5.11 | 6.61 | 1.50 | B | 99.0 | - | - | 11:21 | 11:33 | 1.8 | 21.2 | 8.41 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 5.11 | 6.61 | 1.50 | C | 80.0 | - | - | 11:33 | 12:00 | 1.5 | 12.1 | 5.41 | 38.3 | - | 1.62 | -2.0 | 7.2 | 12.2 | |
| | | 03-Dec-10 | 4 | 5.11 | 6.61 | 1.50 | D | 105.2 | - | - | 12:00 | 12:15 | 2.1 | 20.3 | 7.02 | - | - | - | - | - | - | Communicated to T31+062.5. Split quantities. |
| | | 03-Dec-10 | 4 | 5.11 | 6.61 | 1.50 | X | 31.4 | 405.0 | 270.0 | 12:15 | 12:23 | 2.8 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.04 | 8.04 | 1.00 | B | 137.8 | - | - | 9:49 | 10:10 | 2.0 | 10.8 | 4.80 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.04 | 8.04 | 1.00 | C | 122.4 | 260.2 | 260.2 | 10:10 | 10:55 | 3.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.04 | 12.00 | 3.96 | A | 21.5 | 21.5 | 5.4 | 9:30 | 9:44 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.00 | 17.60 | 5.60 | A | 48.2 | 48.2 | 8.6 | 9:12 | 9:25 | 5.7 | 1.7 | 0.05 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+070 | P | 30-Oct-10 | 4 | 5.01 | 6.51 | 1.50 | B | 160.8 | - | - | 21:54 | 22:16 | 1.2 | 12.7 | 8.07 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.01 | 6.51 | 1.50 | C | 165.0 | - | - | 22:16 | 22:29 | 2.0 | 8.8 | 3.84 | 150.2 | 0.0 | 1.65 | 12.0 | 6.0 | 15.5 | |
| | | 30-Oct-10 | 4 | 5.01 | 6.51 | 1.50 | D | 170.3 | - | - | 22:29 | 22:42 | 2.6 | 18.2 | 1.42 | 134.0 | 0.0 | 1.66 | 12.0 | 6.0 | 15.0 | |
| | | 30-Oct-10 | 4 | 5.01 | 6.51 | 1.50 | E | 306.9 | 803.0 | 535.3 | 22:42 | 23:01 | 2.2 | 21.6 | 6.55 | 147.1 | - | 1.64 | 12.0 | 6.0 | 14.0 | |
| | | 21-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | B | 184.6 | - | - | 6:06 | 6:53 | 1.0 | 6.7 | 7.27 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | C | 129.8 | - | - | 6:53 | 7:14 | 1.0 | 6.0 | 6.23 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | D | 291.9 | 606.3 | 606.3 | 7:04 | 8:01 | 1.9 | 10.1 | 5.28 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 8.01 | 12.00 | 3.99 | A | 32.7 | 32.7 | 8.2 | 5:43 | 5:56 | 2.8 | 0.7 | 0.06 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 1 | 12.00 | 17.40 | 5.40 | A | 23.2 | 23.2 | 4.3 | 5:23 | 5:37 | 5.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+071.5 | T | 10-Dec-10 | 4 | 5.11 | 6.61 | 1.50 | MF | 160.6 | - | - | 8:34 | 8:58 | 1.7 | 11.9 | 5.50 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 5.11 | 6.61 | 1.50 | B | 125.9 | 286.5 | 191.0 | 8:58 | 9:34 | 2.4 | 0.3 | 0.13 | 38.0 | 1.5 | 1.65 | 14.4 | 8.5 | 17.3 | |
| | | 26-Oct-10 | 3 | 7.11 | 8.11 | 1.00 | A | 16.9 | 16.9 | 16.9 | 13:34 | 13:47 | 3.2 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.11 | 12.10 | 3.99 | A | 23.2 | 23.2 | 5.8 | 13:18 | 13:38 | 3.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.10 | 17.40 | 5.30 | A | 29.8 | 29.8 | 5.6 | 13:00 | 13:13 | 6.2 | 0.6 | 0.02 | 33.4 | 5.0 | 1.64 | 4.3 | 9.7 | 19.5 | |
| S-31+073 | S | 06-Nov-10 | 4 | 5.09 | 6.59 | 1.50 | B | 205.4 | - | - | 10:40 | 11:10 | 1.2 | 14.8 | 8.58 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.09 | 6.59 | 1.50 | C | 205.7 | - | - | 11:10 | 11:23 | 1.9 | 15.3 | 5.26 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.09 | 6.59 | 1.50 | D | 171.6 | - | - | 11:23 | 11:37 | 1.9 | 14.9 | 5.24 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.09 | 6.59 | 1.50 | E | 123.7 | - | - | 11:37 | 11:45 | 2.1 | 15.7 | 5.00 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.09 | 6.59 | 1.50 | X | 140.6 | 847.0 | 564.7 | 11:45 | 11:54 | 2.2 | 14.8 | 4.48 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | A | 71.5 | - | - | 4:15 | 4:28 | 2.0 | 6.3 | 3.13 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | B | 84.1 | - | - | 4:28 | 4:36 | 2.5 | 12.6 | 5.05 | 34.2 | 4.2 | 1.62 | 5.0 | 9.0 | 15.7 | |
| | | 16-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | C | 136.5 | - | - | 4:36 | 4:44 | 3.5 | 17.7 | 5.43 | 44.0 | 1.6 | 1.75 | 5.0 | 9.0 | 15.1 | |
| | | 16-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | D | 164.2 | - | - | 4:44 | 4:59 | 3.3 | 11.5 | 3.50 | 67.2 | - | 1.66 | 5.0 | 9.0 | 14.5 | |
| | | 16-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | D+ | 152.8 | 609.1 | 609.1 | 4:59 | 5:13 | 3.4 | 11.8 | 3.44 | 51.3 | - | 1.63 | 5.0 | 9.0 | 14.1 | |
| | | 16-Oct-10 | 2 | 8.09 | 12.10 | 4.01 | A | 38.9 | 38.9 | 9.7 | 3:44 | 3:58 | 2.9 | 0.9 | 0.08 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 1 | 12.10 | 17.40 | 5.30 | A | 21.5 | 21.5 | 4.1 | 3:25 | 3:38 | 5.2 | 0.0 | 0.00 | 31.2 | - | 1.60 | 5.0 | 9.0 | 15.7 | |
| Q-31+073.75 | Q | 20-Jun-11 | 4 | 5.06 | 6.56 | 1.50 | MF | 35.1 | 35.10 | 23.40 | 19:38 | 19:56 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 07-Mar-11 | 3 | 7.06 | 8.1 | 1.04 | A | 45.6 | 45.60 | 43.85 | 8:35 | 8:58 | 3.0 | 0.1 | 0.04 | - | - | - | - | - | - | |
| T-31+074.5 | T | 03-Dec-10 | 4 | 5.01 | 6.54 | 1.53 | MF | 170.0 | - | - | 9:00 | 9:30 | 0.8 | 11.5 | 10.94 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 5.01 | 6.54 | 1.53 | B | 230.0 | - | - | 9:30 | 9:50 | 1.3 | 15.7 | 6.56 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 5.01 | 6.54 | 1.53 | C | 190.0 | - | - | 9:50 | 10:01 | 1.9 | 14.2 | 5.84 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 5.01 | 6.54 | 1.53 | D | 147.6 | - | - | 10:01 | 10:15 | 2.4 | 7.2 | 1.91 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 5.01 | 6.54 | 1.53 | X | 26.7 | 764.3 | 499.5 | 10:15 | 10:32 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | B | 153.7 | - | - | 14:32 | 14:53 | 0.8 | 13.1 | 14.81 | 34.9 | - | 1.62 | 6.7 | 8.8 | 17.8 | |
| | | 26-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | C | 214.2 | - | - | 14:53 | 15:07 | 1.1 | 15.2 | 13.76 | 48.6 | - | 1.62 | 15.7 | 9.3 | 15.1 | |
| | | 26-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | D | 149.7 | - | - | 15:07 | 15:15 | 1.3 | 18.2 | 15.19 | 69.4 | 4.0 | 1.64 | 14.7 | 9.4 | 15.2 | |
| | | 26-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | E | 96.8 | 614.4 | 614.4 | 15:15 | 15:21 | 1.3 | 18.0 | 14.19 | 71.8 | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.01 | 12.00 | 3.99 | A | 27.6 | 27.6 | 6.9 | 14:15 | 14:27 | 3.1 | 0.4 | 0.04 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.00 | 17.40 | 5.40 | A | 23.1 | 23.1 | 4.3 | 13:55 | 14:07 | 5.8 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-31+075.25 | Q | 15-Jun-11 | 4 | 5.19 | 6.69 | 1.50 | MF | 37.8 | 37.80 | 25.20 | 9:41 | 9:59 | 2.6 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 15-Apr-11 | 3 | 7.19 | 8.2 | 1.01 | A | 31.6 | 31.60 | 31.29 | 14:53 | 15:13 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+076 | P | 30-Oct-10 | 4 | 5.16 | 6.66 | 1.50 | B | 179.4 | - | - | 1:48 | 2:11 | 0.7 | 15.0 | 8.59 | 36.1 | - | 1.63 | 15.0 | 8.0 | 15.0 | |
| | | 30-Oct-10 | 4 | 5.16 | 6.66 | 1.50 | C | 164.5 | - | - | 2:11 | 2:21 | 1.6 | 19.3 | 8.37 | 87.0 | - | 1.65 | 15.0 | 8.0 | 15.0 | |
| | | 30-Oct-10 | 4 | 5.16 | 6.66 | 1.50 | D | 179.9 | - | - | 2:21 | 2:31 | 1.8 | 17.4 | 6.66 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.16 | 6.66 | 1.50 | E | 284.2 | 808.0 | 538.7 | 2:31 | 2:44 | 2.6 | 21.5 | 5.56 | 261.7 | 0.0 | 1.66 | 15.0 | 8.0 | 13.0 | |
| | | 21-Oct-10 | 3 | 7.16 | 8.16 | 1.00 | B | 22.8 | 22.8 | 22.8 | 9:05 | 9:22 | 3.1 | 0.6 | 0.20 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 8.16 | 12.20 | 4.04 | A | 64.4 | 64.4 | 15.9 | 8:42 | 9:02 | 3.0 | 1.2 | 0.10 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 12.20 | 17.40 | 5.20 | A | 22.2 | 22.2 | 4.3 | 8:19 | 8:35 | 6.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+076.75 | Q | 20-Jun-11 | 4 | 5.22 | 6.72 | 1.50 | MF | 37.2 | 37.20 | 24.80 | 19:58 | 20:17 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 07-Mar-11 | 3 | 7.22 | 8.2 | 0.98 | A | 71.3 | 71.30 | 72.76 | 9:18 | 9:46 | 2.9 | 0.3 | 0.10 | 30.6 | 6.0 | 1.6 | 12.9 | 19.6 | 25.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+077.5 | T | 03-Dec-10 | 4A | 5.47 | 6.97 | 1.50 | MF | 87.6 | - | - | 6:43 | 7:07 | 0.9 | 12.2 | 8.30 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4A | 5.47 | 6.97 | 1.50 | B | 114.0 | - | - | 7:07 | 7:19 | 1.5 | 15.2 | 6.31 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4A | 5.47 | 6.97 | 1.50 | C | 92.9 | - | - | 7:19 | 7:31 | 1.8 | 14.1 | 6.63 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4A | 5.47 | 6.97 | 1.50 | D | 73.8 | - | - | 7:31 | 7:44 | 2.2 | 10.7 | 3.34 | - | - | - | - | - | - | Communicated to T31+080.5. Split quantities. |
| | | 03-Dec-10 | 4A | 5.47 | 6.97 | 1.50 | X | 23.7 | 391.9 | 261.2 | 7:44 | 8:04 | 2.7 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | B | 154.6 | - | - | 16:07 | 16:27 | 0.9 | 12.5 | 13.84 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | C | 175.1 | - | - | 16:27 | 16:40 | 1.3 | 15.8 | 11.97 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | D | 213.7 | - | - | 16:40 | 16:52 | 1.6 | 19.3 | 12.12 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | E | 47.3 | 590.7 | 590.7 | 16:52 | 16:57 | 1.8 | 17.9 | 10.14 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.47 | 12.50 | 4.03 | A | 21.7 | 21.7 | 5.4 | 15:50 | 16:02 | 3.0 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.50 | 17.80 | 5.30 | A | 26.0 | 26.0 | 4.9 | 15:28 | 15:42 | 5.7 | 0.3 | 0.01 | - | - | - | - | - | - | |
| Q-31+078.25 | Q | 15-Jun-11 | 4 | 5.11 | 6.61 | 1.50 | MF | 43.5 | 43.50 | 29.00 | 10:03 | 10:24 | 2.8 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 15-Apr-11 | 3 | 7.11 | 8.2 | 1.09 | A | 152.7 | - | - | 15:26 | 16:36 | 2.7 | 1.1 | 0.36 | - | - | - | - | - | - | |
| | | 15-Apr-11 | 3 | 7.11 | 8.2 | 1.09 | B | 9.9 | 162.60 | 149.17 | 16:36 | 16:55 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+079 | S | 06-Nov-10 | 4 | 5.19 | 6.69 | 1.50 | B | 218.6 | - | - | 14:17 | 14:48 | 1.2 | 12.7 | 6.93 | 35.1 | - | 1.62 | 6.4 | 14.9 | 15.0 | |
| | | 06-Nov-10 | 4 | 5.19 | 6.69 | 1.50 | C | 183.7 | - | - | 14:48 | 15:04 | 1.4 | 12.3 | 6.45 | 42.8 | - | 1.61 | 8.5 | 6.9 | 13.0 | |
| | | 06-Nov-10 | 4 | 5.19 | 6.69 | 1.50 | D | 192.0 | - | - | 15:04 | 15:20 | 2.1 | 14.3 | 4.84 | 49.6 | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.19 | 6.69 | 1.50 | E | 112.7 | - | - | 15:20 | 15:29 | 2.0 | 12.6 | 4.31 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.19 | 6.69 | 1.50 | X | 160.0 | 867.0 | 578.0 | 15:29 | 15:45 | 1.7 | 12.1 | 2.27 | >180 | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.19 | 8.19 | 1.00 | A | 12.1 | 12.1 | 12.1 | 6:06 | 6:20 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 8.19 | 12.20 | 4.01 | A | 23.8 | 23.8 | 5.9 | 5:47 | 6:01 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 1 | 12.20 | 17.40 | 5.20 | A | 26.2 | 26.2 | 5.0 | 5:27 | 5:41 | 5.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+080.5 | T | 03-Dec-10 | 4 | 5.34 | 6.84 | 1.50 | MF | 87.6 | - | - | 6:43 | 7:07 | 0.9 | 12.2 | 8.30 | 28.4 | 5.5 | 1.59 | 2.2 | 9.3 | 14.6 | |
| | | 03-Dec-10 | 4 | 5.34 | 6.84 | 1.50 | B | 114.0 | - | - | 7:07 | 7:19 | 1.5 | 15.2 | 6.31 | 39.1 | - | 1.62 | 2.2 | 9.3 | 14.8 | |
| | | 03-Dec-10 | 4 | 5.34 | 6.84 | 1.50 | C | 92.9 | - | - | 7:19 | 7:31 | 1.8 | 14.1 | 6.63 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 5.34 | 6.84 | 1.50 | D | 73.8 | - | - | 7:31 | 7:44 | 2.2 | 10.7 | 3.34 | - | - | - | - | - | - | Communicated to T31+077.5. Split quantities. |
| | | 03-Dec-10 | 4 | 5.34 | 6.84 | 1.50 | X | 23.7 | 391.9 | 261.2 | 7:44 | 8:04 | 2.7 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.34 | 8.34 | 1.00 | A | 15.4 | 15.4 | 15.4 | 17:55 | 18:08 | 3.5 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.34 | 12.30 | 3.96 | A | 25.2 | 25.2 | 6.4 | 17:40 | 17:51 | 2.7 | 0.6 | 0.06 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.30 | 17.80 | 5.50 | A | 32.7 | 32.7 | 5.9 | 17:19 | 17:31 | 5.9 | 0.5 | 0.01 | - | - | - | - | - | - | |
| P-31+082 | P | 30-Oct-10 | 4 | 5.34 | 6.84 | 1.50 | B | 155.3 | - | - | 3:02 | 3:22 | 1.0 | 12.6 | 14.43 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.34 | 6.84 | 1.50 | C | 159.8 | - | - | 3:22 | 3:32 | 2.1 | 15.4 | 4.16 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.34 | 6.84 | 1.50 | D | 186.4 | - | - | 3:32 | 3:44 | 2.3 | 18.2 | 5.12 | 158.6 | - | 1.66 | 15.0 | 8.0 | 13.0 | |
| | | 30-Oct-10 | 4 | 5.34 | 6.84 | 1.50 | E | 306.5 | 808.0 | 538.7 | 3:44 | 3:58 | 2.7 | 24.5 | 6.04 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.34 | 8.34 | 1.00 | B | 23.0 | 23.0 | 23.0 | 10:35 | 10:49 | 3.1 | 0.7 | 0.22 | 35.1 | 4.0 | 1.63 | 15.3 | 8.0 | 25.4 | |
| | | 21-Oct-10 | 2 | 8.34 | 12.30 | 3.96 | A | 35.8 | 35.8 | 9.0 | 10:20 | 10:33 | 2.9 | 1.1 | 0.10 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 12.30 | 17.40 | 5.10 | A | 22.0 | 22.0 | 4.3 | 10:05 | 10:16 | 5.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+083.5 | T | 10-Dec-10 | 4 | 5.32 | 6.82 | 1.50 | MF | 181.6 | - | - | 10:14 | 10:46 | 1.4 | 6.7 | 3.20 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 5.32 | 6.82 | 1.50 | B | 169.1 | - | - | 10:46 | 10:57 | 2.3 | 22.6 | 6.71 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 5.32 | 6.82 | 1.50 | C | 150.5 | - | - | 10:57 | 11:04 | 1.9 | 3.3 | 1.14 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 5.32 | 6.82 | 1.50 | D | 40.5 | 541.7 | 361.1 | 11:04 | 11:35 | 2.4 | 0.4 | 0.10 | 71.0 | 1.0 | 1.64 | 13.2 | 8.6 | 18.7 | |
| | | 26-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | B | 54.3 | 54.3 | 54.3 | 18:57 | 19:45 | 2.9 | 0.0 | 0.00 | 35.7 | 3.2 | 1.62 | 10.0 | 8.0 | 16.0 | |
| | | 26-Oct-10 | 2 | 8.32 | 12.30 | 3.98 | A | 28.1 | 28.1 | 7.1 | 18:38 | 18:52 | 2.8 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.30 | 17.50 | 5.20 | A | 26.4 | 26.4 | 5.1 | 18:15 | 18:26 | 5.6 | 0.3 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+085 | S | 06-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | B | 246.0 | - | - | 15:59 | 16:31 | 1.5 | 16.2 | 6.68 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | C | 174.0 | - | - | 16:31 | 16:43 | 2.1 | 14.6 | 4.58 | 40.4 | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | D | 178.0 | - | - | 16:43 | 16:55 | 1.7 | 15.2 | 6.32 | 71.9 | - | 1.69 | 0.6 | 10.7 | - | |
| | | 06-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | E | 104.0 | - | - | 16:55 | 17:02 | 2.3 | 14.1 | 4.16 | 51.5 | - | 1.65 | 0.6 | 6.9 | 13.8 | |
| | | 06-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | X | 111.0 | 813.0 | 542.0 | 17:02 | 17:09 | 3.1 | 7.7 | 1.67 | >180 | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | B | 44.3 | 44.3 | 44.3 | 7:48 | 8:20 | 3.6 | 0.6 | 0.15 | 40.2 | 5.0 | 1.63 | 2.5 | 6.5 | 15.3 | |
| | | 17-Oct-10 | 2 | 8.32 | 12.30 | 3.98 | A | 105.2 | 105.2 | 26.4 | 7:05 | 7:38 | 3.1 | 2.1 | 0.17 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 1 | 12.30 | 17.40 | 5.10 | A | 21.7 | 21.7 | 4.3 | 6:43 | 6:57 | 5.9 | 0.0 | 0.00 | 32.2 | 4.0 | 1.61 | 1.8 | 7.9 | 19.0 | |
| Q-31+085.75 | Q | 20-Jun-11 | 4 | 5.11 | 6.61 | 1.50 | MF | 68.7 | 68.70 | 45.80 | 20:27 | 21:04 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | By-Pass outside casing |
| | | 07-Mar-11 | 3 | 7.11 | 8.1 | 0.99 | A | 179.2 | - | - | 10:04 | 10:41 | 1.1 | 9.2 | 8.14 | - | - | - | - | - | - | |
| | | 07-Mar-11 | 3 | 7.11 | 8.1 | 0.99 | B | 174.4 | - | - | 10:41 | 10:54 | 2.4 | 18.7 | 7.96 | 29.6 | 10.0 | 1.6 | - | - | - | |
| | | 07-Mar-11 | 3 | 7.11 | 8.1 | 0.99 | C | 172.3 | - | - | 10:54 | 11:04 | 2.8 | 14.3 | 6.05 | 37.8 | 12.0 | 1.6 | 10.4 | 13.1 | 20.4 | |
| | | 07-Mar-11 | 3 | 7.11 | 8.1 | 0.99 | D | 75.1 | 601.00 | 607.07 | 11:04 | 11:12 | 2.9 | 4.7 | 1.62 | - | - | - | - | - | - | |
| T-31+086.5 | T | 02-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | MF | 81.9 | - | - | 2:52 | 3:04 | 1.0 | 9.6 | 5.79 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | B | 156.5 | - | - | 3:04 | 3:18 | 2.2 | 12.6 | 4.06 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | C | 164.4 | - | - | 3:18 | 3:36 | 2.3 | 5.0 | 1.39 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | D | 99.5 | 502.3 | 334.9 | 3:36 | 4:14 | 2.5 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | A | 33.0 | - | - | 20:30 | 20:36 | 0.6 | 6.5 | 11.21 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | B | 130.6 | - | - | 20:36 | 20:51 | 1.4 | 14.6 | 9.53 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | C | 160.4 | - | - | 20:51 | 21:00 | 2.0 | 19.1 | 9.36 | 45.0 | 2.4 | 1.60 | 10.0 | 8.0 | 16.0 | |
| | | 26-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | D | 164.9 | - | - | 21:00 | 21:08 | 2.7 | 24.7 | 8.30 | >150 | - | 1.65 | 10.0 | 8.0 | 16.0 | |
| | | 26-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | E | 123.1 | 612.0 | 612.0 | 21:08 | 21:13 | 3.0 | 26.2 | 8.82 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.24 | 12.20 | 3.96 | A | 23.9 | 23.9 | 6.0 | 20:14 | 20:26 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.20 | 17.40 | 5.20 | A | 21.3 | 21.3 | 4.1 | 19:58 | 20:10 | 5.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+087.25 | Q | 15-Jun-11 | 4 | 5.19 | 6.69 | 1.50 | MF | 39.8 | 39.80 | 26.53 | 10:27 | 10:46 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 3 | 7.19 | 8.19 | 1.00 | A | 20.3 | 20.30 | 20.30 | 13:29 | 13:45 | 3.0 | 0.5 | 0.19 | 33.1 | - | 1.6 | 11.9 | 16.9 | 19.1 | |
| | | 16-Apr-11 | 3 | 7.19 | 8.2 | 1.01 | A | 89.1 | 89.10 | 88.22 | 8:19 | 8:56 | 3.1 | 0.1 | 0.04 | - | - | - | - | - | - | |
| P-31+088 | P | 30-Oct-10 | 4 | 5.27 | 6.77 | 1.50 | B | 159.6 | - | - | 4:30 | 4:53 | 0.9 | 13.3 | 9.43 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.27 | 6.77 | 1.50 | C | 162.4 | - | - | 4:53 | 5:04 | 1.7 | 18.5 | 6.59 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.27 | 6.77 | 1.50 | D | 168.9 | - | - | 5:04 | 5:12 | 2.0 | 22.8 | 6.78 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.27 | 6.77 | 1.50 | E | 322.1 | 813.0 | 542.0 | 5:12 | 5:25 | 3.0 | 34.8 | 7.70 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | A | 25.9 | 25.9 | 25.9 | 11:32 | 11:51 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 8.27 | 12.30 | 4.03 | A | 24.1 | 24.1 | 6.0 | 11:15 | 11:31 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 12.30 | 17.30 | 5.00 | A | 25.1 | 25.1 | 5.0 | 10:57 | 11:11 | 6.0 | 0.3 | 0.01 | 33.1 | - | 1.66 | 16.1 | 8.1 | 18.1 | |
| Q-31+088.75 | Q | 20-Jun-11 | 4 | 5.11 | 6.61 | 1.50 | MF | 39.6 | 39.60 | 26.40 | 21:07 | 21:24 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 07-Mar-11 | 3 | 7.11 | 8.1 | 0.99 | A | 164.9 | - | - | 14:27 | 14:54 | 0.4 | 6.4 | 16.09 | 31.6 | - | 1.5 | 13.3 | 15.3 | 20.5 | Communicated to 31+085.75 |
| | | 07-Mar-11 | 3 | 7.11 | 8.1 | 0.99 | C | 263.8 | 428.70 | 433.03 | 14:54 | 16:13 | 2.7 | 0.5 | 0.20 | - | - | - | - | - | - | |
| T-31+089.5 | T | 10-Dec-10 | 4 | 5.22 | 6.72 | 1.50 | MF | 11.0 | 11.0 | 7.3 | 13:55 | 14:10 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.22 | 8.22 | 1.00 | A | 82.9 | - | - | 22:07 | 22:20 | 0.7 | 9.2 | 15.17 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.22 | 8.22 | 1.00 | B | 80.7 | - | - | 22:20 | 22:27 | 1.1 | 12.3 | 6.12 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.22 | 8.22 | 1.00 | C | 166.1 | - | - | 22:27 | 22:37 | 1.2 | 19.5 | 15.49 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.22 | 8.22 | 1.00 | D | 167.6 | - | - | 22:37 | 22:44 | 1.6 | 24.2 | 14.81 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.22 | 8.22 | 1.00 | E | 109.7 | 607.0 | 607.0 | 22:44 | 22:48 | 2.0 | 28.4 | 14.57 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.22 | 12.20 | 3.98 | A | 23.0 | 23.0 | 5.8 | 21:52 | 22:04 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.20 | 17.30 | 5.10 | A | 25.2 | 25.2 | 4.9 | 21:34 | 21:47 | 5.5 | 0.0 | 0.00 | 32.4 | - | 1.64 | 10.0 | 8.0 | 16.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+090.25 | Q | 15-Jun-11 | 4 | 5.06 | 6.56 | 1.50 | MF | 58.7 | 58.70 | 39.13 | 10:48 | 11:13 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 7.06 | 8.06 | 1.00 | A | 178.8 | - | - | 10:44 | 11:09 | 0.3 | 12.8 | 46.16 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 7.06 | 8.06 | 1.00 | B | 216.7 | - | - | 11:09 | 11:22 | 1.8 | 18.1 | 10.25 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 7.06 | 8.06 | 1.00 | C | 117.4 | - | - | 11:22 | 11:34 | 3.2 | 8.4 | 2.63 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 7.06 | 8.06 | 1.00 | D | 125.4 | - | - | 11:34 | 12:00 | 2.6 | 4.9 | 1.76 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 7.06 | 8.06 | 1.00 | X | 111.9 | 750.20 | 750.20 | 12:00 | 12:39 | 2.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| S-31+091 | S | 06-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | B | 157.7 | - | - | 20:11 | 20:32 | 1.2 | 13.8 | 7.64 | 35.9 | - | 1.59 | 7.6 | 11.8 | 14.2 | |
| | | 06-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | C | 162.1 | - | - | 20:32 | 20:46 | 1.7 | 12.9 | 6.14 | 42.2 | 4.0 | 1.64 | 15.2 | 6.6 | 15.2 | |
| | | 06-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | D | 153.2 | - | - | 20:46 | 20:58 | 1.7 | 13.1 | 5.31 | 49.8 | - | 1.63 | 16.5 | 6.5 | 15.3 | |
| | | 06-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | E | 214.9 | - | - | 20:58 | 21:15 | 1.7 | 12.1 | 4.46 | 72.6 | - | 1.65 | 17.0 | 6.5 | 15.2 | |
| | | 06-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | X | 129.1 | 817.0 | 544.7 | 21:15 | 21:24 | 1.7 | 11.2 | 4.30 | 79.7 | - | 1.64 | 17.2 | 6.6 | 14.6 | |
| | | 17-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | A | 123.1 | - | - | 9:26 | 10:03 | 3.3 | 8.2 | 2.44 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | B | 138.9 | - | - | 10:03 | 10:14 | 3.6 | 2.9 | 0.81 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | C | 55.1 | - | - | 10:14 | 10:39 | 3.6 | 2.3 | 0.50 | 51.4 | - | 1.64 | 8.2 | 2.1 | 16.4 | |
| | | 17-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | D | 39.0 | 356.1 | 356.1 | 10:39 | 11:11 | 3.9 | 0.4 | 0.10 | 59.9 | - | 1.67 | 8.2 | 2.1 | 14.8 | |
| | | 17-Oct-10 | 2 | 8.32 | 12.30 | 3.98 | A | 24.6 | 24.6 | 6.2 | 9:08 | 9:21 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 1 | 12.30 | 17.40 | 5.10 | A | 27.0 | 27.0 | 5.3 | 8:49 | 9:02 | 5.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+091.75 | Q | 20-Jun-11 | 4 | 5.32 | 6.82 | 1.50 | MF | 16.9 | 16.90 | 11.27 | 21:27 | 21:39 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 7.32 | 8.3 | 0.98 | A | 138 | 138.00 | 140.82 | 6:50 | 7:45 | 2.7 | 0.3 | 0.13 | 34.4 | 7.0 | 1.6 | 12.6 | 15.1 | 21.1 | |
| T-31+092.5 | T | 02-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | E | 128.2 | - | - | 0:03 | 0:10 | 2.7 | 14.6 | 3.68 | 94.5 | - | - | -12.0 | 10.0 | 17.0 | |
| | | 02-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | X | 59.2 | 629.6 | 419.7 | 0:10 | 0:25 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | MF | 81.5 | - | - | 23:13 | 23:37 | 0.8 | 9.5 | 2.25 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | B | 85.7 | - | - | 23:37 | 23:45 | 1.2 | 12.4 | 6.90 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | C | 75.9 | - | - | 23:45 | 23:51 | 1.4 | 12.9 | 6.34 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | D | 199.1 | - | - | 23:51 | 0:03 | 1.9 | 18.1 | 6.52 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | A | 84.5 | - | - | 2:23 | 2:35 | 0.9 | 8.5 | 11.45 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | B | 72.5 | - | - | 2:35 | 2:41 | 1.9 | 12.7 | 7.19 | 34.8 | - | 1.62 | 17.0 | 9.0 | 18.0 | |
| | | 26-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | C | 180.6 | - | - | 2:41 | 2:51 | 2.5 | 19.2 | 7.93 | 39.4 | - | 1.61 | 17.0 | 9.0 | 16.0 | |
| | | 26-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | D | 148.0 | - | - | 2:51 | 3:01 | 3.2 | 13.0 | 4.31 | 62.7 | 2.0 | 1.67 | 17.0 | 9.0 | 17.0 | |
| | | 26-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | E | 120.3 | 605.9 | 605.9 | 3:01 | 3:12 | 3.2 | 12.5 | 3.89 | 71.7 | - | 1.69 | 17.0 | 9.0 | 16.5 | |
| | | 26-Oct-10 | 2 | 8.62 | 12.60 | 3.98 | A | 22.9 | 22.9 | 5.8 | 2:06 | 2:19 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.60 | 17.70 | 5.10 | A | 26.6 | 26.6 | 5.2 | 1:47 | 2:02 | 5.3 | 0.1 | 0.00 | 31.4 | 4.0 | 1.61 | 17.0 | 9.0 | 17.0 | |
| Q-31+093.25 | Q | 15-Jun-11 | 4 | 5.34 | 6.84 | 1.50 | MF | 44.5 | 44.50 | 29.67 | 11:15 | 11:37 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Apr-10 | 3 | 7.34 | 8.34 | 1.00 | A | 18 | 18.00 | 18.00 | 14:06 | 14:21 | 3.1 | 0.6 | 0.20 | - | - | - | - | - | - | |
| P-31+094 | P | 31-Oct-10 | 4 | 5.60 | 7.10 | 1.50 | B | 238.5 | - | - | 7:14 | 7:46 | 1.2 | 11.7 | 7.25 | 36.5 | 6.0 | 1.65 | 7.2 | 8.1 | 15.6 | |
| | | 31-Oct-10 | 4 | 5.60 | 7.10 | 1.50 | C | 186.8 | - | - | 7:46 | 8:01 | 1.3 | 12.3 | 6.80 | 44.0 | 0.0 | 1.67 | 7.2 | 11.8 | 18.2 | |
| | | 31-Oct-10 | 4 | 5.60 | 7.10 | 1.50 | D | 165.3 | - | - | 8:01 | 8:15 | 0.8 | 12.4 | 8.05 | 48.6 | - | 1.68 | 13.0 | 9.9 | 14.7 | |
| | | 31-Oct-10 | 4 | 5.60 | 7.10 | 1.50 | E | 215.4 | 806.0 | 537.3 | 8:15 | 8:33 | 0.9 | 12.1 | 8.96 | 57.3 | 1.0 | 1.68 | 13.0 | 7.1 | 14.2 | |
| | | 21-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | A | 28.7 | - | - | 15:26 | 15:31 | 0.4 | 3.3 | 9.69 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | B | 148.1 | - | - | 15:31 | 15:47 | 0.7 | 12.1 | 17.14 | 35.4 | - | 1.62 | 12.5 | 9.0 | 18.3 | |
| | | 21-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | C | 194.2 | - | - | 15:47 | 16:01 | 1.3 | 18.6 | 15.15 | 48.2 | 0.0 | 1.66 | 12.5 | 9.0 | 18.4 | |
| | | 21-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | D | 233.7 | 604.7 | 604.7 | 16:01 | 16:14 | 0.8 | 21.9 | 26.51 | 58.1 | - | 1.68 | 12.5 | 9.0 | 18.3 | |
| | | 21-Oct-10 | 2 | 8.60 | 12.60 | 4.00 | A | 21.9 | 21.9 | 5.5 | 15:12 | 15:23 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 12.60 | 17.80 | 5.20 | A | 26.2 | 26.2 | 5.0 | 14:54 | 16:06 | 5.6 | 0.3 | 0.01 | 32.2 | - | 1.62 | 11.5 | 8.4 | 16.4 | |
| Q-31+094.75 | Q | 20-Jun-11 | 4 | 5.44 | 6.94 | 1.50 | MF | 40.3 | 40.30 | 26.87 | 21:41 | 21:58 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 7.44 | 8.5 | 1.06 | A | 172 | - | - | 8:23 | 8:43 | 2.3 | 13.8 | 5.48 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 7.44 | 8.5 | 1.06 | B | 162.9 | - | - | 8:43 | 8:55 | 2.9 | 12.4 | 3.35 | 28.0 | 16.0 | 1.6 | 12.4 | 24.1 | 20.1 | |
| | | 08-Mar-11 | 3 | 7.44 | 8.5 | 1.06 | C | 199.6 | - | - | 8:55 | 9:20 | 2.8 | 7.9 | 2.68 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 7.44 | 8.5 | 1.06 | D | 72.5 | 607.00 | 572.64 | 9:20 | 9:29 | 2.8 | 8.0 | 2.68 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+095.5 | T | 10-Dec-10 | 4 | 5.80 | 7.30 | 1.50 | MF | 148.7 | - | - | 14:17 | 14:40 | 1.4 | 12.4 | 5.92 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 5.80 | 7.30 | 1.50 | B | 191.1 | - | - | 14:40 | 14:52 | 2.5 | 20.8 | 5.06 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 5.80 | 7.30 | 1.50 | C | 115.5 | 455.3 | 303.5 | 14:52 | 15:32 | 2.3 | 0.4 | 0.12 | 45.2 | - | 1.67 | -20.0 | 8.4 | 19.3 | |
| | | 26-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | A | 27.6 | - | - | 4:07 | 4:13 | 1.0 | 6.0 | 6.42 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | B | 136.3 | - | - | 4:13 | 4:26 | 1.4 | 15.7 | 12.59 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | C | 159.2 | - | - | 4:26 | 4:35 | 1.2 | 21.2 | 14.54 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | D | 162.8 | - | - | 4:35 | 4:42 | 1.6 | 24.9 | 14.52 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | E | 125.5 | 611.4 | 611.4 | 4:42 | 4:47 | 2.5 | 28.7 | 11.63 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.80 | 12.80 | 4.00 | A | 23.7 | 23.7 | 5.9 | 3:50 | 4:03 | 2.8 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.80 | 18.00 | 5.20 | A | 23.8 | 23.8 | 4.6 | 3:34 | 3:46 | 5.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+096.25 | Q | 15-Jun-11 | 4 | 5.7 | 7.2 | 1.50 | MF | 155.5 | 155.50 | 103.67 | 13:32 | 14:20 | 2.4 | 0.1 | 0.02 | - | - | - | - | - | - | Communicated to Q-31+099.25 |
| | | 29-Apr-10 | 3 | 7.7 | 8.7 | 1.00 | A | 36.1 | 36.10 | 36.10 | 14:29 | 14:53 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+097 | S | 06-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | B | 161.7 | - | - | 22:20 | 22:41 | 1.6 | 12.2 | 4.60 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | C | 170.8 | - | - | 22:41 | 22:54 | 2.0 | 13.7 | 4.46 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | D | 147.7 | - | - | 22:54 | 23:07 | 1.5 | 13.9 | 6.43 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | E | 174.0 | - | - | 23:07 | 23:21 | 2.0 | 16.4 | 5.85 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | X | 151.8 | 806.0 | 537.3 | 23:21 | 23:32 | 2.3 | 11.8 | 3.37 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | B | 140.4 | - | - | 14:52 | 15:12 | 1.8 | 12.9 | 7.09 | 34.5 | - | 1.62 | 3.4 | 7.0 | 15.8 | |
| | | 17-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | C | 178.2 | - | - | 15:12 | 15:24 | 2.2 | 20.1 | 9.26 | 53.1 | - | 1.66 | 3.6 | 7.0 | 18.9 | |
| | | 17-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | D | 181.7 | - | - | 15:24 | 15:38 | 2.4 | 15.4 | 6.23 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | D+ | 143.5 | 643.8 | 643.8 | 15:38 | 15:42 | 2.7 | 11.6 | 4.33 | 77.3 | - | 1.66 | 3.6 | 7.0 | 14.2 | |
| | | 17-Oct-10 | 2 | 8.90 | 12.90 | 4.00 | A | 69.5 | 69.5 | 17.4 | 14:27 | 14:47 | 3.1 | 1.4 | 0.11 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 1 | 12.90 | 18.30 | 5.40 | A | 11.7 | 11.7 | 2.2 | 14:08 | 14:21 | 5.8 | 0.0 | 0.00 | 33.4 | 6.0 | 1.64 | 3.4 | 7.0 | 17.0 | |
| Q-31+097.75 | Q | 20-Jun-11 | 4 | 5.88 | 7.38 | 1.50 | MF | 43.8 | 43.80 | 29.20 | 22:00 | 22:20 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 7.88 | 8.9 | 1.02 | A | 136.1 | - | - | 11:01 | 11:19 | 2.8 | 9.8 | 3.44 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 7.88 | 8.9 | 1.02 | B | 163.3 | - | - | 11:19 | 11:44 | 3.0 | 3.4 | 1.09 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 7.88 | 8.9 | 1.02 | C | 16.6 | 316.00 | 309.80 | 11:44 | 12:01 | 2.8 | 0.0 | 0.00 | 35.1 | - | 1.6 | 10.6 | 18.0 | 19.4 | |
| T-31+098.5 | T | 02-Dec-10 | 4 | 5.93 | 7.43 | 1.50 | MF | 84.0 | - | - | 21:29 | 21:43 | 0.5 | 9.4 | 11.30 | 28.4 | - | 1.44 | -4.3 | 9.4 | 13.6 | |
| | | 02-Dec-10 | 4 | 5.93 | 7.43 | 1.50 | B | 96.9 | - | - | 21:43 | 21:58 | 0.8 | 9.2 | 7.25 | 35.6 | - | 1.67 | -4.0 | 9.3 | 14.0 | |
| | | 02-Dec-10 | 4 | 5.93 | 7.43 | 1.50 | C | 72.5 | - | - | 21:58 | 22:04 | 1.1 | 12.3 | 7.52 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.93 | 7.43 | 1.50 | D | 70.8 | - | - | 22:04 | 22:05 | 1.6 | 15.5 | 6.61 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.93 | 7.43 | 1.50 | E | 176.3 | - | - | 22:05 | 22:25 | 2.5 | 6.0 | 1.62 | 87.5 | 0.0 | 1.76 | -4.0 | -9.5 | 15.0 | |
| | | 02-Dec-10 | 4 | 5.93 | 7.43 | 1.50 | X | 39.2 | 539.7 | 359.8 | 22:25 | 22:45 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.93 | 8.93 | 1.00 | A | 54.5 | - | - | 5:42 | 5:52 | 0.6 | 6.4 | 8.20 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.93 | 8.93 | 1.00 | B | 105.4 | - | - | 5:52 | 6:01 | 1.0 | 13.7 | 14.34 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.93 | 8.93 | 1.00 | C | 163.2 | - | - | 6:01 | 6:11 | 1.7 | 21.8 | 12.48 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.93 | 8.93 | 1.00 | D | 160.8 | - | - | 6:11 | 6:18 | 1.8 | 24.3 | 13.37 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.93 | 8.93 | 1.00 | E | 118.9 | 602.8 | 602.8 | 6:18 | 6:22 | 2.2 | 28.6 | 12.81 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.93 | 12.90 | 3.97 | A | 22.4 | 22.4 | 5.6 | 5:27 | 5:39 | 2.9 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 1 | 12.90 | 18.00 | 5.10 | A | 23.6 | 23.6 | 4.6 | 5:09 | 5:22 | 5.7 | 0.3 | 0.01 | - | - | - | - | - | - | |
| Q-31+099.25 | Q | 15-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 8.5 | 8.50 | 5.67 | 14:23 | 14:34 | 2.7 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 8.16 | 9.16 | 1.00 | A | 125.5 | 125.50 | 125.50 | 14:43 | 15:39 | 2.9 | 0.3 | 0.11 | 33.8 | - | 1.6 | 11.4 | 4.6 | 12.2 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+100 | P | 31-Oct-10 | 4 | 6.03 | 7.53 | 1.50 | B | 245.3 | - | - | 8:48 | 9:19 | 0.7 | 15.8 | 17.67 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 6.03 | 7.53 | 1.50 | C | 165.2 | - | - | 9:19 | 9:30 | 0.9 | 15.1 | 11.72 | 41.4 | - | 1.67 | 8.1 | 9.2 | 16.9 | |
| | | 31-Oct-10 | 4 | 6.03 | 7.53 | 1.50 | D | 171.9 | - | - | 9:30 | 9:42 | 1.1 | 15.1 | 9.20 | 55.3 | - | 1.68 | - | 6.8 | 19.4 | |
| | | 31-Oct-10 | 4 | 6.03 | 7.53 | 1.50 | E | 121.4 | - | - | 9:42 | 9:50 | 1.4 | 15.0 | 7.46 | 59.2 | 1.0 | 1.67 | 13.2 | - | 13.7 | |
| | | 31-Oct-10 | 4 | 6.03 | 7.53 | 1.50 | X | 98.2 | 802.0 | 534.7 | 9:50 | 9:56 | 1.4 | 10.6 | 5.21 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | A | 105.4 | - | - | 16:58 | 17:14 | 0.6 | 11.0 | 18.63 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | B | 59.3 | - | - | 17:14 | 17:20 | 0.7 | 12.7 | 16.92 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | C | 140.5 | - | - | 17:20 | 17:28 | 1.0 | 19.5 | 19.48 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | D | 228.7 | - | - | 17:28 | 17:40 | 1.4 | 22.0 | 15.55 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | E | 71.3 | 605.2 | 605.2 | 17:40 | 17:44 | 1.8 | 19.0 | 10.34 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 9.03 | 13.00 | 3.97 | A | 32.2 | 32.2 | 8.1 | 16:44 | 16:56 | 3.2 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 13.00 | 18.20 | 5.20 | A | 27.4 | 27.4 | 5.3 | 16:27 | 16:40 | 6.1 | 0.6 | 0.02 | - | - | - | - | - | - | |
| Q-31+100.75 | Q | 20-Jun-11 | 4 | 6.23 | 7.73 | 1.50 | MF | 88.7 | - | - | 22:22 | 22:35 | 2.5 | 1.1 | 1.14 | 33.8 | 2.5 | 1.5 | 11.6 | 10.0 | 10.5 | By-Pass outside casing |
| | | 20-Jun-11 | 4 | 6.23 | 7.73 | 1.50 | C | 1.5 | 90.20 | 60.13 | 22:35 | 22:46 | 2.6 | 0.1 | 0.03 | 45.5 | 4.0 | 1.7 | 11.9 | 16.3 | 18.6 | |
| | | 08-Mar-11 | 3 | 9.18 | 10.2 | 1.02 | A | 22.3 | 22.30 | 21.86 | 9:54 | 10:07 | 2.7 | 0.1 | 0.02 | - | - | - | - | - | - | |
| T-31+101.5 | T | 10-Dec-10 | 4 | 6.71 | 8.21 | 1.50 | MF | 15.2 | 15.2 | 10.1 | 15:49 | 16:07 | 2.4 | 0.3 | 0.08 | 32.6 | - | 1.48 | 1.0 | 8.6 | 11.4 | |
| | | 27-Oct-10 | 3 | 8.71 | 9.71 | 1.00 | B | 153.1 | - | - | 7:17 | 7:45 | 1.0 | 11.6 | 10.72 | 37.1 | 5.0 | 1.59 | 6.1 | 12.1 | 20.1 | |
| | | 27-Oct-10 | 3 | 8.71 | 9.71 | 1.00 | C | 179.2 | - | - | 7:45 | 7:57 | 1.5 | 15.5 | 10.46 | 50.3 | 2.0 | 1.59 | 6.3 | 9.6 | 19.5 | |
| | | 27-Oct-10 | 3 | 8.71 | 9.71 | 1.00 | D | 161.2 | - | - | 7:57 | 8:07 | 1.6 | 17.9 | 11.48 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 8.71 | 9.71 | 1.00 | E | 123.8 | 617.3 | 617.3 | 8:07 | 8:13 | 1.6 | 19.5 | 12.18 | 80.1 | - | 1.64 | 6.3 | 9.6 | 13.9 | |
| | | 27-Oct-10 | 2 | 9.71 | 13.70 | 3.99 | A | 27.1 | 27.1 | 6.8 | 7:03 | 7:15 | 3.1 | 0.8 | 0.06 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 1 | 13.70 | 19.00 | 5.30 | A | 81.5 | 81.5 | 15.4 | 6:40 | 6:57 | 5.9 | 0.4 | 0.01 | - | - | - | - | - | - | |
| Q-31+102.25 | Q | 15-Jun-11 | 4 | 6.51 | 8.01 | 1.50 | MF | 67.9 | 67.90 | 45.27 | 14:40 | 15:03 | 2.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 8.51 | 9.51 | 1.00 | A | 19.4 | 19.40 | 19.40 | 15:47 | 16:03 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+103 | S | 06-Nov-10 | 4 | 6.66 | 8.16 | 1.50 | B | 160.8 | - | - | 1:47 | 2:08 | 1.6 | 12.1 | 5.11 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 6.66 | 8.16 | 1.50 | C | 160.3 | - | - | 2:08 | 2:21 | 2.8 | 12.3 | 5.37 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 6.66 | 8.16 | 1.50 | D | 160.4 | - | - | 2:21 | 2:35 | 1.7 | 13.6 | 5.29 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 6.66 | 8.16 | 1.50 | E | 159.4 | - | - | 2:35 | 2:47 | 1.4 | 13.1 | 6.02 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 6.66 | 8.16 | 1.50 | X | 181.1 | 822.0 | 548.0 | 2:47 | 3:00 | 0.9 | 13.2 | 10.33 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 8.66 | 9.66 | 1.00 | B | 161.9 | - | - | 16:32 | 16:56 | 1.0 | 13.9 | 12.88 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 8.66 | 9.66 | 1.00 | C | 197.9 | - | - | 16:56 | 17:09 | 1.5 | 18.8 | 13.15 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 8.66 | 9.66 | 1.00 | D | 120.1 | - | - | 17:09 | 17:15 | 1.7 | 18.7 | 11.23 | 61.0 | - | 1.65 | -0.1 | 7.8 | 13.4 | |
| | | 17-Oct-10 | 3 | 8.66 | 9.66 | 1.00 | D+ | 163.9 | 643.8 | 643.8 | 17:15 | 17:23 | 1.5 | 19.3 | 12.52 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 9.66 | 13.70 | 4.04 | A | 22.1 | 22.1 | 5.5 | 16:16 | 16:28 | 2.8 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 1 | 13.70 | 18.90 | 5.20 | A | 21.6 | 21.6 | 4.2 | 15:58 | 16:11 | 6.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+103.75 | Q | 20-Jun-11 | 4 | 6.79 | 8.29 | 1.50 | MF | 50.4 | 50.40 | 33.60 | 22:52 | 23:11 | 2.4 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 8.79 | 9.8 | 1.01 | A | 169.2 | - | - | 14:21 | 14:42 | 2.1 | 12.4 | 5.80 | 30.4 | - | 1.6 | 12.9 | 23.7 | 20.4 | |
| | | 08-Mar-11 | 3 | 8.79 | 9.8 | 1.01 | B | 178 | - | - | 14:42 | 14:53 | 2.3 | 18.9 | 8.73 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 8.79 | 9.8 | 1.01 | C | 117.5 | 464.70 | 460.10 | 14:53 | 15:15 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+104.5 | T | 02-Dec-10 | 4A | 6.99 | 8.49 | 1.50 | D | 80.0 | - | - | 17:43 | 19:00 | 1.4 | 2.5 | 1.13 | - | - | - | - | - | - | Communicated to T31+107.5. Split quantities. |
| | | 02-Dec-10 | 4A | 6.99 | 8.49 | 1.50 | X | 70.3 | 150.3 | 100.2 | 19:00 | 20:07 | 2.5 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 8.99 | 9.99 | 1.00 | A | 17.9 | - | - | 8:58 | 9:01 | 0.2 | 3.0 | 18.04 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 8.99 | 9.99 | 1.00 | B | 123.0 | - | - | 9:01 | 9:22 | 1.1 | 12.0 | 11.12 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 8.99 | 9.99 | 1.00 | C | 183.7 | - | - | 9:22 | 9:35 | 1.2 | 18.9 | 15.99 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 8.99 | 9.99 | 1.00 | D | 160.3 | - | - | 9:35 | 9:44 | 1.8 | 21.1 | 12.80 | 64.1 | - | 1.62 | 18.4 | 11.1 | 18.8 | |
| | | 27-Oct-10 | 3 | 8.99 | 9.99 | 1.00 | E | 110.1 | 595.0 | 595.0 | 9:44 | 9:49 | 1.5 | 22.0 | 14.40 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 9.99 | 14.00 | 4.01 | A | 23.2 | 23.2 | 5.8 | 8:40 | 8:54 | 2.6 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 1 | 14.00 | 19.00 | 5.00 | A | 23.2 | 23.2 | 4.6 | 8:22 | 8:35 | 5.6 | 0.0 | 0.00 | 34.0 | - | 1.63 | 6.3 | 9.6 | 13.3 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+105.25 | Q | 15-Jun-11 | 4 | 6.99 | 8.49 | 1.50 | MF | 104.8 | 104.80 | 69.87 | 15:05 | 15:57 | 2.6 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 8.99 | 9.99 | 1.00 | A | 163.1 | - | - | 14:02 | 14:26 | 2.5 | 12.2 | 4.49 | 30.3 | - | 1.6 | 9.6 | 5.7 | 17.3 | |
| | | 30-Apr-10 | 3 | 8.99 | 9.99 | 1.00 | B | 156.9 | - | - | 14:26 | 14:44 | 2.9 | 14.5 | 5.71 | 36.2 | - | 1.6 | 11.2 | 5.7 | 18.4 | |
| | | 30-Apr-10 | 3 | 8.99 | 9.99 | 1.00 | C | 121 | 441.00 | 441.00 | 14:44 | 15:03 | 2.8 | 0.0 | 0.02 | - | - | 1.6 | 11.4 | 5.7 | 19.0 | |
| P-31+106 | P | 31-Oct-10 | 4 | 7.17 | 8.67 | 1.50 | B | 250.6 | - | - | 10:16 | 10:47 | 1.4 | 15.1 | 7.59 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 7.17 | 8.67 | 1.50 | C | 171.5 | - | - | 10:47 | 10:59 | 1.6 | 15.7 | 6.60 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 7.17 | 8.67 | 1.50 | D | 156.1 | - | - | 10:59 | 11:10 | 1.6 | 15.3 | 6.14 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 7.17 | 8.67 | 1.50 | E | 125.7 | - | - | 11:10 | 11:18 | 1.4 | 15.1 | 7.42 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 7.17 | 8.67 | 1.50 | X | 97.1 | 801.0 | 534.0 | 11:18 | 11:25 | 2.4 | 18.5 | 5.05 | 67.1 | - | 1.69 | 12.9 | 7.3 | 14.5 | |
| | | 21-Oct-10 | 3 | 9.17 | 10.17 | 1.00 | B | 146.0 | - | - | 18:28 | 18:50 | 0.7 | 9.6 | 12.12 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 9.17 | 10.17 | 1.00 | C | 172.0 | - | - | 18:50 | 19:02 | 1.7 | 14.3 | 8.89 | 51.5 | 0.0 | 1.65 | 7.0 | 9.0 | 19.0 | |
| | | 21-Oct-10 | 3 | 9.17 | 10.17 | 1.00 | D | 152.1 | - | - | 19:02 | 19:11 | 1.6 | 21.1 | 10.09 | 58.6 | 0.0 | 1.67 | 7.0 | 9.0 | 19.0 | |
| | | 21-Oct-10 | 3 | 9.17 | 10.17 | 1.00 | D+ | 132.9 | 603.0 | 603.0 | 19:11 | 19:17 | 2.0 | 22.2 | 11.39 | 72.5 | - | 1.69 | 7.0 | 9.0 | 17.0 | |
| | | 21-Oct-10 | 2 | 10.17 | 14.20 | 4.03 | A | 19.8 | 19.8 | 4.9 | 18:09 | 18:21 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 14.20 | 19.60 | 5.40 | A | 24.4 | 24.4 | 4.5 | 17:53 | 18:05 | 5.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+106.75 | Q | 20-Jun-11 | 4 | 7.22 | 8.72 | 1.50 | MF | 47.4 | 47.40 | 31.60 | 23:13 | 23:32 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 9.22 | 10.2 | 0.98 | A | 210.8 | - | - | 15:32 | 15:57 | 2.4 | 14.6 | 6.16 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 9.22 | 10.2 | 0.98 | B | 135.2 | - | - | 15:57 | 16:05 | 2.7 | 20.0 | 7.49 | - | - | - | - | - | - | |
| | | 08-Mar-11 | 3 | 9.22 | 10.2 | 0.98 | C | 121.2 | 467.20 | 476.73 | 16:05 | 16:31 | 3.0 | 0.0 | 0.00 | 48.9 | 4.0 | 1.6 | 13.1 | 22.7 | 20.6 | |
| T-31+107.5 | T | 02-Dec-10 | 4A | 7.27 | 8.77 | 1.50 | D | 80.0 | - | - | 17:43 | 19:00 | 1.4 | 2.5 | 1.13 | - | - | - | - | - | - | Communicated to T31+104.5. Split quantities. |
| | | 02-Dec-10 | 4A | 7.27 | 8.77 | 1.50 | X | 70.3 | 150.3 | 100.2 | 19:00 | 20:07 | 2.5 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.27 | 10.27 | 1.00 | B | 151.5 | - | - | 11:02 | 11:25 | 1.0 | 11.5 | 9.52 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.27 | 10.27 | 1.00 | C | 199.7 | - | - | 11:25 | 11:43 | 1.6 | 15.5 | 10.39 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.27 | 10.27 | 1.00 | D | 107.0 | - | - | 11:43 | 11:51 | 2.3 | 21.4 | 9.92 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.27 | 10.27 | 1.00 | E | 172.9 | 631.1 | 631.1 | 11:51 | 11:57 | 2.0 | 21.5 | 10.79 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 10.27 | 14.30 | 4.03 | A | 28.6 | 28.6 | 7.1 | 10:44 | 10:56 | 2.8 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 1 | 14.30 | 19.30 | 5.00 | A | 46.5 | 46.5 | 9.3 | 10:25 | 10:38 | 5.8 | 2.0 | 0.07 | - | - | - | - | - | - | |
| Q-31+108.25 | Q | 15-Jun-11 | 4 | 7.43 | 8.93 | 1.50 | MF | 60.3 | 60.30 | 40.20 | 15:59 | 16:20 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 9.43 | 10.43 | 1.00 | A | 170.2 | - | - | 11:05 | 11:28 | 1.6 | 15.8 | 8.28 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 3 | 9.43 | 10.43 | 1.00 | B | 193.2 | - | - | 11:28 | 11:39 | 2.4 | 21.9 | 7.68 | 34.4 | - | 1.6 | 6.1 | 5.9 | 6.8 | |
| | | 30-Apr-10 | 3 | 9.43 | 10.43 | 1.00 | C | 158.5 | - | - | 11:39 | 11:51 | 3.0 | 6.8 | 2.48 | 41.4 | - | 1.7 | 6.1 | 5.9 | 15.8 | |
| | | 30-Apr-10 | 3 | 9.43 | 10.43 | 1.00 | D | 58.1 | 580.00 | 580.00 | 11:51 | 12:04 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 2 | 10.43 | 14.4 | 3.97 | A | 16.3 | 16.30 | 4.11 | 10:45 | 11:28 | 2.8 | 0.6 | 0.05 | - | - | - | - | - | - | |
| | | 30-Apr-10 | 1 | 14.4 | 19.4 | 5.00 | A | 8.1 | 8.10 | 1.62 | 10:27 | 10:40 | 5.5 | 0.1 | 0.00 | 31.2 | - | 1.6 | 6.1 | 5.8 | 6.5 | |
| S-31+109 | S | 06-Nov-10 | 4 | 7.58 | 9.08 | 1.50 | B | 160.8 | - | - | 3:18 | 3:38 | 1.4 | 12.3 | 4.20 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 7.58 | 9.08 | 1.50 | C | 170.9 | - | - | 3:38 | 3:52 | 2.2 | 18.2 | 5.56 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 7.58 | 9.08 | 1.50 | D | 152.3 | - | - | 3:52 | 4:09 | 1.6 | 13.2 | 5.81 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 7.58 | 9.08 | 1.50 | E | 161.9 | - | - | 4:09 | 4:14 | 1.3 | 14.6 | 8.20 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 7.58 | 9.08 | 1.50 | X | 170.1 | 816.0 | 544.0 | 4:14 | 4:26 | 1.6 | 15.8 | 6.78 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 9.58 | 10.58 | 1.00 | B | 16.6 | 16.6 | 16.6 | 21:11 | 21:24 | 3.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 10.58 | 14.60 | 4.02 | A | 37.3 | 37.3 | 9.3 | 20:51 | 21:06 | 2.8 | 1.5 | 0.13 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 1 | 14.60 | 19.90 | 5.30 | A | 186.6 | - | - | 19:22 | 19:45 | 0.0 | 11.8 | inf | 30.8 | 4.0 | 1.60 | 5.1 | 9.5 | 15.1 | |
| | | 17-Oct-10 | 1 | 14.60 | 19.90 | 5.30 | B | 200.3 | - | - | 19:45 | 19:57 | 0.1 | 18.0 | 25.66 | 33.9 | 6.0 | 1.62 | 5.1 | 9.5 | 12.9 | |
| | | 17-Oct-10 | 1 | 14.60 | 19.90 | 5.30 | C | 455.1 | 842.0 | 158.9 | 19:57 | 20:39 | 5.6 | 5.6 | 0.19 | 84.0 | - | 1.64 | 5.1 | 9.5 | 12.5 | |
| Q-31+109.75 | Q | 20-Jun-11 | 4 | 7.49 | 8.99 | 1.50 | MF | 49.8 | 49.80 | 33.20 | 1:25 | 1:43 | 2.6 | 0.0 | 0.00 | 30.3 | - | 1.4 | - | - | - | |
| | | 09-Mar-11 | 3 | 9.49 | 10.5 | 1.01 | A | 176.3 | - | - | 7:51 | 8:17 | 3.0 | 12.6 | 5.67 | 31.2 | - | 1.5 | -3.7 | 19.7 | 20.1 | |
| | | 09-Mar-11 | 3 | 9.49 | 10.5 | 1.01 | B | 151.9 | - | - | 8:17 | 8:29 | 2.9 | 12.1 | 4.17 | 34.4 | 9.0 | 1.6 | -3.7 | 19.8 | 20.3 | |
| | | 09-Mar-11 | 3 | 9.49 | 10.5 | 1.01 | C | 180.9 | - | - | 8:29 | 8:47 | 3.0 | 8.1 | 2.69 | 46.8 | 4.0 | 1.6 | -3.9 | 19.7 | 20.6 | |
| | | 09-Mar-11 | 3 | 9.49 | 10.5 | 1.01 | D | 93.7 | 602.80 | 596.83 | 8:47 | 8:59 | 2.8 | 7.1 | 2.51 | 63.0 | - | 1.6 | -4.7 | 19.5 | 20.3 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+110.5 | T | 02-Dec-10 | 4 | 7.45 | 8.95 | 1.50 | MF | 189.9 | - | - | 15:55 | 16:19 | 0.9 | 12.7 | 9.87 | 27.5 | - | 1.59 | -9.7 | 8.6 | 11.4 | Communicated to T31+107.5 and T31+104.5 |
| | | 02-Dec-10 | 4 | 7.45 | 8.95 | 1.50 | B | 229.7 | - | - | 16:19 | 16:33 | 1.6 | 15.0 | 8.17 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 7.45 | 8.95 | 1.50 | C | 144.3 | - | - | 16:33 | 17:08 | 1.6 | 19.0 | 8.24 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 7.45 | 8.95 | 1.50 | D | 190.1 | - | - | 17:08 | 17:16 | 1.5 | 21.8 | 10.82 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 7.45 | 8.95 | 1.50 | X | 103.0 | 857.0 | 571.3 | 17:16 | 17:25 | 2.2 | 10.3 | 3.14 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.45 | 10.45 | 1.00 | B | 147.0 | - | - | 14:58 | 15:21 | 1.7 | 12.1 | 7.20 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.45 | 10.45 | 1.00 | C | 167.1 | - | - | 15:21 | 15:33 | 2.8 | 15.2 | 5.48 | 52.4 | - | 1.62 | 5.8 | 12.8 | 12.1 | |
| | | 27-Oct-10 | 3 | 9.45 | 10.45 | 1.00 | D | 140.6 | - | - | 15:33 | 15:44 | 2.8 | 12.4 | 4.64 | 79.0 | 2.0 | 1.63 | 5.1 | 12.4 | 12.5 | |
| | | 27-Oct-10 | 3 | 9.45 | 10.45 | 1.00 | E | 149.2 | 603.9 | 603.9 | 15:44 | 15:53 | 3.0 | 16.9 | 5.67 | 86.1 | - | 1.64 | 5.2 | 12.5 | 10.5 | |
| | | 27-Oct-10 | 2 | 10.45 | 14.50 | 4.05 | A | 24.4 | 24.4 | 6.0 | 14:41 | 14:53 | 2.8 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 1 | 14.50 | 19.50 | 5.00 | A | 25.4 | 25.4 | 5.1 | 14:23 | 14:37 | 5.5 | 0.0 | 0.00 | 33.9 | - | 1.60 | 5.9 | 12.7 | 19.7 | |
| Q-31+111.25 | Q | 15-Jun-11 | 4 | 7.55 | 9.05 | 1.50 | MF | 80.3 | 80.30 | 53.53 | 16:24 | 16:51 | 2.6 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 9.55 | 10.55 | 1.00 | A | 169.3 | - | - | 16:25 | 16:52 | 2.0 | 12.9 | 6.62 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 9.55 | 10.55 | 1.00 | B | 166.6 | - | - | 16:52 | 17:02 | 2.5 | 20.5 | 8.24 | 35.6 | - | 1.6 | 12.9 | 12.0 | 14.0 | |
| | | 01-May-11 | 3 | 9.55 | 10.55 | 1.00 | C | 139.2 | - | - | 17:02 | 17:11 | 2.9 | 12.1 | 3.96 | 46.2 | - | 1.6 | 12.9 | 12.0 | 13.7 | |
| | | 01-May-11 | 3 | 9.55 | 10.55 | 1.00 | D | 155.3 | 630.40 | 630.40 | 17:11 | 17:43 | 2.9 | 0.0 | 0.00 | 48.6 | - | 1.6 | 12.9 | 12.0 | 12.9 | |
| P-31+112 | P | 31-Oct-10 | 4 | 7.78 | 9.28 | 1.50 | B | 250.3 | - | - | 14:14 | 14:46 | 0.9 | 12.4 | 8.34 | 35.3 | - | 1.65 | 16.1 | 7.1 | 18.2 | |
| | | 31-Oct-10 | 4 | 7.78 | 9.28 | 1.50 | C | 182.2 | - | - | 14:46 | 15:01 | 1.3 | 12.1 | 6.17 | 45.2 | - | 1.68 | 16.1 | 9.0 | 19.1 | |
| | | 31-Oct-10 | 4 | 7.78 | 9.28 | 1.50 | D | 162.8 | - | - | 15:01 | 15:15 | 0.9 | 12.1 | 8.67 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 7.78 | 9.28 | 1.50 | E | 61.6 | - | - | 15:15 | 15:20 | 1.3 | 11.7 | 5.96 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 7.78 | 9.28 | 1.50 | X | 159.1 | 816.0 | 544.0 | 15:20 | 15:34 | 1.7 | 10.9 | 4.17 | 112.0 | 0.0 | 1.69 | 11.8 | 11.3 | 17.6 | |
| | | 21-Oct-10 | 3 | 9.78 | 10.78 | 1.00 | A | 23.4 | 23.4 | 23.4 | 20:44 | 21:03 | 3.5 | 0.6 | 0.17 | 30.8 | 4.4 | 1.63 | 7.0 | 8.0 | 15.0 | |
| | | 21-Oct-10 | 2 | 10.78 | 14.80 | 4.02 | A | 25.4 | 25.4 | 6.3 | 20:29 | 20:41 | 3.0 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 14.80 | 20.00 | 5.20 | A | 22.9 | 22.9 | 4.4 | 20:13 | 20:26 | 5.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+113.5 | T | 10-Dec-10 | 4 | 8.65 | 10.15 | 1.50 | MF | 160.7 | - | - | 16:33 | 16:57 | 1.4 | 15.6 | 7.36 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 8.65 | 10.15 | 1.50 | B | 178.7 | - | - | 16:57 | 17:08 | 2.1 | 23.5 | 7.01 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 8.65 | 10.15 | 1.50 | C | 150.4 | - | - | 17:08 | 17:16 | 2.0 | 18.3 | 6.23 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 8.65 | 10.15 | 1.50 | D | 121.9 | 611.7 | 407.8 | 17:16 | 17:46 | 2.4 | 0.0 | 0.00 | 51.5 | - | 1.68 | -16.2 | 8.6 | 15.2 | |
| | | 27-Oct-10 | 3 | 10.65 | 11.65 | 1.00 | A | 15.4 | 15.4 | 15.4 | 16:41 | 16:54 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 11.65 | 15.60 | 3.95 | A | 23.1 | 23.1 | 5.8 | 16:24 | 16:37 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 1 | 15.60 | 20.70 | 5.10 | A | 21.9 | 21.9 | 4.3 | 16:07 | 16:20 | 5.5 | 0.1 | 0.00 | - | - | - | - | - | - | |
| S-31+115 | S | 06-Nov-10 | 4 | 8.80 | 10.30 | 1.50 | B | 146.9 | - | - | 5:15 | 5:35 | 1.6 | 12.0 | 10.03 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 8.80 | 10.30 | 1.50 | C | 171.0 | - | - | 5:35 | 5:45 | 1.5 | 18.9 | 6.69 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 8.80 | 10.30 | 1.50 | D | 169.4 | - | - | 5:45 | 5:55 | 1.5 | 17.3 | 10.65 | 46.3 | - | 1.62 | -2.8 | 8.1 | 12.6 | |
| | | 06-Nov-10 | 4 | 8.80 | 10.30 | 1.50 | E | 167.6 | - | - | 5:55 | 6:05 | 1.5 | 17.6 | 7.90 | 52.0 | - | 1.62 | -2.8 | 8.1 | 12.3 | |
| | | 06-Nov-10 | 4 | 8.80 | 10.30 | 1.50 | X | 159.1 | 814.0 | 542.7 | 6:05 | 6:13 | 1.9 | 18.9 | 6.65 | 120.6 | - | 1.63 | -2.8 | 8.1 | 12.3 | |
| | | 17-Oct-10 | 3 | 10.80 | 11.80 | 1.00 | B | 11.5 | 11.5 | 11.5 | 0:56 | 1:09 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 11.80 | 15.80 | 4.00 | A | 205.1 | - | - | 21:56 | 22:27 | 1.0 | 12.1 | 2.64 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 11.80 | 15.80 | 4.00 | B | 266.0 | - | - | 22:27 | 22:46 | 2.6 | 18.9 | 1.81 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 11.80 | 15.80 | 4.00 | C | 248.0 | - | - | 22:46 | 22:57 | 2.6 | 18.5 | 1.81 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 11.80 | 15.80 | 4.00 | D | 227.9 | - | - | 22:57 | 23:16 | 2.7 | 11.6 | 1.13 | 52.7 | 3.0 | 1.62 | 5.1 | 6.2 | 11.5 | |
| | | 17-Oct-10 | 2 | 11.80 | 15.80 | 4.00 | D+ | 251.0 | - | - | 23:16 | 23:43 | 2.7 | 7.3 | 0.65 | 120.0 | 0.0 | 1.65 | 5.1 | 6.2 | 13.6 | |
| | | 17-Oct-10 | 2 | 11.80 | 15.80 | 4.00 | E | 322.0 | 1520.0 | 380.0 | 23:43 | 0:47 | 2.8 | 2.2 | 0.20 | 67.7 | - | 1.60 | 5.1 | 6.2 | 13.0 | |
| | | 17-Oct-10 | 1 | 15.80 | 21.40 | 5.60 | A | 22.7 | 22.7 | 4.1 | 21:38 | 21:51 | 5.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+115.75 | Q | 20-Jun-11 | 4 | 8.73 | 10.23 | 1.50 | MF | 17.9 | 17.90 | 11.93 | 1:46 | 1:58 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 10.73 | 11.7 | 0.97 | A | 172.1 | - | - | 9:15 | 9:36 | 3.0 | 13.5 | 5.17 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 10.73 | 11.7 | 0.97 | B | 171 | - | - | 9:36 | 9:50 | 2.9 | 10.4 | 3.52 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 10.73 | 11.7 | 0.97 | C | 165.5 | - | - | 9:50 | 10:15 | 2.9 | 2.6 | 0.98 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 10.73 | 11.7 | 0.97 | D | 22 | 530.60 | 547.01 | 10:15 | 10:35 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+116.5 | T | 02-Dec-10 | 4 | 8.77 | 10.27 | 1.50 | MF | 175.0 | - | - | 14:19 | 14:42 | 0.9 | 12.8 | 10.60 | 29.8 | - | 1.60 | -9.1 | 10.1 | 13.1 | |
| | | 02-Dec-10 | 4 | 8.77 | 10.27 | 1.50 | B | 193.4 | - | - | 14:42 | 14:54 | 1.0 | 18.1 | 11.81 | 37.3 | 6.0 | 1.62 | -9.2 | 10.1 | 12.1 | |
| | | 02-Dec-10 | 4 | 8.77 | 10.27 | 1.50 | C | 185.5 | - | - | 14:54 | 15:04 | 1.7 | 20.1 | 9.16 | 49.7 | - | 1.64 | -9.7 | 10.1 | 12.4 | |
| | | 02-Dec-10 | 4 | 8.77 | 10.27 | 1.50 | D | 189.3 | - | - | 15:04 | 15:17 | 2.3 | 18.6 | 3.78 | 79.8 | - | 1.69 | -9.7 | 10.1 | 13.6 | |
| | | 02-Dec-10 | 4 | 8.77 | 10.27 | 1.50 | X | 33.8 | 777.0 | 518.0 | 15:17 | 15:34 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 10.77 | 11.77 | 1.00 | A | 177.4 | - | - | 17:48 | 18:13 | 1.5 | 11.8 | 7.41 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 10.77 | 11.77 | 1.00 | B | 171.7 | - | - | 18:13 | 18:24 | 2.9 | 16.4 | 5.56 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 10.77 | 11.77 | 1.00 | C | 257.4 | 606.5 | 606.5 | 18:24 | 18:43 | 2.7 | 16.3 | 5.99 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 11.77 | 15.80 | 4.03 | A | 68.4 | 68.4 | 17.0 | 17:24 | 17:44 | 2.8 | 0.6 | 0.05 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 1 | 15.80 | 21.40 | 5.60 | A | 41.8 | 41.8 | 7.5 | 17:04 | 17:19 | 5.8 | 0.4 | 0.01 | - | - | - | - | - | - | |
| Q-31+117.25 | Q | 15-Jun-11 | 4 | 8.54 | 10.04 | 1.50 | MF | 63 | 63.00 | 42.00 | 16:54 | 17:15 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-May-11 | 3 | 10.54 | 11.5 | 0.96 | A | 169.1 | - | - | 10:08 | 10:37 | 2.3 | 11.7 | 4.53 | 30.2 | 4.0 | 1.6 | 21.9 | 21.7 | 23.6 | |
| | | 11-May-11 | 3 | 10.54 | 11.5 | 0.96 | B | 150.2 | - | - | 10:37 | 10:46 | 3.2 | 19.5 | 6.57 | 35.6 | - | 1.6 | 15.6 | 18.2 | 24.1 | |
| | | 11-May-11 | 3 | 10.54 | 11.5 | 0.96 | C | 159.7 | - | - | 10:46 | 11:01 | 2.9 | 6.2 | 2.04 | 44.8 | - | 1.6 | 15.6 | 18.2 | 25.4 | |
| | | 11-May-11 | 3 | 10.54 | 11.5 | 0.96 | D | 8.4 | 487.40 | 507.71 | 11:01 | 11:14 | 3.1 | 0.0 | 0.00 | 60.2 | - | 1.6 | 15.5 | 18.3 | 25.8 | |
| P-31+118 | P | 31-Oct-10 | 4 | 8.47 | 9.97 | 1.50 | B | 254.7 | - | - | 15:57 | 16:29 | 1.7 | 15.3 | 6.20 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 8.47 | 9.97 | 1.50 | C | 154.2 | - | - | 16:29 | 16:39 | 1.7 | 15.2 | 6.03 | 54.0 | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 8.47 | 9.97 | 1.50 | D | 182.9 | - | - | 16:39 | 16:51 | 2.0 | 15.1 | 5.36 | 70.0 | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 8.47 | 9.97 | 1.50 | E | 123.7 | - | - | 16:51 | 17:00 | 1.7 | 15.6 | 6.13 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 8.47 | 9.97 | 1.50 | X | 99.5 | 815.0 | 543.3 | 17:00 | 17:07 | 3.2 | 23.1 | 4.86 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 10.47 | 11.47 | 1.00 | A | 63.2 | - | - | 21:53 | 22:06 | 0.6 | 5.8 | 13.05 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 10.47 | 11.47 | 1.00 | B | 101.6 | - | - | 22:06 | 22:17 | 1.0 | 12.6 | 13.43 | 34.6 | 6.0 | 1.62 | 7.0 | 8.0 | 16.0 | |
| | | 21-Oct-10 | 3 | 10.47 | 11.47 | 1.00 | C | 159.9 | - | - | 22:17 | 22:29 | 1.4 | 16.0 | 11.25 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 10.47 | 11.47 | 1.00 | D | 161.2 | - | - | 22:29 | 22:37 | 2.2 | 21.9 | 9.46 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 10.47 | 11.47 | 1.00 | D+ | 140.5 | 626.4 | 626.4 | 22:37 | 22:43 | 2.6 | 25.8 | 9.91 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 11.47 | 15.50 | 4.03 | A | 20.6 | 20.6 | 5.1 | 21:38 | 21:50 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 15.50 | 20.50 | 5.00 | A | 41.3 | 41.3 | 8.3 | 21:19 | 21:33 | 5.5 | 1.8 | 0.07 | - | - | - | - | - | - | |
| T-31+119.5 | T | 11-Dec-10 | 4 | 8.16 | 9.66 | 1.50 | MF | 181.0 | - | - | 6:55 | 7:24 | 1.3 | 9.5 | 5.46 | 31.4 | 2.0 | 1.49 | 14.1 | 9.2 | 20.2 | |
| | | 11-Dec-10 | 4 | 8.16 | 9.66 | 1.50 | B | 160.8 | - | - | 7:24 | 8:01 | 1.7 | 12.6 | 5.12 | 37.3 | 2.0 | 1.63 | 8.5 | 9.1 | 18.0 | |
| | | 11-Dec-10 | 4 | 8.16 | 9.66 | 1.50 | C | 159.3 | - | - | 8:01 | 8:13 | 1.9 | 19.1 | 6.84 | 47.2 | - | 1.65 | 8.4 | 9.1 | 17.7 | |
| | | 11-Dec-10 | 4 | 8.16 | 9.66 | 1.50 | D | 167.2 | - | - | 8:13 | 8:21 | 2.1 | 21.6 | 7.17 | 66.3 | - | 1.66 | 8.5 | 9.0 | 18.7 | |
| | | 11-Dec-10 | 4 | 8.16 | 9.66 | 1.50 | X | 51.4 | 719.7 | 479.8 | 8:21 | 8:39 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 10.16 | 11.16 | 1.00 | A | 29.2 | - | - | 19:38 | 19:45 | 1.1 | 5.5 | 3.64 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 10.16 | 11.16 | 1.00 | B | 129.8 | - | - | 19:45 | 20:09 | 2.9 | 3.9 | 1.41 | 35.9 | 3.0 | 1.65 | 5.0 | 10.0 | 17.5 | |
| | | 27-Oct-10 | 3 | 10.16 | 11.16 | 1.00 | C | 160.2 | - | - | 20:09 | 20:43 | 3.1 | 5.8 | 2.03 | 37.9 | 4.0 | 1.59 | 5.0 | 10.0 | 15.5 | |
| | | 27-Oct-10 | 3 | 10.16 | 11.16 | 1.00 | D | 67.0 | 386.2 | 386.2 | 20:43 | 21:32 | 3.1 | 0.0 | 0.00 | 64.0 | - | 1.70 | 5.0 | 10.0 | 18.0 | |
| | | 27-Oct-10 | 2 | 11.16 | 15.20 | 4.04 | A | 22.8 | 22.8 | 5.6 | 19:20 | 19:33 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 1 | 15.20 | 20.20 | 5.00 | A | 26.9 | 26.9 | 5.4 | 19:02 | 19:14 | 5.6 | 0.6 | 0.02 | - | - | - | - | - | - | |
| S-31+121 | S | 07-Nov-10 | 4 | 8.04 | 9.54 | 1.50 | B | 242.6 | - | - | 6:48 | 7:23 | 2.0 | 11.9 | 4.05 | 36.6 | 2.0 | 1.61 | 3.5 | 12.4 | 13.9 | |
| | | 07-Nov-10 | 4 | 8.04 | 9.54 | 1.50 | C | 151.0 | - | - | 7:23 | 7:36 | 1.8 | 12.0 | 4.33 | 40.8 | 3.0 | 1.62 | 3.6 | 9.8 | 13.8 | |
| | | 07-Nov-10 | 4 | 8.04 | 9.54 | 1.50 | D | 215.8 | - | - | 7:36 | 7:54 | 2.6 | 12.0 | 3.12 | 47.7 | - | 1.63 | 3.8 | 6.1 | 14.5 | |
| | | 07-Nov-10 | 4 | 8.04 | 9.54 | 1.50 | E | 87.9 | - | - | 7:54 | 8:01 | 2.2 | 12.0 | 3.72 | >120 | - | - | 5.3 | 9.1 | 14.2 | |
| | | 07-Nov-10 | 4 | 8.04 | 9.54 | 1.50 | X | 121.7 | 819.0 | 546.0 | 8:01 | 8:11 | 2.4 | 13.0 | 3.67 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 10.04 | 11.04 | 1.00 | A | 46.7 | - | - | 4:01 | 4:09 | 0.0 | 6.5 | inf | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 10.04 | 11.04 | 1.00 | B | 188.8 | - | - | 4:09 | 4:26 | 1.0 | 16.3 | 16.68 | 32.4 | - | 1.60 | -1.3 | 7.7 | 13.7 | |
| | | 17-Oct-10 | 3 | 10.04 | 11.04 | 1.00 | C | 181.5 | - | - | 4:26 | 4:36 | 1.7 | 15.3 | 13.65 | 66.9 | - | 1.64 | -1.3 | 7.7 | 10.7 | |
| | | 17-Oct-10 | 3 | 10.04 | 11.04 | 1.00 | D | 143.8 | - | - | 4:36 | 4:43 | 1.7 | 21.5 | 12.91 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 10.04 | 11.04 | 1.00 | D+ | 65.8 | 626.6 | 626.6 | 4:43 | 4:46 | 1.8 | 21.2 | 11.66 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 11.04 | 15.00 | 3.96 | A | 23.0 | 23.0 | 5.8 | 3:43 | 3:55 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 1 | 15.00 | 20.20 | 5.20 | A | 44.0 | 44.0 | 8.5 | 3:25 | 3:38 | 5.6 | 2.4 | 0.08 | 31.6 | - | 1.60 | -1.3 | 7.7 | 13.5 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+121.75 | Q | 20-Jun-11 | 4 | 7.43 | 8.93 | 1.50 | MF | 51 | 51.00 | 34.00 | 2:00 | 2:19 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 9.43 | 10.4 | 0.97 | A | 144.3 | - | - | 10:55 | 11:14 | 1.9 | 12.9 | 6.04 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 9.43 | 10.4 | 0.97 | B | 164.8 | - | - | 11:14 | 11:24 | 2.6 | 19.3 | 8.95 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 9.43 | 10.4 | 0.97 | C | 186.4 | - | - | 11:24 | 11:34 | 2.6 | 19.8 | 7.58 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 9.43 | 10.4 | 0.97 | D | 101.9 | 597.40 | 615.88 | 11:34 | 11:40 | 3.2 | 26.0 | 8.31 | - | - | - | - | - | - | |
| T-31+122.5 | T | 02-Dec-10 | 4 | 7.43 | 8.93 | 1.50 | MF | 187.0 | - | - | 10:36 | 11:01 | 0.8 | 14.0 | 10.23 | 30.1 | 3.0 | - | -9.6 | 9.1 | 13.2 | |
| | | 02-Dec-10 | 4 | 7.43 | 8.93 | 1.50 | B | 184.2 | - | - | 11:01 | 11:12 | 0.9 | 18.3 | 13.92 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 7.43 | 8.93 | 1.50 | C | 162.4 | - | - | 11:12 | 11:26 | 1.3 | 19.4 | 8.71 | 42.4 | - | 1.63 | -9.6 | 9.1 | 12.9 | |
| | | 02-Dec-10 | 4 | 7.43 | 8.93 | 1.50 | D | 196.6 | - | - | 11:26 | 11:38 | 2.2 | 15.5 | 5.07 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 7.43 | 8.93 | 1.50 | X | 48.4 | 778.6 | 519.1 | 11:38 | 11:57 | 2.8 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.43 | 10.43 | 1.00 | A | 32.5 | - | - | 23:11 | 23:18 | 1.2 | 7.5 | 5.84 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.43 | 10.43 | 1.00 | B | 137.9 | - | - | 23:18 | 23:32 | 1.4 | 15.6 | 11.51 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.43 | 10.43 | 1.00 | C | 161.2 | - | - | 23:32 | 23:42 | 1.7 | 18.9 | 11.78 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.43 | 10.43 | 1.00 | D | 159.3 | - | - | 23:42 | 23:49 | 1.7 | 25.0 | 11.50 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.43 | 10.43 | 1.00 | E | 120.9 | 611.8 | 611.8 | 23:49 | 23:54 | 2.3 | 28.5 | 12.34 | 78.6 | 2.0 | 1.69 | 5.0 | 9.0 | 15.0 | |
| | | 27-Oct-10 | 2 | 10.43 | 14.40 | 3.97 | A | 27.9 | 27.9 | 7.0 | 22:53 | 23:05 | 2.7 | 0.4 | 0.03 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 1 | 14.40 | 19.40 | 5.00 | A | 22.3 | 22.3 | 4.5 | 22:36 | 22:48 | 5.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+123.25 | Q | 15-Jun-11 | 4 | 7.36 | 8.86 | 1.50 | MF | 59.9 | 59.90 | 39.93 | 17:16 | 17:39 | 2.5 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 9.36 | 10.36 | 1.00 | A | 152.2 | - | - | 8:42 | 9:04 | 2.0 | 12.2 | 6.36 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 9.36 | 10.36 | 1.00 | B | 166.6 | - | - | 9:04 | 9:17 | 2.4 | 12.6 | 6.24 | 33.4 | - | 1.6 | 4.7 | 4.9 | 12.9 | |
| | | 01-May-11 | 3 | 9.36 | 10.36 | 1.00 | C | 166.9 | - | - | 9:17 | 9:27 | 2.2 | 4.1 | 2.15 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 9.36 | 10.36 | 1.00 | D | 143 | - | - | 9:27 | 9:43 | 2.7 | 10.9 | 4.21 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 9.36 | 10.36 | 1.00 | X | 21.2 | 649.90 | 649.90 | 9:43 | 9:58 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| P-31+124 | P | 31-Oct-10 | 4 | 7.48 | 8.98 | 1.50 | B | 254.5 | - | - | 17:22 | 17:53 | 1.8 | 15.1 | 5.58 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 7.48 | 8.98 | 1.50 | C | 155.2 | - | - | 17:53 | 18:04 | 2.1 | 15.4 | 4.89 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 7.48 | 8.98 | 1.50 | D | 178.7 | - | - | 18:04 | 18:16 | 2.3 | 14.9 | 4.22 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 7.48 | 8.98 | 1.50 | E | 213.6 | 802.0 | 534.7 | 18:16 | 18:30 | 2.1 | 20.6 | 6.47 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 9.48 | 10.48 | 1.00 | B | 115.1 | - | - | 0:09 | 0:20 | 0.8 | 13.0 | 15.87 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 9.48 | 10.48 | 1.00 | C | 162.1 | - | - | 0:20 | 0:31 | 1.7 | 18.5 | 13.14 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 9.48 | 10.48 | 1.00 | D | 171.4 | - | - | 0:31 | 0:39 | 3.7 | 17.7 | 5.46 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 9.48 | 10.48 | 1.00 | E | 110.2 | 606.7 | 606.7 | 0:39 | 0:49 | 3.5 | 12.9 | 3.71 | 86.5 | - | 1.70 | 7.0 | 7.0 | 17.0 | |
| | | 21-Oct-10 | 3 | 9.48 | 10.48 | 1.00 | A | 47.9 | - | - | 23:59 | 0:09 | 0.5 | 5.9 | 12.33 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 10.48 | 14.50 | 4.02 | A | 45.3 | 45.3 | 11.3 | 23:39 | 23:54 | 2.5 | 1.0 | 0.10 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 14.50 | 19.00 | 4.50 | A | 36.4 | 36.4 | 8.1 | 23:16 | 23:31 | 5.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+124.75 | Q | 20-Jun-11 | 4 | 7.31 | 8.81 | 1.50 | MF | 48.6 | 48.60 | 32.40 | 2:23 | 2:41 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 9.31 | 10.4 | 1.09 | A | 163.9 | - | - | 14:08 | 14:29 | 1.8 | 12.2 | 6.07 | 31.2 | 3.0 | 1.6 | -15.5 | 15.5 | 18.3 | |
| | | 09-Mar-11 | 3 | 9.31 | 10.4 | 1.09 | B | 178.7 | - | - | 14:29 | 14:41 | 2.7 | 18.4 | 6.11 | 36.5 | - | 1.6 | -15.1 | 15.6 | 19.5 | |
| | | 09-Mar-11 | 3 | 9.31 | 10.4 | 1.09 | C | 186.9 | - | - | 14:41 | 14:51 | 2.7 | 18.1 | 6.32 | 45.2 | - | 1.6 | -14.8 | 15.6 | 20.3 | |
| | | 09-Mar-11 | 3 | 9.31 | 10.4 | 1.09 | D | 73.7 | 603.20 | 553.39 | 14:51 | 14:55 | 2.8 | 17.5 | 5.64 | - | - | - | - | - | - | |
| T-31+125.5 | T | 11-Dec-10 | 4 | 7.22 | 8.72 | 1.50 | MF | 182.2 | - | - | 9:03 | 9:30 | 1.6 | 15.2 | 6.61 | - | - | - | 8.2 | - | - | |
| | | 11-Dec-10 | 4 | 7.22 | 8.72 | 1.50 | B | 160.9 | - | - | 9:30 | 9:39 | 1.9 | 18.0 | 7.07 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 7.22 | 8.72 | 1.50 | C | 163.3 | - | - | 9:39 | 9:47 | 2.1 | 21.5 | 6.89 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 7.22 | 8.72 | 1.50 | D | 149.3 | - | - | 9:47 | 9:54 | 2.6 | 19.0 | 4.86 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 7.22 | 8.72 | 1.50 | X | 10.5 | 666.2 | 444.1 | 9:54 | 10:07 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.22 | 10.22 | 1.00 | A | 57.7 | - | - | 3:30 | 3:40 | 0.5 | 6.6 | 14.39 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.22 | 10.22 | 1.00 | B | 105.4 | - | - | 3:40 | 3:50 | 1.1 | 13.8 | 14.20 | 36.1 | - | 1.62 | 3.5 | 9.0 | 15.5 | |
| | | 27-Oct-10 | 3 | 9.22 | 10.22 | 1.00 | C | 160.4 | - | - | 3:50 | 4:01 | 1.3 | 18.9 | 13.95 | 42.4 | - | 1.62 | 6.0 | 9.0 | 15.0 | |
| | | 27-Oct-10 | 3 | 9.22 | 10.22 | 1.00 | D | 155.1 | - | - | 4:01 | 4:09 | 1.7 | 23.2 | 13.32 | 53.1 | 1.6 | 1.68 | 6.0 | 9.0 | 16.5 | |
| | | 27-Oct-10 | 3 | 9.22 | 10.22 | 1.00 | E | 140.7 | 619.3 | 619.3 | 4:09 | 4:15 | 2.2 | 24.9 | 11.55 | >120 | - | 1.72 | 6.0 | 9.0 | 13.5 | |
| | | 27-Oct-10 | 2 | 10.22 | 14.20 | 3.98 | A | 23.9 | 23.9 | 6.0 | 3:12 | 3:25 | 2.8 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 1 | 14.20 | 19.40 | 5.20 | A | 47.6 | 47.6 | 9.2 | 2:52 | 3:06 | 5.7 | 1.4 | 0.05 | 32.6 | 3.4 | 1.63 | 3.5 | 9.0 | 14.5 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+126.25 | Q | 15-Jun-11 | 4 | 7.38 | 8.88 | 1.50 | MF | 182.6 | - | - | 19:05 | 19:29 | 2.5<br>2.3 | 12.8 | 3.27 | 30.4 | 4.0 | 1.4 | 8.5 | 10.5 | 12.4 | Communicated to Q-31+132.25 |
| | | 15-Jun-11 | 4 | 7.38 | 8.88 | 1.50 | B | 182.5 | - | - | 19:29 | 19:42 | 2.5 | 14.8 | 3.79 | 36.7 | - | 1.6 | 7.9 | 10.5 | 12.8 | |
| | | 15-Jun-11 | 4 | 7.38 | 8.88 | 1.50 | C | 96.1 | 461.20 | 307.47 | 19:42 | 20:08 | 2.5 | 0.0 | 0.00 | 46.7 | - | 1.6 | 8.1 | 9.9 | 11.9 | |
| | | 01-May-11 | 3 | 9.38 | 10.38 | 1.00 | A | 167.7 | - | - | 7:15 | 7:37 | 1.9 | 10.4 | 5.17 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 9.38 | 10.38 | 1.00 | B | 170.1 | - | - | 7:37 | 7:49 | 1.9 | 16.4 | 8.94 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 9.38 | 10.38 | 1.00 | C | 186.4 | - | - | 7:49 | 7:59 | 2.0 | 18.5 | 9.16 | 42.2 | - | 1.6 | 4.5 | 4.9 | 14.4 | |
| | | 01-May-11 | 3 | 9.38 | 10.38 | 1.00 | D | 136.2 | - | - | 7:59 | 8:07 | 2.5 | 11.8 | 3.80 | 45.6 | - | 1.6 | 7.2 | 9.4 | 12.5 | |
| | | 01-May-11 | 3 | 9.38 | 10.38 | 1.00 | X | 24.2 | 684.60 | 684.60 | 8:07 | 8:23 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 10.38 | 14.4 | 4.02 | A | 13.1 | 13.10 | 3.26 | 6:54 | 7:12 | 2.8 | 0.1 | 0.01 | 33.2 | - | 1.6 | 12.0 | 12.9 | 17.8 | |
| S-31+127 | S | 07-Nov-10 | 4 | 7.37 | 8.87 | 1.50 | B | 255.9 | - | - | 8:37 | 9:07 | 1.7 | 15.3 | 6.05 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.37 | 8.87 | 1.50 | C | 145.6 | - | - | 9:07 | 9:17 | 1.5 | 15.9 | 8.58 | 43.0 | - | 1.63 | 3.9 | 10.8 | 15.7 | |
| | | 07-Nov-10 | 4 | 7.37 | 8.87 | 1.50 | D | 184.9 | - | - | 9:17 | 9:30 | 2.2 | 14.5 | 4.49 | 47.9 | - | 1.64 | 2.7 | 9.0 | 15.0 | |
| | | 07-Nov-10 | 4 | 7.37 | 8.87 | 1.50 | E | 110.7 | - | - | 9:30 | 9:38 | 2.0 | 14.3 | 4.43 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.37 | 8.87 | 1.50 | X | 119.9 | 817.0 | 544.7 | 9:38 | 9:47 | 2.8 | 13.5 | 3.19 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 9.35 | 10.35 | 1.00 | B | 159.0 | - | - | 7:28 | 7:55 | 0.7 | 3.7 | 5.67 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 9.35 | 10.35 | 1.00 | C | 191.3 | - | - | 7:55 | 8:24 | 1.2 | 12.8 | 10.57 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 9.35 | 10.35 | 1.00 | D | 130.2 | - | - | 8:24 | 8:33 | 2.2 | 19.0 | 7.95 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 9.35 | 10.35 | 1.00 | D+ | 124.2 | 604.7 | 604.7 | 8:33 | 8:39 | 2.4 | 19.3 | 8.21 | 75.3 | - | 1.65 | 0.2 | 6.5 | 13.5 | |
| | | 17-Oct-10 | 2 | 10.35 | 14.30 | 3.95 | A | 210.9 | - | - | 5:37 | 5:58 | 1.6 | 15.6 | 2.65 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 10.35 | 14.30 | 3.95 | B | 210.1 | - | - | 5:58 | 6:10 | 2.0 | 21.5 | 2.81 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 10.35 | 14.30 | 3.95 | C | 179.7 | - | - | 6:10 | 6:17 | 2.8 | 21.8 | 2.03 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 10.35 | 14.30 | 3.95 | D | 221.3 | - | - | 6:17 | 6:35 | 2.5 | 10.0 | 0.98 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 10.35 | 14.30 | 3.95 | D+ | 175.0 | 997.0 | 252.4 | 6:35 | 7:23 | 2.8 | 2.4 | 0.22 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 1 | 14.30 | 19.60 | 5.30 | A | 23.4 | 23.4 | 4.4 | 5:18 | 5:31 | 5.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+127.75 | Q | 20-Jun-11 | 4 | 7.76 | 9.26 | 1.50 | MF | 49.6 | 49.60 | 33.07 | 2:45 | 3:04 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 9.76 | 10.8 | 1.04 | A | 24.2 | 24.20 | 23.27 | 15:13 | 15:30 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| T-31+128.5 | T | 02-Dec-10 | 4 | 7.35 | 8.85 | 1.50 | MF | 177.7 | - | - | 9:13 | 9:36 | 0.9 | 14.9 | 12.48 | 30.7 | - | 1.60 | -9.4 | 9.6 | 12.8 | |
| | | 02-Dec-10 | 4 | 7.35 | 8.85 | 1.50 | B | 227.0 | - | - | 9:36 | 9:49 | 1.0 | 19.7 | 14.17 | 34.0 | - | 1.61 | -9.4 | 9.6 | 13.1 | |
| | | 02-Dec-10 | 4 | 7.35 | 8.85 | 1.50 | C | 151.7 | - | - | 9:49 | 9:58 | 1.3 | 18.2 | 9.88 | 46.3 | - | - | -9.4 | 9.6 | 12.9 | |
| | | 02-Dec-10 | 4 | 7.35 | 8.85 | 1.50 | D | 165.1 | - | - | 9:58 | 10:08 | 1.8 | 14.0 | 5.17 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 7.35 | 8.85 | 1.50 | X | 91.5 | 813.0 | 542.0 | 10:08 | 10:16 | 2.7 | 0.7 | 0.17 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.35 | 10.35 | 1.00 | A | 66.0 | - | - | 5:02 | 5:13 | 0.9 | 9.2 | 11.58 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.35 | 10.35 | 1.00 | B | 94.8 | - | - | 5:13 | 5:22 | 1.3 | 12.2 | 9.87 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.35 | 10.35 | 1.00 | C | 163.0 | - | - | 5:22 | 5:31 | 1.7 | 18.4 | 10.71 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.35 | 10.35 | 1.00 | D | 160.6 | - | - | 5:31 | 5:39 | 2.2 | 24.8 | 11.56 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.35 | 10.35 | 1.00 | E | 122.2 | 606.6 | 606.6 | 5:39 | 5:44 | 2.7 | 28.8 | 10.70 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 10.35 | 14.30 | 3.95 | A | 43.4 | 43.4 | 11.0 | 4:48 | 5:00 | 3.0 | 1.2 | 0.10 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 1 | 14.30 | 19.50 | 5.20 | A | 24.7 | 24.7 | 4.8 | 4:29 | 4:43 | 5.6 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-31+129.25 | Q | 15-Jun-11 | 4 | 7.78 | 9.28 | 1.50 | MF | 181.4 | - | - | 20:13 | 20:51 | 2.4 | 11.7 | 3.13 | - | - | - | - | - | - | Communicated to Q-31+126.25 |
| | | 15-Jun-11 | 4 | 7.78 | 9.28 | 1.50 | B | 89.8 | 271.20 | 180.80 | 20:51 | 21:16 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | and Q-31+132.25 |
| | | 02-May-11 | 3 | 9.78 | 10.78 | 1.00 | A | 18.8 | 18.80 | 18.80 | 7:06 | 7:19 | 3.0 | 0.6 | 0.20 | 30.1 | - | 1.6 | -1.7 | 5.6 | 15.2 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+130 | P | 31-Oct-10 | 4 | 7.96 | 9.46 | 1.50 | B | 163.1 | - | - | 21:00 | 21:21 | 0.5 | 12.7 | 18.01 | 35.5 | 4.0 | 1.65 | -4.0 | 5.0 | 11.0 | |
| | | 31-Oct-10 | 4 | 7.96 | 9.46 | 1.50 | C | 180.0 | - | - | 21:21 | 21:32 | 1.0 | 18.9 | 10.28 | 66.7 | 1.0 | 1.65 | -4.0 | 5.0 | 12.0 | |
| | | 31-Oct-10 | 4 | 7.96 | 9.46 | 1.50 | D | 174.1 | - | - | 21:32 | 21:41 | 1.3 | 21.5 | 10.31 | 68.3 | - | 1.66 | -4.0 | 5.0 | 12.0 | |
| | | 31-Oct-10 | 4 | 7.96 | 9.46 | 1.50 | E | 168.3 | - | - | 21:41 | 21:49 | 1.6 | 23.1 | 12.45 | 70.0 | - | 1.67 | -4.0 | 5.0 | 12.0 | |
| | | 31-Oct-10 | 4 | 7.96 | 9.46 | 1.50 | X | 138.5 | 824.0 | 549.3 | 21:49 | 21:55 | 1.6 | 24.2 | 9.98 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 9.96 | 10.96 | 1.00 | A | 79.0 | - | - | 3:56 | 4:11 | 0.6 | 9.5 | 15.66 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 9.96 | 10.96 | 1.00 | B | 95.2 | - | - | 4:11 | 4:20 | 0.9 | 12.3 | 14.29 | 34.0 | - | 1.62 | 15.0 | 7.0 | 16.0 | |
| | | 21-Oct-10 | 3 | 9.96 | 10.96 | 1.00 | C | 149.2 | - | - | 4:20 | 4:30 | 1.5 | 18.2 | 14.05 | 46.8 | - | 1.62 | 15.0 | 7.0 | 13.5 | |
| | | 21-Oct-10 | 3 | 9.96 | 10.96 | 1.00 | D | 195.1 | - | - | 4:30 | 4:39 | 2.7 | 24.1 | 8.84 | 70.3 | - | 1.69 | 15.0 | 7.0 | 16.0 | |
| | | 21-Oct-10 | 3 | 9.96 | 10.96 | 1.00 | E | 112.8 | 631.3 | 631.3 | 4:39 | 4:43 | 2.9 | 26.9 | 9.17 | 84.8 | - | 1.70 | 15.0 | 7.0 | 16.0 | |
| | | 21-Oct-10 | 2 | 10.96 | 15.00 | 4.04 | A | 24.2 | 24.2 | 6.0 | 3:41 | 3:53 | 2.4 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 15.00 | 20.00 | 5.00 | A | 35.8 | 35.8 | 7.2 | 3:17 | 3:36 | 5.5 | 0.5 | 0.02 | 31.2 | - | 1.62 | 15.0 | 7.0 | 17.0 | |
| Q-31+130.75 | Q | 20-Jun-11 | 4 | 8.49 | 9.99 | 1.50 | MF | 58.1 | 58.10 | 38.73 | 3:07 | 3:27 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 10.49 | 11.5 | 1.01 | A | 163.4 | - | - | 15:51 | 16:13 | 1.9 | 13.1 | 6.39 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 10.49 | 11.5 | 1.01 | B | 162.9 | - | - | 16:13 | 16:24 | 2.5 | 19.2 | 8.24 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 10.49 | 11.5 | 1.01 | C | 176.1 | - | - | 16:24 | 16:33 | 2.5 | 19.1 | 7.05 | - | - | - | - | - | - | |
| | | 09-Mar-11 | 3 | 10.49 | 11.5 | 1.01 | D | 95.9 | 598.30 | 592.38 | 16:33 | 17:05 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+131.5 | T | 11-Dec-10 | 4 | 8.49 | 9.99 | 1.50 | MF | 162.5 | - | - | 13:58 | 14:37 | 2.4 | 10.4 | 5.17 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 8.49 | 9.99 | 1.50 | B | 177.7 | - | - | 14:37 | 14:50 | 1.9 | 18.5 | 6.54 | 38.5 | - | 1.64 | 8.0 | 7.6 | 15.6 | |
| | | 11-Dec-10 | 4 | 8.49 | 9.99 | 1.50 | C | 161.2 | - | - | 14:50 | 14:59 | 1.9 | 19.0 | 6.35 | 44.0 | 2.0 | 1.65 | 15.2 | 7.4 | 17.0 | |
| | | 11-Dec-10 | 4 | 8.49 | 9.99 | 1.50 | D | 161.7 | - | - | 14:59 | 15:10 | 2.4 | 19.0 | 7.32 | 63.0 | 2.0 | 1.66 | 15.1 | 7.4 | 18.3 | |
| | | 11-Dec-10 | 4 | 8.49 | 9.99 | 1.50 | X | 17.6 | 680.7 | 453.8 | 15:10 | 15:17 | 2.5 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.49 | 11.49 | 1.00 | A | 78.2 | - | - | 6:39 | 6:53 | 1.3 | 9.1 | 6.21 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.49 | 11.49 | 1.00 | B | 124.9 | - | - | 6:53 | 7:05 | 3.1 | 13.4 | 4.19 | 39.2 | 3.0 | 1.60 | 1.3 | 5.9 | 13.3 | |
| | | 28-Oct-10 | 3 | 10.49 | 11.49 | 1.00 | C | 164.5 | - | - | 7:05 | 7:16 | 2.7 | 13.6 | 4.97 | 46.2 | - | 1.58 | 1.3 | 6.0 | 11.1 | |
| | | 28-Oct-10 | 3 | 10.49 | 11.49 | 1.00 | D | 124.2 | - | - | 7:16 | 7:26 | 3.3 | 13.4 | 4.17 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.49 | 11.49 | 1.00 | E | 109.1 | 600.9 | 600.9 | 7:26 | 7:36 | 2.8 | 9.4 | 3.33 | 113.2 | - | 1.71 | 1.3 | 6.0 | 11.9 | |
| | | 28-Oct-10 | 2 | 11.49 | 15.50 | 4.01 | A | 21.8 | 21.8 | 5.4 | 6:19 | 6:31 | 2.9 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 15.50 | 20.40 | 4.90 | A | 23.2 | 23.2 | 4.7 | 6:02 | 6:14 | 5.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+132.25 | Q | 15-Jun-11 | 4 | 8.75 | 10.25 | 1.50 | MF | 61.4 | 61.40 | 40.93 | 21:23 | 21:43 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 10.75 | 11.82 | 1.07 | A | 19.6 | 19.60 | 18.32 | 8:16 | 8:33 | 3.1 | 0.0 | 0.00 | 31.0 | - | 1.6 | 11.6 | 14.6 | 19.4 | |
| S-31+133 | S | 07-Nov-10 | 4 | 9.03 | 10.53 | 1.50 | B | 164.0 | - | - | 10:26 | 10:51 | 1.5 | 12.3 | 5.47 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 9.03 | 10.53 | 1.50 | C | 168.8 | - | - | 10:51 | 11:02 | 1.7 | 15.1 | 5.82 | 39.7 | - | 1.61 | - | - | 15.6 | |
| | | 07-Nov-10 | 4 | 9.03 | 10.53 | 1.50 | D | 186.3 | - | - | 11:02 | 11:15 | 2.0 | 15.1 | 5.12 | 49.3 | - | 1.66 | 1.7 | 10.4 | 14.6 | |
| | | 07-Nov-10 | 4 | 9.03 | 10.53 | 1.50 | E | 197.4 | - | - | 11:15 | 11:28 | 1.9 | 14.7 | 5.25 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 9.03 | 10.53 | 1.50 | X | 83.4 | 799.9 | 533.3 | 11:28 | 11:34 | 1.9 | 14.4 | 5.20 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 11.03 | 12.03 | 1.00 | B | 15.2 | 15.2 | 15.2 | 9:44 | 9:59 | 3.7 | 15.2 | 0.06 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 12.03 | 16.00 | 3.97 | B | 25.1 | 25.1 | 6.3 | 9:26 | 9:39 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 1 | 16.00 | 21.10 | 5.10 | B | 25.3 | 25.3 | 5.0 | 9:02 | 9:15 | 5.5 | 0.0 | 0.00 | 36.4 | 4.0 | 1.64 | 0.3 | 6.5 | 14.8 | |
| Q-31+133.75 | Q | 20-Jun-11 | 4 | 9.15 | 10.65 | 1.50 | MF | 56.2 | 56.20 | 37.47 | 3:37 | 3:56 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 11.15 | 12.15 | 1.00 | A | 186.3 | - | - | 7:37 | 8:03 | 2.2 | 16.0 | 7.38 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 11.15 | 12.15 | 1.00 | B | 149.6 | - | - | 8:03 | 8:11 | 2.2 | 18.4 | 8.45 | 36.3 | - | 1.6 | -1.9 | 5.6 | 14.6 | |
| | | 02-May-11 | 3 | 11.15 | 12.15 | 1.00 | C | 145.5 | - | - | 8:11 | 8:23 | 2.8 | 9.5 | 3.54 | 46.3 | - | 1.6 | -1.9 | 5.6 | 14.8 | |
| | | 02-May-11 | 3 | 11.15 | 12.15 | 1.00 | D | 59.4 | 540.80 | 540.80 | 8:23 | 8:46 | 3.0 | 0.4 | 0.13 | 62.4 | - | 1.7 | -1.9 | 6.2 | 18.1 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+134.5 | T | 02-Dec-10 | 4 | 9.36 | 10.86 | 1.50 | MF | 170.7 | - | - | 7:31 | 7:55 | 0.8 | 12.5 | 10.34 | 30.2 | - | 1.59 | - | 11.2 | - | |
| | | 02-Dec-10 | 4 | 9.36 | 10.86 | 1.50 | B | 219.7 | - | - | 7:55 | 8:10 | 0.8 | 18.2 | 16.02 | 38.2 | - | 1.62 | -9.7 | 12.1 | 12.8 | |
| | | 02-Dec-10 | 4 | 9.36 | 10.86 | 1.50 | C | 155.4 | - | - | 8:10 | 8:19 | 1.6 | 18.1 | 7.67 | 44.8 | 1.5 | 1.67 | -9.2 | 9.6 | 12.9 | |
| | | 02-Dec-10 | 4 | 9.36 | 10.86 | 1.50 | D | 198.9 | - | - | 8:19 | 8:31 | 2.0 | 18.5 | 6.70 | 45.0 | - | 1.67 | -9.2 | 9.6 | 13.1 | |
| | | 02-Dec-10 | 4 | 9.36 | 10.86 | 1.50 | X | 61.3 | 806.0 | 537.3 | 8:31 | 8:40 | 2.7 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 11.36 | 12.36 | 1.00 | B | 160.6 | - | - | 8:24 | 8:46 | 1.6 | 15.4 | 10.31 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 11.36 | 12.36 | 1.00 | C | 174.5 | - | - | 8:46 | 8:57 | 1.6 | 18.0 | 10.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 11.36 | 12.36 | 1.00 | D | 192.8 | - | - | 8:57 | 9:06 | 2.3 | 25.5 | 10.49 | 60.1 | - | 1.67 | 11.3 | 6.4 | 10.9 | |
| | | 28-Oct-10 | 3 | 11.36 | 12.36 | 1.00 | E | 100.9 | 628.8 | 628.8 | 9:06 | 9:09 | 2.5 | 26.8 | 10.53 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 12.36 | 16.40 | 4.04 | A | 28.0 | 28.0 | 6.9 | 8:07 | 8:20 | 2.9 | 0.4 | 0.03 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 16.40 | 22.00 | 5.60 | A | 31.5 | 31.5 | 5.6 | 7:48 | 8:00 | 5.6 | 0.4 | 0.01 | 33.7 | 3.0 | 1.57 | 1.3 | 5.9 | 10.9 | |
| Q-31+135.25 | Q | 15-Jun-11 | 4 | 8.85 | 10.35 | 1.50 | MF | 181.5 | - | - | 21:46 | 22:12 | 2.3 | 12.6 | 3.54 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 4 | 8.85 | 10.35 | 1.50 | B | 180.7 | - | - | 22:12 | 22:24 | 2.3 | 15.8 | 4.71 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 4 | 8.85 | 10.35 | 1.50 | C | 138.2 | - | - | 22:24 | 22:54 | 2.6 | 6.3 | 1.55 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 4 | 8.85 | 10.35 | 1.50 | D | 149.3 | - | - | 22:54 | 23:24 | 2.6 | 6.1 | 1.68 | 70.4 | - | 1.7 | 7.9 | 10.6 | 12.6 | |
| | | 15-Jun-11 | 4 | 8.85 | 10.35 | 1.50 | X | 51 | 700.70 | 467.13 | 23:24 | 23:55 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 10.85 | 11.91 | 1.06 | A | 175.7 | - | - | 8:44 | 9:10 | 2.8 | 12.4 | 4.20 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 10.85 | 11.91 | 1.06 | B | 148.2 | - | - | 9:10 | 9:24 | 2.1 | 5.1 | 2.10 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 10.85 | 11.91 | 1.06 | C | 35.6 | 359.50 | 339.15 | 9:24 | 9:42 | 3.0 | 0.0 | 0.00 | 41.9 | 1.0 | 1.6 | 14.3 | 15.3 | 22.3 | |
| P-31+136 | P | 31-Oct-10 | 4 | 8.67 | 10.17 | 1.50 | B | 158.9 | - | - | 22:13 | 22:34 | 0.7 | 15.0 | 13.66 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 8.67 | 10.17 | 1.50 | C | 159.6 | - | - | 22:34 | 22:44 | 1.5 | 18.8 | 10.40 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 8.67 | 10.17 | 1.50 | D | 179.7 | - | - | 22:44 | 22:54 | 1.5 | 22.4 | 9.54 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 4 | 8.67 | 10.17 | 1.50 | E | 304.8 | 803.0 | 535.3 | 22:54 | 23:07 | 2.8 | 24.0 | 5.73 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 10.67 | 11.67 | 1.00 | A | 57.7 | - | - | 5:42 | 5:54 | 0.6 | 6.1 | 10.54 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 10.67 | 11.67 | 1.00 | B | 99.5 | - | - | 5:54 | 6:04 | 1.0 | 12.6 | 11.42 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 10.67 | 11.67 | 1.00 | C | 168.9 | - | - | 6:04 | 6:14 | 1.9 | 18.4 | 10.70 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 10.67 | 11.67 | 1.00 | D | 158.0 | - | - | 6:14 | 6:23 | 2.9 | 24.3 | 6.22 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 10.67 | 11.67 | 1.00 | E | 155.1 | 639.2 | 639.2 | 6:23 | 6:32 | 3.4 | 13.4 | 3.97 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 11.67 | 15.70 | 4.03 | A | 22.7 | 22.7 | 5.6 | 5:24 | 5:37 | 2.8 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 1 | 15.70 | 21.00 | 5.30 | A | 21.4 | 21.4 | 4.0 | 5:04 | 5:16 | 5.7 | 0.2 | 0.01 | - | - | - | - | - | - | |
| Q-31+136.75 | Q | 20-Jun-11 | 4 | 8.21 | 9.71 | 1.50 | MF | 92.5 | 92.50 | 61.67 | 3:58 | 4:37 | 2.5 | 0.6 | 0.15 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 10.21 | 11.21 | 1.00 | A | 159.7 | - | - | 9:00 | 9:26 | 2.1 | 11.9 | 5.81 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 10.21 | 11.21 | 1.00 | B | 179 | - | - | 9:26 | 9:37 | 2.8 | 20.3 | 8.18 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 10.21 | 11.21 | 1.00 | C | 144 | - | - | 9:37 | 9:45 | 3.1 | 10.7 | 3.27 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 10.21 | 11.21 | 1.00 | D | 92.2 | 574.90 | 574.90 | 9:45 | 10:28 | 2.8 | 0.4 | 0.13 | - | - | - | - | - | - | |
| T-31+137.5 | T | 11-Dec-10 | 4 | 8.26 | 9.76 | 1.50 | MF | 179.1 | - | - | 15:47 | 16:13 | 1.3 | 12.8 | 5.02 | 33.3 | - | 1.42 | -6.7 | 7.2 | 9.1 | |
| | | 11-Dec-10 | 4 | 8.26 | 9.76 | 1.50 | B | 158.2 | - | - | 16:13 | 16:23 | 1.3 | 17.1 | 5.23 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 8.26 | 9.76 | 1.50 | C | 163.2 | - | - | 16:23 | 16:35 | 1.7 | 15.8 | 5.65 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 8.26 | 9.76 | 1.50 | D | 164.7 | - | - | 16:35 | 16:44 | 2.5 | 16.5 | 4.59 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 8.26 | 9.76 | 1.50 | X | 53.5 | 718.7 | 479.1 | 16:44 | 16:56 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.26 | 11.26 | 1.00 | B | 158.7 | - | - | 10:23 | 10:48 | 1.0 | 12.0 | 11.34 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.26 | 11.26 | 1.00 | C | 172.5 | - | - | 10:48 | 10:59 | 1.5 | 18.1 | 13.31 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.26 | 11.26 | 1.00 | D | 154.3 | - | - | 10:59 | 11:06 | 1.8 | 20.9 | 12.11 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.26 | 11.26 | 1.00 | E | 140.1 | 625.6 | 625.6 | 11:06 | 11:13 | 2.1 | 23.1 | 11.27 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 11.26 | 15.30 | 4.04 | A | 27.8 | 27.8 | 6.9 | 10:08 | 10:20 | 2.5 | 0.5 | 0.05 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 15.30 | 20.50 | 5.20 | A | 36.9 | 36.9 | 7.1 | 9:52 | 10:04 | 5.6 | 1.2 | 0.04 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+138.25 | Q | 15-Jun-11 | 4 | 8.21 | 9.71 | 1.50 | MF | 180.8 | - | - | 2:14 | 2:37 | 2.3 | 12.4 | 3.67 | 30.9 | 2.0 | 1.4 | 4.3 | 11.9 | 12.6 | Communicated to Q-31+135.25 and Q-31+126.25 |
| | | 15-Jun-11 | 4 | 8.21 | 9.71 | 1.50 | B | 195.1 | - | - | 2:37 | 2:58 | 1.2 | 4.5 | 1.83 | 36.1 | - | 1.6 | 4.5 | 11.8 | 13.1 | |
| | | 15-Jun-11 | 4 | 8.21 | 9.71 | 1.50 | C | 194.4 | - | - | 2:58 | 3:16 | 1.9 | 15.2 | 5.25 | 45.3 | - | 1.6 | 4.7 | 12.3 | 17.1 | |
| | | 15-Jun-11 | 4 | 8.21 | 9.71 | 1.50 | D | 136.5 | - | - | 3:16 | 3:25 | 2.6 | 7.0 | 2.02 | 63.5 | - | 1.7 | 4.8 | 13.1 | 16.2 | |
| | | 15-Jun-11 | 4 | 8.21 | 9.71 | 1.50 | X | 80.7 | 787.50 | 525.00 | 3:25 | 3:36 | 2.3 | 9.6 | 2.83 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 10.21 | 11.3 | 1.09 | A | 180.2 | - | - | 9:54 | 10:22 | 2.5 | 11.5 | 4.23 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 10.21 | 11.3 | 1.09 | B | 148.2 | - | - | 10:22 | 10:34 | 2.9 | 12.2 | 4.93 | 33.6 | - | 1.5 | 15.3 | 16.5 | 22.1 | |
| | | 05-May-11 | 3 | 10.21 | 11.3 | 1.09 | C | 179.8 | - | - | 10:34 | 10:51 | 3.0 | 6.5 | 1.88 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 10.21 | 11.3 | 1.09 | D | 34 | 542.20 | 497.43 | 10:51 | 11:08 | 3.0 | 0.0 | 0.01 | 60.2 | - | 1.6 | 12.2 | 16.3 | 21.3 | |
| S-31+139 | S | 07-Nov-10 | 4 | 8.62 | 10.12 | 1.50 | B | 24.4 | 24.4 | 16.3 | 14:31 | 14:50 | 2.9 | 0.0 | 0.00 | 36.2 | - | 1.63 | 11.0 | 7.4 | 14.9 | |
| | | 18-Oct-10 | 3 | 10.62 | 11.62 | 1.00 | A | 32.9 | - | - | 11:14 | 11:21 | 0.5 | 4.8 | 6.64 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 10.62 | 11.62 | 1.00 | B | 108.2 | - | - | 11:21 | 11:35 | 0.8 | 12.1 | 14.00 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 10.62 | 11.62 | 1.00 | C | 161.2 | - | - | 11:35 | 11:46 | 1.3 | 20.5 | 15.05 | 45.5 | - | 1.64 | 2.2 | 7.6 | 15.7 | |
| | | 18-Oct-10 | 3 | 10.62 | 11.62 | 1.00 | D | 238.7 | - | - | 11:46 | 11:57 | 1.9 | 23.3 | 13.01 | 62.4 | - | 1.65 | 2.2 | 7.6 | 13.9 | |
| | | 18-Oct-10 | 3 | 10.62 | 11.62 | 1.00 | D+ | 71.2 | 612.2 | 612.2 | 11:57 | 12:00 | 1.2 | 23.8 | 20.03 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 11.62 | 15.60 | 3.98 | A | 113.2 | 113.2 | 28.4 | 10:39 | 11:11 | 3.0 | 2.3 | 0.19 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 1 | 15.60 | 20.70 | 5.10 | A | 23.0 | 23.0 | 4.5 | 10:15 | 10:30 | 6.0 | 0.1 | 0.00 | 29.8 | - | 1.62 | 1.0 | 6.7 | 16.5 | |
| T-31+140.5 | T | 01-Dec-10 | 4 | 8.57 | 10.07 | 1.50 | MF | 181.5 | - | - | 4:21 | 5:00 | 0.8 | 12.0 | 4.98 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 8.57 | 10.07 | 1.50 | B | 168.5 | - | - | 5:00 | 5:17 | 1.0 | 18.4 | 9.44 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 8.57 | 10.07 | 1.50 | C | 152.2 | - | - | 5:17 | 5:25 | 1.5 | 18.7 | 5.08 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 8.57 | 10.07 | 1.50 | D | 145.3 | - | - | 5:25 | 5:37 | 2.3 | 7.7 | 1.39 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 8.57 | 10.07 | 1.50 | X | 102.5 | 750.0 | 500.0 | 5:37 | 5:58 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 10.57 | 11.57 | 1.00 | A | 23.0 | 23.0 | 23.0 | 10:57 | 11:12 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 11.57 | 15.60 | 4.03 | A | 29.0 | 29.0 | 7.2 | 10:43 | 10:55 | 3.0 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 1 | 15.60 | 20.70 | 5.10 | A | 26.2 | 26.2 | 5.1 | 10:22 | 10:35 | 5.7 | 0.0 | 0.00 | 31.3 | - | 1.62 | 1.3 | 9.2 | 15.7 | |
| P-31+142 | P | 31-Oct-10 | 4 | 8.70 | 10.20 | 1.50 | B | 166.6 | - | - | 2:11 | 2:32 | 0.7 | 18.6 | 12.51 | 36.3 | - | 1.63 | -3.0 | 9.0 | 13.0 | |
| | | 31-Oct-10 | 4 | 8.70 | 10.20 | 1.50 | C | 172.0 | - | - | 2:32 | 2:42 | 1.5 | 18.2 | 8.50 | 69.5 | - | 1.65 | -3.0 | 9.0 | 13.0 | |
| | | 31-Oct-10 | 4 | 8.70 | 10.20 | 1.50 | D | 175.4 | - | - | 2:42 | 2:50 | 1.9 | 21.7 | 7.83 | 76.0 | 0.0 | 1.66 | -3.0 | 9.0 | 13.0 | |
| | | 31-Oct-10 | 4 | 8.70 | 10.20 | 1.50 | E | 178.2 | - | - | 2:50 | 2:57 | 2.6 | 28.5 | 6.67 | 136.8 | 0.0 | 1.66 | -3.0 | 9.0 | 13.0 | |
| | | 31-Oct-10 | 4 | 8.70 | 10.20 | 1.50 | X | 139.8 | 832.0 | 554.7 | 2:57 | 3:03 | 2.8 | 26.6 | 6.26 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 10.70 | 11.70 | 1.00 | A | 43.0 | - | - | 8:08 | 8:17 | 0.8 | 6.4 | 8.29 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 10.70 | 11.70 | 1.00 | B | 135.7 | - | - | 8:17 | 8:33 | 1.4 | 12.3 | 9.35 | 36.2 | 3.0 | 1.66 | 4.0 | 7.8 | 14.7 | |
| | | 22-Oct-10 | 3 | 10.70 | 11.70 | 1.00 | C | 164.2 | - | - | 8:33 | 8:44 | 1.8 | 18.7 | 10.64 | 48.4 | - | 1.65 | 4.5 | 7.9 | 12.5 | |
| | | 22-Oct-10 | 3 | 10.70 | 11.70 | 1.00 | D | 232.1 | - | - | 8:44 | 8:57 | 2.7 | 16.4 | 6.32 | 69.0 | - | 1.69 | 4.5 | 7.9 | 13.3 | |
| | | 22-Oct-10 | 3 | 10.70 | 11.70 | 1.00 | E | 27.4 | 602.4 | 602.4 | 8:57 | 8:58 | 2.6 | 17.7 | 6.70 | 93.2 | - | 1.69 | 4.7 | 8.0 | 14.1 | |
| | | 22-Oct-10 | 2 | 11.70 | 15.70 | 4.00 | A | 23.5 | 23.5 | 5.9 | 7:54 | 8:05 | 2.8 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 15.70 | 20.80 | 5.10 | A | 22.4 | 22.4 | 4.4 | 7:15 | 7:49 | 5.2 | 0.0 | 0.00 | 33.7 | 6.0 | 1.62 | 22.1 | 8.3 | 13.2 | |
| Q-31+142.75 | Q | 20-Jun-11 | 4 | 8.04 | 9.54 | 1.50 | MF | 56.3 | 56.30 | 37.53 | 4:44 | 5:04 | 2.7 | 0.6 | 0.14 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 10.04 | 11.04 | 1.00 | A | 66.8 | 66.80 | 66.80 | 11:15 | 11:49 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+143.5 | T | 12-Dec-10 | 4 | 8.14 | 9.64 | 1.50 | MF | 188.3 | - | - | 7:04 | 7:30 | 1.5 | 16.6 | 7.89 | 32.4 | 2.0 | 1.64 | 16.4 | 7.3 | 16.2 | |
| | | 12-Dec-10 | 4 | 8.14 | 9.64 | 1.50 | B | 148.6 | - | - | 7:30 | 7:39 | 1.3 | 16.7 | 8.18 | 37.5 | 1.5 | 1.64 | 16.5 | 7.2 | 17.1 | |
| | | 12-Dec-10 | 4 | 8.14 | 9.64 | 1.50 | C | 163.1 | - | - | 7:39 | 7:48 | 1.7 | 22.5 | 8.94 | 36.7 | - | 1.65 | 16.4 | 7.2 | 17.8 | |
| | | 12-Dec-10 | 4 | 8.14 | 9.64 | 1.50 | D | 138.7 | - | - | 7:48 | 7:54 | 1.8 | 12.1 | 4.42 | 48.4 | - | 1.68 | 18.8 | 7.8 | 17.6 | |
| | | 12-Dec-10 | 4 | 8.14 | 9.64 | 1.50 | X | 203.3 | 842.0 | 561.3 | 7:54 | 8:15 | 2.5 | 7.1 | 1.88 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 10.14 | 11.14 | 1.00 | A | 35.4 | - | - | 4:10 | 4:18 | 1.0 | 6.3 | 7.54 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 10.14 | 11.14 | 1.00 | B | 127.2 | - | - | 4:18 | 4:32 | 1.2 | 12.8 | 10.30 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 10.14 | 11.14 | 1.00 | C | 161.6 | - | - | 4:32 | 4:42 | 2.4 | 18.6 | 7.20 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 10.14 | 11.14 | 1.00 | D | 161.3 | - | - | 4:42 | 4:51 | 2.8 | 17.8 | 6.28 | 70.0 | 1.0 | 1.68 | 8.4 | 8.8 | 11.4 | |
| | | 31-Oct-10 | 3 | 10.14 | 11.14 | 1.00 | E | 115.8 | 601.3 | 601.3 | 4:51 | 5:00 | 3.1 | 10.8 | 3.46 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 11.14 | 15.10 | 3.96 | A | 27.2 | 27.2 | 6.9 | 3:53 | 4:06 | 3.1 | 0.6 | 0.05 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 1 | 15.10 | 20.10 | 5.00 | A | 29.6 | 29.6 | 5.9 | 3:27 | 3:42 | 5.6 | 0.4 | 0.02 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+144.25 | Q | 16-Jun-11 | 4 | 8.39 | 9.89 | 1.50 | MF | 180 | - | - | 6:32 | 6:55 | 2.2 | 15.1 | 4.46 | - | - | - | - | - | - | Communicated to Q-31+138.25 |
| | | 16-Jun-11 | 4 | 8.39 | 9.89 | 1.50 | B | 160 | - | - | 6:55 | 7:08 | 2.5 | 18.5 | 5.04 | 38.4 | - | 1.6 | 6.8 | 10.4 | 16.9 | and Q-31+135.25 |
| | | 16-Jun-11 | 4 | 8.39 | 9.89 | 1.50 | C | 210 | - | - | 7:08 | 7:18 | 2.3 | 20.0 | 5.16 | 46.1 | - | 1.6 | 6.8 | 10.4 | 16.7 | |
| | | 16-Jun-11 | 4 | 8.39 | 9.89 | 1.50 | X | 76 | 626.00 | 417.33 | 7:18 | 7:32 | 2.8 | 0.7 | 0.16 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 10.39 | 11.44 | 1.05 | A | 165.8 | - | - | 14:16 | 14:43 | 2.5 | 12.1 | 4.09 | 31.6 | 4.0 | 1.6 | 10.3 | 15.8 | 18.8 | |
| | | 05-May-11 | 3 | 10.39 | 11.44 | 1.05 | B | 161.9 | - | - | 14:43 | 15:06 | 2.9 | 6.7 | 2.53 | 37.2 | - | 1.6 | 10.1 | 15.6 | 18.6 | |
| | | 05-May-11 | 3 | 10.39 | 11.44 | 1.05 | C | 42.3 | 370.00 | 352.38 | 15:06 | 15:35 | 3.2 | 0.3 | 0.08 | 44.1 | - | 1.6 | 8.6 | 11.8 | 21.0 | |
| S-31+145 | S | 14-Nov-10 | 4 | 8.24 | 9.74 | 1.50 | B | 161.6 | - | - | 3:12 | 3:41 | 1.3 | 12.9 | 7.26 | 37.9 | 4.5 | 1.65 | 20.1 | 12.0 | 20.7 | |
| | | 14-Nov-10 | 4 | 8.24 | 9.74 | 1.50 | C | 161.4 | - | - | 3:41 | 3:52 | 1.7 | 18.3 | 6.51 | 50.9 | 2.0 | 1.69 | 17.5 | 8.4 | 20.8 | |
| | | 14-Nov-10 | 4 | 8.24 | 9.74 | 1.50 | D | 283.8 | - | - | 3:52 | 4:05 | 2.5 | 21.8 | 5.60 | 62.9 | - | 1.70 | 17.5 | 8.4 | 19.2 | |
| | | 14-Nov-10 | 4 | 8.24 | 9.74 | 1.50 | E | 215.2 | 822.0 | 548.0 | 4:05 | 4:21 | 2.6 | 16.4 | 4.14 | 93.7 | - | 1.70 | 17.5 | 8.4 | 18.5 | |
| | | 18-Oct-10 | 3 | 10.24 | 11.24 | 1.00 | B | 164.5 | - | - | 18:06 | 18:41 | 3.5 | 5.9 | 1.84 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 10.24 | 11.24 | 1.00 | C | 154.2 | - | - | 18:41 | 19:11 | 3.3 | 5.1 | 1.53 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 10.24 | 11.24 | 1.00 | D | 98.6 | - | - | 19:11 | 19:31 | 3.0 | 3.7 | 1.28 | 33.7 | 9.0 | 1.55 | 0.3 | 14.2 | 18.4 | |
| | | 18-Oct-10 | 3 | 10.24 | 11.24 | 1.00 | D+ | 184.4 | 601.7 | 601.7 | 19:31 | 20:30 | 3.4 | 2.4 | 0.70 | 78.0 | 1.0 | 1.60 | 0.3 | 14.2 | 17.4 | |
| | | 18-Oct-10 | 2 | 11.24 | 15.20 | 3.96 | A | 289.9 | - | - | 15:03 | 15:33 | 2.1 | 15.0 | 1.83 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 11.24 | 15.20 | 3.96 | B | 125.1 | - | - | 15:33 | 15:41 | 2.4 | 19.1 | 1.93 | 38.1 | 3.0 | 1.63 | 2.6 | 7.6 | 15.6 | |
| | | 18-Oct-10 | 2 | 11.24 | 15.20 | 3.96 | C | 162.6 | - | - | 15:41 | 15:50 | 2.6 | 16.7 | 1.52 | 53.6 | - | 1.64 | 2.6 | 7.6 | 15.8 | |
| | | 18-Oct-10 | 2 | 11.24 | 15.20 | 3.96 | D | 193.6 | - | - | 15:50 | 16:04 | 2.1 | 15.1 | 1.27 | 57.6 | - | 1.64 | 2.6 | 7.6 | 16.3 | |
| | | 18-Oct-10 | 2 | 11.24 | 15.20 | 3.96 | D+ | 527.8 | - | - | 16:04 | 17:00 | 2.3 | 7.7 | 0.82 | 62.0 | - | 1.67 | 2.6 | 7.6 | 15.2 | |
| | | 18-Oct-10 | 2 | 11.24 | 15.20 | 3.96 | E | 264.0 | 1563.0 | 394.7 | 17:00 | 18:01 | 2.9 | 1.0 | 0.09 | 73.6 | - | 1.67 | -0.8 | 10.8 | 14.6 | |
| | | 18-Oct-10 | 1 | 15.20 | 20.20 | 5.00 | A | 21.1 | 21.1 | 4.2 | 14:45 | 14:57 | 6.3 | 0.0 | 0.00 | 32.2 | 4.0 | 1.63 | 3.4 | 9.2 | 15.5 | |
| Q-31+145.75 | Q | 20-Jun-11 | 4 | 7.93 | 9.43 | 1.50 | MF | 54.3 | 54.30 | 36.20 | 5:07 | 5:26 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 9.93 | 10.93 | 1.00 | A | 162.9 | - | - | 13:47 | 14:12 | 2.5 | 10.1 | 4.18 | 32.0 | - | 1.6 | -5.6 | 12.5 | 11.8 | |
| | | 02-May-11 | 3 | 9.93 | 10.93 | 1.00 | B | 176.9 | - | - | 14:12 | 14:26 | 2.5 | 15.3 | 6.03 | 35.5 | - | 1.6 | -5.6 | 12.6 | 11.9 | |
| | | 02-May-11 | 3 | 9.93 | 10.93 | 1.00 | C | 137.6 | - | - | 14:26 | 14:39 | 2.8 | 10.4 | 4.23 | 43.2 | - | 1.6 | -5.6 | 12.6 | 12.2 | |
| | | 02-May-11 | 3 | 9.93 | 10.93 | 1.00 | D | 79.4 | 556.80 | 556.80 | 14:39 | 15:00 | 2.9 | 0.0 | 0.01 | 70.1 | - | 1.6 | -5.6 | 12.7 | 12.3 | |
| T-31+146.5 | T | 01-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | MF | 170.8 | - | - | 2:24 | 2:48 | 1.1 | 11.8 | 6.80 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | B | 172.8 | - | - | 2:48 | 3:00 | 1.7 | 16.4 | 7.29 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | C | 161.8 | - | - | 3:00 | 3:09 | 2.1 | 18.9 | 7.62 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | D | 156.4 | - | - | 3:09 | 3:23 | 2.5 | 15.2 | 4.88 | - | - | - | - | - | - | Communicated to T-31+140.5 |
| | | 01-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | X | 16.2 | 678.0 | 452.0 | 3:23 | 3:36 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 9.71 | 10.71 | 1.00 | B | 228.5 | - | - | 6:07 | 6:35 | 2.7 | 12.1 | 4.45 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 9.71 | 10.71 | 1.00 | C | 233.8 | - | - | 6:35 | 6:58 | 2.8 | 12.3 | 4.33 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 9.71 | 10.71 | 1.00 | D | 137.7 | 600.0 | 600.0 | 6:58 | 7:09 | 2.5 | 18.0 | 7.28 | 80.0 | 1.0 | 1.68 | 1.5 | 9.5 | 16.0 | |
| | | 31-Oct-10 | 2 | 10.71 | 14.70 | 3.99 | A | 24.6 | 24.6 | 6.2 | 5:50 | 6:03 | 2.7 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 1 | 14.70 | 19.80 | 5.10 | A | 29.4 | 29.4 | 5.8 | 5:32 | 5:45 | 5.6 | 0.0 | 0.00 | 31.6 | - | 1.62 | -2.0 | 8.0 | 13.0 | |
| Q-31+147.25 | Q | 16-Jun-11 | 4 | 7.83 | 9.33 | 1.50 | MF | 66.8 | 66.80 | 44.53 | 7:43 | 8:09 | 2.6 | 0.5 | 0.13 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 9.83 | 10.98 | 1.15 | A | 25.1 | 25.10 | 21.83 | 15:44 | 16:19 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+148 | P | 07-Nov-10 | 4 | 7.93 | 9.43 | 1.50 | B | 185.3 | - | - | 14:58 | 15:24 | 1.3 | 12.0 | 5.93 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.93 | 9.43 | 1.50 | C | 190.2 | - | - | 15:24 | 15:40 | 1.6 | 11.6 | 4.45 | 41.7 | - | 1.62 | 11.1 | 8.2 | 15.8 | |
| | | 07-Nov-10 | 4 | 7.93 | 9.43 | 1.50 | D | 158.4 | - | - | 15:40 | 15:53 | 1.8 | 11.9 | 4.49 | 47.1 | - | 1.65 | 0.5 | 8.6 | 13.5 | |
| | | 07-Nov-10 | 4 | 7.93 | 9.43 | 1.50 | E | 163.3 | - | - | 15:53 | 16:07 | 1.9 | 12.2 | 4.23 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.93 | 9.43 | 1.50 | X | 136.8 | 834.0 | 556.0 | 16:07 | 16:19 | 2.6 | 13.3 | 2.57 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.93 | 10.93 | 1.00 | B | 13.7 | 13.7 | 13.7 | 9:57 | 10:09 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 10.93 | 14.90 | 3.97 | A | 22.9 | 22.9 | 5.8 | 9:36 | 9:51 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 14.90 | 20.00 | 5.10 | A | 25.1 | 25.1 | 4.9 | 9:14 | 9:27 | 5.3 | 0.5 | 0.02 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+148.75 | Q | 21-Jun-11 | 4 | 7.96 | 9.46 | 1.50 | MF | 154.1 | - | - | 6:34 | 6:58 | 2.2 | 0.0 | 0.00 | 30.4 | - | 1.4 | 9.6 | 14.0 | 15.1 | |
| | | 21-Jun-11 | 4 | 7.96 | 9.46 | 1.50 | B | 3 | 157.10 | 104.73 | 6:58 | 7:09 | 2.5 | 0.3 | 0.07 | 37.1 | - | 1.6 | 9.0 | 14.0 | 18.1 | |
| | | 02-May-11 | 3 | 9.96 | 10.96 | 1.00 | A | 163.6 | - | - | 15:28 | 15:55 | 2.4 | 12.6 | 5.32 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 9.96 | 10.96 | 1.00 | B | 167.6 | - | - | 15:55 | 16:08 | 2.7 | 15.9 | 6.18 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 9.96 | 10.96 | 1.00 | C | 123.5 | - | - | 16:08 | 16:40 | 2.1 | 10.2 | 4.90 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 9.96 | 10.96 | 1.00 | D | 192.4 | - | - | 16:40 | 16:59 | 2.8 | 12.7 | 4.54 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 9.96 | 10.96 | 1.00 | X | 33.1 | 680.20 | 680.20 | 16:59 | 17:18 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+149.5 | T | 12-Dec-10 | 4 | 7.83 | 9.33 | 1.50 | MF | 181.1 | - | - | 8:50 | 9:16 | 1.4 | 15.8 | 7.55 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 7.83 | 9.33 | 1.50 | B | 160.1 | - | - | 9:16 | 9:26 | 1.6 | 21.5 | 9.17 | 37.4 | - | - | -24.0 | - | - | |
| | | 12-Dec-10 | 4 | 7.83 | 9.33 | 1.50 | C | 165.2 | - | - | 9:26 | 9:33 | 1.7 | 25.0 | 9.97 | - | - | - | - | - | - | Communicated to T-31+143.5 |
| | | 12-Dec-10 | 4 | 7.83 | 9.33 | 1.50 | D | 142.6 | - | - | 9:33 | 9:53 | 2.3 | 8.1 | 2.86 | 67.0 | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 7.83 | 9.33 | 1.50 | X | 10.7 | 659.7 | 439.8 | 9:53 | 10:01 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 9.83 | 10.83 | 1.00 | A | 65.5 | - | - | 8:01 | 8:16 | 0.3 | 5.1 | 14.35 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 9.83 | 10.83 | 1.00 | B | 128.9 | - | - | 8:16 | 8:30 | 1.5 | 15.1 | 10.20 | 35.6 | - | 1.64 | 4.1 | 9.1 | 16.9 | |
| | | 01-Nov-10 | 3 | 9.83 | 10.83 | 1.00 | C | 140.2 | - | - | 8:30 | 8:39 | 2.2 | 15.3 | 7.05 | 59.7 | - | 1.67 | 4.2 | 9.3 | 17.1 | |
| | | 01-Nov-10 | 3 | 9.83 | 10.83 | 1.00 | D | 159.7 | - | - | 8:39 | 8:50 | 2.1 | 15.3 | 7.49 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 9.83 | 10.83 | 1.00 | E | 128.8 | 623.1 | 623.1 | 8:50 | 8:58 | 2.2 | 15.1 | 7.00 | 73.2 | 1.0 | 1.67 | 1.1 | 9.0 | 14.4 | |
| | | 01-Nov-10 | 2 | 10.83 | 14.80 | 3.97 | A | 24.8 | 24.8 | 6.2 | 7:46 | 7:57 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 1 | 14.80 | 20.10 | 5.30 | A | 24.3 | 24.3 | 4.6 | 7:27 | 7:41 | 5.5 | 0.0 | 0.00 | 33.0 | 6.0 | 1.62 | 1.5 | 9.4 | 15.4 | |
| Q-31+150.25 | Q | 16-Jun-11 | 4 | 7.81 | 9.31 | 1.50 | MF | 180 | - | - | 8:13 | 8:35 | 2.4 | 12.3 | 3.26 | - | - | - | - | - | - | Communicated to Q-31+144.25 |
| | | 16-Jun-11 | 4 | 7.81 | 9.31 | 1.50 | B | 120 | - | - | 8:35 | 8:46 | 2.4 | 9.7 | 2.54 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 4 | 7.81 | 9.31 | 1.50 | D | 99 | - | - | 8:46 | 8:57 | 2.5 | 7.5 | 2.19 | 58.9 | - | 1.7 | 6.8 | 10.4 | 17.3 | |
| | | 16-Jun-11 | 4 | 7.81 | 9.31 | 1.50 | X | 24.1 | 423.10 | 282.07 | 8:57 | 9:10 | 2.7 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 9.81 | 10.9 | 1.09 | A | 24.3 | 24.30 | 22.29 | 8:27 | 8:45 | 3.0 | 0.1 | 0.00 | 33.0 | 4.0 | 1.6 | 13.2 | 15.0 | 20.5 | |
| S-31+151 | S | 14-Nov-10 | 4 | 8.01 | 9.51 | 1.50 | B | 145.7 | - | - | 4:50 | 5:13 | 1.4 | 12.3 | 6.23 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 4 | 8.01 | 9.51 | 1.50 | C | 164.3 | - | - | 5:13 | 5:24 | 2.2 | 12.9 | 4.04 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 4 | 8.01 | 9.51 | 1.50 | D | 159.9 | - | - | 5:24 | 5:33 | 3.1 | 17.2 | 3.90 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 4 | 8.01 | 9.51 | 1.50 | E | 32.5 | 502.4 | 334.9 | 5:33 | 5:51 | 2.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.10 | 11.01 | 0.91 | A | 32.7 | - | - | 14:04 | 14:11 | 1.1 | 3.8 | 3.33 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.10 | 11.01 | 0.91 | B | 107.8 | - | - | 14:11 | 14:24 | 3.3 | 8.5 | 2.25 | 37.9 | - | 1.62 | 11.6 | 8.8 | 19.6 | |
| | | 28-Oct-10 | 3 | 10.10 | 11.01 | 0.91 | C | 183.5 | - | - | 14:24 | 15:22 | 3.7 | 1.9 | 0.51 | 45.7 | 3.0 | 1.61 | 8.5 | 9.3 | 13.7 | |
| | | 28-Oct-10 | 3 | 10.10 | 11.01 | 0.91 | D | 91.2 | - | - | 15:22 | 15:57 | 3.3 | 1.9 | 0.53 | 37.0 | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.10 | 11.01 | 0.91 | E | 58.5 | 473.7 | 520.5 | 15:57 | 16:45 | 3.8 | 0.1 | 0.04 | 82.0 | 3.0 | 1.67 | 9.3 | 7.0 | 14.9 | |
| | | 28-Oct-10 | 2 | 11.01 | 15.00 | 3.99 | A | 23.1 | 23.1 | 5.8 | 13:50 | 14:02 | 2.7 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 15.00 | 20.20 | 5.20 | A | 27.2 | 27.2 | 5.2 | 13:31 | 13:45 | 5.8 | 0.2 | 0.01 | 31.8 | - | 1.64 | 11.7 | 8.7 | 15.4 | |
| T-31+152.5 | T | 01-Dec-10 | 4 | 8.37 | 9.87 | 1.50 | MF | 172.2 | - | - | 22:34 | 22:56 | 1.0 | 14.4 | 10.80 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 8.37 | 9.87 | 1.50 | B | 201.3 | - | - | 22:56 | 23:09 | 1.2 | 18.4 | 10.10 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 8.37 | 9.87 | 1.50 | C | 146.6 | - | - | 23:09 | 23:17 | 1.7 | 18.5 | 7.32 | 46.1 | 2.0 | 1.64 | -4.6 | 9.8 | 17.7 | |
| | | 01-Dec-10 | 4 | 8.37 | 9.87 | 1.50 | D | 148.7 | - | - | 23:17 | 23:25 | 2.2 | 19.5 | 4.97 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 8.37 | 9.87 | 1.50 | X | 27.6 | 696.4 | 464.3 | 23:25 | 23:38 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 10.37 | 11.37 | 1.00 | A | 18.4 | 18.4 | 18.4 | 9:47 | 10:00 | 2.9 | 0.5 | 0.13 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 11.37 | 15.40 | 4.03 | A | 24.2 | 24.2 | 6.0 | 9:32 | 9:44 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 1 | 15.40 | 20.90 | 5.50 | A | 23.8 | 23.8 | 4.3 | 9:14 | 9:27 | 5.5 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+154 | P | 07-Nov-10 | 4 | 7.55 | 9.05 | 1.50 | B | 153.6 | - | - | 19:00 | 19:21 | 1.8 | 12.8 | 4.64 | 32.2 | 7.0 | 1.60 | 5.7 | 6.1 | 15.4 | |
| | | 07-Nov-10 | 4 | 7.55 | 9.05 | 1.50 | C | 173.9 | - | - | 19:21 | 19:34 | 1.7 | 13.8 | 4.43 | 39.6 | 2.0 | 1.62 | 6.0 | 5.2 | 16.1 | |
| | | 07-Nov-10 | 4 | 7.55 | 9.05 | 1.50 | D | 195.3 | - | - | 19:34 | 19:50 | 1.8 | 13.8 | 4.78 | 57.0 | - | 1.63 | - | - | 15.4 | |
| | | 07-Nov-10 | 4 | 7.55 | 9.05 | 1.50 | E | 216.8 | - | - | 19:50 | 20:06 | 1.5 | 12.9 | 4.86 | 105.0 | - | 1.66 | 5.3 | 9.1 | 14.2 | |
| | | 07-Nov-10 | 4 | 7.55 | 9.05 | 1.50 | X | 79.4 | 819.0 | 546.0 | 20:06 | 20:12 | 2.1 | 15.9 | 5.15 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 9.55 | 10.55 | 1.00 | B | 152.8 | - | - | 0:28 | 0:48 | 1.4 | 9.5 | 9.30 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 9.55 | 10.55 | 1.00 | C | 164.0 | - | - | 0:48 | 0:59 | 2.0 | 19.9 | 11.03 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 9.55 | 10.55 | 1.00 | D | 166.2 | - | - | 0:59 | 1:07 | 3.0 | 22.5 | 8.95 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 9.55 | 10.55 | 1.00 | D+ | 118.2 | 601.2 | 601.2 | 1:07 | 1:12 | 2.7 | 25.1 | 9.25 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 10.55 | 14.60 | 4.05 | A | 206.0 | - | - | 21:46 | 22:10 | 0.5 | 12.3 | 7.50 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 10.55 | 14.60 | 4.05 | B | 192.5 | - | - | 22:10 | 22:23 | 2.7 | 12.5 | 1.10 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 10.55 | 14.60 | 4.05 | C | 225.6 | - | - | 22:23 | 22:40 | 2.7 | 13.1 | 1.21 | 67.4 | 3.0 | 1.63 | -0.7 | 10.5 | 14.4 | |
| | | 18-Oct-10 | 2 | 10.55 | 14.60 | 4.05 | D | 177.9 | - | - | 22:40 | 22:55 | 2.5 | 12.5 | 1.23 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 10.55 | 14.60 | 4.05 | D+ | 255.0 | - | - | 22:55 | 23:19 | 2.7 | 10.7 | 1.00 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 10.55 | 14.60 | 4.05 | E | 316.0 | 1373.0 | 339.0 | 23:19 | 0:20 | 2.7 | 1.9 | 0.18 | 125.1 | 0.0 | 1.65 | -0.7 | 9.8 | 17.5 | |
| | | 18-Oct-10 | 1 | 14.60 | 19.90 | 5.30 | A | 207.6 | - | - | 20:58 | 21:21 | 4.9 | 12.4 | 0.47 | 32.2 | - | 1.62 | 0.3 | 14.2 | 15.0 | |
| | | 18-Oct-10 | 1 | 14.60 | 19.90 | 5.30 | B | 97.1 | 304.7 | 57.5 | 21:21 | 21:38 | 5.7 | 2.3 | 0.07 | 34.1 | 6.0 | 1.64 | 0.3 | 14.2 | 14.3 | |
| T-31+155.5 | T | 12-Dec-10 | 4 | 7.88 | 9.38 | 1.50 | MF | 183.4 | - | - | 10:28 | 10:53 | 1.5 | 14.7 | 6.50 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 7.88 | 9.38 | 1.50 | B | 151.6 | - | - | 10:53 | 11:02 | 2.7 | 21.2 | 6.74 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 7.88 | 9.38 | 1.50 | C | 178.5 | - | - | 11:02 | 11:20 | 2.0 | 3.7 | 1.21 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 7.88 | 9.38 | 1.50 | D | 35.4 | 548.9 | 365.9 | 11:20 | 11:43 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 9.88 | 10.88 | 1.00 | A | 35.6 | - | - | 14:24 | 14:30 | 0.6 | 2.5 | 4.51 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 9.88 | 10.88 | 1.00 | B | 118.1 | - | - | 14:30 | 14:48 | 2.7 | 15.8 | 6.11 | 35.9 | 2.0 | 1.65 | 16.3 | 7.2 | 15.8 | |
| | | 01-Nov-10 | 3 | 9.88 | 10.88 | 1.00 | C | 162.8 | - | - | 14:48 | 14:59 | 2.1 | 14.9 | 7.00 | 78.0 | 0.0 | 1.68 | 16.3 | 8.9 | 15.6 | |
| | | 01-Nov-10 | 3 | 9.88 | 10.88 | 1.00 | D | 125.9 | - | - | 14:59 | 15:08 | 2.1 | 15.4 | 7.46 | 105.3 | - | 1.65 | - | 8.8 | 13.1 | |
| | | 01-Nov-10 | 3 | 9.88 | 10.88 | 1.00 | E | 153.4 | 595.8 | 595.8 | 15:08 | 15:18 | 3.0 | 11.4 | 3.83 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 10.88 | 14.90 | 4.02 | A | 21.9 | 21.9 | 5.4 | 14:07 | 14:20 | 3.0 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 1 | 14.90 | 20.90 | 6.00 | A | 26.8 | 26.8 | 4.5 | 13:52 | 14:04 | 5.5 | 0.1 | 0.00 | 33.9 | - | 1.68 | 16.4 | 6.9 | 15.7 | |
| S-31+157 | S | 15-Nov-10 | 4 | 7.83 | 9.33 | 1.50 | B | 180.6 | - | - | 6:24 | 6:52 | 1.7 | 14.2 | 3.67 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 7.83 | 9.33 | 1.50 | C | 131.6 | - | - | 6:52 | 7:03 | 1.7 | 14.9 | 5.64 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 7.83 | 9.33 | 1.50 | D | 278.0 | - | - | 7:03 | 7:21 | 2.7 | 20.1 | 5.26 | 69.1 | 0.5 | - | 9.7 | 8.4 | 17.6 | |
| | | 15-Nov-10 | 4 | 7.83 | 9.33 | 1.50 | E | 147.3 | - | - | 7:21 | 7:47 | 2.6 | 2.5 | 1.95 | 115.6 | - | - | 7.7 | 8.4 | 18.9 | |
| | | 15-Nov-10 | 4 | 7.83 | 9.33 | 1.50 | X | 17.3 | 754.8 | 503.2 | 7:47 | 8:04 | 2.9 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.83 | 10.83 | 1.00 | A | 50.4 | - | - | 11:14 | 11:25 | 0.8 | 6.3 | 7.35 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.83 | 10.83 | 1.00 | B | 145.6 | - | - | 11:25 | 11:38 | 3.0 | 18.0 | 6.01 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.83 | 10.83 | 1.00 | C | 175.5 | - | - | 11:38 | 11:49 | 3.4 | 15.6 | 4.52 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.83 | 10.83 | 1.00 | D | 111.5 | - | - | 11:49 | 11:56 | 3.4 | 14.3 | 4.16 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.83 | 10.83 | 1.00 | E | 119.5 | 602.5 | 602.5 | 11:56 | 12:06 | 3.2 | 12.6 | 3.94 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 10.83 | 14.80 | 3.97 | A | 21.2 | 21.2 | 5.3 | 10:57 | 11:09 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 14.80 | 20.10 | 5.30 | A | 32.6 | 32.6 | 6.2 | 10:37 | 10:57 | 5.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+157.75 | Q | 21-Jun-11 | 4 | 7.35 | 8.85 | 1.50 | MF | 52.3 | 52.30 | 34.87 | 7:16 | 7:38 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 9.35 | 10.4 | 1.05 | A | 28 | 28.00 | 26.67 | 13:28 | 13:45 | 2.8 | 0.4 | 0.16 | 31.2 | - | 1.6 | 15.4 | 11.5 | 20.3 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+158.5 | T | 01-Dec-10 | 4 | 7.65 | 9.15 | 1.50 | MF | 186.6 | - | - | 20:33 | 21:06 | 1.0 | 11.1 | 7.68 | - | - | - | - | - | - | Communicated to T-31+164.5 |
| | | 01-Dec-10 | 4 | 7.65 | 9.15 | 1.50 | B | 154.6 | - | - | 21:06 | 21:19 | 1.2 | 12.3 | 6.68 | 35.3 | 5.0 | 1.58 | 4.5 | 8.9 | 13.7 | |
| | | 01-Dec-10 | 4 | 7.65 | 9.15 | 1.50 | C | 164.2 | - | - | 21:19 | 21:43 | 1.5 | 9.7 | 4.32 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 7.65 | 9.15 | 1.50 | D | 164.4 | - | - | 21:43 | 21:55 | 2.0 | 15.2 | 4.94 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 7.65 | 9.15 | 1.50 | X | 70.3 | 740.1 | 493.4 | 21:55 | 22:11 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 9.65 | 10.65 | 1.00 | A | 17.9 | - | - | 17:32 | 17:36 | 0.5 | 3.1 | 5.45 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 9.65 | 10.65 | 1.00 | B | 153.0 | - | - | 17:36 | 17:54 | 1.5 | 14.8 | 10.23 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 9.65 | 10.65 | 1.00 | C | 190.5 | - | - | 17:54 | 18:05 | 2.9 | 20.6 | 7.06 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 9.65 | 10.65 | 1.00 | D | 155.1 | 420.7 | - | 18:05 | 18:11 | 2.8 | 23.6 | 9.37 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 9.65 | 10.65 | 1.00 | E | 134.4 | 650.9 | 650.9 | 18:11 | 18:16 | 2.9 | 22.6 | 7.82 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 10.65 | 14.70 | 4.05 | A | 29.3 | 29.3 | 7.2 | 17:17 | 17:29 | 2.7 | 0.4 | 0.03 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 14.70 | 20.00 | 5.30 | A | 28.6 | 28.6 | 5.4 | 17:02 | 17:14 | 5.6 | 0.3 | 0.01 | - | - | - | - | - | - | |
| Q-31+159.25 | Q | 16-Jun-11 | 4 | 8.47 | 9.97 | 1.50 | MF | 180 | - | - | 9:16 | 9:43 | 2.2 | 12.5 | 3.65 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 4 | 7.83 | 9.97 | 1.50 | B | 160 | - | - | 9:43 | 9:54 | 2.4 | 15.0 | 3.20 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 4 | 6.54 | 9.97 | 1.50 | C | 160 | - | - | 9:54 | 10:22 | 2.6 | 6.1 | 1.50 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 4 | 8.47 | 9.97 | 1.50 | D | 97.7 | 597.70 | 398.47 | 10:22 | 10:56 | 2.4 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 10.47 | 11.5 | 1.03 | A | 163.4 | - | - | 9:06 | 9:30 | 0.5 | 12.0 | 22.10 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 10.47 | 11.5 | 1.03 | B | 163.6 | - | - | 9:30 | 9:41 | 1.3 | 18.8 | 14.94 | 37.5 | - | 1.6 | 6.1 | 16.0 | 21.6 | |
| | | 06-May-11 | 3 | 10.47 | 11.5 | 1.03 | C | 174 | - | - | 9:41 | 9:49 | 1.8 | 21.4 | 11.40 | 47.9 | - | 1.6 | 6.1 | 16.0 | 21.6 | |
| | | 06-May-11 | 3 | 10.47 | 11.5 | 1.03 | D | 224.5 | - | - | 9:49 | 10:01 | 2.9 | 18.8 | 7.91 | 72.5 | - | 1.6 | 7.6 | 16.4 | 21.6 | |
| | | 06-May-11 | 3 | 10.47 | 11.5 | 1.03 | X | 28.9 | 754.40 | 732.43 | 10:01 | 10:15 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| P-31+160 | P | 07-Nov-10 | 4 | 7.81 | 9.31 | 1.50 | B | 154.3 | - | - | 20:29 | 20:50 | 1.8 | 15.7 | 5.95 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.81 | 9.31 | 1.50 | C | 167.9 | - | - | 20:50 | 21:03 | 1.6 | 12.7 | 4.61 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.81 | 9.31 | 1.50 | D | 234.5 | - | - | 21:03 | 21:22 | 1.9 | 19.3 | 6.37 | - | 5.0 | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.81 | 9.31 | 1.50 | E | 171.4 | - | - | 21:22 | 21:33 | 1.8 | 19.0 | 6.49 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.81 | 9.31 | 1.50 | X | 93.9 | 822.0 | 548.0 | 21:33 | 21:40 | 1.8 | 17.7 | 6.48 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 9.81 | 10.81 | 1.00 | A | 45.1 | - | - | 4:28 | 4:37 | 0.5 | 6.3 | 13.42 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 9.81 | 10.81 | 1.00 | B | 105.5 | - | - | 4:37 | 4:49 | 0.9 | 13.0 | 15.05 | 33.6 | - | 1.60 | -1.2 | 11.4 | 13.9 | |
| | | 18-Oct-10 | 3 | 9.81 | 10.81 | 1.00 | C | 175.5 | - | - | 4:49 | 5:01 | 1.6 | 15.9 | 11.00 | 63.1 | - | 1.63 | -1.2 | 11.4 | 14.3 | |
| | | 18-Oct-10 | 3 | 9.81 | 10.81 | 1.00 | D | 157.7 | - | - | 5:01 | 5:10 | 3.1 | 21.7 | 6.83 | 97.8 | - | 1.66 | -1.2 | 11.4 | 13.1 | |
| | | 18-Oct-10 | 3 | 9.81 | 10.81 | 1.00 | D+ | 137.4 | 621.2 | 621.2 | 5:10 | 5:17 | 3.4 | 21.1 | 6.15 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 10.81 | 14.80 | 3.99 | A | 21.4 | 21.4 | 5.4 | 4:13 | 4:25 | 2.7 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 1 | 14.80 | 20.20 | 5.40 | A | 23.4 | 23.4 | 4.3 | 3:53 | 4:06 | 5.4 | 0.0 | 0.00 | 30.9 | 4.4 | 1.63 | 8.7 | 11.4 | 14.0 | |
| Q-31+160.75 | Q | 21-Jun-11 | 4 | 7.88 | 9.38 | 1.50 | MF | 50.5 | 50.50 | 33.67 | 7:44 | 8:06 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 9.88 | 11 | 1.12 | A | 76.6 | 76.60 | 68.39 | 13:53 | 14:30 | 2.7 | 0.2 | 0.06 | - | - | - | - | - | - | |
| T-31+161.5 | T | 12-Dec-10 | 4 | 8.29 | 9.79 | 1.50 | MF | 171.8 | - | - | 13:56 | 14:23 | 1.7 | 12.2 | 4.68 | 32.6 | - | 1.63 | -14.0 | 6.7 | 16.2 | |
| | | 12-Dec-10 | 4 | 8.29 | 9.79 | 1.50 | B | 165.7 | - | - | 14:23 | 14:34 | 1.9 | 15.4 | 7.56 | 37.6 | - | 1.66 | -13.8 | 7.1 | 15.4 | |
| | | 12-Dec-10 | 4 | 8.29 | 9.79 | 1.50 | C | 171.1 | - | - | 14:34 | 14:44 | 2.3 | 21.8 | 6.38 | 45.1 | - | 1.65 | -14.1 | 7.1 | 16.1 | |
| | | 12-Dec-10 | 4 | 8.29 | 9.79 | 1.50 | D | 138.5 | - | - | 14:44 | 15:05 | 2.4 | 6.7 | 2.89 | 54.7 | 1.0 | 1.68 | 4.5 | 5.1 | 11.4 | |
| | | 12-Dec-10 | 4 | 8.29 | 9.79 | 1.50 | X | 27.8 | 674.9 | 449.9 | 15:05 | 15:15 | 2.6 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.29 | 11.29 | 1.00 | A | 50.6 | - | - | 19:13 | 19:22 | 1.0 | 7.2 | 6.55 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.29 | 11.29 | 1.00 | B | 113.0 | - | - | 19:22 | 19:33 | 1.2 | 12.6 | 11.89 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.29 | 11.29 | 1.00 | C | 161.2 | - | - | 19:33 | 19:42 | 1.5 | 21.5 | 14.00 | 51.4 | 2.4 | 1.63 | 4.5 | 8.5 | 13.5 | |
| | | 28-Oct-10 | 3 | 10.29 | 11.29 | 1.00 | D | 160.1 | - | - | 19:42 | 19:49 | 2.2 | 23.9 | 10.65 | 73.5 | 1.6 | 1.68 | 4.5 | 8.5 | 14.5 | |
| | | 28-Oct-10 | 3 | 10.29 | 11.29 | 1.00 | E | 121.3 | 606.2 | 606.2 | 19:49 | 19:54 | 2.4 | 28.7 | 12.03 | 85.6 | - | 1.67 | 4.5 | 8.5 | 14.0 | |
| | | 28-Oct-10 | 2 | 11.29 | 15.30 | 4.01 | A | 27.4 | 27.4 | 6.8 | 18:58 | 19:10 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 15.30 | 20.50 | 5.20 | A | 38.5 | 38.5 | 7.4 | 18:41 | 18:53 | 5.3 | 1.5 | 0.06 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+162.25 | Q | 16-Jun-11 | 4 | 9.61 | 11.11 | 1.50 | MF | 24.5 | 24.50 | 16.33 | 11:00 | 11:17 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 11.61 | 12.71 | 1.10 | A | 168.9 | - | - | 14:56 | 15:24 | 0.5 | 13.2 | 15.52 | 30.5 | 3.5 | 1.6 | 10.4 | 12.2 | 19.0 | |
| | | 06-May-11 | 3 | 11.61 | 12.71 | 1.10 | B | 166.8 | - | - | 15:24 | 15:33 | 1.7 | 18.7 | 9.57 | 36.9 | - | 1.6 | 7.2 | 17.0 | 21.8 | |
| | | 06-May-11 | 3 | 11.61 | 12.71 | 1.10 | C | 163.4 | - | - | 15:33 | 15:41 | 2.3 | 21.7 | 9.83 | 50.8 | - | 1.6 | 7.5 | 12.3 | 21.7 | |
| | | 06-May-11 | 3 | 11.61 | 12.71 | 1.10 | D | 223.3 | - | - | 15:41 | 15:52 | 1.9 | 20.1 | 9.15 | 66.3 | - | 1.7 | 3.9 | 12.4 | 21.1 | |
| | | 06-May-11 | 3 | 11.61 | 12.71 | 1.10 | X | 124.6 | 847.00 | 770.00 | 15:52 | 16:14 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 11.61 | 12.61 | 1.00 | A | 156.9 | - | - | 14:54 | 15:23 | 2.1 | 13.0 | 6.13 | 31.3 | - | 1.6 | 4.2 | 11.1 | 15.4 | |
| | | 08-May-11 | 3 | 11.61 | 12.61 | 1.00 | B | 195.5 | - | - | 15:23 | 15:35 | 2.1 | 20.9 | 9.31 | 38.2 | 0.5 | 1.6 | 3.9 | 10.1 | 14.7 | |
| | | 08-May-11 | 3 | 11.61 | 12.61 | 1.00 | C | 169.9 | - | - | 15:35 | 15:45 | 2.6 | 15.1 | 5.84 | 42.0 | - | 1.6 | 4.1 | 10.4 | 15.3 | |
| | | 08-May-11 | 3 | 11.61 | 12.61 | 1.00 | D | 142 | - | - | 15:45 | 15:58 | 3.0 | 7.1 | 2.54 | 62.5 | - | 1.7 | 4.3 | 10.3 | 16.7 | |
| | | 08-May-11 | 3 | 11.61 | 12.61 | 1.00 | X | 20.4 | 684.70 | 684.70 | 15:58 | 16:12 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+163 | S | 15-Nov-10 | 4 | 8.54 | 10.04 | 1.50 | B | 26.3 | 26.3 | 17.5 | 9:54 | 10:09 | 3.4 | 0.2 | 0.03 | 37.6 | - | - | 12.9 | 9.7 | 17.9 | |
| | | 22-Oct-10 | 3 | 10.54 | 11.54 | 1.00 | B | 188.3 | - | - | 14:51 | 15:14 | 0.9 | 12.7 | 15.69 | 35.3 | - | 1.62 | 10.3 | 9.3 | 15.7 | |
| | | 22-Oct-10 | 3 | 10.54 | 11.54 | 1.00 | C | 149.6 | - | - | 15:14 | 15:23 | 1.5 | 19.2 | 11.65 | 47.8 | 0.0 | 1.61 | 9.8 | 11.8 | 14.8 | |
| | | 22-Oct-10 | 3 | 10.54 | 11.54 | 1.00 | D | 165.5 | - | - | 15:23 | 15:32 | 1.6 | 21.8 | 14.14 | 66.0 | 0.0 | 1.63 | 32.8 | 11.4 | 20.9 | |
| | | 22-Oct-10 | 3 | 10.54 | 11.54 | 1.00 | E | 99.5 | 602.9 | 602.9 | 15:32 | 15:37 | 2.0 | 22.0 | 11.12 | 92.4 | - | 1.68 | 32.8 | 11.6 | 20.0 | |
| | | 22-Oct-10 | 2 | 11.54 | 15.50 | 3.96 | A | 61.5 | 61.5 | 15.5 | 14:32 | 14:47 | 2.9 | 1.1 | 0.09 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 15.50 | 20.60 | 5.10 | A | 41.7 | 41.7 | 8.2 | 14:12 | 14:25 | 5.8 | 1.3 | 0.04 | 32.9 | - | 1.62 | 10.3 | 9.3 | 16.9 | |
| Q-31+163.75 | Q | 21-Jun-11 | 4 | 8.95 | 10.45 | 1.50 | MF | 52.9 | 52.90 | 35.27 | 8:12 | 8:37 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 10.95 | 12 | 1.05 | A | 31.6 | 31.60 | 30.10 | 14:41 | 15:00 | 2.7 | 0.4 | 0.16 | - | - | - | - | - | - | |
| T-31+164.5 | T | 01-Dec-10 | 4 | 9.20 | 10.70 | 1.50 | MF | 181.8 | - | - | 19:03 | 19:26 | 1.4 | 15.0 | 7.07 | 30.1 | 4.0 | 1.40 | 18.4 | 9.2 | 12.8 | Communicated to T-31+170.5 |
| | | 01-Dec-10 | 4 | 9.20 | 10.70 | 1.50 | B | 151.8 | - | - | 19:26 | 19:36 | 1.8 | 15.9 | 6.27 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 9.20 | 10.70 | 1.50 | C | 166.9 | - | - | 19:36 | 19:46 | 2.0 | 18.3 | 5.96 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 9.20 | 10.70 | 1.50 | D | 162.7 | - | - | 19:46 | 19:54 | 2.1 | 19.6 | 5.46 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 9.20 | 10.70 | 1.50 | X | 73.1 | 736.3 | 490.9 | 19:54 | 20:10 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.20 | 11.20 | 1.00 | A | 27.2 | - | - | 21:21 | 21:27 | 0.9 | 3.8 | 3.96 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.20 | 11.20 | 1.00 | B | 102.0 | - | - | 21:27 | 21:39 | 1.4 | 12.3 | 8.93 | 35.1 | - | 1.65 | 4.5 | 8.5 | 19.0 | |
| | | 28-Oct-10 | 3 | 10.20 | 11.20 | 1.00 | C | 177.5 | - | - | 21:39 | 21:49 | 2.3 | 21.4 | 12.08 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.20 | 11.20 | 1.00 | D | 175.7 | - | - | 21:49 | 21:56 | 2.7 | 28.9 | 11.56 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.20 | 11.20 | 1.00 | E | 124.0 | 606.4 | 606.4 | 21:56 | 22:01 | 2.4 | 28.6 | 11.84 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 11.20 | 16.20 | 5.00 | A | 24.4 | 24.4 | 4.9 | 21:05 | 21:17 | 2.9 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 16.20 | 21.70 | 5.50 | A | 26.5 | 26.5 | 4.8 | 20:45 | 20:59 | 5.4 | 0.0 | 0.00 | 31.5 | - | 1.62 | 4.5 | 8.5 | 14.0 | |
| Q-31+165.25 | Q | 16-Jun-11 | 4 | 9.15 | 10.65 | 1.50 | MF | 180 | - | - | 11:21 | 11:43 | 2.1 | 13.6 | 4.15 | - | - | - | - | - | - | Communicated to Q-31+159.25. |
| | | 16-Jun-11 | 4 | 9.15 | 10.65 | 1.50 | B | 157 | - | - | 11:43 | 11:52 | 2.5 | 15.8 | 4.43 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 4 | 9.15 | 10.65 | 1.50 | D | 147 | - | - | 11:52 | 12:27 | 2.5 | 16.3 | 4.49 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 4 | 9.15 | 10.65 | 1.50 | X | 23 | 507.00 | 338.00 | 12:27 | 12:34 | 2.7 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 11.15 | 12.21 | 1.06 | A | 166.9 | - | - | 10:37 | 11:04 | 2.9 | 8.7 | 3.02 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 11.15 | 12.21 | 1.06 | B | 172.2 | - | - | 11:04 | 11:29 | 2.8 | 7.3 | 2.40 | 35.1 | - | 1.6 | 7.6 | 16.4 | 21.6 | |
| | | 06-May-11 | 3 | 11.15 | 12.21 | 1.06 | C | 114.6 | 453.70 | 428.02 | 11:29 | 12:44 | 3.2 | 0.7 | 0.23 | - | - | - | - | - | - | |
| P-31+166 | P | 07-Nov-10 | 4 | 8.75 | 10.25 | 1.50 | B | 158.5 | - | - | 21:58 | 22:19 | 1.8 | 12.7 | 4.81 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 8.75 | 10.25 | 1.50 | C | 160.2 | - | - | 22:19 | 22:31 | 1.9 | 13.2 | 4.51 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 8.75 | 10.25 | 1.50 | D | 202.2 | - | - | 22:31 | 22:43 | 1.9 | 19.3 | 6.76 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 8.75 | 10.25 | 1.50 | E | 215.2 | - | - | 22:43 | 22:54 | 1.6 | 16.5 | 6.89 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 8.75 | 10.25 | 1.50 | X | 80.9 | 817.0 | 544.7 | 22:54 | 22:58 | 1.9 | 8.1 | 2.78 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 10.70 | 11.70 | 1.00 | B | 121.4 | - | - | 9:12 | 9:30 | 1.2 | 12.8 | 10.81 | 37.2 | 3.0 | 1.62 | 1.4 | 7.8 | 12.6 | |
| | | 19-Oct-10 | 3 | 10.70 | 11.70 | 1.00 | C | 239.3 | - | - | 9:30 | 9:46 | 1.5 | 18.8 | 12.79 | 50.3 | - | 1.63 | 1.5 | 7.9 | 13.4 | |
| | | 19-Oct-10 | 3 | 10.70 | 11.70 | 1.00 | D | 154.7 | - | - | 9:46 | 9:55 | 1.7 | 17.7 | 9.87 | 58.3 | - | 1.63 | 1.5 | 7.9 | 11.2 | |
| | | 19-Oct-10 | 3 | 10.70 | 11.70 | 1.00 | D+ | 111.8 | 627.2 | 627.2 | 9:55 | 10:02 | 1.7 | 16.4 | 9.68 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 11.70 | 15.70 | 4.00 | A | 110.4 | 110.4 | 27.6 | 8:42 | 9:08 | 2.8 | 2.0 | 0.18 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 1 | 15.70 | 21.00 | 5.30 | A | 31.6 | 31.6 | 6.0 | 8:20 | 8:35 | 5.7 | 0.5 | 0.02 | 33.7 | 4.0 | 1.62 | 1.9 | 7.8 | 14.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+167.5 | T | 12-Dec-10 | 4 | 9.20 | 10.70 | 1.50 | MF | 173.9 | - | - | 15:43 | 16:09 | 1.9 | 15.6 | 8.26 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 9.20 | 10.70 | 1.50 | B | 162.2 | - | - | 16:09 | 16:18 | 2.4 | 18.9 | 6.19 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 9.20 | 10.70 | 1.50 | C | 159.0 | - | - | 16:18 | 16:28 | 2.0 | 15.1 | 5.34 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 9.20 | 10.70 | 1.50 | D | 138.2 | - | - | 16:28 | 16:52 | 1.8 | 6.0 | 2.09 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 9.20 | 10.70 | 1.50 | X | 12.1 | 645.4 | 430.3 | 16:52 | 17:01 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 11.20 | 12.20 | 1.00 | B | 18.7 | 18.7 | 18.7 | 23:02 | 23:20 | 2.8 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 12.20 | 16.20 | 4.00 | A | 41.1 | 41.1 | 10.3 | 22:44 | 23:00 | 2.8 | 0.5 | 0.04 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 16.20 | 21.50 | 5.30 | A | 29.8 | 29.8 | 5.6 | 22:25 | 22:37 | 5.6 | 0.2 | 0.01 | - | - | - | - | - | - | |
| S-31+169 | S | 15-Nov-10 | 4 | 8.52 | 10.02 | 1.50 | B | 151.9 | - | - | 10:16 | 10:47 | 1.2 | 7.4 | 4.36 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 8.52 | 10.02 | 1.50 | C | 180.1 | - | - | 10:47 | 11:17 | 1.8 | 12.7 | 4.42 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 8.52 | 10.02 | 1.50 | D | 190.5 | - | - | 11:17 | 11:31 | 2.2 | 16.3 | 4.84 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 8.52 | 10.02 | 1.50 | E | 198.9 | - | - | 11:31 | 11:57 | 2.6 | 7.5 | 1.90 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 8.52 | 10.02 | 1.50 | X | 39.4 | 760.8 | 507.2 | 11:57 | 12:12 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 10.52 | 11.52 | 1.00 | B | 149.6 | - | - | 16:18 | 16:39 | 0.6 | 12.3 | 20.99 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 10.52 | 11.52 | 1.00 | C | 176.5 | - | - | 16:39 | 16:50 | 1.4 | 18.9 | 17.16 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 10.52 | 11.52 | 1.00 | D | 148.9 | - | - | 16:50 | 16:59 | 2.3 | 17.9 | 8.49 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 10.52 | 11.52 | 1.00 | E | 126.2 | 601.2 | 601.2 | 16:59 | 17:08 | 2.5 | 16.6 | 6.74 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 11.52 | 15.50 | 3.98 | A | 20.8 | 20.8 | 5.2 | 16:01 | 16:16 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 15.50 | 20.60 | 5.10 | A | 23.7 | 23.7 | 4.6 | 15:46 | 15:58 | 5.9 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-31+169.75 | Q | 21-Jun-11 | 4 | 8.29 | 9.79 | 1.50 | MF | 56.1 | 56.10 | 37.40 | 8:40 | 9:04 | 2.4 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 10.24 | 11.24 | 1.00 | A | 175.3 | - | - | 7:12 | 7:40 | 2.3 | 13.1 | 7.30 | 28.9 | 4.0 | 1.6 | 2.1 | 17.4 | 24.3 | |
| | | 03-May-11 | 3 | 10.24 | 11.24 | 1.00 | B | 165.6 | - | - | 7:40 | 7:52 | 2.6 | 17.7 | 8.76 | 31.0 | - | 1.6 | -5.5 | 18.5 | 25.3 | |
| | | 03-May-11 | 3 | 10.24 | 11.24 | 1.00 | C | 139.2 | - | - | 7:52 | 8:00 | 2.3 | 18.2 | 7.68 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 10.24 | 11.24 | 1.00 | D | 50.9 | 531.00 | 531.00 | 8:00 | 8:15 | 2.9 | 0.1 | 0.02 | 49.7 | - | 1.7 | -5.4 | 16.6 | 23.5 | |
| T-31+170.5 | T | 01-Dec-10 | 4 | 8.32 | 9.82 | 1.50 | MF | 194.5 | - | - | 16:21 | 16:45 | 0.9 | 12.5 | 9.30 | 27.7 | - | - | -9.5 | 8.9 | 13.5 | |
| | | 01-Dec-10 | 4 | 8.32 | 9.82 | 1.50 | B | 173.1 | - | - | 16:45 | 16:55 | 1.1 | 18.1 | 11.10 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 8.32 | 9.82 | 1.50 | C | 213.3 | - | - | 16:55 | 17:08 | 2.0 | 15.9 | 4.71 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 8.32 | 9.82 | 1.50 | D | 37.2 | 618.1 | 412.1 | 17:08 | 17:23 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.31 | 11.32 | 1.01 | A | 87.4 | - | - | 2:25 | 2:38 | 1.0 | 9.8 | 8.79 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 10.31 | 11.32 | 1.01 | B | 73.4 | - | - | 2:38 | 2:44 | 1.4 | 13.0 | 9.55 | 37.1 | 2.0 | 1.62 | 17.0 | 8.0 | 17.5 | |
| | | 28-Oct-10 | 3 | 10.31 | 11.32 | 1.01 | C | 163.7 | - | - | 2:44 | 2:53 | 1.7 | 18.8 | 10.85 | 46.5 | - | 1.64 | 17.0 | 8.0 | 15.0 | |
| | | 28-Oct-10 | 3 | 10.31 | 11.32 | 1.01 | D | 156.7 | - | - | 2:53 | 3:01 | 2.4 | 24.5 | 10.35 | 58.6 | - | 1.69 | 17.0 | 8.0 | 16.0 | |
| | | 28-Oct-10 | 3 | 10.31 | 11.32 | 1.01 | E | 126.7 | 607.9 | 601.9 | 3:01 | 3:06 | 2.8 | 28.6 | 10.32 | 87.6 | - | 1.69 | 17.0 | 8.0 | 15.5 | |
| | | 28-Oct-10 | 2 | 11.32 | 15.30 | 3.98 | A | 23.1 | 23.1 | 5.8 | 2:11 | 2:22 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 15.30 | 20.60 | 5.30 | A | 25.3 | 25.3 | 4.8 | 1:53 | 2:06 | 5.8 | 0.3 | 0.01 | 31.4 | 3.0 | 1.63 | 17.0 | 8.0 | 15.0 | |
| Q-31+171.25 | Q | 16-Jun-11 | 4 | 8.7 | 10.2 | 1.50 | MF | 180 | - | - | 14:18 | 14:40 | 2.5 | 20.1 | 5.03 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 4 | 8.7 | 10.2 | 1.50 | B | 160 | - | - | 14:40 | 14:49 | 2.4 | 18.7 | 5.33 | 34.7 | 4.0 | 1.5 | 6.8 | 10.8 | 13.1 | |
| | | 16-Jun-11 | 4 | 8.7 | 10.2 | 1.50 | D | 92 | - | - | 14:49 | 14:59 | 2.5 | 4.9 | 1.42 | - | - | - | - | - | - | Communicated to Q- 31+165.25 |
| | | 16-Jun-11 | 4 | 8.7 | 10.2 | 1.50 | X | 24.1 | 456.10 | 304.07 | 14:59 | 15:13 | 2.4 | 0.8 | 0.22 | - | - | - | - | - | - | |
| | | 11-May-11 | 3 | 10.7 | 11.83 | 1.13 | A | 25 | 25.00 | 22.12 | 14:23 | 14:36 | 3.0 | 0.0 | 0.00 | 30.6 | - | 1.6 | 14.5 | 18.3 | 22.2 | |
| P-31+172 | P | 07-Nov-10 | 4 | 8.70 | 10.20 | 1.50 | B | 175.4 | - | - | 1:43 | 2:05 | 1.6 | 12.6 | 5.53 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 8.70 | 10.20 | 1.50 | C | 141.3 | - | - | 2:05 | 2:16 | 2.2 | 16.0 | 5.82 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 8.70 | 10.20 | 1.50 | D | 201.9 | - | - | 2:16 | 2:30 | 1.6 | 13.1 | 4.84 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 8.70 | 10.20 | 1.50 | E | 203.3 | - | - | 2:30 | 2:44 | 2.2 | 16.8 | 5.35 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 8.70 | 10.20 | 1.50 | X | 94.1 | 816.0 | 544.0 | 2:44 | 2:51 | 2.4 | 21.8 | 6.06 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 10.70 | 11.70 | 1.00 | A | 38.6 | 38.6 | 38.6 | 11:33 | 12:00 | 3.7 | 0.8 | 0.22 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 11.70 | 15.70 | 4.00 | A | 23.3 | 23.3 | 5.8 | 11:16 | 11:30 | 3.0 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 1 | 15.70 | 21.00 | 5.30 | A | 28.1 | 28.1 | 5.3 | 10:20 | 10:36 | 5.9 | 0.2 | 0.01 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+173.5 | T | 13-Dec-10 | 4 | 8.39 | 9.89 | 1.50 | MF | 170.6 | - | - | 7:05 | 7:30 | 1.9 | 17.8 | 6.87 | 31.3 | 3.0 | 1.63 | 14.7 | 12.2 | - | |
| | | 13-Dec-10 | 4 | 8.39 | 9.89 | 1.50 | B | 164.9 | - | - | 7:30 | 7:40 | 1.9 | 19.7 | 7.56 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 8.39 | 9.89 | 1.50 | C | 177.2 | - | - | 7:40 | 7:48 | 2.3 | 20.2 | 5.27 | 37.3 | - | 1.64 | -17.0 | 8.0 | 16.4 | |
| | | 13-Dec-10 | 4 | 8.39 | 9.89 | 1.50 | D | 125.0 | 637.7 | 425.1 | 7:48 | 8:30 | 2.3 | 0.0 | 0.01 | 62.0 | 0.5 | 1.68 | -17.0 | 8.1 | 15.5 | |
| | | 28-Oct-10 | 3 | 10.39 | 11.39 | 1.00 | A | 18.3 | 18.3 | 18.3 | 4:00 | 4:14 | 3.1 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 11.39 | 15.40 | 4.01 | A | 24.4 | 24.4 | 6.1 | 3:44 | 3:57 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 15.40 | 20.70 | 5.30 | A | 26.6 | 26.6 | 5.0 | 3:24 | 3:37 | 5.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+175 | S | 15-Nov-10 | 4 | 8.16 | 9.66 | 1.50 | B | 196.1 | - | - | 14:33 | 15:01 | 1.5 | 12.6 | 5.32 | 38.8 | 4.0 | - | 2.4 | 8.7 | 13.8 | |
| | | 15-Nov-10 | 4 | 8.16 | 9.66 | 1.50 | C | 207.6 | - | - | 15:01 | 15:15 | 1.7 | 15.6 | 2.23 | 57.6 | 1.0 | - | 2.9 | 8.7 | 15.7 | |
| | | 15-Nov-10 | 4 | 8.16 | 9.66 | 1.50 | D | 190.5 | - | - | 15:15 | 15:25 | 2.3 | 19.6 | 6.14 | 69.1 | - | - | 2.9 | 8.7 | 16.4 | |
| | | 15-Nov-10 | 4 | 8.16 | 9.66 | 1.50 | E | 208.8 | 803.0 | 535.3 | 15:25 | 15:44 | 3.1 | 14.4 | 2.70 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 10.16 | 11.16 | 1.00 | B | 171.2 | - | - | 18:16 | 18:38 | 0.9 | 13.1 | 14.51 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 10.16 | 11.16 | 1.00 | C | 155.5 | - | - | 18:38 | 18:46 | 1.3 | 18.4 | 13.25 | 42.3 | 0.0 | 1.70 | 30.0 | 13.0 | 18.0 | |
| | | 22-Oct-10 | 3 | 10.16 | 11.16 | 1.00 | D | 163.5 | - | - | 18:46 | 18:56 | 2.0 | 21.7 | 10.70 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 10.16 | 11.16 | 1.00 | E | 136.7 | 626.9 | 626.9 | 18:56 | 19:02 | 3.6 | 16.8 | 4.71 | 91.6 | 0.0 | 1.71 | 30.0 | 13.0 | 20.0 | |
| | | 22-Oct-10 | 2 | 11.16 | 15.20 | 4.04 | A | 22.3 | 22.3 | 5.5 | 18:03 | 18:13 | 3.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 15.20 | 20.60 | 5.40 | A | 33.5 | 33.5 | 6.2 | 17:41 | 17:53 | 5.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+176.5 | T | 01-Dec-10 | 4 | 7.96 | 9.46 | 1.50 | MF | 189.6 | - | - | 14:41 | 15:05 | 1.0 | 15.7 | 8.20 | 30.1 | - | 1.59 | 12.9 | 10.8 | 13.0 | |
| | | 01-Dec-10 | 4 | 7.96 | 9.46 | 1.50 | B | 174.7 | - | - | 15:05 | 15:16 | 1.0 | 18.3 | 12.58 | 36.5 | - | 1.62 | 10.5 | 10.8 | 12.6 | |
| | | 01-Dec-10 | 4 | 7.96 | 9.46 | 1.50 | C | 158.4 | - | - | 15:16 | 15:24 | 1.7 | 19.5 | 8.55 | 50.0 | - | - | 10.5 | 10.8 | 12.8 | |
| | | 01-Dec-10 | 4 | 7.96 | 9.46 | 1.50 | D | 201.9 | - | - | 15:24 | 15:39 | 2.1 | 15.1 | 5.14 | 78.1 | - | 1.68 | 10.5 | 10.8 | 13.8 | |
| | | 01-Dec-10 | 4 | 7.96 | 9.46 | 1.50 | X | 36.4 | 761.0 | 507.3 | 15:39 | 15:57 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 9.96 | 10.96 | 1.00 | A | 50.6 | - | - | 4:56 | 5:06 | 1.0 | 6.5 | 6.78 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 9.96 | 10.96 | 1.00 | B | 111.7 | - | - | 5:06 | 5:16 | 2.4 | 11.9 | 4.27 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 9.96 | 10.96 | 1.00 | C | 170.5 | - | - | 5:16 | 5:35 | 3.3 | 8.2 | 3.02 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 9.96 | 10.96 | 1.00 | D | 150.8 | - | - | 5:35 | 5:59 | 3.0 | 5.1 | 1.65 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 9.96 | 10.96 | 1.00 | E | 119.7 | 603.3 | 603.3 | 5:59 | 6:27 | 2.9 | 4.0 | 1.40 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 10.90 | 15.00 | 4.10 | A | 22.4 | 22.4 | 5.5 | 4:40 | 4:52 | 3.0 | 0.2 | 0.20 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 1 | 15.00 | 20.20 | 5.20 | A | 24.0 | 24.0 | 4.6 | 4:23 | 4:35 | 5.7 | 0.1 | 0.00 | - | - | - | - | - | - | |
| P-31+178 | P | 07-Nov-10 | 4 | 7.73 | 9.23 | 1.50 | B | 158.7 | - | - | 3:13 | 3:34 | 1.9 | 12.3 | 4.26 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.73 | 9.23 | 1.50 | C | 162.8 | - | - | 3:34 | 3:44 | 2.2 | 16.7 | 5.11 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.73 | 9.23 | 1.50 | D | 201.4 | - | - | 3:44 | 3:56 | 1.9 | 18.7 | 7.02 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.73 | 9.23 | 1.50 | E | 197.6 | - | - | 3:56 | 4:07 | 2.0 | 19.3 | 4.68 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 7.73 | 9.23 | 1.50 | X | 80.5 | 801.0 | 534.0 | 4:07 | 4:13 | 2.1 | 15.0 | 4.65 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 9.73 | 10.73 | 1.00 | B | 154.0 | - | - | 15:11 | 15:33 | 0.8 | 13.3 | 17.30 | 38.2 | - | 1.63 | 7.4 | 7.9 | 17.6 | |
| | | 19-Oct-10 | 3 | 9.73 | 10.73 | 1.00 | C | 175.5 | - | - | 15:33 | 15:45 | 1.6 | 18.4 | 12.84 | 47.0 | 0.0 | 1.64 | 7.4 | 7.9 | 14.1 | |
| | | 19-Oct-10 | 3 | 9.73 | 10.73 | 1.00 | D | 156.6 | - | - | 15:45 | 15:53 | 2.3 | 22.5 | 10.27 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 9.73 | 10.73 | 1.00 | D+ | 155.6 | 641.7 | 641.7 | 15:53 | 16:01 | 2.3 | 21.5 | 9.44 | 57.1 | 0.0 | 1.68 | 7.4 | 7.9 | 12.3 | |
| | | 19-Oct-10 | 2 | 10.73 | 14.70 | 3.97 | A | 21.6 | 21.6 | 5.4 | 14:57 | 15:08 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 1 | 14.70 | 20.90 | 6.20 | A | 21.1 | 21.1 | 3.4 | 14:40 | 14:51 | 5.7 | 0.0 | 0.00 | 33.0 | - | 1.63 | 1.4 | 9.3 | 21.1 | |
| Q-31+178.75 | Q | 21-Jun-11 | 4 | 7.53 | 9.03 | 1.50 | MF | 100.2 | 100.20 | 66.80 | 9:09 | 9:40 | 2.5 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 9.53 | 10.53 | 1.00 | A | 41.3 | 41.30 | 41.30 | 8:57 | 9:53 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+179.5 | T | 13-Dec-10 | 4 | 7.17 | 8.67 | 1.50 | MF | 179.6 | - | - | 8:52 | 9:18 | 1.3 | 15.6 | 7.52 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 7.17 | 8.67 | 1.50 | B | 158.9 | - | - | 9:18 | 9:28 | 1.6 | 18.3 | 7.76 | 37.3 | 2.0 | 1.66 | -17.0 | 8.1 | 15.8 | |
| | | 13-Dec-10 | 4 | 7.17 | 8.67 | 1.50 | C | 170.0 | - | - | 9:28 | 9:35 | 1.8 | 25.6 | 7.54 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 7.17 | 8.67 | 1.50 | D | 137.8 | - | - | 9:35 | 9:41 | 1.8 | 10.4 | 2.77 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 7.17 | 8.67 | 1.50 | X | 36.5 | 682.8 | 455.2 | 9:41 | 9:52 | 2.4 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3A | 9.17 | 12.17 | 3.00 | A | 26.9 | 26.9 | 9.0 | 16:13 | 16:28 | 3.3 | 0.1 | 0.01 | 31.4 | - | 1.60 | -4.7 | 11.3 | 14.9 | Targeted depth of stage 3 possibly missed |
| | | 29-Oct-10 | 3 | 11.41 | 12.41 | 1.00 | A | 15.4 | 15.4 | 15.4 | 7:48 | 8:00 | 3.2 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 2 | 12.41 | 16.40 | 3.99 | A | 22.6 | 22.6 | 5.7 | 7:34 | 7:47 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 1 | 16.40 | 21.70 | 5.30 | A | 30.9 | 30.9 | 5.8 | 7:14 | 7:30 | 5.4 | 0.0 | 0.00 | 32.0 | 5.0 | - | 15.0 | 8.0 | 15.1 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+180.25 | Q | 16-Jun-11 | 4 | 6.87 | 8.37 | 1.50 | A | 46.7 | 46.70 | 31.13 | 15:20 | 15:41 | 2.5 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 07-May-11 | 2,3 | 8.87 | 13.95 | 5.08 | A | 176.9 | - | - | 7:21 | 7:49 | 2.4 | 12.6 | 4.46 | 30.6 | - | 1.6 | 3.6 | 16.2 | 22.5 | Incorrectly grouted. |
| | | 07-May-11 | 2,3 | 8.87 | 13.95 | 5.08 | B | 152.6 | - | - | 7:49 | 8:00 | 2.9 | 5.0 | 2.28 | 36.1 | 4.0 | 1.6 | 3.4 | 16.1 | 20.6 | |
| | | 07-May-11 | 2,3 | 8.87 | 13.95 | 5.08 | C | 66.9 | 396.40 | 78.03 | 8:00 | 9:02 | 3.1 | 0.0 | 0.00 | 41.6 | - | 1.6 | 3.4 | 16.1 | 20.1 | |
| | | 07-May-11 | 2 | 9.87 | 14 | 4.13 | A | 3.2 | 3.20 | 0.77 | 11:16 | 11:29 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+181 | S | 15-Nov-10 | 4 | 6.71 | 8.21 | 1.50 | B | 185.0 | - | - | 16:08 | 16:30 | 1.3 | 15.7 | 7.23 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 6.71 | 8.21 | 1.50 | C | 224.1 | - | - | 16:30 | 16:44 | 1.6 | 19.1 | 8.07 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 6.71 | 8.21 | 1.50 | D | 142.7 | - | - | 16:44 | 16:51 | 2.1 | 22.7 | 7.01 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 6.71 | 8.21 | 1.50 | E | 185.7 | - | - | 16:51 | 17:11 | 2.6 | 18.5 | 4.67 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 6.71 | 8.21 | 1.50 | X | 71.5 | 809.0 | 539.3 | 17:11 | 17:20 | 2.5 | 9.8 | 2.62 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.71 | 9.71 | 1.00 | A | 23.7 | - | - | 20:34 | 20:40 | 0.4 | 3.5 | 13.15 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.71 | 9.71 | 1.00 | B | 143.4 | - | - | 20:40 | 20:55 | 1.3 | 13.2 | 10.68 | 33.5 | 6.4 | 1.61 | 23.0 | 11.0 | 17.0 | |
| | | 22-Oct-10 | 3 | 8.71 | 9.71 | 1.00 | C | 160.5 | - | - | 20:55 | 21:06 | 2.8 | 19.6 | 6.47 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.71 | 9.71 | 1.00 | D | 156.1 | - | - | 21:06 | 21:18 | 3.5 | 8.7 | 2.65 | 71.8 | 0.0 | 1.69 | 23.0 | 11.0 | 18.0 | |
| | | 22-Oct-10 | 3 | 8.71 | 9.71 | 1.00 | E | 82.0 | 565.7 | 565.7 | 21:18 | 21:52 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 9.71 | 13.70 | 3.99 | A | 21.9 | 21.9 | 5.5 | 20:17 | 20:30 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 13.70 | 18.70 | 5.00 | A | 47.6 | 47.6 | 9.5 | 19:56 | 20:11 | 5.7 | 1.6 | 0.06 | 31.2 | - | 1.62 | 28.0 | 13.0 | 16.0 | |
| Q-31+181.75 | Q | 21-Jun-11 | 4 | 6.77 | 8.27 | 1.50 | MF | 45.6 | 45.60 | 30.40 | 9:43 | 10:05 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 8.77 | 9.77 | 1.00 | A | 165.4 | - | - | 10:04 | 10:30 | 1.3 | 12.7 | 9.82 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 8.77 | 9.77 | 1.00 | B | 158 | - | - | 10:30 | 10:40 | 1.9 | 21.3 | 8.78 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 8.77 | 9.77 | 1.00 | C | 173.2 | - | - | 10:40 | 10:49 | 2.3 | 15.4 | 6.83 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 8.77 | 9.77 | 1.00 | D | 139.8 | - | - | 10:49 | 10:58 | 3.0 | 7.7 | 3.42 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 8.77 | 9.77 | 1.00 | X | 46.8 | 683.20 | 683.20 | 10:58 | 11:19 | 3.1 | 0.6 | 0.19 | - | - | - | - | - | - | |
| T-31+182.5 | T | 01-Dec-10 | 4 | 6.61 | 8.11 | 1.50 | MF | 201.9 | - | - | 11:17 | 11:39 | 1.1 | 15.8 | 8.93 | 29.4 | - | 1.60 | 16.9 | 8.2 | 16.4 | |
| | | 01-Dec-10 | 4 | 6.61 | 8.11 | 1.50 | B | 148.1 | - | - | 11:39 | 11:48 | 1.2 | 18.7 | 10.39 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 6.61 | 8.11 | 1.50 | C | 178.9 | - | - | 11:48 | 11:57 | 2.2 | 17.7 | 5.52 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 4 | 6.61 | 8.11 | 1.50 | D | 138.5 | 667.4 | 444.9 | 11:57 | 12:22 | 2.8 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 3 | 8.61 | 9.61 | 1.00 | A | 51.0 | - | - | 8:38 | 8:53 | 1.0 | 2.7 | 3.48 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 3 | 8.61 | 9.61 | 1.00 | B | 162.4 | - | - | 8:53 | 9:12 | 1.3 | 8.5 | 6.26 | 37.5 | 3.0 | 1.63 | 15.1 | 15.0 | 17.8 | |
| | | 29-Oct-10 | 3 | 8.61 | 9.61 | 1.00 | C | 179.0 | - | - | 9:12 | 9:27 | 1.3 | 12.0 | 9.03 | 43.0 | - | - | 15.0 | 11.0 | 17.8 | |
| | | 29-Oct-10 | 3 | 8.61 | 9.61 | 1.00 | D | 82.6 | - | - | 9:27 | 9:34 | 1.4 | 12.6 | 9.34 | 46.0 | - | - | 15.0 | 11.0 | 17.2 | |
| | | 29-Oct-10 | 3 | 8.61 | 9.61 | 1.00 | E | 171.2 | 646.2 | 646.2 | 9:34 | 9:48 | 1.4 | 12.3 | 9.08 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 2 | 9.61 | 13.60 | 3.99 | A | 22.7 | 22.7 | 5.7 | 8:24 | 8:36 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 1 | 13.60 | 18.90 | 5.30 | A | 31.2 | 31.2 | 5.9 | 8:09 | 8:21 | 5.5 | 0.8 | 0.03 | - | - | - | - | - | - | |
| Q-31+183.25 | Q | 16-Jun-11 | 4 | 6.94 | 8.44 | 1.50 | A | 74.1 | 74.10 | 49.40 | 15:43 | 16:18 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 8.94 | 10.01 | 1.07 | A | 62.1 | 62.10 | 58.04 | 10:02 | 11:03 | 2.9 | 0.6 | 0.20 | - | - | - | - | - | - | |
| P-31+184 | P | 08-Nov-10 | 4 | 7.76 | 9.26 | 1.50 | B | 159.1 | - | - | 6:50 | 7:16 | 1.9 | 12.2 | 4.37 | 38.0 | 4.0 | 1.63 | 1.4 | 16.4 | 15.3 | |
| | | 08-Nov-10 | 4 | 7.76 | 9.26 | 1.50 | C | 169.3 | - | - | 7:16 | 7:30 | 2.0 | 12.4 | 4.05 | 42.9 | 4.0 | 1.65 | 1.4 | 16.4 | 15.5 | |
| | | 08-Nov-10 | 4 | 7.76 | 9.26 | 1.50 | D | 173.6 | - | - | 7:30 | 7:45 | 1.9 | 12.0 | 3.94 | 46.6 | - | 1.65 | 7.4 | 9.6 | 14.7 | |
| | | 08-Nov-10 | 4 | 7.76 | 9.26 | 1.50 | E | 190.6 | - | - | 7:45 | 8:01 | 2.1 | 12.1 | 3.95 | 52.0 | - | 1.66 | 3.2 | 9.8 | 17.3 | |
| | | 08-Nov-10 | 4 | 7.76 | 9.26 | 1.50 | X | 74.1 | 766.7 | 511.1 | 8:01 | 8:07 | 2.4 | 15.2 | 4.20 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 9.76 | 10.76 | 1.00 | A | 44.5 | - | - | 16:56 | 17:06 | 0.7 | 6.0 | 8.37 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 9.76 | 10.76 | 1.00 | B | 167.5 | - | - | 17:06 | 17:20 | 1.4 | 18.3 | 12.73 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 9.76 | 10.76 | 1.00 | C | 148.0 | - | - | 17:20 | 17:27 | 1.2 | 20.4 | 17.45 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 9.76 | 10.76 | 1.00 | D | 121.8 | - | - | 17:27 | 17:33 | 1.6 | 22.0 | 13.70 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 9.76 | 10.76 | 1.00 | E | 138.2 | 620.0 | 620.0 | 17:33 | 17:39 | 1.6 | 28.1 | 17.54 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 10.76 | 14.80 | 4.04 | A | 53.9 | 53.9 | 13.3 | 16:35 | 16:52 | 2.8 | 1.6 | 0.14 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 1 | 14.80 | 20.90 | 6.10 | A | 42.1 | 42.1 | 6.9 | 16:11 | 16:25 | 6.1 | 1.7 | 0.05 | - | - | - | - | - | - | |
| Q-31+184.75 | Q | 21-Jun-11 | 4 | 7.63 | 9.13 | 1.50 | MF | 51.1 | 51.10 | 34.07 | 10:07 | 10:31 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 9.63 | 10.63 | 1.00 | A | 16.7 | 16.70 | 16.70 | 13:29 | 13:44 | 3.0 | 0.3 | 0.09 | 29.4 | - | 1.6 | 6.5 | 17.6 | 23.8 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+185.5 | T | 13-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | MF | 170.7 | - | - | 10:13 | 10:38 | 1.5 | 12.6 | 6.66 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | B | 160.3 | - | - | 10:38 | 10:48 | 1.6 | 18.7 | 7.30 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | C | 167.4 | - | - | 10:48 | 10:54 | 1.9 | 25.7 | 7.84 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | D | 141.1 | 639.5 | 426.3 | 10:54 | 11:20 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 3 | 9.71 | 10.71 | 1.00 | A | 93.0 | - | - | 10:35 | 10:55 | 1.0 | 6.0 | 6.43 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 3 | 9.71 | 10.71 | 1.00 | B | 92.3 | - | - | 10:55 | 11:05 | 1.0 | 9.2 | 8.34 | 36.8 | 2.0 | 1.64 | -3.6 | 11.4 | 13.1 | |
| | | 29-Oct-10 | 3 | 9.71 | 10.71 | 1.00 | C | 84.9 | - | - | 11:05 | 11:15 | 1.3 | 9.1 | 7.18 | 90.0 | 1.0 | - | - | - | 12.3 | |
| | | 29-Oct-10 | 3 | 9.71 | 10.71 | 1.00 | D | 176.5 | - | - | 11:15 | 11:35 | 1.4 | 8.9 | 6.45 | 38.0 | - | 1.63 | - | 11.4 | 12.1 | |
| | | 29-Oct-10 | 3 | 9.71 | 10.71 | 1.00 | E | 165.1 | 611.8 | 611.8 | 11:35 | 11:53 | 1.8 | 8.9 | 5.00 | 50.2 | - | 1.65 | -3.6 | 11.4 | 11.8 | |
| | | 29-Oct-10 | 2 | 10.71 | 14.70 | 3.99 | A | 23.0 | 23.0 | 5.8 | 10:20 | 10:32 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 1 | 14.70 | 20.00 | 5.30 | A | 22.5 | 22.5 | 4.2 | 10:04 | 10:16 | 5.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+186.25 | Q | 16-Jun-11 | 4 | 7.35 | 8.85 | 1.50 | A | 58.6 | 58.60 | 39.07 | 16:20 | 16:40 | 2.6 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 9.35 | 10.35 | 1.00 | A | 148.1 | - | - | 16:04 | 16:33 | 2.8 | 7.4 | 2.36 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 9.35 | 10.35 | 1.00 | B | 133.2 | 281.30 | 281.30 | 16:33 | 17:30 | 2.9 | 0.3 | 0.09 | 36.9 | - | 1.6 | 3.9 | 14.4 | 17.4 | |
| | | 07-May-11 | 2 | 10.35 | 14.35 | 4.00 | A | 10.8 | 10.80 | 2.70 | 15:43 | 15:57 | 2.8 | 0.0 | 0.00 | 29.9 | - | 1.6 | 18.4 | 13.1 | 15.3 | |
| S-31+187 | S | 15-Nov-10 | 4 | 7.25 | 8.75 | 1.50 | B | 184.4 | - | - | 17:33 | 17:56 | 1.4 | 12.4 | 6.06 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 7.25 | 8.75 | 1.50 | C | 166.6 | - | - | 17:56 | 18:08 | 1.8 | 16.0 | 6.10 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 7.25 | 8.75 | 1.50 | D | 372.0 | - | - | 18:08 | 19:19 | 2.6 | 13.3 | 3.41 | 56.2 | 2.0 | 1.65 | 8.0 | 9.0 | 19.0 | |
| | | 15-Nov-10 | 4 | 7.25 | 8.75 | 1.50 | X | 50.4 | 773.4 | 515.6 | 19:19 | 19:35 | 3.1 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.25 | 10.25 | 1.00 | A | 36.4 | - | - | 22:51 | 22:59 | 0.5 | 6.4 | 14.17 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.25 | 10.25 | 1.00 | B | 122.3 | - | - | 22:59 | 23:12 | 0.7 | 12.3 | 16.62 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.25 | 10.25 | 1.00 | C | 169.0 | - | - | 23:12 | 23:22 | 1.7 | 21.5 | 15.95 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.25 | 10.25 | 1.00 | D | 155.4 | - | - | 23:22 | 23:29 | 1.9 | 21.6 | 12.06 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 9.25 | 10.25 | 1.00 | E | 118.9 | 602.0 | 602.0 | 23:29 | 23:34 | 2.3 | 24.5 | 10.58 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 10.25 | 14.20 | 3.95 | A | 29.8 | 29.8 | 7.5 | 22:34 | 22:47 | 2.6 | 0.7 | 0.07 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 14.20 | 19.90 | 5.70 | A | 45.3 | 45.3 | 7.9 | 22:12 | 22:26 | 5.7 | 1.7 | 0.05 | - | - | - | - | - | - | |
| Q-31+187.75 | Q | 21-Jun-11 | 4 | 7.1 | 8.6 | 1.50 | MF | 50.9 | 50.90 | 33.93 | 10:33 | 10:55 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 9.1 | 10.1 | 1.00 | A | 173.9 | - | - | 13:51 | 14:20 | 2.6 | 12.3 | 5.97 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 9.1 | 10.1 | 1.00 | B | 159.3 | - | - | 14:20 | 14:33 | 2.8 | 9.8 | 3.81 | 34.1 | - | 1.6 | 6.5 | 12.1 | 20.2 | |
| | | 03-May-11 | 3 | 9.1 | 10.1 | 1.00 | C | 138 | - | - | 14:33 | 14:55 | 3.0 | 4.3 | 1.52 | 33.9 | - | 1.6 | 6.6 | 12.1 | 19.2 | |
| | | 03-May-11 | 3 | 9.1 | 10.1 | 1.00 | D | 19.3 | 490.50 | 490.50 | 14:55 | 15:12 | 3.0 | 0.0 | 0.00 | 62.4 | - | 1.6 | 6.7 | 12.1 | 20.4 | |
| T-31+188.5 | T | 01-Dec-10 | 4 | 6.56 | 8.08 | 1.52 | MF | 171.3 | - | - | 9:27 | 9:51 | 0.9 | 13.2 | 9.68 | 28.0 | - | 1.61 | 17.1 | 13.9 | 19.6 | |
| | | 01-Dec-10 | 4 | 6.56 | 8.08 | 1.52 | B | 185.1 | - | - | 9:51 | 10:05 | 1.4 | 18.8 | 8.30 | 35.0 | - | 1.61 | 17.1 | 13.9 | 18.9 | |
| | | 01-Dec-10 | 4 | 6.56 | 8.08 | 1.52 | C | 171.9 | - | - | 10:05 | 10:14 | 2.4 | 16.1 | 5.07 | 50.5 | 0.5 | 1.64 | 17.1 | 13.9 | 17.6 | |
| | | 01-Dec-10 | 4 | 6.56 | 8.08 | 1.52 | D | 201.4 | - | - | 10:14 | 10:37 | 2.1 | 15.5 | 5.07 | 45.9 | - | 1.67 | -6.0 | 8.4 | 15.7 | |
| | | 01-Dec-10 | 4 | 6.56 | 8.08 | 1.52 | X | 61.1 | 790.8 | 520.3 | 10:37 | 10:55 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | A | 16.8 | - | - | 14:32 | 14:35 | 0.6 | 3.1 | 4.76 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | B | 175.6 | - | - | 14:35 | 15:00 | 1.2 | 11.8 | 10.39 | 35.6 | 3.0 | 1.63 | -1.5 | 9.3 | 13.8 | |
| | | 29-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | C | 76.4 | - | - | 15:00 | 15:06 | 1.7 | 12.1 | 7.08 | 60.5 | 1.0 | 1.65 | -1.5 | 6.1 | 13.1 | |
| | | 29-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | D | 186.1 | - | - | 15:06 | 15:22 | 1.8 | 12.3 | 7.18 | 63.0 | - | 1.65 | -1.2 | 7.0 | 11.8 | |
| | | 29-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | E | 125.1 | - | - | 15:22 | 15:33 | 2.1 | 11.9 | 7.03 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | X | 48.7 | 628.7 | 628.7 | 15:33 | 15:36 | 2.1 | 9.0 | 4.40 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 2 | 9.56 | 13.60 | 4.04 | A | 23.3 | 23.3 | 5.8 | 14:16 | 14:28 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 1 | 13.60 | 19.10 | 5.50 | A | 23.5 | 23.5 | 4.3 | 14:00 | 14:12 | 5.7 | 0.0 | 0.00 | 32.6 | - | 1.64 | 0.0 | 6.8 | 14.9 | |
| Q-31+189.25 | Q | 16-Jun-11 | 4 | 6.71 | 8.21 | 1.50 | A | 89.4 | 89.40 | 59.60 | 16:42 | 17:10 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 8.71 | 9.76 | 1.05 | A | 152.7 | - | - | 7:16 | 7:43 | 2.9 | 11.5 | 4.18 | 31.0 | 2.5 | 1.6 | 12.2 | 11.1 | 18.6 | |
| | | 08-May-11 | 3 | 8.71 | 9.76 | 1.05 | B | 166.2 | - | - | 7:43 | 8:04 | 3.0 | 6.1 | 1.91 | 37.4 | - | 1.6 | 12.0 | 12.1 | 18.1 | |
| | | 08-May-11 | 3 | 8.71 | 9.76 | 1.05 | C | 47.2 | 366.10 | 348.67 | 8:04 | 8:47 | 2.9 | 0.6 | 0.21 | 44.8 | - | 1.7 | 1.7 | 11.9 | 18.2 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+190 | P | 08-Nov-10 | 4 | 6.56 | 8.06 | 1.50 | B | 147.4 | - | - | 19:01 | 19:21 | 1.8 | 16.3 | 5.98 | 32.1 | 3.0 | 1.63 | 15.7 | 11.6 | 24.1 | |
| | | 08-Nov-10 | 4 | 6.56 | 8.06 | 1.50 | C | 174.8 | - | - | 19:21 | 19:32 | 1.8 | 15.4 | 5.67 | 38.1 | 3.0 | 1.65 | 9.4 | 21.7 | 20.1 | |
| | | 08-Nov-10 | 4 | 6.56 | 8.06 | 1.50 | D | 197.9 | - | - | 19:32 | 19:46 | 1.9 | 12.7 | 4.38 | 87.0 | - | 1.67 | 9.4 | 8.5 | 16.8 | |
| | | 08-Nov-10 | 4 | 6.56 | 8.06 | 1.50 | E | 201.6 | - | - | 19:46 | 20:00 | 1.8 | 17.3 | 6.28 | 89.3 | - | 1.64 | - | 9.6 | 16.1 | |
| | | 08-Nov-10 | 4 | 6.56 | 8.06 | 1.50 | X | 85.3 | 807.0 | 538.0 | 20:00 | 20:05 | 2.1 | 17.3 | 5.51 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | A | 87.0 | - | - | 18:31 | 18:44 | 0.6 | 9.4 | 20.53 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | B | 87.3 | - | - | 18:44 | 18:52 | 0.7 | 19.6 | 21.38 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | C | 174.2 | - | - | 18:52 | 19:04 | 1.1 | 18.9 | 17.93 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | D | 146.1 | - | - | 19:04 | 19:11 | 1.3 | 21.7 | 16.60 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.56 | 9.56 | 1.00 | D+ | 146.8 | 641.4 | 641.4 | 19:11 | 19:18 | 1.7 | 24.6 | 14.84 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 9.56 | 13.60 | 4.04 | A | 32.7 | 32.7 | 8.1 | 18:08 | 18:24 | 3.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 1 | 13.60 | 20.90 | 7.30 | A | 52.1 | 52.1 | 7.1 | 17:51 | 18:04 | 5.9 | 1.3 | 0.03 | - | - | - | - | - | - | |
| Q-31+190.75 | Q | 21-Jun-11 | 4 | 6.61 | 8.11 | 1.50 | MF | 50.5 | 50.50 | 33.67 | 10:59 | 11:21 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 8.61 | 9.6 | 0.99 | A | 155 | - | - | 6:37 | 7:03 | 3.2 | 14.3 | 3.25 | 30.7 | 3.5 | 1.6 | 22.6 | 13.2 | 25.8 | |
| | | 10-May-11 | 3 | 8.61 | 9.6 | 0.99 | B | 42.2 | 197.20 | 199.19 | 7:03 | 7:31 | 3.0 | 0.0 | 0.00 | 34.8 | - | 1.6 | 22.1 | 13.2 | 25.8 | |
| T-31+191.5 | T | 13-Dec-10 | 4 | 6.79 | 8.29 | 1.50 | MF | 178.7 | - | - | 13:47 | 14:13 | 2.1 | 15.7 | 5.01 | 32.7 | - | 1.63 | -19.0 | 7.9 | 13.4 | |
| | | 13-Dec-10 | 4 | 6.79 | 8.29 | 1.50 | B | 167.4 | - | - | 14:13 | 14:23 | 1.7 | 19.1 | 7.40 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 6.79 | 8.29 | 1.50 | C | 156.8 | - | - | 14:23 | 14:32 | 2.1 | 13.9 | 4.50 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 6.79 | 8.29 | 1.50 | D | 81.5 | 584.4 | 389.6 | 14:32 | 15:20 | 2.6 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.79 | 9.79 | 1.00 | A | 49.1 | - | - | 16:57 | 17:09 | 0.3 | 6.0 | 22.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.79 | 9.79 | 1.00 | B | 169.2 | - | - | 17:09 | 17:27 | 1.9 | 12.1 | 10.60 | 35.1 | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.79 | 9.79 | 1.00 | C | 176.7 | - | - | 17:27 | 17:38 | 1.8 | 15.6 | 9.53 | 52.7 | 1.0 | 1.66 | 13.4 | 9.6 | 16.7 | |
| | | 01-Nov-10 | 3 | 8.79 | 9.79 | 1.00 | D | 167.3 | - | - | 17:38 | 17:50 | 1.9 | 14.9 | 8.01 | 78.0 | - | 1.62 | 13.4 | 9.6 | 11.1 | |
| | | 01-Nov-10 | 3 | 8.79 | 9.79 | 1.00 | E | 80.8 | 643.1 | 643.1 | 17:50 | 17:55 | 2.2 | 11.9 | 5.39 | >200 | - | 1.62 | 13.4 | 9.6 | 10.4 | |
| | | 01-Nov-10 | 2 | 9.79 | 13.80 | 4.01 | A | 26.1 | 26.1 | 6.5 | 16:42 | 16:54 | 2.8 | 0.9 | 0.08 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 1 | 13.80 | 18.80 | 5.00 | A | 29.5 | 29.5 | 5.9 | 16:25 | 16:37 | 5.7 | 1.0 | 0.04 | - | - | - | - | - | - | |
| Q-31+192.25 | Q | 16-Jun-11 | 4 | 6.99 | 8.49 | 1.50 | A | 88.5 | 88.50 | 59.00 | 17:13 | 17:44 | 2.6 | 0.5 | 0.13 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 9.6 | 10.6 | 1.00 | A | 170.2 | - | - | 9:12 | 9:42 | 3.1 | 4.8 | 1.41 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 9.6 | 10.6 | 1.00 | B | 13.7 | 183.90 | 183.90 | 9:42 | 9:55 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+193 | S | 15-Nov-10 | 4 | 6.87 | 8.37 | 1.50 | B | 144.8 | - | - | 20:44 | 21:02 | 1.2 | 12.2 | 5.54 | 37.3 | 8.0 | 1.63 | 9.5 | 8.7 | 16.4 | |
| | | 15-Nov-10 | 4 | 6.87 | 8.37 | 1.50 | C | 180.6 | - | - | 21:02 | 21:14 | 1.9 | 15.1 | 6.24 | 51.2 | - | 1.68 | 9.4 | 8.7 | 16.0 | |
| | | 15-Nov-10 | 4 | 6.87 | 8.37 | 1.50 | D | 161.0 | - | - | 21:14 | 21:25 | 2.7 | 16.1 | 3.72 | 66.9 | - | 1.70 | 9.4 | 8.7 | 16.3 | |
| | | 15-Nov-10 | 4 | 6.87 | 8.37 | 1.50 | E | 234.9 | - | - | 21:25 | 22:10 | 3.0 | 10.1 | 2.25 | 107.6 | 0.5 | 1.69 | 9.4 | 8.7 | 16.1 | |
| | | 15-Nov-10 | 4 | 6.87 | 8.37 | 1.50 | X | 20.8 | 742.1 | 494.7 | 22:10 | 22:24 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.87 | 9.87 | 1.00 | A | 36.9 | - | - | 2:43 | 2:50 | 0.5 | 6.0 | 0.50 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.87 | 9.87 | 1.00 | B | 139.9 | - | - | 2:50 | 3:04 | 1.0 | 13.8 | 13.44 | 34.6 | - | 1.64 | 11.0 | 8.0 | 16.0 | |
| | | 22-Oct-10 | 3 | 8.87 | 9.87 | 1.00 | C | 171.6 | - | - | 3:04 | 3:14 | 1.3 | 18.8 | 18.73 | 49.6 | - | 1.64 | 11.0 | 8.0 | 16.0 | |
| | | 22-Oct-10 | 3 | 8.87 | 9.87 | 1.00 | D | 192.2 | - | - | 3:14 | 3:23 | 1.7 | 24.5 | 13.59 | 75.0 | - | 1.70 | 15.0 | 8.0 | 18.0 | |
| | | 22-Oct-10 | 3 | 8.87 | 9.87 | 1.00 | E | 60.9 | 601.5 | 601.5 | 3:23 | 3:26 | 2.1 | 24.4 | 11.38 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 9.87 | 13.90 | 4.03 | A | 29.2 | 29.2 | 7.2 | 2:25 | 2:38 | 2.6 | 0.6 | 0.06 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 13.90 | 19.00 | 5.10 | A | 41.3 | 41.3 | 8.1 | 2:05 | 2:16 | 5.8 | 1.9 | 0.06 | 31.6 | 5.0 | 1.63 | 11.0 | 8.0 | 17.0 | |
| Q-31+193.75 | Q | 21-Jun-11 | 4 | 6.54 | 8.04 | 1.50 | MF | 78.3 | 78.30 | 52.20 | 11:25 | 11:52 | 2.5 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 8.54 | 9.54 | 1.00 | A | 164.3 | - | - | 15:31 | 16:00 | 1.9 | 9.5 | 7.04 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 8.54 | 9.54 | 1.00 | B | 144.1 | - | - | 16:00 | 16:20 | 2.5 | 4.7 | 1.25 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 8.54 | 9.54 | 1.00 | C | 32.9 | 341.30 | 341.30 | 16:20 | 16:48 | 3.0 | 0.2 | 0.06 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+194.5 | T | 01-Dec-10 | 4 | 6.69 | 8.19 | 1.50 | MF | 185.7 | - | - | 6:54 | 7:36 | 1.2 | 12.5 | 6.39 | 28.0 | 1.0 | 1.60 | 18.5 | 11.2 | 21.4 | |
| | | 01-Dec-10 | 4 | 6.69 | 8.19 | 1.50 | B | 186.5 | - | - | 7:36 | 7:51 | 1.7 | 18.9 | 6.91 | 37.6 | - | 1.64 | 17.2 | 11.1 | 20.6 | |
| | | 01-Dec-10 | 4 | 6.69 | 8.19 | 1.50 | C | 151.8 | - | - | 7:51 | 7:59 | 2.0 | 17.9 | 6.30 | 44.2 | - | 1.64 | 17.2 | 11.1 | 20.8 | |
| | | 01-Dec-10 | 4 | 6.69 | 8.19 | 1.50 | D | 219.2 | - | - | 7:59 | 8:46 | 2.3 | 6.7 | 2.09 | 47.3 | - | 1.69 | 17.1 | 13.9 | 18.0 | |
| | | 01-Dec-10 | 4 | 6.69 | 8.19 | 1.50 | X | 19.5 | 762.7 | 508.5 | 8:46 | 9:00 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.69 | 9.69 | 1.00 | B | 190.8 | - | - | 20:44 | 21:15 | 1.3 | 12.2 | 9.20 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.69 | 9.69 | 1.00 | C | 175.1 | - | - | 21:15 | 21:28 | 1.6 | 10.9 | 6.67 | 50.0 | 4.0 | 1.60 | 6.7 | 3.4 | 18.1 | |
| | | 01-Nov-10 | 3 | 8.69 | 9.69 | 1.00 | D | 142.3 | - | - | 21:28 | 21:40 | 2.2 | 11.3 | 4.53 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.69 | 9.69 | 1.00 | E | 102.1 | 610.3 | 610.3 | 21:40 | 21:47 | 1.8 | 12.9 | 7.07 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 9.69 | 13.70 | 4.01 | A | 20.0 | 20.0 | 5.0 | 20:05 | 20:21 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 1 | 13.70 | 19.00 | 5.30 | A | 21.6 | 21.6 | 4.1 | 18:17 | 18:29 | 5.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+195.25 | Q | 16-Jun-11 | 4 | 6.59 | 8.09 | 1.50 | A | 47.9 | 47.90 | 31.93 | 17:48 | 18:08 | 2.4 | 1.2 | 0.33 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 8.59 | 9.59 | 1.00 | A | 24.1 | 24.10 | 24.10 | 10:28 | 10:50 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+196 | P | 08-Nov-10 | 4 | 6.23 | 7.73 | 1.50 | B | 161.3 | - | - | 20:45 | 21:04 | 1.8 | 13.8 | 4.78 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.23 | 7.73 | 1.50 | C | 166.2 | - | - | 21:04 | 21:14 | 2.2 | 10.3 | 3.86 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.23 | 7.73 | 1.50 | D | 216.8 | - | - | 21:14 | 21:29 | 1.9 | 18.9 | 6.63 | - | 3.0 | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.23 | 7.73 | 1.50 | E | 186.6 | - | - | 21:29 | 21:41 | 2.1 | 11.0 | 3.90 | - | 5.0 | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.23 | 7.73 | 1.50 | X | 84.1 | 815.0 | 543.3 | 21:41 | 21:48 | 2.3 | 16.0 | 4.72 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.23 | 9.23 | 1.00 | A | 58.4 | - | - | 20:57 | 21:08 | 0.6 | 6.4 | 11.59 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.23 | 9.23 | 1.00 | B | 103.2 | - | - | 21:08 | 21:18 | 1.3 | 12.3 | 9.88 | 34.4 | 4.4 | 1.62 | 16.0 | 7.0 | 17.0 | |
| | | 19-Oct-10 | 3 | 8.23 | 9.23 | 1.00 | C | 156.0 | - | - | 21:18 | 21:30 | 3.2 | 17.9 | 5.90 | 53.5 | - | 1.67 | 16.0 | 7.0 | 16.0 | |
| | | 19-Oct-10 | 3 | 8.23 | 9.23 | 1.00 | D | 167.0 | - | - | 21:30 | 21:40 | 3.5 | 16.1 | 4.66 | 56.7 | - | 1.66 | 16.0 | 7.0 | 14.0 | |
| | | 19-Oct-10 | 3 | 8.23 | 9.23 | 1.00 | D+ | 128.6 | 613.2 | 613.2 | 21:40 | 21:49 | 3.7 | 12.3 | 3.35 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 9.23 | 13.20 | 3.97 | A | 33.3 | 33.3 | 8.4 | 20:38 | 20:51 | 2.7 | 0.7 | 0.06 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 1 | 13.20 | 18.50 | 5.30 | A | 22.1 | 22.1 | 4.2 | 20:18 | 20:31 | 5.6 | 0.0 | 0.00 | 31.1 | 3.6 | 1.62 | -1.0 | 7.0 | 12.0 | |
| Q-31+196.75 | Q | 21-Jun-11 | 4 | 6.56 | 8.06 | 1.50 | MF | 46.7 | 46.70 | 31.13 | 11:56 | 12:16 | 2.5 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 8.56 | 9.56 | 1.00 | A | 17.6 | 17.60 | 17.60 | 16:11 | 16:26 | 3.2 | 0.6 | 0.21 | - | - | - | - | - | - | |
| T-31+197.5 | T | 13-Dec-10 | 4 | 6.51 | 8.01 | 1.50 | MF | 182.1 | - | - | 15:37 | 16:03 | 1.6 | 15.4 | 5.97 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 6.51 | 8.01 | 1.50 | B | 175.3 | - | - | 16:03 | 16:21 | 2.5 | 6.2 | 2.36 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 6.51 | 8.01 | 1.50 | C | 135.1 | - | - | 16:21 | 16:58 | 1.8 | 3.8 | 1.34 | 46.8 | 1.0 | 1.68 | -21.0 | 8.0 | 11.2 | |
| | | 13-Dec-10 | 4 | 6.51 | 8.01 | 1.50 | D | 4.2 | 496.7 | 331.1 | 16:58 | 17:11 | 2.7 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.51 | 9.51 | 1.00 | D | 175.6 | - | - | 0:11 | 0:26 | 2.2 | 12.7 | 6.34 | 69.0 | - | 1.62 | 6.7 | 3.4 | 15.1 | |
| | | 01-Nov-10 | 3 | 8.51 | 9.51 | 1.00 | E | 101.7 | 621.4 | 621.4 | 0:26 | 0:34 | 2.3 | 12.0 | 5.16 | 105.0 | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.51 | 9.51 | 1.00 | B | 164.8 | - | - | 23:33 | 23:56 | 0.0 | 11.3 | inf | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.51 | 9.51 | 1.00 | C | 179.3 | - | - | 23:56 | 0:11 | 1.5 | 12.1 | 9.56 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 9.51 | 13.50 | 3.99 | A | 20.4 | 20.4 | 5.1 | 23:11 | 23:27 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 1 | 13.50 | 18.60 | 5.10 | A | 31.2 | 31.2 | 6.1 | 22:46 | 23:03 | 5.6 | 0.4 | 0.02 | 31.4 | 4.0 | 1.56 | 6.4 | 3.3 | 15.9 | |
| Q-31+198.25 | Q | 16-Jun-11 | 4 | 6.56 | 8.06 | 1.50 | A | 181.1 | - | - | 18:15 | 18:36 | 2.1 | 12.5 | 3.97 | 32.6 | - | 1.6 | 6.1 | 10.9 | 13.1 | Communicated to Q-31+195.25 |
| | | 16-Jun-11 | 4 | 6.56 | 8.06 | 1.50 | B | 166.7 | - | - | 18:36 | 18:52 | 1.6 | 13.6 | 5.01 | 36.2 | - | 1.6 | 6.3 | 10.9 | 13.8 | |
| | | 16-Jun-11 | 4 | 6.56 | 8.06 | 1.50 | C | 124.5 | - | - | 18:52 | 19:02 | 2.7 | 10.6 | 3.61 | 47.1 | - | 1.6 | 6.5 | 11.1 | 14.2 | |
| | | 16-Jun-11 | 4 | 6.56 | 8.06 | 1.50 | X | 62.5 | 534.80 | 356.53 | 19:02 | 19:17 | 2.7 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 11-May-11 | 3 | 8.56 | 9.59 | 1.03 | A | 24.2 | 24.20 | 23.50 | 15:00 | 15:13 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+199 | S | 15-Nov-10 | 4 | 6.84 | 8.34 | 1.50 | B | 154.0 | - | - | 22:47 | 23:07 | 1.3 | 12.6 | 5.78 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 6.84 | 8.34 | 1.50 | C | 180.7 | - | - | 23:07 | 23:19 | 2.0 | 15.7 | 6.90 | 47.4 | 1.0 | 1.64 | 4.3 | 6.5 | 15.7 | |
| | | 15-Nov-10 | 4 | 6.84 | 8.34 | 1.50 | D | 157.6 | - | - | 23:19 | 23:29 | 2.5 | 17.7 | 4.17 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 6.84 | 8.34 | 1.50 | E | 22.8 | 515.1 | 343.4 | 23:29 | 23:43 | 2.9 | 0.9 | 0.20 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.84 | 9.84 | 1.00 | A | 55.2 | - | - | 4:17 | 4:27 | 0.5 | 6.1 | 13.46 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.84 | 9.84 | 1.00 | B | 109.0 | - | - | 4:27 | 4:38 | 0.7 | 12.3 | 17.61 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.84 | 9.84 | 1.00 | C | 164.1 | - | - | 4:38 | 4:49 | 1.2 | 19.2 | 14.84 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.84 | 9.84 | 1.00 | D | 160.6 | - | - | 4:49 | 4:57 | 1.7 | 22.2 | 11.55 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.84 | 9.84 | 1.00 | E | 114.1 | 603.0 | 603.0 | 4:57 | 5:02 | 2.3 | 24.4 | 10.82 | 87.1 | - | 1.71 | 11.0 | 9.5 | 15.0 | |
| | | 22-Oct-10 | 2 | 9.84 | 13.80 | 3.96 | A | 19.0 | 19.0 | 4.8 | 4:02 | 4:14 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 13.80 | 18.10 | 4.30 | A | 27.0 | 27.0 | 6.3 | 3:43 | 3:56 | 5.7 | 0.5 | 0.02 | - | - | - | - | - | - | |
| Q-31+199.75 | Q | 21-Jun-11 | 4 | 6.51 | 8.01 | 1.50 | MF | 52.1 | 52.10 | 34.73 | 12:18 | 12:40 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 8.51 | 9.51 | 1.00 | A | 170.1 | - | - | 6:48 | 7:17 | 2.3 | 11.3 | 3.68 | 30.3 | - | 1.6 | 19.0 | 20.6 | 29.3 | |
| | | 04-May-11 | 3 | 8.51 | 9.51 | 1.00 | B | 147.4 | 317.50 | 317.50 | 7:17 | 8:25 | 3.0 | 0.1 | 0.02 | 34.1 | 12.0 | 1.6 | 15.1 | 20.6 | 25.2 | |
| T-31+200.5 | T | 30-Nov-10 | 4 | 6.69 | 8.19 | 1.50 | MF | 179.0 | - | - | 3:24 | 3:46 | 1.9 | 12.2 | 3.96 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 6.69 | 8.19 | 1.50 | B | 154.6 | - | - | 3:46 | 3:55 | 2.3 | 18.6 | 6.18 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 6.69 | 8.19 | 1.50 | C | 150.8 | - | - | 3:55 | 4:05 | 2.6 | 0.4 | 0.04 | 46.9 | - | 1.65 | 16.3 | 12.2 | 14.6 | |
| | | 30-Nov-10 | 4 | 6.69 | 8.19 | 1.50 | D | 173.0 | - | - | 4:05 | 4:27 | 2.6 | 6.9 | 1.94 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 6.69 | 8.19 | 1.50 | X | 15.2 | 672.6 | 448.4 | 4:27 | 4:40 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.69 | 9.69 | 1.00 | B | 154.9 | - | - | 3:41 | 4:01 | 1.5 | 15.3 | 9.32 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.69 | 9.69 | 1.00 | C | 172.8 | - | - | 4:01 | 4:14 | 1.2 | 15.4 | 12.47 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.69 | 9.69 | 1.00 | D | 180.1 | - | - | 4:14 | 4:26 | 1.6 | 17.5 | 11.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.69 | 9.69 | 1.00 | E | 112.8 | 620.6 | 620.6 | 4:26 | 4:30 | 1.3 | 13.9 | 10.83 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 9.69 | 13.70 | 4.01 | A | 12.3 | 12.3 | 3.1 | 3:18 | 3:34 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 1 | 13.70 | 18.60 | 4.90 | A | 25.0 | 25.0 | 5.1 | 2:53 | 3:10 | 5.4 | 0.2 | 0.01 | - | - | - | - | - | - | |
| Q-31+201.25 | Q | 16-Jun-11 | 4 | 6.54 | 8.04 | 1.50 | A | 91.6 | 91.60 | 61.07 | 20:01 | 20:42 | 2.2 | 0.0 | 0.00 | 32.7 | - | 1.6 | 7.5 | 8.0 | 12.1 | Erratic pump behaviour |
| | | 11-May-11 | 3 | 8.54 | 9.56 | 1.02 | A | 171.1 | - | - | 15:39 | 16:05 | 1.3 | 11.9 | 8.57 | - | - | - | - | - | - | |
| | | 11-May-11 | 3 | 8.54 | 9.56 | 1.02 | B | 140.5 | - | - | 16:05 | 16:15 | 2.4 | 15.4 | 7.67 | 35.9 | 4.0 | 1.6 | 16.8 | 15.6 | 20.1 | |
| | | 11-May-11 | 3 | 8.54 | 9.56 | 1.02 | C | 179.1 | - | - | 16:15 | 16:26 | 1.9 | 16.3 | 8.21 | 43.7 | - | 1.6 | 15.7 | 15.4 | 20.3 | |
| | | 11-May-11 | 3 | 8.54 | 9.56 | 1.02 | D | 66.9 | 557.60 | 546.67 | 16:26 | 16:47 | 2.9 | 0.0 | 0.00 | 73.2 | - | 1.7 | 15.7 | 15.2 | 20.7 | |
| P-31+202 | P | 08-Nov-10 | 4 | 6.44 | 7.94 | 1.50 | B | 158.1 | - | - | 22:55 | 23:14 | 1.9 | 16.0 | 6.24 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.44 | 7.94 | 1.50 | C | 165.6 | - | - | 23:14 | 23:23 | 1.8 | 14.0 | 5.38 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.44 | 7.94 | 1.50 | D | 197.3 | - | - | 23:23 | 23:34 | 2.3 | 21.7 | 6.77 | 81.4 | - | 1.65 | -4.4 | 7.0 | 16.0 | |
| | | 08-Nov-10 | 4 | 6.44 | 7.94 | 1.50 | E | 206.6 | - | - | 23:34 | 23:48 | 1.8 | 18.4 | 6.40 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.44 | 7.94 | 1.50 | X | 82.4 | 810.0 | 540.0 | 23:48 | 23:52 | 2.2 | 16.6 | 5.05 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.44 | 9.44 | 1.00 | C | 21.9 | 179.7 | 179.7 | 0:24 | 0:47 | 3.3 | 0.6 | 0.19 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.44 | 9.44 | 1.00 | B | 157.8 | - | - | 23:34 | 0:24 | 3.6 | 1.7 | 0.48 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 9.44 | 13.40 | 3.96 | A | 203.1 | - | - | 22:24 | 22:53 | 2.8 | 6.6 | 0.58 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 9.44 | 13.40 | 3.96 | B | 140.4 | 343.5 | 86.7 | 22:53 | 23:30 | 2.8 | 1.2 | 0.11 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 1 | 13.40 | 18.40 | 5.00 | A | 24.1 | 24.1 | 4.8 | 22:06 | 22:18 | 5.7 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-31+202.75 | Q | 21-Jun-11 | 4 | 6.13 | 7.63 | 1.50 | MF | 59.1 | 59.10 | 39.40 | 14:26 | 14:48 | 2.3 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 09-May-11 | 3 | 8.54 | 9.54 | 1.00 | A | 15.7 | 15.70 | 15.70 | 6:56 | 7:11 | 3.1 | 0.5 | 0.14 | 30.3 | 2.0 | 1.6 | 21.5 | 13.5 | 22.5 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+203.5 | T | 14-Dec-10 | 4 | 6.71 | 8.21 | 1.50 | MF | 174.8 | - | - | 6:51 | 7:19 | 1.6 | 9.1 | 3.86 | 31.6 | 2.0 | 1.63 | 9.1 | 11.9 | 16.3 | |
| | | 14-Dec-10 | 4 | 6.71 | 8.21 | 1.50 | B | 164.8 | - | - | 7:19 | 7:35 | 1.7 | 11.8 | 4.55 | 36.2 | 2.0 | 1.65 | 14.3 | 10.2 | 17.2 | |
| | | 14-Dec-10 | 4 | 6.71 | 8.21 | 1.50 | C | 154.6 | - | - | 7:35 | 7:48 | 2.2 | 13.7 | 4.15 | 45.5 | - | 1.66 | 14.1 | 9.8 | 17.1 | |
| | | 14-Dec-10 | 4 | 6.71 | 8.21 | 1.50 | D | 180.2 | - | - | 7:48 | 8:10 | 2.3 | 23.6 | 6.82 | 71.2 | - | 1.67 | 14.6 | 10.0 | 18.2 | |
| | | 14-Dec-10 | 4 | 6.71 | 8.21 | 1.50 | X | 22.5 | 696.9 | 464.6 | 8:10 | 8:17 | 2.5 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.71 | 9.71 | 1.00 | B | 157.6 | - | - | 5:35 | 5:59 | 0.2 | 12.6 | 80.50 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.71 | 9.71 | 1.00 | C | 166.6 | - | - | 5:59 | 6:12 | 1.1 | 12.5 | 9.78 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.71 | 9.71 | 1.00 | D | 155.8 | - | - | 6:12 | 6:26 | 3.2 | 15.0 | 4.72 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.71 | 9.71 | 1.00 | E | 225.0 | 705.0 | 705.0 | 6:26 | 6:37 | 2.7 | 28.6 | 10.77 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 9.71 | 13.70 | 3.99 | A | 21.7 | 21.7 | 5.4 | 5:14 | 5:30 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 1 | 13.70 | 19.00 | 5.30 | A | 23.7 | 23.7 | 4.5 | 4:55 | 5:08 | 5.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+204.25 | Q | 16-Jun-11 | 4 | 6.54 | 8.04 | 1.50 | A | 58.8 | 58.80 | 39.20 | 3:05 | 3:26 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 8.54 | 9.57 | 1.03 | A | 81.6 | 81.60 | 79.22 | 15:03 | 15:32 | 3.1 | 0.0 | 0.00 | 30.2 | 2.0 | 1.7 | 9.0 | 16.3 | 20.1 | |
| S-31+205 | S | 15-Nov-10 | 4 | 6.69 | 8.19 | 1.50 | B | 128.8 | - | - | 1:48 | 2:05 | 2.8 | 17.5 | 5.20 | 52.3 | - | 1.64 | 1.0 | 7.0 | 14.0 | |
| | | 15-Nov-10 | 4 | 6.69 | 8.19 | 1.50 | C | 191.6 | - | - | 2:05 | 2:18 | 2.4 | 16.9 | 4.71 | 49.3 | - | 1.64 | 6.4 | 7.1 | 16.4 | |
| | | 15-Nov-10 | 4 | 6.69 | 8.19 | 1.50 | D | 151.8 | - | - | 2:18 | 3:11 | 2.7 | 4.2 | 0.92 | 106.2 | - | 1.69 | 6.4 | 7.1 | 14.8 | |
| | | 15-Nov-10 | 4 | 6.69 | 8.19 | 1.50 | E | 20.4 | 492.6 | 328.4 | 3:11 | 3:27 | 2.9 | 0.9 | 0.21 | 106.2 | - | 1.69 | 6.4 | 7.1 | 14.8 | |
| | | 22-Oct-10 | 3 | 8.69 | 9.69 | 1.00 | A | 21.8 | 21.8 | 21.8 | 5:56 | 6:14 | 3.4 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 9.69 | 13.70 | 4.01 | A | 24.5 | 24.5 | 6.1 | 5:41 | 5:53 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 1 | 13.70 | 19.20 | 5.50 | A | 24.8 | 24.8 | 4.5 | 5:22 | 5:34 | 5.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+205.75 | Q | 21-Jun-11 | 4 | 6.54 | 8.04 | 1.50 | MF | 54 | 54.00 | 36.00 | 14:52 | 15:14 | 2.5 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 09-May-11 | 3 | 8.54 | 9.54 | 1.00 | A | 172.3 | - | - | 15:26 | 15:51 | 3.2 | 10.6 | 3.98 | 30.2 | 1.0 | 1.6 | 18.5 | 13.9 | 24.0 | |
| | | 09-May-11 | 3 | 8.54 | 9.54 | 1.00 | B | 137.1 | - | - | 15:51 | 16:17 | 3.3 | 0.7 | 0.18 | 35.8 | - | 1.6 | 18.6 | 13.9 | 24.2 | |
| | | 09-May-11 | 3 | 8.54 | 9.54 | 1.00 | C | 2.1 | 311.50 | 311.50 | 16:17 | 16:30 | 2.9 | 0.1 | 0.02 | 47.0 | - | 1.6 | 13.7 | 13.8 | 24.5 | |
| T-31+206.5 | T | 30-Nov-10 | 4 | 6.64 | 8.14 | 1.50 | MF | 182.1 | - | - | 2:05 | 2:28 | 1.8 | 15.6 | 7.15 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 6.64 | 8.14 | 1.50 | B | 161.1 | - | - | 2:28 | 2:38 | 2.0 | 19.0 | 6.00 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 6.64 | 8.14 | 1.50 | C | 153.7 | - | - | 2:38 | 2:47 | 2.7 | 9.7 | 2.51 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 6.64 | 8.14 | 1.50 | D | 52.3 | 549.2 | 366.1 | 2:47 | 3:10 | 2.4 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.64 | 9.64 | 1.00 | A | 45.3 | - | - | 7:59 | 8:11 | 0.7 | 6.1 | 8.10 | 35.5 | 2.0 | 1.62 | 1.6 | 15.0 | 18.2 | |
| | | 02-Nov-10 | 3 | 8.64 | 9.64 | 1.00 | B | 114.2 | - | - | 8:11 | 8:25 | 1.5 | 11.3 | 7.84 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.64 | 9.64 | 1.00 | C | 175.5 | - | - | 8:25 | 8:40 | 2.1 | 12.1 | 5.72 | 45.6 | - | 1.59 | 0.3 | 6.5 | 15.1 | |
| | | 02-Nov-10 | 3 | 8.64 | 9.64 | 1.00 | D | 182.1 | - | - | 8:40 | 8:55 | 2.8 | 9.2 | 3.30 | 44.0 | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.64 | 9.64 | 1.00 | E | 153.4 | 670.5 | 670.5 | 8:55 | 9:05 | 2.2 | 16.5 | 7.53 | 56.0 | - | - | - | - | - | |
| | | 02-Nov-10 | 2 | 9.64 | 13.60 | 3.96 | A | 19.1 | 19.1 | 4.8 | 7:43 | 7:56 | 2.6 | 0.6 | 0.06 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 1 | 13.60 | 18.90 | 5.30 | A | 22.2 | 22.2 | 4.2 | 7:26 | 7:39 | 5.5 | 0.0 | 0.00 | 32.4 | 4.0 | 1.64 | 5.9 | 7.9 | 17.9 | |
| Q-31+207.25 | Q | 16-Jun-11 | 4 | 6.54 | 8.04 | 1.50 | A | 53.8 | 53.80 | 35.87 | 3:27 | 3:47 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 8.54 | 9.55 | 1.01 | A | 30.8 | 30.80 | 30.50 | 7:16 | 7:36 | 3.1 | 0.7 | 0.21 | 30.8 | 4.0 | 1.7 | 14.9 | 20.8 | 22.7 | |
| P-31+208 | P | 08-Nov-10 | 4 | 6.43 | 7.93 | 1.50 | B | 152.8 | - | - | 1:53 | 2:14 | 2.2 | 13.1 | 3.99 | 38.0 | - | 1.59 | -2.9 | 5.6 | - | |
| | | 08-Nov-10 | 4 | 6.43 | 7.93 | 1.50 | C | 184.4 | - | - | 2:14 | 2:24 | 1.6 | 12.2 | 5.11 | 49.0 | - | 1.62 | -2.9 | 5.6 | - | |
| | | 08-Nov-10 | 4 | 6.43 | 7.93 | 1.50 | D | 188.7 | - | - | 2:24 | 2:38 | 2.3 | 15.8 | 4.16 | 80.0 | - | 1.61 | -0.2 | 5.6 | - | |
| | | 08-Nov-10 | 4 | 6.43 | 7.93 | 1.50 | E | 192.0 | - | - | 2:38 | 2:51 | 1.9 | 17.6 | 6.59 | 85.0 | 0.0 | 1.67 | 2.3 | 8.5 | 17.2 | |
| | | 08-Nov-10 | 4 | 6.43 | 7.93 | 1.50 | X | 87.1 | 805.0 | 536.7 | 2:51 | 2:56 | 2.1 | 16.1 | 5.03 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | B | 149.6 | - | - | 4:16 | 4:37 | 1.4 | 12.5 | 9.24 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | C | 177.5 | - | - | 4:37 | 4:49 | 2.2 | 17.1 | 8.26 | 52.9 | 0.0 | 1.66 | 2.0 | 8.0 | 14.0 | |
| | | 19-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | D | 143.8 | - | - | 4:49 | 4:57 | 3.3 | 22.5 | 6.99 | 54.9 | 0.0 | 1.67 | 2.0 | 8.0 | 16.0 | |
| | | 19-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | D+ | 156.6 | 627.5 | 627.5 | 4:57 | 5:04 | 3.3 | 22.8 | 7.02 | 60.4 | - | 1.65 | 2.0 | 8.0 | 16.0 | |
| | | 19-Oct-10 | 2 | 9.43 | 13.40 | 3.97 | A | 190.7 | - | - | 3:17 | 3:58 | 2.5 | 2.7 | 0.26 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 9.43 | 13.40 | 3.97 | B | 25.1 | 215.8 | 54.4 | 3:58 | 4:09 | 2.7 | 1.9 | 0.18 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 1 | 13.40 | 18.50 | 5.10 | A | 22.4 | 22.4 | 4.4 | 3:02 | 3:14 | 5.8 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+209.5 | T | 14-Dec-10 | 4 | 7.30 | 8.80 | 1.50 | MF | 180.5 | - | - | 8:42 | 9:08 | 1.2 | 12.1 | 6.61 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 7.30 | 8.80 | 1.50 | B | 165.3 | - | - | 9:08 | 9:18 | 2.0 | 17.7 | 6.24 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 7.30 | 8.80 | 1.50 | C | 161.2 | - | - | 9:18 | 9:25 | 2.1 | 29.1 | 9.05 | - | 1.5 | - | - | - | - | |
| | | 14-Dec-10 | 4 | 7.30 | 8.80 | 1.50 | D | 138.5 | - | - | 9:25 | 9:32 | 2.5 | 9.5 | 2.59 | - | 1.0 | - | - | - | - | |
| | | 14-Dec-10 | 4 | 7.30 | 8.80 | 1.50 | X | 10.9 | 656.4 | 437.6 | 9:32 | 9:39 | 2.4 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 9.30 | 10.30 | 1.00 | A | 51.6 | - | - | 9:52 | 10:05 | 1.0 | 5.7 | 5.95 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 9.30 | 10.30 | 1.00 | B | 105.6 | - | - | 10:05 | 10:17 | 1.3 | 12.0 | 9.59 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 9.30 | 10.30 | 1.00 | C | 197.3 | - | - | 10:17 | 10:31 | 3.0 | 10.0 | 3.38 | 45.6 | 2.0 | 1.61 | 3.5 | 7.9 | 14.9 | |
| | | 02-Nov-10 | 3 | 9.30 | 10.30 | 1.00 | D | 166.8 | - | - | 10:31 | 10:43 | 3.0 | 11.0 | 3.70 | 51.3 | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 9.30 | 10.30 | 1.00 | E | 118.0 | 639.3 | 639.3 | 10:43 | 11:03 | 2.6 | 6.2 | 2.37 | 83.0 | - | - | - | - | - | |
| | | 02-Nov-10 | 2 | 10.30 | 14.30 | 4.00 | A | 26.1 | 26.1 | 6.5 | 9:38 | 9:50 | 2.9 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 1 | 14.30 | 19.60 | 5.30 | A | 32.8 | 32.8 | 6.2 | 9:20 | 9:33 | 5.6 | 1.3 | 0.05 | - | - | - | - | - | - | |
| S-31+211 | S | 15-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | B | 148.6 | - | - | 4:05 | 4:24 | 1.8 | 14.1 | 5.22 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | C | 173.0 | - | - | 4:24 | 4:36 | 2.0 | 13.3 | 5.23 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | D | 457.2 | 778.8 | 519.2 | 4:36 | 5:07 | 2.7 | 9.4 | 2.37 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 8.41 | 9.41 | 1.00 | A | 76.7 | - | - | 7:48 | 8:04 | 2.5 | 9.4 | 4.08 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 8.41 | 9.41 | 1.00 | B | 95.3 | - | - | 8:04 | 8:13 | 2.9 | 12.2 | 4.30 | 37.0 | 3.0 | 1.62 | 15.1 | 6.7 | 15.3 | |
| | | 23-Oct-10 | 3 | 8.41 | 9.41 | 1.00 | C | 193.0 | 365.0 | 365.0 | 8:13 | 8:58 | 3.7 | 0.0 | 0.00 | 47.7 | - | 1.62 | 15.1 | 6.7 | 14.2 | |
| | | 23-Oct-10 | 2 | 9.41 | 13.40 | 3.99 | A | 21.9 | 21.9 | 5.5 | 7:33 | 7:44 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 1 | 13.40 | 18.70 | 5.30 | A | 23.4 | 23.4 | 4.4 | 7:10 | 7:25 | 5.8 | 0.0 | 0.00 | 32.2 | 4.0 | 1.62 | 6.4 | 7.8 | 18.1 | |
| Q-31+211.75 | Q | 21-Jun-11 | 4 | 6.54 | 8.04 | 1.50 | MF | 58.2 | 58.20 | 38.80 | 15:16 | 15:37 | 2.5 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 8.54 | 9.54 | 1.00 | A | 168.5 | - | - | 9:01 | 9:30 | 2.1 | 8.5 | 5.89 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 8.54 | 9.54 | 1.00 | B | 149.2 | - | - | 9:30 | 9:58 | 2.9 | 1.8 | 0.71 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 8.54 | 9.54 | 1.00 | C | 14.8 | 332.50 | 332.50 | 9:58 | 10:17 | 2.9 | 0.1 | 0.03 | - | - | - | - | - | - | |
| T-31+212.5 | T | 30-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | MF | 172.9 | - | - | 22:23 | 22:45 | 1.1 | 11.9 | 7.67 | 33.6 | 4.0 | 1.39 | 15.6 | 12.1 | 13.2 | |
| | | 30-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | B | 176.8 | - | - | 22:45 | 22:58 | 1.7 | 12.3 | 5.34 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | C | 154.6 | - | - | 22:58 | 23:24 | 1.8 | 16.6 | 5.07 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | D | 144.8 | 649.1 | 432.7 | 23:24 | 23:53 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | A | 53.0 | - | - | 14:31 | 14:44 | 0.4 | 6.0 | 15.63 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | B | 127.9 | - | - | 14:44 | 14:58 | 1.3 | 13.4 | 8.95 | 36.9 | - | 1.62 | 3.3 | 9.0 | 17.3 | |
| | | 02-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | C | 192.6 | - | - | 14:58 | 15:14 | 2.1 | 12.1 | 5.72 | 40.0 | - | 1.60 | 3.4 | 8.9 | 16.1 | |
| | | 02-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | D | 177.0 | - | - | 15:14 | 15:29 | 1.9 | 12.0 | 6.27 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | E | 127.0 | 677.5 | 677.5 | 15:29 | 15:37 | 2.5 | 14.9 | 6.05 | 85.0 | - | - | - | - | - | |
| | | 02-Nov-10 | 2 | 9.41 | 13.40 | 3.99 | A | 22.5 | 22.5 | 5.6 | 14:17 | 14:29 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 1 | 13.40 | 18.40 | 5.00 | A | 23.3 | 23.3 | 4.7 | 14:01 | 14:13 | 5.6 | 0.2 | 0.01 | 33.0 | - | 1.63 | 0.7 | 2.7 | 16.2 | |
| Q-31+213.25 | Q | 16-Jun-11 | 4 | 6.56 | 8.06 | 1.50 | A | 59.2 | 59.20 | 39.47 | 3:49 | 4:09 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 8.56 | 9.59 | 1.03 | A | 30 | 30.00 | 29.13 | 7:46 | 8:05 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+214 | P | 08-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | B | 152.5 | - | - | 3:43 | 4:03 | 1.6 | 12.8 | 5.58 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | C | 167.5 | - | - | 4:03 | 4:15 | 1.5 | 14.4 | 4.71 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | D | 204.3 | - | - | 4:15 | 4:32 | 2.2 | 10.8 | 3.17 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | E | 191.4 | - | - | 4:32 | 4:45 | 1.2 | 13.0 | 8.30 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | X | 91.3 | 807.0 | 538.0 | 4:45 | 4:52 | 1.6 | 13.2 | 5.46 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 70.1 | - | - | 6:01 | 6:14 | 0.3 | 6.3 | 16.14 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | B | 119.9 | - | - | 6:14 | 6:27 | 0.9 | 11.2 | 11.84 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | C | 153.5 | - | - | 6:27 | 6:37 | 0.9 | 15.9 | 19.45 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | D | 258.5 | 602.0 | 602.0 | 6:37 | 6:50 | 0.8 | 17.8 | 23.23 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 9.16 | 13.20 | 4.04 | A | 23.4 | 23.4 | 5.8 | 5:43 | 5:56 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 1 | 13.20 | 18.50 | 5.30 | A | 29.7 | 29.7 | 5.6 | 5:22 | 5:35 | 5.6 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+214.75 | Q | 21-Jun-11 | 4 | 6.56 | 8.06 | 1.50 | MF | 58.8 | 58.80 | 39.20 | 15:39 | 16:02 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 8.56 | 9.56 | 1.00 | A | 225.1 | - | - | 10:32 | 11:03 | 2.8 | 14.1 | 5.41 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 8.56 | 9.56 | 1.00 | B | 158.9 | - | - | 11:03 | 11:26 | 3.0 | 3.5 | 2.70 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 8.56 | 9.56 | 1.00 | C | 6.9 | 390.90 | 390.90 | 11:26 | 11:38 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| T-31+215.5 | T | 14-Dec-10 | 4 | 6.38 | 7.88 | 1.50 | MF | 180.5 | - | - | 10:06 | 10:35 | 1.8 | 12.1 | 4.57 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 6.38 | 7.88 | 1.50 | B | 165.0 | - | - | 10:35 | 10:45 | 1.9 | 18.4 | 6.59 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 6.38 | 7.88 | 1.50 | C | 155.2 | - | - | 10:45 | 10:51 | 2.4 | 23.0 | 6.48 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 6.38 | 7.88 | 1.50 | D | 148.8 | - | - | 10:51 | 11:06 | 2.5 | 6.4 | 1.75 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 6.38 | 7.88 | 1.50 | X | 12.9 | 662.4 | 441.6 | 11:06 | 11:15 | 2.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | A | 48.2 | - | - | 16:24 | 16:37 | 1.1 | 6.6 | 5.86 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | B | 111.4 | - | - | 16:37 | 16:50 | 1.5 | 12.0 | 8.20 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | C | 157.5 | - | - | 16:50 | 17:01 | 1.8 | 14.9 | 8.46 | 46.0 | - | 1.60 | - | 4.8 | 15.0 | |
| | | 02-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | D | 169.5 | - | - | 17:01 | 17:13 | 1.9 | 15.3 | 8.17 | 58.0 | - | 1.63 | - | - | 15.2 | |
| | | 02-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | E | 170.6 | 657.2 | 657.2 | 17:13 | 17:25 | 1.7 | 17.3 | 10.41 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 2 | 9.38 | 13.40 | 4.02 | A | 22.6 | 22.6 | 5.6 | 16:09 | 16:21 | 3.0 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 1 | 13.40 | 18.40 | 5.00 | A | 22.9 | 22.9 | 4.6 | 15:53 | 16:06 | 5.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+216.25 | Q | 16-Jun-11 | 4 | 5.23 | 6.73 | 1.50 | A | 50.2 | 50.20 | 33.47 | 4:11 | 4:30 | 2.4 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 7.23 | 8.25 | 1.02 | A | 25.6 | 25.60 | 25.10 | 8:19 | 8:34 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+217 | S | 15-Nov-10 | 4 | 5.85 | 7.35 | 1.50 | B | 152.0 | - | - | 5:22 | 5:41 | 1.8 | 12.5 | 5.26 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 5.85 | 7.35 | 1.50 | C | 170.6 | - | - | 5:41 | 5:53 | 2.2 | 16.2 | 4.46 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 5.85 | 7.35 | 1.50 | D | 154.4 | - | - | 5:53 | 6:02 | 2.7 | 19.6 | 4.80 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 4 | 5.85 | 7.35 | 1.50 | E | 243.1 | 720.1 | 480.1 | 6:02 | 6:59 | 3.2 | 3.0 | 0.66 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | A | 15.1 | 15.1 | 15.1 | 9:47 | 10:00 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 8.85 | 12.50 | 3.65 | A | 20.1 | 20.1 | 5.5 | 9:29 | 9:44 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 1 | 12.50 | 18.90 | 6.40 | A | 23.5 | 23.5 | 3.7 | 9:08 | 9:24 | 5.7 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-31+217.75 | Q | 21-Jun-11 | 4 | 6.32 | 7.82 | 1.50 | MF | 49.5 | 49.50 | 33.00 | 16:04 | 16:25 | 2.5 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 8.32 | 9.32 | 1.00 | A | 214.5 | 214.50 | 214.50 | 14:06 | 15:40 | 2.9 | 0.7 | 0.24 | 30.8 | - | 1.6 | 7.1 | 13.3 | 20.5 | |
| T-31+218.5 | T | 30-Nov-10 | 4 | 5.88 | 7.38 | 1.50 | MF | 184.4 | - | - | 19:43 | 20:09 | 1.0 | 12.2 | 6.48 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 5.88 | 7.38 | 1.50 | B | 160.8 | - | - | 20:09 | 20:20 | 1.5 | 15.4 | 6.24 | 37.7 | 4.0 | 1.65 | 14.0 | 8.7 | 17.3 | |
| | | 30-Nov-10 | 4 | 5.88 | 7.38 | 1.50 | C | 156.2 | - | - | 20:20 | 20:44 | 1.5 | 3.4 | 1.57 | 49.8 | - | 1.64 | 14.0 | 8.9 | 17.2 | |
| | | 30-Nov-10 | 4 | 5.88 | 7.38 | 1.50 | D | 53.1 | 554.5 | 369.7 | 20:44 | 21:36 | 1.6 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 7.88 | 8.88 | 1.00 | B | 32.3 | - | - | 18:13 | 18:41 | 0.6 | 2.8 | 5.17 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 7.88 | 8.88 | 1.00 | C | 124.4 | - | - | 18:41 | 18:53 | 0.6 | 12.2 | 15.14 | 48.5 | 4.0 | 1.56 | 2.5 | 7.3 | 12.3 | |
| | | 02-Nov-10 | 3 | 7.88 | 8.88 | 1.00 | D | 168.9 | - | - | 18:53 | 19:11 | 1.0 | 15.6 | 12.69 | 70.5 | 3.0 | 1.62 | 2.5 | 7.4 | 12.6 | |
| | | 02-Nov-10 | 3 | 7.88 | 8.88 | 1.00 | E | 297.3 | 622.9 | 622.9 | 19:11 | 19:14 | 1.5 | 15.7 | 10.30 | 104.0 | - | 1.68 | 2.4 | 8.5 | 17.5 | |
| | | 02-Nov-10 | 2 | 8.88 | 12.90 | 4.02 | A | 22.8 | 22.8 | 5.7 | 18:00 | 18:12 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 1 | 12.90 | 17.80 | 4.90 | A | 23.2 | 23.2 | 4.7 | 17:45 | 17:57 | 5.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+219.25 | Q | 16-Jun-11 | 4 | 5.95 | 7.45 | 1.50 | A | 154.6 | - | - | 4:32 | 5:04 | 2.6 | 4.9 | 2.06 | 32.6 | - | 1.5 | - | - | - | By-Pass Outside Casing |
| | | 16-Jun-11 | 4 | 5.95 | 7.45 | 1.50 | C | 69.3 | 223.90 | 149.27 | 5:04 | 5:35 | 2.7 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 7.95 | 8.99 | 1.04 | A | 155.2 | - | - | 15:47 | 16:17 | 2.8 | 4.7 | 1.54 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 7.95 | 8.99 | 1.04 | B | 36.7 | 191.90 | 184.52 | 16:17 | 16:40 | 3.3 | 0.0 | 0.00 | 36.1 | - | 1.7 | 9.2 | 16.2 | 21.6 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+220 | P | 09-Nov-10 | 4 | 5.62 | 7.12 | 1.50 | B | 176.6 | - | - | 7:14 | 7:37 | 0.7 | 12.5 | 10.76 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 4 | 5.62 | 7.12 | 1.50 | C | 155.7 | - | - | 7:37 | 7:48 | 1.4 | 16.1 | 7.38 | 42.3 | 1.5 | 1.62 | 15.5 | 7.1 | 14.1 | |
| | | 09-Nov-10 | 4 | 5.62 | 7.12 | 1.50 | D | 192.5 | - | - | 7:48 | 8:00 | 1.3 | 15.8 | 12.79 | 56.3 | - | 1.61 | 15.5 | 7.1 | 13.9 | |
| | | 09-Nov-10 | 4 | 5.62 | 7.12 | 1.50 | E | 240.0 | - | - | 8:00 | 8:21 | 1.5 | 10.9 | 4.61 | 86.4 | - | 1.61 | 15.5 | 7.1 | 14.6 | |
| | | 09-Nov-10 | 4 | 5.62 | 7.12 | 1.50 | X | 56.2 | 821.0 | 547.3 | 8:21 | 8:29 | 1.6 | 5.8 | 2.41 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | A | 94.4 | - | - | 7:43 | 7:59 | 0.6 | 9.3 | 14.54 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | B | 53.1 | - | - | 7:59 | 8:04 | 0.7 | 10.6 | 16.45 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | C | 164.3 | - | - | 8:04 | 8:16 | 1.1 | 15.9 | 15.72 | 43.0 | 0.0 | 1.63 | 8.3 | 8.2 | 17.0 | |
| | | 20-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | D | 105.5 | - | - | 8:16 | 8:25 | 1.7 | 22.7 | 14.67 | 51.8 | 0.0 | 1.63 | 8.3 | 8.2 | 15.7 | |
| | | 20-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | E | 183.4 | 600.7 | 600.7 | 8:25 | 8:32 | 1.7 | 20.8 | 12.50 | 53.7 | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 8.62 | 12.60 | 3.98 | A | 22.4 | 22.4 | 5.6 | 7:29 | 7:41 | 3.2 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 1 | 12.60 | 17.60 | 5.00 | A | 21.2 | 21.2 | 4.2 | 7:12 | 7:24 | 6.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-31+220.75 | Q | 21-Jun-11 | 4 | 5.77 | 7.27 | 1.50 | MF | 55.4 | 55.40 | 36.93 | 16:31 | 16:51 | 2.5 | 0.0 | 0.00 | 30.8 | 4.0 | 1.4 | 14.5 | 19.7 | 16.3 | |
| | | 10-May-11 | 3 | 7.77 | 8.8 | 1.03 | A | 165.6 | - | - | 7:59 | 8:36 | 0.0 | 12.0 | inf | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 7.77 | 8.8 | 1.03 | B | 158.4 | - | - | 8:36 | 8:46 | 0.3 | 18.4 | 67.01 | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 7.77 | 8.8 | 1.03 | C | 165.9 | - | - | 8:46 | 8:56 | 0.8 | 17.9 | 22.16 | 45.6 | - | 1.6 | 22.8 | 13.3 | 26.1 | |
| | | 10-May-11 | 3 | 7.77 | 8.8 | 1.03 | D | 141.4 | 631.30 | 612.91 | 8:56 | 9:04 | 2.2 | 16.5 | 7.56 | 62.5 | - | 1.6 | 16.8 | 13.1 | 22.2 | |
| T-31+221.5 | T | 15-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | MF | 181.4 | - | - | 6:41 | 7:10 | 1.8 | 12.1 | 4.60 | 29.8 | 3.0 | 1.48 | 13.4 | 9.2 | 21.3 | |
| | | 15-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | B | 162.9 | - | - | 7:10 | 7:25 | 1.9 | 11.7 | 4.11 | 37.2 | 3.0 | 1.63 | 14.4 | 9.0 | 16.9 | |
| | | 15-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | C | 162.0 | - | - | 7:25 | 7:49 | 1.7 | 20.5 | 8.30 | 46.1 | 1.0 | 1.66 | 14.2 | 8.6 | 17.1 | |
| | | 15-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | D | 146.0 | - | - | 7:49 | 8:08 | 2.6 | 12.0 | 3.13 | 65.2 | - | 1.62 | 13.9 | 8.5 | 18.2 | |
| | | 15-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | X | 5.1 | 657.4 | 438.3 | 8:08 | 8:14 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.08 | 9.08 | 1.00 | B | 166.6 | - | - | 20:42 | 21:10 | 0.3 | 12.1 | 25.02 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.08 | 9.08 | 1.00 | C | 178.5 | - | - | 21:10 | 21:23 | 1.3 | 6.3 | 4.79 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.08 | 9.08 | 1.00 | D | 209.0 | - | - | 21:23 | 21:37 | 0.9 | 16.4 | 16.98 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.08 | 9.08 | 1.00 | E | 72.0 | 626.1 | 626.1 | 21:37 | 21:41 | 1.1 | 15.6 | 13.61 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 2 | 9.08 | 13.10 | 4.02 | A | 21.4 | 21.4 | 5.3 | 20:25 | 20:38 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 1 | 13.10 | 18.10 | 5.00 | A | 21.5 | 21.5 | 4.3 | 20:03 | 20:16 | 5.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+222.25 | Q | 17-Jun-11 | 4 | 6.18 | 7.68 | 1.50 | A | 157.5 | 157.50 | 105.00 | 6:52 | 7:58 | 2.6 | 0.0 | 0.00 | 34.0 | 4.5 | 1.6 | 20.1 | 11.8 | 17.8 | Communicated to Q-31+219.25 |
| | | 12-May-11 | 3 | 8.18 | 9.21 | 1.03 | A | 24.4 | 24.40 | 23.69 | 9:20 | 9:35 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+223 | S | 16-Nov-10 | 4 | 6.05 | 7.55 | 1.50 | B | 200.3 | - | - | 7:39 | 8:03 | 2.2 | 15.2 | 4.85 | 35.8 | 0.5 | 1.61 | 3.9 | 11.6 | 13.6 | |
| | | 16-Nov-10 | 4 | 6.05 | 7.55 | 1.50 | C | 180.5 | - | - | 8:03 | 8:13 | 2.2 | 18.7 | 5.82 | 44.3 | - | 1.64 | 3.9 | 11.6 | 14.1 | |
| | | 16-Nov-10 | 4 | 6.05 | 7.55 | 1.50 | D | 202.0 | - | - | 8:13 | 8:26 | 2.6 | 16.1 | 4.51 | - | - | - | - | - | - | |
| | | 16-Nov-10 | 4 | 6.05 | 7.55 | 1.50 | E | 153.7 | - | - | 8:26 | 8:51 | 2.6 | 4.6 | 1.12 | - | - | - | - | - | - | |
| | | 16-Nov-10 | 4 | 6.05 | 7.55 | 1.50 | X | 69.5 | 806.0 | 537.3 | 8:51 | 9:12 | 2.8 | 3.3 | 0.77 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 8.05 | 9.05 | 1.00 | A | 17.2 | 17.2 | 17.2 | 10:47 | 11:01 | 3.7 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 9.05 | 13.10 | 4.05 | A | 21.3 | 21.3 | 5.3 | 10:28 | 10:44 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 1 | 13.10 | 18.30 | 5.20 | A | 23.4 | 23.4 | 4.5 | 10:08 | 10:21 | 5.5 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-31+223.75 | Q | 21-Jun-11 | 4 | 6.03 | 7.53 | 1.50 | MF | 60.7 | 60.70 | 40.47 | 16:53 | 17:14 | 2.5 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 8.03 | 9 | 0.97 | A | 146.2 | - | - | 9:20 | 9:48 | 1.5 | 6.2 | 3.86 | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 8.03 | 9 | 0.97 | B | 179.4 | - | - | 9:48 | 10:17 | 3.3 | 7.2 | 2.18 | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 8.03 | 9 | 0.97 | C | 43.3 | 368.90 | 380.31 | 10:17 | 10:44 | 3.0 | 0.1 | 0.04 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+224.5 | T | 30-Nov-10 | 4 | 5.98 | 7.48 | 1.50 | MF | 187.2 | - | - | 17:30 | 18:02 | 1.0 | 13.6 | 9.29 | 27.3 | - | 1.40 | 13.6 | 8.2 | 16.2 | |
| | | 30-Nov-10 | 4 | 5.98 | 7.48 | 1.50 | B | 162.1 | - | - | 18:02 | 18:13 | 1.3 | 15.8 | 8.46 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 5.98 | 7.48 | 1.50 | C | 59.1 | - | - | 18:13 | 18:35 | 1.2 | 2.0 | 1.08 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 5.98 | 7.48 | 1.50 | D | 42.8 | 451.2 | 300.8 | 18:35 | 19:24 | 1.5 | 0.2 | 0.10 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 7.98 | 8.98 | 1.00 | A | 24.4 | - | - | 22:45 | 22:50 | 0.6 | 1.8 | 8.59 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 7.98 | 8.98 | 1.00 | B | 159.7 | - | - | 22:50 | 23:07 | 0.0 | 6.9 | inf | 37.2 | - | 1.61 | 1.3 | 3.1 | 16.6 | |
| | | 02-Nov-10 | 3 | 7.98 | 8.98 | 1.00 | C | 164.6 | - | - | 23:07 | 23:18 | 0.5 | 14.4 | 28.01 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 7.98 | 8.98 | 1.00 | D | 135.0 | - | - | 23:18 | 23:27 | 1.3 | 15.8 | 11.15 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 7.98 | 8.98 | 1.00 | E | 137.4 | 621.1 | 621.1 | 23:27 | 23:36 | 1.0 | 14.5 | 14.99 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 2 | 8.98 | 13.00 | 4.02 | A | 23.9 | 23.9 | 5.9 | 22:25 | 22:39 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 1 | 13.00 | 18.10 | 5.10 | A | 43.4 | 43.4 | 8.5 | 22:05 | 22:20 | 6.2 | 0.5 | 0.02 | 34.1 | 5.0 | 1.60 | -1.6 | 6.1 | 0.5 | |
| Q-31+225.25 | Q | 17-Jun-11 | 4 | 5.77 | 7.27 | 1.50 | A | 41.3 | 41.30 | 27.53 | 8:05 | 8:30 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 7.77 | 8.9 | 1.13 | A | 165.6 | - | - | 9:43 | 10:10 | 2.9 | 5.6 | 2.00 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 7.77 | 8.9 | 1.13 | B | 71 | 236.60 | 209.38 | 10:10 | 11:06 | 3.1 | 0.0 | 0.00 | 35.4 | - | 1.6 | 14.7 | 19.1 | 23.0 | |
| P-31+226 | P | 09-Nov-10 | 4 | 5.95 | 7.45 | 1.50 | B | 106.7 | - | - | 8:50 | 9:20 | 1.2 | 10.0 | 5.78 | 35.9 | - | 1.58 | 11.8 | 7.1 | 12.0 | |
| | | 09-Nov-10 | 4 | 5.95 | 7.45 | 1.50 | C | 276.9 | - | - | 9:20 | 9:39 | 1.4 | 19.0 | 10.65 | 40.7 | - | - | 12.9 | 6.5 | - | |
| | | 09-Nov-10 | 4 | 5.95 | 7.45 | 1.50 | D | 170.9 | - | - | 9:39 | 9:48 | 1.2 | 20.2 | 10.87 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 4 | 5.95 | 7.45 | 1.50 | E | 259.5 | - | - | 9:48 | 10:02 | 2.3 | 17.2 | 5.05 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 4 | 5.95 | 7.45 | 1.50 | X | 51.0 | 865.0 | 576.7 | 10:02 | 10:07 | 1.9 | 15.2 | 5.42 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.95 | 8.95 | 1.00 | B | 168.9 | - | - | 10:48 | 11:10 | 0.8 | 12.3 | 11.70 | 35.4 | - | 1.64 | 27.7 | 11.1 | 19.3 | |
| | | 20-Oct-10 | 3 | 7.95 | 8.95 | 1.00 | C | 138.1 | - | - | 11:10 | 11:19 | 1.0 | 15.6 | 14.62 | 44.5 | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.95 | 8.95 | 1.00 | D | 227.1 | - | - | 11:19 | 11:31 | 1.6 | 23.6 | 15.11 | 70.3 | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.95 | 8.95 | 1.00 | E | 115.3 | 649.4 | 649.4 | 11:31 | 11:36 | 1.6 | 23.9 | 14.84 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 8.95 | 13.00 | 4.05 | A | 25.4 | 25.4 | 6.3 | 10:33 | 10:45 | 2.7 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 1 | 13.00 | 18.40 | 5.40 | A | 22.1 | 22.1 | 4.1 | 10:17 | 10:28 | 5.6 | 0.1 | 0.00 | 31.5 | - | 1.64 | 17.3 | 11.0 | 17.1 | |
| T-31+227.5 | T | 15-Dec-10 | 4 | 6.00 | 7.50 | 1.50 | MF | 181.9 | - | - | 8:40 | 9:05 | 1.8 | 11.9 | 4.80 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 6.00 | 7.50 | 1.50 | B | 156.7 | - | - | 9:05 | 9:21 | 1.7 | 7.0 | 2.78 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 6.00 | 7.50 | 1.50 | C | 72.6 | 411.2 | 274.1 | 9:21 | 9:57 | 2.4 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.00 | 9.00 | 1.00 | B | 165.5 | - | - | 2:22 | 2:44 | 2.7 | 13.3 | 4.14 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.00 | 9.00 | 1.00 | C | 160.3 | - | - | 2:44 | 2:55 | 2.3 | 14.7 | 5.79 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 8.00 | 9.00 | 1.00 | D | 86.0 | 411.8 | 411.8 | 2:55 | 3:20 | 3.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 2 | 9.00 | 13.00 | 4.00 | A | 23.0 | 23.0 | 5.8 | 2:03 | 2:15 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 1 | 13.00 | 18.10 | 5.10 | A | 25.3 | 25.3 | 5.0 | 1:44 | 2:01 | 5.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+229 | S | 30-Nov-10 | 4 | 6.43 | 7.93 | 1.50 | B | 178.8 | - | - | 15:02 | 15:24 | 2.5 | 12.0 | 3.14 | 36.8 | - | 1.62 | 12.1 | 8.2 | 16.6 | |
| | | 30-Nov-10 | 4 | 6.43 | 7.93 | 1.50 | C | 164.3 | - | - | 15:24 | 15:36 | 2.6 | 13.1 | 3.60 | 45.4 | 0.5 | 1.63 | 13.6 | 8.2 | 16.2 | |
| | | 30-Nov-10 | 4 | 6.43 | 7.93 | 1.50 | D | 189.7 | - | - | 15:36 | 16:06 | 3.1 | 5.3 | 1.12 | 47.3 | - | 1.65 | 13.6 | 8.2 | 16.2 | |
| | | 30-Nov-10 | 4 | 6.43 | 7.93 | 1.50 | X | 47.8 | 580.6 | 387.1 | 16:06 | 16:22 | 3.1 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | A | 42.4 | - | - | 14:08 | 14:20 | 0.7 | 5.8 | 8.04 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | B | 118.0 | - | - | 14:20 | 14:35 | 1.2 | 12.4 | 9.35 | 34.0 | - | 1.61 | 25.2 | 8.0 | 17.7 | |
| | | 23-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | C | 183.5 | - | - | 14:35 | 14:48 | 1.5 | 15.4 | 11.03 | 45.6 | - | 1.62 | 25.2 | 8.0 | 16.4 | |
| | | 23-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | D | 129.5 | - | - | 14:48 | 14:55 | 1.5 | 19.6 | 12.64 | 68.9 | - | 1.62 | 25.2 | 8.0 | 17.2 | |
| | | 23-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | E | 137.5 | 610.9 | 610.9 | 14:55 | 15:02 | 1.5 | 15.9 | 10.40 | 88.9 | - | 1.73 | 25.4 | 8.1 | 18.3 | |
| | | 23-Oct-10 | 2 | 9.43 | 13.40 | 3.97 | A | 25.7 | 25.7 | 6.5 | 13:54 | 14:07 | 2.8 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 1 | 13.40 | 18.50 | 5.10 | A | 29.6 | 29.6 | 5.8 | 13:37 | 13:50 | 5.7 | 0.5 | 0.02 | 31.0 | 4.0 | 1.65 | 26.5 | 11.9 | 23.1 | |
| T-31+230.5 | T | 16-Dec-10 | 4 | 5.52 | 7.02 | 1.50 | MF | 174.1 | - | - | 15:37 | 16:06 | 2.5 | 10.9 | 2.73 | 31.3 | - | 1.45 | 12.4 | 12.3 | 19.2 | |
| | | 16-Dec-10 | 4 | 5.52 | 7.02 | 1.50 | B | 92.6 | 266.7 | 177.8 | 16:06 | 16:41 | 2.3 | 0.0 | 0.01 | 37.2 | - | 1.64 | 15.2 | 12.1 | 18.3 | |
| | | 15-Nov-10 | 3 | 7.52 | 8.52 | 1.00 | A | 11.6 | 11.6 | 11.6 | 10:04 | 10:22 | 2.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 2 | 8.52 | 12.80 | 4.28 | B | 159.7 | - | - | 8:32 | 8:58 | 1.4 | 10.0 | 1.79 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 2 | 8.52 | 12.80 | 4.28 | C | 240.3 | - | - | 8:58 | 9:15 | 2.2 | 20.5 | 2.39 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 2 | 8.52 | 12.80 | 4.28 | D | 223.7 | 623.7 | 145.7 | 9:15 | 9:58 | 2.5 | 0.1 | 0.01 | 46.1 | 4.0 | 1.63 | 5.2 | 7.8 | 18.8 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+232 | P | 26-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | B | 170.2 | - | - | 7:36 | 7:59 | 1.6 | 12.4 | 5.29 | 37.0 | - | 1.61 | -13.3 | 8.8 | 12.8 | |
| | | 26-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | C | 200.0 | - | - | 7:59 | 8:10 | 2.3 | 11.0 | 3.24 | 44.7 | 1.0 | 1.62 | -13.3 | 8.8 | 13.1 | |
| | | 26-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | D | 139.7 | - | - | 8:10 | 8:22 | 2.4 | 10.5 | 3.05 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 4 | 6.41 | 7.91 | 1.50 | X | 53.0 | 562.9 | 375.3 | 8:22 | 8:40 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 8.41 | 9.41 | 1.00 | A | 32.0 | - | - | 13:56 | 14:02 | 0.3 | 5.8 | 19.41 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 8.41 | 9.41 | 1.00 | B | 174.0 | - | - | 14:02 | 14:20 | 0.7 | 12.0 | 16.79 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 8.41 | 9.41 | 1.00 | C | 167.6 | - | - | 14:20 | 14:31 | 1.4 | 19.0 | 14.50 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 8.41 | 9.41 | 1.00 | D | 116.7 | - | - | 14:31 | 14:37 | 1.5 | 22.6 | 14.47 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 8.41 | 9.41 | 1.00 | E | 138.4 | 628.7 | 628.7 | 14:37 | 14:45 | 1.0 | 23.8 | 23.11 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 9.41 | 13.80 | 4.39 | A | 27.2 | 27.2 | 6.2 | 13:37 | 13:50 | 2.4 | 0.0 | 0.00 | 31.1 | 4.0 | 1.62 | 16.3 | 9.9 | 19.3 | |
| T-31+233.5 | T | 22-Jun-11 | 4 | 5.88 | 7.38 | 1.50 | MF | 42.8 | 42.8 | 28.5 | 5:15 | 5:32 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 15-Nov-10 | 3 | 7.88 | 8.88 | 1.00 | B | 50.7 | 50.7 | 50.7 | 7:38 | 8:24 | 2.6 | 0.0 | 0.01 | 35.1 | 1.0 | 1.62 | 4.8 | 6.0 | 18.6 | |
| | | 15-Nov-10 | 2 | 8.88 | 12.80 | 3.92 | A | 21.7 | 21.7 | 5.5 | 7:22 | 7:36 | 2.6 | 0.0 | 0.00 | 30.9 | 3.0 | 1.58 | 6.3 | 9.1 | 17.8 | |
| S-31+235 | S | 28-Nov-10 | 4 | 5.16 | 6.66 | 1.50 | B | 152.5 | - | - | 1:31 | 1:53 | 2.3 | 11.3 | 6.04 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 4 | 5.16 | 6.66 | 1.50 | C | 165.0 | - | - | 1:53 | 2:04 | 2.6 | 11.8 | 3.95 | 38.6 | 1.0 | 1.68 | -9.2 | 7.1 | 17.0 | |
| | | 28-Nov-10 | 4 | 5.16 | 6.66 | 1.50 | D | 37.9 | 355.4 | 236.9 | 2:04 | 2:30 | 2.3 | 0.8 | 0.24 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.16 | 8.16 | 1.00 | A | 22.7 | - | - | 15:37 | 15:45 | 1.4 | 3.5 | 2.40 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.16 | 8.16 | 1.00 | B | 132.7 | 155.4 | 155.4 | 15:45 | 16:57 | 3.1 | 0.6 | 0.18 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 8.16 | 12.70 | 4.54 | A | 78.1 | 78.1 | 17.2 | 15:12 | 15:35 | 2.8 | 1.8 | 0.14 | - | - | - | - | - | - | |
| T-31+236.5 | T | 17-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | MF | 80.9 | 80.9 | 53.9 | 15:01 | 15:38 | 2.5 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 6.83 | 7.83 | 1.00 | A | 88.6 | - | - | 5:00 | 5:13 | 1.2 | 9.6 | 6.48 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 6.83 | 7.83 | 1.00 | B | 133.7 | - | - | 5:13 | 5:24 | 2.1 | 14.0 | 5.34 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 6.83 | 7.83 | 1.00 | C | 88.7 | 311.0 | 311.0 | 5:24 | 5:44 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 7.83 | 11.80 | 3.97 | A | 38.3 | 38.3 | 9.6 | 4:50 | 4:56 | 2.3 | 3.5 | 0.38 | - | - | - | - | - | - | By-Pass |
| P-31+238 | P | 25-Nov-10 | 4 | 4.40 | 5.90 | 1.50 | B | 139.3 | - | - | 5:51 | 6:13 | 2.2 | 8.5 | 2.55 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 4.40 | 5.90 | 1.50 | - | 105.3 | 244.6 | 163.1 | 6:13 | 6:58 | 2.6 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.40 | 7.40 | 1.00 | A | 75.0 | - | - | 15:30 | 15:44 | 0.7 | 9.4 | 12.89 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.40 | 7.40 | 1.00 | B | 143.4 | - | - | 15:44 | 15:57 | 1.1 | 13.3 | 13.45 | 35.6 | 2.0 | 1.63 | 16.0 | 9.6 | 16.5 | |
| | | 20-Oct-10 | 3 | 6.40 | 7.40 | 1.00 | C | 101.3 | - | - | 15:57 | 16:03 | 1.2 | 16.3 | 15.36 | 47.4 | - | 1.64 | 16.0 | 9.6 | 15.5 | |
| | | 20-Oct-10 | 3 | 6.40 | 7.40 | 1.00 | D | 210.2 | - | - | 16:03 | 16:13 | 1.6 | 22.2 | 14.11 | 71.2 | - | 1.66 | 16.0 | 9.6 | 16.3 | |
| | | 20-Oct-10 | 3 | 6.40 | 7.40 | 1.00 | E | 96.3 | 626.2 | 626.2 | 16:13 | 16:18 | 1.4 | 19.7 | 13.98 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 7.40 | 11.50 | 4.10 | A | 86.4 | 86.4 | 21.1 | 14:54 | 15:24 | 2.8 | 1.2 | 0.10 | - | - | - | - | - | - | |
| Q-31+238.75 | Q | 27-Jun-11 | 4 | 4.58 | 6.08 | 1.50 | MF | 46.3 | 46.30 | 30.87 | 13:42 | 14:03 | 2.0 | 0.0 | 0.02 | 32.1 | 3.0 | 1.4 | 10.7 | 15.6 | 14.5 | |
| | | 23-Jun-11 | 3 | 6.58 | 7.6 | 1.02 | A | 39.2 | 39.20 | 38.43 | 10:49 | 11:12 | 2.5 | 0.2 | 0.09 | 32.8 | - | 1.6 | 11.4 | 16.3 | 15.5 | |
| T-31+239.5 | T | 22-Jun-11 | 4 | 4.48 | 5.98 | 1.50 | MF | 32.5 | 32.5 | 21.7 | 4:57 | 5:13 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 6.48 | 7.48 | 1.00 | A | 61.9 | - | - | 3:40 | 3:50 | 1.1 | 7.4 | 7.75 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 6.48 | 7.48 | 1.00 | B | 149.8 | - | - | 3:50 | 4:08 | 1.2 | 7.6 | 7.34 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 6.48 | 7.48 | 1.00 | C | 155.3 | - | - | 4:08 | 4:24 | 2.0 | 11.7 | 5.49 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 6.48 | 7.48 | 1.00 | D | 234.2 | 601.2 | 601.2 | 4:24 | 4:43 | 2.0 | 13.8 | 6.79 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 7.48 | 11.90 | 4.42 | A | 22.5 | 22.5 | 5.1 | 3:24 | 3:36 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+240.25 | Q | 27-Jun-11 | 4 | 3.99 | 5.49 | 1.50 | MF | 37.6 | 37.60 | 25.07 | 14:07 | 14:24 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 6.99 | 8 | 1.01 | A | 22.7 | 22.70 | 22.48 | 2:43 | 2:57 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+241 | S | 28-Nov-10 | 4 | 4.50 | 6.00 | 1.50 | B | 148.3 | - | - | 2:45 | 3:09 | 1.5 | 11.7 | 5.33 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 4 | 4.50 | 6.00 | 1.50 | C | 168.2 | - | - | 3:09 | 3:20 | 2.0 | 16.2 | 4.32 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 4 | 4.50 | 6.00 | 1.50 | D | 60.1 | 376.6 | 251.1 | 3:20 | 3:46 | 2.5 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 6.80 | 7.80 | 1.00 | A | 23.4 | - | - | 17:23 | 17:28 | 1.5 | 3.4 | 2.49 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 6.80 | 7.80 | 1.00 | B | 182.9 | - | - | 17:28 | 17:47 | 1.9 | 13.1 | 6.84 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 6.80 | 7.80 | 1.00 | C | 162.4 | - | - | 17:47 | 17:59 | 2.4 | 13.9 | 5.95 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 6.80 | 7.80 | 1.00 | D | 164.6 | - | - | 17:59 | 18:08 | 3.0 | 20.4 | 17.20 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 6.80 | 7.80 | 1.00 | E | 113.1 | 646.4 | 646.4 | 18:08 | 18:17 | 2.2 | 16.7 | 7.68 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 7.80 | 11.60 | 3.80 | A | 23.6 | 23.6 | 6.2 | 17:02 | 17:19 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+242.5 | T | 17-Dec-10 | 4 | 4.28 | 5.78 | 1.50 | MF | 179.5 | - | - | 7:32 | 8:01 | 1.6 | 10.2 | 4.11 | 30.2 | 2.0 | 1.47 | 7.3 | 11.6 | 17.3 | |
| | | 17-Dec-10 | 4 | 4.28 | 5.78 | 1.50 | B | 102.7 | 282.2 | 188.1 | 8:01 | 8:40 | 2.2 | 0.4 | 0.14 | 36.5 | 3.0 | 1.64 | 16.6 | 11.2 | 20.5 | |
| | | 14-Nov-10 | 3 | 6.28 | 7.28 | 1.00 | A | 55.6 | - | - | 2:09 | 2:19 | 0.8 | 7.0 | 8.54 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 6.28 | 7.28 | 1.00 | B | 169.5 | - | - | 2:19 | 2:35 | 1.0 | 12.1 | 11.88 | 34.3 | - | 1.63 | 12.2 | 9.3 | 16.5 | |
| | | 14-Nov-10 | 3 | 6.28 | 7.28 | 1.00 | C | 164.9 | - | - | 2:35 | 2:46 | 2.2 | 18.8 | 8.35 | 48.7 | - | 1.64 | 12.0 | 9.2 | 17.1 | |
| | | 14-Nov-10 | 3 | 6.28 | 7.28 | 1.00 | D | 116.3 | 506.3 | 506.3 | 2:46 | 3:13 | 2.7 | 0.1 | 0.04 | 67.4 | - | 1.65 | 12.1 | 9.0 | 17.8 | |
| | | 14-Nov-10 | 2 | 7.28 | 11.80 | 4.52 | A | 55.0 | 55.0 | 12.2 | 1:47 | 2:05 | 2.7 | 0.8 | 0.08 | 31.4 | - | 1.66 | 7.3 | 16.1 | 17.4 | |
| P-31+244 | P | 25-Nov-10 | 4 | 4.66 | 6.16 | 1.50 | B | 139.9 | - | - | 3:41 | 4:09 | 1.3 | 2.6 | 1.66 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 4.66 | 6.16 | 1.50 | C | 160.0 | - | - | 4:09 | 4:46 | 2.4 | 4.1 | 1.14 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 4.66 | 6.16 | 1.50 | D | 81.5 | 381.4 | 254.3 | 4:46 | 5:30 | 2.7 | 0.3 | 0.07 | 65.0 | 1.0 | 1.63 | -11.7 | 11.3 | 21.3 | |
| | | 20-Oct-10 | 3 | 6.66 | 7.66 | 1.00 | B | 157.5 | - | - | 17:12 | 17:33 | 1.4 | 13.9 | 10.72 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.66 | 7.66 | 1.00 | C | 138.2 | - | - | 17:33 | 17:43 | 2.1 | 16.8 | 7.63 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.66 | 7.66 | 1.00 | D | 173.0 | - | - | 17:43 | 17:53 | 2.4 | 13.8 | 5.50 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.66 | 7.66 | 1.00 | D+ | 133.0 | 601.7 | 601.7 | 17:53 | 18:05 | 2.2 | 12.3 | 5.69 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 7.66 | 11.90 | 4.24 | A | 36.5 | 36.5 | 8.6 | 16:53 | 17:07 | 2.8 | 0.3 | 0.03 | - | - | - | - | - | - | |
| T-31+245.5 | T | 22-Jun-11 | 4 | 4.52 | 6.02 | 1.50 | MF | 33.8 | 33.8 | 22.5 | 4:39 | 4:55 | 2.1 | 0.2 | 0.06 | 31.4 | 5.5 | 1.43 | 14.1 | 9.4 | 12.8 | |
| | | 14-Nov-10 | 3 | 6.53 | 7.53 | 1.00 | A | 51.3 | 51.3 | 51.3 | 22:45 | 23:24 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 7.53 | 11.90 | 4.37 | A | 126.1 | 126.1 | 28.9 | 22:03 | 22:40 | 2.5 | 1.5 | 0.15 | - | - | - | - | - | - | |
| S-31+247 | S | 28-Nov-10 | 4 | 4.86 | 6.36 | 1.50 | B | 144.5 | - | - | 4:27 | 4:50 | 1.9 | 13.8 | 4.28 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 4 | 4.86 | 6.36 | 1.50 | C | 159.1 | - | - | 4:50 | 5:05 | 2.0 | 6.9 | 2.40 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 4 | 4.86 | 6.36 | 1.50 | D | 50.4 | 354.0 | 236.0 | 5:05 | 5:30 | 2.1 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 6.86 | 7.86 | 1.00 | A | 16.5 | 16.5 | 16.5 | 19:37 | 19:51 | 3.0 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 7.86 | 11.90 | 4.04 | A | 81.8 | 81.8 | 20.2 | 19:00 | 19:33 | 2.4 | 0.7 | 0.08 | - | - | - | - | - | - | |
| T-31+248.5 | T | 17-Dec-10 | 4 | 5.04 | 6.54 | 1.50 | MF | 178.1 | - | - | 9:01 | 9:29 | 2.6 | 11.7 | 3.06 | - | - | - | - | - | - | |
| | | 17-Dec-10 | 4 | 5.04 | 6.54 | 1.50 | B | 164.0 | - | - | 9:29 | 9:51 | 1.9 | 3.8 | 1.31 | - | - | - | - | - | - | |
| | | 17-Dec-10 | 4 | 5.04 | 6.54 | 1.50 | C | 48.9 | 391.0 | 260.7 | 9:51 | 10:35 | 1.9 | 0.3 | 0.11 | 37.9 | - | 1.65 | 16.6 | 11.2 | 20.5 | |
| | | 14-Nov-10 | 3 | 7.04 | 8.04 | 1.00 | A | 55.6 | - | - | 20:56 | 21:06 | 1.4 | 5.8 | 5.18 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 7.04 | 8.04 | 1.00 | B | 161.8 | - | - | 21:06 | 21:20 | 2.1 | 15.3 | 7.48 | 35.7 | 2.0 | 1.63 | 6.9 | 15.9 | 18.8 | |
| | | 14-Nov-10 | 3 | 7.04 | 8.04 | 1.00 | C | 117.6 | 335.0 | 335.0 | 21:20 | 21:58 | 2.5 | 0.0 | 0.00 | 45.4 | 1.0 | 1.63 | 6.9 | 15.9 | 17.9 | |
| | | 14-Nov-10 | 2 | 8.04 | 12.20 | 4.16 | A | 75.2 | 75.2 | 18.1 | 20:31 | 20:53 | 2.8 | 1.0 | 0.09 | - | - | - | - | - | - | |
| P-31+250 | P | 25-Nov-10 | 4 | 5.37 | 6.87 | 1.50 | B | 141.7 | - | - | 1:53 | 2:21 | 1.6 | 9.7 | 4.34 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 5.37 | 6.87 | 1.50 | C | 143.4 | - | - | 2:21 | 3:06 | 2.3 | 1.8 | 0.50 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 5.37 | 6.87 | 1.50 | D | 13.7 | 298.8 | 199.2 | 3:06 | 3:24 | 2.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | A | 47.2 | - | - | 19:00 | 19:11 | 1.4 | 6.2 | 4.81 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | B | 105.5 | - | - | 19:11 | 19:24 | 2.7 | 9.9 | 2.13 | 34.3 | 7.0 | 1.63 | 19.0 | 10.0 | 19.0 | |
| | | 20-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | C | 216.0 | - | - | 19:24 | 20:12 | 2.9 | 3.4 | 1.00 | 52.1 | - | 1.67 | 19.0 | 10.0 | 16.0 | |
| | | 20-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | D | 106.2 | - | - | 20:12 | 20:47 | 3.0 | 3.0 | 0.98 | 59.3 | - | 1.67 | 19.0 | 10.0 | 16.0 | |
| | | 20-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | D+ | 126.5 | 601.4 | 601.4 | 20:47 | 21:48 | 2.9 | 1.6 | 0.54 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 8.37 | 12.40 | 4.03 | A | 128.8 | 128.8 | 32.0 | 18:13 | 18:51 | 2.4 | 2.0 | 0.21 | 32.3 | 24.0 | 1.62 | 19.0 | 10.0 | 18.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+251.5 | T | 26-Apr-10 | 4 | 5.09 | 6.59 | 1.50 | MF | 50.8 | 50.8 | 33.9 | 13:13 | 13:50 | 2.1 | 0.3 | 0.11 | 28.4 | - | 1.43 | 10.3 | 4.5 | 8.4 | |
| | | 19-Nov-10 | 3 | 7.09 | 8.09 | 1.00 | A | 125.8 | - | - | 3:10 | 3:30 | 2.6 | 8.6 | 4.42 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 7.09 | 8.09 | 1.00 | B | 156.2 | - | - | 3:30 | 3:56 | 2.5 | 3.6 | 1.75 | 47.5 | - | 1.65 | 2.5 | 8.4 | 15.4 | |
| | | 19-Nov-10 | 3 | 7.09 | 8.09 | 1.00 | C | 25.5 | 307.5 | 307.5 | 3:56 | 4:18 | 2.5 | 0.0 | 0.02 | 51.3 | - | 1.67 | 2.5 | 8.4 | 18.5 | |
| | | 19-Nov-10 | 2 | 8.09 | 12.90 | 4.81 | A | 28.7 | 28.7 | 6.0 | 2:45 | 3:03 | 2.5 | 0.4 | 0.04 | 41.1 | - | 1.63 | 2.2 | 8.6 | 15.7 | |
| S-31+253 | S | 29-Nov-10 | 4 | 5.24 | 6.74 | 1.50 | B | 155.9 | - | - | 6:56 | 7:18 | 1.2 | 12.8 | 2.34 | 38.3 | 2.5 | 1.62 | -7.3 | 7.4 | 13.2 | |
| | | 29-Nov-10 | 4 | 5.24 | 6.74 | 1.50 | C | 188.4 | - | - | 7:18 | 7:31 | 2.0 | 7.5 | 0.82 | 44.3 | - | 1.63 | -9.6 | 7.4 | 12.7 | |
| | | 29-Nov-10 | 4 | 5.24 | 6.74 | 1.50 | D | 154.8 | 499.1 | 332.7 | 7:31 | 8:05 | 2.9 | 0.5 | 0.04 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3A | 7.24 | 9.24 | 2.00 | B | 28.0 | 28.0 | 14.0 | 9:58 | 10:15 | 3.8 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 8.24 | 9.24 | 1.00 | B | 160.5 | - | - | 15:57 | 16:24 | 1.6 | 9.3 | 6.11 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 8.24 | 9.24 | 1.00 | C | 161.7 | - | - | 16:24 | 16:38 | 2.0 | 15.3 | 6.99 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 8.24 | 9.24 | 1.00 | D | 179.2 | - | - | 16:38 | 16:53 | 2.3 | 11.1 | 4.82 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 8.24 | 9.24 | 1.00 | E | 32.8 | 534.2 | 534.2 | 16:53 | 17:09 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 9.24 | 13.00 | 3.76 | A | 78.3 | 78.3 | 20.8 | 15:38 | 15:53 | 2.4 | 2.1 | 0.18 | - | - | - | - | - | - | |
| T-31+254.5 | T | 17-Dec-10 | 4 | 5.29 | 6.79 | 1.50 | MF | 177.1 | - | - | 13:34 | 14:01 | 1.8 | 11.7 | 4.33 | 31.5 | - | 1.44 | 4.1 | 13.6 | 19.8 | |
| | | 17-Dec-10 | 4 | 5.29 | 6.79 | 1.50 | B | 61.9 | 239.0 | 159.3 | 14:01 | 14:18 | 1.9 | 0.6 | 0.20 | 36.9 | - | 1.65 | 16.1 | 13.1 | 21.2 | |
| | | 19-Nov-10 | 3 | 7.29 | 8.29 | 1.00 | A | 190.1 | - | - | 23:06 | 23:29 | 2.1 | 15.2 | 7.42 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 7.29 | 8.29 | 1.00 | B | 149.6 | - | - | 23:29 | 23:40 | 2.4 | 13.6 | 5.73 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 7.29 | 8.29 | 1.00 | C | 84.5 | 424.2 | 424.2 | 23:40 | 0:07 | 2.6 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 2 | 8.29 | 12.60 | 4.31 | A | 116.1 | 116.1 | 26.9 | 22:42 | 23:02 | 2.0 | 9.9 | 1.16 | - | - | - | - | - | - | By-Pass |
| P-31+256 | P | 25-Nov-10 | 4 | 5.37 | 6.87 | 1.50 | B | 147.4 | - | - | 22:31 | 22:54 | 1.4 | 12.8 | 5.75 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 5.37 | 6.87 | 1.50 | C | 162.0 | - | - | 22:54 | 23:07 | 2.1 | 7.2 | 3.59 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 5.37 | 6.87 | 1.50 | D | 128.4 | 437.8 | 291.9 | 23:07 | 23:40 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | A | 37.7 | - | - | 22:29 | 22:39 | 0.6 | 3.5 | 6.35 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | B | 126.8 | - | - | 22:39 | 22:54 | 1.4 | 9.0 | 9.01 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | C | 176.9 | - | - | 22:54 | 23:07 | 1.6 | 15.8 | 10.25 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | D | 164.4 | - | - | 23:07 | 23:15 | 2.2 | 21.6 | 10.48 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | D+ | 111.9 | 617.7 | 617.7 | 23:15 | 23:21 | 3.3 | 26.6 | 8.01 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 8.37 | 12.40 | 4.03 | A | 31.1 | 31.1 | 7.7 | 22:08 | 22:23 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+257.5 | T | 26-Apr-10 | 4 | 5.64 | 7.15 | 1.51 | MF | 35.7 | 35.7 | 23.6 | 13:56 | 14:17 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 7.65 | 8.65 | 1.00 | A | 120.5 | - | - | 21:40 | 22:16 | 2.2 | 3.6 | 1.67 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 7.65 | 8.65 | 1.00 | B | 28.7 | 149.2 | 149.2 | 22:16 | 22:40 | 2.4 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 2 | 8.65 | 12.90 | 4.25 | A | 23.8 | 23.8 | 5.6 | 21:23 | 21:37 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+259 | S | 29-Nov-10 | 4 | 5.11 | 6.61 | 1.50 | B | 117.8 | - | - | 8:19 | 8:41 | 2.4 | 5.2 | 1.58 | 37.0 | - | 1.61 | 13.5 | 7.4 | 18.4 | |
| | | 29-Nov-10 | 4 | 5.11 | 6.61 | 1.50 | C | 83.8 | 201.6 | 134.4 | 8:41 | 9:29 | 2.9 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 7.11 | 8.11 | 1.00 | B | 160.0 | - | - | 14:19 | 14:41 | 1.2 | 11.4 | 10.50 | 35.6 | - | 1.67 | 7.2 | 10.9 | 17.4 | |
| | | 14-Nov-10 | 3 | 7.11 | 8.11 | 1.00 | C | 149.6 | - | - | 14:41 | 14:56 | 2.5 | 20.4 | 8.21 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 7.11 | 8.11 | 1.00 | D | 170.2 | - | - | 14:56 | 15:01 | 2.8 | 18.9 | 1.18 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 7.11 | 8.11 | 1.00 | E | 14.0 | 493.8 | 493.8 | 15:01 | 15:18 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 8.11 | 12.10 | 3.99 | A | 21.3 | 21.3 | 5.3 | 14:03 | 14:16 | 2.7 | 0.0 | 0.00 | 30.9 | - | 1.57 | 7.2 | 17.9 | 17.2 | |
| T-31+260.5 | T | 17-Dec-10 | 4 | 4.45 | 5.95 | 1.50 | MF | 175.0 | - | - | 10:09 | 10:41 | 1.9 | 6.9 | 3.21 | - | - | - | - | - | - | |
| | | 17-Dec-10 | 4 | 4.45 | 5.95 | 1.50 | B | 36.2 | 211.2 | 140.8 | 10:41 | 11:03 | 1.9 | 0.6 | 0.21 | 31.7 | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | A | 152.3 | - | - | 20:04 | 20:26 | 2.3 | 12.4 | 5.38 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | B | 147.7 | - | - | 20:26 | 20:49 | 3.3 | 2.1 | 0.92 | 50.7 | 2.0 | 1.67 | -10.1 | 8.9 | 17.3 | |
| | | 19-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | C | 10.7 | 310.7 | 310.7 | 20:49 | 21:07 | 2.4 | 0.0 | 0.00 | 56.3 | 1.0 | 1.69 | -10.1 | 8.9 | 18.6 | |
| | | 19-Nov-10 | 2 | 7.45 | 11.90 | 4.45 | A | 21.9 | 21.9 | 4.9 | 19:45 | 20:00 | 2.6 | 0.2 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+262 | P | 25-Nov-10 | 4 | 3.79 | 5.29 | 1.50 | B | 144.2 | - | - | 20:41 | 21:08 | 1.8 | 9.5 | 2.94 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 3.79 | 5.29 | 1.50 | C | 157.3 | - | - | 21:08 | 21:39 | 2.0 | 6.7 | 2.40 | 85.0 | 1.0 | 1.69 | -10.1 | 8.7 | 19.0 | By-Pass. Raised Packer 0.6 m. |
| | | 25-Nov-10 | 4 | 3.79 | 5.29 | 1.50 | D | 24.6 | 326.1 | 217.4 | 21:39 | 22:04 | 2.1 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 3 | 5.79 | 6.79 | 1.00 | B | 161.2 | - | - | 15:47 | 16:11 | 1.8 | 12.3 | 6.15 | 34.0 | - | 1.62 | 2.0 | 4.0 | 16.0 | |
| | | 05-Nov-10 | 3 | 5.79 | 6.79 | 1.00 | C | 192.6 | - | - | 16:11 | 16:25 | 2.9 | 12.8 | 4.40 | 44.0 | - | 1.64 | 4.0 | 5.0 | 17.0 | |
| | | 05-Nov-10 | 3 | 5.79 | 6.79 | 1.00 | D | 221.3 | 575.1 | 575.1 | 16:25 | 17:16 | 3.2 | 2.0 | 0.60 | 35.0 | - | - | - | - | - | |
| | | 05-Nov-10 | 2 | 6.79 | 11.10 | 4.31 | A | 146.6 | - | - | 10:45 | 11:38 | 1.6 | 4.9 | 0.72 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 2 | 6.79 | 11.10 | 4.31 | B | 199.8 | - | - | 14:55 | 15:30 | 2.4 | 8.2 | 0.74 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 2 | 6.79 | 11.10 | 4.31 | C | 24.5 | 370.9 | 86.1 | 15:30 | 15:45 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+263.5 | T | 26-Apr-10 | 4 | 3.59 | 5.09 | 1.50 | MF | 27.0 | 27.0 | 18.0 | 14:22 | 14:46 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.59 | 6.59 | 1.00 | A | 15.0 | 15.0 | 15.0 | 18:11 | 18:26 | 2.7 | 0.2 | 0.07 | 33.4 | 6.0 | 1.60 | 3.6 | 6.2 | 13.4 | |
| | | 19-Nov-10 | 2 | 6.59 | 11.10 | 4.51 | A | 22.4 | 22.4 | 5.0 | 17:54 | 18:06 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+265 | S | 29-Nov-10 | 4 | 3.44 | 4.94 | 1.50 | B | 190.1 | 190.1 | 126.7 | 9:43 | 10:47 | 3.0 | 0.0 | 0.00 | 37.9 | - | 1.62 | 14.1 | 7.0 | 17.9 | |
| | | 14-Nov-10 | 3 | 5.44 | 6.44 | 1.00 | B | 128.9 | - | - | 10:26 | 10:49 | 2.3 | 10.6 | 4.57 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 5.44 | 6.44 | 1.00 | C | 192.6 | - | - | 10:49 | 11:03 | 2.6 | 13.4 | 4.83 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 5.44 | 6.44 | 1.00 | D | 123.0 | - | - | 11:03 | 11:17 | 2.5 | 15.8 | 6.41 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 5.44 | 6.44 | 1.00 | E | 154.6 | 599.1 | 599.1 | 11:17 | 11:36 | 2.4 | 0.3 | 0.13 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 6.44 | 10.90 | 4.46 | A | 69.5 | 69.5 | 15.6 | 9:56 | 10:21 | 2.6 | 1.1 | 0.11 | - | - | - | - | - | - | |
| T-31+266.5 | T | 17-Dec-10 | 4 | 3.92 | 5.42 | 1.50 | MF | 181.5 | - | - | 8:23 | 9:12 | 2.0 | 3.2 | 1.01 | - | - | - | - | - | - | |
| | | 17-Dec-10 | 4 | 3.92 | 5.42 | 1.50 | B | 77.4 | 258.9 | 172.6 | 9:12 | 9:56 | 2.1 | 0.4 | 0.14 | 34.0 | 2.5 | 1.59 | -2.3 | 12.6 | 20.0 | |
| | | 19-Nov-10 | 3 | 5.92 | 6.92 | 1.00 | A | 130.2 | - | - | 15:52 | 16:14 | 2.1 | 12.1 | 5.99 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.92 | 6.92 | 1.00 | B | 181.6 | - | - | 16:14 | 16:29 | 2.2 | 9.5 | 4.53 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.92 | 6.92 | 1.00 | C | 193.9 | - | - | 16:29 | 17:01 | 2.2 | 8.4 | 4.01 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.92 | 6.92 | 1.00 | D | 148.2 | 653.9 | 653.9 | 17:01 | 17:44 | 2.2 | 2.5 | 1.15 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 2 | 6.92 | 11.00 | 4.08 | A | 15.1 | 15.1 | 3.7 | 15:35 | 15:48 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+268 | P | 25-Nov-10 | 4 | 3.08 | 4.58 | 1.50 | B | 135.0 | - | - | 19:30 | 20:05 | 2.2 | 1.4 | 0.40 | 40.7 | 4.0 | 1.63 | 2.7 | 9.8 | 20.2 | By-Pass. Raised Packer 0.5 m. |
| | | 25-Nov-10 | 4 | 3.08 | 4.58 | 1.50 | C | 18.2 | 153.2 | 102.1 | 20:05 | 20:22 | 2.3 | 0.5 | 0.14 | 50.3 | - | 1.70 | 2.6 | 9.8 | 19.8 | |
| | | 05-Nov-10 | 3 | 5.08 | 6.08 | 1.00 | B | 169.1 | - | - | 9:18 | 9:45 | 1.1 | 12.2 | 11.40 | 33.0 | 6.0 | 1.63 | 2.0 | 4.0 | 16.0 | |
| | | 05-Nov-10 | 3 | 5.08 | 6.08 | 1.00 | C | 160.4 | - | - | 9:45 | 9:56 | 1.9 | 19.9 | 10.36 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 3 | 5.08 | 6.08 | 1.00 | D | 120.4 | - | - | 9:56 | 10:04 | 2.6 | 22.5 | 8.98 | 79.0 | 1.0 | 1.69 | 4.0 | 3.0 | 17.0 | |
| | | 05-Nov-10 | 3 | 5.08 | 6.08 | 1.00 | E | 150.1 | 600.0 | 600.0 | 10:04 | 10:10 | 2.7 | 6.9 | 2.50 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 2 | 6.08 | 10.10 | 4.02 | A | 202.0 | - | - | 8:23 | 8:57 | 2.6 | 5.3 | 0.50 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 2 | 6.08 | 10.10 | 4.02 | B | 38.1 | 240.1 | 59.7 | 8:57 | 9:15 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+268.75 | Q | 27-Jun-11 | 4 | 2.7 | 4.2 | 1.50 | MF | 27.8 | 27.80 | 18.53 | 14:26 | 14:41 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 3 | 4.7 | 5.7 | 1.00 | A | 15.5 | 15.50 | 15.50 | 11:26 | 11:39 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+269.5 | T | 26-Apr-10 | 4 | 3.01 | 4.51 | 1.50 | MF | 23.7 | 23.7 | 15.8 | 15:00 | 15:18 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.01 | 6.01 | 1.00 | A | 155.5 | - | - | 13:54 | 14:16 | 1.8 | 12.6 | 7.78 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.01 | 6.01 | 1.00 | B | 167.1 | - | - | 14:16 | 14:29 | 2.1 | 11.4 | 6.06 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.01 | 6.01 | 1.00 | C | 160.4 | - | - | 14:29 | 14:47 | 2.1 | 9.7 | 5.02 | 49.6 | - | 1.64 | 3.4 | 6.0 | 13.9 | |
| | | 19-Nov-10 | 3 | 5.01 | 6.01 | 1.00 | D | 128.0 | 611.0 | 611.0 | 14:47 | 15:25 | 2.0 | 14.5 | 7.53 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 2 | 6.01 | 10.60 | 4.59 | A | 25.6 | 25.6 | 5.6 | 13:36 | 13:49 | 2.7 | 0.4 | 0.04 | 31.3 | - | 1.60 | 2.6 | 6.2 | 12.9 | |
| Q-31+270.25 | Q | 27-Jun-11 | 4 | 3.16 | 4.66 | 1.50 | MF | 144.1 | 144.10 | 96.07 | 14:45 | 15:30 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 5.16 | 6.16 | 1.00 | A | 11.4 | 11.40 | 11.40 | 2:27 | 2:38 | 2.8 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 2 | 6.16 | 8.7 | 2.54 | A | 30.4 | 30.40 | 11.97 | 2:06 | 2:18 | 2.6 | 0.6 | 0.10 | 31.9 | - | 1.6 | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+271 | S | 29-Nov-10 | 4 | 3.13 | 4.63 | 1.50 | B | 128.8 | 128.8 | 85.9 | 11:10 | 11:43 | 2.6 | 0.6 | 0.15 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 5.13 | 6.13 | 1.00 | B | 149.2 | - | - | 8:34 | 9:00 | 1.6 | 12.9 | 9.09 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 5.13 | 6.13 | 1.00 | C | 164.3 | - | - | 9:00 | 9:12 | 2.0 | 15.5 | 7.85 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 5.13 | 6.13 | 1.00 | D | 154.9 | - | - | 9:12 | 9:22 | 2.7 | 16.5 | 6.78 | 102.2 | 1.0 | 1.68 | 10.5 | 11.1 | 18.8 | |
| | | 14-Nov-10 | 3 | 5.13 | 6.13 | 1.00 | E | 108.6 | 577.0 | 577.0 | 9:22 | 9:45 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 6.13 | 10.50 | 4.37 | A | 20.4 | 20.4 | 4.7 | 8:16 | 8:29 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+272.5 | T | 17-Dec-10 | 4 | 3.03 | 4.53 | 1.50 | MF | 136.8 | 136.8 | 91.2 | 7:00 | 8:17 | 1.8 | 0.5 | 0.19 | 28.5 | 3.0 | 1.40 | 2.3 | 13.5 | 15.5 | |
| | | 19-Nov-10 | 3 | 5.03 | 6.03 | 1.00 | A | 160.1 | - | - | 10:14 | 10:36 | 1.7 | 12.8 | 7.40 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.03 | 6.03 | 1.00 | B | 165.8 | - | - | 10:36 | 10:47 | 2.1 | 16.3 | 7.63 | 36.4 | - | 1.61 | 3.9 | 7.1 | 13.0 | |
| | | 19-Nov-10 | 3 | 5.03 | 6.03 | 1.00 | C | 225.3 | - | - | 10:47 | 11:17 | 2.2 | 5.4 | 2.45 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.03 | 6.03 | 1.00 | D | 51.0 | 602.2 | 602.2 | 11:17 | 11:27 | 2.3 | 5.4 | 2.38 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 2 | 6.03 | 10.50 | 4.47 | A | 17.1 | 17.1 | 3.8 | 9:56 | 10:10 | 2.7 | 0.2 | 0.02 | 32.4 | - | 1.61 | 3.3 | 7.1 | 12.6 | |
| P-31+274 | P | 25-Nov-10 | 4 | 3.21 | 4.71 | 1.50 | B | 171.9 | - | - | 15:47 | 16:20 | 1.8 | 5.1 | 1.78 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 3.21 | 4.71 | 1.50 | C | 188.8 | - | - | 16:20 | 16:40 | 2.3 | 15.3 | 4.15 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 3.21 | 4.71 | 1.50 | D | 113.2 | 473.9 | 315.9 | 16:40 | 17:19 | 2.6 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 3 | 5.21 | 6.21 | 1.00 | B | 160.5 | - | - | 7:02 | 7:26 | 1.0 | 11.8 | 11.45 | 31.0 | - | 1.61 | 7.0 | 6.0 | 15.0 | |
| | | 05-Nov-10 | 3 | 5.21 | 6.21 | 1.00 | C | 176.7 | - | - | 7:26 | 7:37 | 2.4 | 18.7 | 8.37 | 53.0 | 1.0 | 1.65 | 6.0 | 5.0 | 16.0 | |
| | | 05-Nov-10 | 3 | 5.21 | 6.21 | 1.00 | D | 194.3 | - | - | 7:37 | 7:50 | 3.0 | 11.2 | 3.93 | >120 | - | - | - | - | - | |
| | | 05-Nov-10 | 3 | 5.21 | 6.21 | 1.00 | E | 85.9 | 617.4 | 617.4 | 7:50 | 8:06 | 2.3 | 9.8 | 4.24 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 2 | 6.21 | 10.20 | 3.99 | A | 22.7 | 22.7 | 5.7 | 6:44 | 6:58 | 2.2 | 0.0 | 0.00 | 31.0 | 4.0 | 1.60 | 7.0 | 5.0 | 19.0 | |
| T-31+275.5 | T | 26-Apr-10 | 4 | 3.29 | 4.79 | 1.50 | MF | 27.0 | 27.0 | 18.0 | 15:22 | 15:40 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.29 | 6.29 | 1.00 | A | 152.8 | - | - | 6:31 | 7:00 | 2.2 | 9.6 | 4.60 | 31.6 | 4.0 | 1.60 | 4.0 | 7.3 | 14.6 | |
| | | 19-Nov-10 | 3 | 5.29 | 6.29 | 1.00 | B | 164.0 | - | - | 7:00 | 7:23 | 2.3 | 5.3 | 2.28 | 38.5 | 1.5 | 1.62 | 4.0 | 7.3 | 15.2 | |
| | | 19-Nov-10 | 3 | 5.29 | 6.29 | 1.00 | C | 162.9 | - | - | 7:23 | 8:16 | 2.1 | 3.4 | 1.47 | 57.8 | - | 1.64 | 4.0 | 7.3 | 14.8 | |
| | | 19-Nov-10 | 3 | 5.29 | 6.29 | 1.00 | D | 89.8 | 569.5 | 569.5 | 8:16 | 9:16 | 2.8 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 2 | 6.29 | 10.60 | 4.31 | A | 25.0 | 25.0 | 5.8 | 6:09 | 6:25 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+277 | S | 29-Nov-10 | 4 | 3.62 | 5.12 | 1.50 | B | 156.3 | - | - | 14:28 | 14:47 | 2.4 | 5.7 | 1.67 | 38.0 | - | 1.62 | 12.5 | 2.6 | 18.2 | |
| | | 29-Nov-10 | 4 | 3.62 | 5.12 | 1.50 | C | 214.8 | - | - | 14:47 | 15:13 | 2.6 | 9.1 | 2.56 | 47.8 | 1.0 | 1.64 | 12.5 | 7.6 | 17.9 | |
| | | 29-Nov-10 | 4 | 3.62 | 5.12 | 1.50 | D | 112.9 | 484.0 | 322.7 | 15:13 | 16:11 | 2.5 | 0.1 | 0.04 | 65.4 | - | 1.64 | 12.5 | 7.6 | 18.3 | |
| | | 14-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | B | 189.3 | - | - | 7:14 | 7:41 | 1.5 | 11.8 | 8.70 | 36.5 | 2.0 | 1.63 | 9.4 | 10.1 | 18.0 | |
| | | 14-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | C | 34.7 | - | - | 7:41 | 7:49 | 1.9 | 17.2 | 9.20 | 45.9 | - | 1.63 | 10.2 | 11.0 | 18.6 | |
| | | 14-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | D | 256.0 | - | - | 7:49 | 7:58 | 2.6 | 14.8 | 5.96 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | E | 120.0 | 600.0 | 600.0 | 7:58 | 8:15 | 2.6 | 9.9 | 3.86 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 2 | 6.62 | 11.00 | 4.38 | A | 46.1 | 46.1 | 10.5 | 6:55 | 7:09 | 2.6 | 1.6 | 0.12 | 31.3 | 4.0 | 1.59 | 13.5 | 12.4 | 19.6 | |
| T-31+278.5 | T | 16-Dec-10 | 4 | 3.79 | 5.29 | 1.50 | MF | 153.8 | - | - | 3:57 | 4:27 | 2.1 | 3.9 | 1.25 | - | - | - | - | - | - | |
| | | 16-Dec-10 | 4 | 3.79 | 5.29 | 1.50 | B | 92.3 | 246.1 | 164.1 | 4:27 | 5:17 | 2.0 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 5.79 | 6.79 | 1.00 | A | 130.7 | - | - | 4:23 | 4:44 | 2.5 | 11.7 | 5.09 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 5.79 | 6.79 | 1.00 | B | 109.4 | 240.1 | 240.1 | 4:44 | 5:23 | 2.4 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 2 | 6.79 | 11.30 | 4.51 | A | 25.2 | 25.2 | 5.6 | 4:03 | 4:18 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+280 | P | 25-Nov-10 | 4 | 3.72 | 5.22 | 1.50 | B | 162.3 | - | - | 14:23 | 14:44 | 1.2 | 13.0 | 6.29 | 42.0 | 3.0 | 1.61 | -14.5 | 10.3 | 16.0 | |
| | | 25-Nov-10 | 4 | 3.72 | 5.22 | 1.50 | C | 178.0 | - | - | 14:44 | 14:56 | 1.5 | 17.1 | 7.05 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 3.72 | 5.22 | 1.50 | D | 171.3 | - | - | 14:56 | 15:08 | 2.2 | 18.2 | 5.44 | 61.0 | - | 1.68 | -0.5 | 8.2 | 14.0 | |
| | | 25-Nov-10 | 4 | 3.72 | 5.22 | 1.50 | X | 78.7 | 590.3 | 393.5 | 15:08 | 15:29 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 3 | 5.72 | 6.72 | 1.00 | B | 162.8 | - | - | 14:42 | 15:08 | 1.4 | 12.9 | 8.96 | 34.0 | - | 1.63 | 5.0 | 4.0 | 16.0 | |
| | | 04-Nov-10 | 3 | 5.72 | 6.72 | 1.00 | C | 190.0 | - | - | 15:08 | 15:22 | 2.4 | 11.2 | 3.64 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 3 | 5.72 | 6.72 | 1.00 | D | 154.4 | - | - | 15:22 | 15:37 | 2.6 | 8.0 | 3.01 | 60.0 | - | 1.65 | 6.0 | 4.0 | 18.0 | |
| | | 04-Nov-10 | 3 | 5.72 | 6.72 | 1.00 | E | 94.2 | 601.4 | 601.4 | 15:37 | 15:52 | 2.8 | 6.4 | 2.26 | 60.0 | - | - | - | - | - | |
| | | 04-Nov-10 | 2 | 6.72 | 11.00 | 4.28 | A | 33.3 | 33.3 | 7.8 | 14:25 | 14:38 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+281.5 | T | 26-Apr-10 | 4 | 3.62 | 5.12 | 1.50 | MF | 31.9 | 31.9 | 21.3 | 15:44 | 16:03 | 2.0 | 0.4 | 0.13 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | A | 101.7 | - | - | 2:21 | 2:38 | 1.7 | 9.3 | 5.59 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | B | 192.6 | - | - | 2:38 | 2:59 | 2.0 | 12.8 | 5.58 | 44.8 | - | 1.62 | -3.1 | 6.5 | 12.6 | |
| | | 18-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | C | 146.7 | - | - | 2:59 | 3:20 | 2.5 | 11.4 | 5.24 | 60.7 | - | 1.67 | -2.1 | 5.6 | 11.7 | |
| | | 18-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | D | 35.1 | 476.1 | 476.1 | 3:20 | 3:47 | 2.4 | 0.0 | 0.00 | 76.5 | 1.0 | 1.69 | -2.5 | 8.8 | 12.8 | |
| | | 18-Nov-10 | 2 | 6.62 | 10.80 | 4.18 | A | 39.7 | 39.7 | 9.5 | 1:59 | 2:15 | 2.3 | 0.2 | 0.02 | 34.3 | - | 1.65 | -3.1 | 6.5 | 12.5 | |
| S-31+283 | S | 29-Nov-10 | 4 | 3.40 | 4.90 | 1.50 | B | 159.1 | - | - | 16:21 | 16:59 | 2.4 | 3.3 | 0.89 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 4 | 3.40 | 4.90 | 1.50 | C | 33.8 | 192.9 | 128.6 | 16:59 | 17:20 | 2.6 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 8.56 | 9.56 | 1.00 | A | 15.6 | 15.6 | 15.6 | 5:02 | 5:17 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3A | 9.56 | 14.00 | 4.44 | A | 32.9 | 32.9 | 7.4 | 13:45 | 14:02 | 2.5 | 0.1 | 0.01 | 30.6 | 3.0 | 1.59 | -4.7 | 11.3 | 15.6 | |
| | | 26-Nov-10 | 3B | 8.56 | 9.56 | 1.00 | A | 19.1 | 19.1 | 19.1 | 14:08 | 14:22 | 3.1 | 0.7 | 0.23 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 9.56 | 14.00 | 4.44 | A | 27.9 | 27.9 | 6.3 | 4:45 | 4:57 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+284.5 | T | 16-Dec-10 | 4 | 4.05 | 5.55 | 1.50 | MF | 155.4 | - | - | 2:32 | 2:55 | 1.7 | 13.4 | 4.74 | - | - | - | - | - | - | |
| | | 16-Dec-10 | 4 | 4.05 | 5.55 | 1.50 | B | 104.4 | 259.8 | 173.2 | 2:55 | 3:40 | 2.0 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 6.05 | 7.05 | 1.00 | A | 137.8 | - | - | 22:56 | 23:16 | 1.6 | 13.1 | 6.80 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 6.05 | 7.05 | 1.00 | B | 158.4 | - | - | 23:16 | 23:27 | 2.6 | 6.1 | 2.69 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 6.05 | 7.05 | 1.00 | C | 10.5 | 306.7 | 306.7 | 23:27 | 23:49 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 2 | 7.05 | 11.30 | 4.25 | A | 27.0 | 27.0 | 6.4 | 22:36 | 22:50 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+286 | P | 25-Nov-10 | 4 | 3.79 | 5.29 | 1.50 | B | 188.5 | - | - | 10:52 | 11:15 | 1.9 | 16.3 | 6.32 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 3.79 | 5.29 | 1.50 | C | 170.1 | - | - | 11:15 | 11:27 | 1.9 | 14.5 | 4.91 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 3.79 | 5.29 | 1.50 | D | 154.7 | 513.3 | 342.2 | 11:27 | 12:13 | 2.6 | 0.0 | 0.00 | 52.1 | - | - | - | - | - | |
| | | 05-Nov-10 | 3 | 7.62 | 8.62 | 1.00 | A | 14.3 | 14.3 | 14.3 | 2:01 | 2:16 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3A | 6.80 | 7.60 | 0.80 | A | 34.2 | 34.2 | 42.8 | 19:27 | 19:47 | 2.6 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 14-Nov-10 | 3B | 5.80 | 6.80 | 1.00 | A | 15.6 | 15.6 | 15.6 | 19:51 | 20:05 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 2 | 8.62 | 12.80 | 4.18 | A | 32.5 | 32.5 | 7.8 | 1:31 | 1:56 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+287.5 | T | 26-Apr-10 | 4 | 3.97 | 5.47 | 1.50 | MF | 33.3 | 33.3 | 22.2 | 16:00 | 16:39 | 1.9 | 0.5 | 0.19 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | A | 133.4 | - | - | 21:31 | 21:50 | 1.6 | 12.6 | 6.42 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | B | 167.4 | - | - | 21:50 | 22:03 | 2.4 | 0.6 | 0.27 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | C | 6.8 | 307.6 | 307.6 | 22:03 | 22:21 | 2.3 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 2 | 6.97 | 11.20 | 4.23 | A | 28.2 | 28.2 | 6.7 | 21:08 | 21:25 | 2.3 | 0.5 | 0.05 | 43.5 | 9.0 | 1.64 | 0.5 | 4.6 | 10.4 | |
| S-31+289 | S | 29-Nov-10 | 4 | 3.87 | 5.37 | 1.50 | B | 169.1 | - | - | 19:30 | 19:55 | 2.8 | 2.5 | 0.65 | 37.6 | 1.0 | 1.65 | 15.4 | 10.3 | 18.9 | |
| | | 29-Nov-10 | 4 | 3.87 | 5.37 | 1.50 | C | 46.3 | 215.4 | 143.6 | 19:55 | 20:35 | 2.3 | 0.6 | 0.17 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 7.77 | 8.77 | 1.00 | A | 19.8 | 19.8 | 19.8 | 4:20 | 4:37 | 2.8 | 0.3 | 0.12 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3A | 7.77 | 9.77 | 2.00 | B | 28.5 | 28.5 | 14.3 | 11:21 | 11:36 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 8.77 | 12.80 | 4.03 | A | 40.9 | 40.9 | 10.1 | 4:03 | 4:17 | 2.6 | 0.9 | 0.09 | - | - | - | - | - | - | |
| T-31+290.5 | T | 16-Dec-10 | 4 | 3.82 | 5.32 | 1.50 | MF | 160.1 | - | - | 22:57 | 23:23 | 1.8 | 9.5 | 3.67 | - | - | - | - | - | - | Communicated to T-31+284.5 |
| | | 16-Dec-10 | 4 | 3.82 | 5.32 | 1.50 | B | 119.1 | 279.2 | 186.1 | 23:23 | 0:08 | 2.1 | 0.6 | 0.18 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 5.82 | 6.82 | 1.00 | A | 182.5 | - | - | 17:48 | 18:09 | 1.4 | 12.6 | 8.99 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 3 | 5.82 | 6.82 | 1.00 | B | 144.0 | - | - | 18:09 | 18:44 | 1.9 | 9.6 | 5.14 | 37.6 | 5.0 | 1.60 | -9.0 | 5.2 | 13.8 | |
| | | 18-Nov-10 | 3 | 5.82 | 6.82 | 1.00 | C | 163.5 | - | - | 18:44 | 19:10 | 2.0 | 6.0 | 2.61 | 54.9 | 0.0 | 1.66 | -9.0 | 5.2 | 11.4 | |
| | | 18-Nov-10 | 3 | 5.82 | 6.82 | 1.00 | D | 110.0 | 600.0 | 600.0 | 19:10 | 20:05 | 2.3 | 0.8 | 0.35 | 61.4 | - | 1.68 | -9.0 | 5.2 | 13.8 | |
| | | 18-Nov-10 | 2 | 6.82 | 11.20 | 4.38 | A | 28.5 | 28.5 | 6.5 | 17:32 | 17:45 | 2.7 | 0.5 | 0.04 | - | - | - | - | - | - | |
| P-31+292 | P | 25-Nov-10 | 4 | 4.22 | 5.72 | 1.50 | B | 155.3 | - | - | 8:18 | 8:43 | 2.0 | 12.0 | 3.97 | 36.4 | - | 1.61 | 6.8 | 8.6 | 14.9 | |
| | | 25-Nov-10 | 4 | 4.22 | 5.72 | 1.50 | C | 181.3 | - | - | 8:43 | 8:56 | 2.2 | 18.6 | 5.73 | 39.5 | - | 1.62 | 6.8 | 8.6 | 15.2 | |
| | | 25-Nov-10 | 4 | 4.22 | 5.72 | 1.50 | D | 163.9 | - | - | 8:56 | 9:13 | 2.4 | 14.4 | 4.28 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 4 | 4.22 | 5.72 | 1.50 | X | 140.7 | 641.2 | 427.5 | 9:13 | 9:56 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | B | 85.0 | 85.0 | 85.0 | 9:58 | 11:16 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 2 | 8.01 | 12.60 | 4.59 | A | 98.6 | 98.6 | 21.5 | 9:24 | 9:55 | 2.5 | 1.3 | 0.11 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+293.5 | T | 26-Apr-10 | 4 | 4.45 | 5.95 | 1.50 | MF | 34.3 | 34.3 | 22.9 | 16:44 | 17:01 | 2.1 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | A | 74.9 | - | - | 2:22 | 2:36 | 1.3 | 9.4 | 6.80 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | B | 168.6 | - | - | 2:36 | 2:46 | 2.3 | 40.1 | 16.19 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | C | 183.1 | - | - | 2:46 | 3:06 | 2.4 | 4.0 | 1.43 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | D | 4.8 | 431.4 | 431.4 | 3:06 | 3:19 | 2.4 | 0.0 | 0.01 | 63.8 | 1.0 | 1.57 | 22.3 | 9.2 | 17.8 | |
| | | 13-Nov-10 | 2 | 7.45 | 11.90 | 4.45 | A | 22.8 | 22.8 | 5.1 | 2:06 | 2:18 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+295 | S | 29-Nov-10 | 4 | 4.50 | 6.00 | 1.50 | B | 164.2 | - | - | 20:55 | 21:14 | 1.5 | 12.3 | 5.64 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 4 | 4.50 | 6.00 | 1.50 | C | 157.7 | - | - | 21:14 | 21:25 | 2.3 | 14.6 | 3.96 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 4 | 4.50 | 6.00 | 1.50 | D | 159.8 | - | - | 21:25 | 21:40 | 2.3 | 8.4 | 2.74 | 69.0 | 3.0 | 1.68 | -6.6 | 10.3 | 16.2 | |
| | | 29-Nov-10 | 4 | 4.50 | 6.00 | 1.50 | X | 145.6 | 627.3 | 418.2 | 21:40 | 22:07 | 2.9 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 3 | 6.50 | 7.50 | 1.00 | B | 163.9 | - | - | 10:01 | 10:27 | 0.6 | 12.7 | 21.00 | 33.0 | 3.0 | 1.62 | 7.0 | 1.0 | 16.0 | |
| | | 04-Nov-10 | 3 | 6.50 | 7.50 | 1.00 | C | 161.0 | - | - | 10:27 | 10:38 | 2.0 | 18.4 | 8.17 | 50.0 | 2.0 | 1.66 | 6.0 | 2.0 | 17.0 | |
| | | 04-Nov-10 | 3 | 6.50 | 7.50 | 1.00 | D | 158.8 | - | - | 10:38 | 10:48 | 3.0 | 10.5 | 3.52 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 3 | 6.50 | 7.50 | 1.00 | E | 120.9 | 604.6 | 604.6 | 10:48 | 11:03 | 3.1 | 12.9 | 4.13 | - | - | - | - | - | - | |
| | | 04-Nov-10 | 2 | 7.50 | 11.70 | 4.20 | A | 22.0 | 22.0 | 5.2 | 9:44 | 9:59 | 2.4 | 0.0 | 0.00 | 31.0 | 5.0 | 1.60 | 8.0 | 1.0 | 15.0 | |
| T-31+296.5 | T | 16-Dec-10 | 4 | 4.71 | 6.21 | 1.50 | MF | 153.8 | - | - | 21:33 | 22:00 | 1.9 | 10.2 | 3.86 | - | - | - | - | - | - | |
| | | 16-Dec-10 | 4 | 4.71 | 6.21 | 1.50 | B | 137.0 | 290.8 | 193.9 | 22:00 | 22:39 | 2.0 | 0.6 | 0.22 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 6.71 | 7.71 | 1.00 | A | 60.5 | - | - | 23:18 | 23:34 | 1.2 | 5.8 | 4.86 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 6.71 | 7.71 | 1.00 | B | 153.2 | - | - | 23:34 | 23:45 | 2.6 | 31.0 | 10.55 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 6.71 | 7.71 | 1.00 | C | 142.7 | 356.4 | 356.4 | 23:45 | 0:09 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 7.71 | 12.10 | 4.39 | A | 21.6 | 21.6 | 4.9 | 22:59 | 23:12 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+298 | P | 25-Nov-10 | 4 | 5.04 | 6.54 | 1.50 | B | 179.5 | - | - | 6:58 | 7:25 | 1.6 | 12.4 | 5.60 | 38.0 | - | 1.62 | 6.0 | 8.3 | 13.9 | |
| | | 25-Nov-10 | 4 | 5.04 | 6.54 | 1.50 | C | 185.7 | - | - | 7:25 | 7:36 | 1.9 | 19.4 | 6.79 | 49.7 | 1.0 | 1.64 | 6.0 | 8.3 | 14.6 | |
| | | 25-Nov-10 | 4 | 5.04 | 6.54 | 1.50 | D | 166.5 | - | - | 7:36 | 7:51 | 2.2 | 14.1 | 4.30 | 73.8 | 0.5 | 1.65 | 6.0 | 8.3 | 14.4 | |
| | | 25-Nov-10 | 4 | 5.04 | 6.54 | 1.50 | X | 32.7 | 564.4 | 376.3 | 7:51 | 8:05 | 2.9 | 0.0 | 0.00 | >120 | - | - | 6.0 | 8.3 | 16.1 | |
| | | 29-Oct-10 | 3 | 6.25 | 7.25 | 1.00 | B | 54.0 | 54.0 | 54.0 | 8:55 | 9:21 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 2 | 7.25 | 11.30 | 4.05 | A | 145.1 | 145.1 | 35.8 | 8:20 | 8:54 | 2.5 | 1.2 | 0.12 | - | - | - | - | - | - | |
| T-31+299.5 | T | 26-Apr-10 | 4 | 4.94 | 6.44 | 1.50 | MF | 50.7 | 50.7 | 33.8 | 17:08 | 17:27 | 2.1 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 6.94 | 7.94 | 1.00 | A | 76.1 | - | - | 21:56 | 22:07 | 1.4 | 9.7 | 7.23 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 6.94 | 7.94 | 1.00 | B | 156.6 | - | - | 22:07 | 22:18 | 2.6 | 18.6 | 6.36 | 37.1 | 4.0 | 1.64 | 7.0 | 8.7 | 17.3 | |
| | | 13-Nov-10 | 3 | 6.94 | 7.94 | 1.00 | C | 73.9 | 306.6 | 306.6 | 22:18 | 22:47 | 2.3 | 0.0 | 0.00 | 46.9 | 1.0 | 1.65 | 7.0 | 8.7 | 16.6 | |
| | | 13-Nov-10 | 2 | 7.94 | 12.30 | 4.36 | A | 29.3 | 29.3 | 6.7 | 21:30 | 21:53 | 2.4 | 0.4 | 0.04 | - | - | - | - | - | - | |
| S-31+301 | S | 29-Nov-10 | 4 | 4.94 | 6.44 | 1.50 | B | 162.5 | - | - | 22:50 | 23:09 | 1.9 | 12.5 | 4.47 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 4 | 4.94 | 6.44 | 1.50 | C | 171.2 | - | - | 23:09 | 23:23 | 2.3 | 13.4 | 3.59 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 4 | 4.94 | 6.44 | 1.50 | D | 228.5 | - | - | 23:23 | 23:38 | 3.0 | 14.5 | 3.25 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 4 | 4.94 | 6.44 | 1.50 | X | 46.0 | 608.2 | 405.5 | 23:38 | 23:52 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | A | 22.9 | - | - | 1:57 | 2:03 | 0.4 | 3.9 | 9.69 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | B | 160.0 | - | - | 2:03 | 2:23 | 1.9 | 12.6 | 6.69 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | C | 160.0 | - | - | 2:23 | 2:33 | 2.2 | 18.8 | 8.55 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | D | 160.0 | - | - | 2:33 | 2:42 | 2.5 | 7.4 | 2.99 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | E | 61.2 | 564.1 | 564.1 | 2:42 | 3:03 | 2.8 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 2 | 7.35 | 11.70 | 4.35 | A | 57.1 | 57.1 | 13.1 | 1:32 | 1:51 | 2.0 | 1.2 | 0.15 | - | - | - | - | - | - | |
| T-31+302.5 | T | 16-Dec-10 | 4 | 4.30 | 5.80 | 1.50 | MF | 153.5 | - | - | 19:53 | 20:16 | 1.6 | 11.4 | 4.76 | 27.4 | 0.8 | 1.43 | 6.3 | 9.4 | 12.7 | |
| | | 16-Dec-10 | 4 | 4.30 | 5.80 | 1.50 | B | 137.5 | 291.0 | 194.0 | 20:16 | 21:18 | 2.0 | 0.4 | 0.15 | 34.9 | 0.8 | 1.64 | 11.3 | 10.3 | 17.3 | |
| | | 13-Nov-10 | 3 | 6.30 | 7.30 | 1.00 | A | 106.9 | 106.9 | 106.9 | 20:33 | 21:23 | 2.5 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 7.30 | 11.60 | 4.30 | A | 108.4 | 108.4 | 25.2 | 19:50 | 20:25 | 2.3 | 2.1 | 0.22 | 31.2 | - | 1.68 | 5.4 | 9.0 | 16.2 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+304 | P | 24-Nov-10 | 4 | 4.25 | 5.75 | 1.50 | B | 148.0 | - | - | 5:01 | 5:25 | 1.2 | 9.2 | 5.47 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 4 | 4.25 | 5.75 | 1.50 | C | 164.6 | - | - | 5:25 | 5:38 | 1.9 | 14.8 | 5.16 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 4 | 4.25 | 5.75 | 1.50 | D | 209.2 | - | - | 5:38 | 5:59 | 2.4 | 10.5 | 3.02 | - | 1.0 | - | 14.3 | 12.9 | 20.5 | |
| | | 24-Nov-10 | 4 | 4.25 | 5.75 | 1.50 | X | 21.4 | 543.2 | 362.1 | 5:59 | 6:12 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 3 | 6.25 | 7.25 | 1.00 | B | 146.2 | 146.2 | 146.2 | 7:36 | 8:14 | 3.1 | 0.3 | 0.09 | 36.0 | 4.0 | 1.64 | 10.0 | 9.0 | 17.0 | |
| | | 29-Oct-10 | 2 | 7.25 | 11.40 | 4.15 | A | 225.8 | 225.8 | 54.4 | 6:48 | 7:32 | 2.5 | 1.5 | 0.15 | 33.0 | 6.0 | 1.63 | 6.0 | 10.0 | 16.0 | |
| T-31+305.5 | T | 27-Apr-10 | 4 | 4.23 | 5.73 | 1.50 | MF | 53.6 | 53.6 | 35.7 | 6:51 | 7:15 | 2.1 | 0.3 | 0.10 | 29.4 | - | 1.42 | 21.5 | 13.2 | 23.7 | |
| | | 12-Nov-10 | 3 | 6.23 | 7.23 | 1.00 | A | 81.9 | - | - | 1:52 | 2:07 | 1.5 | 9.4 | 6.41 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 6.23 | 7.23 | 1.00 | B | 159.3 | - | - | 2:07 | 2:36 | 2.6 | 15.3 | 6.18 | 34.9 | - | 1.64 | 8.3 | 14.2 | 15.5 | |
| | | 12-Nov-10 | 3 | 6.23 | 7.23 | 1.00 | C | 158.2 | - | - | 2:36 | 2:50 | 2.2 | 9.4 | 3.47 | 44.5 | - | 1.61 | 8.3 | 14.2 | 14.1 | |
| | | 12-Nov-10 | 3 | 6.23 | 7.23 | 1.00 | D | 200.8 | 600.2 | 600.2 | 2:50 | 3:34 | 2.4 | 5.9 | 2.41 | 58.1 | - | 1.60 | 22.6 | 8.7 | 15.0 | |
| | | 12-Nov-10 | 2 | 7.23 | 11.60 | 4.37 | A | 24.5 | 24.5 | 5.6 | 1:35 | 1:48 | 2.4 | 0.3 | 0.03 | - | - | - | - | - | - | |
| S-31+307 | S | 29-Nov-10 | 4 | 3.97 | 5.47 | 1.50 | B | 157.7 | - | - | 2:25 | 2:53 | 2.2 | 9.1 | 2.94 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 4 | 3.97 | 5.47 | 1.50 | C | 149.9 | - | - | 2:53 | 3:05 | 2.6 | 17.7 | 4.56 | 35.5 | 1.0 | 1.65 | 17.4 | 11.3 | 18.3 | |
| | | 29-Nov-10 | 4 | 3.97 | 5.47 | 1.50 | D | 25.7 | 333.3 | 222.2 | 3:05 | 3:21 | 2.3 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | A | 31.4 | - | - | 21:11 | 21:20 | 0.5 | 3.0 | 6.23 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | B | 164.2 | - | - | 21:20 | 21:37 | 0.9 | 13.1 | 14.09 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | C | 133.0 | - | - | 21:37 | 21:46 | 2.1 | 19.3 | 9.07 | 48.0 | - | 1.61 | 3.0 | 7.7 | 12.0 | |
| | | 02-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | D | 162.7 | - | - | 21:46 | 21:56 | 2.8 | 17.0 | 5.70 | 66.0 | - | 1.62 | 3.0 | 7.7 | 14.7 | |
| | | 02-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | E | 127.6 | 618.9 | 618.9 | 21:56 | 22:06 | 2.9 | 15.8 | 5.35 | 82.0 | - | 1.62 | 3.0 | 7.7 | 13.0 | |
| | | 02-Nov-10 | 2 | 6.97 | 10.80 | 3.83 | A | 61.3 | 61.3 | 16.0 | 20:39 | 21:02 | 2.4 | 1.0 | 0.11 | - | - | - | - | - | - | |
| T-31+308.5 | T | 16-Dec-10 | 4 | 3.97 | 5.47 | 1.50 | MF | 177.2 | - | - | 17:29 | 17:59 | 1.8 | 8.6 | 3.24 | - | - | - | - | - | - | |
| | | 16-Dec-10 | 4 | 3.97 | 5.47 | 1.50 | B | 132.3 | 309.5 | 206.3 | 17:59 | 18:56 | 2.0 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | A | 180.8 | - | - | 22:25 | 22:53 | 2.2 | 12.7 | 7.06 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | B | 141.7 | - | - | 22:53 | 23:02 | 2.3 | 16.1 | 7.22 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | C | 169.8 | - | - | 23:02 | 23:25 | 2.5 | 1.2 | 0.46 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | D | 1.7 | 494.0 | 494.0 | 23:25 | 23:37 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 6.97 | 11.20 | 4.23 | A | 35.2 | 35.2 | 8.3 | 22:09 | 22:22 | 1.9 | 0.3 | 0.04 | - | - | - | - | - | - | |
| P-31+310 | P | 24-Nov-10 | 4 | 3.62 | 5.12 | 1.50 | B | 130.7 | - | - | 2:12 | 2:34 | 1.8 | 11.1 | 3.75 | 38.9 | 5.0 | 1.63 | 1.8 | 10.9 | 20.3 | |
| | | 24-Nov-10 | 4 | 3.62 | 5.12 | 1.50 | C | 205.3 | - | - | 2:34 | 3:22 | 2.6 | 0.1 | 0.04 | 45.5 | 1.0 | 1.64 | 1.8 | 10.9 | 19.3 | |
| | | 24-Nov-10 | 4 | 3.62 | 5.12 | 1.50 | D | 12.2 | 348.2 | 232.1 | 3:22 | 3:44 | 2.2 | 0.0 | 0.00 | 75.3 | - | 1.68 | 12.4 | 11.6 | 22.0 | |
| | | 28-Oct-10 | 3 | 5.62 | 6.62 | 1.00 | A | 66.9 | - | - | 4:47 | 5:01 | 0.1 | 7.6 | 61.36 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 5.62 | 6.62 | 1.00 | B | 61.8 | 128.7 | 128.7 | 5:01 | 5:22 | 2.7 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 6.62 | 10.70 | 4.08 | A | 65.4 | 65.4 | 16.0 | 4:17 | 4:41 | 2.6 | 0.2 | 0.02 | - | - | - | - | - | - | |
| T-31+311.5 | T | 27-Apr-10 | 4 | 3.49 | 4.99 | 1.50 | MF | 33.5 | 33.5 | 22.3 | 7:19 | 7:44 | 2.2 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | A | 26.6 | - | - | 21:04 | 21:10 | 1.4 | 2.6 | 1.84 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | B | 152.7 | 179.3 | 179.3 | 21:10 | 22:02 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 6.49 | 10.90 | 4.41 | A | 43.6 | 43.6 | 9.9 | 20:46 | 21:00 | 2.9 | 1.0 | 0.09 | - | - | - | - | - | - | |
| S-31+313 | S | 29-Nov-10 | 4 | 3.41 | 4.91 | 1.50 | B | 143.4 | - | - | 3:34 | 3:57 | 2.0 | 12.6 | 4.29 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 4 | 3.41 | 4.91 | 1.50 | C | 168.4 | - | - | 3:57 | 4:09 | 2.8 | 13.0 | 3.30 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 4 | 3.41 | 4.91 | 1.50 | D | 95.6 | 407.4 | 271.6 | 4:09 | 4:53 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 5.41 | 6.41 | 1.00 | A | 50.3 | - | - | 19:16 | 19:42 | 2.9 | 1.6 | 0.42 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 5.41 | 6.41 | 1.00 | B | 40.6 | 90.9 | 90.9 | 19:42 | 20:27 | 3.1 | 0.2 | 0.07 | 32.0 | - | 1.62 | 6.1 | 8.5 | 18.0 | |
| | | 02-Nov-10 | 2 | 6.41 | 12.80 | 6.39 | A | 21.7 | 21.7 | 3.4 | 18:59 | 19:12 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+314.5 | T | 16-Dec-10 | 4 | 4.17 | 5.67 | 1.50 | MF | 175.3 | - | - | 15:53 | 16:39 | 1.8 | 2.2 | 1.23 | 29.2 | 2.5 | 1.40 | 11.5 | 9.5 | 10.3 | |
| | | 16-Dec-10 | 4 | 4.17 | 5.67 | 1.50 | B | 85.3 | 260.6 | 173.7 | 16:39 | 17:14 | 2.1 | 0.5 | 0.15 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 6.17 | 7.17 | 1.00 | A | 68.0 | - | - | 19:33 | 19:47 | 1.9 | 9.8 | 6.38 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 6.17 | 7.17 | 1.00 | B | 90.1 | - | - | 19:47 | 19:57 | 2.7 | 8.2 | 3.00 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 6.17 | 7.17 | 1.00 | C | 62.4 | 220.5 | 220.5 | 19:57 | 20:40 | 2.6 | 0.3 | 0.13 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 7.17 | 12.60 | 5.43 | A | 23.6 | 23.6 | 4.3 | 19:14 | 19:29 | 2.5 | 0.0 | 0.00 | 30.8 | - | 1.63 | 8.0 | 9.0 | 16.9 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+316 | P | 24-Nov-10 | 4 | 4.96 | 6.46 | 1.50 | B | 164.7 | - | - | 9:54 | 10:18 | 1.9 | 13.5 | 4.32 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 4 | 4.96 | 6.46 | 1.50 | C | 175.9 | - | - | 10:18 | 10:30 | 2.2 | 12.6 | 2.99 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 4 | 4.96 | 6.46 | 1.50 | D | 164.7 | - | - | 10:30 | 10:54 | 2.3 | 6.7 | 1.95 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 4 | 4.96 | 6.46 | 1.50 | E | 107.5 | 612.8 | 408.5 | 10:54 | 11:56 | 2.9 | 0.0 | 0.00 | 86.2 | - | 1.66 | 4.9 | 11.2 | 14.6 | |
| | | 28-Oct-10 | 3 | 6.96 | 7.96 | 1.00 | B | 111.7 | - | - | 3:13 | 3:32 | 2.4 | 9.6 | 3.97 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.96 | 7.96 | 1.00 | C | 51.5 | 163.2 | 163.2 | 3:32 | 3:56 | 3.0 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 7.96 | 12.10 | 4.14 | A | 66.3 | 66.3 | 16.0 | 2:45 | 3:07 | 2.4 | 0.4 | 0.04 | - | - | - | - | - | - | |
| T-31+317.5 | T | 27-Apr-10 | 4 | 4.94 | 6.44 | 1.50 | MF | 41.1 | 41.1 | 27.4 | 7:47 | 8:09 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 6.94 | 7.94 | 1.00 | B | 154.4 | - | - | 18:04 | 18:35 | 2.3 | 13.5 | 6.74 | 34.9 | - | 1.66 | 8.0 | 9.0 | 18.0 | |
| | | 12-Nov-10 | 3 | 6.94 | 7.94 | 1.00 | C | 104.9 | 259.3 | 259.3 | 18:35 | 19:05 | 2.8 | 0.7 | 0.25 | 44.8 | 1.5 | 1.64 | 8.0 | 9.1 | 17.3 | |
| | | 12-Nov-10 | 2 | 7.94 | 12.20 | 4.26 | A | 33.0 | 33.0 | 7.7 | 17:43 | 17:57 | 2.7 | 0.6 | 0.05 | - | - | - | - | - | - | |
| S-31+319 | S | 29-Nov-10 | 4 | 5.27 | 6.77 | 1.50 | B | 145.3 | - | - | 5:05 | 5:23 | 2.6 | 16.9 | 4.18 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 4 | 5.27 | 6.77 | 1.50 | C | 254.8 | 400.1 | 266.7 | 5:23 | 6:39 | 2.6 | 1.0 | 0.25 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 7.27 | 8.27 | 1.00 | B | 284.9 | - | - | 15:18 | 16:26 | 3.2 | 2.8 | 0.81 | 38.0 | 4.0 | 1.64 | 6.0 | 4.0 | 18.0 | |
| | | 02-Nov-10 | 3 | 7.27 | 8.27 | 1.00 | C | 111.1 | 396.0 | 396.0 | 16:26 | 17:29 | 2.9 | 0.1 | 0.02 | 37.0 | - | - | - | - | - | |
| | | 02-Nov-10 | 2 | 8.27 | 12.80 | 4.53 | A | 216.0 | 216.0 | 47.7 | 15:02 | 15:15 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+319.75 | Q | 27-Jun-11 | 4 | 5.14 | 6.64 | 1.50 | MF | 46.8 | 46.80 | 31.20 | 15:57 | 16:18 | 2.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 3 | 7.14 | 8.2 | 1.06 | A | 32.9 | 32.90 | 31.04 | 13:46 | 14:05 | 2.5 | 0.1 | 0.05 | 31.0 | 1.0 | 1.6 | 11.0 | 12.3 | 15.0 | |
| T-31+320.5 | T | 16-Dec-10 | 4 | 4.96 | 6.46 | 1.50 | MF | 176.9 | - | - | 14:01 | 14:30 | 1.6 | 8.3 | 4.60 | 27.6 | - | 1.49 | 13.1 | 13.0 | 18.2 | |
| | | 16-Dec-10 | 4 | 4.96 | 6.46 | 1.50 | B | 158.3 | - | - | 14:30 | 14:54 | 2.0 | 6.2 | 2.14 | 35.0 | - | 1.62 | - | - | 15.6 | |
| | | 16-Dec-10 | 4 | 4.96 | 6.46 | 1.50 | C | 70.7 | 405.9 | 270.6 | 14:54 | 15:36 | 2.0 | 0.5 | 0.19 | 42.3 | - | 1.70 | -4.5 | 8.1 | 16.8 | |
| | | 12-Nov-10 | 3 | 6.96 | 7.96 | 1.00 | B | 143.5 | - | - | 11:02 | 11:25 | 2.0 | 9.4 | 5.18 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 6.96 | 7.96 | 1.00 | C | 177.2 | - | - | 11:25 | 11:48 | 2.3 | 7.8 | 3.27 | 79.0 | - | 1.69 | 8.0 | 8.6 | 19.5 | |
| | | 12-Nov-10 | 3 | 6.96 | 7.96 | 1.00 | D | 279.5 | 600.2 | 600.2 | 11:48 | 12:26 | 2.5 | 10.7 | 4.36 | 64.2 | - | 1.69 | 8.0 | 8.6 | 18.6 | |
| | | 12-Nov-10 | 2 | 7.96 | 12.20 | 4.24 | A | 23.6 | 23.6 | 5.6 | 10:46 | 11:00 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+321.25 | Q | 27-Jun-11 | 4 | 4.71 | 6.21 | 1.50 | MF | 37.9 | 37.90 | 25.27 | 16:21 | 16:39 | 2.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 6.71 | 7.8 | 1.09 | A | 15.3 | 15.30 | 14.04 | 22:55 | 23:07 | 2.7 | 0.2 | 0.05 | - | - | - | - | - | - | |
| P-31+322 | P | 24-Nov-10 | 4 | 4.63 | 6.13 | 1.50 | B | 146.8 | - | - | 7:38 | 8:00 | 2.2 | 9.4 | 4.81 | 37.6 | 2.0 | 1.63 | 4.9 | 10.6 | 15.6 | |
| | | 24-Nov-10 | 4 | 4.63 | 6.13 | 1.50 | C | 220.8 | - | - | 8:00 | 8:17 | 2.0 | 15.1 | 5.22 | 45.1 | 1.0 | 1.63 | 4.7 | 10.6 | 16.7 | |
| | | 24-Nov-10 | 4 | 4.63 | 6.13 | 1.50 | D | 120.7 | - | - | 8:17 | 8:32 | 2.3 | 8.0 | 2.86 | 72.8 | - | 1.64 | -11.3 | 10.6 | 10.4 | |
| | | 24-Nov-10 | 4 | 4.63 | 6.13 | 1.50 | E | 214.6 | 702.9 | 468.6 | 8:32 | 9:34 | 2.5 | 0.3 | 0.08 | 84.7 | - | 1.66 | -10.2 | 10.6 | 12.4 | |
| | | 28-Oct-10 | 3 | 6.61 | 7.61 | 1.00 | A | 70.3 | - | - | 1:32 | 1:44 | 0.7 | 6.7 | 9.10 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.61 | 7.61 | 1.00 | B | 206.7 | - | - | 1:44 | 2:04 | 1.1 | 12.5 | 11.78 | 35.2 | - | 1.65 | 14.3 | 9.1 | 18.4 | |
| | | 28-Oct-10 | 3 | 6.61 | 7.61 | 1.00 | C | 118.0 | - | - | 2:04 | 2:14 | 1.4 | 12.4 | 8.72 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.61 | 7.61 | 1.00 | E | 205.5 | 600.5 | 600.5 | 2:14 | 2:28 | 2.4 | 14.9 | 6.23 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 7.61 | 11.90 | 4.29 | A | 25.3 | 25.3 | 5.9 | 1:12 | 1:24 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+323.5 | T | 27-Apr-10 | 4 | 4.61 | 6.11 | 1.50 | MF | 37.2 | 37.2 | 24.8 | 8:25 | 8:44 | 2.1 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 6.61 | 7.61 | 1.00 | B | 353.0 | - | - | 8:02 | 10:01 | 2.8 | 1.8 | 0.81 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 6.61 | 7.61 | 1.00 | C | 25.7 | 378.7 | 378.7 | 10:01 | 10:36 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 7.61 | 11.90 | 4.29 | A | 25.0 | 25.0 | 5.8 | 7:47 | 8:00 | 2.7 | 0.2 | 0.02 | - | - | - | - | - | - | |
| S-31+325 | S | 30-Nov-10 | 4 | 4.48 | 5.98 | 1.50 | B | 158.8 | - | - | 8:20 | 8:42 | 1.8 | 12.3 | 5.12 | 36.1 | 2.0 | 1.61 | 11.6 | 7.9 | 16.8 | |
| | | 30-Nov-10 | 4 | 4.48 | 5.98 | 1.50 | C | 180.6 | - | - | 8:42 | 8:54 | 1.9 | 15.6 | 5.32 | 46.3 | - | 1.62 | 11.6 | 7.9 | 17.4 | |
| | | 30-Nov-10 | 4 | 4.48 | 5.98 | 1.50 | D | 182.8 | 522.2 | 348.1 | 8:54 | 10:04 | 2.5 | 0.7 | 0.19 | 79.0 | - | 1.66 | 11.6 | 7.9 | 16.8 | |
| | | 02-Nov-10 | 3 | 6.48 | 7.48 | 1.00 | B | 250.9 | - | - | 10:01 | 10:45 | 2.9 | 5.7 | 1.45 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 6.48 | 7.48 | 1.00 | C | 178.6 | - | - | 10:45 | 11:23 | 3.1 | 3.0 | 0.69 | 51.0 | - | 1.66 | 5.0 | 4.0 | 18.0 | |
| | | 02-Nov-10 | 3 | 6.48 | 7.48 | 1.00 | D | 52.4 | - | - | 11:23 | 11:45 | 3.1 | 2.5 | 0.57 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 6.48 | 7.48 | 1.00 | E | 21.6 | 503.5 | 503.5 | 11:45 | 12:10 | 3.0 | 0.0 | 0.00 | 131.0 | - | - | - | - | - | |
| | | 02-Nov-10 | 2 | 7.48 | 11.40 | 3.92 | A | 17.6 | 17.6 | 4.5 | 9:45 | 9:58 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+326.5 | T | 16-Dec-10 | 4 | 4.35 | 5.85 | 1.50 | MF | 170.7 | - | - | 10:21 | 10:51 | 1.4 | 10.0 | 4.82 | - | - | - | - | - | - | |
| | | 16-Dec-10 | 4 | 4.35 | 5.85 | 1.50 | B | 184.8 | 355.5 | 237.0 | 10:51 | 11:43 | 1.9 | 0.1 | 0.10 | 35.0 | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | B | 2.8 | 2.8 | 2.8 | 7:26 | 7:38 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 7.35 | 11.80 | 4.45 | A | 22.6 | 22.6 | 5.1 | 7:10 | 7:24 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+328 | P | 23-Nov-10 | 4 | 5.72 | 7.22 | 1.50 | B | 130.0 | - | - | 2:51 | 3:14 | 2.4 | 4.4 | 1.76 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 4 | 5.72 | 7.22 | 1.50 | C | 175.1 | - | - | 3:14 | 3:53 | 1.7 | 12.0 | 5.46 | - | - | - | - | - | - | By-Pass |
| | | 23-Nov-10 | 4 | 5.72 | 7.22 | 1.50 | D | 308.5 | 613.6 | 409.1 | 3:53 | 5:07 | 2.5 | 0.4 | 0.12 | 99.0 | 0.0 | 1.71 | -10.8 | 8.4 | 17.7 | |
| | | 28-Oct-10 | 3 | 7.72 | 8.72 | 1.00 | A | 56.5 | 56.5 | 56.5 | 22:09 | 22:31 | 2.8 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 8.72 | 12.90 | 4.18 | A | 20.3 | 20.3 | 4.9 | 21:56 | 22:06 | 3.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-31+329.5 | T | 27-Apr-10 | 4 | 4.76 | 6.26 | 1.50 | MF | 33.4 | 33.4 | 22.3 | 8:49 | 9:07 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 6.76 | 7.76 | 1.00 | B | 10.9 | 10.9 | 10.9 | 6:50 | 7:03 | 2.6 | 0.0 | 0.01 | 34.2 | 2.0 | 1.63 | 7.0 | 5.0 | 18.0 | |
| | | 12-Nov-10 | 2 | 7.76 | 12.10 | 4.34 | A | 24.5 | 24.5 | 5.6 | 6:35 | 6:48 | 2.9 | 0.0 | 0.00 | 32.5 | 5.0 | 1.61 | 7.0 | 6.0 | 19.0 | |
| S-31+331 | S | 30-Nov-10 | 4 | 3.62 | 5.12 | 1.50 | B | 188.8 | - | - | 10:14 | 10:39 | 2.5 | 12.1 | 3.82 | 37.8 | - | 1.62 | 11.6 | 7.9 | 15.9 | |
| | | 30-Nov-10 | 4 | 3.62 | 5.12 | 1.50 | C | 170.5 | - | - | 10:39 | 10:49 | 2.5 | 19.5 | 5.34 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 3.62 | 5.12 | 1.50 | D | 180.4 | - | - | 10:49 | 11:12 | 2.5 | 6.0 | 2.10 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 4 | 3.62 | 5.12 | 1.50 | X | 29.1 | 568.8 | 379.2 | 11:12 | 11:30 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | B | 5.3 | 5.3 | 5.3 | 9:25 | 9:40 | 3.0 | 0.1 | 0.03 | 36.0 | 2.0 | 1.62 | 2.0 | 5.0 | 16.0 | |
| | | 02-Nov-10 | 2 | 6.62 | 10.90 | 4.28 | A | 61.2 | 61.2 | 14.3 | 9:00 | 9:20 | 2.5 | 1.1 | 0.10 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+332.5 | T | 17-Dec-10 | 4 | 3.74 | 5.24 | 1.50 | MF | 175.1 | - | - | 13:44 | 14:25 | 2.0 | 2.4 | 0.79 | 28.6 | 4.0 | 1.40 | -1.3 | 13.6 | 16.8 | |
| | | 17-Dec-10 | 4 | 3.74 | 5.24 | 1.50 | B | 58.9 | 234.0 | 156.0 | 14:25 | 15:12 | 2.0 | 0.3 | 0.10 | 38.3 | 3.0 | 1.64 | 8.1 | 14.1 | 19.2 | |
| | | 11-Nov-10 | 3 | 5.74 | 6.74 | 1.00 | B | 13.8 | 13.8 | 13.8 | 4:39 | 4:52 | 2.4 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 6.74 | 11.30 | 4.56 | B | 7.4 | 7.4 | 1.6 | 4:25 | 4:36 | 2.3 | 0.3 | 0.03 | - | - | - | - | - | - | |
| P-31+334 | P | 23-Nov-10 | 4 | 4.05 | 5.55 | 1.50 | B | 126.8 | - | - | 1:30 | 1:50 | 2.0 | 2.8 | 0.92 | 42.1 | - | 1.67 | -13.9 | 13.1 | 17.9 | |
| | | 23-Nov-10 | 4 | 4.05 | 5.55 | 1.50 | C | 76.0 | 202.8 | 135.2 | 1:50 | 2:28 | 2.1 | 0.0 | 0.00 | 54.3 | 0.5 | 1.72 | -13.9 | 13.1 | 19.0 | |
| | | 28-Oct-10 | 3 | 6.05 | 7.05 | 1.00 | B | 17.3 | 17.3 | 17.3 | 21:30 | 21:44 | 2.9 | 0.4 | 0.13 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 7.05 | 11.20 | 4.15 | A | 204.5 | - | - | 19:28 | 19:53 | 1.8 | 12.7 | 1.71 | 30.4 | 6.0 | 1.62 | 8.6 | 16.5 | - | |
| | | 28-Oct-10 | 2 | 7.05 | 11.20 | 4.15 | B | 248.5 | - | - | 19:53 | 20:16 | 2.4 | 6.9 | 0.69 | 36.4 | 6.0 | 1.63 | 8.6 | 16.5 | - | |
| | | 28-Oct-10 | 2 | 7.05 | 11.20 | 4.15 | C | 176.0 | - | - | 20:16 | 20:57 | 2.5 | 4.3 | 0.43 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 7.05 | 11.20 | 4.15 | D | 34.3 | 663.3 | 159.8 | 20:57 | 21:15 | 2.4 | 1.2 | 0.13 | - | - | - | - | - | - | |
| T-31+335.5 | T | 27-Apr-10 | 4 | 4.78 | 6.28 | 1.50 | MF | 35.7 | 35.7 | 23.8 | 9:10 | 9:28 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 6.78 | 7.78 | 1.00 | B | 43.3 | 43.3 | 43.3 | 3:48 | 4:16 | 2.7 | 0.4 | 0.14 | - | - | - | - | - | - | Communicated to T-31+332.5 |
| | | 11-Nov-10 | 2 | 7.78 | 11.80 | 4.02 | A | 142.7 | - | - | 2:57 | 3:17 | 1.7 | 10.5 | 2.14 | 31.8 | - | 1.64 | 21.0 | 8.3 | 20.0 | |
| | | 11-Nov-10 | 2 | 7.78 | 11.80 | 4.02 | B | 114.4 | 257.1 | 64.0 | 3:17 | 3:42 | 2.6 | 1.6 | 0.15 | - | - | - | - | - | - | |
| S-31+337 | S | 07-Dec-10 | 4 | 3.89 | 5.39 | 1.50 | B | 159.0 | - | - | 8:28 | 8:53 | 2.1 | 9.5 | 3.73 | 40.0 | 2.0 | 1.69 | -3.7 | 10.7 | 19.2 | |
| | | 07-Dec-10 | 4 | 3.89 | 5.39 | 1.50 | C | 112.1 | - | - | 8:53 | 9:07 | 2.6 | 5.8 | 1.50 | 44.0 | 1.0 | 1.71 | -5.2 | 13.6 | 18.4 | |
| | | 07-Dec-10 | 4 | 3.89 | 5.39 | 1.50 | D | 28.4 | 299.5 | 199.7 | 9:07 | 9:29 | 2.6 | 0.9 | 0.23 | 45.1 | - | 1.71 | -0.5 | 12.3 | 17.6 | |
| | | 02-Nov-10 | 3 | 5.89 | 6.89 | 1.00 | B | 160.1 | - | - | 7:55 | 8:21 | 1.2 | 12.9 | 10.70 | - | - | - | - | - | - | |
| | | 02-Nov-10 | 3 | 5.89 | 6.89 | 1.00 | C | 89.7 | 249.8 | 249.8 | 8:21 | 8:45 | 3.0 | 0.3 | 0.10 | 46.0 | 1.0 | 1.64 | 4.0 | 6.0 | 18.0 | |
| | | 02-Nov-10 | 2 | 6.89 | 10.90 | 4.01 | A | 203.8 | 203.8 | 50.8 | 7:21 | 7:51 | 0.8 | 13.1 | 3.74 | 31.0 | 4.0 | 1.63 | 7.1 | 7.3 | 17.9 | By-Pass |
| T-31+338.5 | T | 16-Dec-10 | 4 | 4.17 | 5.67 | 1.50 | MF | 174.9 | - | - | 8:31 | 9:07 | 2.0 | 6.7 | 2.09 | - | - | - | - | - | - | |
| | | 16-Dec-10 | 4 | 4.17 | 5.67 | 1.50 | B | 88.7 | 263.6 | 175.7 | 9:07 | 9:44 | 2.0 | 0.0 | 0.00 | 32.9 | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 6.17 | 7.17 | 1.00 | B | 82.8 | 82.8 | 82.8 | 2:19 | 2:49 | 2.2 | 0.3 | 0.16 | 35.1 | - | 1.63 | 24.5 | 8.2 | 20.0 | |
| | | 11-Nov-10 | 2 | 7.17 | 11.70 | 4.53 | A | 210.0 | - | - | 1:23 | 1:58 | 2.3 | 14.3 | 1.88 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 7.17 | 11.70 | 4.53 | B | 67.5 | 277.5 | 61.3 | 1:58 | 2:16 | 2.3 | 0.4 | 0.04 | - | - | - | - | - | - | |
| P-31+340 | P | 23-Nov-10 | 4 | 4.61 | 6.11 | 1.50 | A | 158.1 | - | - | 19:51 | 20:29 | 1.7 | 2.4 | 0.94 | 34.1 | 6.0 | 1.62 | 7.8 | 16.9 | 16.4 | |
| | | 23-Nov-10 | 4 | 4.61 | 6.11 | 1.50 | B | 174.0 | - | - | 20:29 | 21:00 | 1.7 | 12.3 | 4.94 | 37.9 | 5.0 | 1.63 | 7.8 | 15.9 | 17.4 | |
| | | 23-Nov-10 | 4 | 4.61 | 6.11 | 1.50 | C | 191.7 | - | - | 21:00 | 21:15 | 2.3 | 12.9 | 3.71 | 59.3 | - | 1.68 | 6.9 | 10.4 | 17.5 | |
| | | 23-Nov-10 | 4 | 4.61 | 6.11 | 1.50 | D | 199.6 | - | - | 21:15 | 22:17 | 2.4 | 9.1 | 2.56 | 98.1 | - | 1.68 | 6.9 | 10.4 | 16.3 | |
| | | 23-Nov-10 | 4 | 4.61 | 6.11 | 1.50 | E | 23.8 | 747.2 | 498.1 | 22:17 | 22:22 | 2.5 | 0.0 | 0.01 | 79.1 | 0.5 | 1.68 | -1.7 | 10.7 | 18.2 | |
| | | 28-Oct-10 | 3 | 6.61 | 7.61 | 1.00 | B | 150.2 | - | - | 17:19 | 17:43 | 0.5 | 12.0 | 20.65 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.61 | 7.61 | 1.00 | C | 197.7 | - | - | 17:43 | 17:57 | 1.2 | 15.9 | 12.95 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.61 | 7.61 | 1.00 | D | 107.1 | - | - | 17:57 | 18:04 | 1.2 | 15.6 | 12.75 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.61 | 7.61 | 1.00 | E | 148.2 | 603.2 | 603.2 | 18:04 | 18:12 | 1.3 | 5.4 | 4.26 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 7.61 | 11.70 | 4.09 | A | 160.3 | - | - | 16:19 | 16:44 | 0.2 | 12.4 | 11.81 | 33.0 | 4.0 | 1.63 | 3.0 | 6.0 | 17.0 | |
| | | 28-Oct-10 | 2 | 7.61 | 11.70 | 4.09 | B | 162.5 | - | - | 16:44 | 16:56 | 0.4 | 18.0 | 10.65 | 42.0 | - | 1.66 | 5.0 | 8.0 | 18.0 | |
| | | 28-Oct-10 | 2 | 7.61 | 11.70 | 4.09 | C | 252.8 | - | - | 16:56 | 17:07 | 0.2 | 24.0 | 30.00 | 46.0 | - | 1.67 | 5.0 | 8.0 | 17.0 | By-Pass |
| | | 28-Oct-10 | 2 | 7.61 | 11.70 | 4.09 | D | 143.4 | 719.0 | 175.8 | 17:07 | 17:14 | 0.5 | 24.5 | 12.31 | - | - | - | - | - | - | |
| T-31+341.5 | T | 27-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 44.7 | 44.7 | 29.8 | 16:41 | 17:00 | 2.1 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | A | 42.3 | - | - | 22:57 | 23:08 | 2.7 | 4.4 | 1.30 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | B | 2.7 | 45.0 | 45.0 | 23:08 | 23:20 | 2.8 | 0.0 | 0.00 | 33.2 | 3.0 | 1.62 | 6.8 | 8.5 | 18.1 | |
| | | 11-Nov-10 | 2 | 9.16 | 13.20 | 4.04 | A | 23.1 | 23.1 | 5.7 | 22:41 | 22:54 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+343 | S | 07-Dec-10 | 4 | 5.88 | 7.38 | 1.50 | B | 161.0 | - | - | 9:38 | 10:05 | 2.0 | 12.1 | 4.19 | - | - | - | - | - | - | |
| | | 07-Dec-10 | 4 | 5.88 | 7.38 | 1.50 | C | 158.2 | - | - | 10:05 | 10:18 | 2.7 | 7.1 | 1.79 | - | - | - | - | - | - | |
| | | 07-Dec-10 | 4 | 5.88 | 7.38 | 1.50 | D | 102.4 | 421.6 | 281.1 | 10:18 | 11:09 | 2.6 | 0.7 | 0.17 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 7.88 | 8.88 | 1.00 | B | 132.0 | - | - | 3:25 | 3:45 | 2.7 | 7.3 | 2.70 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 7.88 | 8.88 | 1.00 | C | 149.4 | 281.4 | 281.4 | 3:45 | 4:33 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 8.88 | 12.80 | 3.92 | A | 23.4 | 23.4 | 6.0 | 3:10 | 3:22 | 2.4 | 0.1 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+344.5 | T | 16-Dec-10 | 4 | 4.91 | 6.41 | 1.50 | MF | 179.1 | - | - | 6:52 | 7:20 | 1.7 | 12.4 | 4.94 | 28.1 | - | 1.41 | -6.5 | 10.3 | 10.6 | |
| | | 16-Dec-10 | 4 | 4.91 | 6.41 | 1.50 | B | 134.0 | - | - | 7:20 | 7:32 | 2.2 | 12.0 | 3.59 | 40.1 | 3.5 | 1.65 | 0.1 | 10.3 | 14.9 | |
| | | 16-Dec-10 | 4 | 4.91 | 6.41 | 1.50 | C | 39.3 | 352.4 | 234.9 | 7:32 | 8:17 | 2.1 | 0.4 | 0.15 | 43.0 | 1.5 | 1.67 | -8.2 | 10.3 | 15.7 | |
| | | 13-Nov-10 | 3 | 6.91 | 7.91 | 1.00 | B | 169.1 | - | - | 17:43 | 18:21 | 1.0 | 3.7 | 3.58 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 6.91 | 7.91 | 1.00 | C | 81.0 | 250.1 | 250.1 | 18:21 | 18:49 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 7.91 | 12.20 | 4.29 | A | 23.2 | 23.2 | 5.4 | 17:24 | 17:39 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+346 | P | 23-Nov-10 | 4 | 4.96 | 6.46 | 1.50 | B | 161.1 | - | - | 16:58 | 17:20 | 1.9 | 12.4 | 4.37 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 4 | 4.96 | 6.46 | 1.50 | C | 184.1 | - | - | 17:20 | 17:32 | 2.1 | 16.0 | 5.01 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 4 | 4.96 | 6.46 | 1.50 | D | 171.4 | - | - | 17:32 | 17:45 | 2.4 | 16.1 | 4.55 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 4 | 4.96 | 6.46 | 1.50 | E | 259.4 | 776.0 | 517.3 | 17:45 | 19:03 | 2.3 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | A | 13.5 | 13.5 | 13.5 | 15:35 | 15:48 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3A | 6.96 | 7.96 | 1.00 | A | 17.0 | 17.0 | 17.0 | 22:02 | 22:14 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 8.62 | 12.90 | 4.28 | A | 26.2 | - | - | 15:20 | 15:34 | 2.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 7.96 | 12.20 | 4.24 | A | 30.2 | 56.4 | 13.3 | 21:43 | 21:58 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | Re-grouted |
| T-31+347.5 | T | 27-Apr-10 | 4 | 5.37 | 6.87 | 1.50 | MF | 144.0 | 144.0 | 96.0 | 10:01 | 11:24 | 2.0 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 8.37 | 9.37 | 1.00 | B | 160.8 | - | - | 16:16 | 16:42 | 1.6 | 12.9 | 8.22 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 8.37 | 9.37 | 1.00 | C | 139.4 | - | - | 16:42 | 16:51 | 2.3 | 18.5 | 8.35 | 45.8 | - | 1.64 | 5.0 | 11.0 | 17.7 | |
| | | 13-Nov-10 | 3 | 8.37 | 9.37 | 1.00 | D | 157.4 | - | - | 16:51 | 17:00 | 2.8 | 17.0 | 6.15 | 72.3 | - | 1.69 | 4.5 | 8.0 | 17.6 | |
| | | 13-Nov-10 | 3 | 8.37 | 9.37 | 1.00 | E | 34.3 | 491.9 | 491.9 | 17:00 | 17:16 | 2.8 | 0.0 | 0.00 | 100.1 | - | 1.69 | 5.1 | 8.5 | 17.7 | |
| | | 26-Nov-10 | 3A | 7.37 | 9.37 | 2.00 | A | 29.6 | 29.6 | 14.8 | 14:46 | 15:01 | 2.8 | 0.4 | 0.07 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 9.37 | 12.40 | 3.03 | A | 22.1 | 22.1 | 7.3 | 16:00 | 16:12 | 2.4 | 0.1 | 0.01 | - | - | - | - | - | - | |
| S-31+349 | S | 07-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 159.2 | - | - | 13:30 | 14:04 | 1.4 | 10.1 | 4.80 | 38.0 | - | 1.66 | -0.5 | 12.9 | 21.1 | |
| | | 07-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 162.7 | - | - | 14:04 | 14:18 | 2.1 | 9.3 | 3.43 | 39.3 | - | 1.75 | 4.6 | 12.9 | 18.3 | |
| | | 07-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | D | 134.2 | 456.1 | 304.1 | 14:18 | 15:02 | 2.6 | 0.5 | 0.12 | 55.3 | 0.5 | 1.74 | 4.3 | 11.8 | 17.9 | |
| | | 01-Nov-10 | 3 | 7.75 | 8.75 | 1.00 | A | 18.5 | 18.5 | 18.5 | 2:45 | 2:59 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 8.75 | 12.80 | 4.05 | A | 30.1 | 30.1 | 7.4 | 2:28 | 2:42 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+350.5 | T | 15-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | MF | 163.4 | - | - | 5:09 | 5:33 | 1.6 | 17.8 | 7.24 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 147.3 | - | - | 5:33 | 5:44 | 2.0 | 9.1 | 4.33 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 58.9 | 369.6 | 246.4 | 5:44 | 6:30 | 1.9 | 0.7 | 0.22 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | B | 12.4 | 12.4 | 12.4 | 15:40 | 15:52 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 9.16 | 13.50 | 4.34 | A | 17.0 | 17.0 | 3.9 | 15:26 | 15:37 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+352 | P | 23-Nov-10 | 4 | 5.93 | 7.43 | 1.50 | B | 180.2 | - | - | 15:07 | 15:40 | 1.6 | 9.6 | 4.03 | 35.7 | - | 1.62 | 8.9 | 8.0 | 13.9 | |
| | | 23-Nov-10 | 4 | 5.93 | 7.43 | 1.50 | C | 188.9 | - | - | 15:40 | 15:54 | 2.0 | 16.9 | 5.61 | 45.5 | - | 1.63 | 9.0 | 8.0 | 14.3 | |
| | | 23-Nov-10 | 4 | 5.93 | 7.43 | 1.50 | D | 159.0 | - | - | 15:54 | 16:06 | 1.7 | 13.2 | 5.33 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 4 | 5.93 | 7.43 | 1.50 | E | 204.8 | - | - | 16:06 | 16:27 | 2.1 | 12.1 | 3.86 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 4 | 5.93 | 7.43 | 1.50 | X | 68.1 | 801.0 | 534.0 | 16:27 | 16:35 | 1.8 | 10.2 | 3.78 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 7.77 | 8.77 | 1.00 | A | 55.7 | 66.8 | 66.8 | 14:43 | 15:12 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 7.93 | 8.93 | 1.00 | A | 11.1 | - | - | 5:56 | 6:06 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | Re-Grouted |
| | | 28-Oct-10 | 2 | 8.77 | 13.00 | 4.23 | A | 19.6 | 46.2 | 10.9 | 14:29 | 14:42 | 2.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 8.93 | 13.16 | 4.23 | A | 26.6 | - | - | 5:41 | 5:54 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | Re-Grouted |
| T-31+353.5 | T | 27-Apr-10 | 4 | 6.10 | 7.60 | 1.50 | MF | 174.0 | - | - | 11:29 | - | 1.4 | 0.3 | 3.99 | - | - | - | - | - | - | Communicated to 31+347.5 |
| | | 27-Apr-10 | 4 | 6.10 | 7.60 | 1.50 | A | 49.0 | - | - | 15:52 | - | 0.9 | 5.5 | 5.14 | - | - | - | - | - | - | Restarted with Mix A |
| | | 27-Apr-10 | 4 | 6.10 | 7.60 | 1.50 | B | 69.6 | - | - | - | - | 1.7 | 9.1 | 3.40 | - | - | - | - | - | - | |
| | | 27-Apr-10 | 4 | 6.10 | 7.60 | 1.50 | C | 81.5 | 374.1 | 249.4 | - | 17:13 | 2.0 | 0.6 | 0.20 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 8.10 | 9.10 | 1.00 | B | 207.3 | 207.3 | 207.3 | 14:19 | 15:17 | 2.5 | 0.0 | 0.00 | 35.8 | - | 1.66 | 4.0 | 5.0 | 16.0 | |
| | | 13-Nov-10 | 2 | 9.10 | 13.40 | 4.30 | A | 29.2 | 29.2 | 6.8 | 13:43 | 13:55 | 2.6 | 0.7 | 0.07 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+355 | S | 07-Dec-10 | 4 | 6.03 | 7.53 | 1.50 | B | 160.2 | - | - | 15:09 | 15:36 | 2.1 | 12.3 | 3.93 | 33.9 | - | - | - | - | - | |
| | | 07-Dec-10 | 4 | 6.03 | 7.53 | 1.50 | C | 159.9 | - | - | 15:36 | 15:49 | 2.6 | 13.4 | 3.39 | - | - | - | - | - | - | |
| | | 07-Dec-10 | 4 | 6.03 | 7.53 | 1.50 | D | 129.7 | 449.8 | 299.9 | 15:49 | 16:55 | 2.4 | 0.5 | 0.15 | 54.3 | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.10 | 9.10 | 1.00 | A | 31.5 | - | - | 23:25 | 23:32 | 0.4 | 3.6 | 8.71 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.10 | 9.10 | 1.00 | B | 171.1 | - | - | 23:32 | 23:53 | 2.7 | 8.1 | 3.02 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.10 | 9.10 | 1.00 | C | 66.0 | 268.6 | 268.6 | 23:53 | 0:23 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 3 | 8.03 | 9.03 | 1.00 | A | 13.1 | 281.7 | 281.7 | 5:22 | 5:34 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | Re-Grouted |
| | | 01-Nov-10 | 2 | 9.10 | 13.10 | 4.00 | A | 22.4 | - | - | 23:10 | 23:22 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Nov-10 | 2 | 9.03 | 13.10 | 4.07 | A | 43.3 | 65.7 | 16.1 | 5:03 | 5:20 | 2.6 | 0.5 | 0.05 | - | - | - | - | - | - | Re-Grouted |
| Q-31+355.75 | Q | 27-Jun-11 | 4 | 5.85 | 7.35 | 1.50 | MF | 42.7 | 42.70 | 28.47 | 17:04 | 17:23 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 3 | 7.85 | 8.9 | 1.05 | A | 97 | 97.00 | 92.38 | 14:21 | 14:59 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+356.5 | T | 15-Dec-10 | 4 | 5.77 | 7.27 | 1.50 | MF | 152.8 | - | - | 23:12 | 23:35 | 1.3 | 10.4 | 5.48 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 5.77 | 7.27 | 1.50 | B | 168.7 | - | - | 23:35 | 23:47 | 1.7 | 15.3 | 5.13 | - | - | - | - | - | - | Communicated to T-31+350.5 |
| | | 15-Dec-10 | 4 | 5.77 | 7.27 | 1.50 | C | 128.0 | 449.5 | 299.7 | 23:47 | 0:37 | 2.0 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 7.77 | 8.77 | 1.00 | B | 161.9 | - | - | 10:05 | 10:30 | 2.1 | 12.7 | 6.09 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 3 | 7.77 | 8.77 | 1.00 | C | 158.4 | - | - | 10:30 | 10:42 | 2.3 | 12.7 | 5.52 | 44.8 | 2.0 | 1.63 | 7.0 | 9.8 | 18.2 | |
| | | 13-Nov-10 | 3 | 7.77 | 8.77 | 1.00 | D | 283.0 | 603.3 | 603.3 | 10:42 | 11:12 | 2.4 | 8.7 | 3.61 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 8.77 | 13.10 | 4.33 | A | 11.9 | 11.9 | 2.7 | 9:51 | 10:03 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+357.25 | Q | 27-Jun-11 | 4 | 5.7 | 7.2 | 1.50 | MF | 41.3 | 41.30 | 27.53 | 17:27 | 17:45 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 7.7 | 8.7 | 1.00 | A | 158.7 | - | - | 20:59 | 21:27 | 2.4 | 2.6 | 1.20 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 7.7 | 8.7 | 1.00 | B | 30.9 | 189.60 | 189.60 | 21:27 | 21:54 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 2 | 8.7 | 11.2 | 2.50 | A | 11.7 | 11.70 | 4.68 | 20:40 | 20:54 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+358 | P | 23-Nov-10 | 4 | 5.67 | 7.17 | 1.50 | B | 183.3 | - | - | 10:15 | 10:39 | 1.0 | 12.3 | 8.20 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 4 | 5.67 | 7.17 | 1.50 | C | 180.9 | - | - | 10:39 | 10:52 | 1.2 | 14.5 | 7.80 | 44.8 | - | 1.64 | 3.8 | 6.5 | 11.9 | |
| | | 23-Nov-10 | 4 | 5.67 | 7.17 | 1.50 | D | 159.1 | - | - | 10:52 | 11:05 | 2.2 | 12.9 | 3.93 | 61.5 | - | 1.64 | 3.8 | 6.5 | 12.1 | |
| | | 23-Nov-10 | 4 | 5.67 | 7.17 | 1.50 | E | 100.9 | - | - | 11:05 | 11:15 | 2.2 | 8.1 | 2.41 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 4 | 5.67 | 7.17 | 1.50 | X | 24.0 | 648.2 | 432.1 | 11:15 | 11:32 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 13.4 | 13.4 | 13.4 | 14:11 | 14:24 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3A | 7.67 | 8.67 | 1.00 | A | 13.6 | 13.6 | 13.6 | 21:22 | 21:34 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 9.16 | 13.30 | 4.14 | A | 40.4 | - | - | 13:53 | 14:08 | 2.3 | 0.5 | 0.05 | 32.0 | - | 1.62 | 9.0 | 3.0 | 18.0 | |
| | | 11-Nov-10 | 2 | 8.67 | 12.80 | 4.13 | A | 30.3 | 70.7 | 17.1 | 21:02 | 21:18 | 2.2 | 0.0 | 0.00 | 31.0 | 5.0 | 1.60 | 7.3 | 11.9 | 16.8 | Re-grouted |
| T-31+359.5 | T | 28-Apr-10 | 4 | 5.75 | 7.25 | 1.50 | MF | 13.1 | 13.1 | 8.7 | 7:32 | 7:45 | 2.0 | 0.0 | 0.00 | 29.3 | - | 1.42 | 21.5 | 13.2 | 23.7 | |
| | | 13-Nov-10 | 3 | 7.75 | 8.75 | 1.00 | B | 34.4 | 34.4 | 34.4 | 9:06 | 9:43 | 2.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 13-Nov-10 | 2 | 8.75 | 13.30 | 4.55 | A | 240.5 | - | - | 7:35 | 8:40 | 2.4 | 3.0 | 0.25 | 31.2 | 2.0 | 1.58 | 7.0 | 9.2 | 17.6 | |
| | | 13-Nov-10 | 2 | 8.75 | 13.30 | 4.55 | B | 72.2 | 312.7 | 68.7 | 8:40 | 9:03 | 2.2 | 2.7 | 0.24 | 36.3 | 2.0 | 1.69 | 6.5 | 9.4 | 14.1 | |
| S-31+361 | S | 07-Dec-10 | 4 | 5.80 | 7.30 | 1.50 | B | 169.2 | - | - | 17:19 | 17:45 | 1.7 | 12.7 | 5.15 | 34.0 | - | - | - | - | - | |
| | | 07-Dec-10 | 4 | 5.80 | 7.30 | 1.50 | C | 151.0 | - | - | 17:45 | 17:57 | 2.2 | 14.9 | 4.59 | - | - | - | - | - | - | |
| | | 07-Dec-10 | 4 | 5.80 | 7.30 | 1.50 | D | 239.3 | 559.5 | 373.0 | 17:57 | 18:55 | 2.4 | 0.7 | 0.19 | 65.6 | 0.2 | 1.71 | -4.0 | 11.0 | 14.0 | |
| | | 01-Nov-10 | 3 | 7.37 | 8.37 | 1.00 | B | 14.1 | 14.1 | 14.1 | 22:15 | 22:28 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3A | 7.80 | 8.80 | 1.00 | B | 14.2 | 14.2 | 14.2 | 19:29 | 19:45 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 8.37 | 12.90 | 4.53 | A | 25.0 | 25.0 | 5.5 | 21:52 | 22:05 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+362.5 | T | 15-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | MF | 152.4 | - | - | 21:29 | 21:54 | 1.3 | 12.7 | 9.91 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | B | 155.9 | - | - | 21:54 | 22:05 | 2.1 | 18.2 | 8.98 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | C | 130.1 | 438.4 | 292.3 | 22:05 | 22:45 | 2.0 | 0.3 | 0.10 | 46.6 | 2.0 | 1.70 | 3.7 | 13.3 | 18.5 | |
| | | 11-Nov-10 | 3 | 7.62 | 8.62 | 1.00 | B | 55.9 | 55.9 | 55.9 | 18:06 | 19:04 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 8.62 | 13.20 | 4.58 | A | 23.3 | 23.3 | 5.1 | 17:47 | 18:02 | 2.4 | 0.6 | 0.06 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+364 | P | 23-Nov-10 | 4 | 5.52 | 7.02 | 1.50 | B | 175.7 | - | - | 8:15 | 8:46 | 0.7 | 9.9 | 9.85 | 36.9 | 1.0 | 1.62 | 3.0 | 6.3 | 10.3 | |
| | | 23-Nov-10 | 4 | 5.52 | 7.02 | 1.50 | C | 179.7 | - | - | 8:46 | 9:01 | 0.7 | 14.0 | 12.61 | 46.0 | 2.0 | 1.64 | 3.0 | 6.3 | 10.7 | |
| | | 23-Nov-10 | 4 | 5.52 | 7.02 | 1.50 | D | 203.3 | - | - | 9:01 | 9:15 | 1.4 | 13.3 | 6.47 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 4 | 5.52 | 7.02 | 1.50 | E | 175.6 | - | - | 9:15 | 9:28 | 1.6 | 12.2 | 5.02 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 4 | 5.52 | 7.02 | 1.50 | X | 18.2 | 752.5 | 501.7 | 9:28 | 9:43 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.91 | 7.91 | 1.00 | B | 236.2 | 236.2 | 236.2 | 10:08 | 12:00 | 2.8 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 7.91 | 12.20 | 4.29 | A | 27.5 | 27.5 | 6.4 | 9:51 | 10:05 | 2.4 | 0.2 | 0.02 | - | - | - | - | - | - | |
| T-31+365.5 | T | 28-Apr-10 | 4 | 5.16 | 6.66 | 1.50 | MF | 42.8 | 42.8 | 28.5 | 7:49 | 8:08 | 2.1 | 0.6 | 0.19 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 7.16 | 8.16 | 1.00 | B | 305.7 | - | - | 15:26 | 16:38 | 2.4 | 2.6 | 1.21 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 7.16 | 8.16 | 1.00 | C | 70.8 | 376.5 | 376.5 | 16:38 | 17:32 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 8.16 | 12.60 | 4.44 | A | 19.8 | 19.8 | 4.5 | 15:10 | 15:23 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+367 | S | 07-Dec-10 | 4 | 4.99 | 6.49 | 1.50 | B | 183.8 | - | - | 1:56 | 2:20 | 2.3 | 15.8 | 4.28 | 36.1 | - | 1.64 | 0.0 | 10.0 | 16.0 | |
| | | 07-Dec-10 | 4 | 4.99 | 6.49 | 1.50 | C | 108.1 | 291.9 | 194.6 | 2:20 | 3:15 | 2.7 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 6.99 | 7.99 | 1.00 | A | 59.0 | - | - | 20:27 | 20:39 | 1.3 | 6.2 | 4.94 | 32.0 | 3.0 | 1.64 | 8.0 | 3.0 | 14.0 | |
| | | 01-Nov-10 | 3 | 6.99 | 7.99 | 1.00 | B | 115.7 | - | - | 20:39 | 20:53 | 2.8 | 7.2 | 2.47 | 37.0 | - | 1.63 | 8.0 | 3.0 | 15.2 | |
| | | 01-Nov-10 | 3 | 6.99 | 7.99 | 1.00 | C | 125.7 | 300.4 | 300.4 | 20:53 | 21:36 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 7.99 | 12.60 | 4.61 | A | 22.0 | 22.0 | 4.8 | 20:10 | 20:23 | 2.3 | 0.0 | 0.03 | - | - | - | - | - | - | |
| T-31+368.5 | T | 15-Dec-10 | 4 | 5.16 | 6.66 | 1.50 | MF | 154.8 | - | - | 18:53 | 19:20 | 1.2 | 10.7 | 6.83 | 26.1 | 4.0 | 1.40 | 11.6 | 11.1 | 15.0 | |
| | | 15-Dec-10 | 4 | 5.16 | 6.66 | 1.50 | B | 167.5 | - | - | 19:20 | 19:32 | 1.8 | 15.7 | 5.76 | 31.1 | 5.0 | 1.61 | -1.4 | 11.1 | 18.3 | |
| | | 15-Dec-10 | 4 | 5.16 | 6.66 | 1.50 | C | 185.7 | 508.0 | 338.7 | 19:32 | 20:37 | 1.9 | 0.0 | 0.00 | 46.3 | - | 1.70 | -9.6 | 15.0 | 11.0 | |
| | | 11-Nov-10 | 3 | 7.16 | 8.16 | 1.00 | B | 60.2 | 60.2 | 60.2 | 13:44 | 14:39 | 2.8 | 0.4 | 0.13 | 35.4 | - | 1.63 | 6.0 | 4.9 | 17.6 | |
| | | 11-Nov-10 | 2 | 8.16 | 11.70 | 3.54 | A | 23.6 | 23.6 | 6.7 | 13:23 | 13:37 | 2.2 | 0.0 | 0.00 | 33.2 | - | 1.61 | 8.0 | 4.0 | 17.9 | |
| P-31+370 | P | 22-Nov-10 | 4 | 4.71 | 6.21 | 1.50 | A | 133.1 | - | - | 5:48 | 6:09 | 0.9 | 13.4 | 40.07 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 4.71 | 6.21 | 1.50 | B | 156.9 | - | - | 6:09 | 6:30 | 1.4 | 3.0 | 4.12 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 4.71 | 6.21 | 1.50 | C | 250.7 | - | - | 6:30 | 6:58 | 2.4 | 8.4 | 11.66 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 4.71 | 6.21 | 1.50 | D | 183.2 | - | - | 6:58 | 7:10 | 1.6 | 18.8 | 15.22 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 4.71 | 6.21 | 1.50 | E | 133.7 | - | - | 7:10 | 7:24 | 2.1 | 8.2 | 8.61 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 4.71 | 6.21 | 1.50 | X | 46.2 | 903.8 | 602.5 | 7:24 | 7:41 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.71 | 7.71 | 1.00 | B | 161.9 | - | - | 8:48 | 9:13 | 1.3 | 12.5 | 8.22 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.71 | 7.71 | 1.00 | C | 159.9 | - | - | 9:13 | 9:24 | 3.0 | 18.8 | 6.36 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.71 | 7.71 | 1.00 | D | 169.9 | - | - | 9:24 | 9:35 | 2.8 | 14.7 | 5.41 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.71 | 7.71 | 1.00 | E | 119.5 | 611.2 | 611.2 | 9:35 | 9:44 | 2.4 | 12.6 | 5.18 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 7.71 | 11.90 | 4.19 | A | 11.6 | 11.6 | 2.8 | 8:32 | 8:46 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+371.5 | T | 28-Apr-10 | 4 | 4.83 | 6.33 | 1.50 | MF | 65.0 | 65.0 | 43.3 | 8:11 | 8:47 | 2.1 | 0.5 | 0.16 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 6.83 | 7.83 | 1.00 | B | 304.1 | - | - | 9:51 | 10:48 | 2.5 | 8.0 | 3.00 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 6.83 | 7.83 | 1.00 | C | 24.3 | 328.4 | 328.4 | 10:48 | 11:06 | 2.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 11-Nov-10 | 2 | 7.83 | 11.90 | 4.07 | A | 23.6 | 23.6 | 5.8 | 9:36 | 9:48 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+373 | S | 07-Dec-10 | 4 | 4.66 | 6.16 | 1.50 | B | 157.7 | - | - | 20:13 | 20:41 | 1.6 | 11.9 | 5.12 | 36.0 | 5.0 | 1.64 | -4.0 | 11.0 | 15.0 | |
| | | 07-Dec-10 | 4 | 4.66 | 6.16 | 1.50 | C | 188.9 | - | - | 20:41 | 20:54 | 2.1 | 16.8 | 4.13 | 45.9 | 0.6 | 1.68 | -4.0 | 11.0 | 18.0 | |
| | | 07-Dec-10 | 4 | 4.66 | 6.16 | 1.50 | D | 179.4 | 526.0 | 350.7 | 20:54 | 21:40 | 2.4 | 0.7 | 0.20 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 6.66 | 7.66 | 1.00 | A | 117.2 | 117.2 | 117.2 | 17:12 | 17:52 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 7.66 | 11.90 | 4.24 | A | 32.7 | 32.7 | 7.7 | 16:56 | 17:12 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+374.5 | T | 15-Dec-10 | 4 | 4.66 | 6.16 | 1.50 | MF | 174.5 | - | - | 16:33 | 17:00 | 1.4 | 13.1 | 6.16 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 4.66 | 6.16 | 1.50 | B | 159.6 | - | - | 17:00 | 17:13 | 2.0 | 9.5 | 3.18 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 4.66 | 6.16 | 1.50 | C | 108.7 | 442.8 | 295.2 | 17:13 | 17:58 | 2.3 | 0.8 | 0.24 | 40.0 | - | - | - | - | - | |
| | | 11-Nov-10 | 3 | 6.66 | 7.66 | 1.00 | B | 160.0 | - | - | 7:47 | 8:11 | 2.4 | 8.0 | 3.43 | 36.4 | 2.0 | 1.60 | 9.0 | 11.1 | 15.1 | |
| | | 11-Nov-10 | 3 | 6.66 | 7.66 | 1.00 | C | 125.2 | 285.2 | 285.2 | 8:11 | 9:24 | 2.2 | 0.4 | 0.16 | 51.3 | - | 1.62 | 5.0 | 6.0 | 17.0 | |
| | | 11-Nov-10 | 2 | 7.66 | 11.80 | 4.14 | A | 21.6 | 21.6 | 5.2 | 7:28 | 7:43 | 2.6 | 0.3 | 0.02 | 30.9 | 3.0 | 1.59 | 9.0 | 14.0 | 16.2 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+376 | P | 22-Nov-10 | 4 | 4.53 | 6.03 | 1.50 | A | 23.1 | 23.1 | 15.4 | 4:31 | 4:47 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.76 | 7.76 | 1.00 | B | 203.7 | - | - | 7:32 | 8:01 | 2.3 | 14.8 | 7.35 | 38.0 | 5.0 | 1.66 | 6.0 | 6.0 | 16.0 | |
| | | 28-Oct-10 | 3 | 6.76 | 7.76 | 1.00 | C | 176.8 | - | - | 8:01 | 8:10 | 2.0 | 21.1 | 10.27 | 45.0 | 4.0 | 1.68 | 5.0 | 6.0 | 17.0 | |
| | | 28-Oct-10 | 3 | 6.76 | 7.76 | 1.00 | D | 161.0 | - | - | 8:10 | 8:18 | 2.6 | 22.5 | 8.52 | 72.0 | - | 1.69 | 5.0 | 5.0 | 17.0 | |
| | | 28-Oct-10 | 3 | 6.76 | 7.76 | 1.00 | E | 89.6 | 631.1 | 631.1 | 8:18 | 8:21 | 2.5 | 16.1 | 6.52 | 113.2 | - | 1.71 | 1.3 | 6.0 | 11.1 | |
| | | 28-Oct-10 | 2 | 7.76 | 12.00 | 4.24 | A | 22.1 | 22.1 | 5.2 | 7:12 | 7:28 | 2.6 | 0.0 | 0.00 | 32.0 | 4.0 | 1.62 | 6.0 | 8.0 | 17.0 | |
| T-31+377.5 | T | 10-Nov-10 | 3 | 6.63 | 7.63 | 1.00 | A | 61.0 | - | - | 3:16 | 3:28 | 1.4 | 6.4 | 4.53 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 6.63 | 7.63 | 1.00 | B | 136.3 | - | - | 3:28 | 3:48 | 2.6 | 8.6 | 2.73 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 6.63 | 7.63 | 1.00 | C | 20.1 | 217.4 | 217.4 | 3:48 | 4:05 | 2.6 | 0.0 | 0.00 | 44.8 | - | 1.64 | 4.3 | 9.7 | 17.0 | |
| | | 10-Nov-10 | 2 | 7.63 | 12.10 | 4.47 | A | 22.1 | 22.1 | 4.9 | 3:01 | 3:13 | 2.3 | 0.2 | 0.01 | - | - | - | - | - | - | |
| S-31+379 | S | 03-Dec-10 | 4 | 4.96 | 6.46 | 1.50 | B | 162.1 | - | - | 10:06 | 10:33 | 1.9 | 9.3 | 3.19 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 4.96 | 6.46 | 1.50 | C | 157.2 | - | - | 10:33 | 10:50 | 1.6 | 9.4 | 3.96 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 4 | 4.96 | 6.46 | 1.50 | D | 203.9 | 523.2 | 348.8 | 10:50 | 11:24 | 2.5 | 0.5 | 0.14 | 60.1 | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 6.96 | 7.96 | 1.00 | A | 91.6 | 91.6 | 91.6 | 15:45 | 16:15 | 2.4 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 7.96 | 12.50 | 4.54 | A | 23.0 | 23.0 | 5.1 | 15:27 | 15:40 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+380.5 | T | 15-Dec-10 | 4 | 4.86 | 6.36 | 1.50 | MF | 175.8 | - | - | 14:12 | 14:39 | 1.4 | 13.0 | 6.11 | 28.1 | - | 1.40 | -10.0 | 10.1 | 14.1 | |
| | | 15-Dec-10 | 4 | 4.86 | 6.36 | 1.50 | B | 148.8 | - | - | 14:39 | 14:51 | 2.1 | 14.0 | 3.80 | 40.5 | - | 1.66 | -5.3 | 10.7 | 17.5 | |
| | | 15-Dec-10 | 4 | 4.86 | 6.36 | 1.50 | C | 143.8 | 468.4 | 312.3 | 14:51 | 15:37 | 2.1 | 0.5 | 0.15 | 46.2 | - | 1.69 | -4.7 | 10.9 | 16.3 | |
| | | 10-Nov-10 | 3 | 6.86 | 7.86 | 1.00 | B | 156.0 | - | - | 1:43 | 2:06 | 2.4 | 8.5 | 3.22 | 37.6 | 3.0 | 1.65 | 4.1 | 9.4 | 16.3 | |
| | | 10-Nov-10 | 3 | 6.86 | 7.86 | 1.00 | C | 84.7 | 240.7 | 240.7 | 2:06 | 2:50 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 7.86 | 12.00 | 4.14 | A | 21.7 | 21.7 | 5.2 | 1:27 | 1:40 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+382 | P | 22-Nov-10 | 4 | 5.06 | 6.56 | 1.50 | A | 24.0 | 24.0 | 16.0 | 3:45 | 4:22 | 3.1 | 0.0 | 0.00 | 35.1 | - | 1.63 | 4.9 | 11.1 | 19.5 | |
| | | 27-Oct-10 | 3 | 7.06 | 8.06 | 1.00 | A | 82.7 | - | - | 5:02 | 5:15 | 0.7 | 10.5 | 13.69 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.06 | 8.06 | 1.00 | B | 79.3 | - | - | 5:15 | 5:22 | 1.5 | 12.4 | 7.87 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.06 | 8.06 | 1.00 | C | 160.1 | - | - | 5:22 | 5:34 | 2.7 | 16.1 | 6.22 | 46.1 | - | 1.64 | 9.0 | 9.7 | 12.2 | |
| | | 27-Oct-10 | 3 | 7.06 | 8.06 | 1.00 | D | 157.9 | - | - | 5:34 | 5:45 | 2.8 | 13.1 | 4.64 | 69.6 | - | 1.65 | 9.0 | 9.7 | 13.6 | |
| | | 27-Oct-10 | 3 | 7.06 | 8.06 | 1.00 | E | 120.0 | 600.0 | 600.0 | 5:45 | 5:57 | 2.6 | 9.8 | 3.71 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 8.06 | 12.30 | 4.24 | A | 24.0 | 24.0 | 5.7 | 4:40 | 4:54 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+383.5 | T | 28-Apr-10 | 4 | 4.66 | 6.16 | 1.50 | MF | 0.4 | 0.4 | 0.3 | 9:10 | 9:33 | 2.0 | 0.3 | 0.13 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 6.66 | 7.66 | 1.00 | B | 46.8 | - | - | 22:39 | 22:48 | 0.9 | 6.8 | 7.68 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 6.66 | 7.66 | 1.00 | C | 134.4 | - | - | 22:48 | 23:04 | 2.3 | 5.8 | 2.52 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 6.66 | 7.66 | 1.00 | D | 86.7 | 267.9 | 267.9 | 23:04 | 23:34 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 7.66 | 11.80 | 4.14 | A | 24.9 | 24.9 | 6.0 | 22:20 | 22:34 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+385 | S | 03-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | B | 153.8 | - | - | 8:32 | 8:59 | 2.2 | 9.0 | 2.47 | 42.1 | 1.0 | 1.65 | -4.7 | 11.6 | 14.6 | |
| | | 03-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | C | 137.9 | - | - | 8:59 | 9:14 | 2.3 | 8.6 | 2.38 | 47.3 | 0.5 | 1.67 | -4.7 | 11.6 | 16.3 | |
| | | 03-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | D | 130.2 | 421.9 | 281.3 | 9:14 | 10:01 | 2.4 | 0.3 | 0.09 | 55.9 | - | 1.71 | 4.8 | 11.9 | 16.1 | |
| | | 01-Nov-10 | 3 | 6.83 | 7.83 | 1.00 | B | 146.1 | 146.1 | 146.1 | 14:40 | 15:13 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 7.83 | 11.90 | 4.07 | A | 22.4 | 22.4 | 5.5 | 14:26 | 14:37 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+386.5 | T | 15-Dec-10 | 4 | 4.56 | 6.06 | 1.50 | MF | 180.3 | - | - | 10:43 | 11:11 | 1.7 | 13.3 | 5.44 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 4.56 | 6.06 | 1.50 | B | 146.7 | - | - | 11:11 | 11:23 | 1.8 | 10.1 | 3.69 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 4.56 | 6.06 | 1.50 | C | 87.6 | 414.6 | 276.4 | 11:23 | 11:56 | 2.2 | 0.5 | 0.15 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 6.56 | 7.56 | 1.00 | B | 15.7 | 15.7 | 15.7 | 21:05 | 21:20 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 7.56 | 12.80 | 5.24 | A | 25.6 | 25.6 | 4.9 | 20:45 | 20:59 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+388 | P | 20-Nov-10 | 4 | 4.53 | 6.03 | 1.50 | B | 155.1 | - | - | 19:29 | 19:51 | 1.3 | 13.8 | 7.50 | 39.5 | 1.0 | 1.59 | -8.7 | 7.9 | 13.4 | |
| | | 20-Nov-10 | 4 | 4.53 | 6.03 | 1.50 | C | 151.1 | - | - | 19:51 | 20:02 | 2.0 | 15.4 | 5.09 | 56.0 | 2.0 | 1.65 | 4.8 | 8.9 | 15.3 | |
| | | 20-Nov-10 | 4 | 4.53 | 6.03 | 1.50 | D | 409.6 | - | - | 20:02 | 21:11 | 2.6 | 2.4 | 0.60 | 69.5 | - | 1.67 | 4.8 | 8.9 | 14.5 | |
| | | 20-Nov-10 | 4 | 4.53 | 6.03 | 1.50 | X | 4.9 | 720.7 | 480.5 | 21:11 | 21:23 | 2.4 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 6.53 | 7.53 | 1.00 | A | 14.7 | 14.7 | 14.7 | 4:16 | 4:30 | 2.9 | 0.1 | 0.04 | 30.3 | - | 1.63 | 9.0 | 9.7 | 15.4 | |
| | | 27-Oct-10 | 2 | 7.53 | 11.60 | 4.07 | A | 32.7 | 32.7 | 8.0 | 3:57 | 4:11 | 2.3 | 0.5 | 0.05 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+389.5 | T | 28-Apr-10 | 4 | 4.73 | 6.23 | 1.50 | MF | 20.3 | 20.3 | 13.5 | 9:35 | 9:50 | 2.1 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 6.73 | 7.73 | 1.00 | B | 151.1 | - | - | 19:44 | 20:10 | 2.3 | 5.3 | 2.36 | 37.8 | 3.6 | 1.67 | 3.7 | 8.7 | 18.2 | |
| | | 10-Nov-10 | 3 | 6.73 | 7.73 | 1.00 | C | 46.8 | 197.9 | 197.9 | 20:10 | 20:34 | 2.5 | 0.0 | 0.00 | 45.4 | - | 1.66 | 3.6 | 8.8 | 17.6 | |
| | | 10-Nov-10 | 2 | 7.73 | 11.80 | 4.07 | A | 20.8 | 20.8 | 5.1 | 19:26 | 19:40 | 2.2 | 0.0 | 0.00 | 30.3 | 4.0 | 1.62 | 4.3 | 9.0 | 16.3 | |
| S-31+391 | S | 07-Dec-10 | 4 | 5.57 | 7.07 | 1.50 | B | 161.2 | - | - | 3:50 | 4:12 | 1.3 | 12.0 | 6.29 | - | - | - | - | - | - | |
| | | 07-Dec-10 | 4 | 5.57 | 7.07 | 1.50 | C | 156.4 | - | - | 4:12 | 4:24 | 2.0 | 14.8 | 4.96 | 49.0 | - | 1.69 | 0.0 | 10.0 | 16.0 | |
| | | 07-Dec-10 | 4 | 5.57 | 7.07 | 1.50 | D | 205.2 | 522.8 | 348.5 | 4:24 | 5:15 | 2.4 | 0.6 | 0.17 | 62.1 | - | 1.72 | 0.0 | 10.0 | 17.0 | |
| | | 01-Nov-10 | 3 | 7.57 | 8.57 | 1.00 | B | 16.0 | 16.0 | 16.0 | 13:30 | 13:45 | 2.8 | 0.0 | 0.00 | 34.0 | 4.0 | 1.62 | 7.0 | 3.0 | 16.0 | |
| | | 01-Nov-10 | 2 | 8.57 | 12.60 | 4.03 | A | 21.7 | 21.7 | 5.4 | 13:17 | 13:28 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+392.5 | T | 15-Dec-10 | 4 | 6.66 | 8.16 | 1.50 | MF | 179.1 | - | - | 8:54 | 9:22 | 1.7 | 13.0 | 5.24 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 6.66 | 8.16 | 1.50 | B | 160.7 | - | - | 9:22 | 9:35 | 1.8 | 12.4 | 4.24 | - | - | - | - | - | - | |
| | | 15-Dec-10 | 4 | 6.66 | 8.16 | 1.50 | C | 115.6 | 455.4 | 303.6 | 9:35 | 10:25 | 2.1 | 0.4 | 0.11 | 37.5 | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 8.66 | 9.66 | 1.00 | B | 156.4 | - | - | 18:09 | 18:32 | 2.2 | 13.4 | 6.99 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 8.66 | 9.66 | 1.00 | C | 148.9 | - | - | 18:32 | 18:57 | 2.3 | 1.0 | 0.42 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 8.66 | 9.66 | 1.00 | D | 4.1 | 309.4 | 309.4 | 18:57 | 19:10 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 9.66 | 13.90 | 4.24 | A | 28.4 | 28.4 | 6.7 | 17:52 | 18:05 | 2.9 | 0.5 | 0.04 | - | - | - | - | - | - | |
| P-31+394 | P | 20-Nov-10 | 4 | 7.17 | 8.67 | 1.50 | B | 163.8 | - | - | 15:44 | 16:10 | 1.6 | 9.9 | 4.08 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 4 | 7.17 | 8.67 | 1.50 | C | 236.2 | - | - | 16:10 | 16:27 | 2.1 | 15.3 | 4.78 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 4 | 7.17 | 8.67 | 1.50 | D | 97.9 | - | - | 16:27 | 16:36 | 2.2 | 9.4 | 2.57 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 4 | 7.17 | 8.67 | 1.50 | E | 127.8 | - | - | 16:36 | 17:16 | 2.3 | 3.6 | 1.37 | 83.8 | - | - | 0.5 | 8.4 | 14.5 | |
| | | 20-Nov-10 | 4 | 7.17 | 8.67 | 1.50 | X | 22.5 | 648.2 | 432.1 | 17:16 | 17:36 | 2.4 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 9.17 | 10.17 | 1.00 | A | 49.9 | 49.9 | 49.9 | 23:28 | 23:56 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 10.17 | 14.70 | 4.53 | A | 23.1 | 23.1 | 5.1 | 23:10 | 23:23 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+395.5 | T | 28-Apr-10 | 4 | 6.26 | 7.76 | 1.50 | MF | 165.9 | - | - | 9:53 | 10:16 | 1.8 | 5.2 | 2.16 | - | - | - | - | - | - | |
| | | 28-Apr-10 | 4 | 6.26 | 7.76 | 1.50 | A | 75.4 | 241.3 | 160.9 | 10:16 | 11:00 | 2.0 | 0.5 | 0.17 | 32.2 | - | 1.60 | 16.8 | 15.0 | 17.4 | |
| | | 10-Nov-10 | 3 | 8.26 | 9.26 | 1.00 | B | 159.1 | - | - | 16:27 | 16:53 | 1.9 | 13.1 | 7.09 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 8.26 | 9.26 | 1.00 | C | 161.1 | - | - | 16:53 | 17:07 | 2.6 | 9.3 | 3.60 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 8.26 | 9.26 | 1.00 | D | 176.5 | - | - | 17:07 | 17:29 | 2.3 | 6.6 | 2.96 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 8.26 | 9.26 | 1.00 | E | 86.0 | 582.7 | 582.7 | 17:29 | 17:43 | 2.5 | 7.8 | 3.11 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 9.26 | 13.50 | 4.24 | A | 23.0 | 23.0 | 5.4 | 16:11 | 16:25 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+397 | S | 08-Dec-10 | 4 | 6.05 | 7.55 | 1.50 | B | 160.6 | - | - | 5:35 | 5:59 | 1.9 | 12.4 | 4.64 | - | - | - | - | - | - | |
| | | 08-Dec-10 | 4 | 6.05 | 7.55 | 1.50 | C | 158.6 | - | - | 5:59 | 6:10 | 1.9 | 15.1 | 5.23 | - | - | - | - | - | - | |
| | | 08-Dec-10 | 4 | 6.05 | 7.55 | 1.50 | D | 167.6 | 486.8 | 324.5 | 6:10 | 6:58 | 2.5 | 0.8 | 0.21 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.05 | 9.05 | 1.00 | B | 160.1 | - | - | 9:58 | 10:23 | 0.7 | 11.8 | 16.88 | 38.0 | - | 1.62 | 3.0 | 4.0 | 15.0 | |
| | | 01-Nov-10 | 3 | 8.05 | 9.05 | 1.00 | C | 175.4 | - | - | 10:23 | 10:35 | 1.6 | 17.2 | 10.49 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 8.05 | 9.05 | 1.00 | D | 66.9 | 402.4 | 402.4 | 10:35 | 10:55 | 3.3 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 9.05 | 13.10 | 4.05 | A | 30.7 | 30.7 | 7.6 | 9:40 | 9:52 | 2.6 | 0.2 | 0.02 | - | - | - | - | - | - | |
| T-31+398.5 | T | 15-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | MF | 177.6 | - | - | 6:53 | 7:22 | 1.7 | 13.3 | 5.10 | 28.1 | - | 1.41 | -11.9 | 8.6 | 11.6 | |
| | | 15-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 159.9 | - | - | 7:22 | 7:37 | 2.1 | 6.8 | 2.12 | 40.9 | 2.0 | 1.65 | -6.8 | 8.6 | 12.8 | |
| | | 15-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 45.1 | 382.6 | 255.1 | 7:37 | 8:25 | 2.0 | 0.4 | 0.14 | 41.6 | 2.0 | 1.70 | -18.0 | 12.1 | 14.0 | |
| | | 10-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | B | 160.7 | - | - | 15:12 | 15:38 | 2.3 | 12.1 | 5.18 | 34.1 | - | 1.62 | 8.0 | 9.0 | 18.0 | |
| | | 10-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | C | 35.1 | 195.8 | 195.8 | 15:38 | 16:04 | 2.2 | 0.0 | 0.00 | 46.2 | 0.0 | 1.63 | 8.2 | 15.0 | 17.6 | |
| | | 10-Nov-10 | 2 | 9.16 | 13.50 | 4.34 | A | 21.2 | 21.2 | 4.9 | 14:57 | 15:09 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+400 | P | 20-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | B | 181.4 | - | - | 13:35 | 14:01 | 1.2 | 12.6 | 7.26 | 36.2 | - | 1.61 | 1.4 | 11.6 | 16.9 | |
| | | 20-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | C | 180.3 | - | - | 14:01 | 14:19 | 1.5 | 16.1 | 7.53 | 44.9 | 3.0 | 1.63 | 1.4 | 11.6 | 17.2 | |
| | | 20-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | D | 182.7 | - | - | 14:19 | 14:30 | 2.1 | 13.7 | 4.64 | 71.7 | - | 1.65 | 0.6 | 11.6 | 15.2 | |
| | | 20-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | E | 186.5 | - | - | 14:30 | 15:00 | 2.1 | 5.7 | 1.88 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | X | 77.1 | 808.0 | 538.7 | 15:00 | 15:24 | 2.3 | 7.8 | 2.31 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 86.3 | - | - | 21:56 | 22:11 | 0.8 | 9.8 | 13.95 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | B | 125.7 | - | - | 22:11 | 22:22 | 1.5 | 12.2 | 8.33 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | C | 154.0 | - | - | 22:22 | 22:31 | 2.4 | 12.7 | 7.49 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | D | 133.0 | - | - | 22:31 | 22:40 | 2.6 | 17.9 | 6.88 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | E | 102.0 | 601.0 | 601.0 | 22:40 | 22:49 | 1.7 | 14.4 | 8.36 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 9.16 | 13.50 | 4.34 | A | 22.5 | 22.5 | 5.2 | 21:37 | 21:50 | 2.5 | 0.0 | 0.00 | 29.5 | - | 1.62 | 13.4 | 9.0 | 13.2 | |
| T-31+401.5 | T | 28-Apr-10 | 4 | 6.23 | 7.73 | 1.50 | MF | 187.4 | - | - | 13:52 | 14:20 | 1.8 | 7.7 | 2.55 | - | - | - | - | - | - | Communicated to T-31+395.5 |
| | | 28-Apr-10 | 4 | 6.23 | 7.73 | 1.50 | A | 120.6 | 308.0 | 205.3 | 14:20 | 15:14 | 2.0 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 8.23 | 9.23 | 1.00 | B | 38.7 | 38.7 | 38.7 | 13:59 | 14:36 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 9.23 | 15.50 | 6.27 | A | 43.9 | 43.9 | 7.0 | 13:42 | 13:57 | 2.6 | 1.9 | 0.12 | 30.5 | - | 1.58 | 1.3 | 12.0 | 17.2 | |
| S-31+403 | S | 08-Dec-10 | 4 | 5.67 | 7.17 | 1.50 | B | 159.0 | - | - | 8:15 | 8:45 | 2.0 | 8.8 | 4.82 | 36.3 | 1.0 | 1.66 | -10.9 | 16.7 | 15.5 | |
| | | 08-Dec-10 | 4 | 5.67 | 7.17 | 1.50 | C | 146.9 | - | - | 8:45 | 8:58 | 2.6 | 6.3 | 1.00 | 45.5 | 0.5 | 1.70 | -6.4 | 16.7 | 16.9 | |
| | | 08-Dec-10 | 4 | 5.67 | 7.17 | 1.50 | D | 83.3 | 389.2 | 259.5 | 8:58 | 9:55 | 2.6 | 1.0 | 0.26 | 47.9 | - | 1.71 | -6.4 | 14.0 | 17.8 | |
| | | 01-Nov-10 | 3 | 7.67 | 8.67 | 1.00 | A | 19.9 | - | - | 8:21 | 8:25 | 0.1 | 3.3 | 34.27 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 7.67 | 8.67 | 1.00 | B | 163.5 | - | - | 8:25 | 8:47 | 0.4 | 12.4 | 31.03 | 36.0 | - | 1.63 | 6.0 | 2.0 | 16.0 | |
| | | 01-Nov-10 | 3 | 7.67 | 8.67 | 1.00 | C | 157.1 | - | - | 8:47 | 8:57 | 1.7 | 11.1 | 6.67 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 7.67 | 8.67 | 1.00 | D | 202.0 | - | - | 8:57 | 9:18 | 1.4 | 1.8 | 3.76 | 66.0 | - | 1.65 | 4.0 | 3.0 | 15.0 | |
| | | 01-Nov-10 | 3 | 7.67 | 8.67 | 1.00 | E | 59.7 | 602.2 | 602.2 | 9:18 | 9:24 | 2.0 | 10.1 | 5.13 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 2 | 8.67 | 12.70 | 4.03 | A | 35.9 | 35.9 | 8.9 | 8:06 | 8:18 | 2.6 | 1.2 | 0.11 | 32.0 | 4.0 | 1.61 | 5.0 | 4.0 | 17.0 | |
| Q-31+403.75 | Q | 27-Jun-11 | 4 | 5.62 | 7.12 | 1.50 | MF | 126.3 | 126.30 | 84.20 | 18:38 | 19:11 | 2.1 | 0.2 | 0.07 | 30.6 | 3.0 | 1.5 | 10.6 | 11.6 | 17.3 | |
| | | 23-Jun-11 | 3 | 7.62 | 8.7 | 1.08 | A | 12.7 | 12.70 | 11.76 | 15:22 | 15:35 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+404.5 | T | 14-Dec-10 | 4 | 5.95 | 7.45 | 1.50 | MF | 156.1 | - | - | 4:38 | 5:00 | 1.5 | 13.2 | 4.81 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 5.95 | 7.45 | 1.50 | B | 161.0 | - | - | 5:00 | 5:14 | 2.0 | 6.9 | 2.47 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 5.95 | 7.45 | 1.50 | C | 99.1 | 416.2 | 277.5 | 5:14 | 6:17 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 7.95 | 8.95 | 1.00 | B | 160.2 | - | - | 10:27 | 10:53 | 1.1 | 12.5 | 11.25 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 7.95 | 8.95 | 1.00 | C | 160.2 | - | - | 10:53 | 11:05 | 1.9 | 14.9 | 8.04 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 7.95 | 8.95 | 1.00 | D | 159.8 | - | - | 11:05 | 11:15 | 2.2 | 8.1 | 3.62 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 7.95 | 8.95 | 1.00 | E | 122.2 | 602.4 | 602.4 | 11:15 | 11:28 | 2.5 | 11.0 | 4.47 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 2 | 8.95 | 13.20 | 4.25 | A | 204.8 | 204.8 | 48.2 | 9:41 | 10:25 | 2.6 | 1.5 | 0.12 | - | - | - | - | - | - | |
| Q-31+405.25 | Q | 28-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 54.6 | 54.60 | 36.40 | 15:21 | 15:46 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | A | 20.8 | 20.80 | 20.00 | 19:48 | 20:05 | 2.6 | 0.3 | 0.11 | - | - | - | - | - | - | |
| P-31+406 | P | 20-Nov-10 | 4 | 5.67 | 7.17 | 1.50 | B | 176.5 | - | - | 9:50 | 10:15 | 1.4 | 12.8 | 5.93 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 4 | 5.67 | 7.17 | 1.50 | C | 167.5 | - | - | 10:15 | 10:26 | 1.5 | 18.9 | 8.33 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 4 | 5.67 | 7.17 | 1.50 | D | 190.7 | - | - | 10:26 | 10:38 | 1.8 | 17.5 | 5.68 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 4 | 5.67 | 7.17 | 1.50 | E | 178.9 | - | - | 10:38 | 10:55 | 2.2 | 11.6 | 3.45 | 86.3 | - | 1.66 | 0.5 | 10.3 | 16.1 | |
| | | 20-Nov-10 | 4 | 5.67 | 7.17 | 1.50 | X | 73.3 | 786.9 | 524.6 | 10:55 | 11:08 | 1.7 | 4.6 | 1.84 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.67 | 8.67 | 1.00 | A | 94.0 | - | - | 20:25 | 20:42 | 0.4 | 9.0 | 21.37 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.67 | 8.67 | 1.00 | B | 184.0 | - | - | 20:42 | 20:56 | 1.1 | 18.4 | 9.09 | 38.9 | 2.0 | 1.64 | 13.4 | 9.0 | 14.6 | |
| | | 27-Oct-10 | 3 | 7.67 | 8.67 | 1.00 | C | 177.0 | - | - | 20:56 | 21:08 | 2.3 | 18.8 | 7.82 | >120 | - | 1.68 | 13.4 | 9.0 | 15.3 | |
| | | 27-Oct-10 | 3 | 7.67 | 8.67 | 1.00 | D | 143.0 | 598.0 | 598.0 | 21:08 | 21:15 | 2.4 | 21.0 | 6.40 | >120 | 2.0 | 1.61 | 13.4 | 9.0 | 14.7 | |
| | | 27-Oct-10 | 2 | 8.67 | 13.30 | 4.63 | A | 93.0 | 93.0 | 20.1 | 19:50 | 20:16 | 2.7 | 0.6 | 0.05 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+407.5 | T | 28-Apr-10 | 4 | 5.93 | 7.43 | 1.50 | MF | 158.4 | - | - | 15:21 | 15:53 | 1.8 | 1.6 | 0.55 | - | - | - | - | - | - | Communicated to T-31+401.5 |
| | | 28-Apr-10 | 4 | 5.93 | 7.43 | 1.50 | A | 110.4 | - | - | 15:53 | 17:19 | 2.0 | 0.1 | 0.66 | 31.4 | - | 1.61 | 17.0 | 16.0 | 18.2 | |
| | | 28-Apr-10 | 4 | 5.93 | 7.43 | 1.50 | B | 1.7 | 270.5 | 180.3 | 17:19 | 17:28 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 7.93 | 8.93 | 1.00 | A | 17.4 | - | - | 22:11 | 22:18 | 2.3 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 10-Nov-10 | 3 | 7.93 | 8.93 | 1.00 | B | 1.1 | 18.5 | 18.5 | 9:18 | 9:34 | 2.3 | 0.0 | 0.00 | 36.1 | 1.0 | 1.61 | 14.0 | 14.1 | 19.8 | |
| | | 09-Nov-10 | 2 | 8.93 | 12.90 | 3.97 | A | 75.5 | - | - | 21:33 | 22:04 | 2.8 | 0.0 | 0.00 | 30.1 | 2.0 | 1.57 | 10.2 | - | 21.2 | |
| | | 10-Nov-10 | 2 | 8.93 | 12.90 | 3.97 | A | 42.9 | 118.4 | 29.8 | 8:50 | 9:08 | 3.1 | 0.0 | 0.00 | 30.8 | 3.0 | 1.59 | 14.0 | 14.0 | 19.5 | |
| S-31+409 | S | 08-Dec-10 | 4 | 5.83 | 7.33 | 1.50 | B | 171.4 | - | - | 10:47 | 11:10 | 1.6 | 12.1 | 4.34 | 33.4 | - | 1.65 | -6.3 | 13.9 | 16.9 | |
| | | 08-Dec-10 | 4 | 5.83 | 7.33 | 1.50 | C | 148.3 | - | - | 11:10 | 11:22 | 2.4 | 7.5 | 1.25 | 53.3 | - | 1.69 | -6.0 | 9.0 | 17.9 | |
| | | 08-Dec-10 | 4 | 5.83 | 7.33 | 1.50 | D | 31.3 | 351.0 | 234.0 | 11:22 | 11:50 | 2.6 | 0.8 | 0.21 | 59.9 | - | 1.73 | -12.2 | 8.6 | 16.7 | |
| | | 01-Nov-10 | 3 | 7.83 | 8.83 | 1.00 | B | 163.9 | - | - | 6:42 | 7:13 | 2.5 | 12.7 | 5.20 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 7.83 | 8.83 | 1.00 | C | 159.2 | - | - | 7:13 | 7:26 | 2.7 | 13.1 | 5.21 | 48.0 | 0.0 | 1.64 | 6.0 | 3.0 | 16.0 | |
| | | 01-Nov-10 | 3 | 7.83 | 8.83 | 1.00 | D | 162.5 | - | - | 7:26 | 7:38 | 3.0 | 13.4 | 4.47 | - | - | - | - | - | - | |
| | | 01-Nov-10 | 3 | 7.83 | 8.83 | 1.00 | E | 114.5 | 600.1 | 600.1 | 7:38 | 7:47 | 2.5 | 14.6 | 5.76 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 8.83 | 12.70 | 3.87 | A | 140.8 | - | - | 4:34 | 4:56 | 0.7 | 9.4 | 3.36 | - | - | - | - | - | - | Communicated to P-31+416.5 |
| | | 31-Oct-10 | 2 | 8.83 | 12.70 | 3.87 | B | 246.9 | - | - | 4:56 | 5:14 | 0.9 | 17.7 | 5.42 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 8.83 | 12.70 | 3.87 | C | 215.3 | - | - | 5:14 | 5:26 | 0.9 | 18.0 | 5.00 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 8.83 | 12.70 | 3.87 | D | 172.0 | - | - | 5:26 | 5:37 | 1.0 | 17.5 | 4.57 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 8.83 | 12.70 | 3.87 | E | 569.0 | 1344.0 | 347.3 | 5:37 | 6:29 | 2.4 | 0.4 | 0.05 | - | - | - | - | - | - | |
| T-31+410.5 | T | 14-Dec-10 | 4 | 5.72 | 7.22 | 1.50 | MF | 157.5 | - | - | 2:34 | 2:58 | 1.4 | 13.1 | 6.75 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 5.72 | 7.22 | 1.50 | B | 159.9 | - | - | 2:58 | 3:09 | 1.9 | 13.9 | 5.00 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 5.72 | 7.22 | 1.50 | C | 147.0 | 464.4 | 309.6 | 3:09 | 4:21 | 2.1 | 0.5 | 0.15 | 45.9 | 2.0 | 1.63 | 15.4 | 13.6 | 18.4 | |
| | | 09-Nov-10 | 3 | 7.72 | 8.72 | 1.00 | B | 29.0 | 29.0 | 29.0 | 20:58 | 21:25 | 2.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 2 | 8.72 | 12.90 | 4.18 | A | 81.6 | 81.6 | 19.5 | 20:29 | 20:54 | 2.4 | 1.4 | 0.14 | - | - | - | - | - | - | |
| P-31+412 | P | 20-Nov-10 | 4 | 5.80 | 7.30 | 1.50 | B | 172.6 | - | - | 8:29 | 8:53 | 1.5 | 13.2 | 5.95 | 35.3 | 5.0 | 1.60 | 3.9 | 9.1 | 17.8 | |
| | | 20-Nov-10 | 4 | 5.80 | 7.30 | 1.50 | C | 202.6 | - | - | 8:53 | 9:06 | 1.7 | 19.3 | 7.87 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 4 | 5.80 | 7.30 | 1.50 | D | 245.7 | - | - | 9:06 | 9:19 | 2.0 | 17.3 | 5.86 | 79.8 | 1.5 | 1.63 | 3.9 | 9.1 | 17.1 | |
| | | 20-Nov-10 | 4 | 5.80 | 7.30 | 1.50 | E | 131.1 | - | - | 9:14 | 9:28 | 1.8 | 10.9 | 3.23 | 82.6 | - | - | 0.5 | 10.3 | 15.2 | |
| | | 20-Nov-10 | 4 | 5.80 | 7.30 | 1.50 | X | 54.0 | 806.0 | 537.3 | 9:28 | 9:34 | 2.4 | 8.2 | 2.26 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | B | 247.8 | - | - | 16:50 | 17:23 | 2.4 | 16.3 | 6.79 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | C | 163.4 | - | - | 17:23 | 17:34 | 2.5 | 16.1 | 6.05 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | D | 189.6 | 600.8 | 600.8 | 17:34 | 17:46 | 2.6 | 15.9 | 6.06 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 8.80 | 13.10 | 4.30 | A | 104.4 | 104.4 | 24.3 | 16:29 | 16:49 | 0.5 | 9.1 | 4.32 | - | - | - | - | - | - | By-Pass |
| T-31+413.5 | T | 29-Apr-10 | 4 | 5.83 | 7.33 | 1.50 | MF | 150.2 | - | - | 6:34 | 8:09 | 1.8 | 0.6 | 0.20 | 28.3 | - | 1.44 | 19.2 | 16.7 | 20.1 | |
| | | 29-Apr-10 | 4 | 5.83 | 7.33 | 1.50 | A | 9.4 | 159.6 | 106.4 | 8:09 | 8:34 | 2.0 | 0.2 | 0.07 | 31.5 | - | 1.60 | 19.6 | 16.9 | 20.7 | |
| | | 09-Nov-10 | 3 | 7.83 | 8.83 | 1.00 | A | 23.3 | - | - | 19:33 | 19:41 | 1.8 | 3.3 | 1.66 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 7.83 | 8.83 | 1.00 | B | 54.3 | 77.6 | 77.6 | 19:41 | 20:14 | 2.7 | 0.3 | 0.10 | 37.9 | - | 1.62 | 12.0 | 11.3 | 18.7 | |
| | | 09-Nov-10 | 2 | 8.83 | 13.00 | 4.17 | A | 47.8 | 47.8 | 11.5 | 19:11 | 19:27 | 2.6 | 0.9 | 0.08 | 31.4 | - | 1.63 | 12.8 | 11.6 | 11.4 | |
| S-31+415 | S | 08-Dec-10 | 4 | 5.27 | 6.77 | 1.50 | B | 159.0 | - | - | 14:19 | 14:44 | 1.8 | 12.0 | 4.33 | 37.2 | - | 1.65 | -10.0 | 9.9 | 17.2 | |
| | | 08-Dec-10 | 4 | 5.27 | 6.77 | 1.50 | C | 160.9 | - | - | 14:44 | 14:57 | 2.4 | 13.6 | 3.91 | 50.9 | - | 1.71 | -10.0 | 9.0 | 14.8 | |
| | | 08-Dec-10 | 4 | 5.27 | 6.77 | 1.50 | D | 170.7 | 490.6 | 327.1 | 14:57 | 15:53 | 2.5 | 0.7 | 0.18 | 58.7 | 0.0 | 1.75 | -6.0 | 9.2 | 12.2 | |
| | | 31-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | B | 204.4 | - | - | 2:28 | 2:55 | 0.4 | 9.7 | 27.62 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | C | 151.3 | - | - | 2:55 | 3:05 | 0.8 | 19.6 | 27.74 | 43.0 | 1.0 | 1.67 | 5.1 | 5.7 | 15.8 | |
| | | 31-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | D | 145.0 | - | - | 3:05 | 3:14 | 0.7 | 15.8 | 23.09 | 80.1 | - | 1.66 | 5.1 | 5.7 | 13.1 | |
| | | 31-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | E | 150.6 | 651.3 | 651.3 | 3:14 | 3:25 | 0.9 | 15.2 | 16.38 | ~135 | - | 1.71 | 5.1 | 5.7 | 14.3 | |
| | | 31-Oct-10 | 2 | 8.27 | 12.60 | 4.33 | A | 94.1 | 94.1 | 21.7 | 2:07 | 22:22 | 0.0 | 8.5 | inf | - | - | - | - | - | - | By-Pass |
| T-31+416.5 | T | 14-Dec-10 | 4 | 5.01 | 6.51 | 1.50 | MF | 158.6 | - | - | 22:54 | 23:18 | 1.7 | 13.1 | 5.38 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 5.01 | 6.51 | 1.50 | B | 137.0 | 295.6 | 197.1 | 23:18 | 23:47 | 2.1 | 0.6 | 0.18 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 7.01 | 8.01 | 1.00 | B | 52.4 | 52.4 | 52.4 | 16:38 | 17:06 | 2.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 2 | 8.01 | 12.60 | 4.59 | A | 30.6 | 30.6 | 6.7 | 16:25 | 16:36 | 2.5 | 0.7 | 0.06 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+418 | P | 19-Nov-10 | 4 | 5.22 | 6.72 | 1.50 | B | 164.4 | - | - | 15:22 | 15:47 | 2.0 | 15.5 | 5.27 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 4 | 5.22 | 6.72 | 1.50 | C | 167.2 | - | - | 15:47 | 15:58 | 2.2 | 16.7 | 5.06 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 4 | 5.22 | 6.72 | 1.50 | D | 194.1 | - | - | 15:58 | 16:12 | 2.7 | 16.7 | 4.14 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 4 | 5.22 | 6.72 | 1.50 | X | 56.1 | 581.8 | 387.9 | 16:12 | 16:35 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.22 | 8.22 | 1.00 | B | 176.7 | - | - | 15:32 | 15:59 | 0.9 | 14.2 | 16.77 | 36.0 | 5.0 | 1.63 | 11.0 | 4.0 | 19.0 | |
| | | 27-Oct-10 | 3 | 7.22 | 8.22 | 1.00 | C | 141.1 | - | - | 15:59 | 16:09 | 1.3 | 18.7 | 14.59 | 48.0 | - | 1.68 | 10.0 | 4.0 | 18.0 | |
| | | 27-Oct-10 | 3 | 7.22 | 8.22 | 1.00 | D | 298.8 | 616.6 | 616.6 | 16:09 | 16:24 | 2.8 | 21.6 | 7.78 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 8.22 | 12.50 | 4.28 | A | 200.0 | - | - | 14:25 | 15:16 | 2.5 | 3.1 | 0.32 | 32.3 | 5.0 | 1.61 | 9.0 | 3.0 | 17.0 | |
| | | 27-Oct-10 | 2 | 8.22 | 12.50 | 4.28 | B | 28.9 | 228.9 | 53.5 | 15:16 | 15:30 | 2.4 | 1.3 | 0.13 | - | - | - | - | - | - | |
| T-31+419.5 | T | 29-Apr-10 | 4 | 5.19 | 6.69 | 1.50 | MF | 37.5 | 37.5 | 25.0 | 8:48 | 9:09 | 2.0 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 7.19 | 8.19 | 1.00 | B | 16.7 | 16.7 | 16.7 | 16:11 | 16:23 | 2.4 | 0.3 | 0.14 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 2 | 8.19 | 12.50 | 4.31 | A | 73.5 | 73.5 | 17.1 | 15:45 | 16:08 | 2.6 | 0.8 | 0.07 | - | - | - | - | - | - | |
| S-31+421 | S | 08-Dec-10 | 4 | 5.09 | 6.59 | 1.50 | B | 166.3 | - | - | 16:09 | 16:37 | 2.3 | 8.6 | 2.47 | 34.8 | - | - | - | - | - | |
| | | 08-Dec-10 | 4 | 5.09 | 6.59 | 1.50 | C | 158.7 | 325.0 | 216.7 | 16:37 | 17:27 | 2.5 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | B | 148.2 | - | - | 22:51 | 23:12 | 1.0 | 12.8 | 13.89 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | C | 149.3 | - | - | 23:12 | 23:22 | 1.4 | 16.3 | 9.63 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | D | 157.6 | - | - | 23:22 | 23:33 | 1.4 | 16.1 | 11.07 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 7.09 | 8.09 | 1.00 | E | 156.3 | 611.4 | 611.4 | 23:33 | 23:43 | 1.6 | 17.0 | 10.77 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 8.09 | 12.50 | 4.41 | A | 153.5 | 153.5 | 34.8 | 22:21 | 22:43 | 0.0 | 12.0 | inf | - | - | - | - | - | - | By-Pass |
| T-31+422.5 | T | 14-Dec-10 | 4 | 5.19 | 6.69 | 1.50 | MF | 157.8 | - | - | 21:14 | 21:42 | 1.9 | 6.5 | 2.53 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 5.19 | 6.69 | 1.50 | B | 148.5 | 306.3 | 204.2 | 21:42 | 22:35 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 7.19 | 8.19 | 1.00 | B | 270.4 | - | - | 14:29 | 15:21 | 2.7 | 4.7 | 1.97 | 31.3 | - | 1.62 | 10.0 | 11.3 | 18.0 | |
| | | 09-Nov-10 | 3 | 7.19 | 8.19 | 1.00 | C | 14.8 | 285.2 | 285.2 | 15:21 | 15:36 | 2.4 | 0.2 | 0.02 | 43.2 | - | 1.62 | 13.1 | 10.9 | 18.3 | |
| | | 09-Nov-10 | 2 | 8.19 | 12.20 | 4.01 | A | 111.2 | 111.2 | 27.7 | 13:49 | 14:26 | 2.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-31+424 | P | 19-Nov-10 | 4 | 5.27 | 6.77 | 1.50 | B | 160.6 | - | - | 13:43 | 14:08 | 2.1 | 11.0 | 1.49 | 36.7 | - | 1.60 | -11.6 | 8.8 | 13.5 | |
| | | 19-Nov-10 | 4 | 5.27 | 6.77 | 1.50 | C | 181.5 | - | - | 14:08 | 14:23 | 2.3 | 7.8 | 0.99 | 46.2 | - | 1.61 | -11.4 | 9.0 | 14.0 | |
| | | 19-Nov-10 | 4 | 5.27 | 6.77 | 1.50 | D | 198.8 | - | - | 14:23 | 14:42 | 2.6 | 10.0 | 1.11 | 63.4 | - | 1.69 | -10.8 | 8.5 | 14.0 | |
| | | 19-Nov-10 | 4 | 5.27 | 6.77 | 1.50 | X | 37.1 | 578.0 | 385.3 | 14:42 | 15:07 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | B | 160.4 | - | - | 10:55 | 11:21 | 0.6 | 12.4 | 22.10 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | C | 159.7 | - | - | 11:21 | 11:32 | 0.9 | 18.3 | 19.95 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | D | 169.9 | - | - | 11:32 | 11:40 | 1.7 | 24.0 | 14.46 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | E | 133.1 | 623.1 | 623.1 | 11:40 | 11:45 | 2.1 | 28.7 | 13.88 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 8.27 | 12.40 | 4.13 | A | 205.4 | - | - | 9:04 | 9:33 | 0.1 | 12.7 | 33.41 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 8.27 | 12.40 | 4.13 | B | 194.9 | - | - | 9:33 | 9:45 | 0.2 | 17.8 | 27.55 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 8.27 | 12.40 | 4.13 | C | 201.1 | - | - | 9:45 | 9:55 | 0.7 | 20.5 | 7.13 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 2 | 8.27 | 12.40 | 4.13 | D | 202.6 | - | - | 9:55 | 10:05 | 1.1 | 20.6 | 4.82 | - | - | - | - | - | - | By-Pass |
| | | 27-Oct-10 | 2 | 8.27 | 12.40 | 4.13 | E | 713.0 | 1517.0 | 367.3 | 10:05 | 10:51 | 2.3 | 12.1 | 1.26 | 78.0 | 1.0 | 1.69 | 12.0 | 4.0 | 19.0 | |
| T-31+425.5 | T | 29-Apr-10 | 4 | 4.91 | 6.41 | 1.50 | MF | 38.9 | 38.9 | 25.9 | 9:14 | 9:38 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 3 | 6.91 | 7.91 | 1.00 | B | 78.9 | 78.9 | 78.9 | 11:14 | 11:44 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 2 | 7.91 | 11.90 | 3.99 | A | 22.9 | 22.9 | 5.7 | 10:58 | 11:11 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Nov-10 | 1 | 11.90 | 17.40 | 5.50 | A | 21.6 | 21.6 | 3.9 | 10:38 | 10:54 | 5.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| S-31+427 | S | 08-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | B | 158.8 | - | - | 19:17 | 19:39 | 1.9 | 12.7 | 4.57 | 37.5 | 2.0 | 1.64 | -21.0 | 9.0 | 10.0 | |
| | | 08-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | C | 173.8 | - | - | 19:39 | 19:52 | 2.4 | 18.6 | 3.85 | 49.1 | 0.4 | 1.68 | -21.0 | 9.0 | 11.0 | |
| | | 08-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | D | 122.5 | 455.1 | 303.4 | 19:52 | 20:52 | 2.4 | 0.9 | 0.25 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | B | 145.1 | - | - | 20:51 | 21:18 | 0.9 | 12.8 | 13.89 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | C | 162.9 | - | - | 21:18 | 21:32 | 1.6 | 12.1 | 6.56 | >240 | - | 1.67 | 6.0 | 8.8 | 16.3 | |
| | | 31-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | D | 138.7 | - | - | 21:32 | 21:43 | 1.8 | 15.8 | 7.67 | >120 | - | 1.67 | 6.0 | 8.8 | 17.8 | |
| | | 31-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | E | 162.7 | 609.4 | 609.4 | 21:43 | 21:58 | 1.8 | 11.6 | 6.57 | ~230 | - | 1.72 | 6.0 | 8.8 | 15.5 | |
| | | 31-Oct-10 | 2 | 8.24 | 12.40 | 4.16 | A | 206.0 | - | - | 19:24 | 19:57 | 1.8 | 6.5 | 0.86 | 30.5 | 12.0 | 1.63 | 6.0 | 7.9 | 17.6 | |
| | | 31-Oct-10 | 2 | 8.24 | 12.40 | 4.16 | B | 257.6 | 463.6 | 111.4 | 19:57 | 20:45 | 2.4 | 1.6 | 0.17 | 32.9 | - | 1.64 | 6.0 | 7.9 | 15.6 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+428.5 | T | 14-Dec-10 | 4 | 5.85 | 7.35 | 1.50 | MF | 159.9 | - | - | 19:13 | 19:35 | 1.8 | 12.3 | 6.51 | 27.4 | 4.0 | 1.34 | -8.1 | 13.2 | 12.8 | |
| | | 14-Dec-10 | 4 | 5.85 | 7.35 | 1.50 | B | 203.1 | 363.0 | 242.0 | 19:35 | 20:46 | 2.1 | 0.4 | 0.13 | 36.1 | 5.0 | 1.58 | 10.6 | 13.2 | 15.9 | |
| | | 09-Nov-10 | 3 | 7.85 | 8.85 | 1.00 | B | 160.0 | - | - | 8:44 | 9:57 | 1.8 | 8.1 | 4.42 | 36.1 | 2.0 | 1.63 | 5.0 | 4.0 | 19.4 | |
| | | 09-Nov-10 | 3 | 7.85 | 8.85 | 1.00 | C | 160.5 | - | - | 9:57 | 10:11 | 2.5 | 8.9 | 3.47 | 45.8 | 1.0 | 1.64 | 6.0 | 6.3 | 17.7 | |
| | | 09-Nov-10 | 3 | 7.85 | 8.85 | 1.00 | D | 65.0 | 385.5 | 385.5 | 10:11 | 10:29 | 2.6 | 0.2 | 0.07 | 61.5 | 0.0 | 1.66 | 4.0 | 6.3 | 17.0 | |
| | | 09-Nov-10 | 2 | 8.85 | 12.90 | 4.05 | A | 198.0 | 198.0 | 48.9 | 7:47 | 8:40 | 2.3 | 1.9 | 0.20 | 32.6 | 3.0 | 1.62 | 5.8 | 7.2 | 15.7 | |
| P-31+430 | P | 19-Nov-10 | 4 | 5.57 | 7.07 | 1.50 | B | 163.8 | - | - | 9:29 | 9:51 | 1.7 | 9.6 | 3.86 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 4 | 5.57 | 7.07 | 1.50 | C | 169.3 | - | - | 9:51 | 10:05 | 2.0 | 14.7 | 5.03 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 4 | 5.57 | 7.07 | 1.50 | D | 196.2 | - | - | 10:05 | 10:20 | 2.5 | 16.1 | 4.31 | 120.0 | 1.0 | 1.73 | -11.9 | 8.3 | 12.4 | |
| | | 19-Nov-10 | 4 | 5.57 | 7.07 | 1.50 | E | 91.6 | - | - | 10:20 | 10:34 | 2.4 | 5.8 | 1.60 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 4 | 5.57 | 7.07 | 1.50 | X | 48.6 | 669.5 | 446.3 | 10:34 | 11:03 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Oct-10 | 3 | 7.57 | 8.57 | 1.00 | B | 174.7 | - | - | 8:02 | 8:29 | 1.0 | 12.8 | 13.43 | 35.0 | 5.0 | 1.63 | 11.0 | 3.0 | 17.0 | |
| | | 27-Oct-10 | 3 | 7.57 | 8.57 | 1.00 | C | 248.8 | - | - | 8:29 | 8:44 | 1.7 | 21.9 | 12.70 | 46.0 | - | 1.65 | 15.0 | 7.0 | 18.0 | |
| | | 27-Oct-10 | 3 | 7.57 | 8.57 | 1.00 | D | 257.0 | 680.5 | 680.5 | 8:44 | 8:56 | 2.3 | 20.3 | 8.84 | 68.0 | 1.0 | 1.66 | 2.0 | 7.0 | 15.0 | |
| | | 27-Oct-10 | 2 | 8.57 | 13.00 | 4.43 | A | 248.6 | 248.6 | 56.1 | 6:40 | 7:59 | 2.6 | 0.0 | 0.00 | 32.0 | 5.0 | 1.60 | 8.0 | 2.0 | 17.0 | |
| Q-31+430.75 | Q | 27-Jun-11 | 4 | 4.81 | 6.31 | 1.50 | MF | 33.7 | 33.70 | 22.47 | 19:15 | 19:31 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 3 | 6.81 | 7.81 | 1.00 | A | 23.3 | 23.30 | 23.30 | 16:06 | 16:18 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 2 | 7.81 | 12 | 4.19 | A | 40 | 40.00 | 9.55 | 15:47 | 16:03 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+431.5 | T | 29-Apr-10 | 4 | 4.81 | 6.31 | 1.50 | MF | 42.3 | 42.3 | 28.2 | 9:42 | 10:06 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 2, 3 | 6.81 | 11.80 | 4.99 | A | 29.5 | - | - | 4:16 | 4:26 | 2.2 | 6.3 | 2.64 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 2, 3 | 6.81 | 11.80 | 4.99 | B | 153.0 | 182.5 | 36.6 | 4:26 | 5:05 | 2.6 | 0.1 | 0.05 | 33.2 | 1.2 | 1.62 | 6.2 | 6.5 | 18.5 | |
| | | 08-Nov-10 | 2 | 7.81 | 11.80 | 3.99 | A | 66.9 | 66.9 | 16.8 | 4:01 | 4:12 | 1.1 | 7.1 | 1.57 | - | - | - | - | - | - | By-Pass |
| | | 08-Nov-10 | 1 | 11.80 | 17.00 | 5.20 | A | 22.7 | 22.7 | 4.4 | 3:37 | 3:55 | 7.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+432.25 | Q | 28-Jun-11 | 4 | 4.55 | 6.05 | 1.50 | MF | 36.3 | 36.30 | 24.20 | 14:51 | 15:08 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 6.55 | 7.55 | 1.00 | A | 11.9 | 11.90 | 11.90 | 17:49 | 18:02 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 2 | 7.55 | 11 | 3.45 | A | 22.9 | 22.90 | 6.64 | 17:33 | 17:47 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+433 | S | 08-Dec-10 | 4 | 4.43 | 5.93 | 1.50 | B | 159.0 | - | - | 21:05 | 21:29 | 2.5 | 12.0 | 3.39 | - | - | - | - | - | - | |
| | | 08-Dec-10 | 4 | 4.43 | 5.93 | 1.50 | C | 160.2 | - | - | 21:29 | 22:16 | 2.4 | 2.9 | 0.84 | - | - | - | - | - | - | |
| | | 08-Dec-10 | 4 | 4.43 | 5.93 | 1.50 | D | 83.2 | 402.4 | 268.3 | 22:16 | 23:28 | 2.6 | 0.4 | 0.10 | 64.1 | 0.6 | 1.71 | -21.0 | 9.0 | 12.0 | |
| | | 31-Oct-10 | 3 | 6.43 | 7.43 | 1.00 | B | 194.7 | - | - | 16:16 | 16:40 | 1.3 | 14.0 | 10.82 | 36.0 | 2.0 | 1.63 | 7.0 | 5.0 | 15.0 | |
| | | 31-Oct-10 | 3 | 6.43 | 7.43 | 1.00 | C | 165.3 | - | - | 16:40 | 16:53 | 1.4 | 15.8 | 11.63 | 46.0 | - | 1.64 | 6.0 | 5.0 | 16.0 | |
| | | 31-Oct-10 | 3 | 6.43 | 7.43 | 1.00 | D | 172.4 | - | - | 16:53 | 17:02 | 1.4 | 22.4 | 15.09 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 6.43 | 7.43 | 1.00 | E | 134.2 | 666.6 | 666.6 | 17:02 | 17:09 | 1.4 | 23.9 | 17.04 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 7.43 | 11.80 | 4.37 | A | 202.4 | - | - | 14:20 | 14:48 | 0.7 | 12.1 | 4.38 | 31.0 | - | 1.61 | 8.0 | 4.0 | 16.0 | Communicated to T-31+434.5 |
| | | 31-Oct-10 | 2 | 7.43 | 11.80 | 4.37 | B | 205.6 | - | - | 14:48 | 15:01 | 1.8 | 19.0 | 2.43 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 7.43 | 11.80 | 4.37 | C | 110.0 | - | - | 15:01 | 15:11 | 1.5 | 4.2 | 0.65 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 7.43 | 11.80 | 4.37 | D | 237.0 | - | - | 15:11 | 15:24 | 1.8 | 12.4 | 1.45 | 50.0 | 1.0 | - | - | - | - | |
| | | 31-Oct-10 | 2 | 7.43 | 11.80 | 4.37 | E | 588.0 | 1343.0 | 307.3 | 15:24 | 16:04 | 1.0 | 32.5 | 7.14 | - | - | - | - | - | - | |
| Q-31+433.75 | Q | 27-Jun-11 | 4 | 4.3 | 5.8 | 1.50 | MF | 27.1 | 27.10 | 18.07 | 19:33 | 19:50 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 3 | 6.3 | 7.6 | 1.30 | A | 16.3 | 16.30 | 12.54 | 16:24 | 16:38 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+434.5 | T | 14-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | MF | 183.0 | - | - | 16:11 | 16:40 | 2.2 | 11.8 | 3.99 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | B | 157.2 | - | - | 16:40 | 16:58 | 2.1 | 5.6 | 1.78 | - | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | C | 70.2 | 410.4 | 273.6 | 16:58 | 17:50 | 2.2 | 0.6 | 0.19 | 37.3 | - | 1.64 | 0.3 | - | 18.6 | |
| | | 08-Nov-10 | 2, 3 | 6.83 | 11.80 | 4.97 | A | 5.0 | 5.0 | 1.0 | 3:11 | 3:25 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 2 | 7.83 | 11.80 | 3.97 | A | 32.4 | 32.4 | 8.2 | 2:56 | 3:05 | 0.2 | 6.2 | 0.03 | - | - | - | - | - | - | By-Pass |
| | | 08-Nov-10 | 1 | 11.80 | 17.00 | 5.20 | A | 29.1 | 29.1 | 5.6 | 2:18 | 2:56 | 8.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| Q-31+435.25 | Q | 28-Jun-11 | 4 | 4.78 | 6.28 | 1.50 | MF | 36.8 | 36.80 | 24.53 | 14:31 | 14:48 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 6.78 | 8 | 1.22 | A | 20.7 | 20.70 | 16.97 | 18:23 | 18:36 | 2.6 | 0.3 | 0.10 | 31.4 | 8.0 | 1.6 | 11.5 | 13.9 | 16.8 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+436 | P | 19-Nov-10 | 4 | 4.94 | 6.44 | 1.50 | B | 170.1 | - | - | 7:26 | 7:51 | 2.3 | 12.3 | 3.55 | 36.0 | 1.0 | 1.58 | 8.5 | 8.7 | 17.8 | |
| | | 19-Nov-10 | 4 | 4.94 | 6.44 | 1.50 | C | 156.9 | - | - | 7:51 | 8:05 | 2.5 | 9.5 | 2.51 | 45.7 | 1.0 | 1.60 | 8.5 | 8.8 | 17.9 | |
| | | 19-Nov-10 | 4 | 4.94 | 6.44 | 1.50 | D | 75.8 | 402.8 | 268.5 | 8:05 | 8:25 | 2.7 | 0.2 | 0.05 | 61.3 | - | 1.62 | 8.7 | 9.2 | 18.1 | |
| | | 26-Oct-10 | 3 | 6.94 | 7.94 | 1.00 | B | 171.9 | - | - | 4:40 | 5:06 | 1.0 | 12.7 | 10.58 | 35.1 | - | 1.64 | 4.5 | 6.0 | 14.0 | |
| | | 26-Oct-10 | 3 | 6.94 | 7.94 | 1.00 | C | 171.4 | - | - | 5:06 | 5:17 | 1.7 | 15.6 | 9.18 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 6.94 | 7.94 | 1.00 | D | 170.3 | - | - | 5:17 | 5:27 | 1.8 | 18.3 | 10.65 | >120 | - | 1.65 | 4.5 | 6.0 | 13.0 | |
| | | 26-Oct-10 | 3 | 6.94 | 7.94 | 1.00 | E | 87.3 | 600.9 | 600.9 | 5:27 | 5:32 | 2.4 | 19.0 | 8.07 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 7.94 | 12.00 | 4.06 | A | 209.0 | 209.0 | 51.5 | 3:42 | 4:34 | 2.4 | 1.6 | 0.17 | - | - | - | - | - | - | |
| T-31+437.5 | T | 29-Apr-10 | 4 | 5.14 | 6.64 | 1.50 | MF | 43.9 | 43.9 | 29.3 | 10:20 | 10:42 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 7.14 | 8.14 | 1.00 | A | 19.2 | 19.2 | 19.2 | 1:44 | 2:01 | 2.5 | 0.2 | 0.09 | 32.2 | - | 1.56 | 8.3 | 12.5 | 16.7 | |
| | | 08-Nov-10 | 2 | 8.14 | 12.20 | 4.06 | A | 23.9 | 23.9 | 5.9 | 1:22 | 1:40 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+439 | S | 08-Dec-10 | 4 | 5.19 | 6.69 | 1.50 | B | 160.6 | - | - | 2:24 | 2:48 | 1.8 | 12.8 | 4.71 | 36.6 | - | 1.64 | -4.0 | 8.0 | 13.0 | |
| | | 08-Dec-10 | 4 | 5.19 | 6.69 | 1.50 | C | 155.1 | - | - | 2:48 | 2:59 | 2.1 | 13.2 | 3.97 | 48.2 | - | 1.69 | -4.0 | 8.0 | 13.0 | |
| | | 08-Dec-10 | 4 | 5.19 | 6.69 | 1.50 | D | 87.8 | 403.5 | 269.0 | 2:59 | 3:47 | 2.5 | 0.7 | 0.20 | 74.6 | - | 1.73 | -13.0 | 8.0 | 13.0 | |
| | | 31-Oct-10 | 3 | 7.19 | 8.19 | 1.00 | B | 160.0 | - | - | 10:54 | 11:19 | 0.9 | 13.0 | 14.61 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 7.19 | 8.19 | 1.00 | C | 164.4 | - | - | 11:19 | 11:30 | 2.0 | 18.4 | 9.17 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 7.19 | 8.19 | 1.00 | D | 156.6 | - | - | 11:30 | 11:38 | 2.9 | 16.6 | 5.80 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 7.19 | 8.19 | 1.00 | E | 129.7 | 610.7 | 610.7 | 11:38 | 11:45 | 2.8 | 7.2 | 2.60 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 8.19 | 13.40 | 5.21 | A | 139.4 | 139.4 | 26.8 | 10:20 | 10:51 | 2.6 | 2.3 | 0.17 | - | - | - | - | - | - | |
| T-31+440.5 | T | 14-Dec-10 | 4 | 4.81 | 6.31 | 1.50 | MF | 48.0 | 48.0 | 32.0 | 15:17 | 16:04 | 2.1 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 6.81 | 7.81 | 1.00 | A | 24.7 | - | - | 22:13 | 22:19 | 1.5 | 3.7 | 2.33 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 6.81 | 7.81 | 1.00 | B | 163.5 | - | - | 22:19 | 22:35 | 2.4 | 16.4 | 7.19 | 35.8 | 2.0 | 1.65 | 6.2 | 7.6 | 15.6 | |
| | | 08-Nov-10 | 3 | 6.81 | 7.81 | 1.00 | C | 155.9 | 344.1 | 344.1 | 22:35 | 23:21 | 2.5 | 0.1 | 0.04 | 45.5 | - | 1.64 | 3.8 | 7.6 | 15.8 | |
| | | 08-Nov-10 | 2 | 7.81 | 12.30 | 4.49 | A | 48.4 | 48.4 | 10.8 | 21:49 | 22:09 | 2.6 | 1.0 | 0.09 | 32.1 | 6.0 | 1.63 | 5.8 | 7.6 | 13.6 | |
| P-31+442 | P | 18-Nov-10 | 4 | 5.60 | 7.10 | 1.50 | B | 167.1 | - | - | 4:47 | 5:12 | 1.9 | 9.1 | 3.28 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 5.60 | 7.10 | 1.50 | C | 160.7 | - | - | 5:12 | 5:25 | 2.3 | 13.1 | 3.73 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 5.60 | 7.10 | 1.50 | D | 194.7 | - | - | 5:25 | 6:40 | 2.4 | 2.7 | 0.75 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 5.60 | 7.10 | 1.50 | E | 137.4 | 659.9 | 439.9 | 6:40 | 7:14 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | B | 13.3 | 13.3 | 13.3 | 0:20 | 0:35 | 2.9 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.60 | 12.90 | 4.30 | A | 228.7 | - | - | 22:35 | 23:00 | 0.7 | 14.9 | 4.47 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.60 | 12.90 | 4.30 | B | 179.1 | - | - | 23:00 | 23:11 | 1.7 | 17.8 | 2.56 | 36.0 | 2.0 | 1.64 | 3.0 | 6.1 | 12.0 | |
| | | 26-Oct-10 | 2 | 8.60 | 12.90 | 4.30 | C | 174.5 | - | - | 23:11 | 23:19 | 2.2 | 22.9 | 2.45 | 49.0 | - | 1.65 | 3.0 | 6.0 | 14.0 | |
| | | 26-Oct-10 | 2 | 8.60 | 12.90 | 4.30 | D | 254.7 | - | - | 23:19 | 23:34 | 2.3 | 22.3 | 2.09 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.60 | 12.90 | 4.30 | E | 222.0 | 1059.0 | 246.3 | 23:34 | 0:09 | 2.1 | 0.0 | 0.00 | >120 | - | 1.62 | 3.0 | 6.0 | 15.0 | |
| T-31+443.5 | T | 02-Jun-11 | 4 | 5.22 | 6.72 | 1.50 | MF | 43.6 | 43.6 | 29.1 | 14:38 | 14:58 | 2.0 | 0.9 | 0.29 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 7.22 | 8.22 | 1.00 | A | 109.5 | - | - | 19:50 | 20:07 | 2.6 | 8.1 | 3.14 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 7.22 | 8.22 | 1.00 | B | 130.0 | 239.5 | 239.5 | 20:07 | 20:50 | 2.2 | 0.1 | 0.05 | 34.3 | 1.0 | 1.63 | 3.2 | 8.4 | 14.9 | |
| | | 08-Nov-10 | 2 | 8.22 | 12.30 | 4.08 | A | 126.4 | 126.4 | 31.0 | 19:04 | 19:40 | 2.4 | 0.5 | 0.05 | 31.1 | 2.0 | 1.62 | 3.2 | 9.4 | 17.5 | |
| S-31+445 | S | 08-Dec-10 | 4 | 4.71 | 6.21 | 1.50 | B | 157.2 | - | - | 4:11 | 4:35 | 2.3 | 12.6 | 3.68 | - | - | - | - | - | - | |
| | | 08-Dec-10 | 4 | 4.71 | 6.21 | 1.50 | C | 154.2 | - | - | 4:35 | 5:24 | 2.5 | 1.7 | 0.59 | - | - | - | - | - | - | |
| | | 08-Dec-10 | 4 | 4.71 | 6.21 | 1.50 | D | 12.1 | 323.5 | 215.7 | 5:24 | 5:37 | 2.4 | 0.6 | 0.17 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 6.71 | 7.71 | 1.00 | B | 206.0 | - | - | 9:09 | 9:41 | 1.8 | 12.8 | 6.46 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 6.71 | 7.71 | 1.00 | C | 121.4 | - | - | 9:41 | 9:50 | 1.8 | 15.1 | 8.65 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 6.71 | 7.71 | 1.00 | D | 153.5 | - | - | 9:50 | 9:58 | 2.3 | 18.3 | 5.32 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 3 | 6.71 | 7.71 | 1.00 | E | 123.0 | 603.9 | 603.9 | 9:58 | 10:07 | 3.1 | 12.5 | 4.01 | - | - | - | - | - | - | |
| | | 31-Oct-10 | 2 | 7.71 | 12.20 | 4.49 | A | 102.7 | 102.7 | 22.9 | 8:35 | 9:06 | 2.4 | 1.2 | 0.11 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+446.5 | T | 14-Dec-10 | 4 | 4.35 | 5.85 | 1.50 | MF | 172.0 | - | - | 13:26 | 13:54 | 1.6 | 7.7 | 3.34 | 28.0 | - | 1.41 | -3.0 | 6.2 | 15.2 | |
| | | 14-Dec-10 | 4 | 4.35 | 5.85 | 1.50 | B | 150.5 | - | - | 13:54 | 14:05 | 2.2 | 5.1 | 1.55 | 40.0 | - | 1.65 | 3.5 | 6.2 | 19.5 | |
| | | 14-Dec-10 | 4 | 4.35 | 5.85 | 1.50 | C | 74.1 | 396.6 | 264.4 | 14:05 | 15:03 | 2.1 | 0.7 | 0.22 | 42.8 | - | 1.68 | 4.4 | 8.3 | 18.5 | |
| | | 08-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | B | 160.3 | - | - | 17:31 | 17:58 | 2.1 | 12.7 | 5.97 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | C | 87.4 | 247.7 | 247.7 | 17:58 | 18:13 | 2.9 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 2 | 7.35 | 11.80 | 4.45 | A | 24.0 | 24.0 | 5.4 | 17:18 | 17:30 | 2.6 | 0.1 | 0.01 | - | - | - | - | - | - | |
| P-31+448 | P | 18-Nov-10 | 4 | 4.35 | 5.85 | 1.50 | B | 160.6 | - | - | 3:14 | 3:42 | 2.0 | 12.7 | 4.34 | 36.5 | - | 1.64 | -6.0 | 7.0 | 12.0 | |
| | | 18-Nov-10 | 4 | 4.35 | 5.85 | 1.50 | C | 159.5 | - | - | 3:42 | 3:55 | 2.0 | 15.1 | 4.96 | 47.8 | - | 1.69 | -6.0 | 7.0 | 10.0 | |
| | | 18-Nov-10 | 4 | 4.35 | 5.85 | 1.50 | D | 228.0 | - | - | 3:55 | 4:08 | 1.8 | 0.0 | 0.00 | 55.9 | - | 1.69 | -6.0 | 7.0 | 11.0 | |
| | | 18-Nov-10 | 4 | 4.35 | 5.85 | 1.50 | E | 173.1 | - | - | 4:08 | 4:26 | 2.4 | 6.6 | 1.84 | 55.4 | - | 1.70 | 2.0 | 7.0 | 13.0 | |
| | | 18-Nov-10 | 4 | 4.35 | 5.85 | 1.50 | X | 21.8 | 743.0 | 495.3 | 4:26 | 4:42 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 6.35 | 7.35 | 1.00 | A | 157.2 | - | - | 19:08 | 19:47 | 0.8 | 12.6 | 17.01 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 6.35 | 7.35 | 1.00 | B | 205.0 | - | - | 19:47 | 20:02 | 0.9 | 18.1 | 18.40 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 6.35 | 7.35 | 1.00 | C | 131.5 | - | - | 20:02 | 20:08 | 1.0 | 21.4 | 22.12 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 6.35 | 7.35 | 1.00 | D | 107.3 | 601.0 | 601.0 | 20:08 | 20:13 | 1.2 | 24.6 | 21.09 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 7.35 | 11.70 | 4.35 | A | 210.7 | - | - | 16:29 | 16:57 | 1.8 | 15.8 | 1.37 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 7.35 | 11.70 | 4.35 | B | 172.7 | - | - | 16:57 | 17:08 | 1.8 | 18.3 | 2.19 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 7.35 | 11.70 | 4.35 | C | 206.3 | - | - | 17:08 | 17:23 | 1.4 | 11.1 | 1.75 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 7.35 | 11.70 | 4.35 | D | 313.3 | - | - | 17:23 | 17:55 | 2.4 | 7.2 | 0.66 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 7.35 | 11.70 | 4.35 | E | 244.0 | 1147.0 | 263.7 | 17:55 | 18:58 | 2.4 | 1.7 | 0.17 | - | - | - | - | - | - | |
| T-31+449.5 | T | 02-Jun-11 | 4 | 4.35 | 5.85 | 1.50 | MF | 45.1 | 45.1 | 30.1 | 13:11 | 13:38 | 2.0 | 0.5 | 0.15 | 27.5 | - | 1.44 | 4.6 | 14.0 | 13.1 | |
| | | 08-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | B | 160.2 | - | - | 15:44 | 16:12 | 2.5 | 9.9 | 4.06 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | C | 90.7 | - | - | 16:12 | 16:58 | 2.5 | 1.7 | 0.70 | 38.3 | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | D | 37.7 | 288.6 | 288.6 | 16:58 | 17:10 | 2.5 | 0.0 | 0.01 | >120 | - | 1.65 | 0.3 | 10.4 | 17.6 | |
| | | 08-Nov-10 | 2 | 7.35 | 11.60 | 4.25 | A | 32.5 | 32.5 | 7.6 | 15:22 | 15:41 | 2.5 | 0.6 | 0.06 | - | - | - | - | - | - | |
| S-31+451 | S | 09-Dec-10 | 4 | 4.91 | 6.41 | 1.50 | B | 159.0 | - | - | 7:05 | 7:32 | 1.9 | 12.2 | 3.64 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 4.91 | 6.41 | 1.50 | C | 191.3 | - | - | 7:32 | 7:48 | 2.5 | 12.1 | 3.18 | 46.3 | 1.0 | 1.69 | -7.0 | 12.0 | 14.5 | |
| | | 09-Dec-10 | 4 | 4.91 | 6.41 | 1.50 | D | 22.8 | 373.1 | 248.7 | 7:48 | 8:07 | 2.4 | 0.9 | 0.24 | 53.5 | 1.0 | 1.74 | -7.0 | 12.2 | 15.6 | |
| | | 31-Oct-10 | 3 | 6.91 | 7.91 | 1.00 | B | 170.3 | - | - | 6:56 | 7:23 | 1.0 | 12.6 | 12.66 | 30.0 | - | 1.63 | 12.0 | 4.0 | 15.0 | |
| | | 31-Oct-10 | 3 | 6.91 | 7.91 | 1.00 | C | 144.8 | - | - | 7:23 | 7:36 | 2.9 | 9.6 | 3.36 | 49.0 | 1.0 | 1.65 | 11.0 | 4.0 | 19.5 | |
| | | 31-Oct-10 | 3 | 6.91 | 7.91 | 1.00 | D | 205.4 | 520.5 | 520.5 | 7:36 | 8:21 | 2.9 | 0.0 | 0.01 | 74.0 | 1.0 | 1.63 | 10.0 | 3.0 | 18.0 | |
| | | 31-Oct-10 | 2 | 7.91 | 12.40 | 4.49 | A | 32.5 | 32.5 | 7.2 | 6:40 | 6:53 | 2.5 | 0.3 | 0.03 | 30.0 | 6.0 | 1.62 | 10.0 | 2.0 | 16.0 | |
| Q-31+451.75 | Q | 27-Jun-11 | 4 | 5.19 | 6.69 | 1.50 | MF | 34.2 | 34.20 | 22.80 | 19:59 | 20:16 | 2.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 3 | 7.19 | 8.3 | 1.11 | A | 27.8 | 27.80 | 25.05 | 16:42 | 17:02 | 2.6 | 0.1 | 0.05 | - | - | - | - | - | - | |
| T-31+452.5 | T | 14-Dec-10 | 4 | 4.81 | 6.31 | 1.50 | MF | 223.8 | - | - | 9:37 | 10:06 | 1.6 | 9.5 | 4.08 | 28.0 | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 4.81 | 6.31 | 1.50 | B | 132.8 | - | - | 10:06 | 10:27 | 2.1 | 1.0 | 0.30 | 36.0 | - | - | - | - | - | |
| | | 14-Dec-10 | 4 | 4.81 | 6.31 | 1.50 | C | 7.7 | 364.3 | 242.9 | 10:27 | 10:40 | 1.9 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 6.81 | 7.81 | 1.00 | B | 163.2 | - | - | 14:14 | 14:39 | 1.9 | 11.3 | 5.92 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 6.81 | 7.81 | 1.00 | C | 157.8 | - | - | 14:39 | 14:50 | 2.5 | 18.4 | 7.24 | 41.0 | 5.0 | 1.56 | 0.2 | 7.3 | 18.3 | |
| | | 08-Nov-10 | 3 | 6.81 | 7.81 | 1.00 | D | 146.0 | - | - | 14:50 | 15:01 | 2.3 | 10.4 | 4.57 | 50.3 | 3.0 | 1.58 | 0.2 | 7.3 | 14.1 | |
| | | 08-Nov-10 | 3 | 6.81 | 7.81 | 1.00 | E | 133.0 | 600.0 | 600.0 | 15:01 | 15:16 | 2.0 | 7.9 | 3.87 | 61.5 | - | 1.60 | 0.2 | 9.3 | 13.8 | |
| | | 08-Nov-10 | 2 | 7.81 | 11.90 | 4.09 | A | 32.1 | 32.1 | 7.8 | 13:59 | 14:11 | 2.5 | 1.0 | 0.10 | - | - | - | - | - | - | |
| Q-31+453.25 | Q | 28-Jun-11 | 4 | 4.89 | 6.39 | 1.50 | MF | 44.7 | 44.70 | 29.80 | 14:10 | 14:28 | 2.3 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 6.89 | 8 | 1.11 | A | 41.7 | 41.70 | 37.57 | 18:44 | 19:11 | 2.8 | 0.2 | 0.08 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+454 | P | 18-Nov-10 | 4 | 4.40 | 5.90 | 1.50 | E | 40.0 | 545.7 | 363.8 | 0:29 | 0:49 | 2.4 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 4.40 | 5.90 | 1.50 | B | 162.3 | - | - | 22:56 | 23:20 | 1.4 | 9.5 | 4.52 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 4.40 | 5.90 | 1.50 | C | 166.0 | - | - | 23:20 | 23:32 | 2.5 | 9.2 | 2.44 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 4.40 | 5.90 | 1.50 | D | 177.4 | - | - | 23:32 | 0:29 | 2.3 | 6.4 | 1.82 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 6.40 | 7.40 | 1.00 | B | 150.7 | - | - | 15:23 | 15:47 | 1.4 | 11.9 | 8.44 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 6.40 | 7.40 | 1.00 | C | 182.9 | - | - | 15:47 | 16:00 | 2.1 | 18.5 | 9.52 | 46.3 | 3.4 | 1.60 | 5.2 | 9.9 | 16.4 | |
| | | 26-Oct-10 | 3 | 6.40 | 7.40 | 1.00 | D | 305.7 | 639.3 | 639.3 | 16:00 | 16:15 | 2.8 | 19.3 | 7.00 | 52.0 | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 7.40 | 11.70 | 4.30 | A | 227.4 | - | - | 14:10 | 14:40 | 0.1 | 15.1 | 21.29 | 32.1 | - | 1.62 | 14.3 | 9.9 | 17.5 | |
| | | 26-Oct-10 | 2 | 7.40 | 11.70 | 4.30 | B | 182.7 | - | - | 14:40 | 14:51 | 2.1 | 14.7 | 1.30 | 35.4 | - | 1.61 | 9.0 | 9.9 | 15.0 | |
| | | 26-Oct-10 | 2 | 7.40 | 11.70 | 4.30 | C | 108.3 | 518.4 | 120.6 | 14:51 | 15:20 | 2.5 | 2.0 | 0.19 | 66.0 | - | - | 5.2 | 9.9 | 17.8 | |
| T-31+455.5 | T | 02-Jun-11 | 4 | 4.38 | 5.88 | 1.50 | MF | 44.2 | 44.2 | 29.5 | 13:43 | 14:05 | 2.2 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 6.38 | 7.38 | 1.00 | B | 162.3 | - | - | 10:29 | 10:56 | 2.1 | 12.5 | 5.81 | 46.9 | - | 1.63 | 1.9 | 9.8 | 15.7 | |
| | | 08-Nov-10 | 3 | 6.38 | 7.38 | 1.00 | C | 322.4 | 484.7 | 484.7 | 10:56 | 12:07 | 2.5 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 2 | 7.38 | 11.90 | 4.52 | A | 200.6 | - | - | 9:06 | 9:38 | 2.6 | 7.4 | 0.61 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 2 | 7.38 | 11.90 | 4.52 | B | 200.2 | 400.8 | 88.7 | 9:38 | 10:25 | 2.4 | 1.3 | 0.12 | 32.3 | - | 1.60 | 2.0 | 8.9 | 15.6 | |
| S-31+457 | S | 09-Dec-10 | 4 | 4.56 | 6.06 | 1.50 | B | 160.6 | - | - | 8:59 | 9:26 | 2.2 | 9.4 | 2.42 | 40.2 | - | 1.64 | -6.0 | 12.0 | 15.2 | |
| | | 09-Dec-10 | 4 | 4.56 | 6.06 | 1.50 | C | 125.8 | - | - | 9:26 | 9:38 | 2.6 | 5.2 | 1.47 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 4.56 | 6.06 | 1.50 | D | 51.1 | 337.5 | 225.0 | 9:38 | 10:14 | 2.5 | 0.9 | 0.25 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.56 | 7.56 | 1.00 | B | 163.2 | - | - | 3:35 | 3:57 | 0.6 | 12.0 | 18.12 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.56 | 7.56 | 1.00 | C | 170.9 | - | - | 3:57 | 4:10 | 1.3 | 12.4 | 9.94 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.56 | 7.56 | 1.00 | D | 140.7 | - | - | 4:10 | 4:22 | 1.1 | 12.9 | 11.77 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 6.56 | 7.56 | 1.00 | E | 126.0 | 600.8 | 600.8 | 4:22 | 4:32 | 1.5 | 12.0 | 8.09 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 7.56 | 12.00 | 4.44 | A | 37.8 | 37.8 | 8.5 | 3:09 | 3:27 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+458.5 | T | 14-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | MF | 160.0 | - | - | 7:08 | 7:34 | 1.5 | 11.9 | 5.87 | 28.7 | - | 1.40 | 2.1 | 10.6 | 13.1 | |
| | | 14-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | B | 160.5 | - | - | 7:34 | 7:46 | 1.7 | 15.8 | 6.18 | 38.6 | 2.0 | 1.64 | - | - | 17.5 | |
| | | 14-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | C | 149.4 | - | - | 7:46 | 8:03 | 2.0 | 2.3 | 0.68 | 53.5 | 1.5 | 1.68 | 7.5 | 8.4 | 16.1 | |
| | | 14-Dec-10 | 4 | 5.24 | 6.74 | 1.50 | D | 66.7 | 536.6 | 357.7 | 8:03 | 9:13 | 2.0 | 0.5 | 0.17 | 47.6 | - | 1.71 | 6.6 | 9.5 | 16.1 | |
| | | 08-Nov-10 | 3 | 7.24 | 8.24 | 1.00 | B | 162.5 | - | - | 6:54 | 7:27 | 1.9 | 13.0 | 6.54 | 35.2 | 5.0 | 1.63 | 4.0 | 11.0 | 14.6 | |
| | | 08-Nov-10 | 3 | 7.24 | 8.24 | 1.00 | C | 159.7 | - | - | 7:27 | 7:38 | 2.2 | 18.9 | 8.58 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 7.24 | 8.24 | 1.00 | D | 158.0 | - | - | 7:38 | 7:47 | 2.4 | 13.6 | 5.80 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 3 | 7.24 | 8.24 | 1.00 | E | 104.8 | 585.0 | 585.0 | 7:47 | 8:24 | 2.3 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 08-Nov-10 | 2 | 8.24 | 12.60 | 4.36 | A | 26.2 | 26.2 | 6.0 | 6:42 | 6:56 | 2.6 | 0.3 | 0.03 | 31.2 | 2.0 | 1.65 | 6.0 | 3.0 | 17.0 | |
| P-31+460 | P | 18-Nov-10 | 4 | 5.24 | 6.74 | 1.50 | B | 140.0 | - | - | 21:29 | 21:50 | 1.5 | 9.8 | 4.24 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 5.24 | 6.74 | 1.50 | C | 139.1 | - | - | 21:50 | 22:01 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 5.24 | 6.74 | 1.50 | D | 164.2 | - | - | 22:01 | 22:12 | 2.6 | 9.1 | 2.31 | 72.5 | 0.8 | 1.70 | -6.0 | 8.0 | 11.0 | |
| | | 18-Nov-10 | 4 | 5.24 | 6.74 | 1.50 | E | 94.4 | 537.7 | 358.5 | 22:12 | 22:45 | 2.5 | 0.9 | 0.24 | 82.4 | 0.8 | 1.70 | -6.0 | 8.0 | 12.0 | |
| | | 26-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | B | 168.6 | - | - | 10:29 | 10:54 | 0.8 | 12.0 | 18.53 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | A | 91.4 | - | - | 10:54 | 11:00 | 1.0 | 11.5 | 11.63 | 30.0 | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | C | 60.0 | - | - | 11:00 | 11:08 | 2.1 | 9.1 | 4.39 | 47.0 | 2.0 | 1.61 | 2.5 | 6.1 | 15.9 | |
| | | 26-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | D | 170.8 | - | - | 11:08 | 11:27 | 3.1 | 4.3 | 2.21 | 63.0 | - | 1.64 | 2.5 | 6.1 | 16.2 | |
| | | 26-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | E | 14.6 | 505.4 | 505.4 | 11:27 | 11:43 | 3.0 | 0.0 | 0.00 | 48.0 | - | - | 2.5 | 6.1 | - | |
| | | 26-Oct-10 | 2 | 8.24 | 12.60 | 4.36 | A | 152.7 | - | - | 9:17 | 9:39 | 0.0 | 12.7 | inf | - | - | - | - | - | - | |
| | | 26-Oct-10 | 2 | 8.24 | 12.60 | 4.36 | B | 281.1 | 433.8 | 99.5 | 9:39 | 10:21 | 2.3 | 0.9 | 0.09 | - | - | - | - | - | - | |
| T-31+461.5 | T | 02-Jun-11 | 4 | 5.24 | 6.74 | 1.50 | MF | 23.2 | 23.2 | 15.5 | 14:10 | 14:23 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 3 | 7.24 | 8.24 | 1.00 | B | 166.5 | - | - | 5:03 | 5:34 | 2.6 | 12.2 | 4.80 | 32.5 | - | 1.64 | - | 12.1 | 20.6 | |
| | | 07-Nov-10 | 3 | 7.24 | 8.24 | 1.00 | C | 30.3 | 196.8 | 196.8 | 5:34 | 5:53 | 2.4 | 0.1 | 0.06 | 38.7 | - | 1.59 | -2.0 | 13.8 | 19.4 | |
| | | 07-Nov-10 | 2 | 8.24 | 12.60 | 4.36 | A | 27.5 | 27.5 | 6.3 | 4:39 | 4:55 | 2.5 | 0.5 | 0.04 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+463 | S | 09-Dec-10 | 4 | 5.27 | 6.77 | 1.50 | B | 160.0 | - | - | 10:32 | 11:07 | 1.3 | 12.1 | 6.30 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 5.27 | 6.77 | 1.50 | C | 162.2 | - | - | 11:07 | 11:19 | 2.0 | 14.1 | 4.67 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 5.27 | 6.77 | 1.50 | D | 288.9 | 611.1 | 407.4 | 11:19 | 12:33 | 2.8 | 0.0 | 0.00 | 55.6 | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | A | 19.4 | - | - | 1:53 | 1:58 | 0.3 | 2.9 | 4.95 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | B | 64.7 | - | - | 1:58 | 2:07 | 1.2 | 9.0 | 7.95 | 32.2 | 4.0 | 1.63 | 6.4 | 7.8 | 17.0 | |
| | | 28-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | C | 128.9 | - | - | 2:07 | 2:20 | 1.2 | 12.2 | 10.72 | 54.9 | 2.0 | 1.66 | 6.4 | 7.8 | 15.7 | |
| | | 28-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | D | 171.5 | - | - | 2:20 | 2:35 | 1.7 | 14.8 | 8.52 | 61.7 | - | 1.68 | 6.4 | 7.8 | 15.1 | |
| | | 28-Oct-10 | 3 | 7.27 | 8.27 | 1.00 | E | 253.3 | 637.8 | 637.8 | 2:35 | 2:51 | 1.8 | 15.5 | 8.54 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 8.27 | 12.60 | 4.33 | A | 36.5 | 36.5 | 8.4 | 1:32 | 1:45 | 2.6 | 0.7 | 0.06 | - | - | - | - | - | - | |
| T-31+464.5 | T | 13-Dec-10 | 4 | 5.47 | 6.97 | 1.50 | MF | 51.7 | 51.7 | 34.5 | 4:58 | 5:27 | 1.9 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 3 | 7.47 | 8.47 | 1.00 | A | 12.6 | 12.6 | 12.6 | 4:15 | 4:31 | 2.5 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 2 | 8.47 | 12.80 | 4.33 | A | 39.5 | 39.5 | 9.1 | 3:44 | 4:04 | 2.3 | 0.6 | 0.06 | - | - | - | - | - | - | |
| P-31+466 | P | 18-Nov-10 | 4 | 5.62 | 7.12 | 1.50 | B | 122.0 | - | - | 18:56 | 19:14 | 1.4 | 10.3 | 4.98 | 36.0 | 2.0 | 1.64 | 1.0 | 8.0 | 13.0 | |
| | | 18-Nov-10 | 4 | 5.62 | 7.12 | 1.50 | C | 141.8 | - | - | 19:14 | 19:35 | 2.0 | 12.9 | 4.34 | 48.3 | 1.6 | 1.65 | 1.0 | 8.0 | 13.0 | |
| | | 18-Nov-10 | 4 | 5.62 | 7.12 | 1.50 | D | 136.9 | - | - | 19:35 | 19:40 | 2.5 | 18.3 | 4.80 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 5.62 | 7.12 | 1.50 | E | 333.7 | - | - | 19:40 | 19:53 | 2.6 | 18.0 | 4.55 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 5.62 | 7.12 | 1.50 | X | 67.6 | 802.0 | 534.7 | 19:53 | 19:57 | 2.7 | 41.5 | 10.36 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | A | 99.7 | - | - | 8:37 | 8:56 | 3.2 | 6.2 | 1.88 | - | - | - | - | - | - | |
| | | 26-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | B | 15.0 | 114.7 | 114.7 | 8:56 | 9:10 | 3.0 | 0.3 | 0.09 | 36.0 | 6.0 | 1.63 | 2.4 | 5.9 | 10.3 | |
| | | 26-Oct-10 | 2 | 8.62 | 13.00 | 4.38 | A | 44.8 | 44.8 | 10.2 | 8:21 | 8:34 | 2.3 | 1.3 | 0.13 | 30.1 | 9.0 | 1.65 | 2.4 | 5.9 | 16.6 | |
| T-31+467.5 | T | 02-Jun-11 | 4 | 5.65 | 7.15 | 1.50 | MF | 23.2 | 23.2 | 15.5 | 15:03 | 15:16 | 1.9 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 3 | 7.65 | 8.65 | 1.00 | A | 97.6 | - | - | 2:27 | 2:50 | 1.6 | 4.8 | 3.08 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 3 | 7.65 | 8.65 | 1.00 | B | 128.8 | - | - | 2:50 | 3:02 | 2.2 | 15.4 | 7.20 | 34.7 | 5.0 | 1.63 | 0.0 | 7.8 | 19.2 | |
| | | 07-Nov-10 | 3 | 7.65 | 8.65 | 1.00 | C | 19.3 | 245.7 | 245.7 | 3:02 | 3:20 | 2.4 | 0.0 | 0.01 | 50.6 | - | 1.64 | -2.0 | 9.5 | 16.1 | |
| | | 07-Nov-10 | 2 | 8.65 | 12.70 | 4.05 | A | 21.8 | 21.8 | 5.4 | 2:08 | 2:22 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+469 | S | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 160.5 | - | - | 15:45 | 16:12 | 1.8 | 12.9 | 4.75 | 39.3 | 2.0 | 1.69 | -7.0 | 11.0 | 14.0 | Communicated to S-31+463 |
| | | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 159.8 | - | - | 16:12 | 16:25 | 2.1 | 13.2 | 4.47 | 51.2 | - | 1.70 | -8.0 | 10.0 | 16.0 | |
| | | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | D | 310.8 | 631.1 | 420.7 | 16:25 | 17:31 | 2.5 | 0.4 | 0.11 | 65.0 | - | 1.74 | -8.0 | 10.0 | 12.3 | |
| | | 28-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 12.6 | 12.6 | 12.6 | 23:20 | 23:32 | 3.1 | 0.4 | 0.15 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 2 | 9.16 | 13.30 | 4.14 | A | 31.1 | 31.1 | 7.5 | 22:59 | 23:13 | 2.7 | 0.2 | 0.02 | 30.2 | 7.0 | 1.63 | 20.0 | 8.1 | 15.8 | |
| T-31+470.5 | T | 13-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | MF | 158.3 | - | - | 22:49 | 23:13 | 1.1 | 12.8 | 7.45 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 169.1 | - | - | 23:13 | 23:25 | 1.8 | 15.2 | 5.66 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 151.0 | - | - | 23:25 | 23:36 | 2.0 | 11.2 | 3.63 | - | - | - | - | - | - | |
| | | 13-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | D | 66.9 | 545.3 | 363.5 | 23:36 | 0:14 | 1.9 | 0.0 | 0.01 | 44.2 | 1.0 | 1.79 | 4.9 | 12.0 | 17.5 | |
| | | 07-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | A | 19.9 | 19.9 | 19.9 | 1:40 | 2:00 | 2.3 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 2 | 9.16 | 13.30 | 4.14 | A | 55.6 | 55.6 | 13.4 | 1:11 | 1:32 | 2.4 | 0.8 | 0.08 | 29.7 | 5.0 | 1.62 | 2.5 | 8.1 | 14.7 | |
| P-31+472 | P | 18-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | B | 160.6 | - | - | 16:35 | 17:00 | 1.2 | 12.0 | 6.90 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | C | 169.3 | - | - | 17:00 | 17:34 | 1.4 | 15.1 | 7.14 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | D | 190.7 | - | - | 17:34 | 17:47 | 1.4 | 14.7 | 7.05 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | E | 215.3 | - | - | 17:47 | 18:02 | 2.9 | 13.8 | 3.19 | - | - | - | - | - | - | |
| | | 18-Nov-10 | 4 | 6.16 | 7.66 | 1.50 | X | 13.6 | 749.5 | 499.7 | 18:02 | 18:17 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 21.4 | - | - | 9:56 | 10:00 | 0.1 | 3.0 | 34.28 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | B | 160.8 | - | - | 10:00 | 10:20 | 1.0 | 12.2 | 11.71 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | C | 147.4 | - | - | 10:20 | 10:36 | 1.5 | 19.0 | 11.38 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | D | 152.6 | 482.2 | 482.2 | 10:36 | 11:00 | 3.1 | 0.1 | 0.04 | 74.5 | - | 1.70 | 0.5 | 9.8 | 18.2 | |
| | | 18-Oct-10 | 2 | 9.16 | 13.70 | 4.54 | A | 21.8 | 21.8 | 4.8 | 9:39 | 9:51 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+473.5 | T | 02-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 21.5 | 21.5 | 14.3 | 15:20 | 15:33 | 1.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 91.6 | 91.6 | 91.6 | 15:28 | 16:00 | 2.9 | 0.3 | 0.11 | 29.0 | - | 1.64 | -2.0 | 5.7 | 12.7 | |
| | | 25-Oct-10 | 2 | 9.16 | 13.50 | 4.34 | A | 200.1 | - | - | 14:14 | 14:44 | 2.3 | 12.4 | 1.47 | 30.4 | - | 1.62 | 7.8 | 7.8 | 13.1 | |
| | | 25-Oct-10 | 2 | 9.16 | 13.50 | 4.34 | B | 195.6 | 395.7 | 91.2 | 14:44 | 15:25 | 2.2 | 1.9 | 0.20 | 31.5 | - | 1.56 | 5.0 | 5.7 | 12.3 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+475 | S | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 168.9 | - | - | 19:37 | 20:02 | 1.8 | 15.9 | 6.63 | 36.7 | 2.0 | 1.63 | -20.0 | 10.0 | 10.0 | |
| | | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 157.3 | - | - | 20:02 | 20:13 | 2.0 | 16.5 | 5.47 | 49.7 | 0.2 | 1.68 | -20.0 | 10.0 | 11.0 | |
| | | 09-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | D | 382.8 | 709.0 | 472.7 | 20:13 | 21:16 | 2.5 | 0.3 | 0.09 | 69.9 | 0.2 | 1.73 | -20.0 | 10.0 | 11.0 | |
| | | 20-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 142.8 | - | - | 16:29 | 16:52 | 1.0 | 12.5 | 13.03 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | B | 151.0 | - | - | 16:52 | 17:02 | 1.0 | 17.0 | 14.13 | 35.4 | - | 1.68 | 13.7 | 10.9 | 14.2 | |
| | | 20-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | C | 165.1 | - | - | 17:02 | 17:12 | 1.1 | 22.6 | 21.07 | 46.2 | - | 1.69 | 13.7 | 10.9 | 16.3 | |
| | | 20-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | D | 146.8 | 605.7 | 605.7 | 17:12 | 17:19 | 1.4 | 20.1 | 13.95 | 62.4 | - | 1.71 | 13.7 | 10.9 | 17.1 | |
| | | 20-Oct-10 | 2 | 9.16 | 13.30 | 4.14 | A | 90.6 | 90.6 | 21.9 | 15:51 | 16:25 | 2.5 | 0.2 | 0.02 | - | - | - | - | - | - | |
| T-31+476.5 | T | 13-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | MF | 154.4 | - | - | 19:21 | 19:53 | 1.8 | 6.7 | 2.44 | 27.9 | 4.0 | 1.43 | -11.4 | 8.0 | 10.9 | |
| | | 13-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 158.3 | - | - | 19:53 | 20:21 | 2.0 | 4.8 | 1.62 | 32.4 | - | 1.60 | -9.4 | 8.0 | 18.9 | |
| | | 13-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 192.4 | 505.1 | 336.7 | 20:21 | 22:07 | 2.2 | 0.0 | 0.01 | 39.3 | 2.0 | 1.66 | 4.9 | 9.6 | 16.0 | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 70.8 | - | - | 11:10 | 11:24 | 0.6 | 7.4 | 13.37 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | B | 46.0 | - | - | 11:24 | 11:32 | 1.1 | 9.5 | 8.13 | 54.0 | - | 1.65 | 5.0 | 7.8 | 13.2 | |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | C | 82.4 | - | - | 11:32 | 11:47 | 2.4 | 2.4 | 0.98 | 57.0 | - | 1.64 | 5.0 | 7.8 | 15.3 | By-Pass. Outside casing. Water only. |
| | | 25-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | D | 8.8 | 208.0 | 208.0 | 11:47 | 12:14 | 2.4 | 0.0 | 0.01 | 58.0 | - | 1.69 | 5.5 | 6.9 | 13.0 | |
| | | 25-Oct-10 | 2 | 9.16 | 13.70 | 4.54 | A | 24.7 | 24.7 | 5.4 | 10:55 | 11:08 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+478 | P | 16-Nov-10 | 4 | 6.21 | 7.71 | 1.50 | B | 161.7 | - | - | 9:23 | 9:33 | 1.1 | 12.1 | 7.54 | 35.7 | 2.0 | 1.59 | 7.5 | 12.3 | 18.2 | |
| | | 16-Nov-10 | 4 | 6.21 | 7.71 | 1.50 | C | 159.6 | - | - | 9:33 | 9:46 | 1.4 | 14.8 | 7.20 | 45.9 | 1.0 | 1.60 | 7.5 | 12.3 | 18.4 | |
| | | 16-Nov-10 | 4 | 6.21 | 7.71 | 1.50 | D | 199.6 | - | - | 9:46 | 10:06 | 1.8 | 14.6 | 5.32 | 63.2 | - | 1.62 | 7.5 | 12.4 | 18.7 | |
| | | 16-Nov-10 | 4 | 6.21 | 7.71 | 1.50 | E | 198.7 | 719.6 | 479.7 | 10:06 | 10:13 | 3.3 | 0.3 | 0.06 | 105.2 | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 8.21 | 9.21 | 1.00 | B | 145.8 | - | - | 8:23 | 8:45 | 1.8 | 12.0 | 10.17 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 8.21 | 9.21 | 1.00 | C | 135.5 | - | - | 8:45 | 8:56 | 2.0 | 12.4 | 6.43 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 8.21 | 9.21 | 1.00 | D | 124.9 | - | - | 8:56 | 9:05 | 2.9 | 15.1 | 5.10 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 8.21 | 9.21 | 1.00 | D+ | 62.7 | - | - | 9:05 | 9:11 | 3.0 | 4.6 | 1.23 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 8.21 | 9.21 | 1.00 | E | 5.5 | 474.4 | 474.4 | 9:11 | 9:18 | 3.1 | 0.1 | 0.10 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 9.21 | 13.70 | 4.49 | A | 34.3 | 34.3 | 7.6 | 8:07 | 8:18 | 2.3 | 0.3 | 0.03 | - | - | - | - | - | - | |
| Q-31+478.75 | Q | 25-Jun-11 | 4 | 5.7 | 7.2 | 1.50 | MF | 48.8 | 48.80 | 32.53 | 2:39 | 3:02 | 1.9 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.7 | 8.7 | 1.00 | A | 158.1 | - | - | 7:37 | 8:02 | 2.4 | 14.6 | 5.82 | 31.3 | - | 1.4 | 14.1 | 14.3 | 15.2 | |
| | | 22-Jun-11 | 3 | 7.7 | 8.7 | 1.00 | B | 104 | 262.10 | 262.10 | 8:02 | 8:29 | 2.5 | 0.0 | 0.00 | 37.1 | 1.0 | 1.6 | 13.1 | 13.5 | 19.7 | |
| T-31+479.5 | T | 02-Jun-11 | 4 | 5.60 | 7.10 | 1.50 | MF | 21.4 | 21.4 | 14.3 | 15:42 | 15:55 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | A | 176.4 | - | - | 9:37 | 10:05 | 0.6 | 12.8 | 16.63 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | B | 156.3 | - | - | 10:05 | 10:15 | 0.9 | 19.7 | 18.71 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | C | 187.3 | - | - | 10:15 | 10:23 | 1.2 | 25.2 | 21.59 | 65.0 | - | 1.63 | -0.5 | 9.4 | 13.7 | By-Pass. Outside casing. Near T-31+476.5. |
| | | 25-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | D | 109.7 | 629.7 | 629.7 | 10:23 | 10:27 | 1.4 | 28.3 | 19.59 | 62.0 | - | 1.63 | 1.0 | 9.4 | 15.5 | |
| | | 25-Oct-10 | 2 | 8.60 | 12.90 | 4.30 | A | 24.4 | 24.4 | 5.7 | 9:21 | 9:34 | 2.6 | 0.1 | 0.01 | - | - | - | - | - | - | |
| Q-31+480.25 | Q | 26-Jun-11 | 4 | 5.34 | 6.84 | 1.50 | MF | 187 | - | - | 3:23 | 3:53 | 1.9 | 6.6 | 2.11 | 30.7 | 3.0 | 1.5 | 12.6 | 12.9 | 16.6 | By-pass outside casing |
| | | 26-Jun-11 | 4 | 5.34 | 6.84 | 1.50 | C | 92 | 279.00 | 186.00 | 3:53 | 4:41 | 2.2 | 0.2 | 0.07 | 45.8 | - | 1.7 | 14.6 | 12.9 | 17.1 | |
| | | 24-Jun-11 | 3 | 7.34 | 8.4 | 1.06 | A | 14.5 | 14.50 | 13.68 | 20:28 | 20:39 | 2.4 | 0.4 | 0.14 | - | - | - | - | - | - | |
| S-31+481 | S | 09-Dec-10 | 4 | 5.57 | 7.07 | 1.50 | B | 162.7 | - | - | 21:42 | 22:03 | 1.5 | 12.0 | 5.61 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 5.57 | 7.07 | 1.50 | C | 164.7 | - | - | 22:03 | 22:15 | 2.2 | 14.6 | 4.50 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 5.57 | 7.07 | 1.50 | D | 384.5 | 711.9 | 474.6 | 22:15 | 23:30 | 2.5 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.57 | 8.57 | 1.00 | B | 13.4 | 13.4 | 13.4 | 15:31 | 15:43 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 8.57 | 12.70 | 4.13 | A | 181.2 | - | - | 14:16 | 14:54 | 2.5 | 4.9 | 0.47 | 30.2 | - | 1.66 | 13.2 | 10.6 | 11.6 | |
| | | 20-Oct-10 | 2 | 8.57 | 12.70 | 4.13 | B | 112.3 | 293.5 | 71.1 | 14:54 | 15:28 | 2.4 | 2.1 | 0.21 | - | - | - | - | - | - | |
| Q-31+481.75 | Q | 25-Jun-11 | 4 | 5.37 | 6.87 | 1.50 | MF | 38.8 | 38.80 | 25.87 | 2:19 | 2:36 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.37 | 8.4 | 1.03 | A | 28.4 | 28.40 | 27.57 | 8:35 | 8:51 | 2.5 | 0.3 | 0.13 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+482.5 | T | 13-Dec-10 | 4 | 5.29 | 6.79 | 1.50 | MF | 160.1 | - | - | 15:14 | 15:39 | 0.9 | 12.4 | 8.28 | 28.9 | - | 1.55 | -21.4 | 10.5 | 11.2 | |
| | | 13-Dec-10 | 4 | 5.29 | 6.79 | 1.50 | B | 170.8 | - | - | 15:39 | 15:52 | 1.3 | 14.8 | 8.38 | 40.3 | - | 1.63 | -21.4 | 10.5 | 14.4 | |
| | | 13-Dec-10 | 4 | 5.29 | 6.79 | 1.50 | C | 154.0 | - | - | 15:52 | 16:02 | 1.7 | 15.5 | 6.11 | 51.0 | 1.0 | 1.69 | -21.0 | 10.6 | 15.2 | |
| | | 13-Dec-10 | 4 | 5.29 | 6.79 | 1.50 | D | 300.0 | 784.9 | 523.3 | 16:02 | 17:20 | 1.9 | 0.5 | 0.18 | 61.3 | 0.0 | 1.74 | -21.0 | 10.7 | 16.8 | |
| | | 25-Oct-10 | 3 | 7.29 | 8.29 | 1.00 | A | 164.2 | - | - | 8:15 | 8:42 | 1.1 | 12.1 | 11.54 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.29 | 8.29 | 1.00 | B | 171.9 | - | - | 8:42 | 8:54 | 1.6 | 18.4 | 12.47 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.29 | 8.29 | 1.00 | C | 169.2 | - | - | 8:54 | 9:02 | 1.8 | 23.3 | 13.16 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.29 | 8.29 | 1.00 | D | 131.9 | 637.2 | 637.2 | 9:02 | 9:08 | 1.8 | 22.2 | 12.20 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 2 | 8.29 | 12.30 | 4.01 | A | 21.2 | 21.2 | 5.3 | 7:58 | 8:11 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+483.25 | Q | 26-Jun-11 | 4 | 5.34 | 6.84 | 1.50 | MF | 34.1 | 34.10 | 22.73 | 4:45 | 5:01 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 7.34 | 8.34 | 1.00 | A | 16.6 | 16.60 | 16.60 | 19:38 | 19:49 | 2.8 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 2 | 8.34 | 10.9 | 2.56 | A | 84.2 | 84.20 | 32.89 | 19:09 | 19:33 | 2.4 | 1.0 | 0.17 | 31.8 | 4.0 | 1.6 | 10.0 | 11.3 | 14.8 | |
| P-31+484 | P | 28-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | B | 166.9 | - | - | 19:43 | 20:07 | 1.0 | 12.0 | 7.90 | - | - | - | - | - | - | |
| | | 28-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | C | 133.1 | - | - | 20:07 | 20:18 | 1.5 | 11.8 | 5.97 | 44.4 | - | 1.65 | 2.9 | 7.6 | 14.3 | |
| | | 28-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | D | 160.3 | - | - | 20:18 | 20:32 | 1.4 | 12.5 | 6.08 | 37.6 | - | 1.65 | 2.9 | 7.6 | 14.8 | |
| | | 28-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | X | 358.7 | 819.0 | 546.0 | 20:32 | 21:01 | 1.3 | 13.5 | 6.73 | 132.3 | - | 1.63 | 2.9 | 7.6 | 14.8 | |
| | | 18-Oct-10 | 3 | 7.42 | 8.42 | 1.00 | A | 74.5 | - | - | 6:59 | 7:11 | 0.8 | 9.1 | 11.47 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 7.42 | 8.42 | 1.00 | B | 134.2 | - | - | 7:11 | 7:24 | 1.0 | 12.4 | 13.03 | 35.4 | 3.0 | 1.65 | 18.4 | 15.8 | 18.3 | |
| | | 18-Oct-10 | 3 | 7.42 | 8.42 | 1.00 | C | 147.4 | - | - | 7:24 | 7:34 | 1.0 | 15.5 | 12.58 | 48.0 | - | 1.66 | 18.4 | 15.8 | 14.6 | |
| | | 18-Oct-10 | 3 | 7.42 | 8.42 | 1.00 | D | 155.9 | - | - | 7:34 | 7:44 | 1.6 | 15.0 | 9.13 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 7.42 | 8.42 | 1.00 | D+ | 79.4 | 591.4 | 591.4 | 7:44 | 7:49 | 2.4 | 16.0 | 6.62 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 8.42 | 12.60 | 4.18 | A | 22.3 | 22.3 | 5.3 | 6:44 | 6:55 | 2.3 | 0.1 | 0.01 | 31.2 | 12.0 | 1.66 | 18.4 | 15.8 | 22.6 | |
| Q-31+484.75 | Q | 25-Jun-11 | 4 | 5.44 | 6.94 | 1.50 | MF | 44 | 44.00 | 29.33 | 1:54 | 2:17 | 2.1 | 0.2 | 0.07 | 30.6 | - | 1.4 | - | - | - | |
| | | 22-Jun-11 | 3 | 7.44 | 8.5 | 1.06 | A | 57.8 | 57.80 | 54.53 | 9:03 | 9:30 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+485.5 | T | 21-Nov-10 | 4 | 5.39 | 6.89 | 1.50 | MF | 153.0 | - | - | 2:07 | 2:30 | 0.6 | 12.2 | 18.56 | 35.3 | 4.0 | 1.39 | 28.8 | 8.2 | 12.4 | |
| | | 21-Nov-10 | 4 | 5.39 | 6.89 | 1.50 | A | 178.2 | - | - | 2:30 | 2:42 | 0.9 | 16.3 | 12.63 | 36.4 | 1.0 | 1.62 | 21.7 | 4.4 | 15.4 | |
| | | 21-Nov-10 | 4 | 5.39 | 6.89 | 1.50 | B | 164.2 | - | - | 2:42 | 2:51 | 1.3 | 8.2 | 5.22 | 42.1 | - | 1.62 | 29.7 | 4.4 | 16.0 | |
| | | 21-Nov-10 | 4 | 5.39 | 6.89 | 1.50 | C | 153.1 | - | - | 2:51 | 3:02 | 1.7 | 16.8 | 6.74 | 52.1 | - | 1.68 | 29.7 | 4.4 | 16.7 | |
| | | 21-Nov-10 | 4 | 5.39 | 6.89 | 1.50 | D | 129.6 | 778.1 | 518.7 | 3:02 | 4:02 | 1.9 | 0.1 | 0.05 | 64.3 | - | 1.70 | 29.7 | 4.4 | 16.7 | |
| | | 25-Oct-10 | 3 | 7.39 | 8.39 | 1.00 | A | 196.4 | - | - | 6:58 | 7:26 | 1.0 | 11.6 | 10.20 | - | - | - | - | - | - | |
| | | 25-Oct-10 | 3 | 7.39 | 8.39 | 1.00 | B | 138.4 | - | - | 7:26 | 7:36 | 1.6 | 19.2 | 10.10 | 34.0 | 9.0 | 1.60 | 10.6 | 13.4 | 15.3 | |
| | | 25-Oct-10 | 3 | 7.39 | 8.39 | 1.00 | C | 167.6 | - | - | 7:36 | 7:43 | 2.0 | 24.9 | 13.47 | 51.0 | - | 1.70 | 10.7 | 13.7 | 15.7 | |
| | | 25-Oct-10 | 3 | 7.39 | 8.39 | 1.00 | C | 117.8 | 620.2 | 620.2 | 7:43 | 7:48 | 2.1 | 27.3 | 12.96 | 50.0 | - | 1.50 | 12.0 | 9.4 | 14.6 | |
| | | 25-Oct-10 | 2 | 8.39 | 12.50 | 4.11 | A | 38.6 | 38.6 | 9.4 | 6:39 | 6:56 | 2.7 | 0.4 | 0.04 | 32.1 | 4.0 | 1.67 | 14.2 | 8.8 | 16.9 | |
| Q-31+486.25 | Q | 26-Jun-11 | 4 | 5.06 | 6.56 | 1.50 | MF | 34.3 | 34.30 | 22.87 | 5:04 | 5:20 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 7.06 | 8.2 | 1.14 | A | 37 | 37.00 | 32.46 | 19:59 | 20:23 | 2.6 | 0.4 | 0.12 | - | - | - | - | - | - | |
| S-31+487 | S | 05-Nov-10 | 4 | 4.99 | 6.49 | 1.50 | A | 122.3 | - | - | 4:24 | 4:47 | 0.9 | 9.5 | 6.17 | 31.4 | 1.0 | 1.64 | 12.8 | - | - | |
| | | 05-Nov-10 | 4 | 4.99 | 6.49 | 1.50 | B | 181.0 | - | - | 4:47 | 5:02 | 1.3 | 15.6 | 8.28 | - | - | - | - | - | - | |
| | | 05-Nov-10 | 4 | 4.99 | 6.49 | 1.50 | C | 167.3 | - | - | 5:02 | 5:11 | 2.2 | 18.6 | 5.19 | 45.1 | - | 1.62 | - | - | 13.6 | |
| | | 05-Nov-10 | 4 | 4.99 | 6.49 | 1.50 | D | 174.4 | - | - | 5:11 | 6:24 | 2.1 | 2.8 | 0.88 | 62.1 | - | 1.59 | - | - | - | |
| | | 05-Nov-10 | 4 | 4.99 | 6.49 | 1.50 | E | 158.0 | 803.0 | 535.3 | 6:24 | 6:55 | 2.5 | 4.4 | 1.19 | 90.0 | 1.0 | 1.71 | 3.0 | 4.0 | 20.0 | |
| | | 20-Oct-10 | 3 | 6.99 | 7.99 | 1.00 | A | 25.7 | - | - | 11:23 | 11:28 | 0.3 | 3.1 | 10.11 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.99 | 7.99 | 1.00 | B | 134.3 | - | - | 11:28 | 11:48 | 0.7 | 12.3 | 15.87 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.99 | 7.99 | 1.00 | C | 188.7 | - | - | 11:48 | 12:02 | 1.3 | 18.2 | 14.94 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.99 | 7.99 | 1.00 | D | 126.3 | - | - | 12:02 | 12:08 | 1.1 | 18.2 | 17.09 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.99 | 7.99 | 1.00 | E | 151.0 | 626.0 | 626.0 | 12:08 | 12:14 | 1.5 | 26.3 | 17.41 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 7.99 | 12.10 | 4.11 | A | 22.4 | 22.4 | 5.5 | 11:07 | 11:19 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+487.75 | Q | 25-Jun-11 | 4 | 5.37 | 6.87 | 1.50 | MF | 37.7 | 37.70 | 25.13 | 23:48 | 0:06 | 2.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.37 | 8.5 | 1.13 | A | 55.1 | 55.10 | 48.76 | 9:36 | 9:59 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+488.5 | T | 21-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | MF | 152.1 | - | - | 4:43 | 5:04 | 1.4 | 12.4 | 11.14 | 32.6 | - | 1.38 | 33.5 | 6.6 | 13.6 | |
| | | 21-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | A | 176.2 | - | - | 5:04 | 5:16 | 1.3 | 15.4 | 7.34 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | B | 165.8 | - | - | 5:16 | 5:25 | 1.8 | 21.5 | 7.96 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | C | 318.7 | - | - | 5:25 | 5:48 | 2.3 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | D | 176.7 | 989.5 | 659.7 | 5:48 | 6:02 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | A | 162.2 | - | - | 16:58 | 17:22 | 0.9 | 12.6 | 12.69 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | B | 158.2 | - | - | 17:22 | 17:32 | 1.5 | 17.8 | 13.69 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | C | 167.9 | - | - | 17:32 | 17:39 | 2.2 | 29.8 | 13.37 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | D | 114.0 | 602.3 | 602.3 | 17:39 | 17:43 | 2.3 | 27.8 | 11.88 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 8.32 | 12.60 | 4.28 | A | 23.3 | 23.3 | 5.4 | 16:45 | 16:55 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+489.25 | Q | 27-Jun-11 | 4 | 5.6 | 7.1 | 1.50 | MF | 49.2 | 49.20 | 32.80 | 6:42 | 7:07 | 1.9 | 0.0 | 0.00 | 31.1 | 9.0 | 1.4 | 8.3 | 10.1 | 13.3 | |
| | | 24-Jun-11 | 3 | 7.6 | 8.8 | 1.20 | A | 17.8 | 17.80 | 14.83 | 20:44 | 20:58 | 2.5 | 0.2 | 0.08 | - | - | - | - | - | - | |
| P-31+490 | P | 30-Oct-10 | 4 | 5.50 | 7.00 | 1.50 | B | 200.5 | - | - | 16:09 | 16:38 | 1.3 | 12.4 | 6.45 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.50 | 7.00 | 1.50 | C | 240.0 | - | - | 16:38 | 16:57 | 1.8 | 12.0 | 4.27 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.50 | 7.00 | 1.50 | D | 184.5 | - | - | 16:57 | 17:11 | 2.1 | 12.8 | 4.16 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.50 | 7.00 | 1.50 | X | 175.0 | 800.0 | 533.3 | 17:11 | 17:42 | 2.5 | 6.1 | 1.64 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | A | 11.5 | 11.5 | 11.5 | 17:09 | 17:21 | 2.9 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 8.85 | 12.90 | 4.05 | A | 20.1 | 20.1 | 5.0 | 16:57 | 17:08 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+490.75 | Q | 25-Jun-11 | 4 | 5.47 | 6.97 | 1.50 | MF | 42.8 | 42.80 | 28.53 | 23:28 | 23:47 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.47 | 8.5 | 1.03 | A | 157.9 | - | - | 10:07 | 10:33 | 2.4 | 9.8 | 4.22 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.47 | 8.5 | 1.03 | B | 155.6 | - | - | 10:33 | 10:58 | 2.5 | 2.9 | 1.05 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.47 | 8.5 | 1.03 | C | 15.6 | 329.10 | 319.51 | 10:58 | 11:16 | 2.5 | 0.0 | 0.00 | 46.2 | - | 1.6 | 13.1 | 13.0 | 19.3 | |
| T-31+491.5 | T | 22-Nov-10 | 4 | 5.57 | 7.07 | 1.50 | MF | 187.2 | - | - | 6:18 | 6:48 | 1.2 | 12.2 | 6.45 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.57 | 7.07 | 1.50 | A | 167.0 | - | - | 6:48 | 7:00 | 1.4 | 15.8 | 8.16 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.57 | 7.07 | 1.50 | B | 175.9 | - | - | 7:00 | 7:12 | 1.1 | 15.7 | 9.10 | 35.1 | 2.0 | 1.60 | 16.2 | 5.6 | 14.9 | |
| | | 22-Nov-10 | 4 | 5.57 | 7.07 | 1.50 | C | 186.9 | - | - | 7:12 | 7:35 | 1.5 | 7.2 | 3.71 | 44.7 | 1.0 | 1.63 | 16.2 | 5.6 | 15.7 | |
| | | 22-Nov-10 | 4 | 5.57 | 7.07 | 1.50 | D | 98.0 | 815.0 | 543.3 | 7:35 | 7:53 | 1.8 | 15.8 | 5.93 | 69.2 | - | 1.65 | 16.2 | 5.6 | 15.2 | |
| | | 24-Oct-10 | 3 | 7.57 | 8.57 | 1.00 | A | 162.3 | - | - | 15:40 | 16:04 | 1.1 | 12.4 | 12.04 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.57 | 8.57 | 1.00 | B | 164.2 | - | - | 16:04 | 16:16 | 1.9 | 18.2 | 9.70 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.57 | 8.57 | 1.00 | C | 170.5 | - | - | 16:16 | 16:25 | 2.8 | 16.3 | 7.90 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.57 | 8.57 | 1.00 | D | 110.8 | 607.8 | 607.8 | 16:25 | 16:32 | 2.6 | 15.2 | 5.92 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 8.57 | 12.60 | 4.03 | A | 22.2 | 22.2 | 5.5 | 15:23 | 15:35 | 2.3 | 0.0 | 0.00 | 38.0 | - | 1.63 | 0.4 | 9.8 | 12.1 | |
| Q-31+492.25 | Q | 27-Jun-11 | 4 | 5.65 | 7.15 | 1.50 | MF | 40.2 | 40.20 | 26.80 | 7:10 | 7:32 | 2.0 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 7.65 | 8.7 | 1.05 | A | 19.8 | 19.80 | 18.86 | 21:01 | 21:14 | 2.7 | 0.3 | 0.12 | - | - | - | - | - | - | |
| S-31+493 | S | 06-Nov-10 | 4 | 5.11 | 6.61 | 1.50 | B | 158.4 | - | - | 7:11 | 7:36 | 1.9 | 8.0 | 2.66 | 36.0 | 4.0 | 1.62 | 5.0 | 4.0 | 19.0 | |
| | | 06-Nov-10 | 4 | 5.11 | 6.61 | 1.50 | C | 338.5 | 496.9 | 331.3 | 7:36 | 8:58 | 2.5 | 0.7 | 0.18 | 47.0 | 1.0 | 1.66 | 3.0 | 4.0 | 18.0 | |
| | | 20-Oct-10 | 3 | 7.11 | 8.11 | 1.00 | A | 36.0 | - | - | 9:51 | 10:00 | 1.2 | 3.0 | 2.44 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.11 | 8.11 | 1.00 | B | 68.6 | 104.6 | 104.6 | 10:00 | 10:42 | 3.1 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 8.11 | 12.80 | 4.69 | A | 28.5 | 28.5 | 6.1 | 9:35 | 9:47 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+493.75 | Q | 25-Jun-11 | 4 | 5.29 | 6.79 | 1.50 | MF | 37.9 | 37.90 | 25.27 | 23:08 | 23:27 | 2.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.29 | 8.3 | 1.01 | A | 24.6 | 24.60 | 24.36 | 13:19 | 13:33 | 2.5 | 0.0 | 0.00 | 33.1 | 1.0 | 1.5 | 12.2 | 20.1 | 16.6 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+494.5 | T | 22-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | MF | 184.6 | - | - | 8:09 | 8:33 | 0.8 | 12.7 | 8.20 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | A | 175.6 | - | - | 8:33 | 8:46 | 1.1 | 15.8 | 10.27 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | B | 199.6 | - | - | 8:46 | 9:00 | 1.5 | 15.0 | 7.62 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | C | 162.8 | - | - | 9:00 | 9:12 | 1.6 | 16.1 | 8.54 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.32 | 6.82 | 1.50 | D | 87.4 | 810.0 | 540.0 | 9:12 | 9:19 | 1.7 | 9.5 | 3.73 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | A | 160.7 | - | - | 14:20 | 14:45 | 0.8 | 12.1 | 14.92 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | B | 160.1 | - | - | 14:45 | 14:56 | 1.0 | 17.9 | 19.11 | 42.0 | - | 1.60 | 0.0 | 9.8 | 13.9 | |
| | | 24-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | C | 238.8 | - | - | 14:56 | 15:06 | 1.1 | 25.6 | 25.55 | 59.0 | - | 1.68 | 0.0 | 9.8 | 13.7 | |
| | | 24-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | D | 85.7 | 645.3 | 645.3 | 15:06 | 15:09 | 1.1 | 25.3 | 22.86 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 8.32 | 12.30 | 3.98 | A | 21.9 | 21.9 | 5.5 | 14:05 | 14:17 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+495.25 | Q | 27-Jun-11 | 4 | 5.34 | 6.84 | 1.50 | MF | 47.3 | 47.30 | 31.53 | 7:33 | 7:57 | 2.0 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 7.34 | 8.4 | 1.06 | A | 122.7 | 122.70 | 115.75 | 21:20 | 22:38 | 2.5 | 0.3 | 0.10 | - | - | - | - | - | - | |
| P-31+496 | P | 30-Oct-10 | 4 | 5.10 | 6.60 | 1.50 | B | 200.0 | - | - | 14:35 | 15:03 | 1.1 | 12.6 | 7.28 | 35.0 | - | 1.63 | 8.0 | 4.0 | 17.0 | |
| | | 30-Oct-10 | 4 | 5.10 | 6.60 | 1.50 | C | 207.4 | - | - | 15:03 | 15:20 | 1.8 | 12.7 | 4.83 | 45.2 | 1.0 | 1.62 | 8.0 | 4.0 | 16.5 | |
| | | 30-Oct-10 | 4 | 5.10 | 6.60 | 1.50 | D | 211.0 | - | - | 15:20 | 15:37 | 2.1 | 14.3 | 4.89 | 64.0 | 2.0 | 1.63 | 8.0 | 4.0 | 15.0 | |
| | | 30-Oct-10 | 4 | 5.10 | 6.60 | 1.50 | X | 181.6 | 800.0 | 533.3 | 15:37 | 15:54 | 2.3 | 1.3 | 0.37 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | A | 35.5 | - | - | 15:57 | 16:04 | 0.6 | 6.1 | 11.99 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | B | 158.0 | - | - | 16:04 | 16:20 | 1.1 | 15.1 | 15.37 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | C | 198.7 | - | - | 16:20 | 16:33 | 1.6 | 15.4 | 11.05 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | D | 136.1 | - | - | 16:33 | 16:40 | 2.4 | 18.0 | 6.79 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | D+ | 121.3 | 649.6 | 649.6 | 16:40 | 16:47 | 2.5 | 19.0 | 7.65 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 8.60 | 12.70 | 4.10 | A | 56.7 | 56.7 | 13.8 | 15:36 | 15:54 | 2.5 | 1.3 | 0.12 | - | - | - | - | - | - | |
| Q-31+496.75 | Q | 25-Jun-11 | 4 | 5.46 | 6.96 | 1.50 | MF | 53.8 | - | - | 22:21 | 22:41 | 2.0 | 0.8 | 0.28 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 25-Jun-11 | 4 | 5.46 | 6.96 | 1.50 | C | 14.4 | 68.20 | 45.47 | 22:41 | 23:03 | 2.0 | 0.5 | 0.16 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.46 | 8.5 | 1.04 | A | 34.6 | 34.60 | 33.27 | 13:39 | 13:55 | 2.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| T-31+497.5 | T | 22-Nov-10 | 4 | 5.14 | 6.64 | 1.50 | MF | 217.9 | - | - | 9:54 | 10:28 | 1.2 | 11.2 | 7.49 | 33.5 | 4.0 | 1.60 | 12.2 | 5.6 | 14.7 | |
| | | 22-Nov-10 | 4 | 5.14 | 6.64 | 1.50 | A | 142.0 | - | - | 10:28 | 10:38 | 1.2 | 15.3 | 8.84 | 30.6 | - | 1.60 | -5.9 | 9.6 | 11.9 | |
| | | 22-Nov-10 | 4 | 5.14 | 6.64 | 1.50 | B | 174.6 | - | - | 10:38 | 10:50 | 1.4 | 16.3 | 7.40 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.14 | 6.64 | 1.50 | C | 142.9 | - | - | 10:50 | 11:03 | 1.6 | 9.8 | 3.88 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.14 | 6.64 | 1.50 | D | 153.6 | 831.0 | 554.0 | 11:03 | 11:22 | 1.9 | 8.7 | 3.08 | 73.3 | - | 1.66 | -5.9 | 9.6 | 12.3 | |
| | | 24-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | A | 160.1 | - | - | 11:26 | 11:48 | 0.9 | 12.4 | 15.00 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | B | 155.4 | - | - | 11:48 | 12:00 | 1.0 | 18.2 | 18.02 | 38.0 | - | 1.67 | 0.0 | 9.2 | 15.3 | |
| | | 24-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | C | 153.8 | - | - | 12:00 | 12:08 | 1.3 | 25.7 | 19.72 | 48.3 | 4.0 | 1.61 | 1.0 | 9.2 | 15.2 | |
| | | 24-Oct-10 | 3 | 7.14 | 8.14 | 1.00 | D | 149.1 | 618.4 | 618.4 | 12:08 | 12:15 | 2.0 | 30.5 | 14.98 | 35.0 | - | 1.61 | 0.0 | 9.8 | 15.3 | |
| | | 24-Oct-10 | 2 | 8.14 | 12.30 | 4.16 | A | 22.8 | 22.8 | 5.5 | 11:10 | 11:22 | 2.4 | 0.0 | 0.00 | 36.0 | 5.0 | 1.60 | -2.5 | 11.3 | 13.7 | |
| Q-31+498.25 | Q | 27-Jun-11 | 4 | 5.27 | 6.77 | 1.50 | MF | 35.2 | 35.20 | 23.47 | 7:59 | 8:17 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 7.27 | 8.4 | 1.13 | A | 20 | 20.00 | 17.70 | 23:09 | 23:26 | 2.7 | 0.1 | 0.03 | - | - | - | - | - | - | |
| S-31+499 | S | 06-Nov-10 | 4 | 4.91 | 6.41 | 1.50 | B | 163.9 | - | - | 9:12 | 9:38 | 2.0 | 12.8 | 4.33 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 4.91 | 6.41 | 1.50 | C | 156.8 | - | - | 9:38 | 9:51 | 2.2 | 12.9 | 3.93 | 52.0 | - | 1.65 | 5.0 | 2.0 | 19.0 | |
| | | 06-Nov-10 | 4 | 4.91 | 6.41 | 1.50 | D | 228.2 | - | - | 9:51 | 10:14 | 2.3 | 11.0 | 3.15 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 4.91 | 6.41 | 1.50 | E | 189.1 | 738.0 | 492.0 | 10:14 | 11:01 | 2.5 | 0.2 | 0.05 | 117.0 | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.91 | 7.91 | 1.00 | A | 133.2 | - | - | 8:25 | 8:45 | 0.9 | 12.3 | 14.60 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.91 | 7.91 | 1.00 | B | 82.3 | - | - | 8:45 | 8:51 | 1.2 | 15.6 | 13.60 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.91 | 7.91 | 1.00 | C | 166.8 | - | - | 8:51 | 9:01 | 2.1 | 18.3 | 8.90 | 47.0 | 7.4 | 1.66 | 4.7 | 9.0 | 13.9 | |
| | | 20-Oct-10 | 3 | 6.91 | 7.91 | 1.00 | D | 187.7 | - | - | 9:01 | 9:08 | 2.3 | 18.4 | 8.40 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 6.91 | 7.91 | 1.00 | E | 56.0 | 626.0 | 626.0 | 9:08 | 9:14 | 2.3 | 14.3 | 6.19 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 7.91 | 12.50 | 4.59 | A | 67.2 | 67.2 | 14.6 | 8:00 | 8:20 | 3.0 | 0.5 | 0.04 | - | - | - | - | - | - | |
| Q-31+499.75 | Q | 25-Jun-11 | 4 | 5.29 | 6.79 | 1.50 | MF | 38.6 | 38.60 | 25.73 | 22:00 | 22:19 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.29 | 8.3 | 1.01 | A | 80.5 | 80.50 | 79.70 | 14:03 | 14:38 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+500.5 | T | 22-Nov-10 | 4 | 5.01 | 6.51 | 1.50 | MF | 185.4 | - | - | 13:54 | 14:20 | 0.8 | 12.2 | 9.98 | 32.6 | - | 1.60 | -3.5 | 10.7 | 13.9 | |
| | | 22-Nov-10 | 4 | 5.01 | 6.51 | 1.50 | A | 178.7 | - | - | 14:20 | 14:32 | 1.1 | 17.9 | 10.25 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.01 | 6.51 | 1.50 | B | 140.7 | - | - | 14:32 | 14:42 | 1.1 | 13.4 | 8.28 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.01 | 6.51 | 1.50 | C | 171.4 | - | - | 14:42 | 14:58 | 1.6 | 10.5 | 4.55 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.01 | 6.51 | 1.50 | D | 144.8 | 821.0 | 547.3 | 14:58 | 15:15 | 1.7 | 6.5 | 2.58 | 70.2 | 0.0 | 1.65 | -3.5 | 10.9 | 13.7 | |
| | | 24-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | A | 166.1 | - | - | 9:58 | 10:22 | 0.6 | 12.8 | 21.24 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | B | 154.8 | - | - | 10:22 | 10:34 | 1.2 | 18.2 | 13.59 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | C | 183.3 | - | - | 10:34 | 10:42 | 1.9 | 25.7 | 13.39 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.01 | 8.01 | 1.00 | D | 97.2 | 601.4 | 601.4 | 10:42 | 10:46 | 1.4 | 22.3 | 16.40 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 8.01 | 12.00 | 3.99 | A | 37.0 | 37.0 | 9.3 | 9:41 | 9:54 | 2.5 | 1.0 | 0.10 | - | - | - | - | - | - | |
| Q-31+501.25 | Q | 27-Jun-11 | 4 | 5.32 | 6.82 | 1.50 | MF | 40.8 | 40.80 | 27.20 | 8:19 | 8:42 | 2.1 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 7.32 | 8.4 | 1.08 | A | 16.8 | 16.80 | 15.56 | 23:33 | 23:44 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+502 | P | 30-Oct-10 | 4 | 5.10 | 6.60 | 1.50 | B | 200.0 | - | - | 10:36 | 11:03 | 1.4 | 13.0 | 6.50 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.10 | 6.60 | 1.50 | C | 201.5 | - | - | 11:03 | 11:19 | 1.6 | 12.2 | 5.30 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.10 | 6.60 | 1.50 | D | 201.8 | - | - | 11:19 | 11:36 | 1.8 | 11.4 | 4.01 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.10 | 6.60 | 1.50 | X | 230.7 | 834.0 | 556.0 | 11:36 | 13:26 | 1.8 | 3.4 | 1.26 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | A | 100.0 | - | - | 14:14 | 14:30 | 0.4 | 8.4 | 17.65 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | B | 75.8 | - | - | 14:30 | 14:36 | 0.7 | 12.9 | 21.18 | 35.0 | - | 1.67 | 9.8 | 11.8 | 20.9 | |
| | | 17-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | C | 216.7 | - | - | 14:36 | 14:54 | 1.3 | 13.4 | 10.72 | 49.3 | - | 1.65 | 10.0 | 11.9 | 18.3 | |
| | | 17-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | D | 164.5 | - | - | 14:54 | 15:08 | 1.3 | 9.8 | 7.56 | 71.0 | 0.0 | 1.74 | 10.1 | 12.0 | 19.3 | |
| | | 17-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | D+ | 112.8 | 669.8 | 669.8 | 15:08 | 15:16 | 1.8 | 18.2 | 9.96 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 8.24 | 12.20 | 3.96 | A | 24.9 | 24.9 | 6.3 | 13:58 | 14:11 | 2.5 | 0.0 | 0.00 | 32.3 | - | 1.67 | 9.0 | 13.3 | 21.2 | |
| Q-31+502.75 | Q | 25-Jun-11 | 4 | 5.42 | 6.92 | 1.50 | MF | 74.8 | 74.80 | 49.87 | 21:34 | 21:58 | 2.0 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.42 | 8.5 | 1.08 | A | 57 | 57.00 | 52.78 | 18:29 | 18:55 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+503.5 | T | 22-Nov-10 | 4 | 5.19 | 6.69 | 1.50 | MF | 145.1 | - | - | 15:30 | 15:54 | 1.5 | 12.6 | 6.22 | 32.5 | - | 1.60 | 1.7 | 10.9 | 15.2 | |
| | | 22-Nov-10 | 4 | 5.19 | 6.69 | 1.50 | A | 188.3 | - | - | 15:54 | 16:03 | 1.4 | 14.7 | 7.70 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.19 | 6.69 | 1.50 | B | 167.3 | - | - | 16:03 | 16:14 | 1.8 | 15.8 | 6.54 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.19 | 6.69 | 1.50 | C | 155.4 | - | - | 16:14 | 16:28 | 2.0 | 6.8 | 3.15 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.19 | 6.69 | 1.50 | D | 144.9 | 801.0 | 534.0 | 16:28 | 17:05 | 1.9 | 3.8 | 1.35 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.19 | 8.19 | 1.00 | A | 173.6 | - | - | 16:06 | 16:34 | 0.9 | 13.1 | 12.43 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.19 | 8.19 | 1.00 | B | 150.3 | - | - | 16:34 | 16:45 | 1.6 | 15.1 | 10.96 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.19 | 8.19 | 1.00 | C | 235.5 | - | - | 16:45 | 16:59 | 1.7 | 17.9 | 11.51 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.19 | 8.19 | 1.00 | D | 102.3 | 661.7 | 661.7 | 16:59 | 17:05 | 2.6 | 19.1 | 7.44 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 8.19 | 12.20 | 4.01 | A | 29.1 | 29.1 | 7.3 | 15:50 | 16:03 | 2.7 | 0.5 | 0.04 | - | - | - | - | - | - | |
| Q-31+504.25 | Q | 27-Jun-11 | 4 | 5.48 | 6.98 | 1.50 | MF | 38.4 | 38.40 | 25.60 | 8:50 | 9:12 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 7.48 | 8.6 | 1.12 | A | 27.6 | 27.60 | 24.64 | 16:19 | 16:35 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+505 | S | 06-Nov-10 | 4 | 5.24 | 6.72 | 1.48 | B | 160.2 | - | - | 13:49 | 14:14 | 2.2 | 11.5 | 3.50 | 36.0 | - | 1.63 | 5.0 | 4.0 | 19.0 | |
| | | 06-Nov-10 | 4 | 5.24 | 6.72 | 1.48 | C | 330.4 | - | - | 14:14 | 15:12 | 2.5 | 11.1 | 3.12 | 49.0 | - | 1.65 | 5.0 | 5.0 | 18.0 | |
| | | 06-Nov-10 | 4 | 5.24 | 6.72 | 1.48 | D | 60.2 | 550.8 | 372.2 | 15:12 | 15:35 | 2.2 | 0.0 | 0.01 | 60.0 | 1.0 | 1.67 | 6.0 | 3.0 | 17.0 | |
| | | 20-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | A | 20.5 | - | - | 6:56 | 7:00 | 0.4 | 2.9 | 7.68 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | B | 161.9 | - | - | 7:00 | 7:23 | 0.8 | 12.4 | 15.16 | 37.5 | 2.4 | 1.68 | 4.7 | 16.9 | 20.1 | |
| | | 20-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | C | 149.5 | - | - | 7:23 | 7:33 | 1.1 | 15.8 | 14.66 | 57.0 | - | 1.70 | 4.7 | 16.9 | 19.1 | |
| | | 20-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | D | 151.1 | - | - | 7:33 | 7:41 | 1.4 | 19.1 | 17.45 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 3 | 7.24 | 8.24 | 1.00 | D+ | 163.0 | 646.0 | 646.0 | 7:41 | 7:48 | 1.3 | 26.1 | 19.82 | - | - | - | - | - | - | |
| | | 20-Oct-10 | 2 | 8.24 | 12.50 | 4.26 | A | 21.7 | 21.7 | 5.1 | 6:40 | 6:53 | 2.7 | 0.0 | 0.00 | 31.2 | 5.0 | 1.66 | 4.7 | 16.9 | 20.2 | |
| Q-31+505.75 | Q | 25-Jun-11 | 4 | 5.46 | 6.96 | 1.50 | MF | 56.6 | 56.60 | 37.73 | 21:06 | 21:32 | 2.1 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.46 | 8.5 | 1.04 | A | 13.7 | 13.70 | 13.17 | 17:30 | 17:44 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+506.5 | T | 22-Nov-10 | 4 | 5.65 | 7.15 | 1.50 | MF | 155.9 | - | - | 17:21 | 17:42 | 1.1 | 12.4 | 8.33 | 32.0 | - | 1.60 | -3.5 | 10.9 | 14.9 | |
| | | 22-Nov-10 | 4 | 5.65 | 7.15 | 1.50 | A | 186.4 | - | - | 17:42 | 17:55 | 1.3 | 15.7 | 9.82 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.65 | 7.15 | 1.50 | B | 216.2 | - | - | 17:55 | 18:35 | 0.9 | 3.8 | 3.46 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.65 | 7.15 | 1.50 | C | 153.0 | - | - | 18:35 | 18:46 | 2.0 | 15.4 | 5.10 | 49.6 | 3.0 | 1.65 | 13.5 | 8.3 | 15.5 | |
| | | 22-Nov-10 | 4 | 5.65 | 7.15 | 1.50 | D | 99.5 | 811.0 | 540.7 | 18:46 | 19:05 | 2.0 | 3.0 | 0.98 | 54.2 | 5.5 | 1.67 | 14.3 | 6.3 | 16.4 | |
| | | 23-Oct-10 | 3 | 7.65 | 8.65 | 1.00 | A | 193.7 | - | - | 14:27 | 14:52 | 1.1 | 15.3 | 14.40 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.65 | 8.65 | 1.00 | B | 146.3 | - | - | 14:52 | 15:00 | 1.6 | 20.9 | 12.77 | 36.2 | - | 1.68 | 18.1 | 10.0 | 17.4 | |
| | | 23-Oct-10 | 3 | 7.65 | 8.65 | 1.00 | C | 156.0 | - | - | 15:00 | 15:08 | 2.0 | 21.7 | 10.66 | 44.0 | 1.8 | 1.69 | 18.3 | 10.2 | 15.7 | |
| | | 23-Oct-10 | 3 | 7.65 | 8.65 | 1.00 | D | 192.0 | 688.0 | 688.0 | 15:08 | 15:18 | 2.0 | 23.7 | 11.82 | 58.0 | - | 1.70 | 17.9 | 9.8 | 17.5 | |
| | | 23-Oct-10 | 2 | 8.65 | 12.70 | 4.05 | A | 22.2 | 22.2 | 5.5 | 14:12 | 14:26 | 2.5 | 0.0 | 0.00 | 32.0 | - | 1.67 | 18.8 | 9.5 | 19.1 | |
| Q-31+507.25 | Q | 27-Jun-11 | 4 | 5.47 | 6.97 | 1.50 | MF | 45.9 | 45.90 | 30.60 | 9:15 | 9:36 | 2.1 | 0.5 | 0.16 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 7.47 | 8.6 | 1.13 | A | 17.3 | 17.30 | 15.31 | 16:02 | 16:15 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+508 | P | 30-Oct-10 | 4 | 5.20 | 6.70 | 1.50 | B | 192.6 | - | - | 8:37 | 9:08 | 1.4 | 12.7 | 6.23 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.20 | 6.70 | 1.50 | C | 195.7 | - | - | 9:08 | 9:19 | 1.5 | 13.5 | 6.33 | 48.0 | - | 1.63 | 4.0 | 6.0 | 14.0 | |
| | | 30-Oct-10 | 4 | 5.20 | 6.70 | 1.50 | D | 208.7 | - | - | 9:19 | 9:37 | 1.8 | 11.1 | 3.84 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.20 | 6.70 | 1.50 | X | 247.0 | 844.0 | 562.7 | 9:37 | 9:56 | 1.7 | 15.7 | 6.26 | 54.9 | - | 1.79 | 4.3 | 7.2 | 17.1 | |
| | | 17-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | A | 23.0 | - | - | 9:50 | 9:51 | 2.5 | 3.7 | 1.43 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | B | 41.6 | 64.6 | 64.6 | 9:51 | 10:40 | 2.9 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 2 | 8.37 | 12.50 | 4.13 | A | 25.4 | 25.4 | 6.2 | 9:36 | 9:48 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+508.75 | Q | 25-Jun-11 | 4 | 5.49 | 6.99 | 1.50 | MF | 44.5 | 44.50 | 29.67 | 20:38 | 20:57 | 2.0 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.49 | 8.5 | 1.01 | A | 57.9 | 57.90 | 57.33 | 17:00 | 17:25 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| T-31+509.5 | T | 22-Nov-10 | 4 | 5.42 | 6.92 | 1.50 | MF | 144.1 | - | - | 19:52 | 20:15 | 1.2 | 10.6 | 8.28 | 32.8 | - | 1.38 | 15.4 | 6.0 | 11.0 | |
| | | 22-Nov-10 | 4 | 5.42 | 6.92 | 1.50 | A | 169.1 | - | - | 20:15 | 20:27 | 1.3 | 15.7 | 7.63 | 38.1 | - | 1.62 | 11.4 | 6.3 | 13.7 | |
| | | 22-Nov-10 | 4 | 5.42 | 6.92 | 1.50 | B | 172.7 | - | - | 20:27 | 20:36 | 1.9 | 23.1 | 10.62 | 41.0 | 8.0 | 1.62 | 11.4 | 6.3 | 14.3 | |
| | | 22-Nov-10 | 4 | 5.42 | 6.92 | 1.50 | C | 160.8 | - | - | 20:36 | 20:49 | 1.7 | 9.4 | 3.70 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.42 | 6.92 | 1.50 | D | 154.3 | 801.0 | 534.0 | 20:49 | 21:36 | 1.8 | 5.3 | 1.95 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.42 | 8.42 | 1.00 | A | 168.9 | - | - | 11:12 | 11:37 | 1.2 | 12.4 | 10.11 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.42 | 8.42 | 1.00 | B | 157.9 | - | - | 11:37 | 11:47 | 1.5 | 18.8 | 11.46 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.42 | 8.42 | 1.00 | C | 174.6 | - | - | 11:47 | 11:54 | 1.8 | 22.8 | 12.12 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.42 | 8.42 | 1.00 | D | 99.8 | 601.2 | 601.2 | 11:54 | 11:58 | 2.6 | 23.1 | 8.77 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 8.42 | 12.70 | 4.28 | A | 23.9 | 23.9 | 5.6 | 11:00 | 11:11 | 2.6 | 0.2 | 0.02 | - | - | - | - | - | - | |
| Q-31+510.25 | Q | 27-Jun-11 | 4 | 5.47 | 6.97 | 1.50 | MF | 42.7 | 42.70 | 28.47 | 10:00 | 10:18 | 2.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 7.47 | 8.6 | 1.13 | A | 42.7 | 42.70 | 37.79 | 15:34 | 15:58 | 2.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| S-31+511 | S | 06-Nov-10 | 4 | 5.50 | 7.00 | 1.50 | B | 169.1 | - | - | 15:38 | 16:03 | 1.8 | 12.7 | 4.55 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.50 | 7.00 | 1.50 | C | 156.1 | - | - | 16:03 | 16:15 | 2.3 | 11.8 | 3.44 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.50 | 7.00 | 1.50 | D | 159.7 | - | - | 16:15 | 16:35 | 2.5 | 11.7 | 3.14 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.50 | 7.00 | 1.50 | E | 316.1 | 801.0 | 534.0 | 16:35 | 17:06 | 2.3 | 9.8 | 2.87 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.50 | 8.50 | 1.00 | A | 26.8 | - | - | 16:05 | 16:12 | 0.6 | 3.1 | 5.11 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.50 | 8.50 | 1.00 | B | 164.2 | - | - | 16:12 | 16:34 | 1.1 | 14.6 | 13.85 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.50 | 8.50 | 1.00 | C | 156.0 | - | - | 16:34 | 16:44 | 1.0 | 16.5 | 17.34 | 53.0 | - | 1.70 | 1.6 | 11.2 | 11.8 | |
| | | 19-Oct-10 | 3 | 7.50 | 8.50 | 1.00 | D | 176.0 | - | - | 16:44 | 16:54 | 1.2 | 14.6 | 9.56 | 86.0 | - | 1.71 | 1.6 | 11.3 | 10.8 | |
| | | 19-Oct-10 | 3 | 7.50 | 8.50 | 1.00 | D+ | 85.0 | 608.0 | 608.0 | 16:54 | 16:58 | 1.0 | 17.8 | 17.40 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 8.50 | 12.80 | 4.30 | A | 23.1 | 23.1 | 5.4 | 15:51 | 16:03 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+511.75 | Q | 25-Jun-11 | 4 | 5.72 | 7.22 | 1.50 | MF | 50.4 | 50.40 | 33.60 | 20:06 | 20:36 | 2.1 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.72 | 8.72 | 1.00 | A | 1.1 | 1.10 | 1.10 | 18:02 | 18:16 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 2 | 8.72 | 11.3 | 2.58 | A | 22.4 | 22.40 | 8.68 | 17:47 | 17:59 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+512.5 | T | 22-Nov-10 | 4 | 5.47 | 6.97 | 1.50 | MF | 163.6 | - | - | 22:08 | 23:02 | 1.4 | 9.6 | 3.86 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.47 | 6.97 | 1.50 | A | 165.7 | - | - | 23:02 | 23:14 | 1.3 | 15.9 | 7.76 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.47 | 6.97 | 1.50 | B | 151.3 | - | - | 23:14 | 23:39 | 1.5 | 3.3 | 1.38 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 4 | 5.47 | 6.97 | 1.50 | C | 54.0 | 534.6 | 356.4 | 23:39 | 0:11 | 1.8 | 0.4 | 0.13 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | A | 192.2 | - | - | 9:43 | 10:10 | 0.6 | 12.6 | 19.56 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | B | 157.8 | - | - | 10:10 | 10:20 | 1.4 | 18.4 | 13.72 | 43.0 | 2.4 | 1.74 | 20.3 | 10.6 | 21.4 | |
| | | 23-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | C | 180.4 | - | - | 10:20 | 10:28 | 1.2 | 24.2 | 20.43 | 53.0 | - | 1.60 | 20.3 | 10.6 | 18.6 | |
| | | 23-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | D | 69.6 | - | - | 10:28 | 10:31 | 1.4 | 21.8 | 15.21 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | E | 200.0 | 800.0 | 800.0 | 10:31 | 10:41 | 1.9 | 26.3 | 13.87 | 300.0 | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 8.47 | 12.70 | 4.23 | A | 23.7 | 23.7 | 5.6 | 9:27 | 9:39 | 2.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| Q-31+513.25 | Q | 27-Jun-11 | 4 | 5.75 | 7.25 | 1.50 | MF | 44.5 | 44.50 | 29.67 | 10:20 | 10:41 | 2.2 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 7.75 | 8.9 | 1.15 | A | 65.1 | 65.10 | 56.61 | 15:02 | 15:30 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+514 | P | 30-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | B | 200.0 | - | - | 7:09 | 7:37 | 0.7 | 12.5 | 11.15 | - | - | - | - | - | - | |
| | | 30-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | C | 201.1 | - | - | 7:37 | 7:54 | 0.9 | 11.7 | 8.90 | 42.0 | 3.0 | 1.63 | 9.0 | 8.0 | 15.0 | |
| | | 30-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | D | 252.6 | - | - | 7:54 | 8:14 | 0.9 | 12.1 | 8.12 | 39.0 | - | 1.64 | 9.0 | 8.0 | 16.0 | |
| | | 30-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | X | 150.3 | 804.0 | 536.0 | 8:14 | 8:25 | 1.1 | 15.2 | 9.36 | - | - | - | - | - | - | |
| | | 17-Oct-10 | 3 | 7.44 | 8.44 | 1.00 | B | 183.6 | - | - | 7:25 | 8:25 | 3.0 | 2.2 | 0.74 | 36.3 | 4.0 | 1.66 | 6.9 | 12.6 | 16.9 | |
| | | 17-Oct-10 | 3 | 7.44 | 8.44 | 1.00 | C | 72.2 | 255.8 | 255.8 | 8:25 | 9:20 | 3.0 | 0.5 | 0.18 | 45.4 | 2.0 | 1.61 | 7.3 | 12.9 | 22.1 | |
| | | 17-Oct-10 | 2 | 8.44 | 12.70 | 4.26 | A | 183.6 | 183.6 | 43.1 | 6:36 | 7:23 | 2.5 | 2.7 | 0.25 | 31.6 | 4.6 | 1.67 | 6.7 | 12.4 | 16.2 | |
| Q-31+514.75 | Q | 25-Jun-11 | 4 | 5.98 | 7.48 | 1.50 | MF | 48.8 | 48.80 | 32.53 | 19:41 | 20:04 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 7.98 | 9 | 1.02 | A | 184.6 | 184.60 | 180.98 | 19:08 | 20:06 | 2.6 | 0.0 | 0.00 | 30.9 | 3.0 | 1.6 | 14.6 | 11.3 | 18.6 | |
| T-31+515.5 | T | 09-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | MF | 181.0 | - | - | 2:31 | 2:56 | 1.1 | 15.6 | 9.52 | 28.8 | 3.0 | 1.43 | 8.0 | 8.0 | 13.0 | |
| | | 09-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | B | 159.6 | - | - | 2:56 | 3:06 | 1.6 | 15.2 | 6.41 | 38.0 | - | 1.63 | -17.0 | 8.0 | 13.0 | |
| | | 09-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | C | 160.1 | - | - | 3:06 | 3:18 | 2.1 | 14.7 | 4.84 | 48.9 | - | 1.68 | -17.0 | 8.0 | 11.0 | |
| | | 09-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | D | 68.2 | 568.9 | 379.3 | 3:18 | 4:09 | 2.0 | 0.6 | 0.18 | 71.0 | - | 1.72 | -17.0 | 8.0 | 11.0 | |
| | | 24-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | A | 171.6 | - | - | 8:22 | 8:48 | 1.0 | 12.5 | 11.95 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | B | 163.8 | - | - | 8:48 | 9:00 | 1.3 | 15.3 | 12.17 | 42.7 | 6.0 | 1.67 | 20.7 | 10.3 | 17.3 | |
| | | 24-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | C | 163.0 | - | - | 9:00 | 9:09 | 1.8 | 21.9 | 12.65 | 48.0 | 0.0 | 1.64 | 20.7 | 10.3 | 16.6 | |
| | | 24-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | D | 142.9 | 641.3 | 641.3 | 9:09 | 9:15 | 2.2 | 24.2 | 11.27 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 8.62 | 12.70 | 4.08 | A | 23.8 | 23.8 | 5.8 | 8:06 | 8:18 | 2.4 | 0.1 | 0.01 | - | - | - | - | - | - | |
| Q-31+516.25 | Q | 27-Jun-11 | 4 | 6 | 7.5 | 1.50 | MF | 46.2 | 46.20 | 30.80 | 10:49 | 11:10 | 2.0 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 8 | 9.2 | 1.20 | A | 67.1 | 67.10 | 55.92 | 14:13 | 14:45 | 2.5 | 0.0 | 0.00 | 31.4 | - | 1.6 | 11.8 | 12.1 | 15.0 | |
| S-31+517 | S | 06-Nov-10 | 4 | 5.65 | 7.15 | 1.50 | B | 128.8 | - | - | 21:50 | 22:14 | 1.8 | 10.5 | 3.87 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.65 | 7.15 | 1.50 | C | 158.3 | - | - | 22:14 | 22:30 | 2.5 | 13.7 | 5.35 | 40.4 | 1.0 | 1.61 | -3.0 | 9.1 | 16.6 | Communicated to S-31+511 |
| | | 06-Nov-10 | 4 | 5.65 | 7.15 | 1.50 | D | 87.8 | 374.9 | 249.9 | 22:30 | 23:26 | 2.6 | 0.9 | 0.22 | 53.2 | - | 1.62 | -3.0 | 9.1 | 16.3 | |
| | | 19-Oct-10 | 3 | 7.65 | 8.65 | 1.00 | A | 71.8 | - | - | 14:47 | 15:00 | 0.5 | 9.3 | 21.27 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.65 | 8.65 | 1.00 | B | 84.1 | - | - | 15:00 | 15:08 | 0.7 | 12.6 | 18.19 | 37.3 | - | 1.69 | 1.5 | 10.5 | 13.6 | |
| | | 19-Oct-10 | 3 | 7.65 | 8.65 | 1.00 | C | 194.4 | - | - | 15:08 | 15:20 | 1.2 | 19.3 | 16.34 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.65 | 8.65 | 1.00 | D | 231.3 | - | - | 15:20 | 15:34 | 2.4 | 18.1 | 7.22 | 42.0 | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.65 | 8.65 | 1.00 | D+ | 109.8 | 691.4 | 691.4 | 15:34 | 15:40 | 2.0 | 21.7 | 11.09 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 8.65 | 12.90 | 4.25 | A | 24.5 | 24.5 | 5.8 | 14:29 | 14:44 | 2.6 | 0.0 | 0.00 | 33.1 | - | 1.68 | 1.4 | 10.7 | 16.3 | |
| T-31+518.5 | T | 02-Dec-10 | 4 | 5.72 | 7.22 | 1.50 | MF | 82.8 | - | - | 2:26 | 2:42 | 1.2 | 11.6 | 7.41 | 30.1 | 4.0 | 1.41 | -2.0 | 13.0 | 13.0 | Communicated to T-31+524.5 |
| | | 02-Dec-10 | 4 | 5.72 | 7.22 | 1.50 | B | 172.2 | - | - | 2:42 | 3:03 | 1.8 | 8.1 | 5.72 | 36.5 | - | 1.63 | -1.0 | 13.0 | 13.0 | |
| | | 02-Dec-10 | 4 | 5.72 | 7.22 | 1.50 | C | 114.0 | 369.0 | 246.0 | 3:03 | 3:51 | 1.9 | 0.5 | 0.16 | 48.9 | 1.0 | 1.68 | -1.0 | 13.0 | 15.0 | |
| | | 24-Oct-10 | 3 | 7.72 | 8.72 | 1.00 | A | 46.1 | 46.1 | 46.1 | 7:27 | 7:55 | 2.5 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 24-Oct-10 | 2 | 8.72 | 12.70 | 3.98 | A | 124.4 | 124.4 | 31.3 | 6:44 | 7:23 | 2.5 | 1.2 | 0.12 | 31.3 | 7.0 | 1.66 | 20.7 | 10.4 | 18.4 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+520 | P | 29-Oct-10 | 4 | 5.80 | 7.30 | 1.50 | B | 191.1 | - | - | 5:07 | 5:33 | 1.1 | 12.2 | 8.11 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 5.80 | 7.30 | 1.50 | C | 205.7 | - | - | 5:33 | 5:50 | 1.1 | 12.4 | 7.90 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 5.80 | 7.30 | 1.50 | D | 205.5 | - | - | 5:50 | 6:07 | 1.2 | 12.0 | 6.42 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 5.80 | 7.30 | 1.50 | X | 197.7 | 800.0 | 533.3 | 6:07 | 6:24 | 1.2 | 6.6 | 3.73 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | B | 176.1 | - | - | 14:30 | 14:59 | 3.1 | 7.1 | 2.34 | 36.2 | - | 1.64 | 6.2 | 10.6 | 18.5 | |
| | | 16-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | C | 249.9 | - | - | 14:59 | 16:10 | 3.0 | 2.4 | 0.78 | 48.9 | - | 1.68 | 6.3 | 10.8 | 18.7 | |
| | | 16-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | D | 92.9 | - | - | 16:10 | 17:10 | 3.2 | 1.2 | 0.40 | 50.0 | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 7.85 | 8.85 | 1.00 | D+ | 32.3 | 551.2 | 551.2 | 17:10 | 17:45 | 3.1 | 0.6 | 0.21 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 8.85 | 13.00 | 4.15 | A | 28.4 | 28.4 | 6.8 | 14:13 | 14:25 | 2.4 | 0.2 | 0.02 | 31.6 | - | 1.67 | 6.2 | 10.6 | 18.4 | |
| Q-31+520.75 | Q | 25-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 45.3 | 45.30 | 30.20 | 19:17 | 19:36 | 2.2 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | A | 38.5 | 38.50 | 37.02 | 21:58 | 22:24 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+521.5 | T | 02-Dec-10 | 4A | 5.98 | 7.48 | 1.50 | A | 40.8 | - | - | 21:58 | 22:15 | 0.8 | 9.3 | 8.52 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4A | 5.98 | 7.48 | 1.50 | B | 40.5 | - | - | 22:15 | 22:23 | 1.1 | 12.6 | 7.07 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4A | 5.98 | 7.48 | 1.50 | C | 78.9 | - | - | 22:23 | 22:34 | 1.9 | 14.6 | 5.49 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4A | 5.98 | 7.48 | 1.50 | D | 76.8 | - | - | 22:34 | 23:10 | 2.1 | 3.4 | 1.02 | - | - | - | - | - | - | Communicated to T-31+524.5. Split Quantities. |
| | | 02-Dec-10 | 4A | 5.98 | 7.48 | 1.50 | E | 5.5 | 242.3 | 161.5 | 23:10 | 23:23 | 2.0 | 0.5 | 0.15 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | A | 175.9 | - | - | 8:05 | 8:32 | 0.5 | 9.0 | 20.71 | - | - | - | - | - | - | |
| | | 23-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | C | 159.4 | - | - | 8:32 | 8:45 | 1.3 | 13.4 | 9.49 | - | - | - | - | - | - | By-Pass. Outside casing. |
| | | 23-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | D | 132.7 | - | - | 8:45 | 8:55 | 1.2 | 12.6 | 10.00 | 78.0 | 2.0 | 1.70 | 38.0 | 11.2 | 22.8 | |
| | | 23-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | E | 172.6 | 640.6 | 640.6 | 8:55 | 9:10 | 1.4 | 11.3 | 7.95 | 60.0 | - | - | - | - | - | |
| | | 23-Oct-10 | 2 | 8.98 | 13.00 | 4.02 | A | 38.0 | 38.0 | 9.5 | 7:46 | 8:00 | 2.7 | 1.0 | 0.09 | 32.5 | 2.0 | 1.67 | 18.0 | 10.1 | 20.2 | |
| Q-31+522.25 | Q | 27-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 51.3 | 51.30 | 34.20 | 11:15 | 11:37 | 1.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | A | 43.8 | 43.80 | 42.12 | 5:04 | 5:25 | 2.6 | 0.2 | 0.06 | - | - | - | - | - | - | |
| S-31+523 | S | 06-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | B | 112.1 | - | - | 0:52 | 1:44 | 1.2 | 10.3 | 5.93 | 37.5 | - | 1.64 | -3.0 | 9.0 | 15.9 | |
| | | 06-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | C | 189.0 | - | - | 1:44 | 1:56 | 2.0 | 16.0 | 6.23 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | D | 178.5 | - | - | 1:56 | 2:07 | 2.9 | 21.4 | 4.01 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 5.90 | 7.40 | 1.50 | E | 104.5 | 584.1 | 389.4 | 2:07 | 2:55 | 2.5 | 0.1 | 0.03 | >180 | 2.0 | 1.55 | 2.9 | 8.9 | 16.8 | |
| | | 19-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | A | 45.8 | - | - | 11:50 | 11:58 | 0.4 | 7.5 | 15.16 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | B | 123.1 | - | - | 11:58 | 12:10 | 1.5 | 14.9 | 10.06 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | C | 155.7 | - | - | 12:10 | 12:19 | 1.1 | 19.6 | 16.71 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | D | 168.6 | - | - | 12:19 | 12:28 | 1.5 | 18.9 | 13.16 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.90 | 8.90 | 1.00 | D+ | 167.0 | 660.2 | 660.2 | 12:28 | 12:35 | 2.1 | 22.0 | 10.32 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 8.90 | 12.90 | 4.00 | A | 107.6 | 107.6 | 26.9 | 11:20 | 11:48 | 3.0 | 0.5 | 0.04 | - | - | - | - | - | - | |
| Q-31+523.75 | Q | 25-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 53.2 | 53.20 | 35.47 | 18:53 | 19:13 | 2.1 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | A | 158.7 | - | - | 20:44 | 21:04 | 2.2 | 10.4 | 4.84 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | B | 115.6 | 274.30 | 263.75 | 21:04 | 21:46 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+524.5 | T | 02-Dec-10 | 4 | 6.03 | 7.53 | 1.50 | A | 40.8 | - | - | 21:58 | 22:15 | 0.8 | 9.3 | 8.52 | 31.5 | 2.4 | 1.62 | 4.0 | 11.0 | 13.0 | |
| | | 02-Dec-10 | 4 | 6.03 | 7.53 | 1.50 | B | 40.5 | - | - | 22:15 | 22:23 | 1.1 | 12.6 | 7.07 | 36.8 | 1.6 | 1.63 | 4.0 | 11.0 | 13.0 | |
| | | 02-Dec-10 | 4 | 6.03 | 7.53 | 1.50 | C | 78.9 | - | - | 22:23 | 22:34 | 1.9 | 14.6 | 5.49 | 46.2 | - | 1.67 | 4.0 | 11.0 | 14.0 | |
| | | 02-Dec-10 | 4 | 6.03 | 7.53 | 1.50 | D | 76.8 | - | - | 22:34 | 23:10 | 2.1 | 3.4 | 1.02 | 64.3 | - | 1.71 | 4.0 | 11.0 | 15.0 | Communicated to T-31+521.5. Split Quantities. |
| | | 02-Dec-10 | 4 | 6.03 | 7.53 | 1.50 | E | 5.5 | 242.3 | 161.5 | 23:10 | 23:23 | 2.0 | 0.5 | 0.15 | 83.5 | - | 1.75 | 4.0 | 11.0 | 16.0 | |
| | | 22-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | A | 69.9 | - | - | 16:49 | 17:04 | 0.8 | 6.1 | 8.16 | - | - | - | - | - | - | By-Pass to ground surface 2 m u/s of c/l. |
| | | 22-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | B | 129.3 | - | - | 17:04 | 17:16 | 1.4 | 13.3 | 7.71 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | C | 53.0 | - | - | 17:16 | 17:20 | 1.6 | 9.5 | 5.95 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | D | 72.2 | - | - | 17:20 | 17:27 | 1.7 | 12.5 | 7.31 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.03 | 9.03 | 1.00 | E | 276.2 | 600.6 | 600.6 | 17:27 | 17:52 | 2.4 | 12.2 | 5.16 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 9.03 | 13.10 | 4.07 | A | 24.2 | 24.2 | 6.0 | 16:36 | 16:45 | 2.1 | 0.3 | 0.03 | - | - | - | - | - | - | |
| Q-31+525.25 | Q | 27-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 47.6 | 47.60 | 31.73 | 20:28 | 20:50 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | A | 70.9 | 70.90 | 68.17 | 4:35 | 4:59 | 2.5 | 0.4 | 0.15 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+526 | P | 29-Oct-10 | 4 | 5.90 | 7.40 | 1.50 | B | 186.4 | - | - | 3:24 | 3:54 | 1.3 | 12.3 | 6.54 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 5.90 | 7.40 | 1.50 | C | 208.0 | - | - | 3:54 | 4:10 | 1.1 | 12.6 | 6.90 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 5.90 | 7.40 | 1.50 | D | 192.6 | - | - | 4:10 | 4:26 | 1.4 | 13.6 | 6.04 | 47.9 | - | 1.73 | 3.0 | 7.1 | 16.3 | |
| | | 29-Oct-10 | 4 | 5.90 | 7.40 | 1.50 | X | 196.9 | 783.9 | 522.6 | 4:26 | 4:43 | 1.2 | 11.6 | 6.25 | >300 | - | 1.70 | 3.0 | 7.1 | 14.4 | |
| | | 16-Oct-10 | 3 | 8.36 | 9.36 | 1.00 | A | 51.9 | - | - | 10:02 | 10:12 | 2.3 | 6.0 | 2.66 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 8.36 | 9.36 | 1.00 | B | 218.9 | - | - | 10:12 | 11:46 | 3.2 | 1.2 | 0.40 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 8.36 | 9.36 | 1.00 | C | 9.6 | 280.4 | 280.4 | 11:46 | 11:56 | 2.8 | 0.3 | 0.12 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 9.36 | 13.60 | 4.24 | A | 23.1 | 23.1 | 5.4 | 9:43 | 9:56 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+526.75 | Q | 25-Jun-11 | 4 | 6.31 | 7.81 | 1.50 | MF | 46.2 | 46.20 | 30.80 | 18:30 | 18:50 | 2.0 | 0.0 | 0.00 | 32.1 | 4.0 | 1.4 | 9.5 | 12.2 | 12.5 | |
| | | 22-Jun-11 | 3 | 8.31 | 9.4 | 1.09 | A | 101.6 | 101.60 | 93.21 | 2:04 | 2:47 | 2.6 | 0.0 | 0.00 | 30.5 | - | 1.6 | 10.6 | 10.1 | 17.2 | |
| T-31+527.5 | T | 09-Dec-10 | 4 | 6.18 | 7.68 | 1.50 | MF | 176.8 | - | - | 4:41 | 5:05 | 1.3 | 11.6 | 5.97 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 6.18 | 7.68 | 1.50 | B | 157.2 | - | - | 5:05 | 5:16 | 2.0 | 15.6 | 5.88 | - | - | - | - | - | - | |
| | | 09-Dec-10 | 4 | 6.18 | 7.68 | 1.50 | C | 142.0 | 476.0 | 317.3 | 5:16 | 6:45 | 2.2 | 0.7 | 0.22 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.18 | 9.18 | 1.00 | A | 160.1 | - | - | 15:27 | 15:55 | 0.9 | 12.4 | 12.22 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.18 | 9.18 | 1.00 | B | 168.6 | - | - | 15:55 | 16:07 | 1.4 | 18.2 | 13.75 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.18 | 9.18 | 1.00 | C | 155.7 | - | - | 16:07 | 16:16 | 1.7 | 18.3 | 10.86 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.18 | 9.18 | 1.00 | D | 191.6 | 676.0 | 676.0 | 16:16 | 16:24 | 1.9 | 25.3 | 13.40 | 77.0 | - | 1.66 | 15.7 | 11.2 | 20.0 | |
| | | 22-Oct-10 | 2 | 9.18 | 13.30 | 4.12 | A | 26.1 | 26.1 | 6.3 | 15:08 | 15:22 | 2.2 | 0.2 | 0.03 | - | - | - | - | - | - | |
| Q-31+528.25 | Q | 27-Jun-11 | 4 | 6.33 | 7.83 | 1.50 | MF | 70.4 | 70.40 | 46.93 | 20:52 | 21:23 | 2.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 8.33 | 9.5 | 1.17 | A | 53.1 | 53.10 | 45.38 | 10:16 | 10:42 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+529 | S | 06-Nov-10 | 4 | 6.13 | 7.63 | 1.50 | B | 157.7 | - | - | 3:41 | 4:02 | 1.9 | 12.9 | 4.55 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 6.13 | 7.63 | 1.50 | C | 151.4 | - | - | 4:02 | 4:12 | 2.4 | 15.4 | 4.69 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 6.13 | 7.63 | 1.50 | D | 162.9 | - | - | 4:12 | 4:40 | 2.6 | 10.6 | 4.63 | - | - | - | - | - | - | |
| | | 06-Nov-10 | 4 | 6.13 | 7.63 | 1.50 | E | 77.6 | 549.6 | 366.4 | 4:40 | 5:27 | 2.5 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.13 | 9.13 | 1.00 | B | 145.8 | - | - | 9:40 | 10:00 | 1.2 | 13.2 | 10.85 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.13 | 9.13 | 1.00 | C | 192.2 | - | - | 10:00 | 10:12 | 1.4 | 18.9 | 13.34 | 71.0 | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.13 | 9.13 | 1.00 | D | 162.0 | - | - | 10:12 | 10:21 | 0.9 | 12.4 | 14.47 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.13 | 9.13 | 1.00 | D+ | 105.2 | 605.2 | 605.2 | 10:21 | 10:26 | 1.0 | 24.8 | 15.34 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 9.13 | 13.60 | 4.47 | A | 57.5 | - | - | 9:14 | 9:26 | 2.5 | 4.2 | 0.36 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 9.13 | 13.60 | 4.47 | B | 23.3 | 80.8 | 18.1 | 9:26 | 9:37 | 2.4 | 2.0 | 10.72 | - | - | - | - | - | - | |
| Q-31+529.75 | Q | 25-Jun-11 | 4 | 6.42 | 7.92 | 1.50 | MF | 58.3 | 58.30 | 38.87 | 17:06 | 17:31 | 1.9 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 8.42 | 9.4 | 0.98 | A | 17.5 | 17.50 | 17.86 | 22:39 | 22:52 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+530.5 | T | 02-Dec-10 | 4 | 6.43 | 7.93 | 1.50 | C | 198.7 | 198.7 | 132.5 | 18:36 | 19:46 | 1.9 | 0.3 | 0.11 | - | - | - | - | - | - | Prior communication. Confirmed closure. |
| | | 22-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | A | 159.0 | - | - | 13:51 | 14:22 | 0.9 | 12.3 | 13.66 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | B | 157.3 | - | - | 14:22 | 14:33 | 1.3 | 14.9 | 11.49 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | C | 157.1 | - | - | 14:33 | 14:42 | 2.0 | 21.4 | 10.43 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.43 | 9.43 | 1.00 | D | 167.5 | 640.9 | 640.9 | 14:42 | 14:53 | 2.3 | 18.2 | 7.82 | 150.0 | - | - | 15.0 | 9.0 | - | |
| | | 22-Oct-10 | 2 | 9.43 | 13.80 | 4.37 | A | 22.4 | 22.4 | 5.1 | 13:39 | 13:51 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+531.25 | Q | 27-Jun-11 | 4 | 6.52 | 8.02 | 1.50 | MF | 41.3 | 41.30 | 27.53 | 21:25 | 21:45 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 8.52 | 9.6 | 1.08 | A | 26.3 | 26.30 | 24.35 | 9:51 | 10:09 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+532 | P | 29-Oct-10 | 4 | 6.10 | 7.60 | 1.50 | B | 203.3 | - | - | 1:50 | 2:15 | 1.0 | 12.7 | 8.52 | 36.6 | - | 1.64 | 3.2 | 8.4 | 12.4 | |
| | | 29-Oct-10 | 4 | 6.10 | 7.60 | 1.50 | C | 177.1 | - | - | 2:15 | 2:32 | 1.0 | 12.1 | 8.05 | 47.0 | - | 1.67 | 3.0 | 8.0 | 13.0 | |
| | | 29-Oct-10 | 4 | 6.10 | 7.60 | 1.50 | D | 210.6 | - | - | 2:32 | 2:50 | 1.0 | 12.1 | 8.25 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 6.10 | 7.60 | 1.50 | X | 196.0 | 787.0 | 524.7 | 2:50 | 3:07 | 1.4 | 15.2 | 7.30 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 8.13 | 9.13 | 1.00 | A | 56.5 | - | - | 8:38 | 8:48 | 0.2 | 9.0 | 44.72 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 3 | 8.13 | 9.13 | 1.00 | B | 166.5 | - | - | 8:48 | 9:03 | 0.6 | 12.1 | 19.38 | 36.0 | 5.0 | 1.67 | 2.4 | 11.7 | 13.7 | |
| | | 16-Oct-10 | 3 | 8.13 | 9.13 | 1.00 | C | 176.3 | - | - | 9:03 | 9:17 | 1.0 | 12.3 | 12.28 | 47.0 | - | 1.64 | 2.4 | 11.7 | 13.8 | |
| | | 16-Oct-10 | 3 | 8.13 | 9.13 | 1.00 | D | 216.2 | 615.5 | 615.5 | 9:17 | 9:30 | 1.7 | 15.9 | 9.34 | - | - | - | - | - | - | |
| | | 16-Oct-10 | 2 | 9.13 | 13.20 | 4.07 | A | 40.3 | 40.3 | 9.9 | 8:22 | 8:34 | 2.4 | 1.1 | 0.12 | 32.0 | 7.0 | 1.66 | 2.4 | 11.7 | 13.6 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+532.75 | Q | 25-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 49.5 | 49.50 | 33.00 | 16:42 | 17:04 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | A | 130.5 | - | - | 22:59 | 23:32 | 2.6 | 3.5 | 1.34 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | B | 57.2 | 187.70 | 180.48 | 23:32 | 0:08 | 2.6 | 0.0 | 0.00 | 37.6 | - | 1.6 | 14.6 | 11.3 | 15.6 | |
| T-31+533.5 | T | 10-Dec-10 | 4 | 5.98 | 7.48 | 1.50 | MF | 175.7 | - | - | 10:18 | 10:44 | 0.8 | 11.7 | 8.75 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 5.98 | 7.48 | 1.50 | B | 144.2 | - | - | 10:44 | 10:55 | 1.6 | 12.7 | 5.22 | 37.5 | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 5.98 | 7.48 | 1.50 | C | 152.5 | - | - | 10:55 | 11:09 | 2.0 | 7.1 | 2.29 | 43.3 | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 5.98 | 7.48 | 1.50 | D | 73.2 | 545.6 | 363.7 | 11:09 | 11:49 | 1.9 | 0.4 | 0.14 | 48.6 | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | A | 160.3 | - | - | 10:49 | 11:12 | 0.6 | 12.2 | 17.92 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | B | 155.0 | - | - | 11:12 | 11:22 | 1.0 | 18.4 | 17.47 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | C | 142.8 | - | - | 11:22 | 11:31 | 1.3 | 21.3 | 16.64 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 7.98 | 8.98 | 1.00 | D | 182.8 | 640.9 | 640.9 | 11:31 | 11:38 | 1.4 | 26.2 | 18.74 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 8.98 | 13.00 | 4.02 | A | 74.8 | 74.8 | 18.6 | 10:24 | 10:45 | 2.4 | 1.2 | 0.12 | - | - | - | - | - | - | |
| Q-31+534.25 | Q | 27-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 221.4 | - | - | 21:46 | 22:30 | 2.1 | 9.0 | 2.71 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | B | 159.2 | - | - | 22:30 | 22:59 | 2.1 | 2.6 | 0.78 | 36.2 | 6.0 | 1.6 | 14.9 | 11.6 | 15.7 | |
| | | 27-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | C | 25.5 | 406.10 | 270.73 | 22:59 | 23:23 | 2.1 | 0.7 | 0.21 | 45.8 | - | 1.7 | 14.9 | 12.0 | 15.6 | |
| | | 24-Jun-11 | 3 | 8.16 | 9.16 | 1.00 | A | 6.1 | 6.10 | 6.10 | 9:32 | 9:46 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 2 | 9.16 | 11.7 | 2.54 | A | 180.3 | - | - | 8:16 | 8:45 | 1.7 | 9.2 | 2.21 | 30.1 | 1.0 | 1.6 | 10.2 | 13.8 | 14.5 | |
| | | 24-Jun-11 | 2 | 9.16 | 11.7 | 2.54 | B | 166.7 | - | - | 8:45 | 8:59 | 2.3 | 14.6 | 2.53 | 36.8 | - | 1.6 | 10.4 | 14.2 | 15.2 | |
| | | 24-Jun-11 | 2 | 9.16 | 11.7 | 2.54 | C | 114.3 | - | - | 8:59 | 9:11 | 2.4 | 4.6 | 0.71 | 49.2 | - | 1.6 | 10.4 | 14.2 | 15.3 | |
| | | 24-Jun-11 | 2 | 9.16 | 11.7 | 2.54 | D | 11 | 472.30 | 185.94 | 9:11 | 9:25 | 2.4 | 0.0 | 0.00 | 73.0 | - | 1.6 | 10.5 | 14.2 | 15.7 | |
| S-31+535 | S | 07-Nov-10 | 4 | 5.88 | 7.38 | 1.50 | B | 176.7 | - | - | 6:36 | 7:02 | 1.7 | 12.0 | 4.80 | 34.0 | 3.0 | 1.62 | 3.0 | 6.0 | 19.0 | |
| | | 07-Nov-10 | 4 | 5.88 | 7.38 | 1.50 | C | 153.3 | - | - | 7:02 | 7:16 | 2.2 | 11.6 | 3.54 | 51.1 | 1.0 | 1.64 | 3.0 | 8.0 | 15.5 | |
| | | 07-Nov-10 | 4 | 5.88 | 7.38 | 1.50 | D | 182.5 | - | - | 7:16 | 7:33 | 2.3 | 10.5 | 2.94 | 44.3 | - | 1.64 | 7.0 | 9.0 | 15.0 | |
| | | 07-Nov-10 | 4 | 5.88 | 7.38 | 1.50 | E | 84.4 | 596.9 | 397.9 | 7:33 | 8:19 | 2.4 | 0.7 | 0.19 | 122.8 | 1.0 | 1.70 | 6.0 | 8.0 | 17.0 | |
| | | 19-Oct-10 | 3 | 7.88 | 8.88 | 1.00 | A | 29.3 | - | - | 8:02 | 8:07 | 0.0 | 3.2 | 98.60 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.88 | 8.88 | 1.00 | B | 130.7 | - | - | 8:07 | 8:23 | 0.6 | 11.4 | 19.64 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.88 | 8.88 | 1.00 | C | 156.1 | - | - | 8:23 | 8:35 | 0.8 | 8.7 | 10.25 | 44.0 | - | 1.68 | 7.2 | 12.5 | 21.5 | |
| | | 19-Oct-10 | 3 | 7.88 | 8.88 | 1.00 | D | 120.9 | - | - | 8:35 | 8:44 | 1.4 | 13.7 | 10.54 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 7.88 | 8.88 | 1.00 | D+ | 183.0 | 620.0 | 620.0 | 8:44 | 8:54 | 1.5 | 20.9 | 13.84 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 2 | 8.88 | 13.00 | 4.12 | A | 22.4 | 22.4 | 5.4 | 7:45 | 7:59 | 2.0 | 0.2 | 0.03 | - | - | - | - | - | - | |
| Q-31+535.75 | Q | 25-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 42.4 | 42.40 | 28.27 | 16:06 | 16:40 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | A | 28.2 | 28.20 | 27.12 | 2:59 | 3:18 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+536.5 | T | 02-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | MF | 191.7 | - | - | 16:23 | 16:54 | 1.1 | 9.4 | 5.98 | - | - | - | - | - | - | Communicated to T-31+530.5 |
| | | 02-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | B | 156.1 | - | - | 16:54 | 17:11 | 1.3 | 9.4 | 4.94 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | C | 156.1 | - | - | 17:11 | 17:27 | 1.5 | 9.9 | 4.37 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | D | 62.2 | 566.1 | 377.4 | 17:27 | 18:10 | 2.0 | 0.5 | 0.16 | 61.0 | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.08 | 9.08 | 1.00 | A | 154.7 | - | - | 9:00 | 9:23 | 0.7 | 13.1 | 18.68 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.08 | 9.08 | 1.00 | B | 156.7 | - | - | 9:23 | 9:34 | 1.2 | 15.1 | 12.73 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.08 | 9.08 | 1.00 | C | 165.1 | - | - | 9:34 | 9:43 | 1.3 | 18.0 | 14.16 | 47.0 | 4.0 | 1.68 | 14.9 | 10.7 | 19.1 | |
| | | 22-Oct-10 | 3 | 8.08 | 9.08 | 1.00 | D | 164.3 | 640.8 | 640.8 | 9:43 | 9:51 | 1.7 | 19.4 | 11.22 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 9.08 | 13.70 | 4.62 | A | 47.5 | 47.5 | 10.3 | 8:45 | 8:56 | 2.4 | 1.8 | 0.16 | - | - | - | - | - | - | |
| Q-31+537.25 | Q | 27-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | D | 51.6 | 328.90 | 219.27 | 0:03 | 0:28 | 2.0 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 189.8 | - | - | 23:30 | 23:53 | 2.0 | 14.4 | 4.95 | - | - | - | - | - | - | Communicated to Q-31+534.25 |
| | | 27-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | C | 87.5 | - | - | 23:53 | 0:03 | 2.1 | 8.6 | 3.13 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | A | 150.2 | - | - | 10:49 | 11:15 | 2.6 | 6.9 | 2.67 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | B | 37.9 | 188.10 | 180.87 | 11:15 | 11:37 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+538 | P | 29-Oct-10 | 4 | 6.10 | 7.60 | 1.50 | B | 193.3 | - | - | 22:24 | 22:50 | 0.9 | 12.5 | 8.34 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 6.10 | 7.60 | 1.50 | C | 190.8 | - | - | 22:50 | 23:06 | 1.1 | 12.0 | 7.26 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 6.10 | 7.60 | 1.50 | D | 198.2 | - | - | 23:06 | 23:22 | 1.1 | 11.4 | 7.27 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 6.10 | 7.60 | 1.50 | X | 218.7 | 801.0 | 534.0 | 23:22 | 23:40 | 1.0 | 12.4 | 8.29 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 102.5 | - | - | 16:32 | 16:47 | 0.4 | 14.4 | 28.00 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | B | 121.5 | - | - | 16:47 | 17:00 | 0.6 | 9.5 | 16.88 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | C | 126.6 | - | - | 17:00 | 17:13 | 0.7 | 11.1 | 15.55 | - | - | - | - | - | - | Clumpy Cement. |
| | | 15-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | D | 256.1 | 606.7 | 606.7 | 17:13 | 17:46 | 3.1 | 21.5 | 6.89 | 59.0 | - | 1.63 | 0.4 | 11.2 | 20.3 | |
| | | 15-Oct-10 | 2 | 9.16 | 13.20 | 4.04 | A | 24.0 | 24.0 | 5.9 | 16:19 | 16:29 | 2.1 | 0.3 | 0.04 | - | - | - | - | - | - | |
| Q-31+538.75 | Q | 25-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 39.5 | 39.50 | 26.33 | 15:43 | 16:04 | 1.9 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | A | 22 | 22.00 | 21.15 | 3:27 | 3:40 | 2.7 | 0.1 | 0.04 | - | - | - | - | - | - | |
| T-31+539.5 | T | 02-Dec-10 | 4A | 6.16 | 7.66 | 1.50 | D | 153.4 | 153.4 | 102.3 | 15:00 | 16:03 | 2.0 | 0.5 | 0.15 | 61.8 | - | - | - | - | - | Prior communication. Confirmed closure. |
| | | 22-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | A | 199.7 | - | - | 7:38 | 8:08 | 0.8 | 12.5 | 14.94 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | B | 150.3 | - | - | 8:08 | 8:18 | 1.2 | 15.1 | 14.64 | 36.2 | 8.0 | 1.65 | 14.9 | 10.7 | 19.8 | |
| | | 22-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | C | 160.2 | - | - | 8:18 | 8:28 | 1.8 | 18.1 | 11.64 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 3 | 8.16 | 9.16 | 1.00 | D | 103.3 | 613.5 | 613.5 | 8:28 | 8:32 | 2.0 | 29.9 | 14.74 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 9.16 | 13.70 | 4.54 | A | 23.5 | 23.5 | 5.2 | 7:23 | 7:35 | 2.4 | 0.2 | 0.01 | - | - | - | - | - | - | |
| Q-31+540.25 | Q | 27-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 69.3 | 69.30 | 46.20 | 2:16 | 2:48 | 2.1 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 8.16 | 9.3 | 1.14 | A | 14.2 | 14.20 | 12.46 | 11:44 | 11:57 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| S-31+541 | S | 07-Nov-10 | 4 | 6.10 | 7.60 | 1.50 | B | 166.2 | - | - | 9:12 | 9:39 | 1.7 | 11.5 | 4.68 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 6.10 | 7.60 | 1.50 | C | 162.2 | - | - | 9:39 | 9:55 | 1.8 | 11.1 | 4.36 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 6.10 | 7.60 | 1.50 | D | 165.1 | - | - | 9:55 | 10:09 | 2.2 | 12.4 | 3.78 | 78.3 | 1.0 | 1.68 | 3.0 | 4.0 | 19.0 | |
| | | 07-Nov-10 | 4 | 6.10 | 7.60 | 1.50 | E | 215.4 | 708.9 | 472.6 | 10:09 | 10:58 | 2.6 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 19-Oct-10 | 3 | 8.10 | 9.10 | 1.00 | B | 91.8 | 91.8 | 91.8 | 6:54 | 7:39 | 3.1 | 0.1 | 0.03 | 35.1 | 5.0 | 1.65 | 7.1 | 12.4 | 20.4 | |
| | | 19-Oct-10 | 2 | 9.10 | 13.20 | 4.10 | A | 29.1 | 29.1 | 7.1 | 6:39 | 6:51 | 2.5 | 0.7 | 0.07 | 32.5 | 4.0 | 1.67 | 7.2 | 12.6 | 21.8 | |
| T-31+542.5 | T | 02-Dec-10 | 4 | 6.05 | 7.55 | 1.50 | MF | 182.7 | - | - | 13:11 | 13:40 | 0.8 | 7.8 | 5.99 | 27.7 | - | 1.42 | 1.0 | 12.0 | 16.5 | |
| | | 02-Dec-10 | 4 | 6.05 | 7.55 | 1.50 | B | 154.7 | - | - | 13:40 | 14:00 | 1.4 | 9.1 | 4.40 | 44.6 | - | 1.64 | -4.1 | 14.3 | 14.5 | Communicated to T-31+539.5 |
| | | 02-Dec-10 | 4 | 6.05 | 7.55 | 1.50 | C | 149.5 | - | - | 14:00 | 14:17 | 2.1 | 8.8 | 2.78 | 42.4 | 1.0 | 1.67 | -4.1 | 13.2 | 15.5 | |
| | | 02-Dec-10 | 4 | 6.05 | 7.55 | 1.50 | D | 61.5 | 548.4 | 365.6 | 14:17 | 14:58 | 1.9 | 0.7 | 0.24 | 58.3 | 0.5 | 1.69 | -1.0 | 11.0 | 16.5 | |
| | | 22-Oct-10 | 3 | 8.05 | 9.05 | 1.00 | A | 13.9 | 13.9 | 13.9 | 7:04 | 7:15 | 2.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 22-Oct-10 | 2 | 9.05 | 13.80 | 4.75 | A | 25.9 | 25.9 | 5.5 | 6:45 | 7:00 | 2.5 | 0.0 | 0.00 | 31.2 | 10.0 | 1.65 | 22.6 | 15.4 | 27.2 | |
| P-31+544 | P | 29-Oct-10 | 4 | 5.80 | 7.30 | 1.50 | B | 190.3 | - | - | 20:46 | 21:12 | 0.8 | 12.6 | 10.59 | 37.2 | 4.0 | 1.67 | 3.0 | 9.0 | 17.4 | |
| | | 29-Oct-10 | 4 | 5.80 | 7.30 | 1.50 | C | 160.2 | - | - | 21:12 | 21:26 | 0.8 | 12.7 | 9.50 | 42.1 | 3.0 | 1.62 | 3.0 | 11.0 | 13.4 | |
| | | 29-Oct-10 | 4 | 5.80 | 7.30 | 1.50 | D | 232.9 | - | - | 21:26 | 21:45 | 0.9 | 12.8 | 7.81 | 51.1 | - | 1.62 | 3.0 | 11.0 | 15.1 | |
| | | 29-Oct-10 | 4 | 5.80 | 7.30 | 1.50 | X | 205.1 | 788.5 | 525.7 | 21:45 | 22:02 | 1.0 | 13.4 | 9.34 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | A | 114.3 | - | - | 14:53 | 15:04 | 0.0 | 13.1 | 112.60 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | B | 191.1 | - | - | 15:04 | 15:22 | 0.7 | 10.6 | 14.66 | 40.3 | - | 1.68 | -1.9 | 11.2 | 15.3 | |
| | | 15-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | C | 234.6 | - | - | 15:22 | 15:47 | 2.0 | 6.0 | 6.00 | 47.3 | 2.6 | 1.65 | -1.8 | 11.5 | 14.9 | Communicated to T-31+542.5 |
| | | 15-Oct-10 | 3 | 7.80 | 8.80 | 1.00 | D | 110.0 | 650.0 | 650.0 | 15:47 | 15:53 | 2.8 | 32.8 | 11.65 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 2 | 8.80 | 13.00 | 4.20 | A | 27.3 | 27.3 | 6.5 | 14:38 | 14:50 | 2.2 | 0.3 | 0.04 | - | - | - | - | - | - | |
| T-31+545.5 | T | 02-Dec-10 | 4A | 6.08 | 7.58 | 1.50 | MF | 91.9 | - | - | 8:38 | 9:13 | 0.5 | 8.5 | 12.16 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4A | 6.08 | 7.58 | 1.50 | B | 80.5 | - | - | 9:13 | 9:31 | 1.0 | 8.4 | 5.41 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4A | 6.08 | 7.58 | 1.50 | C | 74.7 | - | - | 9:31 | 9:47 | 2.0 | 9.0 | 2.95 | - | - | - | - | - | - | Communicated to T-31+548.5. Split quantities. |
| | | 02-Dec-10 | 4A | 6.08 | 7.58 | 1.50 | D | 45.1 | 292.2 | 194.8 | 9:47 | 10:49 | 1.9 | 0.5 | 0.16 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 8.08 | 9.08 | 1.00 | A | 120.2 | 120.2 | 120.2 | 16:57 | 17:55 | 2.5 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 9.08 | 13.80 | 4.72 | A | 25.8 | 25.8 | 5.5 | 16:35 | 16:54 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+547 | S | 07-Nov-10 | 4 | 5.75 | 7.25 | 1.50 | B | 178.0 | - | - | 13:18 | 13:45 | 2.2 | 11.5 | 3.17 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 5.75 | 7.25 | 1.50 | C | 143.6 | - | - | 13:45 | 13:57 | 2.4 | 21.6 | 1.33 | 50.9 | - | 1.63 | -1.0 | 7.0 | 15.4 | |
| | | 07-Nov-10 | 4 | 5.75 | 7.25 | 1.50 | D | 208.4 | 530.0 | 353.3 | 13:57 | 15:08 | 2.6 | 1.1 | 0.27 | 72.0 | - | 1.67 | 0.2 | 7.0 | 16.2 | |
| | | 18-Oct-10 | 3 | 7.75 | 8.75 | 1.00 | B | 167.4 | - | - | 16:28 | 16:45 | 1.0 | 13.6 | 13.69 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 7.75 | 8.75 | 1.00 | C | 152.8 | - | - | 16:45 | 16:59 | 1.2 | 14.3 | 16.91 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 7.75 | 8.75 | 1.00 | D | 150.0 | - | - | 16:59 | 17:05 | 1.2 | 8.7 | 8.24 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 7.75 | 8.75 | 1.00 | D+ | 151.1 | 621.3 | 621.3 | 17:05 | 17:17 | 1.7 | 15.4 | 9.28 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 8.75 | 13.20 | 4.45 | A | 114.0 | 114.0 | 25.6 | 15:58 | 16:25 | 2.5 | 1.2 | 0.11 | - | - | - | - | - | - | |
| Q-31+547.75 | Q | 25-Jun-11 | 4 | 5.89 | 7.39 | 1.50 | MF | 143.9 | - | - | 14:14 | 14:43 | 1.8 | 13.1 | 7.63 | 31.3 | - | 1.4 | 13.4 | 10.6 | 11.6 | |
| | | 25-Jun-11 | 4 | 5.89 | 7.39 | 1.50 | B | 172.3 | - | - | 14:43 | 14:54 | 1.7 | 13.2 | 4.33 | - | - | - | - | - | - | |
| | | 25-Jun-11 | 4 | 5.89 | 7.39 | 1.50 | C | 199.6 | - | - | 14:54 | 15:12 | 2.0 | 11.6 | 3.72 | 47.1 | - | 1.5 | 7.3 | 11.0 | 14.3 | |
| | | 25-Jun-11 | 4 | 5.89 | 7.39 | 1.50 | D | 79.2 | 595.00 | 396.67 | 15:12 | 15:37 | 2.1 | 0.2 | 0.05 | 61.3 | - | 1.6 | 7.0 | 11.3 | 14.5 | |
| | | 22-Jun-11 | 3 | 7.89 | 8.9 | 1.01 | A | 19.9 | 19.90 | 19.70 | 3:48 | 4:00 | 2.5 | 0.3 | 0.11 | - | - | - | - | - | - | |
| T-31+548.5 | T | 02-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | MF | 91.9 | - | - | 8:38 | 9:13 | 0.5 | 8.5 | 12.16 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | B | 80.5 | - | - | 9:13 | 9:31 | 1.0 | 8.4 | 5.41 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | C | 74.7 | - | - | 9:31 | 9:47 | 2.0 | 9.0 | 2.95 | - | - | - | - | - | - | Communicated to T-31+545.5. Split quantities. |
| | | 02-Dec-10 | 4 | 5.62 | 7.12 | 1.50 | D | 45.1 | 292.2 | 194.8 | 9:47 | 10:49 | 1.9 | 0.5 | 0.16 | 52.1 | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | A | 160.0 | - | - | 15:29 | 15:48 | 0.7 | 12.6 | 20.29 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | B | 172.0 | - | - | 15:48 | 16:00 | 1.0 | 16.5 | 15.52 | 37.9 | 1.4 | 1.69 | 14.9 | 10.7 | 18.4 | |
| | | 21-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | C | 122.0 | - | - | 16:00 | 16:08 | 1.5 | 16.0 | 10.59 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.62 | 8.62 | 1.00 | D | 179.6 | 633.6 | 633.6 | 16:08 | 16:18 | 1.4 | 27.7 | 19.31 | 76.0 | 0.0 | 1.72 | 15.0 | 10.9 | 15.2 | |
| | | 21-Oct-10 | 2 | 8.62 | 13.10 | 4.48 | A | 26.2 | 26.2 | 5.8 | 15:08 | 15:20 | 2.4 | 0.1 | 0.01 | 31.2 | - | 1.66 | 16.0 | 12.5 | 16.5 | |
| Q-31+549.25 | Q | 27-Jun-11 | 4 | 5.66 | 7.16 | 1.50 | MF | 113.4 | 113.40 | 75.60 | 2:50 | 3:29 | 1.9 | 0.4 | 0.13 | 30.6 | - | 1.4 | - | - | 14.8 | |
| | | 23-Jun-11 | 3 | 7.66 | 8.7 | 1.04 | A | 20.5 | 20.50 | 19.71 | 4:11 | 4:28 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+550 | P | 29-Oct-10 | 4 | 5.50 | 7.00 | 1.50 | B | 153.9 | - | - | 19:03 | 19:23 | 1.7 | 12.9 | 6.05 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 5.50 | 7.00 | 1.50 | C | 246.8 | - | - | 19:23 | 19:43 | 1.3 | 12.2 | 6.37 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 5.50 | 7.00 | 1.50 | D | 195.5 | - | - | 19:43 | 19:58 | 1.4 | 12.8 | 6.27 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 5.50 | 7.00 | 1.50 | X | 228.8 | 825.0 | 550.0 | 19:58 | 20:15 | 1.4 | 14.9 | 7.11 | >300 | - | 1.69 | 2.2 | 9.1 | 18.6 | |
| | | 15-Oct-10 | 3 | 7.60 | 8.60 | 1.00 | A | 32.8 | 32.8 | 32.8 | 14:11 | 14:30 | 3.0 | 0.1 | 0.04 | 33.1 | - | 1.67 | 0.9 | 11.0 | 20.3 | |
| | | 15-Oct-10 | 2 | 8.60 | 12.80 | 4.20 | A | 26.7 | 26.7 | 6.4 | 13:51 | 14:04 | 2.2 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-31+551.5 | T | 02-Dec-10 | 4A | 5.47 | 6.97 | 1.50 | MF | 93.7 | - | - | 6:54 | 7:24 | 1.1 | 9.0 | 5.57 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4A | 5.47 | 6.97 | 1.50 | B | 75.8 | - | - | 7:24 | 7:41 | 2.0 | 5.8 | 1.95 | - | - | - | - | - | - | |
| | | 02-Dec-10 | 4A | 5.47 | 6.97 | 1.50 | C | 78.6 | - | - | 7:41 | 8:08 | 2.0 | 11.4 | 3.81 | - | - | - | - | - | - | Communicated to T-31+554.5. Split quantities. |
| | | 02-Dec-10 | 4A | 5.47 | 6.97 | 1.50 | D | 3.5 | 251.6 | 167.7 | 8:08 | 8:23 | 2.1 | 0.4 | 0.13 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | A | 180.0 | - | - | 11:25 | 12:04 | 0.5 | 12.6 | 28.26 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | B | 140.0 | - | - | 12:04 | 12:14 | 1.4 | 15.1 | 10.16 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | C | 160.0 | - | - | 12:14 | 12:25 | 2.4 | 13.7 | 5.99 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | D | 120.0 | 600.0 | 600.0 | 12:25 | 12:40 | 2.5 | 7.6 | 3.04 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 8.47 | 12.50 | 4.03 | A | 73.7 | 73.7 | 18.3 | 10:08 | 11:23 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | Plugged lines. Injection paused. |
| S-31+553 | S | 07-Nov-10 | 4 | 5.39 | 6.89 | 1.50 | B | 169.5 | - | - | 15:19 | 15:45 | 1.6 | 12.7 | 5.33 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 5.39 | 6.89 | 1.50 | C | 151.4 | - | - | 15:45 | 15:58 | 2.1 | 12.9 | 4.05 | - | - | - | - | - | - | |
| | | 07-Nov-10 | 4 | 5.39 | 6.89 | 1.50 | D | 166.3 | 487.2 | 324.8 | 15:58 | 16:57 | 2.6 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 7.39 | 8.39 | 1.00 | A | 25.8 | - | - | 14:43 | 14:48 | 0.1 | 3.4 | 59.44 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 7.39 | 8.39 | 1.00 | B | 160.9 | - | - | 14:48 | 15:07 | 0.8 | 12.9 | 17.95 | 38.0 | - | 1.70 | 3.8 | 9.2 | 22.2 | |
| | | 18-Oct-10 | 3 | 7.39 | 8.39 | 1.00 | C | 154.8 | - | - | 15:07 | 15:18 | 1.0 | 15.9 | 16.45 | 46.7 | - | 1.69 | 3.8 | 9.2 | 15.4 | |
| | | 18-Oct-10 | 3 | 7.39 | 8.39 | 1.00 | D | 163.5 | - | - | 15:18 | 15:27 | 1.2 | 18.0 | 15.20 | 65.2 | - | 1.71 | 3.0 | 9.2 | - | |
| | | 18-Oct-10 | 3 | 7.39 | 8.39 | 1.00 | D+ | 94.6 | 599.6 | 599.6 | 15:27 | 15:32 | 2.0 | 15.1 | 7.48 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 8.39 | 12.50 | 4.11 | A | 22.1 | 22.1 | 5.4 | 14:28 | 14:39 | 2.4 | 0.1 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+554.5 | T | 02-Dec-10 | 4 | 5.29 | 6.79 | 1.50 | MF | 93.7 | - | - | 6:54 | 7:24 | 1.1 | 9.0 | 5.57 | 26.1 | 11.0 | 1.40 | 0.8 | 14.0 | 12.4 | |
| | | 02-Dec-10 | 4 | 5.29 | 6.79 | 1.50 | B | 75.8 | - | - | 7:24 | 7:41 | 2.0 | 5.8 | 1.95 | 35.4 | 5.0 | 1.65 | 2.1 | 14.0 | 15.1 | |
| | | 02-Dec-10 | 4 | 5.29 | 6.79 | 1.50 | C | 78.6 | - | - | 7:41 | 8:08 | 2.0 | 11.4 | 3.81 | 42.5 | - | 1.66 | 0.0 | 11.0 | 15.7 | Communicated to T-31+551.5. Split quantities. |
| | | 02-Dec-10 | 4 | 5.29 | 6.79 | 1.50 | D | 3.5 | 251.6 | 167.7 | 8:08 | 8:23 | 2.1 | 0.4 | 0.13 | 49.9 | - | 1.68 | -1.0 | 10.0 | 15.6 | |
| | | 21-Oct-10 | 3 | 7.29 | 8.29 | 1.00 | A | 54.9 | 54.9 | 54.9 | 9:19 | 9:55 | 2.4 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 8.29 | 12.60 | 4.31 | A | 21.1 | 21.1 | 4.9 | 9:02 | 9:15 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+556 | P | 29-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | B | 160.0 | - | - | 14:50 | 15:17 | 1.0 | 12.4 | 7.75 | 37.9 | 5.0 | 1.64 | 12.0 | 10.2 | 17.3 | |
| | | 29-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | C | 240.2 | - | - | 15:17 | 15:37 | 1.2 | 10.8 | 6.34 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | D | 242.8 | - | - | 15:37 | 15:57 | 1.0 | 13.3 | 9.20 | - | - | - | - | - | - | |
| | | 29-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | X | 235.0 | 878.0 | 585.3 | 15:57 | 16:16 | 1.1 | 10.7 | 6.80 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | A | 30.5 | - | - | 9:29 | 9:37 | 1.5 | 3.0 | 1.82 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | B | 166.9 | - | - | 9:37 | 10:02 | 3.0 | 6.4 | 2.10 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | C | 108.2 | - | - | 10:02 | 10:22 | 3.0 | 5.4 | 1.63 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | D | 210.2 | 515.8 | 515.8 | 10:22 | 11:38 | 2.9 | 0.1 | 0.03 | 56.4 | - | 1.53 | 0.0 | 10.4 | 18.4 | |
| | | 15-Oct-10 | 2 | 8.37 | 12.40 | 4.03 | A | 66.5 | 66.5 | 16.5 | 9:03 | 9:25 | 2.4 | 1.5 | 0.50 | - | - | - | - | - | - | |
| T-31+557.5 | T | 10-Dec-10 | 4 | 5.32 | 6.82 | 1.50 | MF | 160.0 | - | - | 8:28 | 9:05 | 0.9 | 12.2 | 9.01 | 27.8 | - | 1.41 | 9.0 | 15.2 | 12.0 | |
| | | 10-Dec-10 | 4 | 5.32 | 6.82 | 1.50 | B | 163.2 | - | - | 9:05 | 9:18 | 1.7 | 11.0 | 4.27 | 37.6 | 4.0 | 1.66 | 9.0 | 15.2 | 12.6 | |
| | | 10-Dec-10 | 4 | 5.32 | 6.82 | 1.50 | C | 66.2 | 389.4 | 259.6 | 9:18 | 9:49 | 2.1 | 0.0 | 0.00 | 43.6 | 1.0 | 1.69 | 9.0 | 15.2 | 12.7 | |
| | | 21-Oct-10 | 3 | 7.32 | 8.32 | 1.00 | A | 14.0 | 14.0 | 14.0 | 8:42 | 8:54 | 2.3 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 8.32 | 12.90 | 4.58 | A | 32.1 | 32.1 | 7.0 | 8:26 | 8:39 | 2.7 | 0.4 | 0.07 | - | - | - | - | - | - | |
| S-31+559 | S | 07-Nov-10 | 4 | 5.44 | 6.94 | 1.50 | B | 49.5 | 49.5 | 33.0 | 19:49 | 20:16 | 2.4 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 3 | 7.44 | 8.44 | 1.00 | B | 107.4 | 107.4 | 107.4 | 13:38 | 14:20 | 3.1 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 18-Oct-10 | 2 | 8.44 | 12.90 | 4.46 | A | 35.7 | 35.7 | 8.0 | 13:23 | 13:34 | 2.4 | 1.0 | 0.10 | - | - | - | - | - | - | |
| T-31+560.5 | T | 01-Dec-10 | 4 | 5.47 | 6.97 | 1.50 | MF | 170.7 | - | - | 4:19 | 5:11 | 1.2 | 12.4 | 7.80 | 30.2 | - | 1.40 | -2.0 | 10.0 | 12.0 | |
| | | 01-Dec-10 | 4 | 5.47 | 6.97 | 1.50 | B | 174.2 | - | - | 5:11 | 5:23 | 2.1 | 13.8 | 3.07 | 37.4 | - | 1.63 | 0.0 | 10.0 | 16.0 | |
| | | 01-Dec-10 | 4 | 5.47 | 6.97 | 1.50 | C | 137.8 | 482.7 | 321.8 | 5:23 | 6:15 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 3 | 7.47 | 8.47 | 1.00 | A | 76.6 | 76.6 | 76.6 | 7:13 | 8:20 | 2.5 | 0.5 | 0.20 | - | - | - | - | - | - | |
| | | 21-Oct-10 | 2 | 8.47 | 12.50 | 4.03 | A | 78.0 | 78.0 | 19.4 | 6:46 | 7:11 | 2.5 | 2.2 | 0.23 | 31.2 | 5.0 | 1.67 | 16.7 | 12.4 | 20.2 | |
| P-31+562 | P | 29-Oct-10 | 4 | 5.30 | 6.80 | 1.50 | B | 40.2 | 40.2 | 26.8 | 14:22 | 14:50 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | A | 152.0 | - | - | 7:40 | 8:00 | 2.6 | 8.9 | 2.55 | - | - | - | - | - | - | |
| | | 15-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | B | 100.7 | - | - | 8:00 | 8:31 | 3.0 | 0.0 | 0.02 | 37.6 | 2.0 | 1.65 | 1.2 | 9.8 | 13.4 | |
| | | 15-Oct-10 | 3 | 7.37 | 8.37 | 1.00 | C | 0.0 | 252.7 | 252.7 | 8:31 | 8:43 | 3.1 | 0.0 | 0.01 | 46.1 | - | 1.60 | 1.7 | 9.9 | 15.4 | |
| | | 15-Oct-10 | 2 | 8.37 | 12.80 | 4.43 | A | 24.9 | 24.9 | 5.6 | 7:22 | 7:37 | 2.8 | 0.1 | 0.00 | 33.4 | 5.0 | 1.69 | - | - | - | |
| T-31+563.5 | T | 27-Jun-11 | 4 | 4.66 | 6.66 | 2.00 | MF | 27.8 | 27.8 | 13.9 | 3:31 | 3:48 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 3 | 7.16 | 8.16 | 1.00 | A | 37.3 | 37.3 | 37.3 | 9:34 | 10:10 | 2.6 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 2 | 8.16 | 12.20 | 4.04 | A | 42.1 | 42.1 | 10.4 | 9:10 | 9:29 | 2.5 | 1.7 | 0.16 | - | - | - | - | - | - | |
| S-31+565 | S | 25-Jun-11 | 4 | 4.94 | 6.94 | 2.00 | A | 36.2 | 36.2 | 18.1 | 9:50 | 10:05 | 2.5 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 3 | 7.44 | 8.44 | 1.00 | A | 169.3 | - | - | 8:40 | 9:07 | 0.9 | 12.5 | 13.07 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 3 | 7.44 | 8.44 | 1.00 | B | 165.1 | - | - | 9:07 | 9:17 | 2.5 | 18.7 | 7.29 | 36.9 | 3.5 | 1.60 | 7.2 | 15.3 | 18.5 | |
| | | 12-Jun-11 | 3 | 7.44 | 8.44 | 1.00 | C | 146.1 | - | - | 9:17 | 9:31 | 3.0 | 6.1 | 2.11 | 43.8 | - | 1.62 | 7.2 | 15.3 | 19.1 | |
| | | 12-Jun-11 | 3 | 7.44 | 8.44 | 1.00 | D | 142.8 | 623.3 | 623.3 | 9:31 | 10:10 | 3.0 | 0.0 | 0.00 | 68.2 | - | 1.63 | 7.2 | 15.3 | 18.9 | |
| | | 12-Jun-11 | 2 | 8.44 | 12.50 | 4.06 | A | 142.9 | 142.9 | 35.2 | 7:53 | 8:36 | 2.4 | 1.0 | 0.11 | 31.2 | 4.5 | 1.58 | 10.6 | 13.2 | 18.4 | |
| T-31+566.5 | T | 10-Jun-11 | 4 | 2.61 | 4.61 | 2.00 | MF | 28.6 | 68.6 | 34.3 | 8:22 | 8:40 | 2.0 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 25-Jun-11 | 4 | 5.60 | 7.60 | 2.00 | MF | 40.0 | - | - | 3:14 | 3:31 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 3 | 8.10 | 9.10 | 1.00 | A | 40.6 | 40.6 | 40.6 | 8:33 | 9:09 | 2.7 | 0.3 | 0.13 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 2 | 9.10 | 13.20 | 4.10 | A | 129.4 | 129.4 | 31.6 | 7:41 | 8:27 | 2.6 | 1.3 | 0.12 | 35.9 | - | 1.61 | 12.5 | 8.2 | 15.4 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+568 | P | 23-Jun-11 | 4 | 5.22 | 7.22 | 2.00 | A | 38.8 | 38.8 | 19.4 | 19:38 | 19:55 | 3.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 3 | 7.72 | 8.72 | 1.00 | A | 23.1 | 23.1 | 23.1 | 8:40 | 8:58 | 3.5 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 2 | 8.72 | 12.90 | 4.18 | A | 66.2 | 66.2 | 15.8 | 8:05 | 8:38 | 2.5 | 0.2 | 0.02 | 31.6 | 3.5 | 1.60 | 11.9 | 11.0 | 14.6 | |
| T-31+569.5 | T | 27-Jun-11 | 4 | 6.66 | 8.66 | 2.00 | MF | 38.8 | 38.8 | 19.4 | 3:55 | 4:15 | 1.9 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 3 | 9.16 | 10.16 | 1.00 | A | 18.6 | 18.6 | 18.6 | 10:54 | 11:10 | 2.6 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 2 | 10.16 | 14.30 | 4.14 | A | 29.2 | 29.2 | 7.1 | 10:22 | 10:43 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+571 | S | 24-Jun-11 | 4 | 6.93 | 8.93 | 2.00 | B | 160.1 | - | - | 2:04 | 2:24 | 2.4 | 11.0 | 1.45 | 36.2 | 4.0 | 1.64 | 10.5 | 10.9 | 14.9 | |
| | | 24-Jun-11 | 4 | 6.93 | 8.93 | 2.00 | C | 21.7 | 181.8 | 90.9 | 2:24 | 2:36 | 2.6 | 0.7 | 0.09 | 48.7 | - | 1.67 | 10.5 | 10.9 | 16.3 | |
| | | 12-Jun-11 | 3 | 9.43 | 10.43 | 1.00 | A | 17.2 | 17.2 | 17.2 | 11:07 | 11:24 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 2 | 10.43 | 14.40 | 3.97 | A | 47.3 | 47.3 | 11.9 | 10:42 | 11:04 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 1 | 14.40 | 19.50 | 5.10 | A | 14.1 | 14.1 | 2.8 | 10:23 | 10:37 | 5.4 | 0.7 | 0.03 | - | - | - | - | - | - | |
| T-31+572.2 | T | 25-Jun-11 | 4 | 8.48 | 10.48 | 2.00 | MF | 54.6 | 54.6 | 27.3 | 3:34 | 3:53 | 2.1 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 3 | 10.98 | 11.98 | 1.00 | A | 18.3 | 18.3 | 18.3 | 10:27 | 10:53 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 2 | 11.98 | 16.00 | 4.02 | A | 19.1 | 19.1 | 4.8 | 10:06 | 10:25 | 2.3 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 1 | 16.00 | 21.00 | 5.00 | A | 14.8 | 14.8 | 3.0 | 9:43 | 10:00 | 5.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+574 | P | 23-Jun-11 | 4 | 10.18 | 12.18 | 2.00 | A | 60.7 | 60.7 | 30.4 | 19:59 | 20:19 | 2.5 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 3 | 12.68 | 13.68 | 1.00 | A | 180.0 | 180.0 | 180.0 | 9:50 | 11:21 | 3.1 | 0.1 | 0.14 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 1,2 | 13.68 | 22.70 | 9.02 | A | 67.0 | 67.0 | 7.4 | 9:15 | 9:43 | 2.5 | 1.4 | 0.06 | - | - | - | - | - | - | Incorrectly Grouted. Pmax not obtained. |
| T-31+575.5 | T | 27-Jun-11 | 4 | 13.14 | 15.14 | 2.00 | MF | 90.0 | 90.0 | 45.0 | 4:16 | 4:41 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 3 | 13.68 | 14.68 | 1.00 | A | 23.3 | 23.3 | 23.3 | 16:03 | 16:33 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 14.68 | 18.70 | 4.02 | A | 38.7 | 38.7 | 9.6 | 15:47 | 16:00 | 3.3 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 1 | 18.70 | 23.70 | 5.00 | A | 25.2 | 25.2 | 5.0 | 15:31 | 15:44 | 6.2 | 0.0 | 0.00 | 32.6 | - | 1.63 | 14.6 | 14.2 | 23.3 | |
| | | 21-Jun-11 | 1C | 23.70 | 31.00 | 7.30 | A | 20.7 | 20.7 | 2.8 | 15:13 | 15:26 | 8.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+577 | S | 24-Jun-11 | 4 | 13.04 | 15.04 | 2.00 | B | 93.1 | 93.1 | 46.6 | 2:44 | 3:09 | 3.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 3 | 15.77 | 16.77 | 1.00 | A | 13.6 | - | - | 14:07 | 14:23 | 3.6 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 3 | 15.54 | 16.54 | 1.00 | A | 163.9 | - | - | 15:29 | 15:56 | 2.5 | 12.1 | 5.39 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 3 | 15.54 | 16.54 | 1.00 | B | 151.4 | - | - | 15:56 | 16:05 | 2.9 | 18.5 | 5.66 | 38.5 | - | 1.60 | 15.3 | 17.9 | 25.6 | |
| | | 14-Jun-11 | 3 | 15.54 | 16.54 | 1.00 | C | 97.7 | 413.0 | 413.0 | 16:05 | 16:31 | 3.5 | 0.2 | 0.06 | 43.8 | - | 1.61 | 15.3 | 17.9 | 26.1 | |
| | | 12-Jun-11 | 2 | 16.77 | 20.60 | 3.83 | A | 15.8 | - | - | 13:47 | 14:04 | 3.5 | 0.4 | 0.03 | 30.2 | 4.0 | 1.59 | 8.2 | 17.3 | 18.1 | |
| | | 14-Jun-11 | 2 | 16.54 | 20.54 | 4.00 | A | 22.7 | 38.5 | 9.6 | 15:08 | 15:23 | 3.4 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 1 | 20.54 | 25.50 | 4.96 | A | 18.0 | 18.0 | 3.6 | 14:44 | 15:00 | 6.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 1C | 25.50 | 30.60 | 5.10 | A | 22.8 | 22.8 | 4.5 | 14:18 | 14:38 | 8.8 | 0.0 | 0.00 | 32.7 | 4.0 | 1.60 | 15.0 | 17.6 | 23.7 | |
| T-31+578.5 | T | 25-Jun-11 | 4 | 13.91 | 15.91 | 2.00 | MF | 176.9 | - | - | 3:56 | 4:16 | 1.8 | 15.4 | 4.54 | - | - | - | - | - | - | Bypass between plastic and steel casing |
| | | 25-Jun-11 | 4 | 13.91 | 15.91 | 2.00 | C | 127.1 | - | - | 4:16 | 4:24 | 2.8 | 16.6 | 3.05 | 33.3 | - | 1.43 | - | - | - | |
| | | 25-Jun-11 | 4 | 13.91 | 15.91 | 2.00 | D | 42.6 | 346.6 | 173.3 | 4:24 | 4:41 | 3.1 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 3 | 16.41 | 17.41 | 1.00 | A | 12.8 | 12.8 | 12.8 | 14:13 | 14:28 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 2 | 17.41 | 21.40 | 3.99 | A | 29.7 | 29.7 | 7.4 | 13:46 | 14:07 | 3.5 | 0.1 | 0.01 | 34.0 | - | 1.63 | 15.0 | 20.2 | 20.4 | |
| | | 17-Jun-11 | 1 | 21.40 | 26.40 | 5.00 | A | 20.7 | 20.7 | 4.1 | 11:22 | 11:38 | 6.3 | 0.5 | 0.02 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 1C | 26.40 | 31.50 | 5.10 | A | 27.8 | 27.8 | 5.5 | 10:38 | 10:54 | 8.9 | 0.1 | 0.00 | - | - | - | - | - | - | Stuck packer issues. |
| P-31+580 | P | 23-Jun-11 | 4 | 13.81 | 15.81 | 2.00 | B | 93.1 | 93.1 | 46.6 | 20:22 | 20:46 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 3 | 16.31 | 17.31 | 1.00 | A | 150.0 | - | - | 13:48 | 14:13 | 2.9 | 13.3 | 4.62 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 3 | 16.31 | 17.31 | 1.00 | B | 167.2 | - | - | 14:13 | 14:24 | 3.3 | 13.8 | 4.29 | 37.3 | 3.5 | 1.61 | 11.9 | 12.1 | 17.0 | |
| | | 08-Jun-11 | 3 | 16.31 | 17.31 | 1.00 | C | 46.7 | 363.9 | 363.9 | 14:24 | 14:43 | 3.6 | 0.0 | 0.00 | 46.2 | 2.0 | 1.61 | 11.9 | 12.1 | 17.2 | |
| | | 11-Jun-11 | 3 | 16.31 | 17.31 | 1.00 | A | 15.8 | - | - | 17:03 | 17:17 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 2 | 17.31 | 21.40 | 4.09 | A | 13.4 | - | - | 13:28 | 13:43 | 3.3 | 0.0 | 0.00 | 32.6 | - | 1.60 | 11.8 | 12.3 | 17.1 | |
| | | 11-Jun-11 | 2 | 17.31 | 21.30 | 3.99 | A | 25.7 | 39.1 | 9.8 | 16:35 | 16:53 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 1 | 21.30 | 26.30 | 5.00 | A | 32.6 | 32.6 | 6.5 | 15:53 | 16:13 | 6.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 1C | 26.30 | 31.40 | 5.10 | A | 41.5 | 41.5 | 8.1 | 13:54 | 14:22 | 8.7 | 0.0 | 0.00 | 32.6 | - | 1.60 | 18.5 | 15.6 | 21.8 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+581.5 | T | 27-Jun-11 | 4 | 14.60 | 16.60 | 2.00 | MF | 85.5 | 85.5 | 42.8 | 4:42 | 5:10 | 3.1 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 3 | 17.10 | 18.10 | 1.00 | A | 20.1 | 20.1 | 20.1 | 18:58 | 19:10 | 3.2 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 18.10 | 22.10 | 4.00 | A | 26.8 | 26.8 | 6.7 | 18:39 | 18:51 | 3.5 | 0.1 | 0.01 | 30.4 | 5.0 | 1.63 | 15.2 | 11.5 | 20.7 | |
| | | 21-Jun-11 | 1 | 22.10 | 27.10 | 5.00 | A | 25.1 | 25.1 | 5.0 | 17:53 | 18:05 | 6.4 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 1C | 27.10 | 32.20 | 5.10 | A | 29.1 | 29.1 | 5.7 | 17:31 | 17:44 | 8.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+582.7 | S | 24-Jun-11 | 4 | 15.93 | 17.93 | 2.00 | B | 115.0 | 115.0 | 57.5 | 3:11 | 3:39 | 3.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 3 | 18.43 | 19.43 | 1.00 | A | 153.9 | - | - | 14:52 | 15:16 | 3.4 | 11.9 | 3.61 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 3 | 18.43 | 19.43 | 1.00 | B | 169.4 | - | - | 15:16 | 15:35 | 3.5 | 4.7 | 1.29 | 37.5 | 2.0 | 1.60 | 7.0 | 16.1 | 18.9 | |
| | | 12-Jun-11 | 3 | 18.43 | 19.43 | 1.00 | C | 26.7 | 350.0 | 350.0 | 15:35 | 15:57 | 3.7 | 0.3 | 0.09 | 46.8 | - | 1.63 | 7.1 | 15.6 | 19.7 | |
| | | 15-Jun-11 | 3 | 18.43 | 19.43 | 1.00 | A | 17.0 | 17.0 | 17.0 | 8:48 | 9:03 | 3.5 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 2 | 19.43 | 23.50 | 4.07 | A | 15.8 | - | - | 14:33 | 14:47 | 3.5 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 2 | 19.43 | 23.40 | 3.97 | A | 19.8 | 35.6 | 9.0 | 8:29 | 8:44 | 3.4 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 1 | 23.40 | 28.40 | 5.00 | A | 16.7 | 16.7 | 3.3 | 8:08 | 8:24 | 6.2 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 1C | 28.40 | 33.50 | 5.10 | A | 25.8 | 25.8 | 5.1 | 7:22 | 8:02 | 8.9 | 0.3 | 0.01 | 33.0 | - | 1.60 | 18.2 | 13.4 | 18.2 | |
| T-31+584.5 | T | 26-Jun-11 | 4 | 14.90 | 16.90 | 2.00 | MF | 143.5 | - | - | 10:06 | 10:30 | 0.9 | 12.5 | 6.99 | - | - | - | - | - | - | By-pass: casing broken |
| | | 26-Jun-11 | 4 | 14.90 | 16.90 | 2.00 | B | 90.9 | - | - | 10:30 | 10:37 | 1.3 | 12.7 | 4.41 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 4 | 14.90 | 16.90 | 2.00 | X | 103.4 | 337.8 | 168.9 | 10:37 | 10:58 | 3.3 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 3 | 17.40 | 18.40 | 1.00 | A | 69.9 | 69.9 | 69.9 | 15:43 | 16:30 | 3.6 | 0.7 | 0.21 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 2 | 18.40 | 22.40 | 4.00 | A | 151.7 | 151.7 | 37.9 | 15:02 | 15:38 | 3.4 | 1.9 | 0.14 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 1 | 22.40 | 27.40 | 5.00 | A | 15.0 | 15.0 | 3.0 | 14:40 | 14:56 | 6.1 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 1C | 27.40 | 32.50 | 5.10 | A | 16.9 | 16.9 | 3.3 | 14:12 | 14:32 | 8.8 | 0.0 | 0.00 | 33.9 | - | 1.62 | 14.7 | 14.4 | 21.4 | |
| P-31+586 | P | 23-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | B | 159.1 | - | - | 20:49 | 21:09 | 2.3 | 12.3 | 2.63 | 35.1 | 4.0 | 1.64 | 14.0 | 10.6 | 17.5 | |
| | | 23-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | C | 213.9 | - | - | 21:09 | 21:24 | 3.6 | 13.4 | 1.65 | 45.7 | - | 1.67 | 14.0 | 10.6 | 16.5 | By-pass between plastic and steel casing |
| | | 23-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | D | 71.0 | - | - | 21:24 | 21:30 | 3.6 | 10.9 | 1.58 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | X | 77.2 | 521.2 | 260.6 | 21:30 | 21:45 | 3.6 | 1.1 | 0.15 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 3 | 18.51 | 19.51 | 1.00 | A | 51.0 | 51.0 | 51.0 | 14:59 | 15:46 | 3.5 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2,3 | 18.52 | 23.60 | 5.08 | A | 201.0 | - | - | 2:35 | 2:58 | 3.3 | 13.9 | 0.24 | - | - | - | - | - | - | Packer set inside casing. |
| | | 06-Jun-11 | 2,3 | 18.52 | 23.60 | 5.08 | B | 199.8 | - | - | 2:58 | 3:18 | 3.6 | 12.7 | 0.19 | - | - | - | - | - | - | Grouted Stages 2 and 3 together. |
| | | 06-Jun-11 | 2,3 | 18.52 | 23.60 | 5.08 | C | 200.2 | - | - | 3:18 | 3:35 | 4.3 | 11.9 | 0.15 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2,3 | 18.52 | 23.60 | 5.08 | D | 200.0 | - | - | 3:35 | 3:51 | 5.2 | 12.0 | 0.11 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2,3 | 18.52 | 23.60 | 5.08 | X | 73.0 | 874.0 | 172.0 | 3:51 | 4:03 | 6.2 | 0.4 | 0.00 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 2 | 19.51 | 23.50 | 3.99 | A | 26.7 | 26.7 | 6.7 | 14:39 | 14:53 | 3.5 | 0.8 | 0.05 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 1 | 23.50 | 28.50 | 5.00 | A | 90.2 | 90.2 | 18.0 | 13:53 | 14:28 | 6.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 1C, 1 | 23.60 | 33.61 | 10.01 | A | 69.2 | 69.2 | 6.9 | 15:04 | 15:32 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | Re-grouted. |
| | | 10-Jun-11 | 1C | 28.50 | 33.50 | 5.00 | A | 41.7 | 41.7 | 8.3 | 13:26 | 13:43 | 8.8 | 2.8 | 0.06 | 31.2 | - | 1.59 | 8.1 | 11.9 | 14.9 | |
| T-31+587.5 | T | 27-Jun-11 | 4 | 15.58 | 17.58 | 2.00 | MF | 189.8 | - | - | 5:12 | 5:34 | 2.6 | 13.4 | 2.92 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 27-Jun-11 | 4 | 15.58 | 17.58 | 2.00 | C | 44.3 | 234.1 | 117.1 | 5:34 | 5:48 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 3 | 18.08 | 19.08 | 1.00 | A | 37.8 | 37.8 | 37.8 | 22:11 | 22:28 | 3.0 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 19.08 | 23.10 | 4.02 | A | 28.3 | 28.3 | 7.0 | 21:52 | 22:03 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 1 | 23.10 | 28.10 | 5.00 | A | 29.0 | 29.0 | 5.8 | 21:21 | 21:31 | 6.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 1C | 28.10 | 33.10 | 5.00 | A | 36.1 | 36.1 | 7.2 | 21:01 | 21:13 | 8.5 | 0.7 | 0.02 | - | - | - | - | - | - | |
| S-31+589 | S | 24-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | B | 161.8 | - | - | 3:41 | 4:02 | 3.3 | 5.3 | 1.08 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | C | 80.3 | - | - | 4:02 | 4:14 | 3.5 | 7.2 | 1.12 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 24-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | D | 40.3 | 282.4 | 141.2 | 4:14 | 4:30 | 3.5 | 0.0 | 0.00 | 63.4 | 2.0 | 1.70 | 10.8 | 11.0 | 16.5 | |
| | | 12-Jun-11 | 3 | 18.25 | 19.52 | 1.27 | A | 37.3 | 54.2 | 42.7 | 16:38 | 17:07 | 3.6 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 3 | 18.52 | 19.52 | 1.00 | A | 16.9 | - | - | 10:54 | 11:15 | 3.8 | 0.8 | 0.20 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 2 | 19.52 | 23.60 | 4.08 | A | 51.1 | - | - | 16:12 | 16:34 | 3.6 | 1.1 | 0.08 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 2 | 19.52 | 23.50 | 3.98 | A | 19.4 | 70.5 | 17.7 | 10:32 | 10:48 | 3.3 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 1 | 23.50 | 28.50 | 5.00 | A | 19.0 | 19.0 | 3.8 | 10:12 | 10:27 | 6.1 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 1C | 28.50 | 33.50 | 5.00 | A | 148.5 | 148.5 | 29.7 | 9:21 | 10:06 | 8.7 | 1.6 | 0.04 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+590.5 | T | 25-Jun-11 | 4 | 15.61 | 17.61 | 2.00 | MF | 99.7 | 99.7 | 49.9 | 4:50 | 5:14 | 3.1 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 3 | 18.11 | 19.11 | 1.00 | A | 213.0 | 213.0 | 213.0 | 16:18 | 17:30 | 3.5 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 2 | 19.11 | 23.10 | 3.99 | A | 20.9 | 20.9 | 5.2 | 15:56 | 16:11 | 3.5 | 0.9 | 0.06 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 1 | 23.10 | 28.10 | 5.00 | A | 14.6 | 14.6 | 2.9 | 15:37 | 15:50 | 6.4 | 1.4 | 0.04 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 1C | 28.10 | 33.20 | 5.10 | A | 13.1 | 13.1 | 2.6 | 15:04 | 15:19 | 8.7 | 0.3 | 0.01 | - | - | - | - | - | - | Stuck packer issues. |
| P-31+592 | P | 23-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | B | 159.8 | - | - | 21:56 | 22:15 | 2.3 | 12.2 | 2.59 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | C | 83.4 | 243.2 | 121.6 | 22:15 | 22:35 | 3.6 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 3 | 18.52 | 19.52 | 1.00 | A | 30.3 | 30.3 | 30.3 | 17:00 | 17:16 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2,3 | 18.52 | 23.60 | 5.08 | A | 203.1 | - | - | 23:20 | 23:48 | 4.1 | 12.1 | 0.58 | - | - | - | - | - | - | Packer set inside casing. |
| | | 06-Jun-11 | 2,3 | 18.52 | 23.60 | 5.08 | B | 116.6 | - | - | 23:48 | 0:03 | 6.3 | 2.7 | 0.08 | - | - | - | - | - | - | Grouted Stages 2 and 3 together. |
| | | 06-Jun-11 | 2,3 | 18.52 | 23.60 | 5.08 | A | 18.3 | 338.0 | 66.5 | 2:08 | 2:24 | 3.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 2 | 19.52 | 23.50 | 3.98 | A | 2.2 | 2.2 | 0.6 | 16:35 | 16:54 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 1 | 23.50 | 28.50 | 5.00 | A | 15.7 | 15.7 | 3.1 | 16:07 | 16:22 | 6.3 | 0.6 | 0.02 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 1C | 28.50 | 33.60 | 5.10 | A | 22.7 | 22.7 | 4.5 | 15:25 | 15:43 | 8.8 | 0.4 | 0.00 | 31.8 | - | 1.61 | 10.8 | 13.7 | 18.1 | |
| T-31+593.5 | T | 28-Jun-11 | 4 | 16.76 | 18.76 | 2.00 | MF | 76.2 | 76.2 | 38.1 | 6:22 | 6:47 | 3.0 | 0.8 | 0.14 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 3 | 19.26 | 20.26 | 1.00 | A | 19.3 | 19.3 | 19.3 | 18:11 | 18:28 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 2 | 20.26 | 24.30 | 4.04 | A | 16.6 | 16.6 | 4.1 | 17:41 | 18:02 | 3.3 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 1 | 24.30 | 29.30 | 5.00 | A | 16.9 | 16.9 | 3.4 | 17:15 | 17:30 | 6.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 1C | 29.30 | 34.30 | 5.00 | A | 20.1 | 20.1 | 4.0 | 16:53 | 17:09 | 8.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+595 | S | 24-Jun-11 | 4 | 16.66 | 18.66 | 2.00 | B | 157.9 | - | - | 4:39 | 4:59 | 3.4 | 10.8 | 1.47 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 4 | 16.66 | 18.66 | 2.00 | C | 36.7 | 194.6 | 97.3 | 4:59 | 5:18 | 3.5 | 0.8 | 0.11 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 3 | 19.16 | 20.16 | 1.00 | A | 29.1 | - | - | 8:22 | 8:44 | 3.4 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 3 | 19.16 | 20.16 | 1.00 | A | 30.9 | 60.0 | 60.0 | 16:06 | 16:42 | 3.6 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 2 | 20.16 | 24.20 | 4.04 | A | 31.1 | - | - | 7:58 | 8:17 | 3.3 | 0.2 | 0.01 | 32.4 | - | 1.60 | 11.5 | 11.8 | 15.4 | |
| | | 15-Jun-11 | 2 | 20.16 | 24.20 | 4.04 | A | 129.0 | 160.1 | 39.6 | 15:07 | 15:54 | 3.5 | 0.5 | 0.03 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 1 | 24.20 | 29.20 | 5.00 | A | 19.2 | 19.2 | 3.8 | 14:38 | 14:54 | 6.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-Jun-11 | 1C | 29.20 | 34.20 | 5.00 | A | 24.5 | 24.5 | 4.9 | 14:12 | 14:30 | 8.5 | 0.0 | 0.00 | 30.2 | - | 1.59 | 20.0 | 13.7 | 19.5 | |
| T-31+596.5 | T | 26-Jun-11 | 4 | 17.16 | 19.16 | 2.00 | MF | 180.0 | - | - | 5:16 | 5:48 | 3.1 | 2.5 | 0.43 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 26-Jun-11 | 4 | 17.16 | 19.16 | 2.00 | B | 149.1 | - | - | 5:48 | 6:28 | 2.8 | 3.8 | 0.65 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 4 | 17.16 | 19.16 | 2.00 | D | 48.1 | 377.2 | 188.6 | 6:28 | 6:52 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 3 | 19.66 | 20.66 | 1.00 | A | 13.9 | 13.9 | 13.9 | 0:45 | 0:56 | 2.9 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 20.66 | 24.70 | 4.04 | C | 117.0 | 517.0 | 128.0 | 0:15 | 0:38 | 3.4 | 0.1 | 0.01 | 46.1 | - | 1.68 | 11.4 | 12.5 | 20.5 | |
| | | 21-Jun-11 | 2 | 20.66 | 24.70 | 4.04 | A | 200.0 | - | - | 23:38 | 23:59 | 2.0 | 15.8 | 2.07 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 20.66 | 24.70 | 4.04 | B | 200.0 | - | - | 23:59 | 0:15 | 3.4 | 12.0 | 0.83 | 38.3 | 2.0 | 1.65 | 11.4 | 12.5 | 20.0 | |
| | | 21-Jun-11 | 1 | 24.70 | 29.70 | 5.00 | A | 28.2 | 28.2 | 5.6 | 23:19 | 23:30 | 6.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 1C | 29.70 | 34.70 | 5.00 | A | 27.8 | 27.8 | 5.6 | 22:53 | 23:05 | 9.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| P-31+598 | P | 23-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | B | 129.3 | 129.3 | 64.7 | 22:40 | 23:07 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 3 | 18.52 | 19.52 | 1.00 | A | 37.6 | 37.6 | 37.6 | 17:09 | 17:32 | 3.6 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2,3 | 18.52 | 23.60 | 5.08 | A | 196.9 | - | - | 7:25 | 7:59 | 3.5 | 2.5 | 0.14 | 30.8 | 3.5 | 1.60 | 1.8 | 10.8 | 14.7 | Packer set inside casing. |
| | | 06-Jun-11 | 2,3 | 18.52 | 23.60 | 5.08 | A | 114.0 | 310.9 | 61.2 | 8:02 | 8:54 | 3.6 | 0.4 | 0.02 | - | - | - | - | - | - | Grouted Stages 2 and 3 together. |
| | | 10-Jun-11 | 2 | 19.52 | 23.50 | 3.98 | A | 19.1 | 19.1 | 4.8 | 16:52 | 17:07 | 3.5 | 0.8 | 0.05 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 1 | 23.50 | 28.50 | 5.00 | A | 23.6 | 23.6 | 4.7 | 16:35 | 16:48 | 6.2 | 0.6 | 0.02 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 1C | 28.50 | 33.50 | 5.00 | A | 56.0 | 56.0 | 11.2 | 16:12 | 16:30 | 8.8 | 2.3 | 0.05 | - | - | - | - | - | - | |
| T-31+599.5 | T | 28-Jun-11 | 4 | 15.26 | 17.26 | 2.00 | MF | 119.3 | 119.3 | 59.6 | 6:54 | 7:33 | 2.9 | 0.2 | 0.03 | 30.8 | 3.0 | 1.42 | 7.2 | 18.0 | 15.3 | |
| | | 19-Jun-11 | 3 | 17.76 | 18.76 | 1.00 | A | 31.5 | 31.5 | 31.5 | 20:35 | 21:07 | 4.0 | 0.9 | 0.24 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 2 | 18.76 | 20.80 | 2.04 | A | 31.9 | 31.9 | 15.6 | 20:16 | 20:31 | 3.5 | 0.7 | 0.05 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 1 | 20.80 | 27.80 | 7.00 | A | 174.8 | 174.8 | 25.0 | 19:22 | 20:09 | 6.7 | 4.6 | 0.14 | - | - | - | - | - | - | By-pass, packer moved up 2 m |
| | | 19-Jun-11 | 1C | 27.80 | 32.80 | 5.00 | A | 22.0 | 22.0 | 4.4 | 18:59 | 19:17 | 8.7 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+601 | S | 25-Jun-11 | 4 | 14.93 | 16.93 | 2.00 | B | 144.2 | - | - | 6:32 | 6:56 | 2.6 | 8.9 | 1.62 | 37.1 | - | 1.56 | 8.8 | 8.5 | 13.0 | |
| | | 25-Jun-11 | 4 | 14.93 | 16.93 | 2.00 | C | 19.9 | - | - | 6:56 | 7:11 | 2.5 | 0.0 | 0.00 | 48.7 | - | 1.61 | 7.9 | 8.5 | 12.8 | Closed at wrong Pmax |
| | | 25-Jun-11 | 4 | 14.93 | 16.93 | 2.00 | B | 9.5 | 173.6 | 86.8 | 8:02 | 8:14 | 3.6 | 0.2 | 0.02 | - | - | - | - | - | - | Regrouted to appropriate Pmax |
| | | 13-Jun-11 | 3 | 17.43 | 18.43 | 1.00 | A | 54.3 | - | - | 9:21 | 9:48 | 3.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 3 | 17.43 | 18.43 | 1.00 | A | 19.5 | 73.8 | 73.8 | 8:11 | 8:27 | 3.6 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 2 | 18.43 | 22.50 | 4.07 | A | 16.5 | - | - | 9:04 | 9:17 | 3.4 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 2 | 18.43 | 22.40 | 3.97 | A | 18.9 | 35.4 | 8.9 | 7:44 | 8:05 | 3.5 | 0.5 | 0.04 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 1 | 22.40 | 27.40 | 5.00 | A | 18.3 | 18.3 | 3.7 | 7:22 | 7:36 | 6.4 | 0.2 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 1C | 27.40 | 32.50 | 5.10 | A | 24.1 | 24.1 | 4.7 | 6:57 | 7:16 | 8.9 | 0.6 | 0.01 | 33.3 | 4.0 | 1.60 | 16.0 | 15.0 | 23.5 | |
| T-31+602.5 | T | 26-Jun-11 | 4 | 14.73 | 16.73 | 2.00 | MF | 103.2 | 103.2 | 51.6 | 7:33 | 8:04 | 3.2 | 0.7 | 0.12 | 31.4 | 2.0 | 1.43 | 9.9 | 19.9 | 13.5 | |
| | | 18-Jun-11 | 3 | 17.23 | 18.23 | 1.00 | A | 205.6 | 205.6 | 205.6 | 16:03 | 17:34 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 2 | 18.23 | 22.20 | 3.97 | A | 19.8 | 19.8 | 5.0 | 15:35 | 15:52 | 3.4 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 1 | 22.20 | 27.20 | 5.00 | A | 15.1 | 15.1 | 3.0 | 15:09 | 15:26 | 6.1 | 0.8 | 0.03 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 1C | 27.20 | 32.20 | 5.00 | A | 20.6 | 20.6 | 4.1 | 14:38 | 14:56 | 8.8 | 0.3 | 0.01 | 34.4 | - | 1.61 | 13.5 | 16.6 | 21.2 | |
| P-31+604 | P | 23-Jun-11 | 4 | 15.39 | 17.39 | 2.00 | B | 102.7 | 102.7 | 51.4 | 23:11 | 23:35 | 3.6 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 3 | 17.89 | 18.89 | 1.00 | A | 15.7 | 15.7 | 15.7 | 8:13 | 8:26 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2,3 | 17.89 | 23.00 | 5.11 | A | 89.6 | - | - | 9:07 | 9:30 | 3.5 | 3.3 | 0.18 | - | - | - | - | - | - | Packer set inside casing. |
| | | 06-Jun-11 | 2,3 | 17.89 | 23.00 | 5.11 | A | 56.3 | 145.9 | 28.6 | 9:32 | 10:10 | 3.5 | 0.3 | 0.02 | - | - | - | - | - | - | Grouted Stages 2 and 3 together. |
| | | 11-Jun-11 | 2 | 18.89 | 22.90 | 4.01 | A | 17.1 | 17.1 | 4.3 | 7:56 | 8:10 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 1 | 22.90 | 27.90 | 5.00 | A | 15.3 | 15.3 | 3.1 | 7:39 | 7:52 | 6.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 1C | 27.90 | 32.90 | 5.00 | A | 16.4 | 16.4 | 3.3 | 7:19 | 7:34 | 8.6 | 0.2 | 0.01 | 30.8 | 3.0 | 1.59 | 15.1 | 13.1 | 20.3 | |
| T-31+605.5 | T | 28-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | MF | 134.5 | - | - | 7:40 | 8:02 | 0.6 | 7.5 | 7.02 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 28-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | C | 69.0 | - | - | 8:02 | 8:08 | 1.9 | 12.3 | 1.72 | 48.4 | - | 1.61 | 9.1 | 18.1 | 16.8 | |
| | | 28-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | X | 28.4 | 231.9 | 116.0 | 8:08 | 8:22 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 3 | 15.07 | 16.07 | 1.00 | A | 23.6 | 23.6 | 23.6 | 4:08 | 4:24 | 3.1 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 16.07 | 20.10 | 4.03 | A | 29.2 | 29.2 | 7.2 | 3:51 | 4:02 | 3.5 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 1 | 20.10 | 25.10 | 5.00 | A | 26.5 | 26.5 | 5.3 | 3:32 | 3:43 | 6.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 1C | 25.10 | 30.10 | 5.00 | A | 31.9 | 31.9 | 6.4 | 3:12 | 3:24 | 8.6 | 0.2 | 0.00 | - | - | - | - | - | - | |
| S-31+607 | S | 25-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | B | 81.8 | 81.8 | 40.9 | 7:19 | 8:00 | 3.6 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 3 | 15.07 | 16.07 | 1.00 | A | 14.1 | - | - | 10:51 | 11:08 | 3.6 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 3 | 15.07 | 16.07 | 1.00 | A | 22.8 | 36.9 | 36.9 | 9:56 | 10:15 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 2 | 16.07 | 20.10 | 4.03 | A | 13.7 | - | - | 10:31 | 10:46 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 2 | 16.07 | 20.10 | 4.03 | A | 18.4 | 32.1 | 8.0 | 9:36 | 9:50 | 3.6 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 1 | 20.10 | 25.10 | 5.00 | A | 32.5 | 32.5 | 6.5 | 9:11 | 9:28 | 6.3 | 0.6 | 0.02 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 1C | 25.10 | 30.10 | 5.00 | A | 29.5 | 29.5 | 5.9 | 8:45 | 9:03 | 8.6 | 0.4 | 0.01 | - | - | - | - | - | - | |
| T-31+608.5 | T | 26-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | MF | 92.6 | 92.6 | 46.3 | 8:06 | 8:35 | 3.0 | 1.3 | 0.22 | - | - | - | - | - | - | |
| | | 20-Jun-11 | 3 | 15.07 | 16.07 | 1.00 | A | 101.2 | 101.2 | 101.2 | 16:46 | 17:25 | 3.0 | 0.5 | 0.18 | - | - | - | - | - | - | |
| | | 20-Jun-11 | 2 | 16.07 | 20.10 | 4.03 | A | 35.1 | 35.1 | 8.7 | 16:00 | 16:15 | 3.2 | 0.6 | 0.05 | - | - | - | - | - | - | |
| | | 20-Jun-11 | 1 | 20.10 | 25.10 | 5.00 | A | 70.3 | 70.3 | 14.1 | 15:26 | 15:52 | 6.2 | 1.3 | 0.04 | - | - | - | - | - | - | |
| | | 20-Jun-11 | 1C | 25.10 | 30.10 | 5.00 | A | 23.1 | 23.1 | 4.6 | 15:05 | 15:22 | 8.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+610 | P | 23-Jun-11 | 4 | 10.81 | 12.81 | 2.00 | B | 157.6 | - | - | 1:16 | 1:35 | 2.0 | 12.8 | 4.17 | 31.6 | - | 1.64 | 9.2 | 11.4 | 15.1 | |
| | | 23-Jun-11 | 4 | 10.81 | 12.81 | 2.00 | C | 157.4 | - | - | 1:35 | 1:46 | 2.7 | 15.5 | 3.20 | 47.5 | 4.0 | 1.66 | 9.2 | 11.4 | 15.0 | |
| | | 23-Jun-11 | 4 | 10.81 | 12.81 | 2.00 | D | 37.7 | 352.7 | 176.4 | 1:46 | 1:59 | 3.6 | 0.0 | 0.00 | 62.0 | - | 1.68 | 9.2 | 11.4 | 15.2 | |
| | | 09-Jun-11 | 3 | 13.31 | 14.31 | 1.00 | A | 16.3 | 16.3 | 16.3 | 8:04 | 8:17 | 3.6 | 0.7 | 0.18 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2,3 | 13.31 | 18.80 | 5.49 | A | 66.9 | - | - | 10:21 | 10:44 | 3.4 | 1.5 | 0.08 | - | - | - | - | - | - | Packer set inside casing. |
| | | 06-Jun-11 | 2,3 | 13.31 | 18.80 | 5.49 | A | 27.0 | 93.9 | 17.1 | 10:48 | 11:15 | 3.5 | 0.4 | 0.02 | - | - | - | - | - | - | Grouted Stages 2 and 3 together. |
| | | 09-Jun-11 | 2 | 14.31 | 18.30 | 3.99 | A | 18.6 | 18.6 | 4.7 | 7:45 | 8:00 | 3.5 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 1 | 18.30 | 23.30 | 5.00 | A | 19.6 | 19.6 | 3.9 | 7:23 | 7:38 | 6.2 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 1C | 23.30 | 28.40 | 5.10 | A | 28.0 | 28.0 | 5.5 | 6:57 | 7:18 | 8.6 | 0.0 | 0.00 | 31.6 | 3.5 | 1.61 | 15.6 | 12.4 | 18.9 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+611.5 | T | 28-Jun-11 | 4 | 11.27 | 13.27 | 2.00 | MF | 80.0 | 80.0 | 40.0 | 8:39 | 9:05 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 3 | 6.81 | 7.81 | 1.00 | A | 15.9 | 15.9 | 15.9 | 14:53 | 15:08 | 3.0 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 3 | 13.77 | 14.77 | 1.00 | A | 20.2 | 20.2 | 20.2 | 11:46 | 12:01 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 2 | 7.81 | 11.80 | 3.99 | A | 16.4 | 16.4 | 4.1 | 14:34 | 14:48 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 2 | 14.77 | 18.80 | 4.03 | A | 29.2 | 29.2 | 7.2 | 11:21 | 11:38 | 3.4 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 1 | 11.80 | 16.80 | 5.00 | A | 197.5 | - | - | 13:10 | 13:44 | 6.0 | 5.7 | 0.07 | 32.6 | - | 1.61 | 18.2 | 16.4 | 24.3 | |
| | | 16-Jun-11 | 1 | 11.80 | 16.80 | 5.00 | B | 126.7 | 324.2 | 64.8 | 13:44 | 14:25 | 6.2 | 0.2 | 0.00 | 40.2 | 2.0 | 1.62 | 12.5 | 6.4 | 25.3 | |
| | | 18-Jun-11 | 1 | 18.80 | 24.40 | 5.60 | A | 35.1 | 35.1 | 6.3 | 10:45 | 11:06 | 6.4 | 0.1 | 0.00 | - | - | - | - | - | - | |
| S-31+613 | S | 25-Jun-11 | 4 | 9.56 | 11.56 | 2.00 | A | 67.0 | 67.0 | 33.5 | 8:16 | 8:39 | 3.4 | 0.0 | 0.00 | 30.2 | 7.0 | 1.55 | 8.2 | 8.8 | 13.4 | |
| | | 11-Jun-11 | 3 | 12.06 | 13.06 | 1.00 | A | 18.1 | 18.1 | 18.1 | 10:22 | 10:36 | 3.5 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 2 | 13.06 | 17.10 | 4.04 | A | 185.1 | - | - | 9:22 | 9:55 | 3.3 | 5.6 | 0.37 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 2 | 13.06 | 17.10 | 4.04 | B | 51.0 | 236.1 | 58.4 | 9:55 | 10:18 | 3.4 | 0.2 | 0.01 | 35.3 | - | 1.61 | 16.2 | 13.9 | 21.4 | |
| | | 11-Jun-11 | 1 | 17.10 | 22.20 | 5.10 | A | 55.1 | 55.1 | 10.8 | 8:55 | 9:19 | 6.2 | 0.9 | 0.03 | - | - | - | - | - | - | |
| T-31+614.5 | T | 23-Jun-11 | 3A | 10.39 | 11.39 | 1.00 | A | 14.9 | 14.9 | 14.9 | 19:07 | 19:19 | 3.1 | 0.0 | 0.00 | 31.9 | 5.0 | 1.61 | 14.0 | 10.6 | 15.7 | |
| | | 26-Jun-11 | 4 | 7.89 | 9.89 | 2.00 | MF | 61.7 | 61.7 | 30.9 | 8:38 | 9:02 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 3 | 11.38 | 12.38 | 1.00 | A | 25.3 | 25.3 | 25.3 | 8:23 | 8:57 | 2.8 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 12.38 | 16.40 | 4.02 | A | 191.0 | - | - | 6:58 | 7:24 | 1.9 | 11.7 | 1.52 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 12.38 | 16.40 | 4.02 | B | 258.7 | - | - | 7:24 | 7:55 | 3.5 | 5.3 | 0.38 | 38.5 | - | 1.64 | 14.2 | 14.3 | 22.8 | |
| | | 21-Jun-11 | 2 | 12.38 | 16.40 | 4.02 | C | 75.6 | 525.3 | 130.7 | 7:55 | 8:19 | 3.5 | 1.8 | 0.13 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 1 | 16.40 | 21.40 | 5.00 | A | 39.4 | 39.4 | 7.9 | 6:36 | 6:51 | 6.1 | 1.0 | 0.03 | 34.9 | 3.0 | 1.65 | 15.0 | 15.3 | 24.5 | |
| P-31+616 | P | 23-Jun-11 | 4 | 7.05 | 9.05 | 2.00 | B | 163.3 | - | - | 2:06 | 2:27 | 2.6 | 12.9 | 2.34 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 7.05 | 9.05 | 2.00 | C | 182.7 | - | - | 2:27 | 2:39 | 3.6 | 15.8 | 2.24 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 7.05 | 9.05 | 2.00 | D | 63.3 | 409.3 | 204.7 | 2:39 | 3:02 | 3.6 | 0.7 | 0.09 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 3 | 9.55 | 10.55 | 1.00 | A | 14.6 | 14.6 | 14.6 | 9:42 | 9:45 | 3.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2,3 | 9.55 | 14.60 | 5.05 | A | 176.6 | - | - | 17:03 | 17:33 | 0.2 | 12.6 | 14.68 | - | - | - | - | - | - | Packer set inside casing. |
| | | 06-Jun-11 | 2,3 | 9.55 | 14.60 | 5.05 | B | 160.4 | - | - | 17:33 | 17:43 | 2.0 | 15.6 | 1.58 | - | - | - | - | - | - | Grouted Stages 2 and 3 together. |
| | | 06-Jun-11 | 2,3 | 9.55 | 14.60 | 5.05 | C | 142.0 | - | - | 17:43 | 17:51 | 3.3 | 13.1 | 0.79 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2,3 | 9.55 | 14.60 | 5.05 | D | 39.0 | - | - | 17:51 | 17:59 | 3.4 | 2.0 | 0.12 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2,3 | 9.55 | 14.60 | 5.05 | A | 161.1 | - | - | 18:13 | 18:39 | 2.6 | 10.3 | 0.78 | 29.5 | - | 1.62 | 10.5 | 13.8 | 22.6 | |
| | | 06-Jun-11 | 2,3 | 9.55 | 14.60 | 5.05 | B | 160.2 | - | - | 18:39 | 18:54 | 3.2 | 10.5 | 0.64 | 36.6 | 4.0 | 1.63 | 10.1 | 14.9 | 22.1 | |
| | | 06-Jun-11 | 2,3 | 9.55 | 14.60 | 5.05 | C | 159.1 | - | - | 18:54 | 19:13 | 3.6 | 6.5 | 0.36 | 43.6 | - | 1.66 | 10.1 | 14.9 | 21.6 | |
| | | 06-Jun-11 | 2,3 | 9.55 | 14.60 | 5.05 | D | 116.0 | 1114.4 | 220.7 | 19:13 | 19:38 | 3.8 | 0.1 | 0.01 | 70.5 | - | 1.68 | 10.1 | 14.9 | 20.8 | |
| | | 09-Jun-11 | 2 | 10.55 | 14.60 | 4.05 | A | 19.5 | 19.5 | 4.8 | 9:21 | 9:35 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 1 | 14.60 | 19.60 | 5.00 | A | 13.0 | 13.0 | 2.6 | 8:59 | 9:16 | 6.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 1C | 19.60 | 25.00 | 5.40 | A | 15.0 | 15.0 | 2.8 | 8:36 | 8:52 | 8.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+617.5 | T | 28-Jun-11 | 4 | 5.78 | 7.78 | 2.00 | MF | 143.4 | - | - | 9:07 | 9:35 | 3.1 | 2.6 | 0.40 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 28-Jun-11 | 4 | 5.78 | 7.78 | 2.00 | C | 7.5 | 150.9 | 75.5 | 9:35 | 9:51 | 3.2 | 0.2 | 0.23 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 3 | 7.04 | 8.04 | 1.00 | A | 15.4 | 15.4 | 15.4 | 15:34 | 15:50 | 2.9 | 0.4 | 0.15 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 3 | 8.28 | 9.28 | 1.00 | A | 19.3 | 19.3 | 19.3 | 10:03 | 10:18 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 2 | 8.04 | 12.00 | 3.96 | A | 20.5 | 20.5 | 5.2 | 15:15 | 15:30 | 3.6 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 2 | 9.28 | 13.30 | 4.02 | A | 23.0 | 23.0 | 5.7 | 9:35 | 9:55 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+619 | S | 25-Jun-11 | 4 | 5.66 | 7.66 | 2.00 | A | 47.4 | 47.4 | 23.7 | 8:40 | 9:00 | 3.5 | 0.4 | 0.06 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 3 | 8.16 | 9.16 | 1.00 | A | 90.9 | 90.9 | 90.9 | 14:56 | 16:00 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 2 | 9.16 | 13.20 | 4.04 | A | 37.1 | 37.1 | 9.2 | 14:34 | 14:51 | 3.5 | 1.9 | 0.14 | - | - | - | - | - | - | |
| T-31+620.5 | T | 26-Jun-11 | 4 | 4.82 | 6.82 | 2.00 | MF | 47.0 | 47.0 | 23.5 | 9:03 | 9:26 | 3.1 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 3 | 7.32 | 8.32 | 1.00 | A | 2.7 | 2.7 | 2.7 | 9:33 | 9:45 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 8.32 | 12.40 | 4.08 | A | 23.7 | 23.7 | 5.8 | 9:17 | 9:29 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+622 | P | 23-Jun-11 | 4 | 4.99 | 6.99 | 2.00 | B | 36.4 | 36.4 | 18.2 | 3:10 | 3:25 | 3.7 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 3 | 7.49 | 8.12 | 0.63 | A | 161.2 | - | - | 21:04 | 21:28 | 3.4 | 4.8 | 2.24 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 3 | 7.49 | 8.12 | 0.63 | B | 159.2 | - | - | 21:28 | 21:47 | 3.3 | 3.6 | 1.75 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 3 | 7.49 | 8.12 | 0.63 | C | 58.0 | 378.4 | 600.6 | 21:47 | 22:26 | 3.4 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 3 | 7.49 | 8.49 | 1.00 | A | 128.3 | 128.3 | 128.3 | 9:08 | 10:45 | 3.7 | 1.1 | 0.20 | - | - | - | - | - | - | |
| | | 06-Jun-11 | 2 | 8.12 | 12.70 | 4.58 | A | 156.5 | 259.5 | 56.7 | 20:25 | 20:59 | 3.6 | 2.9 | 0.19 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 2 | 8.49 | 12.50 | 4.01 | A | 103.0 | - | - | 8:22 | 9:00 | 3.4 | 1.4 | 0.11 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 1 | 12.50 | 17.50 | 5.00 | A | 39.8 | 39.8 | 8.0 | 7:59 | 8:14 | 6.0 | 1.8 | 0.06 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 1C | 17.50 | 22.50 | 5.00 | A | 16.6 | 16.6 | 3.3 | 7:35 | 7:53 | 8.7 | 0.0 | 0.00 | 32.8 | 4.0 | 1.58 | 7.0 | 11.2 | 13.7 | |
| T-31+623.5 | T | 28-Jun-11 | 4 | 4.33 | 6.33 | 2.00 | MF | 43.1 | 43.1 | 21.6 | 10:03 | 10:22 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 3 | 8.08 | 9.08 | 1.00 | A | 38.1 | 38.1 | 38.1 | 16:20 | 17:12 | 3.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 3 | 6.83 | 7.83 | 1.00 | A | 17.0 | 17.0 | 17.0 | 8:57 | 9:13 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 2 | 9.08 | 13.10 | 4.02 | A | 15.5 | 15.5 | 3.9 | 16:01 | 16:15 | 3.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 2 | 7.83 | 12.00 | 4.17 | A | 24.8 | 24.8 | 5.9 | 8:32 | 8:58 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+625 | S | 25-Jun-11 | 4 | 4.46 | 6.46 | 2.00 | A | 39.6 | 39.6 | 19.8 | 9:02 | 9:19 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 3 | 6.96 | 7.96 | 1.00 | A | 116.9 | 116.9 | 116.9 | 17:23 | 18:13 | 3.7 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 2 | 7.96 | 12.00 | 4.04 | A | 192.9 | - | - | 16:21 | 16:57 | 3.4 | 6.7 | 0.45 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 2 | 7.96 | 12.00 | 4.04 | B | 59.1 | 252.0 | 62.4 | 16:57 | 17:15 | 3.5 | 2.2 | 0.16 | - | - | - | - | - | - | |
| T-31+626.5 | T | 28-Jun-11 | 4 | 4.68 | 6.68 | 2.00 | MF | 41.5 | 41.5 | 20.8 | 10:26 | 10:45 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 3 | 7.18 | 8.18 | 1.00 | A | 22.8 | 22.8 | 22.8 | 10:57 | 11:22 | 2.7 | 0.6 | 0.23 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 8.18 | 12.20 | 4.02 | A | 26.8 | 26.8 | 6.7 | 10:41 | 10:54 | 3.5 | 0.2 | 0.02 | - | - | - | - | - | - | |
| P-31+628 | P | 23-Jun-11 | 4 | 4.26 | 6.26 | 2.00 | B | 38.8 | 38.8 | 19.4 | 3:27 | 3:42 | 3.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 3A | 6.76 | 8.13 | 1.37 | A | 142.1 | - | - | 11:04 | 11:28 | 3.5 | 7.0 | 1.46 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 3A | 6.76 | 8.13 | 1.37 | B | 135.4 | 277.5 | 202.6 | 11:28 | 12:16 | 3.6 | 0.0 | 0.00 | 36.0 | - | 1.60 | 9.5 | 13.9 | 19.8 | |
| | | 06-Jun-11 | 3 | 8.13 | 9.13 | 1.00 | A | 150.6 | - | - | 15:27 | 15:56 | 3.4 | 7.8 | 2.12 | - | - | - | - | - | - | Packer set below casing. |
| | | 06-Jun-11 | 3 | 8.13 | 9.13 | 1.00 | B | 153.0 | - | - | 15:56 | 16:24 | 3.4 | 3.3 | 1.03 | 34.9 | - | 1.60 | 5.5 | 11.5 | 17.3 | Communicated to T31+629.5 |
| | | 06-Jun-11 | 3 | 8.13 | 9.13 | 1.00 | C | 19.5 | 323.1 | 323.1 | 16:24 | 16:43 | 3.6 | 0.4 | 0.11 | 49.5 | - | 1.60 | 5.6 | 11.8 | 18.9 | |
| | | 06-Jun-11 | 2 | 9.13 | 11.80 | 2.67 | A | 14.4 | 14.4 | 5.4 | 15:04 | 15:19 | 3.3 | 0.3 | 0.04 | 29.7 | 4.0 | 1.60 | 4.1 | 12.8 | 16.2 | |
| | | 09-Jun-11 | 1 | 11.80 | 16.80 | 5.00 | A | 14.4 | 14.4 | 2.9 | 10:43 | 10:58 | 6.1 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 1C | 16.80 | 21.80 | 5.00 | A | 14.8 | 14.8 | 3.0 | 10:21 | 10:38 | 8.7 | 0.3 | 0.01 | - | - | - | - | - | - | |
| T-31+629.5 | T | 28-Jun-11 | 4 | 4.44 | 6.44 | 2.00 | MF | 39.1 | 39.1 | 19.6 | 10:47 | 11:04 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 3 | 8.13 | 9.13 | 1.00 | A | 12.6 | 12.6 | 12.6 | 2:16 | 2:30 | 2.9 | 0.0 | 0.00 | 31.4 | - | 1.62 | 13.1 | 13.9 | 16.9 | |
| | | 18-Jun-11 | 3 | 6.94 | 7.94 | 1.00 | A | 16.1 | 16.1 | 16.1 | 8:07 | 8:23 | 3.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 16-Jun-11 | 2 | 9.13 | 13.10 | 3.97 | A | 25.4 | 25.4 | 6.4 | 1:56 | 2:14 | 3.0 | 0.0 | 0.00 | 30.5 | 4.0 | 1.61 | 13.9 | 14.2 | 17.9 | |
| | | 18-Jun-11 | 2 | 7.94 | 12.00 | 4.06 | A | 37.1 | 37.1 | 9.1 | 7:37 | 7:59 | 3.6 | 0.0 | 0.00 | 33.8 | 4.0 | 1.61 | 20.3 | 18.5 | 21.5 | |
| S-31+631 | S | 26-Jun-11 | 4 | 4.87 | 6.87 | 2.00 | MF | 27.1 | 27.1 | 13.6 | 9:29 | 9:45 | 2.0 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 3 | 7.37 | 8.37 | 1.00 | A | 21.1 | 21.1 | 21.1 | 7:19 | 7:44 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 2 | 8.37 | 12.40 | 4.03 | A | 14.3 | 14.3 | 3.5 | 6:58 | 7:15 | 2.2 | 0.0 | 0.00 | 31.9 | 4.0 | 1.58 | 14.4 | 16.1 | 21.1 | |
| T-31+632.5 | T | 28-Jun-11 | 4 | 4.89 | 6.89 | 2.00 | MF | 29.0 | 29.0 | 14.5 | 11:06 | 11:22 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 3 | 7.39 | 8.39 | 1.00 | A | 30.1 | 30.1 | 30.1 | 14:02 | 14:22 | 2.5 | 0.3 | 0.12 | - | - | - | - | - | - | |
| | | 21-Jun-11 | 2 | 8.39 | 12.40 | 4.01 | A | 53.0 | 53.0 | 13.2 | 13:39 | 13:58 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+634 | P | 04-Dec-10 | 4 | 4.58 | 6.08 | 1.50 | B | 151.9 | - | - | 13:18 | 13:45 | 1.0 | 8.4 | 5.59 | 36.7 | 1.0 | 1.66 | 18.0 | 7.2 | 15.0 | |
| | | 04-Dec-10 | 4 | 4.58 | 6.08 | 1.50 | C | 157.0 | - | - | 13:45 | 14:01 | 1.9 | 9.1 | 3.23 | 41.2 | 1.5 | 1.69 | 18.0 | 9.0 | 21.7 | |
| | | 04-Dec-10 | 4 | 4.58 | 6.08 | 1.50 | D | 234.7 | 543.6 | 362.4 | 14:01 | 14:50 | 2.5 | 0.0 | 0.00 | 56.9 | - | 1.70 | 9.6 | 9.6 | 21.0 | |
| | | 19-Nov-10 | 3 | 6.58 | 7.58 | 1.00 | A | 22.3 | 22.3 | 22.3 | 21:51 | 22:04 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 2 | 7.58 | 12.00 | 4.42 | A | 22.5 | 22.5 | 5.1 | 21:35 | 21:48 | 2.1 | 0.0 | 0.00 | 30.9 | 3.2 | 1.61 | -7.0 | 12.0 | 13.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+635.5 | T | 28-Jun-11 | 4 | 3.75 | 5.75 | 2.00 | MF | 32.5 | 32.5 | 16.3 | 11:24 | 11:39 | 2.1 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 6.25 | 7.25 | 1.00 | A | 12.5 | 12.5 | 12.5 | 17:40 | 17:52 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 2 | 7.25 | 11.80 | 4.55 | A | 19.7 | 19.7 | 4.3 | 17:24 | 17:37 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+637 | S | 13-Dec-10 | 4 | 4.38 | 5.88 | 1.50 | B | 48.3 | 48.3 | 32.2 | 10:57 | 11:25 | 2.7 | 0.3 | 0.07 | 39.1 | - | - | - | - | - | |
| | | 23-Nov-10 | 3 | 6.38 | 7.38 | 1.00 | A | 81.9 | 81.9 | 81.9 | 12:02 | 12:49 | 2.9 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 2 | 7.38 | 11.40 | 4.02 | A | 160.1 | - | - | 10:35 | 11:00 | 1.0 | 8.9 | 2.13 | 35.2 | - | 1.63 | 1.2 | 12.0 | 18.3 | |
| | | 23-Nov-10 | 2 | 7.38 | 11.40 | 4.02 | B | 175.3 | - | - | 11:00 | 11:24 | 2.2 | 6.9 | 0.77 | 36.4 | 4.0 | 1.65 | 1.3 | 11.9 | 18.5 | |
| | | 23-Nov-10 | 2 | 7.38 | 11.40 | 4.02 | C | 128.4 | 463.8 | 115.4 | 11:24 | 12:00 | 2.2 | 1.7 | 0.19 | 48.0 | - | 1.74 | 1.3 | 12.8 | 16.0 | |
| T-31+638.5 | T | 10-Jun-11 | 4 | 2.99 | 4.99 | 2.00 | MF | 24.5 | 24.5 | 12.3 | 9:28 | 9:44 | 2.0 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | A | 69.7 | - | - | 18:17 | 18:56 | 0.2 | 0.9 | 4.99 | - | - | - | - | - | - | Pump broken from 18:33 to 18:55 |
| | | 26-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | B | 56.1 | - | - | 18:56 | 19:06 | 0.7 | 9.4 | 11.17 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | C | 163.6 | - | - | 19:06 | 19:20 | 1.7 | 16.3 | 9.72 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.49 | 6.49 | 1.00 | D | 71.5 | 360.9 | 360.9 | 19:20 | 19:57 | 2.1 | 0.0 | 0.00 | 67.8 | 0.6 | 1.69 | 7.0 | 14.0 | 19.0 | |
| | | 26-Nov-10 | 2 | 6.49 | 10.60 | 4.11 | A | 19.6 | 19.6 | 4.8 | 18:00 | 18:12 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+640 | P | 04-Dec-10 | 4 | 3.62 | 5.12 | 1.50 | B | 167.9 | - | - | 15:10 | 15:36 | 1.9 | 11.8 | 4.08 | 33.8 | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 3.62 | 5.12 | 1.50 | C | 150.9 | - | - | 15:36 | 15:49 | 2.6 | 12.0 | 3.10 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 3.62 | 5.12 | 1.50 | D | 72.2 | 391.0 | 260.7 | 15:49 | 16:23 | 2.4 | 0.4 | 0.10 | 52.5 | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | A | 97.9 | - | - | 22:58 | 23:13 | 2.9 | 9.4 | 4.15 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | B | 61.0 | - | - | 23:13 | 23:42 | 2.7 | 5.2 | 1.98 | 36.4 | 3.0 | 1.63 | -7.0 | 12.0 | 14.0 | |
| | | 19-Nov-10 | 3 | 5.62 | 6.62 | 1.00 | C | 43.1 | 202.0 | 202.0 | 23:42 | 0:10 | 2.7 | 0.3 | 0.11 | 47.2 | 1.0 | 1.67 | -7.0 | 12.0 | 13.0 | |
| | | 19-Nov-10 | 2 | 6.62 | 10.50 | 3.88 | A | 33.1 | 33.1 | 8.5 | 22:40 | 22:55 | 1.3 | 0.7 | 0.13 | - | - | - | - | - | - | |
| T-31+641.5 | T | 12-Jun-11 | 4 | 3.56 | 5.06 | 1.50 | MF | 26.7 | 26.7 | 17.8 | 21:58 | 22:12 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.56 | 6.56 | 1.00 | A | 20.5 | 20.5 | 20.5 | 21:51 | 22:05 | 2.4 | 0.3 | 0.12 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 2 | 6.56 | 10.70 | 4.14 | A | 74.3 | 74.3 | 17.9 | 21:01 | 21:29 | 2.1 | 1.2 | 0.14 | 31.5 | 3.6 | 1.63 | 7.0 | 14.0 | 15.0 | |
| S-31+643 | S | 13-Dec-10 | 4 | 3.56 | 5.06 | 1.50 | B | 161.1 | - | - | 9:01 | 9:28 | 1.8 | 13.1 | 4.35 | 36.1 | - | 1.64 | -3.6 | 10.2 | 16.3 | |
| | | 13-Dec-10 | 4 | 3.56 | 5.06 | 1.50 | C | 155.1 | 316.2 | 210.8 | 9:28 | 10:00 | 2.4 | 0.5 | 0.12 | 45.8 | - | 1.69 | -4.2 | 8.3 | 14.1 | |
| | | 23-Nov-10 | 3 | 5.56 | 6.56 | 1.00 | A | 164.2 | - | - | 15:06 | 16:10 | 2.9 | 1.6 | 0.54 | 34.1 | 3.0 | 1.65 | 1.2 | 12.9 | 16.0 | |
| | | 23-Nov-10 | 3 | 5.56 | 6.56 | 1.00 | B | 49.3 | 213.5 | 213.5 | 16:10 | 17:02 | 2.9 | 0.4 | 0.13 | 37.0 | - | 1.68 | 1.2 | 12.9 | 15.0 | |
| | | 23-Nov-10 | 2 | 6.56 | 10.60 | 4.04 | A | 41.2 | 41.2 | 10.2 | 14:49 | 15:03 | 2.1 | 1.2 | 0.14 | - | - | - | - | - | - | |
| T-31+644.5 | T | 10-Jun-11 | 4 | 2.73 | 4.73 | 2.00 | MF | 28.1 | 28.1 | 14.1 | 9:06 | 9:23 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.23 | 6.23 | 1.00 | A | 56.2 | - | - | 22:36 | 22:46 | 1.0 | 6.0 | 5.44 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.23 | 6.23 | 1.00 | B | 86.0 | - | - | 22:46 | 22:56 | 1.7 | 9.9 | 5.36 | 36.4 | - | 1.63 | -1.0 | 14.0 | 14.0 | |
| | | 26-Nov-10 | 3 | 5.23 | 6.23 | 1.00 | C | 53.8 | 196.0 | 196.0 | 22:56 | 23:40 | 2.1 | 0.0 | 0.00 | 47.8 | - | 1.67 | -1.0 | 14.0 | 15.0 | |
| | | 26-Nov-10 | 2 | 6.23 | 10.30 | 4.07 | A | 49.6 | 49.6 | 12.2 | 22:14 | 22:31 | 1.9 | 0.5 | 0.07 | - | - | - | - | - | - | |
| P-31+646 | P | 04-Dec-10 | 4 | 3.64 | 5.14 | 1.50 | B | 159.0 | - | - | 19:05 | 19:26 | 2.6 | 8.5 | 2.34 | 37.7 | 2.0 | 1.64 | 13.0 | 8.0 | 17.0 | |
| | | 04-Dec-10 | 4 | 3.64 | 5.14 | 1.50 | C | 24.9 | 183.9 | 122.6 | 19:26 | 19:49 | 2.5 | 0.7 | 0.17 | 47.6 | 1.0 | 1.67 | 13.0 | 8.0 | 16.0 | |
| | | 19-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | A | 58.1 | - | - | 4:00 | 4:10 | 0.3 | 6.7 | 5.40 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | B | 113.0 | - | - | 4:10 | 4:22 | 0.7 | 12.8 | 17.63 | 36.6 | - | 1.64 | -7.0 | 10.0 | 13.0 | |
| | | 19-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | C | 157.0 | - | - | 4:22 | 4:32 | 1.8 | 18.3 | 11.84 | 43.8 | - | 1.67 | -7.0 | 12.0 | 14.5 | |
| | | 19-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | D | 219.3 | - | - | 4:32 | 4:44 | 2.6 | 19.0 | 7.40 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | X | 69.6 | 617.0 | 617.0 | 4:44 | 4:48 | 3.2 | 17.1 | 2.88 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 2 | 6.64 | 10.60 | 3.96 | A | 21.1 | 21.1 | 5.3 | 3:45 | 3:58 | 2.0 | 0.0 | 0.00 | 31.3 | - | 1.61 | -7.0 | 10.0 | 13.0 | |
| T-31+647.5 | T | 12-Jun-11 | 4 | 3.03 | 4.76 | 1.73 | MF | 25.4 | 25.4 | 14.7 | 21:43 | 21:57 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.03 | 6.03 | 1.00 | A | 61.2 | - | - | 2:09 | 2:21 | 1.6 | 6.2 | 4.01 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.03 | 6.03 | 1.00 | B | 105.5 | - | - | 2:21 | 2:31 | 2.0 | 17.2 | 6.17 | 36.5 | 2.4 | 1.65 | -1.0 | 14.0 | 16.0 | |
| | | 26-Nov-10 | 3 | 5.03 | 6.03 | 1.00 | C | 133.4 | 300.1 | 300.1 | 2:31 | 4:03 | 2.3 | 0.2 | 0.09 | 47.1 | 2.0 | 1.69 | -1.0 | 14.0 | 17.0 | |
| | | 26-Nov-10 | 2 | 6.03 | 10.40 | 4.37 | A | 29.7 | 29.7 | 6.8 | 1:56 | 2:07 | 2.0 | 0.8 | 0.11 | 31.1 | - | 1.62 | -1.0 | 14.0 | 16.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+649 | S | 13-Dec-10 | 4 | 3.13 | 4.63 | 1.50 | B | 167.0 | 167.0 | 111.3 | 7:15 | 8:16 | 2.4 | 0.5 | 0.14 | 35.2 | 2.0 | 1.63 | -4.2 | 8.8 | 15.5 | |
| | | 23-Nov-10 | 3 | 5.13 | 6.13 | 1.00 | A | 157.9 | - | - | 17:31 | 17:58 | 2.6 | 12.8 | 4.68 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 3 | 5.13 | 6.13 | 1.00 | B | 131.3 | 289.2 | 289.2 | 17:58 | 19:08 | 2.9 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 2 | 6.13 | 10.20 | 4.07 | A | 23.4 | 23.4 | 5.7 | 17:13 | 17:27 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+650.5 | T | 10-Jun-11 | 4 | 2.51 | 4.51 | 2.00 | MF | 34.0 | 34.0 | 17.0 | 8:45 | 9:03 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.01 | 6.01 | 1.00 | A | 21.3 | - | - | 4:34 | 4:38 | 2.0 | 3.3 | 1.56 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.01 | 6.01 | 1.00 | B | 137.9 | - | - | 4:38 | 5:37 | 2.3 | 0.7 | 0.34 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 5.01 | 6.01 | 1.00 | C | 7.6 | 166.8 | 166.8 | 5:37 | 5:52 | 2.3 | 0.3 | 0.13 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 2 | 6.01 | 10.50 | 4.49 | A | 38.5 | 38.5 | 8.6 | 4:18 | 4:31 | 2.1 | 1.1 | 0.14 | - | - | - | - | - | - | |
| P-31+652A | P | 04-Dec-10 | 4 | 2.96 | 4.46 | 1.50 | B | 213.3 | - | - | 20:00 | 21:15 | 2.1 | 1.3 | 1.26 | - | - | - | - | - | - | Generator stalled. Stopped injection. |
| | | 04-Dec-10 | 4 | 2.96 | 4.46 | 1.50 | C | 13.5 | 226.8 | 151.2 | 21:15 | 21:42 | 2.8 | 1.1 | 0.26 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 4.96 | 5.96 | 1.00 | A | 49.1 | - | - | 5:21 | 5:32 | 3.0 | 4.5 | 1.63 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 4.96 | 5.96 | 1.00 | B | 122.0 | - | - | 5:32 | 6:26 | 2.9 | 1.6 | 0.57 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 3 | 4.96 | 5.96 | 1.00 | C | 27.0 | 198.1 | 198.1 | 6:26 | 6:37 | 3.3 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 19-Nov-10 | 2 | 5.96 | 10.20 | 4.24 | A | 20.8 | 20.8 | 4.9 | 5:05 | 5:17 | 2.2 | 0.2 | 0.02 | - | - | - | - | - | - | |
| T-31+653.5 | T | 12-Jun-11 | 4 | 3.26 | 4.76 | 1.50 | MF | 26.7 | 26.7 | 17.8 | 21:26 | 21:42 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | A | 173.1 | - | - | 6:30 | 7:00 | 1.8 | 8.8 | 4.83 | 34.4 | 2.0 | 1.63 | 0.9 | 9.8 | 18.0 | |
| | | 27-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | B | 155.4 | - | - | 7:00 | 7:16 | 2.3 | 11.5 | 4.94 | 39.4 | 2.0 | 1.65 | 0.9 | 9.8 | 15.0 | |
| | | 27-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | C | 43.6 | 372.1 | 372.1 | 7:16 | 7:42 | 2.5 | 0.5 | 0.24 | 49.8 | - | 1.74 | 0.9 | 9.8 | 16.0 | |
| | | 27-Nov-10 | 2 | 6.26 | 10.50 | 4.24 | A | 27.7 | 27.7 | 6.5 | 6:10 | 6:27 | 2.2 | 0.5 | 0.06 | - | - | - | - | - | - | |
| S-31+655 | S | 12-Dec-10 | 4 | 3.13 | 4.63 | 1.50 | B | 105.6 | 105.6 | 70.4 | 4:36 | 5:04 | 2.5 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3A | 5.26 | 6.26 | 1.00 | B | 31.7 | 31.7 | 31.7 | 14:30 | 14:50 | 3.0 | 0.2 | 0.06 | 35.6 | - | 1.68 | 1.0 | 10.6 | 20.6 | |
| | | 23-Nov-10 | 3 | 5.56 | 6.56 | 1.00 | A | 11.9 | 11.9 | 11.9 | 19:48 | 20:00 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 2 | 6.56 | 10.90 | 4.34 | A | 20.1 | 20.1 | 4.6 | 19:31 | 19:43 | 2.2 | 0.0 | 0.00 | 31.3 | 4.0 | 1.61 | -1.0 | 14.1 | 14.0 | |
| T-31+656.5 | T | 03-Dec-10 | 3A | 5.11 | 6.11 | 1.00 | A | 13.6 | 13.6 | 13.6 | 20:17 | 20:31 | 2.6 | 0.0 | 0.00 | 31.2 | 1.6 | 1.61 | 5.0 | 12.0 | 14.0 | |
| | | 27-Nov-10 | 3 | 5.26 | 6.26 | 1.00 | A | 12.9 | 12.9 | 12.9 | 8:12 | 8:25 | 2.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 2 | 6.26 | 10.50 | 4.24 | A | 38.4 | 38.4 | 9.1 | 7:51 | 8:07 | 2.0 | 0.4 | 0.05 | - | - | - | - | - | - | |
| P-31+658 | P | 04-Dec-10 | 4 | 3.01 | 4.51 | 1.50 | B | 158.6 | - | - | 2:00 | 2:28 | 2.4 | 7.4 | 1.93 | 37.1 | - | 1.64 | 7.0 | 10.0 | 16.0 | |
| | | 04-Dec-10 | 4 | 3.01 | 4.51 | 1.50 | C | 63.3 | 221.9 | 147.9 | 2:28 | 3:09 | 2.4 | 0.6 | 0.17 | 45.8 | - | 1.67 | 7.0 | 10.0 | 18.0 | |
| | | 20-Nov-10 | 3 | 5.11 | 6.11 | 1.00 | B | 175.5 | - | - | 7:33 | 7:56 | 1.1 | 11.4 | 9.33 | 35.9 | 1.0 | 1.60 | 6.0 | 4.0 | 17.3 | |
| | | 20-Nov-10 | 3 | 5.11 | 6.11 | 1.00 | C | 158.7 | - | - | 7:56 | 8:07 | 1.9 | 15.6 | 8.32 | 46.3 | - | 1.62 | 6.0 | 4.0 | 17.2 | |
| | | 20-Nov-10 | 3 | 5.11 | 6.11 | 1.00 | D | 188.6 | 522.8 | 522.8 | 8:07 | 8:19 | 2.5 | 15.7 | 6.29 | 61.2 | - | 1.64 | 7.0 | 5.0 | 17.9 | |
| | | 20-Nov-10 | 2 | 6.11 | 10.00 | 3.89 | A | 41.5 | 41.5 | 10.7 | 7:15 | 7:26 | 2.5 | 1.9 | 0.15 | 31.4 | 3.0 | 1.61 | 6.0 | 2.0 | 17.0 | |
| T-31+659.5 | T | 12-Jun-11 | 4 | 3.56 | 5.06 | 1.50 | MF | 48.5 | 48.5 | 32.3 | 21:04 | 21:25 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 5.11 | 6.11 | 1.00 | A | 163.9 | - | - | 8:47 | 9:19 | 2.6 | 5.0 | 1.98 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 5.11 | 6.11 | 1.00 | B | 44.8 | 208.7 | 208.7 | 9:19 | 10:05 | 2.5 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 2 | 6.11 | 10.90 | 4.79 | A | 22.8 | 22.8 | 4.8 | 8:31 | 8:43 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+661 | S | 12-Dec-10 | 4 | 3.41 | 4.91 | 1.50 | B | 105.8 | 105.8 | 70.5 | 3:37 | 4:29 | 2.6 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | A | 61.1 | - | - | 20:25 | 20:37 | 0.9 | 7.1 | 7.27 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | B | 102.8 | - | - | 20:37 | 20:48 | 1.2 | 13.3 | 9.73 | 35.8 | 3.6 | 1.63 | -1.0 | 14.0 | 15.0 | |
| | | 23-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | C | 160.3 | - | - | 20:48 | 21:00 | 2.0 | 16.3 | 7.74 | 44.7 | 1.6 | 1.67 | -1.0 | 14.0 | 16.0 | |
| | | 23-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | D | 196.7 | - | - | 21:00 | 21:58 | 3.0 | 6.2 | 2.12 | 59.4 | 1.2 | 1.68 | -1.0 | 14.0 | 17.0 | |
| | | 23-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | X | 84.8 | 605.7 | 605.7 | 21:58 | 22:15 | 3.0 | 7.3 | 2.47 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 2 | 6.64 | 11.20 | 4.56 | A | 23.0 | 23.0 | 5.0 | 20:09 | 20:21 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+662.5 | T | 10-Jun-11 | 4 | 2.68 | 4.68 | 2.00 | MF | 27.8 | 27.8 | 13.9 | 8:02 | 8:18 | 1.9 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 3A | 5.20 | 6.20 | 1.00 | A | 12.2 | 12.2 | 12.2 | 20:37 | 20:51 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 5.56 | 6.56 | 1.00 | A | 160.1 | - | - | 13:06 | 13:53 | 2.5 | 2.6 | 1.06 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 5.56 | 6.56 | 1.00 | B | 55.5 | 215.6 | 215.6 | 13:53 | 14:38 | 2.6 | 0.7 | 0.24 | 36.0 | - | 1.66 | 1.0 | 9.9 | 20.3 | |
| | | 27-Nov-10 | 2 | 6.56 | 10.30 | 3.74 | A | 21.7 | 21.7 | 5.8 | 12:51 | 13:03 | 2.2 | 0.0 | 0.00 | 31.4 | - | 1.63 | 1.0 | 9.9 | 19.3 | |
| P-31+664 | P | 04-Dec-10 | 4 | 3.13 | 4.63 | 1.50 | B | 161.5 | - | - | 3:22 | 3:48 | 2.3 | 11.5 | 3.55 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 3.13 | 4.63 | 1.50 | C | 80.8 | 242.3 | 161.5 | 3:48 | 4:09 | 2.4 | 0.7 | 0.20 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 5.18 | 6.18 | 1.00 | A | 12.0 | 12.0 | 12.0 | 9:32 | 9:43 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 6.18 | 10.20 | 4.02 | A | 35.3 | 35.3 | 8.8 | 8:25 | 9:13 | 1.9 | 0.7 | 0.08 | - | - | - | - | - | - | |
| T-31+665.5 | T | 12-Jun-11 | 4 | 3.64 | 5.14 | 1.50 | MF | 27.0 | 27.0 | 18.0 | 20:48 | 21:03 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 5.18 | 6.18 | 1.00 | A | 16.9 | 16.9 | 16.9 | 14:59 | 15:11 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 2 | 6.18 | 10.80 | 4.62 | A | 22.9 | 22.9 | 5.0 | 14:44 | 14:56 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+667 | S | 12-Dec-10 | 4 | 4.07 | 5.57 | 1.50 | B | 159.5 | 159.5 | 106.3 | 2:53 | 3:29 | 2.5 | 0.4 | 0.10 | 37.1 | - | 1.63 | 9.0 | 6.0 | 15.0 | |
| | | 25-Nov-10 | 3A | 5.64 | 6.64 | 1.00 | B | 184.5 | - | - | 14:55 | 15:22 | 2.9 | 10.2 | 3.55 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3A | 5.64 | 6.64 | 1.00 | C | 179.3 | - | - | 15:22 | 15:46 | 2.7 | 6.7 | 2.50 | 44.9 | - | 1.73 | 1.0 | 11.0 | 18.0 | |
| | | 25-Nov-10 | 3A | 5.64 | 6.64 | 1.00 | D | 89.2 | 453.0 | 453.0 | 15:46 | 16:35 | 3.1 | 0.0 | 0.01 | 74.2 | 0.0 | 1.71 | 1.0 | 11.0 | 18.1 | |
| | | 23-Nov-10 | 3 | 6.76 | 7.76 | 1.00 | A | 12.8 | 12.8 | 12.8 | 1:55 | 2:07 | 2.8 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 2 | 7.76 | 11.90 | 4.14 | A | 32.7 | 32.7 | 7.9 | 1:39 | 1:53 | 2.2 | 0.0 | 0.00 | 30.9 | - | 1.61 | 0.0 | 13.0 | 18.0 | |
| T-31+668.5 | T | 10-Jun-11 | 4 | 3.95 | 5.95 | 2.00 | MF | 30.8 | 30.8 | 15.4 | 7:42 | 8:00 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | A | 158.2 | - | - | 16:13 | 16:40 | 2.6 | 10.1 | 3.94 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 5.64 | 6.64 | 1.00 | B | 84.2 | 242.4 | 242.4 | 16:40 | 17:22 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 2 | 6.64 | 11.60 | 4.96 | A | 162.8 | - | - | 15:16 | 15:44 | 1.9 | 9.8 | 1.03 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 2 | 6.64 | 11.60 | 4.96 | B | 125.6 | 288.4 | 58.1 | 15:44 | 16:09 | 2.3 | 2.2 | 0.19 | - | - | - | - | - | - | |
| P-31+670 | P | 04-Dec-10 | 4 | 4.45 | 5.95 | 1.50 | B | 158.8 | - | - | 4:19 | 4:43 | 2.3 | 14.2 | 4.59 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 4.45 | 5.95 | 1.50 | C | 160.2 | - | - | 4:43 | 5:30 | 2.5 | 7.3 | 2.18 | - | - | - | - | - | - | |
| | | 04-Dec-10 | 4 | 4.45 | 5.95 | 1.50 | D | 94.5 | 413.5 | 275.7 | 5:30 | 6:40 | 2.4 | 0.3 | 0.09 | 59.2 | - | 1.69 | 7.0 | 10.0 | 19.0 | |
| | | 20-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | B | 160.6 | - | - | 10:10 | 10:33 | 0.6 | 6.1 | 6.84 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | C | 161.0 | - | - | 10:33 | 11:01 | 1.5 | 16.1 | 11.11 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | D | 197.7 | - | - | 11:01 | 11:14 | 2.7 | 8.6 | 3.29 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | E | 83.1 | 602.4 | 602.4 | 11:14 | 11:20 | 2.9 | 16.3 | 5.68 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 7.45 | 11.90 | 4.45 | A | 29.4 | 29.4 | 6.6 | 9:53 | 10:06 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+671.5 | T | 12-Jun-11 | 4 | 4.76 | 6.26 | 1.50 | MF | 33.9 | 33.9 | 22.6 | 20:30 | 20:47 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 6.45 | 7.45 | 1.00 | B | 91.3 | 91.3 | 91.3 | 18:40 | 19:43 | 2.4 | 0.4 | 0.15 | 36.6 | 3.6 | 1.63 | 18.0 | 13.0 | 19.0 | |
| | | 27-Nov-10 | 2 | 7.45 | 11.90 | 4.45 | A | 162.0 | - | - | 17:29 | 17:52 | 0.1 | 12.0 | 21.48 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 2 | 7.45 | 11.90 | 4.45 | B | 141.5 | - | - | 17:52 | 18:05 | 2.2 | 9.2 | 1.05 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 2 | 7.45 | 11.90 | 4.45 | C | 62.9 | 366.4 | 82.3 | 18:05 | 18:27 | 2.1 | 0.6 | 0.08 | - | - | - | - | - | - | |
| S-31+673 | S | 12-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | C | 35.3 | 194.7 | 129.8 | 0:10 | 0:29 | 2.7 | 0.8 | 0.20 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 4.83 | 6.33 | 1.50 | B | 159.4 | - | - | 23:34 | 0:10 | 2.4 | 2.7 | 0.75 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 3 | 6.58 | 7.58 | 1.00 | A | 80.4 | - | - | 3:03 | 3:18 | 0.9 | 6.4 | 7.88 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 3 | 6.58 | 7.58 | 1.00 | B | 82.4 | - | - | 3:18 | 3:26 | 1.6 | 12.7 | 8.89 | 36.5 | - | 1.63 | 16.0 | 8.0 | 15.0 | |
| | | 23-Nov-10 | 3 | 6.58 | 7.58 | 1.00 | C | 174.9 | - | - | 3:26 | 3:39 | 3.1 | 13.1 | 5.12 | 44.6 | - | 1.66 | 16.0 | 8.0 | 16.0 | |
| | | 23-Nov-10 | 3 | 6.58 | 7.58 | 1.00 | D | 177.2 | 514.9 | 514.9 | 3:39 | 4:43 | 3.0 | 0.0 | 0.01 | 64.4 | - | 1.68 | 16.0 | 8.0 | 16.0 | |
| | | 23-Nov-10 | 2 | 7.58 | 11.50 | 3.92 | A | 144.2 | 144.2 | 36.8 | 2:19 | 3:01 | 2.0 | 1.2 | 0.15 | - | - | - | - | - | - | |
| T-31+674.5 | T | 10-Jun-11 | 4 | 3.47 | 5.47 | 2.00 | MF | 28.4 | 28.4 | 14.2 | 7:23 | 7:40 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 3A | 6.35 | 7.35 | 1.00 | A | 11.9 | 11.9 | 11.9 | 21:18 | 21:30 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 6.76 | 7.76 | 1.00 | A | 91.3 | - | - | 22:11 | 22:27 | 2.2 | 9.8 | 4.10 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 6.76 | 7.76 | 1.00 | B | 81.4 | - | - | 22:27 | 22:37 | 2.3 | 6.6 | 3.21 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 6.76 | 7.76 | 1.00 | C | 43.7 | 216.4 | 216.4 | 22:37 | 23:09 | 2.5 | 0.0 | 0.01 | 44.4 | 0.6 | 1.67 | 2.0 | 10.0 | 15.0 | |
| | | 27-Nov-10 | 2 | 7.76 | 11.10 | 3.34 | A | 21.1 | 21.1 | 6.3 | 21:54 | 22:07 | 2.0 | 0.0 | 0.00 | 31.5 | 3.0 | 1.62 | 18.0 | 10.0 | 16.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+676 | P | 05-Dec-10 | 4 | 4.45 | 5.95 | 1.50 | B | 163.0 | - | - | 7:30 | 7:57 | 2.1 | 8.8 | 2.82 | 33.7 | 3.0 | 1.65 | 4.0 | 9.0 | 16.0 | |
| | | 05-Dec-10 | 4 | 4.45 | 5.95 | 1.50 | C | 86.7 | 249.7 | 166.5 | 7:57 | 8:40 | 2.6 | 0.7 | 0.19 | 59.9 | 1.0 | 1.69 | 4.0 | 9.0 | 14.3 | |
| | | 20-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | B | 173.7 | - | - | 14:36 | 15:02 | 1.4 | 11.9 | 9.12 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | C | 155.3 | - | - | 15:02 | 15:15 | 2.2 | 15.3 | 6.95 | 44.2 | 1.0 | 1.70 | 3.7 | 12.5 | 17.5 | |
| | | 20-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | D | 195.8 | - | - | 15:15 | 15:28 | 2.3 | 15.3 | 6.38 | 55.4 | 1.0 | 1.69 | 3.7 | 8.2 | 14.1 | |
| | | 20-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | E | 70.7 | 595.5 | 595.5 | 15:28 | 15:33 | 2.2 | 12.4 | 5.66 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 6.97 | 11.50 | 4.53 | A | 22.9 | 22.9 | 5.1 | 14:18 | 14:30 | 2.1 | 0.0 | 0.00 | 33.4 | - | 1.71 | 3.7 | 11.2 | 17.5 | |
| T-31+677.5 | T | 12-Jun-11 | 4 | 4.58 | 6.08 | 1.50 | MF | 31.6 | 31.6 | 21.1 | 20:13 | 20:29 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | B | 159.7 | - | - | 3:08 | 4:13 | 2.4 | 0.9 | 0.41 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 5.97 | 6.97 | 1.00 | C | 5.5 | 165.2 | 165.2 | 4:13 | 4:29 | 2.5 | 0.0 | 0.01 | 44.5 | - | 1.69 | 2.0 | 10.0 | 17.0 | |
| | | 27-Nov-10 | 2 | 6.97 | 11.60 | 4.63 | A | 200.3 | - | - | 1:42 | 2:24 | 2.2 | 4.5 | 0.44 | 31.1 | - | 1.61 | 2.0 | 10.0 | 15.0 | |
| | | 27-Nov-10 | 2 | 6.97 | 11.60 | 4.63 | B | 113.2 | 313.5 | 67.7 | 2:24 | 3:06 | 2.1 | 0.5 | 0.05 | 35.5 | - | 1.62 | 2.0 | 10.0 | 15.0 | |
| S-31+679 | S | 12-Dec-10 | 4 | 4.17 | 5.67 | 1.50 | B | 171.8 | - | - | 21:50 | 22:18 | 2.3 | 15.8 | 4.21 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 4.17 | 5.67 | 1.50 | C | 147.9 | - | - | 22:18 | 22:45 | 2.5 | 3.3 | 0.88 | 47.9 | - | 1.68 | 9.0 | 6.0 | 14.0 | |
| | | 12-Dec-10 | 4 | 4.17 | 5.67 | 1.50 | D | 61.5 | 381.2 | 254.1 | 22:45 | 23:25 | 2.6 | 0.6 | 0.15 | 68.1 | - | 1.72 | -15.0 | 7.0 | 11.0 | |
| | | 01-Dec-10 | 3A | 6.17 | 7.17 | 1.00 | A | 13.5 | 13.5 | 13.5 | 2:58 | 3:10 | 2.5 | 0.0 | 0.00 | 31.1 | - | 1.62 | 0.0 | 9.0 | 16.0 | |
| | | 23-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | A | 70.1 | - | - | 5:12 | 5:24 | 0.0 | 7.7 | inf | - | - | - | - | - | - | |
| | | 23-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | B | 94.3 | - | - | 5:24 | 5:34 | 0.0 | 12.1 | inf | - | - | - | - | - | - | |
| | | 23-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | C | 160.4 | - | - | 5:34 | 5:45 | 1.8 | 15.8 | 9.00 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | D | 281.5 | 606.3 | 606.3 | 5:45 | 6:02 | 2.9 | 19.5 | 6.66 | - | - | - | - | - | - | |
| | | 23-Nov-10 | 2 | 7.89 | 11.94 | 4.05 | A | 21.5 | 21.5 | 5.3 | 4:57 | 5:09 | 1.8 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-31+680.5 | T | 10-Jun-11 | 4 | 3.95 | 5.95 | 2.00 | MF | 31.3 | 31.3 | 15.7 | 7:05 | 7:20 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 3A | 5.97 | 6.97 | 1.00 | A | 21.2 | 21.2 | 21.2 | 21:41 | 21:56 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 6.58 | 7.58 | 1.00 | A | 30.1 | - | - | 5:00 | 5:07 | 2.1 | 3.7 | 1.83 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 3 | 6.58 | 7.58 | 1.00 | B | 129.1 | 159.2 | 159.2 | 5:07 | 6:29 | 2.7 | 0.5 | 0.19 | - | - | - | - | - | - | |
| | | 27-Nov-10 | 2 | 7.58 | 11.40 | 3.82 | A | 24.3 | 24.3 | 6.4 | 4:46 | 4:58 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+682 | P | 05-Dec-10 | 4 | 4.50 | 6.00 | 1.50 | B | 138.9 | 138.9 | 92.6 | 8:50 | 9:40 | 2.5 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | B | 40.0 | 40.0 | 40.0 | 16:02 | 16:35 | 3.0 | 0.4 | 0.15 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 7.35 | 12.20 | 4.85 | A | 29.4 | 29.4 | 6.1 | 15:45 | 15:57 | 2.3 | 0.4 | 0.04 | - | - | - | - | - | - | |
| T-31+683.5 | T | 12-Jun-11 | 4 | 4.81 | 6.31 | 1.50 | MF | 34.3 | 34.3 | 22.9 | 19:55 | 20:12 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | A | 133.0 | - | - | 7:37 | 8:01 | 1.7 | 9.0 | 5.20 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | B | 197.3 | - | - | 8:01 | 8:24 | 2.3 | 10.7 | 4.60 | 36.9 | 2.0 | 1.65 | -1.0 | 11.9 | 19.8 | |
| | | 28-Nov-10 | 3 | 6.35 | 7.35 | 1.00 | C | 114.7 | 445.0 | 445.0 | 8:24 | 9:08 | 2.5 | 0.3 | 0.15 | 41.9 | - | 1.71 | -1.0 | 11.9 | 16.2 | |
| | | 28-Nov-10 | 2 | 7.35 | 11.90 | 4.55 | A | 162.1 | 162.1 | 35.6 | 6:43 | 7:33 | 2.1 | 1.5 | 0.19 | 34.5 | 3.0 | 1.63 | 0.0 | 12.5 | 20.1 | |
| S-31+685 | S | 12-Dec-10 | 4 | 4.89 | 6.39 | 1.50 | B | 159.4 | - | - | 21:04 | 21:24 | 2.6 | 12.3 | 3.21 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 4.89 | 6.39 | 1.50 | C | 41.7 | 201.1 | 134.1 | 21:24 | 21:39 | 2.5 | 0.9 | 0.23 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 3 | 7.04 | 8.04 | 1.00 | A | 57.1 | - | - | 7:44 | 8:10 | 1.3 | 8.9 | 6.78 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 3 | 7.04 | 8.04 | 1.00 | B | 266.9 | - | - | 8:10 | 8:29 | 1.2 | 9.0 | 2.22 | 35.8 | 3.0 | 1.66 | 9.4 | 9.6 | 15.3 | |
| | | 24-Nov-10 | 3 | 7.04 | 8.04 | 1.00 | C | 151.3 | - | - | 8:29 | 8:46 | 2.2 | 8.8 | 3.95 | 44.8 | - | 1.71 | 9.4 | 6.8 | 15.5 | |
| | | 24-Nov-10 | 3 | 7.04 | 8.04 | 1.00 | D | 144.9 | 620.2 | 620.2 | 8:46 | 8:37 | 2.7 | 14.4 | 5.38 | 60.0 | - | 1.72 | -13.0 | 6.9 | 13.3 | |
| | | 24-Nov-10 | 2 | 8.04 | 12.80 | 4.76 | A | 21.2 | 21.2 | 4.5 | 7:27 | 7:41 | 2.1 | 0.0 | 0.00 | 33.0 | 3.0 | 1.63 | 9.3 | 15.6 | 15.6 | |
| T-31+686.5 | T | 10-Jun-11 | 4 | 4.39 | 6.39 | 2.00 | MF | 32.6 | 32.6 | 16.3 | 6:45 | 7:02 | 2.0 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 6.81 | 7.81 | 1.00 | A | 149.8 | - | - | 10:03 | 10:27 | 2.1 | 13.2 | 6.34 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 6.81 | 7.81 | 1.00 | B | 170.4 | - | - | 10:27 | 10:47 | 2.3 | 6.7 | 2.90 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 6.81 | 7.81 | 1.00 | C | 24.3 | 344.5 | 344.5 | 10:47 | 11:07 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 2 | 7.81 | 11.90 | 4.09 | A | 121.0 | 121.0 | 29.6 | 9:19 | 9:57 | 2.2 | 0.9 | 0.10 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+688 | P | 05-Dec-10 | 4 | 5.01 | 6.51 | 1.50 | B | 149.1 | 149.1 | 99.4 | 9:48 | 10:55 | 2.6 | 0.5 | 0.13 | 33.9 | - | 1.67 | -6.4 | 11.8 | 20.0 | |
| | | 20-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | B | 161.2 | - | - | 17:07 | 17:31 | 0.9 | 12.9 | 12.47 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | C | 201.9 | - | - | 17:31 | 17:48 | 1.7 | 12.2 | 8.53 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | D | 155.3 | - | - | 17:48 | 18:01 | 2.3 | 12.9 | 5.93 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | X | 82.4 | 600.8 | 600.8 | 18:01 | 18:07 | 2.5 | 12.3 | 5.00 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 7.89 | 12.50 | 4.61 | A | 22.0 | 22.0 | 4.8 | 16:50 | 17:02 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+689.5 | T | 12-Jun-11 | 4 | 5.04 | 6.54 | 1.50 | MF | 44.1 | 44.1 | 29.4 | 19:32 | 19:54 | 2.1 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | A | 162.4 | - | - | 15:14 | 15:41 | 1.9 | 8.6 | 4.91 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | B | 171.9 | - | - | 15:41 | 15:57 | 2.2 | 11.4 | 6.13 | 36.6 | - | 1.67 | -1.0 | 13.0 | 15.0 | |
| | | 28-Nov-10 | 3 | 6.89 | 7.89 | 1.00 | C | 132.9 | 467.2 | 467.2 | 15:57 | 17:02 | 2.5 | 0.0 | 0.00 | 51.5 | 0.0 | 1.71 | 4.1 | 13.0 | 14.7 | |
| | | 28-Nov-10 | 2 | 7.89 | 12.20 | 4.31 | A | 27.3 | 27.3 | 6.3 | 14:57 | 15:11 | 2.2 | 0.2 | 0.03 | - | - | - | - | - | - | |
| S-31+691 | S | 12-Dec-10 | 4 | 5.06 | 6.56 | 1.50 | B | 162.1 | - | - | 18:44 | 19:06 | 2.1 | 13.9 | 4.96 | 36.5 | 1.0 | 1.63 | -15.0 | 7.0 | 11.0 | |
| | | 12-Dec-10 | 4 | 5.06 | 6.56 | 1.50 | C | 97.6 | 259.7 | 173.1 | 19:06 | 19:38 | 2.6 | 0.5 | 0.12 | 47.9 | 0.4 | 1.67 | -15.0 | 7.0 | 11.0 | |
| | | 25-Nov-10 | 3A | 7.04 | 8.04 | 1.00 | B | 155.8 | - | - | 17:05 | 17:29 | 2.4 | 12.1 | 5.10 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3A | 7.04 | 8.04 | 1.00 | C | 182.2 | - | - | 17:29 | 17:44 | 3.0 | 13.2 | 4.36 | 41.1 | - | - | - | - | - | |
| | | 25-Nov-10 | 3A | 7.04 | 8.04 | 1.00 | D | 173.0 | - | - | 17:44 | 18:03 | 3.1 | 5.8 | 1.88 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3A | 7.04 | 8.04 | 1.00 | X | 19.0 | 530.0 | 530.0 | 18:03 | 18:19 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 3 | 8.08 | 9.08 | 1.00 | A | 15.2 | 15.2 | 15.2 | 10:35 | 10:48 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 2 | 9.08 | 13.30 | 4.22 | A | 172.2 | - | - | 9:09 | 9:37 | 2.5 | 7.1 | 0.76 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 2 | 9.08 | 13.30 | 4.22 | B | 149.4 | - | - | 9:37 | 10:05 | 2.0 | 4.8 | 0.59 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 2 | 9.08 | 13.30 | 4.22 | C | 69.8 | 391.4 | 92.7 | 10:05 | 10:31 | 2.2 | 0.5 | 0.06 | - | - | - | - | - | - | |
| T-31+692.5 | T | 10-Jun-11 | 4 | 4.97 | 6.97 | 2.00 | MF | 44.5 | 44.5 | 22.3 | 6:19 | 6:39 | 2.0 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 7.04 | 8.04 | 1.00 | A | 165.4 | - | - | 17:25 | 17:51 | 2.2 | 12.3 | 5.61 | 37.1 | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 7.04 | 8.04 | 1.00 | B | 144.7 | - | - | 17:51 | 18:03 | 2.3 | 12.9 | 5.64 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 7.04 | 8.04 | 1.00 | C | 33.1 | 343.2 | 343.2 | 18:03 | 18:24 | 2.3 | 0.0 | 0.00 | 49.4 | - | - | - | - | - | |
| | | 28-Nov-10 | 2 | 8.04 | 12.60 | 4.56 | A | 27.1 | 27.1 | 5.9 | 17:08 | 17:21 | 2.2 | 0.0 | 0.00 | 29.6 | - | 1.61 | 3.6 | 1.5 | 15.1 | |
| P-31+694 | P | 05-Dec-10 | 4 | 5.42 | 6.92 | 1.50 | B | 149.0 | - | - | 13:26 | 13:54 | 2.5 | 8.9 | 2.39 | 38.5 | - | 1.68 | -2.0 | 11.9 | 15.8 | |
| | | 05-Dec-10 | 4 | 5.42 | 6.92 | 1.50 | C | 101.8 | 250.8 | 167.2 | 13:54 | 14:42 | 2.5 | 0.4 | 0.12 | 40.0 | 1.0 | 1.67 | -15.2 | 7.1 | 12.6 | |
| | | 20-Nov-10 | 3 | 7.47 | 8.47 | 1.00 | A | 78.8 | - | - | 19:50 | 20:05 | 0.5 | 6.6 | 13.25 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 7.47 | 8.47 | 1.00 | B | 82.9 | - | - | 20:05 | 20:13 | 0.8 | 12.4 | 16.67 | 36.8 | 2.4 | 1.63 | 7.0 | 14.0 | 14.0 | |
| | | 20-Nov-10 | 3 | 7.47 | 8.47 | 1.00 | C | 163.4 | - | - | 20:13 | 20:25 | 1.3 | 16.2 | 11.36 | 47.9 | 2.4 | 1.68 | 7.0 | 14.0 | 13.0 | |
| | | 20-Nov-10 | 3 | 7.47 | 8.47 | 1.00 | D | 230.2 | - | - | 20:25 | 20:34 | 2.4 | 18.3 | 8.26 | 59.6 | 2.0 | 1.70 | 7.0 | 14.0 | 16.0 | |
| | | 20-Nov-10 | 3 | 7.47 | 8.47 | 1.00 | X | 68.4 | 623.7 | 623.7 | 20:34 | 20:37 | 2.8 | 14.9 | 5.42 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 8.47 | 12.60 | 4.13 | A | 34.3 | 34.3 | 8.3 | 19:35 | 19:48 | 2.0 | 0.6 | 0.06 | 30.6 | 4.0 | 1.61 | 7.0 | 14.0 | 13.0 | |
| T-31+695.5 | T | 12-Jun-11 | 4 | 6.08 | 7.58 | 1.50 | MF | 161.7 | 161.7 | 107.8 | 18:46 | 19:28 | 2.0 | 0.7 | 0.22 | 37.9 | 4.0 | 1.41 | 5.8 | 8.2 | 10.7 | |
| | | 28-Nov-10 | 3 | 7.47 | 8.47 | 1.00 | B | 168.1 | - | - | 21:57 | 22:25 | 1.9 | 9.8 | 4.91 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 7.47 | 8.47 | 1.00 | C | 174.6 | - | - | 22:25 | 22:38 | 2.5 | 11.1 | 6.79 | 38.9 | - | 1.68 | -4.0 | 13.0 | 16.0 | |
| | | 28-Nov-10 | 3 | 7.47 | 8.47 | 1.00 | D | 70.4 | 413.1 | 413.1 | 22:38 | 23:20 | 2.1 | 0.2 | 0.11 | 46.2 | - | 1.71 | -4.0 | 13.0 | 16.0 | |
| | | 28-Nov-10 | 2 | 8.47 | 13.30 | 4.83 | A | 200.2 | - | - | 20:29 | 21:24 | 2.0 | 2.8 | 0.28 | 30.9 | 3.6 | 1.62 | -4.0 | 13.0 | 13.0 | |
| | | 28-Nov-10 | 2 | 8.47 | 13.30 | 4.83 | B | 70.2 | 270.4 | 56.0 | 21:24 | 21:55 | 2.1 | 1.8 | 0.18 | 32.2 | 3.0 | 1.63 | -4.0 | 13.0 | 15.0 | |
| S-31+697 | S | 12-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | B | 162.0 | - | - | 16:35 | 16:58 | 2.3 | 12.8 | 3.71 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | C | 158.5 | - | - | 16:58 | 17:13 | 2.3 | 12.9 | 3.68 | - | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | D | 101.2 | 421.7 | 281.1 | 17:13 | 17:50 | 2.5 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | B | 39.7 | - | - | 13:38 | 13:47 | 0.9 | 3.2 | 3.41 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | C | 142.7 | - | - | 13:47 | 14:04 | 1.8 | 12.4 | 7.05 | 38.2 | - | 1.63 | -7.0 | 12.5 | 16.5 | |
| | | 24-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | D | 158.5 | - | - | 14:04 | 14:18 | 2.0 | 12.1 | 6.06 | 48.3 | 2.0 | 1.70 | -7.0 | 12.5 | 15.6 | |
| | | 24-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | E | 170.6 | - | - | 14:18 | 14:32 | 2.9 | 12.0 | 4.20 | 60.3 | 2.0 | 1.73 | -7.0 | 12.4 | 15.4 | |
| | | 24-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | X | 30.5 | 542.0 | 542.0 | 14:32 | 14:46 | 3.1 | 0.0 | 0.01 | - | - | 1.79 | - | - | - | |
| | | 24-Nov-10 | 2 | 9.13 | 13.50 | 4.37 | A | 65.3 | 65.3 | 14.9 | 13:12 | 13:33 | 2.3 | 1.3 | 0.14 | 32.0 | - | 1.57 | -7.0 | 12.5 | 18.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+698.5 | T | 09-Jun-11 | 4 | 5.88 | 7.88 | 2.00 | MF | 131.4 | 131.4 | 65.7 | 4:17 | 4:55 | 2.2 | 0.3 | 0.06 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 8.08 | 9.08 | 1.00 | A | 73.7 | - | - | 2:14 | 2:29 | 2.5 | 5.6 | 2.20 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 8.08 | 9.08 | 1.00 | B | 86.0 | - | - | 2:29 | 3:11 | 2.5 | 0.9 | 0.39 | 34.1 | - | 1.63 | -1.0 | 11.0 | 15.0 | |
| | | 28-Nov-10 | 3 | 8.08 | 9.08 | 1.00 | C | 26.0 | 185.7 | 185.7 | 3:11 | 4:04 | 2.3 | 0.2 | 0.07 | 40.3 | 1.6 | 1.69 | -1.0 | 11.0 | 16.0 | |
| | | 28-Nov-10 | 2 | 9.08 | 13.40 | 4.32 | A | 30.4 | 30.4 | 7.0 | 1:58 | 2:11 | 1.8 | 0.5 | 0.06 | 30.3 | - | 1.62 | -1.0 | 11.0 | 14.0 | |
| P-31+700 | P | 05-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | B | 175.1 | - | - | 14:54 | 15:27 | 2.2 | 9.0 | 2.76 | 35.3 | - | - | - | - | - | |
| | | 05-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | C | 130.8 | 305.9 | 203.9 | 15:27 | 16:12 | 2.4 | 0.7 | 0.19 | 44.6 | - | 1.70 | -2.0 | - | 14.9 | |
| | | 20-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | B | 162.5 | - | - | 22:38 | 23:00 | 1.1 | 12.6 | 11.67 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | C | 160.1 | - | - | 23:00 | 23:20 | 1.8 | 15.6 | 11.22 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | D | 204.0 | - | - | 23:20 | 23:31 | 3.0 | 15.1 | 5.11 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | X | 78.9 | 605.5 | 605.5 | 23:31 | 23:32 | 2.7 | 12.5 | 4.65 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 9.38 | 13.30 | 3.92 | A | 201.4 | - | - | 21:00 | 21:25 | 0.2 | 12.4 | 12.38 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 9.38 | 13.30 | 3.92 | B | 201.9 | - | - | 21:25 | 21:38 | 0.6 | 18.2 | 7.55 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 9.38 | 13.30 | 3.92 | C | 195.8 | - | - | 21:38 | 21:47 | 2.0 | 10.8 | 1.30 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 9.38 | 13.30 | 3.92 | D | 125.2 | 724.3 | 184.8 | 21:47 | 22:28 | 1.9 | 1.2 | 0.15 | - | - | - | - | - | - | |
| Q-31+700.75 | Q | 29-Jun-11 | 4 | 5.58 | 7.58 | 2.00 | MF | 34.3 | 34.30 | 17.15 | 13:20 | 13:38 | 2.1 | 0.0 | 0.00 | 29.8 | - | 1.5 | 13.6 | 10.4 | 14.9 | |
| | | 24-Jun-11 | 3 | 8.08 | 9.08 | 1.00 | A | 161.9 | - | - | 14:19 | 14:45 | 1.7 | 12.0 | 7.22 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 8.08 | 9.08 | 1.00 | B | 156.7 | - | - | 14:45 | 14:57 | 2.5 | 13.6 | 5.43 | 36.2 | - | 1.6 | 10.3 | 10.7 | 17.1 | |
| | | 24-Jun-11 | 3 | 8.08 | 9.08 | 1.00 | C | 134 | 452.60 | 452.60 | 14:57 | 16:05 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 2 | 9.08 | 13.1 | 4.02 | A | 27.9 | 27.90 | 6.94 | 14:03 | 14:15 | 2.2 | 0.0 | 0.00 | 30.4 | 10.0 | 1.7 | 10.7 | 10.7 | 16.9 | |
| T-31+701.5 | T | 26-May-11 | 4 | 6.13 | 7.63 | 1.50 | MF | 180.2 | - | - | 21:25 | 21:51 | 1.6 | 12.1 | 5.98 | 30.4 | - | 1.46 | 13.6 | 9.0 | 17.1 | |
| | | 26-May-11 | 4 | 6.13 | 7.63 | 1.50 | B | 150.8 | 331.0 | 220.7 | 21:51 | 22:32 | 2.0 | 0.5 | 0.17 | 36.7 | 5.0 | 1.62 | 17.6 | 9.1 | 19.2 | |
| | | 03-Dec-10 | 3A | 8.15 | 9.15 | 1.00 | A | 14.5 | 14.5 | 14.5 | 22:24 | 22:38 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | A | 28.4 | - | - | 4:41 | 4:47 | 0.8 | 3.6 | 3.72 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | B | 168.4 | - | - | 4:47 | 5:07 | 1.5 | 12.6 | 8.71 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | C | 147.8 | - | - | 5:07 | 5:17 | 1.5 | 18.8 | 13.25 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | D | 180.7 | - | - | 5:17 | 5:27 | 2.5 | 17.0 | 6.40 | 63.5 | - | 1.71 | -4.0 | 11.0 | 18.0 | |
| | | 28-Nov-10 | 3 | 8.38 | 9.38 | 1.00 | X | 75.2 | 600.5 | 600.5 | 5:27 | 5:39 | 2.4 | 5.3 | 2.17 | - | - | - | - | - | - | |
| | | 28-Nov-10 | 2 | 9.38 | 13.30 | 3.92 | A | 26.0 | 26.0 | 6.6 | 4:25 | 4:38 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+702.25 | Q | 05-Jul-11 | 4 | 5.88 | 7.38 | 1.50 | MF | 34.1 | 34.10 | 22.73 | 7:10 | 7:45 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 3 | 7.88 | 8.9 | 1.02 | A | 57.6 | 57.60 | 56.47 | 13:51 | 14:16 | 2.6 | 0.3 | 0.12 | - | - | - | - | - | - | |
| S-31+703 | S | 12-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | B | 158.0 | - | - | 14:38 | 15:06 | 1.5 | 9.0 | 2.71 | 39.8 | - | 1.65 | -19.3 | 10.0 | 14.1 | |
| | | 12-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | C | 163.0 | - | - | 15:06 | 15:55 | 2.2 | 3.1 | 0.68 | 46.8 | - | 1.68 | -19.3 | 10.6 | 11.8 | |
| | | 12-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | D | 35.9 | 356.9 | 237.9 | 15:55 | 16:19 | 2.5 | 0.4 | 0.09 | 61.9 | 1.5 | 1.75 | -19.3 | 10.3 | 10.6 | |
| | | 24-Nov-10 | 3 | 8.49 | 9.49 | 1.00 | B | 161.9 | - | - | 16:17 | 16:49 | 3.0 | 5.5 | 1.84 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 3 | 8.49 | 9.49 | 1.00 | C | 127.5 | 289.4 | 289.4 | 16:49 | 17:56 | 3.2 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 2 | 9.49 | 14.80 | 5.31 | A | 172.2 | - | - | 15:04 | 15:29 | 0.4 | 11.3 | 6.16 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 2 | 9.49 | 14.80 | 5.31 | B | 147.9 | - | - | 15:29 | 15:41 | 1.4 | 12.0 | 1.77 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 2 | 9.49 | 14.80 | 5.31 | C | 139.1 | 459.2 | 86.5 | 15:41 | 16:13 | 2.1 | 1.1 | 0.11 | - | - | - | - | - | - | |
| Q-31+703.75 | Q | 29-Jun-11 | 4 | 5.66 | 7.66 | 2.00 | MF | 46.7 | 46.70 | 23.35 | 13:42 | 14:08 | 2.0 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 3 | 8.16 | 9.2 | 1.04 | A | 28.4 | 28.40 | 27.31 | 1:59 | 17:17 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+704.5 | T | 09-Jun-11 | 4 | 5.71 | 7.71 | 2.00 | MF | 54.4 | 54.4 | 27.2 | 3:49 | 4:10 | 2.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | A | 162.6 | - | - | 7:33 | 7:59 | 1.4 | 9.0 | 6.49 | - | - | - | - | - | - | Communicated to T-31+701.5 |
| | | 29-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | B | 160.4 | - | - | 7:59 | 8:17 | 1.7 | 9.0 | 5.42 | 34.9 | 3.0 | 1.67 | -4.0 | 11.0 | 12.0 | |
| | | 29-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | C | 168.3 | - | - | 8:17 | 8:36 | 1.8 | 8.4 | 4.94 | 38.0 | - | 1.68 | -3.9 | 9.0 | 11.9 | |
| | | 29-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | D | 48.6 | - | - | 8:36 | 8:41 | 2.3 | 8.9 | 4.13 | 58.3 | - | 1.76 | -3.9 | 9.0 | 11.5 | |
| | | 29-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | X | 36.0 | 575.9 | 575.9 | 8:41 | 9:00 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 2 | 9.13 | 13.40 | 4.27 | A | 22.7 | 22.7 | 5.3 | 7:16 | 7:29 | 2.2 | 0.0 | 0.00 | 32.6 | 4.0 | 1.63 | -4.0 | 11.0 | 11.4 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+705.25 | Q | 05-Jul-11 | 4 | 7.02 | 8.52 | 1.50 | MF | 22.4 | 22.40 | 14.93 | 7:47 | 8:00 | 1.9 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 3 | 9.02 | 10.3 | 1.28 | A | 33.2 | 33.20 | 25.94 | 14:19 | 14:35 | 2.3 | 0.2 | 0.05 | - | - | - | - | - | - | |
| P-31+706 | P | 05-Dec-10 | 4 | 6.26 | 7.78 | 1.52 | B | 178.2 | - | - | 16:24 | 16:50 | 2.2 | 12.4 | 3.75 | - | - | - | - | - | - | |
| | | 05-Dec-10 | 4 | 6.26 | 7.78 | 1.52 | C | 145.1 | - | - | 16:50 | 17:03 | 2.4 | 12.1 | 3.39 | - | - | - | - | - | - | |
| | | 05-Dec-10 | 4 | 6.26 | 7.78 | 1.52 | D | 39.0 | 362.3 | 238.4 | 17:03 | 17:37 | 2.5 | 0.0 | 0.00 | 60.0 | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 8.21 | 9.21 | 1.00 | A | 23.3 | - | - | 2:49 | 2:54 | 0.5 | 3.5 | 7.49 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 3 | 8.21 | 9.21 | 1.00 | B | 150.9 | - | - | 2:54 | 3:13 | 2.4 | 12.4 | 5.26 | 36.0 | - | 1.64 | 2.0 | 7.0 | 11.0 | |
| | | 20-Nov-10 | 3 | 8.21 | 9.21 | 1.00 | C | 161.8 | - | - | 3:13 | 3:30 | 2.7 | 9.9 | 3.39 | 37.3 | - | 1.65 | -1.3 | 8.0 | 14.0 | |
| | | 20-Nov-10 | 3 | 8.21 | 9.21 | 1.00 | D | 188.3 | - | - | 3:30 | 4:04 | 2.9 | 4.5 | 1.44 | 43.0 | - | 1.68 | -1.3 | 8.0 | 13.0 | |
| | | 20-Nov-10 | 3 | 8.21 | 9.21 | 1.00 | X | 75.8 | 600.1 | 600.1 | 4:04 | 4:28 | 3.0 | 4.8 | 1.62 | - | - | - | - | - | - | |
| | | 20-Nov-10 | 2 | 9.21 | 13.40 | 4.19 | A | 84.9 | 84.9 | 20.3 | 2:15 | 2:46 | 2.1 | 1.3 | 0.15 | 30.8 | - | 1.61 | 2.0 | 7.0 | 10.0 | |
| T-31+707.5 | T | 26-May-11 | 4 | 6.49 | 7.99 | 1.50 | MF | 188.8 | - | - | 22:57 | 23:24 | 2.2 | 11.3 | 3.39 | - | - | - | - | - | - | Communicated to T-31+701.5 |
| | | 26-May-11 | 4 | 6.49 | 7.99 | 1.50 | B | 220.7 | 409.5 | 273.0 | 23:24 | 0:25 | 2.0 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 8.21 | 9.21 | 1.00 | A | 16.2 | 16.2 | 16.2 | 9:36 | 9:50 | 2.7 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 2 | 9.21 | 14.00 | 4.79 | A | 22.6 | 22.6 | 4.7 | 9:19 | 9:32 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+709 | S | 12-Dec-10 | 4 | 7.02 | 8.52 | 1.50 | B | 159.8 | - | - | 9:52 | 10:19 | 1.8 | 12.6 | 4.65 | 37.2 | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 7.02 | 8.52 | 1.50 | C | 160.2 | - | - | 10:19 | 10:33 | 2.4 | 7.9 | 2.24 | 46.8 | - | - | - | - | - | |
| | | 12-Dec-10 | 4 | 7.02 | 8.52 | 1.50 | D | 115.0 | 435.0 | 290.0 | 10:33 | 11:27 | 2.7 | 0.6 | 0.14 | 61.2 | - | - | - | - | - | |
| | | 25-Nov-10 | 3A | 8.49 | 9.49 | 1.00 | B | 36.7 | 36.7 | 36.7 | 20:23 | 20:42 | 3.1 | 0.0 | 0.00 | 37.0 | 4.0 | 1.63 | 7.0 | 13.0 | 15.0 | |
| | | 24-Nov-10 | 3 | 9.40 | 10.40 | 1.00 | A | 19.7 | 19.7 | 19.7 | 18:21 | 18:35 | 3.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 2 | 10.40 | 14.80 | 4.40 | A | 26.6 | 26.6 | 6.0 | 18:05 | 18:17 | 2.4 | 0.4 | 0.04 | - | - | - | - | - | - | |
| T-31+710.5 | T | 09-Jun-11 | 4 | 6.72 | 8.72 | 2.00 | MF | 163.7 | - | - | 2:00 | 2:22 | 2.0 | 11.3 | 2.40 | 30.5 | 4.0 | 1.43 | 8.6 | 12.5 | 13.5 | |
| | | 09-Jun-11 | 4 | 6.72 | 8.72 | 2.00 | B | 157.4 | - | - | 2:22 | 2:39 | 2.2 | 8.8 | 2.06 | 33.9 | - | 1.62 | 5.8 | 12.9 | 13.1 | |
| | | 09-Jun-11 | 4 | 6.72 | 8.72 | 2.00 | C | 152.6 | 473.7 | 236.9 | 2:39 | 3:38 | 2.3 | 1.1 | 0.24 | 47.1 | - | 1.63 | 5.0 | 12.1 | 13.7 | |
| | | 29-Nov-10 | 3 | 8.49 | 9.49 | 1.00 | A | 56.5 | 56.5 | 56.5 | 10:12 | 11:04 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 2 | 9.49 | 14.40 | 4.91 | A | 33.0 | 33.0 | 6.7 | 9:56 | 10:09 | 2.0 | 1.0 | 0.08 | - | - | - | - | - | - | |
| P-31+712 | P | 05-Dec-10 | 4 | 7.27 | 8.77 | 1.50 | B | 158.6 | - | - | 19:23 | 19:47 | 2.0 | 12.4 | 4.44 | 37.1 | 1.4 | 1.63 | -11.0 | 11.0 | 13.0 | |
| | | 05-Dec-10 | 4 | 7.27 | 8.77 | 1.50 | C | 160.2 | - | - | 19:47 | 19:58 | 2.4 | 13.8 | 3.82 | 47.1 | 0.4 | 1.67 | -11.0 | 11.0 | 14.0 | |
| | | 05-Dec-10 | 4 | 7.27 | 8.77 | 1.50 | D | 155.2 | - | - | 19:58 | 21:30 | 2.3 | 2.7 | 0.79 | 62.4 | - | 1.70 | -11.0 | 11.0 | 15.0 | |
| | | 05-Dec-10 | 4 | 7.27 | 8.77 | 1.50 | E | 15.7 | 489.7 | 326.5 | 21:30 | 21:41 | 2.5 | 0.5 | 0.13 | 89.1 | 0.2 | 1.71 | -11.0 | 11.0 | 18.0 | |
| | | 21-Nov-10 | 3 | 9.22 | 10.22 | 1.00 | B | 163.3 | - | - | 9:23 | 9:58 | 2.8 | 10.0 | 3.54 | 35.8 | - | 1.59 | -1.0 | 9.4 | 16.9 | |
| | | 21-Nov-10 | 3 | 9.22 | 10.22 | 1.00 | C | 161.8 | - | - | 9:58 | 10:22 | 3.0 | 4.5 | 1.53 | 50.4 | 1.0 | 1.67 | -1.0 | 6.9 | 16.8 | |
| | | 21-Nov-10 | 3 | 9.22 | 10.22 | 1.00 | D | 80.9 | 406.0 | 406.0 | 10:22 | 11:21 | 3.4 | 0.0 | 0.00 | 62.4 | - | 1.69 | -1.0 | 6.9 | 16.9 | |
| | | 21-Nov-10 | 2 | 10.22 | 13.80 | 3.58 | A | 12.9 | 12.9 | 3.6 | 9:17 | 9:29 | 2.5 | 0.1 | 0.02 | 31.6 | 3.0 | 1.59 | -1.0 | 9.4 | 16.7 | |
| T-31+713.5 | T | 26-May-11 | 4 | 7.40 | 8.90 | 1.50 | MF | 199.5 | - | - | 2:41 | 3:12 | 1.0 | 11.3 | 6.65 | 29.5 | 4.5 | 1.52 | 1.7 | 12.0 | 15.1 | |
| | | 26-May-11 | 4 | 7.40 | 8.90 | 1.50 | B | 141.9 | - | - | 3:12 | 3:39 | 1.3 | 18.7 | 9.60 | - | - | - | - | - | - | Communicated to T-31+719.5 |
| | | 26-May-11 | 4 | 7.40 | 8.90 | 1.50 | C | 147.3 | - | - | 3:39 | 3:47 | 1.9 | 20.4 | 7.25 | 40.5 | - | 1.66 | 2.5 | 9.6 | 17.1 | |
| | | 26-May-11 | 4 | 7.40 | 8.90 | 1.50 | D | 243.9 | - | - | 3:47 | 4:17 | 2.1 | 10.1 | 3.22 | 64.0 | - | 1.65 | 2.5 | 9.4 | 17.4 | |
| | | 26-May-11 | 4 | 7.40 | 8.90 | 1.50 | X | 44.9 | 777.5 | 518.3 | 4:17 | 4:45 | 1.9 | 0.5 | 0.18 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.22 | 10.22 | 1.00 | A | 167.8 | - | - | 14:29 | 14:49 | 1.0 | 9.8 | 10.03 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.22 | 10.22 | 1.00 | B | 151.8 | - | - | 14:49 | 15:06 | 1.8 | 9.3 | 5.55 | 39.4 | - | 1.68 | 2.9 | 10.0 | 19.9 | |
| | | 29-Nov-10 | 3 | 9.22 | 10.22 | 1.00 | C | 194.6 | - | - | 15:06 | 15:50 | 2.3 | 5.3 | 2.26 | 55.0 | 0.5 | 1.73 | 2.9 | 10.0 | 20.0 | |
| | | 29-Nov-10 | 3 | 9.22 | 10.22 | 1.00 | D | 38.3 | 552.5 | 552.5 | 15:50 | 16:16 | 2.6 | 0.1 | 0.03 | 64.0 | 0.0 | 1.79 | 2.8 | 10.0 | 25.0 | |
| | | 29-Nov-10 | 2 | 10.22 | 14.70 | 4.48 | A | 24.7 | 24.7 | 5.5 | 14:08 | 14:21 | 2.2 | 0.4 | 0.04 | 32.0 | - | 1.63 | 2.9 | 10.0 | 18.0 | |
| S-31+715 | S | 12-Dec-10 | 4 | 7.02 | 8.52 | 1.50 | B | 164.0 | - | - | 7:30 | 7:56 | 1.5 | 15.1 | 6.67 | 35.6 | 3.0 | 1.63 | -3.0 | 10.5 | 11.3 | |
| | | 12-Dec-10 | 4 | 7.02 | 8.52 | 1.50 | C | 156.4 | - | - | 7:56 | 8:08 | 2.1 | 12.7 | 3.97 | 54.4 | 0.5 | 1.69 | -19.0 | 10.7 | 14.1 | |
| | | 12-Dec-10 | 4 | 7.02 | 8.52 | 1.50 | D | 262.1 | 582.5 | 388.3 | 8:08 | 9:28 | 2.6 | 0.5 | 0.14 | 67.8 | - | 1.75 | -19.0 | 10.7 | 11.5 | |
| | | 25-Nov-10 | 3A | 9.40 | 10.40 | 1.00 | B | 75.2 | 75.2 | 75.2 | 20:57 | 21:18 | 3.0 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 3 | 9.40 | 10.40 | 1.00 | A | 12.3 | 12.3 | 12.3 | 20:31 | 20:43 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 2 | 10.40 | 14.80 | 4.40 | A | 22.5 | 22.5 | 5.1 | 20:16 | 20:28 | 2.2 | 0.0 | 0.00 | 31.0 | 3.0 | 1.61 | 18.0 | 12.0 | 17.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+716.5 | T | 09-Jun-11 | 4 | 6.49 | 8.49 | 2.00 | MF | 166.0 | - | - | 23:20 | 23:43 | 2.0 | 10.1 | 2.44 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 4 | 6.49 | 8.49 | 2.00 | B | 94.5 | 260.5 | 130.3 | 23:43 | 12:04 | 2.1 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 3A | 8.98 | 9.98 | 1.00 | A | 14.2 | 14.2 | 14.2 | 23:08 | 23:21 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.40 | 10.40 | 1.00 | A | 15.3 | 15.3 | 15.3 | 16:48 | 17:01 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 2 | 10.40 | 14.20 | 3.80 | A | 23.9 | 23.9 | 6.3 | 16:32 | 16:45 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+718 | P | 05-Dec-10 | 4 | 7.38 | 8.88 | 1.50 | B | 153.2 | - | - | 22:08 | 22:31 | 1.6 | 12.3 | 6.26 | - | - | - | - | - | - | |
| | | 05-Dec-10 | 4 | 7.38 | 8.88 | 1.50 | C | 164.8 | - | - | 22:31 | 22:43 | 2.3 | 15.1 | 4.38 | - | - | - | - | - | - | |
| | | 05-Dec-10 | 4 | 7.38 | 8.88 | 1.50 | D | 139.3 | - | - | 22:43 | 23:00 | 2.4 | 16.8 | 3.91 | - | - | - | - | - | - | |
| | | 05-Dec-10 | 4 | 7.38 | 8.88 | 1.50 | E | 13.6 | 470.9 | 313.9 | 23:00 | 23:10 | 2.5 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 3 | 8.99 | 9.99 | 1.00 | B | 199.5 | - | - | 14:10 | 14:30 | 1.5 | 12.1 | 6.45 | 36.9 | 2.0 | 1.62 | -2.8 | 8.7 | 17.2 | |
| | | 21-Nov-10 | 3 | 8.99 | 9.99 | 1.00 | C | 118.7 | - | - | 14:30 | 14:38 | 2.3 | 16.5 | 6.45 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 3 | 8.99 | 9.99 | 1.00 | D | 204.6 | - | - | 14:38 | 14:54 | 2.5 | 12.4 | 4.74 | 119.0 | - | 1.70 | -2.8 | 8.7 | 16.5 | |
| | | 21-Nov-10 | 3 | 8.99 | 9.99 | 1.00 | X | 79.1 | 601.9 | 601.9 | 14:54 | 15:05 | 2.3 | 13.0 | 5.73 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 2 | 9.99 | 14.40 | 4.41 | A | 229.0 | 229.0 | 51.9 | 13:42 | 13:56 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+719.5 | T | 27-May-11 | 4 | 7.83 | 9.33 | 1.50 | MF | 194.4 | - | - | 5:18 | 5:49 | 1.9 | 10.7 | 3.29 | - | - | - | - | - | - | |
| | | 27-May-11 | 4 | 7.83 | 9.33 | 1.50 | A | 216.3 | - | - | 5:49 | 6:29 | 1.8 | 6.0 | 1.91 | - | - | - | - | - | - | |
| | | 27-May-11 | 4 | 7.83 | 9.33 | 1.50 | B | 44.6 | 455.3 | 303.5 | 6:29 | 6:57 | 2.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 8.99 | 9.99 | 1.00 | B | 166.0 | - | - | 18:02 | 18:38 | 2.5 | 5.0 | 2.10 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 8.99 | 9.99 | 1.00 | C | 68.6 | 234.6 | 234.6 | 18:38 | 19:35 | 2.4 | 0.0 | 0.00 | 48.9 | 1.6 | 1.68 | 7.0 | 13.0 | 22.0 | |
| | | 29-Nov-10 | 2 | 9.99 | 15.00 | 5.01 | A | 203.8 | - | - | 17:11 | 17:39 | 2.1 | 7.0 | 0.66 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 2 | 9.99 | 15.00 | 5.01 | B | 43.3 | 247.1 | 49.3 | 17:39 | 17:57 | 2.1 | 0.6 | 0.06 | - | - | - | - | - | - | |
| S-31+721 | S | 11-Dec-10 | 4 | 8.14 | 9.64 | 1.50 | B | 171.9 | - | - | 4:18 | 4:38 | 1.8 | 14.6 | 5.93 | 37.1 | - | 1.64 | -1.0 | 13.0 | 15.0 | |
| | | 11-Dec-10 | 4 | 8.14 | 9.64 | 1.50 | D | 286.6 | 608.7 | 405.8 | 4:27 | 6:38 | 2.5 | 0.6 | 0.17 | 74.9 | - | 1.74 | -1.0 | 13.0 | 12.3 | |
| | | 11-Dec-10 | 4 | 8.14 | 9.64 | 1.50 | C | 150.2 | - | - | 4:38 | 4:27 | 2.2 | 14.9 | 5.18 | 51.2 | - | 1.69 | -1.0 | 13.0 | 15.0 | |
| | | 24-Nov-10 | 3 | 9.83 | 10.83 | 1.00 | B | 116.7 | 116.7 | 116.7 | 22:45 | 23:43 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 2 | 10.83 | 15.40 | 4.57 | A | 217.0 | - | - | 20:54 | 21:20 | 2.0 | 12.9 | 2.03 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 2 | 10.83 | 15.40 | 4.57 | B | 185.5 | - | - | 21:20 | 21:37 | 2.1 | 10.2 | 1.52 | 35.5 | 2.0 | 1.63 | 18.0 | 12.0 | 17.0 | |
| | | 24-Nov-10 | 2 | 10.83 | 15.40 | 4.57 | C | 140.7 | 543.2 | 118.9 | 21:37 | 22:39 | 2.0 | 0.6 | 0.10 | 46.5 | - | 1.67 | 18.0 | 12.0 | 18.0 | |
| T-31+722.5 | T | 09-Jun-11 | 4 | 7.23 | 9.23 | 2.00 | MF | 162.9 | - | - | 22:03 | 22:24 | 2.0 | 12.5 | 2.20 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 4 | 7.23 | 9.23 | 2.00 | B | 157.8 | - | - | 22:24 | 22:43 | 2.1 | 9.8 | 2.25 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 4 | 7.23 | 9.23 | 2.00 | C | 37.1 | 357.8 | 178.9 | 22:43 | 22:58 | 2.0 | 0.7 | 0.18 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.83 | 10.83 | 1.00 | A | 37.1 | - | - | 20:07 | 20:36 | 2.8 | 1.0 | 0.35 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.83 | 10.83 | 1.00 | B | 23.3 | 60.4 | 60.4 | 20:36 | 21:11 | 2.3 | 0.4 | 0.17 | 36.3 | - | 1.63 | 7.0 | 12.0 | 18.0 | |
| | | 29-Nov-10 | 2 | 10.83 | 15.00 | 4.17 | A | 21.5 | 21.5 | 5.2 | 19:51 | 20:04 | 2.3 | 0.0 | 0.00 | 31.4 | 1.6 | 1.62 | 7.0 | 12.0 | 17.0 | |
| P-31+724 | P | 05-Dec-10 | 4 | 7.43 | 8.93 | 1.50 | E | 193.0 | 688.7 | 459.1 | 0:13 | 0:41 | 2.6 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 05-Dec-10 | 4 | 7.43 | 8.93 | 1.50 | B | 161.9 | - | - | 23:22 | 23:41 | 1.5 | 15.6 | 6.94 | - | - | - | - | - | - | |
| | | 05-Dec-10 | 4 | 7.43 | 8.93 | 1.50 | C | 165.2 | - | - | 23:41 | 23:52 | 1.8 | 15.8 | 5.75 | - | - | - | - | - | - | |
| | | 05-Dec-10 | 4 | 7.43 | 8.93 | 1.50 | D | 168.6 | - | - | 23:52 | 0:13 | 2.1 | 15.7 | 5.09 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3A | 9.43 | 10.43 | 1.00 | A | 20.4 | 20.4 | 20.4 | 23:42 | 23:55 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 3 | 9.73 | 10.73 | 1.00 | B | 12.7 | 12.7 | 12.7 | 2:30 | 2:43 | 2.7 | 0.0 | 0.00 | 36.8 | 2.8 | 1.63 | 5.0 | 7.0 | 14.0 | |
| | | 21-Nov-10 | 2 | 10.73 | 16.60 | 5.87 | A | 20.9 | 20.9 | 3.6 | 15:59 | 16:11 | 2.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-31+725.5 | T | 12-Jun-11 | 4 | 7.04 | 8.54 | 1.50 | MF | 95.4 | 95.4 | 63.6 | 16:47 | 17:13 | 2.0 | 0.7 | 0.24 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 3A | 9.05 | 10.05 | 1.00 | A | 16.2 | 16.2 | 16.2 | 23:27 | 23:40 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.73 | 10.73 | 1.00 | A | 20.7 | 20.7 | 20.7 | 23:21 | 23:32 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 2 | 10.73 | 14.60 | 3.87 | A | 21.2 | 21.2 | 5.5 | 23:05 | 23:18 | 1.9 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+727 | S | 11-Dec-10 | 4 | 6.59 | 8.09 | 1.50 | B | 160.2 | - | - | 22:45 | 23:09 | 1.8 | 13.1 | 4.76 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 6.59 | 8.09 | 1.50 | C | 159.9 | - | - | 23:09 | 23:19 | 2.2 | 13.9 | 4.04 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 6.59 | 8.09 | 1.50 | D | 261.5 | 581.6 | 387.7 | 23:19 | 1:16 | 2.4 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3A | 8.59 | 9.83 | 1.24 | A | 20.3 | 20.3 | 16.4 | 23:22 | 23:36 | 2.4 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 3 | 9.83 | 10.83 | 1.00 | B | 169.7 | - | - | 4:31 | 5:43 | 2.9 | 1.3 | 0.42 | - | - | - | - | - | - | |
| | | 24-Nov-10 | 3 | 9.83 | 10.83 | 1.00 | C | 51.0 | 220.7 | 220.7 | 5:43 | 6:46 | 2.9 | 0.5 | 0.18 | 45.9 | - | 1.68 | 14.0 | 10.0 | 20.0 | |
| | | 24-Nov-10 | 2 | 10.04 | 13.60 | 3.56 | A | 199.6 | - | - | 3:24 | 3:49 | 2.0 | 12.4 | 2.20 | 30.4 | - | 1.62 | 14.0 | 10.0 | 18.0 | |
| | | 24-Nov-10 | 2 | 10.04 | 13.60 | 3.56 | B | 99.4 | 299.0 | 84.0 | 3:49 | 4:26 | 1.9 | 0.8 | 0.14 | 35.9 | - | 1.63 | 14.0 | 10.0 | 17.0 | |
| T-31+728.5 | T | 09-Jun-11 | 4 | 6.67 | 8.67 | 2.00 | MF | 163.0 | - | - | 20:51 | 21:17 | 2.1 | 7.9 | 1.91 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 4 | 6.67 | 8.67 | 2.00 | B | 84.3 | 247.3 | 123.7 | 21:17 | 21:49 | 2.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.04 | 10.04 | 1.00 | A | 84.1 | - | - | 1:59 | 2:14 | 2.2 | 7.0 | 2.87 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.04 | 10.04 | 1.00 | B | 76.0 | - | - | 2:14 | 2:26 | 2.3 | 6.0 | 2.55 | 36.7 | 3.0 | 1.63 | 8.0 | 13.0 | 18.0 | |
| | | 29-Nov-10 | 3 | 9.04 | 10.04 | 1.00 | C | 110.0 | 270.1 | 270.1 | 2:26 | 3:43 | 2.3 | 0.4 | 0.18 | 44.9 | - | 1.68 | 8.0 | 13.0 | 19.0 | |
| | | 29-Nov-10 | 2 | 10.04 | 14.40 | 4.36 | A | 28.8 | 28.8 | 6.6 | 1:43 | 1:57 | 1.9 | 0.1 | 0.02 | 30.8 | - | 1.61 | 8.0 | 13.0 | 17.0 | |
| P-31+730 | P | 05-Dec-10 | 4 | 7.81 | 9.31 | 1.50 | B | 160.2 | - | - | 4:14 | 4:39 | 2.4 | 8.8 | 2.28 | 36.6 | - | 1.63 | -14.0 | 12.0 | 16.0 | |
| | | 05-Dec-10 | 4 | 7.81 | 9.31 | 1.50 | C | 153.0 | - | - | 4:39 | 5:13 | 2.4 | 3.7 | 0.94 | 48.8 | - | 1.68 | -14.0 | 12.0 | 15.0 | |
| | | 05-Dec-10 | 4 | 7.81 | 9.31 | 1.50 | D | 153.0 | 466.2 | 310.8 | 5:13 | 6:38 | 2.5 | 0.7 | 0.18 | 60.8 | - | 1.70 | -14.0 | 12.0 | 17.0 | |
| | | 21-Nov-10 | 3 | 9.17 | 10.17 | 1.00 | B | 167.6 | - | - | 5:03 | 5:26 | 2.0 | 13.2 | 5.66 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 3 | 9.17 | 10.17 | 1.00 | C | 160.5 | - | - | 5:26 | 5:41 | 3.0 | 13.1 | 4.27 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 3 | 9.17 | 10.17 | 1.00 | D | 190.2 | - | - | 5:41 | 6:11 | 2.8 | 5.9 | 2.00 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 3 | 9.17 | 10.17 | 1.00 | X | 51.4 | 569.7 | 569.7 | 6:11 | 6:31 | 2.3 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 2 | 10.17 | 15.90 | 5.73 | A | 202.4 | - | - | 2:49 | 3:15 | 1.6 | 14.5 | 1.89 | 30.6 | 2.4 | 1.61 | 5.0 | 7.0 | 13.0 | |
| | | 21-Nov-10 | 2 | 10.17 | 15.90 | 5.73 | B | 198.4 | - | - | 3:15 | 3:30 | 1.7 | 15.1 | 1.88 | - | - | - | - | - | - | |
| | | 21-Nov-10 | 2 | 10.17 | 15.90 | 5.73 | C | 214.0 | - | - | 3:30 | 3:44 | 2.2 | 12.3 | 1.12 | 45.0 | - | 1.67 | 5.0 | 7.0 | 13.0 | |
| | | 21-Nov-10 | 2 | 10.17 | 15.90 | 5.73 | D | 226.2 | 841.0 | 146.8 | 3:44 | 4:56 | 2.2 | 0.7 | 0.06 | 59.2 | - | 1.69 | 5.0 | 7.0 | 14.0 | |
| Q-31+730.75 | Q | 29-Jun-11 | 4 | 7.66 | 9.66 | 2.00 | MF | 51.3 | 51.30 | 25.65 | 14:20 | 14:42 | 1.8 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 25-Jun-11 | 3 | 10.16 | 11.16 | 1.00 | A | 16.8 | 16.80 | 16.80 | 9:55 | 10:20 | 2.3 | 0.4 | 0.19 | 30.8 | - | 1.6 | 11.1 | 9.5 | 14.4 | |
| | | 25-Jun-11 | 2 | 11.16 | 15.2 | 4.04 | A | 199.9 | - | - | 8:28 | 8:56 | 2.1 | 13.3 | 1.72 | 31.8 | - | 1.7 | 10.1 | 10.8 | 13.3 | |
| | | 25-Jun-11 | 2 | 11.16 | 15.2 | 4.04 | B | 279.3 | 479.20 | 118.61 | 8:56 | 9:53 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+731.5 | T | 12-Jun-11 | 4 | 7.91 | 9.41 | 1.50 | MF | 73.8 | 73.8 | 49.2 | 16:10 | 16:44 | 2.0 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.17 | 10.17 | 1.00 | B | 155.1 | - | - | 5:03 | 5:23 | 2.0 | 13.6 | 7.84 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.17 | 10.17 | 1.00 | C | 150.4 | - | - | 5:23 | 5:34 | 2.4 | 14.3 | 6.79 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.17 | 10.17 | 1.00 | D | 214.8 | - | - | 5:34 | 5:55 | 2.5 | 9.5 | 3.80 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 3 | 9.17 | 10.17 | 1.00 | X | 23.5 | 543.8 | 543.8 | 5:55 | 6:15 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 2 | 10.17 | 15.10 | 4.93 | A | 205.0 | - | - | 3:52 | 4:15 | 1.2 | 15.8 | 2.67 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 2 | 10.17 | 15.10 | 4.93 | B | 196.4 | - | - | 4:15 | 4:28 | 1.4 | 15.3 | 2.16 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 2 | 10.17 | 15.10 | 4.93 | C | 201.6 | - | - | 4:28 | 4:41 | 2.0 | 15.1 | 1.47 | - | - | - | - | - | - | |
| | | 29-Nov-10 | 2 | 10.17 | 15.10 | 4.93 | D | 49.3 | 652.3 | 132.3 | 4:41 | 4:56 | 1.9 | 0.4 | 0.04 | 62.8 | - | 1.70 | 9.0 | 9.6 | 15.0 | |
| Q-31+732.25 | Q | 05-Jul-11 | 4 | 7.91 | 9.41 | 1.50 | MF | 36.2 | 36.20 | 24.13 | 8:05 | 8:29 | 2.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 3 | 9.91 | 10.91 | 1.00 | A | 1 | 1.00 | 1.00 | 15:50 | 16:01 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 2 | 10.91 | 15 | 4.09 | A | 218.7 | 218.70 | 53.47 | 14:56 | 15:47 | 2.0 | 0.8 | 0.09 | - | - | - | - | - | - | |
| S-31+733 | S | 11-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | B | 161.9 | - | - | 20:24 | 20:48 | 1.9 | 12.1 | 4.67 | 37.6 | 1.2 | 1.64 | 19.0 | 9.0 | 15.3 | |
| | | 11-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | C | 163.4 | - | - | 20:48 | 20:59 | 2.3 | 15.5 | 4.42 | 46.9 | 0.6 | 1.68 | 19.0 | 9.0 | 14.0 | |
| | | 11-Dec-10 | 4 | 7.71 | 9.21 | 1.50 | D | 268.6 | 593.9 | 395.9 | 20:59 | 22:28 | 2.5 | 0.7 | 0.20 | 64.9 | - | 1.74 | 19.0 | 9.0 | 14.5 | |
| | | 01-Dec-10 | 3A | 9.43 | 10.43 | 1.00 | A | 17.1 | 17.1 | 17.1 | 23:02 | 23:15 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3 | 9.91 | 10.91 | 1.00 | A | 13.3 | 13.3 | 13.3 | 7:19 | 7:31 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 2 | 10.91 | 14.90 | 3.99 | A | 24.7 | 24.7 | 6.2 | 7:03 | 7:16 | 2.1 | 0.0 | 0.00 | 32.3 | 4.0 | 1.62 | -1.9 | 9.3 | 19.8 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+734.5 | T | 09-Jun-11 | 4 | 7.15 | 9.15 | 2.00 | MF | 161.4 | - | - | 19:02 | 19:25 | 1.2 | 12.6 | 5.18 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 4 | 7.15 | 9.15 | 2.00 | B | 166.0 | - | - | 19:25 | 19:36 | 1.4 | 15.3 | 4.67 | 35.1 | 4.0 | 1.63 | 5.0 | 14.4 | 12.6 | |
| | | 09-Jun-11 | 4 | 7.15 | 9.15 | 2.00 | C | 154.6 | - | - | 19:36 | 19:46 | 1.7 | 14.9 | 4.20 | 46.9 | 4.0 | 1.64 | 5.0 | 14.2 | 13.1 | |
| | | 09-Jun-11 | 4 | 7.15 | 9.15 | 2.00 | D | 159.6 | - | - | 19:46 | 20:03 | 2.1 | 7.5 | 1.82 | 70.0 | - | 1.65 | 5.0 | 15.1 | 13.9 | |
| | | 09-Jun-11 | 4 | 7.15 | 9.15 | 2.00 | X | 98.5 | 740.1 | 370.1 | 20:03 | 20:36 | 2.0 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 3A | 9.65 | 10.65 | 1.00 | A | 17.8 | 17.8 | 17.8 | 2:51 | 3:05 | 2.3 | 0.0 | 0.00 | 31.5 | - | 1.61 | 6.0 | 12.0 | 14.0 | |
| | | 30-Nov-10 | 3 | 9.91 | 10.91 | 1.00 | A | 155.3 | - | - | 7:34 | 7:59 | 1.3 | 9.3 | 7.42 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.91 | 10.91 | 1.00 | B | 160.3 | - | - | 7:59 | 8:17 | 1.9 | 9.1 | 4.74 | 38.2 | 3.0 | 1.65 | -9.0 | 12.1 | 16.8 | |
| | | 30-Nov-10 | 3 | 9.91 | 10.91 | 1.00 | C | 61.5 | 377.1 | 377.1 | 8:17 | 9:00 | 2.6 | 0.1 | 0.05 | 55.0 | - | 1.73 | -9.0 | 11.9 | 16.2 | |
| | | 30-Nov-10 | 2 | 10.91 | 15.00 | 4.09 | A | 57.6 | 57.6 | 14.1 | 7:09 | 7:30 | 2.1 | 0.2 | 0.03 | 31.7 | 4.0 | 1.63 | 3.0 | 11.9 | 17.3 | |
| P-31+736 | P | 06-Dec-10 | 4 | 7.45 | 8.95 | 1.50 | B | 177.9 | - | - | 6:51 | 7:39 | 2.3 | 4.4 | 1.29 | 35.8 | 2.0 | 1.66 | -7.4 | 9.3 | 15.3 | |
| | | 06-Dec-10 | 4 | 7.45 | 8.95 | 1.50 | C | 67.8 | - | - | 7:39 | 8:02 | 2.5 | 3.2 | 0.83 | 41.3 | 1.0 | 1.68 | -7.0 | 9.3 | 16.1 | |
| | | 06-Dec-10 | 4 | 7.45 | 8.95 | 1.50 | D | 54.0 | 299.7 | 199.8 | 8:02 | 8:44 | 2.4 | 0.1 | 0.04 | 42.1 | - | 1.71 | -7.4 | 11.2 | 17.6 | |
| | | 22-Nov-10 | 3 | 9.63 | 10.63 | 1.00 | B | 167.1 | - | - | 7:03 | 7:28 | 0.9 | 12.4 | 14.65 | 36.9 | - | 1.63 | 1.9 | 4.2 | 16.0 | |
| | | 22-Nov-10 | 3 | 9.63 | 10.63 | 1.00 | C | 194.0 | - | - | 7:28 | 7:41 | 1.3 | 17.4 | 12.90 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 9.63 | 10.63 | 1.00 | D | 165.0 | - | - | 7:41 | 7:49 | 2.2 | 21.0 | 9.90 | 96.3 | - | 1.67 | 2.3 | 4.4 | 16.6 | |
| | | 22-Nov-10 | 3 | 9.63 | 10.63 | 1.00 | X | 74.5 | 600.6 | 600.6 | 7:49 | 7:54 | 2.9 | 10.6 | 4.45 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 2 | 10.63 | 14.90 | 4.27 | A | 41.7 | 41.7 | 9.8 | 6:47 | 6:59 | 2.0 | 0.6 | 0.07 | 31.4 | 3.0 | 1.61 | 2.4 | 4.0 | 16.1 | |
| T-31+737.5 | T | 12-Jun-11 | 4 | 9.28 | 10.78 | 1.50 | MF | 69.2 | 69.2 | 46.1 | 15:38 | 16:08 | 2.1 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.65 | 10.65 | 1.00 | A | 18.2 | 18.2 | 18.2 | 10:25 | 10:37 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 10.65 | 16.50 | 5.85 | A | 202.6 | - | - | 9:09 | 9:37 | 1.8 | 11.9 | 1.16 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 10.65 | 16.50 | 5.85 | B | 180.3 | - | - | 9:37 | 10:07 | 2.1 | 8.7 | 0.71 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 10.65 | 16.50 | 5.85 | C | 44.6 | 427.5 | 73.1 | 10:07 | 10:21 | 2.3 | 2.0 | 0.15 | - | - | - | - | - | - | |
| S-31+739 | S | 11-Dec-10 | 4 | 9.59 | 11.09 | 1.50 | B | 160.3 | - | - | 16:40 | 17:06 | 1.6 | 12.6 | 5.98 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 9.59 | 11.09 | 1.50 | C | 167.2 | - | - | 17:06 | 17:20 | 2.3 | 14.5 | 4.28 | 42.4 | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 9.59 | 11.09 | 1.50 | D | 384.7 | - | - | 17:20 | 18:04 | 2.3 | 7.3 | 2.16 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 9.59 | 11.09 | 1.50 | X | 19.6 | 731.8 | 487.9 | 18:04 | 18:17 | 2.6 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3 | 11.28 | 12.28 | 1.00 | A | 32.6 | - | - | 8:14 | 8:21 | 2.2 | 2.9 | 1.39 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3 | 11.28 | 12.28 | 1.00 | B | 116.6 | - | - | 8:21 | 8:53 | 3.0 | 3.7 | 1.23 | 35.3 | 3.0 | 1.65 | -4.3 | 8.2 | 16.8 | |
| | | 25-Nov-10 | 3 | 11.28 | 12.28 | 1.00 | C | 156.4 | 305.6 | 305.6 | 8:53 | 10:17 | 3.0 | 0.1 | 0.02 | 40.0 | - | 1.68 | -4.3 | 8.2 | 18.5 | |
| | | 25-Nov-10 | 2 | 12.28 | 17.00 | 4.72 | A | 107.0 | 107.0 | 22.7 | 7:41 | 8:11 | 2.1 | 1.5 | 0.15 | - | - | - | - | - | - | |
| T-31+740.5 | T | 09-Jun-11 | 4 | 7.50 | 9.50 | 2.00 | MF | 180.0 | - | - | 17:08 | 17:29 | 2.0 | 18.9 | 5.07 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 4 | 7.50 | 9.50 | 2.00 | B | 160.0 | - | - | 17:29 | 17:38 | 1.9 | 19.1 | 4.37 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 4 | 7.50 | 9.50 | 2.00 | C | 100.2 | 440.2 | 220.1 | 17:38 | 17:55 | 2.2 | 1.0 | 0.23 | - | - | - | - | - | - | |
| | | 03-Dec-10 | 3A | 10.08 | 11.28 | 1.20 | A | 27.5 | 27.5 | 22.9 | 3:12 | 3:37 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 11.28 | 12.28 | 1.00 | A | 15.5 | 15.5 | 15.5 | 12:16 | 12:28 | 2.6 | 0.1 | 0.05 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 12.28 | 15.60 | 3.32 | A | 194.7 | - | - | 10:43 | 11:10 | 2.4 | 11.1 | 1.42 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 12.28 | 15.60 | 3.32 | B | 143.1 | - | - | 11:10 | 11:39 | 2.2 | 4.0 | 0.55 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 12.28 | 15.60 | 3.32 | C | 64.3 | 402.1 | 121.1 | 11:39 | 12:11 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+742 | P | 06-Dec-10 | 4 | 8.57 | 10.07 | 1.50 | B | 167.3 | - | - | 9:12 | 9:48 | 2.2 | 5.4 | 1.58 | 40.3 | - | - | - | - | - | |
| | | 06-Dec-10 | 4 | 8.57 | 10.07 | 1.50 | C | 165.5 | - | - | 9:48 | 10:16 | 2.6 | 4.8 | 1.23 | 43.0 | - | - | - | - | - | |
| | | 06-Dec-10 | 4 | 8.57 | 10.07 | 1.50 | D | 37.8 | 370.6 | 247.1 | 10:16 | 10:52 | 2.4 | 0.8 | 0.22 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 10.09 | 11.09 | 1.00 | B | 168.2 | - | - | 9:15 | 9:43 | 2.9 | 3.8 | 1.13 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 10.09 | 11.09 | 1.00 | C | 12.4 | 180.6 | 180.6 | 9:43 | 9:58 | 3.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 2 | 11.09 | 15.75 | 4.66 | A | 130.1 | 130.1 | 27.9 | 8:24 | 8:50 | 0.7 | 3.1 | 9.00 | - | - | - | - | - | - | |
| T-31+743.5 | T | 12-Jun-11 | 4 | 7.15 | 8.65 | 1.50 | MF | 80.7 | 80.7 | 53.8 | 15:10 | 15:35 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | A | 162.4 | - | - | 15:17 | 15:44 | 1.2 | 9.2 | 7.82 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | B | 161.8 | - | - | 15:44 | 16:01 | 2.2 | 11.8 | 5.38 | 39.0 | - | 1.65 | -6.0 | 12.2 | 17.5 | |
| | | 30-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | C | 136.2 | - | - | 16:01 | 16:31 | 2.4 | 2.6 | 1.09 | 41.5 | 2.0 | 1.70 | -6.0 | 12.2 | 17.6 | |
| | | 30-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | D | 23.9 | 484.3 | 484.3 | 16:31 | 16:55 | 2.5 | 0.4 | 0.17 | 54.8 | 0.0 | - | 3.6 | 13.9 | 22.6 | |
| | | 30-Nov-10 | 2 | 10.15 | 14.50 | 4.35 | A | 25.5 | 25.5 | 5.9 | 15:01 | 15:14 | 2.2 | 0.2 | 0.02 | 32.8 | - | 1.62 | -3.0 | 12.9 | 16.4 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+745 | S | 11-Dec-10 | 4 | 7.35 | 8.85 | 1.50 | B | 168.0 | - | - | 13:33 | 13:58 | 1.8 | 13.2 | 5.24 | 40.3 | - | 1.63 | -19.1 | 6.4 | 11.2 | |
| | | 11-Dec-10 | 4 | 7.35 | 8.85 | 1.50 | C | 141.2 | - | - | 13:58 | 14:09 | 2.1 | 14.0 | 4.56 | 47.5 | - | 1.68 | -13.9 | 6.2 | 10.8 | |
| | | 11-Dec-10 | 4 | 7.35 | 8.85 | 1.50 | D | 435.7 | 744.9 | 496.6 | 14:09 | 16:10 | 2.5 | 0.2 | 0.06 | 67.3 | 0.0 | 1.73 | -13.9 | 6.2 | 11.0 | |
| | | 25-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | A | 14.1 | 14.1 | 14.1 | 1:18 | 1:33 | 2.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 2 | 10.15 | 14.50 | 4.35 | A | 31.2 | 31.2 | 7.2 | 1:00 | 1:17 | 2.9 | 0.1 | 0.01 | 30.9 | 3.2 | 1.60 | 12.0 | 10.0 | 19.0 | |
| T-31+746.5 | T | 09-Jun-11 | 4 | 6.81 | 8.81 | 2.00 | MF | 160.0 | - | - | 15:04 | 16:16 | 2.0 | 7.6 | 1.87 | - | - | - | - | - | - | Communicated to T-31+752.5 and T-31+758.5 |
| | | 09-Jun-11 | 4 | 6.81 | 8.81 | 2.00 | B | 73.2 | 233.2 | 116.6 | 16:16 | 16:54 | 2.1 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.31 | 10.31 | 1.00 | A | 164.3 | - | - | 17:16 | 17:41 | 1.1 | 11.5 | 10.44 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.31 | 10.31 | 1.00 | B | 139.2 | - | - | 17:41 | 17:53 | 1.7 | 11.3 | 6.80 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.31 | 10.31 | 1.00 | C | 142.6 | - | - | 17:53 | 18:05 | 2.3 | 6.4 | 4.75 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.31 | 10.31 | 1.00 | D | 13.8 | 459.9 | 459.9 | 18:05 | 18:25 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 10.31 | 14.40 | 4.09 | A | 19.7 | 19.7 | 4.8 | 17:03 | 17:15 | 1.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+748 | P | 06-Dec-10 | 4 | 7.20 | 8.70 | 1.50 | B | 159.6 | - | - | 13:47 | 14:12 | 1.4 | 11.8 | 5.01 | 40.4 | - | 1.69 | -13.4 | 12.2 | 19.1 | |
| | | 06-Dec-10 | 4 | 7.20 | 8.70 | 1.50 | C | 158.4 | - | - | 14:12 | 14:24 | 1.9 | 12.7 | 4.34 | 51.2 | - | 1.75 | -13.4 | 12.2 | 18.6 | |
| | | 06-Dec-10 | 4 | 7.20 | 8.70 | 1.50 | D | 203.5 | - | - | 14:24 | 14:38 | 2.6 | 14.4 | 3.41 | 54.3 | 0.5 | 1.77 | -13.4 | 12.2 | 18.4 | |
| | | 06-Dec-10 | 4 | 7.20 | 8.70 | 1.50 | X | 75.5 | 597.0 | 398.0 | 14:38 | 14:52 | 2.4 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 9.31 | 10.31 | 1.00 | B | 158.1 | - | - | 10:28 | 10:52 | 2.3 | 11.7 | 4.98 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 9.31 | 10.31 | 1.00 | C | 162.0 | - | - | 10:52 | 11:10 | 2.7 | 6.6 | 2.46 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 9.31 | 10.31 | 1.00 | D | 200.1 | - | - | 11:10 | 11:50 | 2.8 | 4.8 | 1.77 | - | - | - | - | - | - | Communicated to T-31+743.5 |
| | | 22-Nov-10 | 3 | 9.31 | 10.31 | 1.00 | X | 75.4 | 595.6 | 595.6 | 11:50 | 12:03 | 2.5 | 6.0 | 2.34 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 2 | 10.31 | 14.40 | 4.09 | A | 22.1 | 22.1 | 5.4 | 10:09 | 10:23 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+749.5 | T | 12-Jun-11 | 4 | 7.45 | 8.95 | 1.50 | MF | 180.0 | - | - | 13:44 | 14:13 | 2.0 | 3.0 | 0.96 | - | - | - | - | - | - | Communicated to T-31+755.5 |
| | | 12-Jun-11 | 4 | 7.45 | 8.95 | 1.50 | B | 64.2 | 244.2 | 162.8 | 14:13 | 15:06 | 2.0 | 0.2 | 0.07 | 36.9 | - | 1.63 | 6.3 | 7.8 | 16.1 | |
| | | 04-Dec-10 | 3A | 9.18 | 10.18 | 1.00 | A | 19.0 | 19.0 | 19.0 | 10:05 | 10:19 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.45 | 10.45 | 1.00 | A | 16.0 | 16.0 | 16.0 | 19:57 | 20:10 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 10.45 | 14.50 | 4.05 | A | 27.1 | 27.1 | 6.7 | 19:42 | 19:54 | 2.5 | 0.0 | 0.00 | 31.5 | 4.0 | 1.62 | 0.0 | 11.0 | 14.0 | |
| S-31+751 | S | 11-Dec-10 | 4 | 7.53 | 9.03 | 1.50 | B | 160.6 | - | - | 9:40 | 10:07 | 2.2 | 12.8 | 3.57 | - | - | - | -17.3 | - | - | |
| | | 11-Dec-10 | 4 | 7.53 | 9.03 | 1.50 | C | 158.8 | - | - | 10:07 | 10:23 | 2.4 | 5.2 | 0.87 | - | - | - | - | - | - | |
| | | 11-Dec-10 | 4 | 7.53 | 9.03 | 1.50 | D | 130.2 | 449.6 | 299.7 | 10:23 | 11:27 | 2.4 | 0.7 | 0.20 | 62.0 | 0.5 | 1.74 | -17.3 | - | 13.0 | |
| | | 25-Nov-10 | 3 | 9.45 | 10.45 | 1.00 | A | 49.8 | - | - | 2:01 | 2:10 | 0.0 | 6.8 | inf | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3 | 9.45 | 10.45 | 1.00 | B | 133.9 | - | - | 2:10 | 2:25 | 3.0 | 10.1 | 3.38 | 36.3 | - | 1.63 | 12.0 | 10.0 | 18.0 | |
| | | 25-Nov-10 | 3 | 9.45 | 10.45 | 1.00 | C | 137.5 | - | - | 2:25 | 2:50 | 2.6 | 4.1 | 1.35 | 48.5 | 0.4 | 1.67 | 12.0 | 10.0 | 18.0 | |
| | | 25-Nov-10 | 3 | 9.45 | 10.45 | 1.00 | D | 124.0 | 445.2 | 445.2 | 2:50 | 4:06 | 2.9 | 0.5 | 0.17 | 63.1 | 0.8 | 1.69 | 12.0 | 10.0 | 20.0 | |
| | | 25-Nov-10 | 2 | 10.45 | 14.60 | 4.15 | A | 21.6 | 21.6 | 5.2 | 1:46 | 1:59 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+752.5 | T | 09-Jun-11 | 4 | 7.23 | 9.23 | 2.00 | MF | 185.0 | - | - | 14:25 | 14:51 | 1.3 | 12.0 | 4.50 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 4 | 7.23 | 9.23 | 2.00 | B | 155.0 | - | - | 14:51 | 14:59 | 1.6 | 18.0 | 4.57 | 33.4 | 5.0 | 1.63 | 18.2 | 12.1 | 17.9 | Communicated to T-31+758.5 |
| | | 09-Jun-11 | 4 | 7.23 | 9.23 | 2.00 | C | 142.6 | 482.6 | 241.3 | 14:59 | 15:36 | 2.1 | 0.2 | 0.04 | 44.2 | - | 1.64 | 8.2 | 12.1 | 18.0 | |
| | | 30-Nov-10 | 3 | 9.73 | 10.73 | 1.00 | A | 162.1 | - | - | 20:40 | 21:04 | 1.7 | 12.5 | 7.34 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.73 | 10.73 | 1.00 | B | 154.1 | - | - | 21:04 | 21:19 | 2.4 | 9.3 | 3.90 | 35.6 | 6.0 | 1.63 | 0.0 | 11.0 | 16.0 | |
| | | 30-Nov-10 | 3 | 9.73 | 10.73 | 1.00 | C | 156.0 | - | - | 21:19 | 21:42 | 2.4 | 6.7 | 2.89 | 46.1 | - | 1.68 | 0.0 | 11.0 | 16.0 | |
| | | 30-Nov-10 | 3 | 9.73 | 10.73 | 1.00 | D | 53.8 | - | - | 21:42 | 21:55 | 2.5 | 3.1 | 1.26 | 64.4 | 1.0 | 1.70 | 0.0 | 11.0 | 17.0 | |
| | | 30-Nov-10 | 3 | 9.73 | 10.73 | 1.00 | X | 30.0 | 556.0 | 556.0 | 21:55 | 22:20 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 10.73 | 15.00 | 4.27 | A | 22.4 | 22.4 | 5.2 | 20:23 | 20:36 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+754 | P | 06-Dec-10 | 4 | 7.32 | 8.82 | 1.50 | B | 158.9 | - | - | 15:08 | 15:34 | 1.6 | 12.5 | 4.83 | - | - | - | - | - | - | |
| | | 06-Dec-10 | 4 | 7.32 | 8.82 | 1.50 | C | 159.8 | - | - | 15:34 | 15:46 | 2.1 | 10.2 | 2.88 | - | - | - | - | - | - | |
| | | 06-Dec-10 | 4 | 7.32 | 8.82 | 1.50 | D | 209.6 | - | - | 15:46 | 16:02 | 2.6 | 16.8 | 2.76 | - | - | - | - | - | - | |
| | | 06-Dec-10 | 4 | 7.32 | 8.82 | 1.50 | X | 60.7 | 589.0 | 392.7 | 16:02 | 16:21 | 2.6 | 0.7 | 0.19 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3A | 9.33 | 10.33 | 1.00 | A | 18.2 | 18.2 | 18.2 | 22:23 | 22:38 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 9.73 | 10.73 | 1.00 | B | 13.3 | 13.3 | 13.3 | 14:06 | 14:17 | 2.9 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 2 | 10.73 | 14.80 | 4.07 | A | 22.1 | 22.1 | 5.4 | 13:51 | 14:01 | 2.2 | 0.0 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+754.75 | Q | 29-Jun-11 | 4 | 6.75 | 8.75 | 2.00 | MF | 60 | 60.00 | 30.00 | 14:48 | 15:14 | 2.1 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 25-Jun-11 | 3 | 9.25 | 10.3 | 1.05 | A | 154.7 | - | - | 10:39 | 11:01 | 1.7 | 11.9 | 5.78 | - | - | - | - | - | - | |
| | | 25-Jun-11 | 3 | 9.25 | 10.3 | 1.05 | B | 167.9 | - | - | 11:01 | 11:13 | 2.4 | 16.2 | 6.33 | 37.9 | - | 1.6 | 10.8 | 9.9 | 15.0 | |
| | | 25-Jun-11 | 3 | 9.25 | 10.3 | 1.05 | C | 174.2 | - | - | 11:13 | 11:29 | 2.2 | 6.9 | 2.99 | 46.9 | - | 1.7 | 10.0 | 9.8 | 14.7 | |
| | | 25-Jun-11 | 3 | 9.25 | 10.3 | 1.05 | D | 30.8 | 527.60 | 502.48 | 11:29 | 11:50 | 2.2 | 0.0 | 0.01 | - | - | - | - | - | - | |
| T-31+755.5 | T | 12-Jun-11 | 4 | 7.15 | 8.65 | 1.50 | MF | 149.2 | 149.2 | 99.5 | 11:12 | 11:49 | 2.0 | 0.8 | 0.25 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | A | 161.0 | - | - | 22:48 | 23:09 | 1.5 | 12.6 | 7.23 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | B | 159.1 | - | - | 23:09 | 23:21 | 1.9 | 14.6 | 7.43 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | C | 158.8 | - | - | 23:21 | 23:32 | 2.4 | 13.0 | 5.38 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | D | 50.1 | - | - | 23:32 | 23:36 | 2.4 | 7.6 | 3.17 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | X | 28.6 | 557.6 | 557.6 | 23:36 | 23:54 | 2.6 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 10.15 | 14.40 | 4.25 | A | 22.3 | 22.3 | 5.2 | 22:32 | 22:44 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+756.25 | Q | 05-Jul-11 | 4 | 6.59 | 8.09 | 1.50 | MF | 158.8 | 158.80 | 105.87 | 8:32 | 9:12 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 3 | 8.59 | 10 | 1.41 | A | 23.5 | 23.50 | 16.67 | 16:18 | 16:33 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+757 | S | 11-Dec-10 | 4 | 6.89 | 8.39 | 1.50 | B | 160.2 | - | - | 7:05 | 7:31 | 2.2 | 12.6 | 3.86 | 34.9 | 2.0 | 1.64 | 2.6 | 5.4 | 18.3 | |
| | | 11-Dec-10 | 4 | 6.89 | 8.39 | 1.50 | C | 159.8 | - | - | 7:31 | 7:43 | 2.5 | 13.8 | 3.74 | 51.0 | 0.5 | 1.69 | 2.5 | 5.4 | 13.2 | |
| | | 11-Dec-10 | 4 | 6.89 | 8.39 | 1.50 | D | 220.3 | 540.3 | 360.2 | 7:43 | 8:32 | 2.4 | 0.6 | 0.15 | 59.5 | - | 1.74 | 2.6 | 5.6 | 13.8 | |
| | | 25-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | A | 48.0 | - | - | 4:41 | 4:51 | 0.7 | 7.2 | 9.30 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | B | 118.0 | - | - | 4:51 | 5:04 | 1.3 | 13.9 | 9.98 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | C | 156.7 | - | - | 5:04 | 5:15 | 2.2 | 15.6 | 7.24 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | D | 202.8 | - | - | 5:15 | 5:28 | 3.1 | 17.1 | 6.62 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 3 | 9.15 | 10.15 | 1.00 | X | 76.2 | 601.7 | 601.7 | 5:28 | 5:39 | 2.6 | 6.2 | 2.43 | - | - | - | - | - | - | |
| | | 25-Nov-10 | 2 | 10.15 | 14.00 | 3.85 | A | 34.1 | 34.1 | 8.9 | 4:25 | 4:39 | 2.2 | 0.6 | 0.06 | - | - | - | - | - | - | |
| T-31+758.5 | T | 09-Jun-11 | 4 | 5.91 | 7.91 | 2.00 | MF | 180.0 | - | - | 10:56 | 11:18 | 2.1 | 10.8 | 2.70 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 4 | 5.91 | 7.91 | 2.00 | B | 160.0 | - | - | 11:18 | 11:31 | 2.0 | 16.9 | 4.27 | - | - | - | - | - | - | Communicated to T-31+752.5. |
| | | 09-Jun-11 | 4 | 5.91 | 7.91 | 2.00 | C | 160.0 | - | - | 11:31 | 12:07 | 2.0 | 1.4 | 0.37 | - | - | - | - | - | - | |
| | | 09-Jun-11 | 4 | 5.91 | 7.91 | 2.00 | D | 12.2 | 512.2 | 256.1 | 12:07 | 12:25 | 2.1 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | A | 13.5 | 13.5 | 13.5 | 2:44 | 2:58 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 9.41 | 14.30 | 4.89 | A | 25.1 | 25.1 | 5.1 | 2:28 | 2:42 | 2.1 | 0.0 | 0.00 | 31.1 | - | 1.62 | -9.0 | 11.0 | 17.0 | |
| P-31+760 | P | 06-Dec-10 | 4 | 7.07 | 8.57 | 1.50 | B | 160.8 | - | - | 16:40 | 17:07 | 1.5 | 11.2 | 5.17 | 37.4 | - | - | - | - | - | |
| | | 06-Dec-10 | 4 | 7.07 | 8.57 | 1.50 | C | 159.4 | - | - | 17:07 | 17:20 | 2.3 | 10.8 | 3.10 | 47.4 | - | - | - | - | - | |
| | | 06-Dec-10 | 4 | 7.07 | 8.57 | 1.50 | D | 318.1 | 638.3 | 425.5 | 17:20 | 18:51 | 2.4 | 0.3 | 0.09 | 59.7 | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | A | 41.8 | - | - | 20:28 | 20:36 | 0.6 | 6.5 | 11.36 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | B | 125.9 | - | - | 20:36 | 20:50 | 2.3 | 12.8 | 5.91 | 36.7 | 7.0 | 1.63 | -5.0 | 12.0 | 14.0 | |
| | | 22-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | C | 155.4 | - | - | 20:50 | 21:07 | 2.5 | 7.9 | 2.81 | 45.4 | - | 1.67 | -5.0 | 12.0 | 14.0 | |
| | | 22-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | D | 192.3 | - | - | 21:07 | 21:46 | 2.8 | 4.0 | 1.45 | 46.3 | - | 1.68 | -5.0 | 12.0 | 16.0 | |
| | | 22-Nov-10 | 3 | 8.41 | 9.41 | 1.00 | X | 25.8 | 541.2 | 541.2 | 21:46 | 22:05 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 2 | 9.41 | 13.10 | 3.69 | A | 21.3 | 21.3 | 5.8 | 20:10 | 20:22 | 2.2 | 0.0 | 0.00 | 31.2 | 4.0 | 1.62 | -5.0 | 12.0 | 13.0 | |
| T-31+761.5 | T | 12-Jun-11 | 4 | 6.46 | 7.96 | 1.50 | MF | 92.7 | 92.7 | 61.8 | 10:23 | 10:48 | 2.0 | 0.4 | 0.16 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.46 | 9.46 | 1.00 | A | 155.2 | - | - | 5:11 | 5:33 | 1.4 | 13.2 | 8.21 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.46 | 9.46 | 1.00 | B | 163.2 | - | - | 5:33 | 5:44 | 1.9 | 15.6 | 8.43 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.46 | 9.46 | 1.00 | C | 152.1 | - | - | 5:44 | 6:05 | 2.1 | 6.5 | 3.07 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.46 | 9.46 | 1.00 | D | 98.4 | 568.9 | 568.9 | 6:05 | 7:04 | 2.5 | 0.3 | 0.12 | 66.3 | - | 1.71 | -9.0 | 11.0 | 18.0 | |
| | | 30-Nov-10 | 2 | 9.46 | 14.00 | 4.54 | A | 204.8 | - | - | 3:07 | 3:44 | 2.3 | 4.9 | 0.48 | - | - | - | - | - | - | |
| | | 30-Nov-10 | 2 | 9.46 | 14.00 | 4.54 | B | 191.8 | - | - | 3:44 | 4:40 | 2.0 | 2.7 | 0.29 | 37.7 | - | 1.63 | -9.0 | 11.0 | 17.0 | |
| | | 30-Nov-10 | 2 | 9.46 | 14.00 | 4.54 | C | 46.8 | 443.4 | 97.7 | 4:40 | 5:02 | 2.1 | 1.9 | 0.20 | 45.6 | - | 1.68 | -9.0 | 11.0 | 17.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+763 | S | 10-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 159.2 | - | - | 4:31 | 4:53 | 1.4 | 12.2 | 5.98 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 161.4 | - | - | 4:53 | 5:04 | 1.9 | 14.6 | 5.52 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | D | 259.6 | 580.2 | 386.8 | 5:04 | 6:33 | 2.8 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 8.46 | 9.46 | 1.00 | A | 38.2 | - | - | 7:59 | 8:09 | 0.9 | 3.1 | 3.50 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 8.46 | 9.46 | 1.00 | B | 146.1 | - | - | 8:09 | 8:29 | 2.1 | 7.3 | 3.36 | 35.2 | 2.0 | 1.64 | 13.7 | 9.0 | 16.5 | |
| | | 26-Nov-10 | 3 | 8.46 | 9.46 | 1.00 | C | 33.3 | 217.6 | 217.6 | 8:29 | 8:56 | 2.9 | 0.5 | 0.19 | 47.0 | - | 1.71 | 13.0 | 9.0 | 16.1 | |
| | | 26-Nov-10 | 2 | 9.46 | 13.30 | 3.84 | A | 21.2 | 21.2 | 5.5 | 7:44 | 7:56 | 2.2 | 0.1 | 0.01 | 32.9 | 3.0 | 1.65 | 13.7 | 9.0 | 15.1 | |
| T-31+764.5 | T | 09-Jun-11 | 4 | 5.66 | 7.66 | 2.00 | MF | 89.8 | 89.8 | 44.9 | 10:25 | 10:50 | 2.1 | 0.7 | 0.16 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.16 | 9.16 | 1.00 | A | 183.5 | - | - | 7:32 | 8:03 | 1.3 | 8.9 | 5.89 | 33.5 | 4.0 | 1.65 | -3.0 | 10.5 | 14.0 | |
| | | 01-Dec-10 | 3 | 8.16 | 9.16 | 1.00 | B | 153.0 | - | - | 8:03 | 8:19 | 2.4 | 9.1 | 3.35 | 42.7 | 3.0 | 1.66 | -3.0 | 10.5 | 14.8 | |
| | | 01-Dec-10 | 3 | 8.16 | 9.16 | 1.00 | C | 105.0 | 441.5 | 441.5 | 8:19 | 8:57 | 2.5 | 0.4 | 0.13 | 50.0 | - | 1.69 | -3.0 | 10.5 | 15.9 | |
| | | 01-Dec-10 | 2 | 9.16 | 13.50 | 4.34 | A | 24.9 | 24.9 | 5.7 | 7:13 | 7:27 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+766 | P | 06-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | B | 160.4 | - | - | 19:52 | 20:13 | 1.4 | 11.5 | 6.45 | 37.1 | 1.6 | 1.63 | -3.0 | 8.0 | 14.0 | |
| | | 06-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | C | 154.8 | - | - | 20:13 | 20:24 | 2.1 | 12.3 | 3.96 | 49.5 | 0.4 | 1.68 | -3.0 | 8.0 | 13.0 | |
| | | 06-Dec-10 | 4 | 6.13 | 7.63 | 1.50 | D | 376.2 | 691.4 | 460.9 | 20:24 | 22:20 | 2.5 | 0.2 | 0.06 | 71.1 | 0.4 | 1.70 | -3.0 | 8.0 | 13.0 | |
| | | 22-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | X | 80.9 | 602.0 | 602.0 | 0:15 | 0:26 | 2.9 | 8.2 | 2.80 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | A | 88.3 | - | - | 23:12 | 23:29 | 1.5 | 9.7 | 6.02 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | B | 75.4 | - | - | 23:29 | 23:36 | 2.3 | 12.8 | 5.51 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | C | 157.4 | - | - | 23:36 | 23:50 | 3.0 | 11.6 | 4.16 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | D | 200.0 | - | - | 23:50 | 0:15 | 2.9 | 7.5 | 2.69 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 2 | 9.16 | 13.10 | 3.94 | A | 26.2 | 26.2 | 6.6 | 22:39 | 22:51 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+767.5 | T | 12-Jun-11 | 4 | 5.85 | 7.35 | 1.50 | MF | 60.1 | 60.1 | 40.1 | 9:43 | 10:16 | 2.1 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 7.85 | 8.85 | 1.00 | A | 15.7 | 15.7 | 15.7 | 9:23 | 9:36 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 2 | 8.85 | 13.70 | 4.85 | A | 37.2 | 37.2 | 7.7 | 9:05 | 9:19 | 2.1 | 0.5 | 0.05 | - | - | - | - | - | - | |
| S-31+769 | S | 10-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | B | 158.4 | - | - | 2:21 | 2:45 | 1.4 | 12.5 | 6.51 | 36.7 | - | 1.63 | -7.0 | 11.0 | 13.0 | |
| | | 10-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | C | 166.5 | - | - | 2:45 | 2:56 | 1.7 | 15.7 | 6.06 | 46.0 | - | 1.67 | -7.0 | 11.0 | 14.0 | |
| | | 10-Dec-10 | 4 | 6.08 | 7.58 | 1.50 | D | 246.9 | 571.8 | 381.2 | 2:56 | 4:09 | 2.5 | 0.8 | 0.22 | 63.1 | - | 1.73 | 5.0 | 11.0 | 16.0 | |
| | | 26-Nov-10 | 3 | 7.85 | 8.85 | 1.00 | A | 14.3 | 14.3 | 14.3 | 9:21 | 9:34 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 2 | 8.85 | 13.30 | 4.45 | A | 22.2 | 22.2 | 5.0 | 9:05 | 9:17 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+770.5 | T | 09-Jun-11 | 4 | 5.60 | 7.60 | 2.00 | MF | 122.8 | 122.8 | 61.4 | 9:47 | 10:20 | 2.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.10 | 9.10 | 1.00 | A | 170.6 | - | - | 10:02 | 10:45 | 2.6 | 10.0 | 3.89 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.10 | 9.10 | 1.00 | B | 154.4 | - | - | 10:45 | 11:01 | 3.1 | 11.3 | 3.67 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.10 | 9.10 | 1.00 | C | 57.1 | 382.1 | 382.1 | 11:01 | 11:30 | 2.5 | 0.0 | 0.00 | 39.6 | - | - | - | - | - | |
| | | 01-Dec-10 | 2 | 9.10 | 13.30 | 4.20 | A | 18.0 | 18.0 | 4.3 | 9:47 | 9:59 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+772 | P | 06-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 158.1 | - | - | 22:37 | 22:59 | 1.7 | 12.0 | 4.99 | - | - | - | - | - | - | |
| | | 06-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 164.7 | - | - | 22:59 | 23:10 | 2.0 | 15.4 | 5.78 | - | - | - | - | - | - | |
| | | 06-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | D | 163.3 | 486.1 | 324.1 | 23:10 | 23:43 | 2.4 | 0.7 | 0.18 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 8.10 | 9.10 | 1.00 | A | 27.1 | - | - | 3:47 | 3:57 | 2.9 | 1.7 | 0.55 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 3 | 8.10 | 9.10 | 1.00 | B | 37.7 | 64.8 | 64.8 | 3:57 | 4:17 | 2.7 | 0.0 | 0.00 | 34.5 | - | 1.62 | -6.0 | 12.0 | 19.0 | |
| | | 22-Nov-10 | 2 | 9.10 | 13.30 | 4.20 | A | 93.6 | 93.6 | 22.3 | 3:13 | 3:43 | 2.1 | 1.4 | 0.17 | - | - | - | - | - | - | |
| T-31+773.5 | T | 12-Jun-11 | 4 | 6.16 | 7.66 | 1.50 | MF | 108.7 | 108.7 | 72.5 | 9:03 | 9:36 | 2.0 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.16 | 9.16 | 1.00 | A | 161.0 | - | - | 14:22 | 14:54 | 2.6 | 4.8 | 1.87 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.16 | 9.16 | 1.00 | B | 18.1 | 179.1 | 179.1 | 14:54 | 15:40 | 2.5 | 0.0 | 0.00 | 36.6 | - | 1.65 | -7.0 | 12.0 | 18.3 | |
| | | 01-Dec-10 | 2 | 9.16 | 13.20 | 4.04 | A | 37.7 | 37.7 | 9.3 | 14:07 | 14:19 | 2.2 | 1.1 | 0.14 | 32.8 | - | 1.64 | -7.0 | 12.0 | 16.5 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+775 | S | 10-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | B | 164.8 | - | - | 21:34 | 21:57 | 1.5 | 15.1 | 6.89 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | C | 153.7 | - | - | 21:57 | 22:09 | 2.0 | 17.3 | 5.20 | - | - | - | - | - | - | |
| | | 10-Dec-10 | 4 | 6.16 | 7.66 | 1.50 | D | 341.2 | 659.7 | 439.8 | 22:09 | 0:07 | 2.5 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | A | 33.9 | - | - | 10:06 | 10:54 | 0.3 | 3.1 | 28.97 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | B | 130.5 | - | - | 10:54 | 11:12 | 1.3 | 12.5 | 8.72 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | C | 162.1 | - | - | 11:12 | 11:27 | 2.8 | 8.7 | 3.08 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 8.16 | 9.16 | 1.00 | D | 145.3 | 471.8 | 471.8 | 11:27 | 12:15 | 3.1 | 0.1 | 0.02 | 61.2 | - | 1.74 | 13.0 | 9.2 | 18.0 | |
| | | 26-Nov-10 | 2 | 9.16 | 13.40 | 4.24 | A | 33.0 | 33.0 | 7.8 | 9:42 | 10:00 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+775.75 | Q | 29-Jun-11 | 4 | 5.2 | 7.2 | 2.00 | MF | 57.9 | 57.90 | 28.95 | 15:29 | 15:55 | 1.9 | 0.5 | 0.13 | - | - | - | - | - | - | |
| | | 25-Jun-11 | 3 | 7.7 | 8.7 | 1.00 | A | 165.2 | - | - | 14:38 | 15:30 | 2.8 | 3.8 | 1.73 | 31.6 | - | 1.6 | 11.0 | 10.9 | 12.7 | |
| | | 25-Jun-11 | 3 | 7.7 | 8.7 | 1.00 | B | 153.9 | - | - | 15:30 | 15:57 | 2.4 | 3.6 | 1.47 | 37.8 | 2.0 | 1.6 | 10.8 | 10.7 | 13.4 | |
| | | 25-Jun-11 | 3 | 7.7 | 8.7 | 1.00 | C | 78.5 | 397.60 | 397.60 | 15:57 | 16:31 | 2.4 | 0.0 | 0.00 | 44.9 | - | 1.7 | 11.1 | 10.0 | 12.9 | |
| T-31+776.5 | T | 09-Jun-11 | 4 | 4.77 | 6.77 | 2.00 | MF | 13.3 | 13.3 | 6.7 | 8:34 | 9:22 | 2.1 | 0.6 | 0.15 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 7.27 | 8.27 | 1.00 | A | 170.3 | - | - | 16:06 | 16:32 | 0.9 | 11.8 | 13.59 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 7.27 | 8.27 | 1.00 | B | 168.3 | - | - | 16:32 | 16:46 | 1.2 | 12.1 | 10.13 | 37.9 | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 7.27 | 8.27 | 1.00 | C | 151.2 | - | - | 16:46 | 16:59 | 2.1 | 12.0 | 5.91 | 42.4 | 1.0 | 1.69 | -6.0 | 12.0 | 19.3 | |
| | | 01-Dec-10 | 3 | 7.27 | 8.27 | 1.00 | D | 154.9 | 644.7 | 644.7 | 16:59 | 17:15 | 2.5 | 8.6 | 3.53 | 75.0 | 0.0 | 1.71 | -6.0 | 13.0 | 19.2 | |
| | | 01-Dec-10 | 2 | 8.27 | 12.90 | 4.63 | A | 27.2 | 27.2 | 5.9 | 15:49 | 16:02 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+777.25 | Q | 05-Jul-11 | 4 | 5.6 | 7.1 | 1.50 | MF | 71.7 | 71.70 | 47.80 | 9:18 | 9:04 | 2.0 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 3 | 7.6 | 8.7 | 1.10 | A | 25.2 | 25.20 | 22.91 | 16:40 | 16:55 | 2.6 | 0.2 | 0.08 | - | - | - | - | - | - | |
| P-31+778 | P | 06-Dec-10 | 4 | 5.98 | 7.48 | 1.50 | B | 160.0 | - | - | 2:36 | 2:59 | 1.5 | 12.1 | 5.31 | 37.6 | - | 1.64 | 3.0 | 8.0 | 15.0 | |
| | | 06-Dec-10 | 4 | 5.98 | 7.48 | 1.50 | C | 168.7 | - | - | 2:59 | 3:10 | 1.8 | 15.6 | 5.59 | 49.3 | - | 1.69 | 3.0 | 8.0 | 15.0 | |
| | | 06-Dec-10 | 4 | 5.98 | 7.48 | 1.50 | D | 349.1 | 677.8 | 451.9 | 3:10 | 4:50 | 2.3 | 1.0 | 0.28 | 63.8 | - | 1.71 | 3.0 | 8.0 | 16.0 | |
| | | 22-Nov-10 | 3 | 7.27 | 8.27 | 1.00 | B | 81.1 | 81.1 | 81.1 | 5:00 | 6:06 | 2.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Nov-10 | 2 | 8.27 | 13.60 | 5.33 | A | 67.8 | 67.8 | 12.7 | 4:30 | 4:50 | 2.1 | 1.8 | 0.18 | 31.7 | - | 1.61 | -6.0 | 12.0 | 18.0 | |
| Q-31+778.75 | Q | 29-Jun-11 | 4 | 5.63 | 7.63 | 2.00 | MF | 24.3 | 24.30 | 12.15 | 15:56 | 16:09 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Jun-11 | 3 | 8.13 | 9.2 | 1.07 | A | 161 | - | - | 16:40 | 17:01 | 2.4 | 8.1 | 3.04 | - | - | - | - | - | - | |
| | | 25-Jun-11 | 3 | 8.13 | 9.2 | 1.07 | B | 30.4 | 191.40 | 178.88 | 17:01 | 17:24 | 2.6 | 0.1 | 0.03 | - | - | - | - | - | - | |
| T-31+779.5 | T | 12-Jun-11 | 4 | 6.05 | 7.55 | 1.50 | MF | 180.4 | - | - | 8:06 | 8:28 | 2.0 | 12.1 | 3.77 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 4 | 6.05 | 7.55 | 1.50 | B | 48.8 | 229.2 | 152.8 | 8:28 | 8:58 | 2.1 | 0.8 | 0.23 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.05 | 9.05 | 1.00 | A | 165.0 | - | - | 20:40 | 21:02 | 1.0 | 12.6 | 14.39 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 3 | 8.05 | 9.05 | 1.00 | B | 150.0 | - | - | 21:02 | 21:13 | 1.3 | 14.3 | 10.39 | 36.3 | 2.4 | 1.63 | 1.0 | 10.0 | 17.0 | |
| | | 01-Dec-10 | 3 | 8.05 | 9.05 | 1.00 | C | 165.9 | - | - | 21:13 | 21:24 | 2.1 | 16.5 | 8.15 | 46.2 | - | 1.67 | 1.0 | 10.0 | 16.0 | |
| | | 01-Dec-10 | 3 | 8.05 | 9.05 | 1.00 | D | 39.7 | - | - | 21:24 | 21:27 | 2.5 | 9.5 | 3.86 | 62.0 | - | 1.70 | 1.0 | 10.0 | 16.0 | |
| | | 01-Dec-10 | 3 | 8.05 | 9.05 | 1.00 | X | 40.7 | 561.3 | 561.3 | 21:27 | 21:51 | 2.5 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 01-Dec-10 | 2 | 9.05 | 13.40 | 4.35 | A | 19.9 | 19.9 | 4.6 | 20:24 | 20:36 | 2.3 | 0.0 | 0.00 | 31.5 | 3.2 | 1.62 | 1.0 | 10.0 | 17.0 | |
| Q-31+780.25 | Q | 05-Jul-11 | 4 | 6.13 | 7.63 | 1.50 | MF | 32.8 | 32.80 | 21.87 | 9:49 | 10:08 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 3 | 8.13 | 9.2 | 1.07 | A | 28.4 | 28.40 | 26.54 | 16:57 | 17:20 | 2.3 | 0.3 | 0.10 | - | - | - | - | - | - | |
| S-31+781 | S | 09-Jun-11 | 4 | 5.63 | 7.63 | 2.00 | B | 160.0 | - | - | 6:43 | 7:03 | 2.1 | 12.3 | 2.85 | 34.1 | 0.1 | 1.62 | 6.7 | 11.4 | 15.2 | |
| | | 09-Jun-11 | 4 | 5.63 | 7.63 | 2.00 | C | 240.0 | - | - | 7:03 | 7:17 | 2.5 | 12.3 | 2.67 | 47.3 | - | 1.64 | 7.6 | 11.4 | 16.3 | |
| | | 09-Jun-11 | 4 | 5.63 | 7.63 | 2.00 | D | 320.0 | - | - | 7:17 | 8:01 | 2.5 | 7.1 | 1.13 | 71.0 | 6.0 | 1.66 | 7.6 | 11.4 | 16.4 | |
| | | 09-Jun-11 | 4 | 5.63 | 7.63 | 2.00 | X | 52.0 | 772.0 | 386.0 | 8:01 | 8:08 | 2.5 | 0.4 | 0.08 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | A | 34.4 | - | - | 14:31 | 14:44 | 0.0 | 3.0 | 16.20 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | B | 131.5 | - | - | 14:47 | 15:12 | 0.2 | 9.0 | 62.69 | 35.0 | - | 1.65 | 13.0 | 12.4 | 17.0 | |
| | | 26-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | C | 175.7 | - | - | 15:12 | 15:32 | 0.9 | 8.1 | 10.55 | 44.8 | 1.0 | 1.73 | -5.7 | 11.3 | 16.6 | |
| | | 26-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | D | 174.1 | - | - | 15:32 | 15:49 | 1.9 | 12.4 | 6.65 | 71.0 | 0.0 | 1.75 | -5.7 | 11.3 | 16.8 | |
| | | 26-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | X | 42.7 | 558.4 | 558.4 | 15:49 | 16:05 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Nov-10 | 2 | 9.13 | 13.50 | 4.37 | A | 23.9 | 23.9 | 5.5 | 14:31 | 14:44 | 2.2 | 0.0 | 0.00 | 33.0 | - | 1.64 | 13.0 | 12.4 | 18.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+782.5 | T | 19-Jun-11 | 4 | 6.13 | 7.63 | 1.50 | MF | 36.8 | 36.8 | 24.5 | 17:36 | 17:55 | 2.1 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 06-Dec-10 | 3 | 8.13 | 9.13 | 1.00 | A | 162.7 | - | - | 5:23 | 5:46 | 1.1 | 10.9 | 10.18 | 31.3 | - | 1.61 | 1.0 | 9.0 | 15.0 | |
| | | 06-Dec-10 | 3 | 8.13 | 9.13 | 1.00 | B | 156.9 | - | - | 5:46 | 6:02 | 1.8 | 9.8 | 6.38 | - | - | - | - | - | - | |
| | | 06-Dec-10 | 3 | 8.13 | 9.13 | 1.00 | C | 160.9 | - | - | 6:02 | 6:23 | 1.6 | 10.9 | 6.84 | - | - | - | - | - | - | |
| | | 06-Dec-10 | 3 | 8.13 | 9.13 | 1.00 | D | 112.9 | 593.4 | 593.4 | 6:23 | 6:35 | 2.0 | 1.5 | 0.75 | - | - | - | - | - | - | |
| | | 06-Dec-10 | 2 | 9.13 | 12.80 | 3.67 | A | 27.5 | 27.5 | 7.5 | 5:04 | 5:19 | 2.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+784 | P | 10-Dec-10 | 4 | 6.31 | 7.81 | 1.50 | B | 159.1 | - | - | 19:33 | 19:56 | 1.2 | 12.4 | 7.70 | 36.5 | 2.4 | 1.63 | -2.0 | 9.0 | 14.0 | |
| | | 10-Dec-10 | 4 | 6.31 | 7.81 | 1.50 | C | 160.5 | - | - | 19:56 | 20:07 | 1.6 | 14.5 | 6.74 | 46.5 | 0.6 | 1.68 | -2.0 | 9.0 | 15.0 | |
| | | 10-Dec-10 | 4 | 6.31 | 7.81 | 1.50 | D | 399.7 | 719.3 | 479.5 | 20:07 | 21:20 | 2.4 | 0.9 | 0.24 | 66.6 | 0.4 | 1.72 | -2.0 | 9.0 | 13.0 | |
| | | 23-Nov-10 | 3 | 8.13 | 9.13 | 1.00 | A | 19.0 | 19.0 | 19.0 | 8:11 | 8:25 | 3.1 | 0.3 | 0.09 | 34.0 | - | 1.64 | 1.4 | 19.4 | 19.0 | |
| | | 23-Nov-10 | 2 | 9.13 | 13.30 | 4.17 | A | 90.9 | 90.9 | 21.8 | 7:11 | 8:08 | 2.2 | 0.1 | 0.06 | - | - | - | - | - | - | |
| T-31+785.5 | T | 14-Jun-11 | 4 | 6.54 | 8.04 | 1.50 | MF | 187.6 | - | - | 20:40 | 21:08 | 2.1 | 7.1 | 2.14 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 6.54 | 8.04 | 1.50 | B | 52.0 | 239.6 | 159.7 | 21:08 | 21:40 | 2.3 | 0.1 | 0.00 | 36.2 | 3.0 | 1.61 | 7.4 | 6.7 | 13.9 | |
| | | 10-May-11 | 3 | 8.54 | 9.54 | 1.00 | A | 22.1 | 22.1 | 22.1 | 14:41 | 14:55 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-11 | 2 | 9.54 | 13.70 | 4.16 | A | 17.3 | 17.3 | 4.2 | 14:21 | 14:37 | 2.5 | 0.0 | 0.00 | 31.5 | 2.2 | 1.66 | 6.1 | 8.2 | 13.6 | |
| S-31+787 | S | 12-Jun-11 | 4 | 6.56 | 8.06 | 1.50 | B | 125.0 | 125.0 | 83.3 | 7:25 | 8:00 | 2.6 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 8.56 | 9.56 | 1.00 | A | 14.4 | 14.4 | 14.4 | 22:24 | 22:38 | 3.1 | 0.0 | 0.00 | 34.2 | 0.5 | 1.61 | 18.2 | 15.4 | 25.5 | |
| | | 05-May-11 | 2 | 9.56 | 14.00 | 4.44 | A | 29.0 | 29.0 | 6.5 | 22:08 | 22:21 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+787B | S | 09-May-11 | 3 | 8.56 | 9.56 | 1.00 | A | 166.9 | - | - | 1:30 | 1:53 | 1.1 | 12.5 | 11.39 | - | - | - | - | - | - | |
| | | 09-May-11 | 3 | 8.56 | 9.56 | 1.00 | B | 160.4 | - | - | 1:53 | 2:09 | 2.4 | 8.8 | 4.12 | 37.3 | 5.0 | 1.63 | 8.9 | 9.4 | 18.3 | |
| | | 09-May-11 | 3 | 8.56 | 9.56 | 1.00 | C | 144.3 | - | - | 2:09 | 2:24 | 3.1 | 6.4 | 2.06 | 46.4 | - | 1.65 | 8.9 | 9.4 | 19.3 | |
| | | 09-May-11 | 3 | 8.56 | 9.56 | 1.00 | D | 20.6 | 492.2 | 492.2 | 2:24 | 2:46 | 3.2 | 0.0 | 0.00 | 64.0 | - | 1.68 | 8.9 | 9.4 | 19.0 | |
| | | 09-May-11 | 2 | 9.56 | 14.00 | 4.44 | A | 86.5 | 86.5 | 19.5 | 1:03 | 1:27 | 2.2 | 1.2 | 0.12 | 31.9 | - | 1.61 | 9.8 | 8.4 | 17.7 | |
| T-31+788.5 | T | 19-Jun-11 | 4 | 6.18 | 7.68 | 1.50 | MF | 119.0 | 119.0 | 79.3 | 16:45 | 17:34 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 8.18 | 9.18 | 1.00 | A | 44.0 | 44.0 | 44.0 | 10:03 | 10:23 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-11 | 2 | 9.18 | 13.70 | 4.52 | A | 25.1 | 25.1 | 5.6 | 9:43 | 9:59 | 2.7 | 0.2 | 0.01 | - | - | - | - | - | - | |
| P-31+790 | P | 08-Jun-11 | 4 | 5.45 | 7.45 | 2.00 | B | 163.4 | - | - | 4:20 | 4:49 | 1.6 | 12.9 | 3.77 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 5.45 | 7.45 | 2.00 | C | 237.9 | - | - | 4:49 | 5:05 | 2.4 | 15.7 | 3.26 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 5.45 | 7.45 | 2.00 | D | 131.9 | 533.2 | 266.6 | 5:05 | 5:31 | 2.7 | 0.4 | 0.08 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 5.06 | 6.06 | 1.00 | A | 203.4 | - | - | 9:07 | 9:40 | 2.6 | 9.2 | 3.54 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 5.06 | 6.06 | 1.00 | B | 197.0 | - | - | 9:40 | 9:57 | 3.2 | 12.3 | 3.22 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 5.06 | 6.06 | 1.00 | C | 160.1 | 560.5 | 560.5 | 9:57 | 10:45 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-11 | 2 | 6.06 | 10.10 | 4.04 | A | 250.8 | - | - | 6:46 | 7:24 | 0.0 | 12.2 | inf | 33.0 | - | - | - | - | - | |
| | | 04-May-11 | 2 | 6.06 | 10.10 | 4.04 | B | 204.2 | - | - | 7:24 | 7:40 | 0.6 | 15.1 | 6.21 | 38.0 | 4.0 | 1.62 | 2.2 | 9.8 | 20.2 | |
| | | 04-May-11 | 2 | 6.06 | 10.10 | 4.04 | C | 202.1 | - | - | 7:40 | 7:52 | 1.4 | 18.7 | 1.94 | 45.0 | - | 1.65 | 0.0 | 9.9 | 18.6 | |
| | | 04-May-11 | 2 | 6.06 | 10.10 | 4.04 | D | 414.9 | 1072.0 | 265.3 | 7:52 | 9:02 | 2.3 | 1.4 | 0.15 | 62.0 | - | 1.65 | 0.0 | 9.5 | 18.5 | |
| T-31+791.5 | T | 14-Jun-11 | 4 | 6.79 | 8.29 | 1.50 | MF | 42.9 | 42.9 | 28.6 | 20:20 | 20:38 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-11 | 3 | 9.27 | 10.27 | 1.00 | A | 22.3 | 22.3 | 22.3 | 8:33 | 8:51 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-11 | 2 | 10.27 | 13.90 | 3.63 | A | 96.5 | 96.5 | 26.6 | 7:21 | 7:58 | 4.7 | 0.0 | 0.00 | 31.7 | 4.0 | 1.66 | 8.9 | 7.2 | 16.8 | |
| S-31+793 | S | 12-Jun-11 | 4 | 7.22 | 8.72 | 1.50 | B | 37.3 | 37.3 | 24.9 | 7:04 | 7:22 | 2.5 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 9.22 | 10.22 | 1.00 | A | 110.4 | 110.4 | 110.4 | 23:27 | 0:06 | 3.1 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 05-May-11 | 2 | 10.22 | 14.70 | 4.48 | A | 144.2 | 144.2 | 32.2 | 22:45 | 23:22 | 2.2 | 0.9 | 0.09 | - | - | - | - | - | - | |
| T-31+794.5 | T | 19-Jun-11 | 4 | 7.91 | 9.41 | 1.50 | MF | 30.5 | 30.5 | 20.3 | 16:25 | 16:42 | 2.0 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 09-May-11 | 3 | 9.91 | 10.91 | 1.00 | A | 33.1 | 33.1 | 33.1 | 4:59 | 5:25 | 2.5 | 0.4 | 0.15 | - | - | - | - | - | - | |
| | | 09-May-11 | 2 | 10.91 | 14.90 | 3.99 | A | 72.1 | 72.1 | 18.1 | 4:29 | 4:54 | 2.1 | 1.4 | 0.17 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+796 | P | 08-Jun-11 | 4 | 7.03 | 9.03 | 2.00 | B | 161.3 | - | - | 3:01 | 3:22 | 1.2 | 12.3 | 4.85 | - | - | - | - | - | - | Communicated to P-31+790 at 600 L. |
| | | 08-Jun-11 | 4 | 7.03 | 9.03 | 2.00 | C | 240.1 | - | - | 3:22 | 3:39 | 2.6 | 12.7 | 2.26 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 7.03 | 9.03 | 2.00 | D | 246.6 | 648.0 | 324.0 | 3:22 | 3:39 | 2.4 | 14.1 | 3.00 | - | - | - | - | - | - | |
| | | 16-Apr-11 | 3 | 9.53 | 10.53 | 1.00 | B | 170.0 | - | - | 16:20 | 17:07 | 2.8 | 4.9 | 1.75 | - | - | - | - | - | - | |
| | | 16-Apr-11 | 3 | 9.53 | 10.53 | 1.00 | C | 117.1 | 287.1 | 287.1 | 17:07 | 17:49 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-Apr-11 | 2 | 10.53 | 14.50 | 3.97 | A | 201.0 | - | - | 14:51 | 15:16 | 0.0 | 15.0 | inf | 31.6 | 5.0 | 1.61 | 16.6 | 9.2 | 15.6 | |
| | | 16-Apr-11 | 2 | 10.53 | 14.50 | 3.97 | B | 215.0 | - | - | 15:16 | 15:28 | 1.1 | 20.6 | 4.32 | - | - | - | - | - | - | |
| | | 16-Apr-11 | 2 | 10.53 | 14.50 | 3.97 | C | 189.8 | - | - | 15:28 | 15:37 | 2.3 | 18.2 | 1.96 | 46.9 | 4.0 | 1.62 | 16.8 | 9.2 | 16.1 | |
| | | 16-Apr-11 | 2 | 10.53 | 14.50 | 3.97 | D | 194.2 | - | - | 15:37 | 15:50 | 2.0 | 11.9 | 1.45 | - | - | - | - | - | - | |
| | | 16-Apr-11 | 2 | 10.53 | 14.50 | 3.97 | X | 17.0 | 817.0 | 205.8 | 15:50 | 16:03 | 2.5 | 0.2 | 0.02 | - | - | - | - | - | - | |
| T-31+797.5 | T | 14-Jun-11 | 4 | 6.89 | 8.39 | 1.50 | MF | 74.2 | 74.2 | 49.5 | 19:52 | 20:19 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-May-11 | 3 | 8.89 | 9.89 | 1.00 | A | 17.2 | 17.2 | 17.2 | 3:49 | 4:08 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-May-11 | 2 | 9.89 | 14.00 | 4.11 | A | 72.0 | 72.0 | 17.5 | 3:21 | 3:44 | 2.4 | 0.9 | 0.10 | - | - | - | - | - | - | |
| S-31+799 | S | 12-Jun-11 | 4 | 6.79 | 8.29 | 1.50 | B | 67.7 | 67.7 | 45.1 | 6:27 | 6:56 | 2.6 | 0.1 | 0.02 | 37.4 | 5.4 | 1.62 | 5.9 | 7.0 | 11.0 | |
| | | 20-Apr-11 | 3 | 8.79 | 9.79 | 1.00 | A | 162.0 | - | - | 22:52 | 23:13 | 1.1 | 13.6 | 10.31 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 3 | 8.79 | 9.79 | 1.00 | B | 173.5 | - | - | 23:13 | 23:26 | 2.1 | 15.8 | 6.78 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 3 | 8.79 | 9.79 | 1.00 | C | 38.5 | 374.0 | 374.0 | 23:26 | 23:42 | 3.2 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 2 | 9.79 | 14.10 | 4.31 | A | 203.6 | - | - | 21:09 | 21:33 | 0.7 | 16.4 | 6.19 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 2 | 9.79 | 14.10 | 4.31 | B | 218.1 | - | - | 21:33 | 21:48 | 2.2 | 14.7 | 1.38 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 2 | 9.79 | 14.10 | 4.31 | C | 173.7 | 595.4 | 138.1 | 21:48 | 22:41 | 2.1 | 0.4 | 0.05 | 46.5 | 2.0 | 1.50 | 0.9 | 6.4 | 12.0 | |
| T-31+800.5 | T | 19-Jun-11 | 4 | 6.56 | 8.06 | 1.50 | MF | 34.3 | 34.3 | 22.9 | 16:04 | 16:21 | 2.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 3 | 8.56 | 9.56 | 1.00 | A | 44.8 | 44.8 | 44.8 | 14:35 | 15:04 | 2.6 | 0.3 | 0.11 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 2 | 9.56 | 13.60 | 4.04 | A | 194.0 | - | - | 10:52 | 11:32 | 2.1 | 3.4 | 0.40 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 2 | 9.56 | 13.60 | 4.04 | B | 60.0 | 254.0 | 62.9 | 11:32 | 12:00 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+802 | P | 08-Jun-11 | 4 | 6.65 | 8.65 | 2.00 | B | 163.0 | - | - | 1:53 | 2:15 | 2.0 | 11.6 | 2.86 | - | - | - | - | - | - | By-pass outside casing. Stopped. |
| | | 08-Jun-11 | 4 | 6.65 | 8.65 | 2.00 | C | 244.0 | - | - | 2:15 | 2:33 | 2.6 | 15.3 | 3.07 | 48.8 | 2.0 | 1.64 | 6.3 | 12.6 | 14.1 | Bleed at 60 mins. |
| | | 08-Jun-11 | 4 | 6.65 | 8.65 | 2.00 | D | 226.8 | 633.8 | 316.9 | 2:33 | 2:05 | 2.8 | 12.6 | 2.28 | 63.1 | - | 1.64 | 6.3 | 11.7 | 15.2 | |
| | | 17-Apr-11 | 3 | 9.15 | 10.15 | 1.00 | B | 165.3 | - | - | 8:24 | 8:48 | 2.9 | 11.8 | 4.09 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 3 | 9.15 | 10.15 | 1.00 | C | 143.8 | - | - | 8:48 | 9:01 | 3.3 | 11.4 | 3.28 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 3 | 9.15 | 10.15 | 1.00 | D | 153.6 | 462.7 | 462.7 | 9:01 | 9:37 | 3.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 2 | 10.15 | 14.10 | 3.95 | A | 239.9 | - | - | 6:39 | 7:09 | 0.0 | 6.6 | inf | - | - | - | - | - | - | |
| | | 17-Apr-11 | 2 | 10.15 | 14.10 | 3.95 | B | 178.0 | - | - | 7:09 | 7:18 | 1.0 | 19.8 | 4.82 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 2 | 10.15 | 14.10 | 3.95 | C | 196.9 | - | - | 7:18 | 7:29 | 1.2 | 21.6 | 3.86 | 47.8 | 1.0 | 1.56 | 5.8 | 13.2 | 19.2 | |
| | | 17-Apr-11 | 2 | 10.15 | 14.10 | 3.95 | D | 201.1 | - | - | 7:29 | 7:39 | 1.3 | 12.9 | 1.92 | 62.3 | 1.0 | 1.61 | 5.8 | 13.2 | 19.4 | |
| | | 17-Apr-11 | 2 | 10.15 | 14.10 | 3.95 | X | 52.1 | - | - | 7:39 | 7:45 | 0.3 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 2 | 10.15 | 14.10 | 3.95 | X- | 47.0 | 915.0 | 231.6 | 7:53 | 8:19 | 2.2 | 0.1 | 0.02 | - | - | - | - | - | - | |
| T-31+803.5 | T | 14-Jun-11 | 4 | 7.02 | 8.52 | 1.50 | MF | 43.0 | 43.0 | 28.7 | 19:33 | 19:51 | 2.2 | 0.0 | 0.00 | 38.1 | - | 1.42 | 6.3 | 6.5 | 13.2 | |
| | | 26-Apr-11 | 3 | 9.02 | 10.02 | 1.00 | A | 156.1 | - | - | 15:38 | 16:04 | 2.5 | 10.8 | 4.24 | 32.5 | 2.0 | 1.64 | -11.4 | 9.5 | 16.8 | |
| | | 26-Apr-11 | 3 | 9.02 | 10.02 | 1.00 | B | 151.2 | - | - | 16:04 | 16:25 | 2.2 | 4.0 | 1.85 | 40.1 | - | 1.65 | -11.4 | 9.5 | 13.0 | |
| | | 26-Apr-11 | 3 | 9.02 | 10.02 | 1.00 | C | 37.5 | 344.8 | 344.8 | 16:25 | 16:50 | 2.3 | 0.0 | 0.00 | 43.0 | - | 1.67 | -13.1 | 9.5 | 13.0 | |
| | | 26-Apr-11 | 2 | 10.02 | 14.30 | 4.28 | A | 34.4 | 34.4 | 8.0 | 15:19 | 15:34 | 2.2 | 0.9 | 0.09 | - | - | - | - | - | - | |
| S-31+805 | S | 11-Jun-11 | 4 | 7.55 | 9.05 | 1.50 | B | 47.2 | 47.2 | 31.5 | 4:44 | 5:03 | 2.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 3 | 9.55 | 10.55 | 1.00 | A | 106.7 | 106.7 | 106.7 | 2:05 | 2:30 | 0.1 | 0.1 | 1.21 | - | - | - | - | - | - | By-Pass outside casing; unable to continue |
| | | 20-Apr-11 | 2 | 10.55 | 14.80 | 4.25 | A | 104.7 | 104.7 | 24.6 | 1:31 | 1:59 | 2.4 | 1.5 | 0.15 | 34.5 | 4.0 | 1.60 | -2.3 | 8.4 | 16.0 | |
| T-31+806.5 | T | 19-Jun-11 | 4 | 7.73 | 9.23 | 1.50 | MF | 180.0 | - | - | 14:58 | 15:22 | 2.0 | 15.1 | 4.20 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 4 | 7.73 | 9.23 | 1.50 | B | 160.0 | - | - | 15:22 | 15:32 | 2.1 | 18.4 | 5.81 | 38.2 | - | 1.61 | 9.0 | 11.0 | 17.0 | |
| | | 19-Jun-11 | 4 | 7.73 | 9.23 | 1.50 | C | 84.5 | 424.5 | 283.0 | 15:32 | 15:57 | 2.0 | 0.5 | 0.15 | 46.7 | - | 1.64 | 9.0 | 11.0 | 17.0 | |
| | | 26-Apr-11 | 3 | 9.73 | 10.73 | 1.00 | A | 51.2 | 51.2 | 51.2 | 17:26 | 17:57 | 2.4 | 0.3 | 0.13 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 2 | 10.73 | 14.80 | 4.07 | A | 35.8 | 35.8 | 8.8 | 17:03 | 17:20 | 2.2 | 0.7 | 0.08 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+808 | P | 08-Jun-11 | 4 | 7.41 | 9.41 | 2.00 | B | 58.6 | 58.6 | 29.3 | 1:29 | 1:50 | 2.6 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 3 | 9.91 | 10.91 | 1.00 | B | 3.1 | 3.1 | 3.1 | 11:36 | 11:49 | 2.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 2 | 10.91 | 14.90 | 3.99 | A | 209.0 | - | - | 10:00 | 10:27 | 2.1 | 11.6 | 1.41 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 2 | 10.91 | 14.90 | 3.99 | B | 179.8 | - | - | 10:27 | 10:47 | 2.2 | 10.1 | 1.13 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 2 | 10.91 | 14.90 | 3.99 | C | 143.9 | 532.7 | 133.5 | 10:47 | 11:26 | 2.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+809.5 | T | 14-Jun-11 | 4 | 8.11 | 9.61 | 1.50 | MF | 100.0 | - | - | 16:45 | 17:02 | 1.6 | 10.6 | 4.46 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 14-Jun-11 | 4 | 8.11 | 9.61 | 1.50 | B | 88.4 | - | - | 17:02 | 17:11 | 1.0 | 7.7 | 5.40 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 8.11 | 9.61 | 1.50 | D | 109.6 | - | - | 17:11 | 17:21 | 2.0 | 11.9 | 3.85 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 8.11 | 9.61 | 1.50 | X | 114.0 | 412.0 | 274.7 | 17:21 | 17:34 | 2.1 | 8.2 | 2.62 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 3 | 10.11 | 11.11 | 1.00 | A | 160.2 | - | - | 18:58 | 19:22 | 0.0 | 9.2 | inf | - | - | - | - | - | - | |
| | | 26-Apr-11 | 3 | 10.11 | 11.11 | 1.00 | B | 161.4 | - | - | 19:22 | 19:38 | 1.2 | 10.0 | 7.29 | 37.4 | - | 1.63 | -14.2 | 12.0 | 15.3 | |
| | | 26-Apr-11 | 3 | 10.11 | 11.11 | 1.00 | C | 77.7 | 399.3 | 399.3 | 19:38 | 20:06 | 2.5 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 2 | 11.11 | 15.20 | 4.09 | A | 41.5 | 41.5 | 10.1 | 18:32 | 18:48 | 2.2 | 1.2 | 0.13 | 31.1 | 5.0 | 1.59 | -14.2 | 12.1 | 14.4 | |
| S-31+811 | S | 11-Jun-11 | 4 | 9.15 | 10.65 | 1.50 | B | 62.4 | 62.4 | 41.6 | 4:22 | 4:43 | 2.5 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 3 | 11.15 | 12.15 | 1.00 | A | 30.0 | 30.0 | 30.0 | 3:56 | 4:15 | 3.0 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 2 | 12.15 | 16.20 | 4.05 | A | 198.7 | - | - | 2:44 | 3:07 | 0.0 | 12.3 | inf | - | - | - | - | - | - | |
| | | 20-Apr-11 | 2 | 12.15 | 16.20 | 4.05 | B | 211.3 | - | - | 3:07 | 3:22 | 1.5 | 16.5 | 2.93 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 2 | 12.15 | 16.20 | 4.05 | C | 91.0 | 501.0 | 123.7 | 3:22 | 3:46 | 2.3 | 0.3 | 0.04 | 43.7 | 9.0 | 1.64 | -3.4 | 8.4 | 15.3 | |
| T-31+812.5 | T | 19-Jun-11 | 4 | 9.64 | 11.14 | 1.50 | MF | 74.7 | 74.7 | 49.8 | 14:30 | 14:55 | 2.1 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 3 | 11.64 | 12.64 | 1.00 | A | 20.0 | 20.0 | 20.0 | 2:37 | 2:53 | 2.6 | 0.3 | 0.10 | 31.9 | - | 1.64 | -15.6 | 10.6 | 12.9 | |
| | | 26-Apr-11 | 2 | 12.64 | 16.60 | 3.96 | A | 203.9 | - | - | 23:27 | 23:55 | 0.5 | 9.4 | 5.81 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 2 | 12.64 | 16.60 | 3.96 | B | 187.3 | 391.2 | 98.8 | 23:55 | 0:30 | 2.4 | 0.3 | 0.03 | 37.4 | - | 1.63 | -14.2 | 12.0 | 15.3 | |
| | | 26-Apr-11 | 1 | 16.60 | 21.70 | 5.10 | A | 203.5 | - | - | 22:18 | 22:46 | 4.3 | 11.4 | 0.48 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 1 | 16.60 | 21.70 | 5.10 | B | 75.8 | 279.3 | 54.8 | 22:46 | 23:16 | 6.0 | 3.3 | 0.11 | - | - | - | - | - | - | |
| P-31+814 | P | 08-Jun-11 | 4 | 10.43 | 12.43 | 2.00 | B | 172.0 | - | - | 22:35 | 22:57 | 1.2 | 12.7 | 5.36 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 10.43 | 12.43 | 2.00 | C | 235.8 | - | - | 22:57 | 23:13 | 1.7 | 15.6 | 6.29 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 10.43 | 12.43 | 2.00 | D | 317.2 | - | - | 23:13 | 23:33 | 1.3 | 15.6 | 5.28 | 62.9 | 4.0 | 1.66 | 6.2 | 10.9 | 13.9 | |
| | | 08-Jun-11 | 4 | 10.43 | 12.43 | 2.00 | X | 95.0 | 820.0 | 410.0 | 23:33 | 23:39 | 1.6 | 15.7 | 4.96 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 3 | 12.93 | 13.93 | 1.00 | B | 13.5 | 13.5 | 13.5 | 15:12 | 15:24 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 1, 2 | 13.93 | 22.90 | 8.97 | A | 26.1 | 26.1 | 2.9 | 14:52 | 15:07 | 6.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+815.5 | T | 14-Jun-11 | 4 | 11.74 | 13.24 | 1.50 | MF | 63.9 | 63.9 | 42.6 | 16:19 | 16:41 | 2.1 | 0.1 | 0.04 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 3 | 13.74 | 14.74 | 1.00 | A | 167.5 | - | - | 4:50 | 5:34 | 2.4 | 4.4 | 1.76 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 3 | 13.74 | 14.74 | 1.00 | B | 158.9 | 326.4 | 326.4 | 5:34 | 6:44 | 2.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 2 | 14.74 | 18.70 | 3.96 | A | 197.6 | - | - | 3:34 | 4:27 | 1.7 | 3.0 | 0.30 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 2 | 14.74 | 18.70 | 3.96 | B | 17.4 | 215.0 | 54.3 | 4:27 | 4:45 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 1 | 18.70 | 23.80 | 5.10 | A | 40.9 | 40.9 | 8.0 | 3:05 | 3:28 | 5.1 | 0.4 | 0.01 | - | - | - | - | - | - | |
| S-31+817 | S | 11-Jun-11 | 4 | 12.05 | 13.55 | 1.50 | B | 142.2 | - | - | 3:34 | 3:57 | 1.8 | 10.3 | 3.84 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 12.05 | 13.55 | 1.50 | C | 96.4 | 238.6 | 159.1 | 3:57 | 4:19 | 2.5 | 0.2 | 0.06 | 45.5 | - | 1.64 | 5.5 | 9.1 | 13.2 | |
| | | 21-Apr-11 | 3 | 14.05 | 15.05 | 1.00 | A | 19.1 | 19.1 | 19.1 | 7:53 | 8:07 | 2.9 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 2 | 15.05 | 19.10 | 4.05 | A | 192.9 | - | - | 6:44 | 7:10 | 1.6 | 15.0 | 2.21 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 2 | 15.05 | 19.10 | 4.05 | B | 243.5 | - | - | 7:10 | 7:34 | 2.1 | 6.2 | 0.65 | 36.6 | 4.0 | 1.57 | 3.2 | 6.9 | 10.5 | |
| | | 21-Apr-11 | 2 | 15.05 | 19.10 | 4.05 | C | 35.6 | 472.0 | 116.5 | 7:34 | 7:51 | 2.3 | 0.2 | 0.02 | - | - | - | - | - | - | |
| T-31+818.5 | T | 19-Jun-11 | 4 | 12.37 | 13.87 | 1.50 | MF | 155.6 | 155.6 | 103.7 | 11:26 | 12:15 | 2.1 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 3 | 14.37 | 15.37 | 1.00 | A | 22.2 | 22.2 | 22.2 | 8:43 | 8:58 | 2.3 | 0.2 | 0.11 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 2 | 15.37 | 19.40 | 4.03 | A | 153.0 | 153.0 | 38.0 | 8:00 | 8:29 | 2.5 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 1 | 19.40 | 24.40 | 5.00 | A | 43.7 | 43.7 | 8.7 | 7:25 | 7:41 | 5.1 | 0.0 | 0.00 | 31.4 | - | 1.59 | -12.1 | 12.3 | 14.6 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+820 | P | 08-Jun-11 | 4 | 13.35 | 15.35 | 2.00 | B | 160.6 | - | - | 21:16 | 21:37 | 1.4 | 12.7 | 4.37 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 13.35 | 15.35 | 2.00 | C | 249.2 | - | - | 21:37 | 21:54 | 1.9 | 15.6 | 4.08 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 13.35 | 15.35 | 2.00 | D | 311.8 | - | - | 21:54 | 22:14 | 2.9 | 15.3 | 2.89 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 13.35 | 15.35 | 2.00 | X | 120.4 | 842.0 | 421.0 | 22:14 | 22:22 | 4.0 | 15.7 | 1.95 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 3 | 15.85 | 16.85 | 1.00 | B | 175.2 | - | - | 16:05 | 16:28 | 0.0 | 12.4 | inf | 37.6 | 3.0 | 1.61 | 8.0 | 11.7 | 18.0 | |
| | | 17-Apr-11 | 3 | 15.85 | 16.85 | 1.00 | C | 153.1 | - | - | 16:28 | 16:38 | 0.6 | 18.0 | 29.13 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 3 | 15.85 | 16.85 | 1.00 | D | 158.5 | - | - | 16:38 | 16:45 | 1.6 | 21.2 | 13.38 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 3 | 15.85 | 16.85 | 1.00 | X- | 314.2 | 801.0 | 801.0 | 16:45 | 17:01 | 2.7 | 11.9 | 4.40 | - | - | - | - | - | - | |
| | | 17-Apr-11 | 1, 2 | 16.85 | 21.20 | 4.35 | A | 27.3 | 27.3 | 6.3 | 15:45 | 16:02 | 2.1 | 0.0 | 0.00 | 30.5 | 3.5 | 1.62 | 7.9 | 11.6 | 17.3 | |
| T-31+821.5 | T | 14-Jun-11 | 4 | 14.08 | 15.58 | 1.50 | MF | 180.0 | - | - | 14:50 | 15:12 | 2.0 | 10.2 | 3.47 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 14.08 | 15.58 | 1.50 | B | 160.0 | - | - | 15:12 | 15:28 | 2.0 | 9.4 | 2.77 | 36.4 | - | 1.60 | 8.1 | 7.2 | 15.4 | |
| | | 14-Jun-11 | 4 | 14.08 | 15.58 | 1.50 | C | 114.0 | 454.0 | 302.7 | 15:28 | 16:14 | 2.1 | 0.3 | 0.11 | 48.3 | - | 1.62 | 8.1 | 7.2 | 14.8 | |
| | | 27-Apr-11 | 3 | 16.08 | 17.08 | 1.00 | A | 19.9 | 19.9 | 19.9 | 10:29 | 10:44 | 2.4 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 2 | 17.08 | 21.10 | 4.02 | A | 24.2 | 24.2 | 6.0 | 10:11 | 10:26 | 2.3 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 1 | 21.10 | 26.10 | 5.00 | A | 205.9 | - | - | 9:14 | 9:45 | 4.8 | 13.9 | 0.89 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 1 | 21.10 | 26.10 | 5.00 | B | 62.3 | 268.2 | 53.6 | 9:45 | 10:04 | 5.0 | 0.4 | 0.02 | 38.7 | 2.0 | 1.64 | -10.3 | 8.5 | 13.8 | |
| S-31+823 | S | 11-Jun-11 | 4 | 15.23 | 16.73 | 1.50 | B | 162.5 | - | - | 2:22 | 2:42 | 0.2 | 12.4 | 40.89 | - | - | - | - | - | - | Water By-Pass. Outside Casing. |
| | | 11-Jun-11 | 4 | 15.23 | 16.73 | 1.50 | D | 227.5 | - | - | 2:42 | 2:58 | 0.8 | 18.6 | 13.95 | 65.2 | 3.0 | 1.67 | 4.2 | 8.1 | 12.3 | |
| | | 11-Jun-11 | 4 | 15.23 | 16.73 | 1.50 | X | 367.4 | 757.4 | 504.9 | 2:58 | 3:21 | 1.3 | 15.8 | 8.23 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 3 | 17.23 | 18.23 | 1.00 | A | 202.4 | - | - | 8:30 | 8:56 | 0.4 | 15.1 | 42.63 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 3 | 17.23 | 18.23 | 1.00 | B | 241.2 | - | - | 8:56 | 9:10 | 1.4 | 21.5 | 15.21 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 3 | 17.23 | 18.23 | 1.00 | C | 148.4 | - | - | 9:10 | 9:19 | 2.8 | 15.4 | 5.72 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 3 | 17.23 | 18.23 | 1.00 | D | 128.6 | - | - | 9:19 | 9:26 | 2.7 | 20.6 | 7.63 | 46.6 | 1.0 | 1.63 | -8.6 | 12.9 | 10.9 | |
| | | 21-Apr-11 | 3 | 17.23 | 18.23 | 1.00 | X | 81.4 | 802.0 | 802.0 | 9:26 | 9:33 | 2.7 | 13.4 | 5.04 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 2 | 18.23 | 22.20 | 3.97 | A | 23.3 | 23.3 | 5.9 | 8:15 | 8:27 | 2.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| T-31+824.5 | T | 19-Jun-11 | 4 | 10.96 | 12.46 | 1.50 | MF | 87.9 | 87.9 | 58.6 | 10:58 | 11:25 | 3.8 | 0.6 | 0.10 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 3 | 12.96 | 13.96 | 1.00 | A | 81.3 | - | - | 15:21 | 15:46 | 3.0 | 8.9 | 2.99 | - | - | - | - | - | - | Packer moved up to 11.96 m |
| | | 27-Apr-11 | 3 | 12.96 | 13.96 | 1.00 | A | 134.3 | 215.6 | 215.6 | 16:40 | 17:11 | 1.7 | 11.1 | 7.12 | - | - | - | - | - | - | Multiple by-pass issues |
| | | 27-Apr-11 | 2 | 13.96 | 18.00 | 4.04 | A | 238.2 | - | - | 14:27 | 14:58 | 2.6 | 15.6 | 1.59 | 32.7 | - | 1.58 | -14.6 | 9.0 | 12.3 | |
| | | 27-Apr-11 | 2 | 13.96 | 18.00 | 4.04 | B | 167.0 | - | - | 14:58 | 15:07 | 3.4 | 20.0 | 1.64 | - | - | - | - | - | - | By-pass within 6" casing |
| | | 27-Apr-11 | 2 | 13.96 | 18.00 | 4.04 | C | 146.4 | 551.6 | 136.5 | 15:07 | 15:14 | 3.4 | 22.4 | 1.61 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 1 | 18.00 | 23.00 | 5.00 | A | 43.0 | 43.0 | 8.6 | 14:01 | 14:18 | 7.2 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 1C | 23.00 | 28.00 | 5.00 | A | 111.7 | 111.7 | 22.3 | 11:22 | 11:45 | 9.2 | 2.5 | 0.05 | - | - | - | - | - | - | |
| P-31+826 | P | 08-Jun-11 | 4 | 14.04 | 16.04 | 2.00 | B | 164.0 | - | - | 19:55 | 20:16 | 2.6 | 12.1 | 2.33 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 14.04 | 16.04 | 2.00 | C | 246.3 | - | - | 20:16 | 20:33 | 3.8 | 14.3 | 1.97 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 14.04 | 16.04 | 2.00 | D | 304.7 | - | - | 20:33 | 20:56 | 4.0 | 12.9 | 1.71 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 14.04 | 16.04 | 2.00 | X | 115.0 | 830.0 | 415.0 | 20:56 | 21:07 | 3.9 | 2.3 | 0.29 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 3 | 16.54 | 17.54 | 1.00 | B | 89.4 | 89.4 | 89.4 | 9:21 | 9:55 | 3.0 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 2 | 17.54 | 21.54 | 4.00 | A | 23.1 | 23.1 | 5.8 | 8:16 | 9:15 | 4.7 | 0.3 | 0.02 | 32.3 | 2.0 | 1.63 | -7.4 | 8.4 | 14.5 | |
| | | 18-Apr-11 | 1 | 21.54 | 26.54 | 5.00 | A | 220.3 | 220.3 | 44.1 | 7:34 | 8:10 | 7.2 | 0.3 | 0.01 | 31.6 | - | 1.62 | 11.0 | 9.7 | 19.2 | |
| | | 18-Apr-11 | 1C | 26.54 | 31.90 | 5.36 | A | 40.8 | 40.8 | 7.6 | 7:06 | 7:22 | 9.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+827.5 | T | 14-Jun-11 | 4 | 14.09 | 16.09 | 2.00 | MF | 93.9 | 93.9 | 47.0 | 14:20 | 14:45 | 3.5 | 0.9 | 0.13 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 3 | 16.59 | 17.59 | 1.00 | A | 159.6 | - | - | 22:06 | 22:40 | 2.8 | 4.4 | 1.55 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 3 | 16.59 | 17.59 | 1.00 | B | 207.0 | 366.6 | 366.6 | 22:40 | 0:13 | 3.3 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 2 | 17.59 | 21.60 | 4.01 | A | 203.4 | - | - | 19:58 | 20:27 | 4.6 | 9.8 | 0.69 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 2 | 17.59 | 21.60 | 4.01 | B | 202.1 | - | - | 20:27 | 20:48 | 4.7 | 9.2 | 0.51 | 40.0 | - | 1.61 | -6.4 | 7.8 | 14.2 | |
| | | 27-Apr-11 | 2 | 17.59 | 21.60 | 4.01 | C | 192.1 | - | - | 20:48 | 21:15 | 4.7 | 5.5 | 0.29 | 45.8 | - | 1.69 | -5.9 | 7.5 | 15.0 | |
| | | 27-Apr-11 | 2 | 17.59 | 21.60 | 4.01 | D | 204.4 | - | - | 21:15 | 21:39 | 4.4 | 11.9 | 0.71 | 39.4 | 2.0 | 1.68 | -5.8 | 9.2 | 15.5 | |
| | | 27-Apr-11 | 2 | 17.59 | 21.60 | 4.01 | X | 59.0 | 861.0 | 214.7 | 21:39 | 21:55 | 4.7 | 0.1 | 0.00 | 146.0 | - | 1.72 | -12.4 | 9.4 | 16.9 | |
| | | 27-Apr-11 | 1 | 21.60 | 26.60 | 5.00 | A | 24.2 | 24.2 | 4.8 | 19:36 | 19:51 | 7.3 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 1C | 26.60 | 31.60 | 5.00 | A | 44.2 | 44.2 | 8.8 | 19:11 | 19:28 | 9.7 | 0.9 | 0.02 | 35.0 | 3.0 | 1.65 | -9.6 | 6.9 | 11.4 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+829 | S | 11-Jun-11 | 4 | 16.99 | 18.99 | 2.00 | B | 109.4 | 109.4 | 54.7 | 1:51 | 2:18 | 4.0 | 0.0 | 0.00 | 37.8 | - | 1.63 | 4.8 | 7.4 | 12.7 | |
| | | 21-Apr-11 | 3 | 19.49 | 20.49 | 1.00 | A | 154.5 | - | - | 11:12 | 11:34 | 1.0 | 11.5 | 9.99 | 32.7 | 6.5 | 1.58 | -7.9 | 11.2 | 10.1 | |
| | | 21-Apr-11 | 3 | 19.49 | 20.49 | 1.00 | B | 175.0 | - | - | 11:34 | 11:45 | 3.2 | 20.0 | 6.35 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 3 | 19.49 | 20.49 | 1.00 | C | 120.4 | 449.9 | 449.9 | 11:45 | 12:16 | 3.5 | 0.1 | 0.05 | 47.2 | 2.0 | 1.62 | -8.0 | 11.2 | 11.4 | |
| | | 21-Apr-11 | 2 | 20.49 | 24.50 | 4.01 | A | 82.7 | 82.7 | 20.6 | 10:49 | 11:10 | 4.5 | 2.6 | 0.14 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1 | 24.50 | 29.50 | 5.00 | A | 51.0 | 51.0 | 10.2 | 10:26 | 10:43 | 7.0 | 2.0 | 0.05 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1C | 29.50 | 34.60 | 5.10 | A | 22.9 | 22.9 | 4.5 | 10:06 | 10:20 | 9.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+830.5 | T | 19-Jun-11 | 4 | 17.83 | 19.83 | 2.00 | MF | 174.0 | - | - | 9:51 | 10:38 | 3.5 | 2.5 | 0.37 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 4 | 17.83 | 19.83 | 2.00 | B | 27.4 | 201.4 | 100.7 | 10:38 | 10:57 | 3.5 | 0.7 | 0.10 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 3 | 20.33 | 21.33 | 1.00 | A | 90.6 | - | - | 4:17 | 4:43 | 0.5 | 3.8 | 8.71 | - | - | - | - | - | - | By-pass in plastic casing; packer moved up; |
| | | 27-Apr-11 | 3 | 20.33 | 21.33 | 1.00 | B | 163.5 | - | - | 4:43 | 5:06 | 1.4 | 10.0 | 7.50 | - | - | - | - | - | - | By-pass continued. Thickened to Mix B; |
| | | 27-Apr-11 | 3 | 20.33 | 21.33 | 1.00 | C | 106.1 | - | - | 5:06 | 5:15 | 2.2 | 9.3 | 2.86 | - | - | - | - | - | - | By-pass stopped. By-pass returned; |
| | | 27-Apr-11 | 3 | 20.33 | 21.33 | 1.00 | D | 132.6 | - | - | 5:15 | 5:32 | 3.2 | 11.0 | 3.17 | - | - | - | - | - | - | thickened to Mix D. By-pass eventually stopped. |
| | | 27-Apr-11 | 3 | 20.33 | 21.33 | 1.00 | X | 63.3 | 556.1 | 556.1 | 5:32 | 5:53 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 2 | 21.33 | 25.30 | 3.97 | A | 202.2 | - | - | 3:16 | 3:48 | 3.9 | 5.7 | 0.35 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 2 | 21.33 | 25.30 | 3.97 | B | 88.7 | 290.9 | 73.3 | 3:48 | 4:10 | 6.9 | 5.4 | 0.20 | 35.9 | 4.0 | 1.63 | -7.3 | 8.2 | 15.3 | |
| | | 27-Apr-11 | 1 | 25.30 | 30.30 | 5.00 | A | 34.9 | 34.9 | 7.0 | 2:53 | 3:08 | 6.9 | 0.7 | 0.02 | - | - | - | - | - | - | |
| | | 27-Apr-11 | 1C | 30.30 | 35.30 | 5.00 | A | 23.7 | 23.7 | 4.7 | 2:34 | 2:47 | 9.8 | 0.0 | 0.00 | 33.2 | - | 1.63 | -7.4 | 8.7 | 15.8 | |
| P-31+832 | P | 08-Jun-11 | 4 | 17.80 | 19.80 | 2.00 | B | 179.5 | - | - | 18:20 | 18:44 | 0.8 | 12.6 | 3.77 | 37.1 | 4.0 | 1.61 | 5.3 | 11.6 | 13.5 | |
| | | 08-Jun-11 | 4 | 17.80 | 19.80 | 2.00 | C | 222.3 | - | - | 18:44 | 18:59 | 1.5 | 15.4 | 5.43 | 46.9 | - | 1.63 | 5.1 | 11.6 | 12.9 | |
| | | 08-Jun-11 | 4 | 17.80 | 19.80 | 2.00 | D | 321.1 | - | - | 18:59 | 19:20 | 1.9 | 15.7 | 4.09 | 62.9 | - | 1.66 | 6.2 | 10.9 | 13.9 | |
| | | 08-Jun-11 | 4 | 17.80 | 19.80 | 2.00 | X | 145.1 | 868.0 | 434.0 | 19:20 | 19:29 | 2.7 | 14.2 | 2.66 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 3 | 20.30 | 21.30 | 1.00 | B | 17.9 | 17.9 | 17.9 | 14:24 | 14:40 | 3.6 | 0.5 | 0.13 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 2 | 21.30 | 25.30 | 4.00 | A | 33.3 | 33.3 | 8.3 | 14:05 | 14:19 | 4.7 | 1.5 | 0.08 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 1 | 25.30 | 30.30 | 5.00 | A | 36.6 | 36.6 | 7.3 | 13:43 | 13:59 | 7.4 | 0.2 | 0.00 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 1C | 30.30 | 35.80 | 5.50 | A | 63.3 | 63.3 | 11.5 | 11:01 | 11:40 | 9.3 | 0.2 | 0.00 | - | - | - | - | - | - | |
| T-31+833.5 | T | 14-Jun-11 | 4 | 17.83 | 19.83 | 2.00 | MF | 163.2 | 163.2 | 81.6 | 13:37 | 14:14 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 3 | 20.33 | 21.33 | 1.00 | A | 33.8 | 33.8 | 33.8 | 9:01 | 9:23 | 2.9 | 0.4 | 0.14 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 2 | 21.33 | 25.30 | 3.97 | A | 43.0 | 43.0 | 10.8 | 8:41 | 8:55 | 4.1 | 1.0 | 0.06 | 32.1 | 4.0 | 1.59 | -2.8 | 8.5 | 19.9 | |
| | | 28-Apr-11 | 1 | 25.30 | 30.30 | 5.00 | A | 31.5 | 31.5 | 6.3 | 8:18 | 8:33 | 7.1 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 1C | 30.30 | 35.40 | 5.10 | A | 22.9 | 22.9 | 4.5 | 7:57 | 8:13 | 8.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+835 | S | 11-Jun-11 | 4 | 16.63 | 18.63 | 2.00 | B | 161.4 | - | - | 22:50 | 23:13 | 2.2 | 13.2 | 3.39 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 16.63 | 18.63 | 2.00 | C | 241.6 | - | - | 23:13 | 23:29 | 2.0 | 15.3 | 3.66 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 16.63 | 18.63 | 2.00 | D | 320.0 | - | - | 23:29 | 23:50 | 2.0 | 15.9 | 3.73 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 16.63 | 18.63 | 2.00 | X | 106.0 | 829.0 | 414.5 | 23:50 | 23:57 | 2.1 | 15.9 | 3.72 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 3 | 19.13 | 20.13 | 1.00 | A | 14.5 | 14.5 | 14.5 | 16:47 | 17:01 | 3.3 | 0.2 | 0.08 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 2 | 20.13 | 24.10 | 3.97 | A | 234.5 | - | - | 15:42 | 16:07 | 4.0 | 18.5 | 1.18 | 31.5 | - | 1.60 | 0.2 | 6.4 | 16.2 | |
| | | 21-Apr-11 | 2 | 20.13 | 24.10 | 3.97 | B | 163.3 | - | - | 16:07 | 16:17 | 1.9 | 9.6 | 1.35 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 2 | 20.13 | 24.10 | 3.97 | C | 153.2 | 551.0 | 138.8 | 16:17 | 16:42 | 4.2 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1 | 24.10 | 29.10 | 5.00 | A | 39.7 | 39.7 | 7.9 | 15:21 | 15:35 | 7.5 | 0.7 | 0.02 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1C | 29.10 | 34.20 | 5.10 | A | 25.1 | 25.1 | 4.9 | 14:45 | 14:59 | 9.7 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-31+836.5 | T | 19-Jun-11 | 4 | 17.98 | 19.98 | 2.00 | MF | 180.0 | - | - | 8:30 | 8:56 | 2.1 | 14.5 | 3.32 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 4 | 17.98 | 19.98 | 2.00 | B | 132.0 | - | - | 8:56 | 9:04 | 2.1 | 12.8 | 3.13 | 32.0 | - | 1.50 | 9.0 | 11.0 | 16.5 | |
| | | 19-Jun-11 | 4 | 17.98 | 19.98 | 2.00 | C | 180.0 | - | - | 9:04 | 9:17 | 2.9 | 15.2 | 2.63 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 4 | 17.98 | 19.98 | 2.00 | D | 187.0 | - | - | 9:17 | 9:29 | 3.3 | 15.0 | 2.31 | - | - | - | - | - | - | |
| | | 19-Jun-11 | 4 | 17.98 | 19.98 | 2.00 | X | 175.0 | 854.0 | 427.0 | 9:29 | 9:41 | 3.6 | 19.8 | 2.74 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 3 | 20.48 | 21.48 | 1.00 | A | 19.9 | 19.9 | 19.9 | 11:01 | 11:15 | 3.0 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 2 | 21.48 | 25.50 | 4.02 | A | 22.6 | 22.6 | 5.6 | 10:44 | 10:57 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 1 | 25.50 | 30.50 | 5.00 | A | 22.6 | 22.6 | 4.5 | 10:20 | 10:34 | 7.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 1C | 30.50 | 34.50 | 4.00 | A | 32.4 | 32.4 | 8.1 | 9:55 | 10:12 | 9.8 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+838 | P | 08-Jun-11 | 4 | 18.59 | 20.59 | 2.00 | B | 162.0 | - | - | 16:36 | 16:56 | 0.5 | 12.4 | 12.04 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 18.59 | 20.59 | 2.00 | C | 240.0 | - | - | 16:56 | 17:09 | 1.4 | 20.0 | 7.40 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 18.59 | 20.59 | 2.00 | D | 318.0 | - | - | 17:09 | 17:25 | 2.5 | 19.8 | 4.28 | 61.4 | - | 1.67 | 9.1 | 13.2 | 18.1 | |
| | | 08-Jun-11 | 4 | 18.59 | 20.59 | 2.00 | X | 157.0 | 877.0 | 438.5 | 17:25 | 17:35 | 3.5 | 23.0 | 3.30 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 3 | 21.09 | 22.09 | 1.00 | B | 23.4 | 23.4 | 23.4 | 16:57 | 17:11 | 3.7 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 2 | 22.09 | 26.10 | 4.01 | A | 28.3 | 28.3 | 7.1 | 16:39 | 16:54 | 4.4 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 1 | 26.10 | 31.10 | 5.00 | A | 232.5 | - | - | 15:53 | 16:18 | 6.5 | 15.9 | 0.49 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 1 | 26.10 | 31.10 | 5.00 | B | 125.3 | 357.8 | 71.6 | 16:18 | 16:34 | 7.2 | 1.9 | 0.05 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 1C | 31.10 | 36.40 | 5.30 | A | 30.8 | 30.8 | 5.8 | 15:26 | 15:45 | 9.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+839.5 | T | 14-Jun-11 | 4 | 19.04 | 21.04 | 2.00 | MF | 180.5 | - | - | 10:14 | 10:35 | 2.3 | 15.1 | 3.59 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 19.04 | 21.04 | 2.00 | B | 159.5 | - | - | 10:35 | 10:47 | 3.4 | 6.9 | 1.03 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 19.04 | 21.04 | 2.00 | C | 52.0 | 392.0 | 196.0 | 10:47 | 11:06 | 3.6 | 1.8 | 0.23 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 21.54 | 22.54 | 1.00 | A | 13.2 | 13.2 | 13.2 | 23:34 | 23:47 | 3.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 22.54 | 26.50 | 3.96 | A | 42.7 | 42.7 | 10.8 | 23:16 | 23:30 | 4.3 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 03-May-11 | 1 | 26.50 | 31.50 | 5.00 | A | 43.9 | 43.9 | 8.8 | 22:57 | 23:10 | 7.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-11 | 1C | 31.50 | 36.50 | 5.00 | A | 41.4 | 41.4 | 8.3 | 22:36 | 22:50 | 9.9 | 0.0 | 0.00 | | - | - | - | - | - | |
| S-31+841 | S | 11-Jun-11 | 4 | 17.88 | 19.88 | 2.00 | B | 161.1 | - | - | 21:28 | 21:50 | 1.0 | 12.3 | 6.30 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 17.88 | 19.88 | 2.00 | C | 240.2 | - | - | 21:50 | 22:06 | 2.5 | 15.3 | 2.87 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 17.88 | 19.88 | 2.00 | D | 322.0 | - | - | 22:06 | 22:26 | 4.1 | 15.6 | 1.96 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 17.88 | 19.88 | 2.00 | X | 104.7 | 828.0 | 414.0 | 22:26 | 22:35 | 4.1 | 12.9 | 1.58 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 3 | 20.38 | 21.38 | 1.00 | A | 155.7 | - | - | 11:55 | 12:20 | 0.1 | 11.7 | 103.50 | 31.2 | 3.0 | 1.59 | -4.2 | 8.9 | 12.8 | |
| | | 22-Apr-11 | 3 | 20.38 | 21.38 | 1.00 | B | 162.9 | - | - | 12:20 | 12:30 | 1.7 | 18.6 | 8.16 | 34.7 | 1.5 | 1.61 | -4.6 | 8.9 | 13.6 | |
| | | 22-Apr-11 | 3 | 20.38 | 21.38 | 1.00 | C | 184.2 | - | - | 12:30 | 12:39 | 0.9 | 20.4 | 23.14 | 49.8 | - | 1.62 | -4.0 | 9.1 | 13.4 | |
| | | 22-Apr-11 | 3 | 20.38 | 21.38 | 1.00 | D | 153.6 | - | - | 12:39 | 12:46 | 1.2 | 20.4 | 17.02 | 71.7 | - | 1.64 | -4.7 | 9.0 | 15.7 | |
| | | 22-Apr-11 | 3 | 20.38 | 21.38 | 1.00 | X | 150.6 | 807.0 | 807.0 | 12:46 | 12:53 | 1.9 | 23.1 | 12.20 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 3 | 20.38 | 21.38 | 1.00 | A | 16.1 | 16.1 | 16.1 | 6:56 | 7:09 | 3.5 | 0.3 | 0.00 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 2 | 21.38 | 25.40 | 4.02 | A | 223.5 | - | - | 5:48 | 6:26 | 4.7 | 9.3 | 0.44 | - | - | - | - | - | - | |
| | | 26-Apr-11 | 2 | 21.38 | 25.40 | 4.02 | B | 95.6 | 319.1 | 79.4 | 6:26 | 6:49 | 4.1 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 1, 2 | 21.38 | 30.40 | 9.02 | A | - | - | - - | - | - | - | - | - | - | - | - | - | - | - | Hole blocked below casing. Stage 3 only |
| | | 25-Apr-11 | 1 | 25.40 | 30.40 | 5.00 | A | 25.0 | 25.0 | 5.0 | 5:08 | 5:24 | 7.2 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 1C | 30.40 | 35.40 | 5.00 | A | 23.5 | 23.5 | 4.7 | 4:36 | 4:56 | 9.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+842.5 | T | 19-Jun-11 | 4 | 18.99 | 20.99 | 2.00 | MF | 180.0 | - | - | 7:33 | 7:57 | 0.7 | 15.2 | 9.48 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 19-Jun-11 | 4 | 18.99 | 20.99 | 2.00 | C | 112.0 | - | - | 7:57 | 8:05 | 0.9 | 15.4 | 8.61 | 47.9 | - | 1.62 | 8.4 | 11.1 | 16.4 | |
| | | 19-Jun-11 | 4 | 18.99 | 20.99 | 2.00 | D | 103.0 | - | - | 8:05 | 8:11 | 0.9 | 14.4 | 8.48 | 69.0 | - | 1.69 | 8.0 | 11.0 | 16.0 | |
| | | 19-Jun-11 | 4 | 18.99 | 20.99 | 2.00 | X | 116.6 | 511.6 | 255.8 | 8:11 | 8:19 | 1.6 | 14.4 | 4.41 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 21.49 | 22.49 | 1.00 | A | 34.3 | 34.3 | 34.3 | 3:09 | 3:30 | 3.3 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 22.49 | 26.50 | 4.01 | A | 49.6 | 49.6 | 12.4 | 2:50 | 3:04 | 4.6 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 03-May-11 | 1 | 26.50 | 31.50 | 5.00 | A | 47.4 | 47.4 | 9.5 | 2:30 | 2:44 | 7.3 | 0.2 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-11 | 1C | 31.50 | 36.50 | 5.00 | A | 42.9 | 42.9 | 8.6 | 2:08 | 2:24 | 9.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+844 | P | 08-Jun-11 | 4 | 19.24 | 21.24 | 2.00 | B | 145.5 | 145.5 | 72.8 | 16:00 | 16:32 | 4.1 | 0.7 | 0.09 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 3 | 21.72 | 22.72 | 1.00 | B | 25.2 | 25.2 | 25.2 | 23:59 | 23:17 | 3.9 | 0.2 | 0.05 | 37.4 | 2.0 | 163.00 | 7.3 | 8.4 | 13.4 | |
| | | 18-Apr-11 | 2 | 22.72 | 26.70 | 3.98 | A | 25.9 | 25.9 | 6.5 | 22:59 | 23:17 | 4.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 1 | 26.70 | 31.70 | 5.00 | A | 25.3 | 25.3 | 5.1 | 22:05 | 22:21 | 7.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-Apr-11 | 1C | 31.70 | 37.20 | 5.50 | A | 27.1 | 27.1 | 4.9 | 21:11 | 21:52 | 10.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+845.5 | T | 14-Jun-11 | 4 | 18.13 | 20.13 | 2.00 | MF | 180.0 | - | - | 9:09 | 9:30 | 2.8 | 15.1 | 2.55 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 18.13 | 20.13 | 2.00 | B | 160.0 | - | - | 9:30 | 9:39 | 3.1 | 20.0 | 3.30 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 18.13 | 20.13 | 2.00 | C | 160.0 | - | - | 9:39 | 9:49 | 3.4 | 14.7 | 2.08 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 18.13 | 20.13 | 2.00 | D | 92.2 | 592.2 | 296.1 | 9:49 | 10:09 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 20.63 | 21.63 | 1.00 | A | 65.0 | 65.0 | 65.0 | 17:26 | 17:55 | 4.1 | 0.6 | 0.16 | - | - | - | - | - | - | |
| | | 04-May-11 | 2 | 21.63 | 25.60 | 3.97 | A | 34.3 | 34.3 | 8.6 | 17:05 | 17:20 | 4.7 | 0.5 | 0.02 | - | - | - | - | - | - | |
| | | 04-May-11 | 1 | 25.60 | 30.60 | 5.00 | A | 20.8 | 20.8 | 4.2 | 16:46 | 17:00 | 7.2 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 04-May-11 | 1C | 30.60 | 35.00 | 4.40 | A | 28.6 | 28.6 | 6.5 | 16:10 | 16:40 | 7.3 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+847 | S | 11-Jun-11 | 4 | 18.66 | 20.66 | 2.00 | B | 160.9 | - | - | 20:09 | 20:32 | 1.9 | 12.3 | 2.74 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 18.66 | 20.66 | 2.00 | C | 242.1 | - | - | 20:32 | 20:49 | 3.5 | 15.4 | 2.16 | - | - | - | - | - | - | Water By-Pass. Outside Casing. |
| | | 11-Jun-11 | 4 | 18.66 | 20.66 | 2.00 | D | 318.8 | - | - | 20:49 | 21:09 | 4.1 | 15.8 | 1.93 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 18.66 | 20.66 | 2.00 | X | 106.2 | 828.0 | 414.0 | 21:09 | 21:18 | 4.1 | 10.8 | 1.32 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 3 | 21.16 | 22.16 | 1.00 | A | 167.0 | - | - | 15:24 | 15:50 | 0.9 | 11.7 | 14.17 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 3 | 21.16 | 22.16 | 1.00 | B | 157.9 | - | - | 15:50 | 16:01 | 2.0 | 19.1 | 9.24 | 37.7 | - | 1.64 | -2.3 | 8.7 | 17.4 | |
| | | 28-Apr-11 | 3 | 21.16 | 22.16 | 1.00 | C | 152.0 | - | - | 16:01 | 16:09 | 3.2 | 12.3 | 3.88 | 43.2 | 1.0 | 1.63 | -2.2 | 8.7 | 16.6 | |
| | | 28-Apr-11 | 3 | 21.16 | 22.16 | 1.00 | D | 63.1 | 540.0 | 540.0 | 16:09 | 16:30 | 3.6 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 2 | 22.16 | 26.20 | 4.04 | A | 122.6 | 122.6 | 30.3 | 14:49 | 15:20 | 4.3 | 1.0 | 0.06 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 1 | 26.20 | 31.20 | 5.00 | A | 101.9 | 101.9 | 20.4 | 14:22 | 14:45 | 6.9 | 3.3 | 0.10 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 1C | 31.20 | 36.60 | 5.40 | A | 25.4 | 25.4 | 4.7 | 13:59 | 14:15 | 9.6 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-31+848.5 | T | 19-Jun-11 | 4 | 15.11 | 17.11 | 2.00 | MF | 180.0 | - | - | 6:38 | 7:01 | 0.5 | 11.0 | 10.80 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 19-Jun-11 | 4 | 15.11 | 17.11 | 2.00 | C | 100.0 | - | - | 7:01 | 7:08 | 0.6 | 14.1 | 12.31 | 48.1 | - | 1.64 | 8.3 | 11.5 | 16.2 | |
| | | 19-Jun-11 | 4 | 15.11 | 17.11 | 2.00 | D | 90.0 | - | - | 7:08 | 7:15 | 0.7 | 14.2 | 11.48 | 67.8 | - | 1.69 | 8.4 | 11.2 | 16.6 | |
| | | 19-Jun-11 | 4 | 15.11 | 17.11 | 2.00 | X | 131.5 | 501.5 | 250.8 | 7:15 | 7:23 | 1.1 | 14.8 | 6.46 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 17.61 | 18.61 | 1.00 | A | 28.0 | 28.0 | 28.0 | 5:33 | 5:45 | 3.2 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 18.61 | 22.60 | 3.99 | A | 35.2 | 35.2 | 8.8 | 5:14 | 5:29 | 4.4 | 0.6 | 0.03 | - | - | - | - | - | - | |
| | | 03-May-11 | 1 | 22.60 | 27.60 | 5.00 | A | 53.9 | 53.9 | 10.8 | 4:54 | 5:09 | 7.3 | 0.8 | 0.02 | - | - | - | - | - | - | |
| | | 03-May-11 | 1C | 27.60 | 36.30 | 8.70 | A | 118.8 | 118.8 | 13.7 | 4:25 | 4:50 | 9.8 | 2.4 | 0.03 | - | - | - | - | - | - | |
| P-31+850 | P | 08-Jun-11 | 4 | 18.00 | 20.00 | 2.00 | B | 113.8 | 113.8 | 56.9 | 14:42 | 15:08 | 4.1 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 3 | 20.50 | 21.50 | 1.00 | A | 194.5 | - | - | 18:00 | 18:12 | 3.7 | 3.3 | 0.91 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 3 | 20.50 | 21.50 | 1.00 | B | 136.0 | 330.5 | 330.5 | 18:12 | 19:36 | 3.6 | 0.0 | 0.01 | 32.4 | 5.0 | 1.58 | -12.6 | 6.9 | 17.4 | |
| | | 20-Apr-11 | 2 | 21.50 | 25.50 | 4.00 | A | 98.0 | 98.0 | 24.5 | 16:52 | 17:12 | 4.5 | 3.8 | 0.21 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 1 | 25.50 | 30.50 | 5.00 | A | 152.9 | 152.9 | 30.6 | 16:25 | 16:45 | 7.3 | 4.6 | 0.13 | 31.3 | 5.0 | 1.55 | -6.5 | 7.8 | 15.9 | |
| | | 20-Apr-11 | 1C | 30.50 | 35.80 | 5.30 | A | 36.3 | 36.3 | 6.8 | 16:00 | 16:14 | 9.6 | 0.8 | 0.02 | - | - | - | - | - | - | |
| T-31+851.5 | T | 14-Jun-11 | 4 | 18.13 | 20.13 | 2.00 | MF | 115.5 | 115.5 | 57.8 | 8:38 | 9:04 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 20.63 | 21.63 | 1.00 | A | 31.7 | 31.7 | 31.7 | 15:31 | 15:45 | 3.8 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 04-May-11 | 2 | 21.63 | 25.60 | 3.97 | A | 62.7 | 62.7 | 15.8 | 15:03 | 15:24 | 4.4 | 0.5 | 0.03 | - | 3.0 | - | - | - | - | |
| | | 04-May-11 | 1 | 25.60 | 30.60 | 5.00 | A | 43.2 | 43.2 | 8.6 | 14:25 | 14:46 | 7.4 | 1.0 | 0.03 | - | - | - | - | - | - | |
| | | 04-May-11 | 1C | 30.60 | 36.00 | 5.40 | A | 28.9 | 28.9 | 5.4 | 13:38 | 14:16 | 10.9 | 0.3 | 0.00 | 30.7 | 7.0 | 1.61 | 18.8 | 13.1 | 20.5 | |
| S-31+853 | S | 11-Jun-11 | 4 | 18.03 | 20.03 | 2.00 | B | 161.0 | - | - | 18:48 | 19:12 | 3.0 | 12.9 | 2.10 | 35.9 | 4.0 | 1.62 | 4.3 | 9.6 | 11.6 | |
| | | 11-Jun-11 | 4 | 18.03 | 20.03 | 2.00 | C | 241.7 | - | - | 19:12 | 19:28 | 2.8 | 15.4 | 2.76 | 46.8 | 4.0 | 1.63 | 5.1 | 9.8 | 12.7 | |
| | | 11-Jun-11 | 4 | 18.03 | 20.03 | 2.00 | D | 326.1 | - | - | 19:28 | 19:48 | 3.0 | 15.3 | 2.31 | 64.5 | - | 1.66 | 5.0 | 9.9 | 13.4 | |
| | | 11-Jun-11 | 4 | 18.03 | 20.03 | 2.00 | X | 100.2 | 829.0 | 414.5 | 19:48 | 19:56 | 3.1 | 15.1 | 2.41 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 3 | 20.53 | 21.53 | 1.00 | A | 172.7 | - | - | 18:53 | 19:19 | 3.0 | 8.9 | 2.83 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 3 | 20.53 | 21.53 | 1.00 | B | 148.9 | - | - | 19:19 | 19:39 | 3.6 | 6.2 | 1.95 | 36.6 | - | 1.63 | 6.2 | 8.3 | 16.2 | |
| | | 28-Apr-11 | 3 | 20.53 | 21.53 | 1.00 | C | 151.7 | - | - | 19:39 | 20:05 | 3.7 | 2.2 | 0.51 | 48.4 | - | 1.64 | 8.9 | 10.2 | 16.9 | |
| | | 28-Apr-11 | 3 | 20.53 | 21.53 | 1.00 | D | 10.9 | 484.2 | 484.2 | 20:05 | 20:22 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 2 | 21.53 | 25.50 | 3.97 | A | 33.9 | 33.9 | 8.5 | 18:34 | 18:48 | 4.5 | 0.6 | 0.04 | 31.1 | 5.0 | 1.61 | 6.2 | 8.3 | 15.5 | |
| | | 28-Apr-11 | 1 | 25.50 | 30.50 | 5.00 | A | 178.3 | 178.3 | 35.7 | 17:45 | 18:25 | 7.3 | 4.6 | 0.13 | 31.1 | 5.0 | 1.61 | 6.2 | 8.3 | 15.5 | |
| | | 28-Apr-11 | 1C | 30.50 | 35.50 | 5.00 | A | 151.0 | 151.0 | 30.2 | 17:06 | 17:36 | 9.3 | 3.2 | 0.07 | - | - | - | - | - | - | |
| T-31+854.5 | T | 18-Jun-11 | 4 | 18.31 | 20.31 | 2.00 | MF | 165.2 | - | - | 4:37 | 4:58 | 1.5 | 12.2 | 4.82 | - | - | - | - | - | - | Communicated to T-31+860.5 between plastic and steel casing |
| | | 18-Jun-11 | 4 | 18.31 | 20.31 | 2.00 | C | 143.7 | - | - | 4:58 | 5:07 | 2.0 | 15.4 | 2.91 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 18.31 | 20.31 | 2.00 | X | 104.8 | 413.7 | 206.9 | 5:07 | 5:20 | 3.9 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 20.81 | 21.81 | 1.00 | A | 31.0 | 31.0 | 31.0 | 20:49 | 21:03 | 4.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 04-May-11 | 2 | 21.81 | 25.80 | 3.99 | A | 37.4 | 37.4 | 9.4 | 20:32 | 20:45 | 4.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-11 | 1 | 25.80 | 30.80 | 5.00 | A | 69.5 | 69.5 | 13.9 | 20:08 | 20:26 | 7.4 | 0.5 | 0.01 | - | - | - | - | - | - | |
| | | 04-May-11 | 1C | 30.80 | 36.00 | 5.20 | A | 47.0 | 47.0 | 9.0 | 19:46 | 20:02 | 9.7 | 0.1 | 0.00 | 32.4 | 5.0 | 1.61 | 13.7 | 10.4 | 14.0 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+856 | P | 08-Jun-11 | 4 | 18.79 | 20.79 | 2.00 | B | 160.0 | - | - | 13:59 | 14:19 | 0.9 | 14.8 | 6.20 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 18.79 | 20.79 | 2.00 | C | 187.3 | 347.3 | 173.7 | 14:19 | 14:35 | 4.0 | 0.8 | 0.09 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 3 | 21.29 | 22.29 | 1.00 | B | 48.4 | 48.4 | 48.4 | 9:04 | 9:43 | 3.6 | 0.6 | 0.15 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 2 | 22.29 | 26.30 | 4.01 | A | 53.8 | 53.8 | 13.4 | 8:45 | 9:00 | 4.5 | 2.1 | 0.12 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 1 | 26.30 | 31.30 | 5.00 | A | 65.9 | 65.9 | 13.2 | 8:12 | 8:36 | 7.0 | 2.6 | 0.08 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 1C | 31.30 | 36.50 | 5.20 | A | 26.8 | 26.8 | 5.2 | 6:46 | 8:04 | 9.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+857.5 | T | 14-Jun-11 | 4 | 18.26 | 20.26 | 2.00 | MF | 180.0 | - | - | 7:32 | 7:53 | 1.5 | 15.5 | 5.22 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 18.26 | 20.26 | 2.00 | B | 160.0 | - | - | 7:53 | 8:02 | 1.5 | 20.0 | 5.84 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 18.26 | 20.26 | 2.00 | C | 160.0 | - | - | 8:02 | 8:11 | 1.8 | 20.6 | 5.59 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 18.26 | 20.26 | 2.00 | D | 160.0 | - | - | 8:11 | 8:19 | 2.2 | 19.2 | 3.95 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 18.26 | 20.26 | 2.00 | X | 253.0 | 913.0 | 456.5 | 8:19 | 8:31 | 3.1 | 14.0 | 2.28 | - | - | - | - | - | - | |
| | | 04-May-11 | 3 | 20.76 | 21.76 | 1.00 | A | 16.3 | 16.3 | 16.3 | 2:12 | 2:25 | 4.0 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 04-May-11 | 2 | 21.76 | 25.80 | 4.04 | A | 29.9 | 29.9 | 7.4 | 1:55 | 2:08 | 4.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-May-11 | 1 | 25.80 | 30.80 | 5.00 | A | 199.1 | - | - | 22:49 | 23;20 | 7.2 | 8.9 | 0.25 | - | - | - | - | - | - | |
| | | 04-May-11 | 1 | 25.80 | 30.80 | 5.00 | B | 54.1 | 253.2 | 50.6 | 23:20 | 23:31 | 7.4 | 2.0 | 0.05 | 37.0 | 3.0 | 1.63 | 16.0 | 8.2 | 18.2 | |
| | | 04-May-11 | 1C | 30.80 | 35.80 | 5.00 | A | 75.8 | 75.8 | 15.2 | 22:23 | 22:43 | 9.6 | 1.9 | 0.04 | - | - | - | - | - | - | |
| S-31+859 | S | 11-Jun-11 | 4 | 18.61 | 20.61 | 2.00 | B | 160.0 | - | - | 16:27 | 16:48 | 0.1 | 12.1 | 33.81 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 18.61 | 20.61 | 2.00 | C | 240.0 | - | - | 16:48 | 17:01 | 1.5 | 20.2 | 6.23 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 18.61 | 20.61 | 2.00 | D | 320.0 | - | - | 17:01 | 17:17 | 2.4 | 20.4 | 4.10 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 18.61 | 20.61 | 2.00 | X | 98.0 | 818.0 | 409.0 | 17:17 | 17:24 | 3.4 | 19.9 | 2.96 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 3 | 21.11 | 22.11 | 1.00 | A | 19.5 | 19.5 | 19.5 | 23:03 | 23:20 | 3.6 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 2 | 22.11 | 26.10 | 3.99 | A | 57.1 | 57.1 | 14.3 | 22:38 | 22:57 | 4.3 | 1.1 | 0.05 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 1 | 26.10 | 31.10 | 5.00 | A | 152.4 | 152.4 | 30.5 | 21:54 | 22:30 | 7.2 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 1C | 31.10 | 36.10 | 5.00 | A | 44.3 | 44.3 | 8.9 | 21:29 | 21:47 | 10.0 | 0.4 | 0.01 | - | - | - | - | - | - | |
| T-31+860.5 | T | 18-Jun-11 | 4 | 15.54 | 17.54 | 2.00 | MF | 181.3 | - | - | 3:38 | 4:01 | 1.4 | 12.8 | 4.59 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 15.54 | 17.54 | 2.00 | B | 154.4 | - | - | 4:01 | 4:11 | 1.5 | 15.6 | 5.26 | - | - | - | - | - | - | Communicated to P-31+856 between |
| | | 18-Jun-11 | 4 | 15.54 | 17.54 | 2.00 | D | 107.9 | - | - | 4:11 | 4:19 | 2.0 | 15.2 | 3.70 | - | - | - | - | - | - | plastic and steel casing |
| | | 18-Jun-11 | 4 | 15.54 | 17.54 | 2.00 | X | 112.7 | 556.3 | 278.2 | 4:19 | 4:27 | 2.2 | 15.7 | 3.53 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 18.04 | 19.04 | 1.00 | A | 29.5 | 29.5 | 29.5 | 7:00 | 7:16 | 4.4 | 0.3 | 0.06 | - | - | - | - | - | - | |
| | | 05-May-11 | 2 | 19.04 | 23.00 | 3.96 | A | 27.5 | 27.5 | 6.9 | 6:41 | 6:54 | 4.6 | 0.3 | 0.01 | 30.4 | 5.0 | 1.58 | 3.7 | 8.1 | 14.2 | |
| | | 04-May-11 | 1 | 23.00 | 28.00 | 5.00 | A | 78.3 | 78.3 | 15.7 | 3:15 | 3:36 | 7.4 | 1.2 | 0.03 | 33.1 | 2.0 | 1.66 | 18.3 | 10.8 | 17.9 | |
| | | 04-May-11 | 1C | 28.00 | 33.10 | 5.10 | A | 70.0 | 70.0 | 13.7 | 2:51 | 3:07 | 9.5 | 1.6 | 0.03 | - | - | - | - | - | - | |
| P-31+862 | P | 08-Jun-11 | 4 | 18.74 | 20.74 | 2.00 | B | 161.0 | - | - | 13:27 | 13:48 | 3.5 | 16.7 | 2.86 | 37.2 | 5.0 | 1.62 | 0.1 | 13.1 | 16.4 | By-pass outside casing. Stopped. |
| | | 08-Jun-11 | 4 | 18.74 | 20.74 | 2.00 | C | 54.0 | 215.0 | 107.5 | 13:48 | 13:51 | 3.5 | 13.0 | 1.84 | 48.9 | - | 1.64 | 9.1 | 13.1 | 17.7 | |
| | | 19-Apr-11 | 3 | 21.24 | 22.24 | 1.00 | B | 27.4 | 27.4 | 27.4 | 13:59 | 14:15 | 3.8 | 0.5 | 0.14 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 2 | 22.24 | 26.20 | 3.96 | A | 120.3 | 120.3 | 30.4 | 13:26 | 13:50 | 4.5 | 1.9 | 0.10 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 1 | 26.20 | 31.20 | 5.00 | A | 57.2 | 57.2 | 11.4 | 11:27 | 11:43 | 7.0 | 1.2 | 0.04 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 1C | 31.20 | 36.40 | 5.20 | A | 98.6 | 98.6 | 19.0 | 10:56 | 11:20 | 9.8 | 0.3 | 0.01 | 33.6 | - | 1.64 | 7.5 | 10.6 | 15.9 | |
| T-31+863.5 | T | 14-Jun-11 | 4 | 18.97 | 20.97 | 2.00 | MF | 180.0 | - | - | 6:27 | 6:48 | 2.0 | 15.4 | 4.74 | - | - | - | - | - | - | |
| | | 14-Jun-11 | 4 | 18.97 | 20.97 | 2.00 | B | 160.0 | - | - | 6:48 | 6:57 | 2.1 | 20.3 | 4.55 | 37.2 | 4.0 | 1.54 | 6.2 | 6.4 | 12.1 | |
| | | 14-Jun-11 | 4 | 18.97 | 20.97 | 2.00 | C | 160.0 | - | - | 6:57 | 7:05 | 2.0 | 20.1 | 5.18 | 45.4 | - | 1.60 | 6.2 | 6.4 | 12.3 | |
| | | 14-Jun-11 | 4 | 18.97 | 20.97 | 2.00 | D | 220.0 | - | - | 7:05 | 7:16 | 2.7 | 20.1 | 3.36 | 61.8 | - | 1.64 | 6.2 | 6.4 | 13.2 | |
| | | 14-Jun-11 | 4 | 18.97 | 20.97 | 2.00 | X | 154.0 | 874.0 | 437.0 | 7:16 | 7:24 | 2.8 | 20.8 | 3.74 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 21.47 | 22.47 | 1.00 | A | 136.9 | 136.9 | 136.9 | 8:57 | 10:12 | 4.0 | 0.6 | 0.15 | - | - | - | - | - | - | |
| | | 05-May-11 | 2 | 22.47 | 26.50 | 4.03 | A | 86.8 | 86.8 | 21.5 | 8:23 | 8:48 | 4.3 | 2.0 | 0.11 | - | - | - | - | - | - | |
| | | 05-May-11 | 1 | 26.50 | 31.50 | 5.00 | A | 25.7 | 25.7 | 5.1 | 8:05 | 8:19 | 7.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-11 | 1C | 31.50 | 36.50 | 5.00 | A | 26.0 | 26.0 | 5.2 | 7:43 | 7:57 | 9.9 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+865 | S | 11-Jun-11 | 4 | 18.11 | 20.11 | 2.00 | B | 160.0 | - | - | 15:32 | 15:43 | 2.6 | 15.5 | 2.95 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 18.11 | 20.11 | 2.00 | C | 240.0 | - | - | 15:43 | 15:57 | 3.1 | 20.1 | 3.11 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 18.11 | 20.11 | 2.00 | D | 320.0 | - | - | 15:57 | 16:11 | 3.5 | 20.2 | 2.92 | 63.0 | - | 1.67 | 7.2 | 14.6 | 15.4 | |
| | | 11-Jun-11 | 4 | 18.11 | 20.11 | 2.00 | X | 95.0 | 815.0 | 407.5 | 16:11 | 16:19 | 4.1 | 12.7 | 1.55 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 3 | 20.61 | 21.61 | 1.00 | A | 178.6 | - | - | 3:34 | 4:06 | 2.2 | 8.9 | 3.99 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 3 | 20.61 | 21.61 | 1.00 | B | 141.2 | - | - | 4:06 | 4:21 | 2.1 | 8.7 | 3.41 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 3 | 20.61 | 21.61 | 1.00 | C | 65.4 | 385.2 | 385.2 | 4:21 | 4:43 | 3.6 | 0.4 | 0.10 | 46.1 | 2.0 | 1.63 | 8.5 | 9.4 | 16.4 | |
| | | 28-Apr-11 | 2 | 21.61 | 25.60 | 3.99 | A | 52.5 | 52.5 | 13.2 | 3:13 | 3:30 | 4.5 | 1.3 | 0.07 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 1 | 25.60 | 30.60 | 5.00 | A | 136.8 | 136.8 | 27.4 | 2:38 | 3:07 | 7.4 | 1.4 | 0.04 | - | - | - | - | - | - | |
| | | 28-Apr-11 | 1C | 30.60 | 35.60 | 5.00 | A | 207.0 | - | - | 1:35 | 2:04 | 2.0 | 12.2 | 1.32 | 32.0 | - | 1.65 | -7.5 | 19.5 | 19.5 | |
| | | 28-Apr-11 | 1C | 30.60 | 35.60 | 5.00 | B | 200.9 | 407.9 | 81.6 | 2:04 | 2:30 | 9.5 | 0.5 | 0.01 | 35.0 | 6.0 | 1.48 | -1.4 | - | 16.7 | |
| T-31+866.5 | T | 18-Jun-11 | 4 | 18.56 | 20.56 | 2.00 | MF | 180.5 | - | - | 2:28 | 2:51 | 0.3 | 12.7 | 21.42 | 31.4 | 4.0 | 1.41 | 7.5 | 7.3 | 9.0 | |
| | | 18-Jun-11 | 4 | 18.56 | 20.56 | 2.00 | B | 160.6 | - | - | 2:51 | 3:03 | 0.4 | 18.1 | 21.98 | 37.6 | - | 1.60 | 7.9 | 8.1 | 10.2 | |
| | | 18-Jun-11 | 4 | 18.56 | 20.56 | 2.00 | C | 160.6 | - | - | 3:03 | 3:10 | 0.9 | 21.4 | 11.86 | 47.0 | - | 1.63 | 8.1 | 8.3 | 11.1 | |
| | | 18-Jun-11 | 4 | 18.56 | 20.56 | 2.00 | D | 159.4 | - | - | 3:10 | 3:20 | 1.4 | 15.7 | 5.97 | 45.8 | - | 1.62 | 9.3 | 11.3 | 11.6 | |
| | | 18-Jun-11 | 4 | 18.56 | 20.56 | 2.00 | X | 149.9 | 811.0 | 405.5 | 3:20 | 3:30 | 1.9 | 15.0 | 3.94 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 21.06 | 22.06 | 1.00 | A | 26.2 | 26.2 | 26.2 | 11:37 | 11:55 | 4.1 | 0.3 | 0.06 | - | - | - | - | - | - | |
| | | 05-May-11 | 2 | 22.06 | 26.10 | 4.04 | A | 45.8 | 45.8 | 11.3 | 11:16 | 11:33 | 5.4 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-11 | 1 | 26.10 | 31.10 | 5.00 | A | 40.0 | 40.0 | 8.0 | 10:55 | 11:12 | 7.1 | 0.2 | 0.00 | - | - | - | - | - | - | |
| | | 05-May-11 | 1C | 31.10 | 36.20 | 5.10 | A | 25.0 | 25.0 | 4.9 | 10:34 | 10:50 | 9.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+868 | P | 08-Jun-11 | 4 | 19.86 | 21.86 | 2.00 | C | 42.3 | 210.3 | 105.2 | 10:22 | 10:35 | 4.5 | 1.8 | 0.19 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 19.86 | 21.86 | 2.00 | B | 168.0 | - | - | 10.:01 | 10:22 | 3.8 | 11.7 | 1.42 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 3 | 22.36 | 23.26 | 0.90 | A | 20.0 | 20.0 | 22.2 | 16:17 | 16:31 | 3.5 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 2 | 23.26 | 27.40 | 4.14 | A | 142.8 | 142.8 | 34.5 | 15:37 | 16:12 | 4.6 | 1.8 | 0.10 | 30.2 | 2.0 | 1.57 | -9.4 | 17.4 | 8.4 | |
| | | 19-Apr-11 | 1 | 27.40 | 32.40 | 5.00 | A | 244.7 | 244.7 | 48.9 | 14:53 | 15:28 | 7.3 | 5.2 | 0.14 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 1C | 32.40 | 37.40 | 5.00 | A | 52.9 | 52.9 | 10.6 | 14:31 | 14:48 | 9.5 | 1.0 | 0.02 | - | - | - | - | - | - | |
| T-31+869.5 | T | 13-Jun-11 | 4 | 18.84 | 20.84 | 2.00 | MF | 192.6 | - | - | 4:02 | 4:26 | 0.9 | 12.3 | 6.19 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 18.84 | 20.84 | 2.00 | B | 148.3 | - | - | 4:26 | 4:36 | 1.2 | 15.7 | 5.08 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 18.84 | 20.84 | 2.00 | C | 161.5 | - | - | 4:36 | 4:47 | 1.9 | 15.5 | 4.25 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 18.84 | 20.84 | 2.00 | D | 164.3 | - | - | 4:47 | 4:57 | 2.0 | 15.9 | 4.03 | - | - | - | - | - | - | Communicated to P-31+868. |
| | | 13-Jun-11 | 4 | 18.84 | 20.84 | 2.00 | X | 114.8 | 781.5 | 390.8 | 4:57 | 5:05 | 2.1 | 12.6 | 3.02 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 21.34 | 22.34 | 1.00 | A | 99.8 | 99.8 | 99.8 | 16:05 | 16:47 | 3.7 | 0.5 | 0.13 | - | - | - | - | - | - | |
| | | 05-May-11 | 2 | 22.34 | 26.30 | 3.96 | A | 69.3 | 69.3 | 17.5 | 15:33 | 15:55 | 4.4 | 2.0 | 0.12 | - | - | - | - | - | - | |
| | | 05-May-11 | 1 | 26.30 | 31.30 | 5.00 | A | 158.6 | 158.6 | 31.7 | 14:54 | 15:25 | 7.1 | 5.3 | 0.15 | - | - | - | - | - | - | |
| | | 05-May-11 | 1C | 31.30 | 36.40 | 5.10 | A | 35.2 | 35.2 | 6.9 | 14:26 | 14:44 | 10.3 | 0.2 | 0.00 | 31.8 | - | 1.60 | 11.7 | 10.7 | 15.9 | |
| S-31+871 | S | 11-Jun-11 | 4 | 18.82 | 20.82 | 2.00 | B | 160.0 | - | - | 14:16 | 14:39 | 4.0 | 6.6 | 0.92 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 18.82 | 20.82 | 2.00 | C | 177.0 | 337.0 | 168.5 | 14:39 | 15:17 | 3.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 3 | 21.32 | 22.32 | 1.00 | A | 77.7 | 77.7 | 77.7 | 8:49 | 9:42 | 3.3 | 0.6 | 0.17 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 2 | 22.32 | 26.30 | 3.98 | A | 206.7 | - | - | 8:00 | 8:32 | 3.6 | 15.1 | 1.00 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 2 | 22.32 | 26.30 | 3.98 | B | 62.7 | 269.4 | 67.7 | 8:32 | 8:45 | 4.1 | 2.3 | 0.13 | 36.1 | - | 1.63 | 4.4 | 8.5 | 16.2 | |
| | | 29-Apr-11 | 1, 1C | 26.30 | 36.30 | 10.00 | A | 63.8 | 63.8 | 6.4 | 6:50 | 7:11 | 8.2 | 0.8 | 0.02 | 32.5 | 4.0 | 1.61 | 4.3 | 8.5 | 15.3 | Stage 1 and 1c combined |
| T-31+872.5 | T | 18-Jun-11 | 4 | 18.26 | 20.26 | 2.00 | MF | 186.6 | - | - | 22:36 | 22:59 | 1.8 | 12.4 | 3.51 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 18.26 | 20.26 | 2.00 | B | 154.9 | - | - | 22:59 | 23:09 | 1.7 | 15.6 | 4.51 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 18.26 | 20.26 | 2.00 | C | 156.0 | - | - | 23:09 | 23:19 | 2.0 | 15.4 | 3.88 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 18.26 | 20.26 | 2.00 | D | 152.9 | - | - | 23:19 | 23:29 | 2.3 | 15.9 | 3.51 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 18.26 | 20.26 | 2.00 | X | 160.6 | 811.0 | 405.5 | 23:29 | 23:39 | 2.5 | 16.2 | 3.25 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 20.76 | 21.76 | 1.00 | A | 37.5 | 37.5 | 37.5 | 15:20 | 15:43 | 4.4 | 0.5 | 0.08 | 31.0 | 5.0 | 1.62 | - | 10.0 | 19.2 | |
| | | 06-May-11 | 2 | 21.76 | 25.80 | 4.04 | A | 73.7 | 73.7 | 18.2 | 14:55 | 15:15 | 4.6 | 2.0 | 0.10 | - | - | - | - | - | - | |
| | | 06-May-11 | 1 | 25.80 | 30.80 | 5.00 | A | 33.3 | 33.3 | 6.7 | 14:32 | 14:50 | 7.0 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 06-May-11 | 1C | 30.80 | 35.70 | 4.90 | A | 123.9 | 123.9 | 25.3 | 13:54 | 14:22 | 9.2 | 2.0 | 0.04 | 30.6 | 10.0 | 1.60 | 17.5 | 9.5 | 21.2 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+874 | S | 08-Jun-11 | 4 | 18.18 | 20.18 | 2.00 | B | 168.0 | - | - | 8:26 | 8:47 | 1.5 | 12.4 | 3.50 | - | - | - | - | - | - | |
| | | 08-Jun-11 | 4 | 18.18 | 20.18 | 2.00 | C | 229.0 | - | - | 8:47 | 9:05 | 3.0 | 20.1 | 3.00 | 47.0 | - | 1.64 | 7.6 | 12.9 | 17.3 | |
| | | 08-Jun-11 | 4 | 18.18 | 20.18 | 2.00 | D | 368.0 | - | - | 9:05 | 9:24 | 3.4 | 19.7 | 2.87 | 63.1 | - | 1.67 | 10.4 | 12.9 | 17.1 | |
| | | 08-Jun-11 | 4 | 18.18 | 20.18 | 2.00 | X | 142.0 | 907.0 | 453.5 | 9:24 | 9:34 | 4.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 3 | 20.68 | 21.68 | 1.00 | A | 42.4 | 42.4 | 42.4 | 21:04 | 21:26 | 3.7 | 0.5 | 0.14 | 45.0 | 3.0 | 16.50 | 0.1 | 10.0 | 15.2 | |
| | | 19-Apr-11 | 2 | 21.68 | 25.70 | 4.02 | A | 57.8 | 57.8 | 14.4 | 20:43 | 21:00 | 4.5 | 1.7 | 0.09 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 1 | 25.70 | 30.70 | 5.00 | A | 210.8 | - | - | 19:51 | 20:19 | 7.2 | 5.9 | 0.19 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 1 | 25.70 | 30.70 | 5.00 | B | 47.5 | 258.3 | 51.7 | 20:19 | 20:31 | 6.7 | 2.8 | 0.09 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 1C | 30.70 | 36.00 | 5.30 | A | 52.7 | 52.7 | 9.9 | 19:23 | 19:41 | 10.1 | 1.3 | 0.02 | 34.5 | 3.0 | 1.64 | 0.1 | 11.4 | 13.9 | |
| T-31+875.5 | T | 13-Jun-11 | 4 | 18.21 | 20.21 | 2.00 | MF | 181.0 | - | - | 2:49 | 3:12 | 2.2 | 12.9 | 2.66 | - | - | - | - | - | - | Water surfacing around casing |
| | | 13-Jun-11 | 4 | 18.21 | 20.21 | 2.00 | B | 162.4 | - | - | 3:12 | 3:22 | 2.5 | 15.4 | 3.15 | 36.5 | - | 1.60 | 7.3 | 9.1 | 12.2 | |
| | | 13-Jun-11 | 4 | 18.21 | 20.21 | 2.00 | C | 159.0 | - | - | 3:22 | 3:33 | 3.2 | 15.7 | 2.49 | 47.1 | - | 1.62 | 7.3 | 9.1 | 13.1 | |
| | | 13-Jun-11 | 4 | 18.21 | 20.21 | 2.00 | D | 158.4 | - | - | 3:33 | 3:43 | 3.6 | 15.7 | 2.21 | 66.1 | - | 1.67 | 7.2 | 8.9 | 12.9 | |
| | | 13-Jun-11 | 4 | 18.21 | 20.21 | 2.00 | X | 139.2 | 800.0 | 400.0 | 3:43 | 3:52 | 3.4 | 13.2 | 1.91 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 20.71 | 21.71 | 1.00 | A | 43.3 | 43.3 | 43.3 | 18:49 | 19:07 | 4.1 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 05-May-11 | 2 | 21.71 | 25.70 | 3.99 | A | 38.9 | 38.9 | 9.7 | 18:23 | 18:42 | 4.9 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-11 | 1 | 25.70 | 30.70 | 5.00 | A | 34.3 | 34.3 | 6.9 | 17:48 | 18:19 | 7.2 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-11 | 1C | 30.70 | 36.00 | 5.30 | A | 52.7 | 52.7 | 9.9 | 17:23 | 17:42 | 9.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+877 | S | 11-Jun-11 | 4 | 18.33 | 20.33 | 2.00 | B | 160.0 | - | - | 11:07 | 11:25 | 2.4 | 12.4 | 3.25 | 35.9 | 7.0 | 1.62 | 7.1 | 14.6 | 16.2 | |
| | | 11-Jun-11 | 4 | 18.33 | 20.33 | 2.00 | C | 240.0 | - | - | 11:25 | 11:42 | 3.8 | 11.8 | 1.29 | 46.7 | - | 1.62 | 7.1 | 14.6 | 17.3 | |
| | | 11-Jun-11 | 4 | 18.33 | 20.33 | 2.00 | D | 76.0 | 476.0 | 238.0 | 11:42 | 12:04 | 4.1 | 0.4 | 0.05 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 3 | 20.83 | 21.83 | 1.00 | A | 29.2 | 29.2 | 29.2 | 11:54 | 12:08 | 3.4 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 2 | 21.83 | 25.80 | 3.97 | A | 167.3 | 167.3 | 42.1 | 11:15 | 11:50 | 4.6 | 0.7 | 0.04 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 1 | 25.80 | 30.80 | 5.00 | A | 36.2 | 36.2 | 7.2 | 10:56 | 11:10 | 7.0 | 0.6 | 0.02 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 1C | 30.80 | 35.90 | 5.10 | A | 51.4 | 51.4 | 10.1 | 10:32 | 10:50 | 9.5 | 0.6 | 0.01 | - | - | - | - | - | - | |
| T-31+878.5 | T | 18-Jun-11 | 4 | 17.55 | 19.55 | 2.00 | MF | 180.8 | - | - | 21:41 | 22:03 | 0.4 | 11.8 | 16.36 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 17.55 | 19.55 | 2.00 | B | 160.7 | - | - | 22:03 | 22:14 | 0.6 | 18.4 | 15.18 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 18-Jun-11 | 4 | 17.55 | 19.55 | 2.00 | D | 160.5 | - | - | 22:14 | 22:22 | 1.0 | 21.5 | 11.86 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 17.55 | 19.55 | 2.00 | X | 91.7 | 593.7 | 296.9 | 22:22 | 22:27 | 1.2 | 11.9 | 5.02 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 20.05 | 21.05 | 1.00 | A | 25.8 | 25.8 | 25.8 | 3:37 | 3:54 | 4.3 | 0.6 | 0.14 | - | - | - | - | - | - | |
| | | 05-May-11 | 2 | 21.05 | 25.00 | 3.95 | A | 70.9 | 70.9 | 17.9 | 3:15 | 3:33 | 4.5 | 1.7 | 0.10 | 36.3 | 5.0 | 1.62 | 15.9 | 9.0 | 17.6 | |
| | | 05-May-11 | 1 | 25.00 | 35.00 | 10.00 | A | 39.9 | 39.9 | 4.0 | 2:54 | 3:07 | 7.3 | 0.5 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-11 | 1C | 30.00 | 35.20 | 5.20 | A | 51.8 | 51.8 | 10.0 | 2:28 | 2:45 | 10.1 | 0.3 | 0.00 | - | - | - | - | - | - | |
| P-31+879.7 | P | 25-Apr-11 | 3 | 19.82 | 20.82 | 1.00 | A | 16.1 | 16.1 | 16.1 | 3:33 | 3:48 | 3.6 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 2 | 20.82 | 24.80 | 3.98 | A | 28.0 | 28.0 | 7.0 | 3:08 | 3:24 | 4.2 | 0.2 | 0.01 | 32.6 | - | 1.63 | -13.6 | 8.0 | 19.3 | |
| | | 25-Apr-11 | 1 | 24.80 | 29.80 | 5.00 | A | 28.8 | 28.8 | 5.8 | 0:08 | 0:25 | 7.1 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 1C | 29.80 | 34.90 | 5.10 | A | 30.0 | 30.0 | 5.9 | 23:38 | 23:57 | 9.7 | 0.1 | 0.00 | - | - | - | - | - | - | |
| P-31+880 | P | 08-Jun-11 | 4 | 17.27 | 19.27 | 2.00 | B | 88.3 | 88.3 | 44.2 | 7:47 | 8:21 | 3.8 | 1.0 | 0.13 | 36.4 | - | 1.62 | 7.6 | 12.9 | 16.1 | |
| | | 19-Apr-11 | 1C | 30.30 | 35.30 | 5.00 | A | 198.3 | - | - | 22:26 | 22:52 | 0.0 | 15.4 | inf | - | - | - | - | - | - | |
| | | 19-Apr-11 | 1C | 30.30 | 35.30 | 5.00 | B | 196.9 | - | - | 22:52 | 23:04 | 0.4 | 14.9 | 5.50 | 45.0 | - | 1.63 | 0.1 | 9.4 | 14.0 | |
| | | 19-Apr-11 | 1C | 30.30 | 35.30 | 5.00 | C | 176.4 | - | - | 23:04 | 23:15 | 3.0 | 13.6 | 1.10 | - | - | - | - | - | - | By-pass in and around casing |
| | | 19-Apr-11 | 1C | 30.30 | 35.30 | 5.00 | D | 118.6 | - | - | 23:15 | 23:24 | 2.4 | 15.4 | 1.38 | - | - | - | - | - | - | |
| | | 19-Apr-11 | 1C | 30.30 | 35.30 | 5.00 | X | 130.8 | 821.0 | 164.2 | 23:24 | 23:32 | 3.4 | 17.4 | 1.02 | - | - | - | - | - | - | Packer stuck - hole abandoned |
| T-31+881.5 | T | 13-Jun-11 | 4 | 18.42 | 20.42 | 2.00 | MF | 104.3 | 104.3 | 52.2 | 2:20 | 2:48 | 3.6 | 0.5 | 0.07 | 38.5 | - | 1.41 | 7.2 | 9.1 | 11.9 | |
| | | 06-May-11 | 3 | 20.92 | 21.92 | 1.00 | A | 28.0 | 28.0 | 28.0 | 21:36 | 21:51 | 4.0 | 0.0 | 0.00 | . | - | - | - | - | - | |
| | | 06-May-11 | 2 | 21.92 | 25.90 | 3.98 | A | 55.1 | 55.1 | 13.8 | 20:35 | 21:33 | 4.5 | 0.1 | 0.00 | 33.6 | 2.0 | 1.64 | 11.3 | 8.3 | 9.8 | |
| | | 06-May-11 | 1 | 25.90 | 30.90 | 5.00 | A | 95.1 | 95.1 | 19.0 | 16:38 | 17:16 | 7.4 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 06-May-11 | 1C | 30.90 | 36.10 | 5.20 | A | 39.5 | 39.5 | 7.6 | 16:11 | 16:32 | 10.0 | 0.5 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+883 | S | 11-Jun-11 | 4 | 19.45 | 21.45 | 2.00 | B | 160.0 | - | - | 10:08 | 10:27 | 0.5 | 15.0 | 14.66 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 19.45 | 21.45 | 2.00 | C | 240.0 | - | - | 10:27 | 10:41 | 1.6 | 20.0 | 7.20 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 19.45 | 21.45 | 2.00 | D | 258.0 | - | - | 10:41 | 10:54 | 2.5 | 20.0 | 4.25 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 19.45 | 21.45 | 2.00 | X | 142.0 | 800.0 | 400.0 | 10:54 | 11:01 | 3.0 | 20.7 | 3.50 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 3 | 21.95 | 22.95 | 1.00 | A | 20.2 | 20.2 | 20.2 | 15:35 | 15:50 | 3.6 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 2 | 22.95 | 27.00 | 4.05 | A | 28.2 | 28.2 | 7.0 | 15:13 | 15:27 | 4.4 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 1 | 27.00 | 32.00 | 5.00 | A | 35.5 | 35.5 | 7.1 | 14:51 | 15:06 | 7.2 | 0.5 | 0.01 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 1C | 32.00 | 37.00 | 5.00 | A | 34.8 | 34.8 | 7.0 | 14:26 | 14:43 | 9.4 | 0.5 | 0.01 | 30.1 | - | 1.59 | -8.4 | 7.1 | 13.3 | |
| T-31+884.5 | T | 18-Jun-11 | 4 | 18.16 | 20.16 | 2.00 | MF | 38.7 | 38.7 | 19.4 | 21:22 | 21:39 | 3.7 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 20.66 | 21.66 | 1.00 | A | 60.8 | 60.8 | 60.8 | 5:31 | 6:00 | 3.9 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 05-May-11 | 2 | 21.66 | 25.70 | 4.04 | A | 60.6 | 60.6 | 15.0 | 5:12 | 5:28 | 4.4 | 1.1 | 0.06 | - | - | - | - | - | - | |
| | | 05-May-11 | 1 | 25.70 | 30.70 | 5.00 | A | 38.2 | 38.2 | 7.6 | 4:55 | 5:07 | 7.4 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-11 | 1C | 30.70 | 35.80 | 5.10 | A | 63.3 | 63.3 | 12.4 | 4:34 | 4:50 | 9.7 | 1.2 | 0.02 | - | - | - | - | - | - | |
| P-31+886 | P | 07-Jun-11 | 4 | 17.80 | 19.80 | 2.00 | B | 162.0 | - | - | 4:02 | 4:22 | 0.1 | 9.9 | 47.66 | - | - | - | - | - | - | |
| | | 07-Jun-11 | 4 | 17.80 | 19.80 | 2.00 | C | 160.1 | - | - | 4:22 | 4:35 | 1.1 | 15.4 | 6.88 | 48.4 | - | 1.63 | 7.5 | 14.3 | 19.1 | |
| | | 07-Jun-11 | 4 | 17.80 | 19.80 | 2.00 | D | 159.4 | - | - | 4:35 | 4:45 | 2.1 | 15.6 | 3.58 | 62.1 | - | 1.67 | 7.4 | 14.3 | 19.3 | |
| | | 07-Jun-11 | 4 | 17.80 | 19.80 | 2.00 | X | 135.1 | 616.6 | 308.3 | 4:45 | 5:05 | 4.0 | 0.4 | 0.05 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 3 | 20.30 | 21.30 | 1.00 | A | 18.9 | 18.9 | 18.9 | 11:04 | 11:19 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 1, 2 | 21.30 | 30.30 | 9.00 | A | 26.3 | 26.3 | 2.9 | 10:43 | 10:58 | 5.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+887.5 | T | 13-Jun-11 | 4 | 17.65 | 19.65 | 2.00 | X | 255.0 | 764.9 | 382.5 | 0:03 | 0:22 | 3.2 | 14.6 | 2.31 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 17.65 | 19.65 | 2.00 | MF | 181.2 | - | - | 23:16 | 23:29 | 0.6 | 10.7 | 12.27 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 17.65 | 19.65 | 2.00 | B | 159.8 | - | - | 23:29 | 23:50 | 1.2 | 16.1 | 6.52 | - | - | - | - | - | - | By-pass outside casing; skipped Mix C |
| | | 13-Jun-11 | 4 | 17.65 | 19.65 | 2.00 | D | 168.9 | - | - | 23:50 | 0:03 | 0.8 | 6.8 | 3.95 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 20.50 | 21.15 | 0.65 | A | 21.4 | 21.4 | 32.9 | 23:28 | 23:43 | 4.0 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 06-May-11 | 2 | 21.15 | 25.10 | 3.95 | A | 42.4 | 42.4 | 10.7 | 23:11 | 23:25 | 4.5 | 0.6 | 0.03 | - | - | - | - | - | - | |
| | | 06-May-11 | 1 | 25.10 | 30.10 | 5.00 | A | 36.4 | 36.4 | 7.3 | 22:51 | 23:05 | 7.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 06-May-11 | 1C | 30.10 | 35.20 | 5.10 | A | 34.4 | 34.4 | 6.7 | 22:17 | 22:30 | 9.8 | 0.1 | 0.00 | - | - | - | - | - | - | |
| S-31+889 | S | 11-Jun-11 | 4 | 16.94 | 18.94 | 2.00 | B | 160.0 | - | - | 9:16 | 9:36 | 3.5 | 12.1 | 1.78 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 16.94 | 18.94 | 2.00 | C | 117.5 | 277.5 | 138.8 | 9:36 | 10:00 | 4.0 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 3 | 19.44 | 20.44 | 1.00 | A | 31.6 | 31.6 | 31.6 | 8:24 | 8:40 | 3.6 | 0.6 | 0.18 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 2 | 20.44 | 24.40 | 3.96 | A | 55.8 | 55.8 | 14.1 | 8:00 | 8:20 | 4.3 | 1.4 | 0.08 | 30.4 | 4.5 | 1.59 | -2.1 | 7.7 | 14.6 | |
| | | 30-Apr-11 | 1 | 24.40 | 29.40 | 5.00 | A | 32.3 | 32.3 | 6.5 | 7:41 | 7:56 | 7.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 1C | 29.40 | 35.00 | 5.60 | A | 58.7 | 58.7 | 10.5 | 7:18 | 7:37 | 9.8 | 1.4 | 0.03 | - | - | - | - | - | - | |
| T-31+890.5 | T | 18-Jun-11 | 4 | 17.04 | 19.04 | 2.00 | MF | 26.4 | 26.4 | 13.2 | 21:05 | 21:20 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 19.54 | 20.54 | 1.00 | A | 32.2 | 32.2 | 32.2 | 3:29 | 3:49 | 4.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 06-May-11 | 2 | 20.54 | 24.50 | 3.96 | A | 34.5 | 34.5 | 8.7 | 3:06 | 3:21 | 4.3 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 06-May-11 | 1 | 24.50 | 29.50 | 5.00 | A | 72.1 | 72.1 | 14.4 | 2:40 | 2:59 | 6.7 | 1.7 | 0.05 | - | - | - | - | - | - | |
| | | 06-May-11 | 1C | 29.50 | 34.60 | 5.10 | A | 80.4 | 80.4 | 15.8 | 2:07 | 2:25 | 10.0 | 1.2 | 0.02 | 33.3 | 3.0 | 1.64 | 16.2 | 8.3 | 16.0 | |
| P-31+892 | P | 07-Jun-11 | 4 | 16.81 | 18.81 | 2.00 | B | 117.2 | 117.2 | 58.6 | 3:20 | 3:48 | 4.1 | 1.0 | 0.12 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 3 | 19.31 | 20.30 | 0.99 | A | 44.3 | 44.3 | 44.7 | 14:08 | 14:43 | 3.6 | 0.6 | 0.17 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 2 | 20.30 | 24.30 | 4.00 | A | 25.5 | 25.5 | 6.4 | 13:48 | 14:03 | 4.3 | 0.4 | 0.02 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 1 | 24.30 | 29.30 | 5.00 | A | 80.1 | 80.1 | 16.0 | 13:18 | 13:39 | 6.9 | 0.9 | 0.03 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 1C | 29.30 | 34.30 | 5.00 | A | 26.8 | 26.8 | 5.4 | 11:02 | 11:17 | 9.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+893.5 | T | 13-Jun-11 | 4 | 16.38 | 18.38 | 2.00 | MF | 115.1 | 115.1 | 57.6 | 22:46 | 23:14 | 3.6 | 0.6 | 0.09 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 18.88 | 19.88 | 1.00 | A | 30.2 | 30.2 | 30.2 | 5:27 | 6:48 | 5.0 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 06-May-11 | 2 | 19.88 | 23.90 | 4.02 | A | 30.2 | 30.2 | 7.5 | 5:10 | 5:23 | 4.2 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 06-May-11 | 1 | 23.90 | 28.90 | 5.00 | A | 34.7 | 34.7 | 6.9 | 4:53 | 5:05 | 7.1 | 0.7 | 0.02 | - | - | - | - | - | - | |
| | | 06-May-11 | 1C | 28.90 | 34.30 | 5.40 | A | 131.9 | 131.9 | 24.4 | 4:19 | 4:49 | 9.6 | 2.4 | 0.05 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+895 | S | 11-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | B | 160.0 | - | - | 8:00 | 8:20 | 3.7 | 11.5 | 2.04 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | C | 240.0 | - | - | 8:20 | 8:44 | 3.9 | 16.8 | 2.20 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | D | 174.4 | 574.4 | 287.2 | 8:44 | 9:10 | 4.0 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 3 | 18.52 | 19.52 | 1.00 | A | 7.3 | 7.3 | 7.3 | 22:21 | 22:34 | 3.4 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 2 | 19.52 | 23.50 | 3.98 | A | 134.8 | 134.8 | 33.9 | 21:40 | 22:11 | 4.5 | 2.4 | 0.13 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 1 | 23.50 | 28.50 | 5.00 | A | 76.2 | 76.2 | 15.2 | 21:12 | 21:33 | 8.2 | 1.4 | 0.03 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 1C | 28.50 | 34.60 | 6.10 | A | 42.8 | 42.8 | 7.0 | 20:38 | 21:03 | 9.9 | 0.7 | 0.01 | 31.2 | 5.0 | 1.61 | 12.6 | 10.9 | 19.1 | |
| T-31+896.5 | T | 18-Jun-11 | 4 | 15.89 | 17.89 | 2.00 | MF | 92.8 | 92.8 | 46.4 | 20:36 | 21:02 | 3.5 | 0.5 | 0.08 | - | - | - | - | - | - | |
| | | 06-May-11 | 3 | 18.39 | 19.39 | 1.00 | A | 35.0 | 35.0 | 35.0 | 10:33 | 10:51 | 4.3 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 06-May-11 | 2 | 19.39 | 23.40 | 4.01 | A | 29.6 | 29.6 | 7.4 | 10:09 | 10:28 | 4.8 | 0.4 | 0.02 | - | - | - | - | - | - | |
| | | 06-May-11 | 1 | 23.40 | 28.40 | 5.00 | A | 62.5 | 62.5 | 12.5 | 9:45 | 9:58 | 7.3 | 1.1 | 0.03 | 31.0 | 9.0 | 1.60 | 13.0 | 8.8 | 19.3 | |
| | | 06-May-11 | 1C | 28.40 | 33.50 | 5.10 | A | 44.1 | 44.1 | 8.6 | 7:48 | 8:08 | 9.4 | 0.6 | 0.01 | - | - | - | - | - | - | |
| P-31+898 | P | 07-Jun-11 | 4 | 16.17 | 18.17 | 2.00 | B | 90.8 | 90.8 | 45.4 | 2:23 | 3:17 | 4.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 3 | 18.67 | 19.67 | 1.00 | A | 20.6 | 20.6 | 20.6 | 10:16 | 10:29 | 3.8 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 2 | 19.67 | 23.70 | 4.03 | A | 209.4 | - | - | 8:58 | 9:35 | 4.5 | 5.7 | 0.30 | 30.8 | 2.0 | 1.60 | -1.4 | 7.5 | 16.1 | |
| | | 20-Apr-11 | 2 | 19.67 | 23.70 | 4.03 | B | 230.7 | - | - | 9:35 | 9:59 | 4.3 | 5.6 | 0.33 | 34.4 | 3.0 | 1.60 | -3.5 | 5.5 | 14.1 | |
| | | 20-Apr-11 | 2 | 19.67 | 23.70 | 4.03 | C | 32.2 | 472.3 | 117.2 | 9:59 | 10:10 | 4.3 | 1.2 | 0.07 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 1 | 23.70 | 28.70 | 5.00 | A | 66.2 | 66.2 | 13.2 | 8:30 | 8:50 | 7.2 | 2.0 | 0.05 | - | - | - | - | - | - | |
| | | 20-Apr-11 | 1C | 28.70 | 33.80 | 5.10 | A | 190.1 | 190.1 | 37.3 | 7:54 | 8:24 | 9.0 | 5.5 | 0.12 | - | - | - | - | - | - | |
| T-31+899.5 | T | 13-Jun-11 | 4 | 16.76 | 18.76 | 2.00 | MF | 177.1 | - | - | 21:29 | 21:50 | 1.4 | 12.9 | 5.63 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 16.76 | 18.76 | 2.00 | B | 164.1 | - | - | 21:50 | 22:01 | 1.8 | 14.4 | 4.06 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 16.76 | 18.76 | 2.00 | C | 160.0 | - | - | 22:01 | 22:11 | 2.1 | 15.2 | 3.67 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 16.76 | 18.76 | 2.00 | D | 159.7 | - | - | 22:11 | 22:22 | 2.5 | 15.5 | 3.15 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 16.76 | 18.76 | 2.00 | X | 186.1 | 847.0 | 423.5 | 22:22 | 22:34 | 2.5 | 15.5 | 3.07 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 19.26 | 20.26 | 1.00 | A | 56.2 | 56.2 | 56.2 | 8:37 | 09:00 | 4.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 07-May-11 | 2 | 20.26 | 24.30 | 4.04 | A | 27.6 | 27.6 | 6.8 | 8:15 | 8:34 | 4.3 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 07-May-11 | 1 | 24.30 | 29.30 | 5.00 | A | 31.6 | 31.6 | 6.3 | 7:52 | 8:09 | 7.2 | 0.2 | 0.05 | 31.9 | 9.0 | 1.65 | 14.8 | 6.2 | 18.9 | |
| | | 07-May-11 | 1C | 29.30 | 34.30 | 5.00 | A | 36.1 | 36.1 | 7.2 | 7:28 | 7:43 | 8.7 | 0.5 | 0.01 | - | - | - | - | - | - | |
| S-31+901 | S | 11-Jun-11 | 4 | 17.39 | 19.39 | 2.00 | B | 160.0 | - | - | 6:47 | 7:07 | 1.4 | 15.5 | 5.36 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 17.39 | 19.39 | 2.00 | C | 240.0 | - | - | 7:07 | 7:20 | 2.6 | 20.2 | 3.84 | 47.2 | - | 1.64 | 5.6 | 14.1 | 15.9 | By-Pass. Outside Casing. |
| | | 11-Jun-11 | 4 | 17.39 | 19.39 | 2.00 | D | 172.0 | - | - | 7:20 | 7:29 | 3.1 | 20.6 | 3.61 | - | - | - | - | - | - | |
| | | 11-Jun-11 | 4 | 17.39 | 19.39 | 2.00 | X | 206.9 | 778.9 | 389.5 | 7:29 | 7:52 | 4.0 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 3 | 19.89 | 20.89 | 1.00 | A | 67.7 | 67.7 | 67.7 | 2:24 | 3:08 | 4.3 | 0.7 | 0.16 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 2 | 20.89 | 24.90 | 4.01 | A | 157.1 | 157.1 | 39.2 | 1:46 | 2:20 | 4.2 | 3.0 | 0.18 | 31.7 | - | 1.61 | - | - | - | |
| | | 29-Apr-11 | 1 | 24.90 | 29.90 | 5.00 | A | 31.1 | 31.1 | 6.2 | 23:28 | 23:42 | 7.0 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 1C | 29.90 | 35.00 | 5.10 | A | 59.3 | 59.3 | 11.6 | 22:59 | 23:21 | 10.1 | 0.3 | 0.00 | - | - | - | - | - | - | |
| T-31+902.5 | T | 18-Jun-11 | 4 | 16.71 | 18.71 | 2.00 | MF | 180.1 | - | - | 19:33 | 19:55 | 1.2 | 14.6 | 3.70 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 16.71 | 18.71 | 2.00 | B | 160.8 | - | - | 19:55 | 20:06 | 1.8 | 15.5 | 4.32 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 16.71 | 18.71 | 2.00 | C | 181.2 | - | - | 20:06 | 20:18 | 2.3 | 16.1 | 3.85 | 46.7 | - | 1.65 | 9.3 | 14.2 | 16.0 | Communicated to T-31+908.5 between plastic and steel casing |
| | | 18-Jun-11 | 4 | 16.71 | 18.71 | 2.00 | X | 159.8 | 681.9 | 341.0 | 20:18 | 20:28 | 3.3 | 15.4 | 2.37 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 19.21 | 20.21 | 1.00 | A | 197.5 | - | - | 11:02 | 11:30 | 1.7 | 12.4 | 6.61 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 19.21 | 20.21 | 1.00 | B | 222.8 | - | - | 11:30 | 11:46 | 3.2 | 19.4 | 5.79 | 37.3 | - | - | 14.9 | 6.2 | 19.0 | |
| | | 07-May-11 | 3 | 19.21 | 20.21 | 1.00 | C | 186.1 | - | - | 11:46 | 11:56 | 3.2 | 18.2 | 5.45 | 46.6 | - | 1.66 | -8.6 | 6.3 | 17.8 | |
| | | 07-May-11 | 3 | 19.21 | 20.21 | 1.00 | D | 119.1 | 725.5 | 725.5 | 11:56 | 12:20 | 4.0 | 0.4 | 0.11 | 61.4 | - | 1.67 | -8.6 | 6.3 | 18.1 | |
| | | 07-May-11 | 2 | 20.21 | 24.20 | 3.99 | A | 71.0 | 71.0 | 17.8 | 10:40 | 10:57 | 4.7 | 1.7 | 0.09 | - | - | - | - | - | - | |
| | | 07-May-11 | 1 | 24.20 | 29.20 | 5.00 | A | 61.9 | 61.9 | 12.4 | 10:03 | 10:26 | 7.1 | 0.6 | 0.02 | - | - | - | - | - | - | |
| | | 07-May-11 | 1C | 29.20 | 34.30 | 5.10 | A | 26.4 | 26.4 | 5.2 | 9:39 | 9:56 | 9.8 | 0.2 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+904 | P | 07-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | B | 131.0 | 131.0 | 65.5 | 2:16 | 2:50 | 4.7 | 0.8 | 0.08 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 3 | 18.52 | 19.52 | 1.00 | A | 33.1 | 33.1 | 33.1 | 0:04 | 0:22 | 3.3 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 2 | 19.52 | 23.50 | 3.98 | A | 61.0 | 61.0 | 15.3 | 23:43 | 0:00 | 5.3 | 1.4 | 0.07 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1 | 23.50 | 28.50 | 5.00 | A | 38.2 | 38.2 | 7.6 | 23:21 | 23:37 | 7.4 | 1.0 | 0.03 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1C | 28.50 | 33.60 | 5.10 | A | 198.3 | - | - | 22:28 | 22:56 | 4.2 | 8.0 | 0.39 | 34.0 | 3.0 | 1.64 | -12.3 | 5.3 | 11.4 | |
| | | 21-Apr-11 | 1C | 28.50 | 33.60 | 5.10 | B | 55.7 | 254.0 | 49.8 | 22:56 | 23:09 | 9.4 | 0.4 | 0.01 | 40.5 | 3.0 | 1.65 | -12.3 | 7.1 | 11.4 | |
| T-31+905.5 | T | 13-Jun-11 | 4 | 17.06 | 19.06 | 2.00 | MF | 119.7 | 119.7 | 59.9 | 20:51 | 21:27 | 3.6 | 0.7 | 0.10 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 19.56 | 20.56 | 1.00 | A | 30.5 | 30.5 | 30.5 | 15:27 | 15:40 | 4.3 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 07-May-11 | 2 | 20.56 | 24.60 | 4.04 | A | 32.8 | 32.8 | 8.1 | 15:07 | 15:21 | 4.8 | 0.6 | 0.03 | - | - | - | - | - | - | |
| | | 07-May-11 | 1 | 24.60 | 29.60 | 5.00 | A | 31.7 | 31.7 | 6.3 | 14:48 | 15:02 | 7.2 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 07-May-11 | 1C | 29.60 | 34.60 | 5.00 | A | 88.9 | 88.9 | 17.8 | 14:16 | 14:42 | 9.4 | 0.9 | 0.02 | 31.7 | - | 1.63 | 2.4 | 10.5 | 15.1 | |
| S-31+907 | S | 11-Jun-11 | 4 | 16.71 | 18.71 | 2.00 | B | 88.8 | 88.8 | 44.4 | 6:20 | 6:44 | 4.0 | 0.5 | 0.06 | 36.4 | 4.6 | 1.63 | 5.6 | 14.1 | 13.8 | |
| | | 30-Apr-11 | 3 | 19.21 | 20.21 | 1.00 | A | 160.2 | - | - | 9:26 | 9:55 | 0.0 | 12.6 | inf | - | - | - | - | - | - | Steel downhole. |
| | | 30-Apr-11 | 3 | 19.21 | 20.21 | 1.00 | B | 172.7 | - | - | 9:55 | 10:06 | 3.5 | 18.5 | 5.57 | 36.8 | - | 1.62 | -2.3 | 7.6 | 15.9 | Only Stage3 carried out at this time. |
| | | 30-Apr-11 | 3 | 19.21 | 20.21 | 1.00 | C | 145.1 | 478.0 | 478.0 | 10:06 | 11:20 | 3.6 | 0.6 | 0.16 | 49.1 | - | 1.64 | -2.6 | 7.6 | 17.1 | |
| | | 03-May-11 | 3 | 19.21 | 20.21 | 1.00 | A | 51.0 | 51.0 | 51.0 | 8:38 | 8:56 | 3.6 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 05-May-11 | 3 | 19.21 | 20.21 | 1.00 | A | 13.6 | 13.6 | 13.6 | 21:06 | 21:21 | 4.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 05-May-11 | 2 | 20.21 | 24.20 | 3.99 | A | 28.5 | 28.5 | 7.1 | 20:49 | 21:02 | 4.5 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 03-May-11 | 1C,1,2 | 20.21 | 34.50 | 14.29 | A | 178.4 | - | - | 7:31 | 7:58 | 4.0 | 12.8 | 0.22 | 31.5 | - | 1.58 | 11.4 | 8.0 | 20.1 | Incorrectly grouted. Pmax not achieved. |
| | | 03-May-11 | 1C,1,2 | 20.21 | 34.50 | 14.29 | B | 185.8 | 364.2 | 25.5 | 7:58 | 8:29 | 4.7 | 2.2 | 0.03 | 37.2 | - | 1.62 | 11.4 | 8.0 | 16.4 | |
| | | 05-May-11 | 1 | 24.20 | 29.20 | 5.00 | A | 23.2 | 23.2 | 4.6 | 20:33 | 20:45 | 7.3 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 05-May-11 | 1C | 29.20 | 34.50 | 5.30 | A | 152.6 | 152.6 | 28.8 | 20:00 | 20:24 | 9.6 | 10.8 | 0.20 | - | - | - | - | - | - | |
| T-31+908.5 | T | 18-Jun-11 | 4 | 15.13 | 17.13 | 2.00 | MF | 183.2 | - | - | 18:32 | 18:54 | 2.1 | 12.5 | 3.04 | 29.9 | 4.0 | 1.40 | 10.0 | 11.8 | 10.6 | By-pass between plastic and steel casing |
| | | 18-Jun-11 | 4 | 15.13 | 17.13 | 2.00 | B | 88.2 | - | - | 18:54 | 18:59 | 1.3 | 15.4 | 6.22 | 36.3 | - | 1.60 | 10.2 | 12.0 | 11.1 | |
| | | 18-Jun-11 | 4 | 15.13 | 17.13 | 2.00 | D | 80.9 | - | - | 18:59 | 19:05 | 1.5 | 14.3 | 4.76 | 61.3 | - | 1.64 | 10.2 | 12.1 | 12.1 | |
| | | 18-Jun-11 | 4 | 15.13 | 17.13 | 2.00 | X | 280.5 | 632.8 | 316.4 | 19:05 | 19:24 | 2.0 | 9.4 | 2.36 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 17.63 | 18.63 | 1.00 | A | 24.6 | 24.6 | 24.6 | 17:18 | 17:30 | 4.3 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 07-May-11 | 2 | 18.63 | 22.60 | 3.97 | A | 84.3 | 84.3 | 21.2 | 16:51 | 17:15 | 4.7 | 0.8 | 0.05 | - | - | - | - | - | - | |
| | | 07-May-11 | 1 | 22.60 | 27.60 | 5.00 | A | 33.8 | 33.8 | 6.8 | 16:31 | 16:46 | 7.2 | 0.6 | 0.02 | - | - | - | - | - | - | |
| | | 07-May-11 | 1C | 27.60 | 32.70 | 5.10 | A | 85.6 | 85.6 | 16.8 | 15:58 | 16:23 | 9.9 | 1.9 | 0.04 | - | - | - | - | - | - | |
| P-31+910 | P | 02-Jun-11 | 4 | 18.49 | 20.49 | 2.00 | MF | 157.0 | - | - | 18:05 | 18:42 | 1.9 | 9.6 | 2.43 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 18.49 | 20.49 | 2.00 | B | 166.0 | - | - | 18:42 | 18:55 | 3.2 | 17.1 | 2.81 | 37.9 | - | 1.61 | 9.5 | 14.0 | 18.4 | |
| | | 02-Jun-11 | 4 | 18.49 | 20.49 | 2.00 | C | 150.9 | - | - | 18:55 | 19:04 | 3.9 | 12.8 | 1.77 | 42.1 | 5.0 | 1.64 | 9.2 | 14.0 | 19.1 | |
| | | 02-Jun-11 | 4 | 18.49 | 20.49 | 2.00 | D | 60.5 | 534.4 | 267.2 | 19:04 | 19:21 | 4.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 3 | 20.99 | 21.99 | 1.00 | A | 28.8 | 28.8 | 28.8 | 4:09 | 4:25 | 3.6 | 0.4 | 0.12 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 2 | 21.99 | 26.00 | 4.01 | A | 33.4 | 33.4 | 8.3 | 3:47 | 4:03 | 4.6 | 0.6 | 0.03 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1 | 26.00 | 31.00 | 5.00 | A | 32.5 | 32.5 | 6.5 | 3:21 | 3:39 | 7.3 | 0.5 | 0.01 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1C | 31.00 | 36.00 | 5.00 | A | 26.7 | 26.7 | 5.3 | 2:46 | 3:03 | 9.4 | 0.1 | 0.00 | 37.6 | 3.0 | 1.63 | -9.3 | 7.8 | 14.8 | |
| T-31+911.5 | T | 13-Jun-11 | 4 | 15.56 | 17.56 | 2.00 | MF | 108.7 | 108.7 | 54.4 | 20:21 | 20:48 | 3.7 | 1.3 | 0.18 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 18.60 | 20.50 | 1.90 | C | 111.0 | - | - | 19:11 | 19:33 | 3.2 | 4.0 | 0.51 | 47.2 | - | 1.65 | 20.8 | 6.2 | 17.2 | |
| | | 07-May-11 | 3 | 18.60 | 20.50 | 1.90 | B | 23.1 | 134.1 | 70.6 | 19:33 | 19:49 | 4.0 | 0.1 | 0.01 | 37.0 | 3.5 | 1.63 | 21.0 | 6.2 | 17.6 | |
| | | 10-May-11 | 2 | 19.06 | 23.10 | 4.04 | A | 39.4 | 39.4 | 9.8 | 23:27 | 23:40 | 4.4 | 1.3 | 0.07 | - | - | - | - | - | - | |
| | | 10-May-11 | 1 | 23.10 | 28.10 | 5.00 | A | 46.7 | 46.7 | 9.3 | 23:09 | 23:24 | 7.8 | 1.5 | 0.04 | - | - | - | - | - | - | |
| | | 10-May-11 | 1C | 28.10 | 33.10 | 5.00 | A | 90.5 | 90.5 | 18.1 | 22:47 | 23:04 | 10.0 | 5.0 | 0.10 | - | - | - | - | - | - | |
| S-31+913 | S | 10-Jun-11 | 4 | 15.92 | 17.92 | 2.00 | B | 163.8 | - | - | 4:28 | 4:50 | 4.3 | 16.7 | 1.89 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 4 | 15.92 | 17.92 | 2.00 | C | 144.6 | 308.4 | 154.2 | 4:50 | 5:21 | 4.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 3 | 18.42 | 19.42 | 1.00 | A | 27.6 | 27.6 | 27.6 | 5:18 | 5:38 | 3.8 | 0.7 | 0.18 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 2 | 19.42 | 23.40 | 3.98 | A | 42.9 | 42.9 | 10.8 | 4:59 | 5:15 | 4.3 | 1.3 | 0.07 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 1 | 23.40 | 28.40 | 5.00 | A | 46.2 | 46.2 | 9.2 | 4:07 | 4:24 | 7.4 | 0.9 | 0.02 | - | - | - | - | - | - | |
| | | 29-Apr-11 | 1C | 28.40 | 33.40 | 5.00 | A | 29.0 | 29.0 | 5.8 | 3:42 | 3:59 | 9.3 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+914.5 | T | 18-Jun-11 | 4 | 14.90 | 16.90 | 2.00 | MF | 180.0 | - | - | 16:51 | 17:12 | 2.3 | 15.2 | 2.39 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 14.90 | 16.90 | 2.00 | B | 162.0 | - | - | 17:12 | 17:21 | 2.6 | 20.2 | 3.59 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 14.90 | 16.90 | 2.00 | C | 162.0 | - | - | 17:21 | 17:30 | 2.6 | 20.6 | 3.96 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 14.90 | 16.90 | 2.00 | D | 156.0 | - | - | 17:30 | 17:38 | 3.0 | 20.8 | 3.31 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 14.90 | 16.90 | 2.00 | X | 163.0 | 823.0 | 411.5 | 17:38 | 17:50 | 3.5 | 16.7 | 2.39 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 17.40 | 19.84 | 2.44 | B | 154.8 | - | - | 21:11 | 21:37 | 3.2 | 12.5 | 1.74 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 17.40 | 19.84 | 2.44 | C | 76.0 | 230.8 | 94.6 | 21:37 | 21:57 | 4.1 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 10-May-11 | 2 | 18.40 | 22.40 | 4.00 | A | 48.9 | 48.9 | 12.2 | 22:13 | 22:30 | 4.5 | 1.4 | 0.08 | - | - | - | - | - | - | |
| | | 10-May-11 | 1 | 22.40 | 27.40 | 5.00 | A | 47.5 | 47.5 | 9.5 | 21:51 | 22:07 | 7.4 | 1.3 | 0.04 | - | - | - | - | - | - | |
| | | 10-May-11 | 1C | 27.40 | 32.50 | 5.10 | A | 46.9 | 46.9 | 9.2 | 21:29 | 21:45 | 9.9 | 0.9 | 0.02 | - | - | - | - | - | - | |
| P-31+916 | P | 02-Jun-11 | 4 | 13.71 | 15.71 | 2.00 | MF | 169.3 | - | - | 19:27 | 20:03 | 3.5 | 8.6 | 1.24 | 30.1 | - | 1.51 | 5.8 | 14.2 | 16.4 | |
| | | 02-Jun-11 | 4 | 13.71 | 15.71 | 2.00 | B | 144.7 | - | - | 20:03 | 20:19 | 3.4 | 12.8 | 1.91 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 13.71 | 15.71 | 2.00 | C | 161.1 | - | - | 20:19 | 20:30 | 4.1 | 13.7 | 1.86 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 13.71 | 15.71 | 2.00 | D | 205.1 | 680.2 | 340.1 | 20:30 | 21:04 | 3.6 | 0.0 | 0.00 | 62.6 | - | 1.63 | 9.6 | 14.0 | 17.0 | |
| | | 22-Apr-11 | 3 | 16.21 | 17.21 | 1.00 | A | 15.2 | 15.2 | 15.2 | 9:47 | 10:02 | 3.6 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 1, 2 | 17.21 | 26.20 | 8.99 | A | 40.0 | 40.0 | 4.4 | 9:19 | 9:41 | 5.5 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1C | 26.20 | 31.30 | 5.10 | A | 187.8 | - | - | 5:03 | 5:24 | 9.1 | 18.4 | 0.39 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1C | 26.20 | 31.30 | 5.10 | B | 225.5 | - | - | 5:24 | 5:34 | 7.2 | 25.1 | 0.77 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1C | 26.20 | 31.30 | 5.10 | C | 202.7 | - | - | 5:34 | 5:49 | 5.7 | 12.2 | 0.42 | - | - | - | - | - | - | |
| | | 21-Apr-11 | 1C | 26.20 | 31.30 | 5.10 | D | 34.0 | 650.0 | 127.5 | 5:49 | 5:52 | 6.5 | 11.4 | 0.35 | - | - | - | - | - | - | By-pass inside casing; packer stuck |
| Q-31+916.75 | Q | 05-Jul-11 | 4 | 13.73 | 15.73 | 2.00 | MF | 27.6 | 27.60 | 13.80 | 10:36 | 10:50 | 3.4 | 0.6 | 0.08 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 16.23 | 17.23 | 1.00 | A | 135.6 | 135.60 | 135.60 | 13:57 | 15:07 | 3.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 2 | 17.23 | 21.2 | 3.97 | A | 20.1 | 20.10 | 5.06 | 13:41 | 13:53 | 4.7 | 0.9 | 0.05 | 32.4 | 3.0 | 1.7 | 10.1 | 11.0 | 13.6 | |
| | | 26-Jun-11 | 1 | 21.2 | 26.3 | 5.10 | A | 54 | 54.00 | 10.59 | 13:22 | 13:36 | 7.1 | 1.8 | 0.05 | - | - | - | - | - | - | |
| T-31+917.5 | T | 13-Jun-11 | 4 | 13.53 | 15.53 | 2.00 | MF | 162.5 | - | - | 18:43 | 19:01 | 2.8 | 13.0 | 2.45 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 13.53 | 15.53 | 2.00 | B | 238.8 | - | - | 19:01 | 19:17 | 3.4 | 15.9 | 2.48 | 37.1 | 4.0 | 1.63 | 4.1 | 8.4 | 11.9 | |
| | | 13-Jun-11 | 4 | 13.53 | 15.53 | 2.00 | C | 321.0 | - | - | 19:17 | 19:36 | 3.6 | 12.8 | 1.73 | 46.0 | - | 1.64 | 4.3 | 8.1 | 12.1 | |
| | | 13-Jun-11 | 4 | 13.53 | 15.53 | 2.00 | D | 103.7 | 826.0 | 413.0 | 19:36 | 19:49 | 3.6 | 7.7 | 1.07 | 63.5 | - | 1.66 | 4.4 | 8.2 | 12.3 | |
| | | 07-May-11 | 2.3 | 16.03 | 23.30 | 7.27 | B | 49.7 | 49.7 | 6.8 | 22:11 | 22:29 | 4.0 | 0.8 | 0.03 | - | - | - | - | - | - | |
| | | 10-May-11 | 2 | 17.03 | 21.00 | 3.97 | A | 25.6 | 25.6 | 6.4 | 20:37 | 20:52 | 4.5 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 10-May-11 | 1 | 21.00 | 26.00 | 5.00 | A | 40.0 | 40.0 | 8.0 | 20:17 | 20:31 | 7.1 | 1.3 | 0.04 | - | - | - | - | - | - | |
| | | 10-May-11 | 1C | 26.00 | 31.10 | 5.10 | A | 115.1 | 115.1 | 22.6 | 19:43 | 20:09 | 10.0 | 2.3 | 0.05 | - | - | - | - | - | - | |
| S-31+919 | S | 10-Jun-11 | 4 | 12.87 | 14.87 | 2.00 | B | 161.4 | - | - | 3:08 | 3:30 | 1.9 | 12.2 | 3.75 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 4 | 12.87 | 14.87 | 2.00 | C | 241.6 | - | - | 3:30 | 3:46 | 2.6 | 15.4 | 2.92 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 4 | 12.87 | 14.87 | 2.00 | D | 318.5 | - | - | 3:46 | 4:07 | 3.4 | 15.2 | 2.13 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 4 | 12.87 | 14.87 | 2.00 | X | 55.9 | 777.4 | 388.7 | 4:07 | 4:17 | 4.1 | 0.9 | 0.11 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 3 | 15.37 | 16.37 | 1.00 | A | 136.5 | - | - | 13:26 | 13:59 | 3.5 | 1.1 | 0.33 | 33.6 | 4.0 | 1.61 | -2.1 | 8.0 | 16.6 | Stage 3 completed first. |
| | | 03-May-11 | 3 | 15.37 | 16.37 | 1.00 | A | 23.8 | 160.3 | 160.3 | 11:05 | 11:21 | 3.9 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 16.37 | 20.40 | 4.03 | A | 25.8 | 25.8 | 6.4 | 10:48 | 11:02 | 4.4 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 1 | 20.40 | 24.00 | 3.60 | A | 10.4 | - | - | 14:09 | 14:23 | 7.2 | 0.3 | 0.01 | - | - | - | - | - | - | Stage 1 injected following Stage 3. |
| | | 03-May-11 | 1 | 20.40 | 25.40 | 5.00 | A | 30.7 | 41.1 | 8.2 | 10:31 | 10:44 | 7.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-11 | 1C | 25.40 | 30.90 | 5.50 | A | 202.8 | - | - | 9:33 | 10:07 | 8.1 | 12.8 | 0.29 | - | - | - | - | - | - | |
| | | 03-May-11 | 1C | 25.40 | 30.90 | 5.50 | B | 79.7 | 282.5 | 51.4 | 10:07 | 10:23 | 9.4 | 1.7 | 0.03 | - | - | - | - | - | - | |
| Q-31+919.75 | Q | 05-Jul-11 | 4 | 12.64 | 14.64 | 2.00 | MF | 29.4 | 29.40 | 14.70 | 10:51 | 11:08 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 15.14 | 16.14 | 1.00 | A | 11.5 | 11.50 | 11.50 | 11:08 | 11:25 | 3.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 2 | 16.14 | 20.1 | 3.96 | A | 24.6 | 24.60 | 6.21 | 10:50 | 11:04 | 4.2 | 1.4 | 0.08 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 1 | 20.1 | 25.2 | 5.10 | A | 90.4 | 90.40 | 17.73 | 10:30 | 10:46 | 7.1 | 3.6 | 0.10 | 31.6 | - | 1.6 | 9.7 | 10.6 | 11.4 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+920.5 | T | 18-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | MF | 180.0 | - | - | 16:02 | 16:23 | 0.4 | 15.7 | 17.41 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 18-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | C | 129.0 | - | - | 16:23 | 16:31 | 0.6 | 18.7 | 17.20 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | D | 91.0 | - | - | 16:31 | 16:37 | 1.1 | 20.2 | 10.79 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | X | 162.2 | 562.2 | 281.1 | 16:37 | 16:45 | 1.9 | 18.1 | 4.68 | - | - | - | - | - | - | |
| | | 07-May-11 | 3 | 15.07 | 16.07 | 1.00 | B | 19.0 | 19.0 | 19.0 | 23:45 | 0:00 | 4.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 07-May-11 | 2 | 16.07 | 24.00 | 7.93 | B | 154.0 | - | - | 22:45 | 23:10 | 1.4 | 12.0 | 1.12 | - | - | - | - | - | - | Communicated to T-31+917.5 |
| | | 07-May-11 | 2 | 16.07 | 24.00 | 7.93 | C | 82.2 | 236.2 | 29.8 | 23:10 | 23:38 | 4.5 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 10-May-11 | 1 | 20.10 | 25.10 | 5.00 | A | 37.3 | 37.3 | 7.5 | 19:07 | 19:22 | 7.3 | 0.5 | 0.01 | - | - | - | - | - | - | |
| | | 10-May-11 | 1C | 25.10 | 30.10 | 5.00 | A | 80.1 | 80.1 | 16.0 | 18:28 | 19:01 | 9.9 | 3.9 | 0.08 | 31.6 | 4.0 | 1.61 | 5.8 | 11.8 | 20.6 | |
| P-31+922 | P | 02-Jun-11 | 4 | 13.16 | 15.16 | 2.00 | B | 6.5 | 6.5 | 3.3 | 21:15 | 21:28 | 3.8 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 3 | 15.66 | 16.66 | 1.00 | A | 174.9 | - | - | 18:22 | 18:43 | 0.1 | 15.0 | 472.00 | 34.0 | 4.0 | 1.58 | -11.5 | 5.0 | 7.8 | |
| | | 22-Apr-11 | 3 | 15.66 | 16.66 | 1.00 | B | 168.0 | - | - | 18:43 | 18:54 | 0.3 | 15.9 | 114.40 | 40.0 | 7.0 | 1.64 | -11.5 | 7.2 | 9.1 | |
| | | 22-Apr-11 | 3 | 15.66 | 16.66 | 1.00 | C | 193.2 | - | - | 18:54 | 19:06 | 2.2 | 16.2 | 8.88 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 3 | 15.66 | 16.66 | 1.00 | D | 19.3 | 555.4 | 555.4 | 19:06 | 19:19 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 2 | 16.66 | 20.70 | 4.04 | A | 203.7 | - | - | 16:01 | 16:28 | 0.0 | 15.1 | inf | - | - | - | - | - | - | |
| | | 22-Apr-11 | 2 | 16.66 | 20.70 | 4.04 | B | 212.2 | - | - | 16:28 | 16:40 | 0.0 | 21.2 | inf | - | - | - | - | - | - | |
| | | 22-Apr-11 | 2 | 16.66 | 20.70 | 4.04 | C | 188.9 | - | - | 16:40 | 16:49 | 0.0 | 20.9 | inf | - | - | - | - | - | - | |
| | | 22-Apr-11 | 2 | 16.66 | 20.70 | 4.04 | D | 205.2 | - | - | 16:49 | 16:59 | 0.0 | 21.5 | inf | - | - | - | - | - | - | |
| | | 22-Apr-11 | 2 | 16.66 | 20.70 | 4.04 | X | 1105.0 | 1915.0 | 474.0 | 16:59 | 18:09 | 0.6 | 7.5 | 3.28 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 1 | 20.70 | 25.70 | 5.00 | A | 27.5 | 27.5 | 5.5 | 15:37 | 15:52 | 7.3 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 1C | 25.70 | 31.30 | 5.60 | A | 41.3 | 41.3 | 7.4 | 15:15 | 15:32 | 10.0 | 0.4 | 0.01 | - | - | - | - | - | - | |
| Q-31+922.75 | Q | 05-Jul-11 | 4 | 13.48 | 15.48 | 2.00 | MF | 28.8 | 28.80 | 14.40 | 11:11 | 11:44 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 26-Jun-11 | 3 | 15.98 | 16.98 | 1.00 | A | 12.5 | 12.50 | 12.50 | 9:56 | 10:10 | 4.0 | 0.4 | 0.11 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 2 | 16.98 | 21 | 4.02 | A | 71.6 | 71.60 | 17.81 | 9:28 | 9:51 | 4.1 | 1.5 | 0.09 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 1 | 21 | 26 | 5.00 | A | 12 | 12.00 | 2.40 | 9:08 | 9:21 | 7.0 | 0.4 | 0.01 | - | - | - | - | - | - | |
| T-31+923.5 | T | 13-Jun-11 | 4 | 12.85 | 14.85 | 2.00 | MF | 86.2 | 86.2 | 43.1 | 18:13 | 18:40 | 3.6 | 0.3 | 0.04 | 37.7 | 4.0 | 1.42 | 4.2 | 8.3 | 12.3 | |
| | | 07-May-11 | 2,3 | 15.35 | 26.70 | 11.35 | B | 139.1 | 139.1 | 12.3 | 3:28 | 4:13 | 3.9 | 0.8 | 0.02 | 35.9 | 4.0 | 1.63 | 20.7 | 6.0 | 16.9 | Hole Collapsed. |
| | | 10-May-11 | 2 | 16.35 | 20.30 | 3.95 | A | 26.6 | 26.6 | 6.7 | 17:48 | 18:03 | 4.8 | 0.3 | 0.02 | - | - | - | - | - | - | Grouted Stages 2 and 3 together. |
| | | 10-May-11 | 1 | 20.30 | 25.30 | 5.00 | A | 55.2 | 55.2 | 11.0 | 17:18 | 17:41 | 8.2 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 10-May-11 | 1C | 25.30 | 30.40 | 5.10 | A | 69.1 | 69.1 | 13.5 | 16:41 | 17:11 | 9.9 | 1.3 | 0.03 | - | - | - | - | - | - | |
| S-31+925 | S | 10-Jun-11 | 4 | 13.10 | 15.10 | 2.00 | B | 161.1 | - | - | 1:51 | 2:12 | 2.4 | 12.3 | 2.70 | 34.8 | - | 1.62 | 5.5 | 14.8 | 11.2 | |
| | | 10-Jun-11 | 4 | 13.10 | 15.10 | 2.00 | C | 240.1 | - | - | 2:12 | 2:28 | 2.9 | 15.6 | 2.79 | 46.1 | 3.0 | 1.63 | 5.9 | 14.8 | 12.9 | |
| | | 10-Jun-11 | 4 | 13.10 | 15.10 | 2.00 | D | 323.7 | - | - | 2:28 | 2:49 | 3.4 | 15.8 | 2.39 | 62.5 | - | 1.66 | 7.2 | 13.1 | 13.8 | |
| | | 10-Jun-11 | 4 | 13.10 | 15.10 | 2.00 | X | 98.1 | 823.0 | 411.5 | 2:49 | 2:56 | 2.9 | 14.0 | 2.39 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 3 | 15.60 | 16.60 | 1.00 | A | 21.4 | 21.4 | 21.4 | 16:22 | 16:35 | 3.5 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 2 | 16.60 | 20.60 | 4.00 | A | 20.1 | 20.1 | 5.0 | 15:39 | 16:20 | 4.3 | 1.8 | 0.10 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 1 | 20.60 | 25.60 | 5.00 | A | 82.1 | 82.1 | 16.4 | 15:06 | 15:30 | 7.1 | 1.3 | 0.04 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 1C | 25.60 | 27.20 | 1.60 | A | 28.7 | 28.7 | 17.9 | 14:45 | 15:00 | 9.6 | 0.1 | 0.00 | - | - | - | - | - | - | |
| Q-31+925.75 | Q | 05-Jul-11 | 4 | 12.54 | 14.54 | 2.00 | MF | 25.5 | 25.50 | 12.75 | 11:50 | 12:04 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 3 | 15.04 | 16.04 | 1.00 | A | 5.4 | 5.40 | 5.40 | 15:51 | 16:08 | 3.8 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 26-Jun-11 | 2 | 16.04 | 20.1 | 4.06 | A | 107.7 | 107.70 | 26.53 | 15:22 | 15:49 | 4.5 | 1.0 | 0.05 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+926.5 | T | 18-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | MF | 180.0 | - | - | 14:43 | 15:04 | 2.6 | 15.5 | 3.17 | - | - | - | - | - | - | Communicated to Q-31+927.25 |
| | | 18-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | B | 160.0 | - | - | 15:04 | 15:16 | 3.3 | 20.1 | 3.09 | 36.8 | - | 1.60 | 7.8 | 12.9 | 14.2 | between plastic and steel casing |
| | | 18-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | C | 201.9 | - | - | 15:16 | 15:26 | 3.6 | 17.5 | 2.35 | 49.1 | - | 1.65 | 7.8 | 12.9 | 16.3 | |
| | | 18-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | X | 160.7 | 702.6 | 351.3 | 15:26 | 15:56 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 15.07 | 16.07 | 1.00 | A | 188.1 | - | - | 6:59 | 7:27 | 0.0 | 13.0 | inf | 31.4 | 15.0 | 1.63 | 4.2 | 9.1 | 14.5 | Communicated to T-31+929.5, T-31+932.5 |
| | | 08-May-11 | 3 | 15.07 | 16.07 | 1.00 | B | 230.8 | - | - | 7:27 | 7:57 | 0.2 | 6.8 | 34.00 | 37.2 | - | 1.64 | 4.1 | 9.1 | 15.3 | and T-31+935.5 |
| | | 08-May-11 | 3 | 15.07 | 16.07 | 1.00 | C | 165.6 | - | - | 7:57 | 8:49 | 1.1 | 9.6 | 8.81 | 46.8 | - | 1.67 | 9.1 | 8.6 | 20.2 | |
| | | 08-May-11 | 3 | 15.07 | 16.07 | 1.00 | D | 198.3 | 782.8 | 782.8 | 8:49 | 9:21 | 3.9 | 13.8 | 3.53 | 61.3 | - | 1.66 | 9.1 | 8.6 | 19.4 | |
| | | 10-May-11 | 2 | 16.07 | 20.10 | 4.03 | A | 32.1 | 32.1 | 8.0 | 16:14 | 16:28 | 4.4 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 10-May-11 | 1 | 20.10 | 25.10 | 5.00 | A | 91.5 | 91.5 | 18.3 | 15:50 | 16:09 | 8.1 | 1.7 | 0.04 | - | - | - | - | - | - | |
| | | 10-May-11 | 1C | 25.10 | 30.10 | 5.00 | A | 44.0 | 44.0 | 8.8 | 15:31 | 15:44 | 9.4 | 1.0 | 0.02 | - | - | - | - | - | - | |
| Q-31+927.25 | Q | 06-Jul-11 | 4 | 12.92 | 14.92 | 2.00 | MF | 36.6 | 36.60 | 18.30 | 14:46 | 15:06 | 3.3 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 3 | 15.42 | 16.42 | 1.00 | A | 19.9 | 19.90 | 19.90 | 17:16 | 17:30 | 3.9 | 0.8 | 0.21 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 2 | 16.42 | 20.5 | 4.08 | A | 188.8 | 188.80 | 46.27 | 16:35 | 17:13 | 4.4 | 0.2 | 0.01 | - | - | - | - | - | - | |
| P-31+928 | P | 02-Jun-11 | 4 | 11.68 | 13.68 | 2.00 | B | 167.4 | - | - | 21:36 | 22:03 | 2.0 | 9.0 | 2.24 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 11.68 | 13.68 | 2.00 | C | 141.8 | - | - | 22:03 | 22:15 | 1.7 | 15.9 | 4.01 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 11.68 | 13.68 | 2.00 | D | 168.1 | - | - | 22:15 | 22:26 | 2.9 | 14.6 | 2.60 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 11.68 | 13.68 | 2.00 | X | 123.5 | 600.8 | 384.5 | 22:26 | 22:49 | 3.7 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 3 | 14.18 | 15.18 | 1.00 | A | 153.4 | - | - | 4:51 | 5:14 | 3.5 | 12.0 | 4.17 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 3 | 14.18 | 15.18 | 1.00 | B | 139.2 | 292.6 | 292.6 | 5:14 | 5:37 | 4.2 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 2 | 15.18 | 19.20 | 4.02 | A | 205.1 | - | - | 2:50 | 3:15 | 0.0 | 15.4 | inf | 33.4 | 4.0 | 1.61 | 3.8 | 6.4 | 16.8 | |
| | | 22-Apr-11 | 2 | 15.18 | 19.20 | 4.02 | B | 213.0 | - | - | 3:15 | 3:27 | 0.1 | 19.6 | 49.74 | 37.2 | 7.0 | 1.60 | 3.8 | 6.4 | 16.3 | |
| | | 22-Apr-11 | 2 | 15.18 | 19.20 | 4.02 | C | 237.8 | - | - | 3:27 | 3:45 | 1.3 | 11.3 | 2.25 | - | - | 1.68 | 3.8 | 6.4 | 14.0 | |
| | | 22-Apr-11 | 2 | 15.18 | 19.20 | 4.02 | D | 145.1 | - | - | 3:45 | 3:57 | 2.5 | 12.6 | 1.15 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 2 | 15.18 | 19.20 | 4.02 | X | 297.0 | 1098.0 | 273.1 | 3:57 | 4:32 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 1 | 19.20 | 24.30 | 5.10 | A | 203.5 | - | - | 22:54 | 23:19 | 0.0 | 15.6 | inf | - | - | - | - | - | - | |
| | | 22-Apr-11 | 1 | 19.20 | 24.30 | 5.10 | B | 200.8 | - | - | 23:19 | 23:31 | 0.0 | 18.3 | inf | - | - | - | - | - | - | |
| | | 22-Apr-11 | 1 | 19.20 | 24.30 | 5.10 | C | 193.3 | - | - | 23:31 | 23:47 | 1.6 | 13.0 | 1.66 | - | - | - | - | - | - | |
| | | 22-Apr-11 | 1 | 19.20 | 24.30 | 5.10 | D | 208.4 | - | - | 23:47 | 0:05 | 1.5 | 12.2 | 1.50 | 75.0 | 1.0 | 1.67 | 20.5 | 7.4 | 16.4 | |
| | | 22-Apr-11 | 1 | 19.20 | 24.30 | 5.10 | X | 156.0 | 962.0 | 188.6 | 0:05 | 0:29 | 6.5 | 0.2 | 0.00 | - | - | - | - | - | - | |
| Q-31+928.75 | Q | 05-Jul-11 | 4 | 12.34 | 14.34 | 2.00 | MF | 24.9 | 24.90 | 12.45 | 13:44 | 14:03 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 28-Jun-11 | 3 | 14.84 | 15.84 | 1.00 | A | 18.9 | 18.90 | 18.90 | 8:26 | 8:44 | 3.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 2 | 15.84 | 19.8 | 3.96 | A | 36.6 | 36.60 | 9.24 | 8:11 | 8:44 | 4.1 | 1.0 | 0.06 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 1 | 19.8 | 24.9 | 5.10 | A | 198.4 | - | - | 7:23 | 7:51 | 3.2 | 12.0 | 0.74 | 31.6 | 3.0 | 1.6 | 12.0 | 10.1 | 13.4 | |
| | | 28-Jun-11 | 1 | 19.8 | 24.9 | 5.10 | B | 26.3 | 224.70 | 44.06 | 7:51 | 8:07 | 6.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+929.5 | T | 13-Jun-11 | 4 | 12.17 | 14.17 | 2.00 | MF | 93.7 | 93.7 | 46.9 | 17:30 | 17:58 | 3.6 | 0.5 | 0.08 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 14.67 | 15.67 | 1.00 | A | 1.1 | 1.1 | 1.1 | 21:55 | 22:08 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-May-11 | 2 | 15.67 | 19.70 | 4.03 | A | 31.0 | 31.0 | 7.7 | 15:37 | 15:52 | 4.4 | 0.4 | 0.02 | - | - | - | - | - | - | |
| | | 09-May-11 | 1 | 19.70 | 24.70 | 5.00 | A | 33.9 | 33.9 | 6.8 | 15:10 | 15:25 | 7.8 | 0.4 | 0.01 | - | - | - | - | - | - | |
| Q-31+930.25 | Q | 06-Jul-11 | 4 | 12.08 | 14.08 | 2.00 | MF | 33.4 | 33.40 | 16.70 | 15:09 | 15:22 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 3 | 14.58 | 15.58 | 1.00 | A | 7 | 7.00 | 7.00 | 16:15 | 16:27 | 3.8 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 2 | 15.58 | 19.6 | 4.02 | A | 54.2 | 54.20 | 13.48 | 15:52 | 16:11 | 4.3 | 0.6 | 0.03 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 1 | 19.6 | 24.7 | 5.10 | A | 197.3 | - | - | 14:49 | 15:16 | 6.3 | 15.3 | 0.48 | 33.8 | - | 1.6 | 11.2 | 10.8 | 12.1 | |
| | | 30-Jun-11 | 1 | 19.6 | 24.7 | 5.10 | B | 195.7 | - | - | 15:16 | 15:29 | 6.6 | 11.5 | 0.34 | 38.8 | - | 1.6 | 11.0 | 10.7 | 12.9 | |
| | | 30-Jun-11 | 1 | 19.6 | 24.7 | 5.10 | C | 92.6 | 485.60 | 95.22 | 15:29 | 15:49 | 7.1 | 0.5 | 0.01 | 45.0 | - | 1.7 | 11.0 | 10.7 | 13.1 | |
| S-31+931 | S | 07-Jun-10 | 4 | 11.93 | 13.93 | 2.00 | B | 106.1 | 106.1 | 53.1 | 11:22 | 11:45 | 4.1 | 0.0 | 0.00 | 37.7 | 7.0 | 1.63 | 4.7 | 8.3 | 13.0 | |
| | | 30-Apr-11 | 3 | 14.43 | 15.43 | 1.00 | A | 15.8 | 15.8 | 15.8 | 19:03 | 19:19 | 4.4 | 0.3 | 0.06 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 2 | 15.43 | 19.40 | 3.97 | A | 208.8 | - | - | 17:48 | 18:26 | 0.8 | 8.0 | 2.63 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 2 | 15.43 | 19.40 | 3.97 | B | 179.6 | 388.4 | 97.8 | 18:26 | 18:58 | 4.5 | 0.4 | 0.02 | 37.3 | 2.0 | 1.61 | 12.4 | 9.5 | 22.7 | |
| | | 30-Apr-11 | 1 | 19.40 | 26.30 | 6.90 | A | 44.4 | 44.4 | 6.4 | 17:22 | 17:43 | 7.0 | 0.4 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+931.75 | Q | 05-Jul-11 | 4 | 12.16 | 14.16 | 2.00 | MF | 31.1 | 31.10 | 15.55 | 14:08 | 14:29 | 3.4 | 0.1 | 0.01 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 27-Jun-11 | 3 | 14.66 | 15.66 | 1.00 | A | 6.1 | 6.10 | 6.10 | 10:53 | 11:10 | 3.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 2 | 15.66 | 19.7 | 4.04 | A | 44.4 | 44.40 | 10.99 | 10:33 | 10:49 | 4.1 | 1.4 | 0.09 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 1 | 19.7 | 24.8 | 5.10 | A | 201.3 | - | - | 9:28 | 9:54 | 1.6 | 15.1 | 1.90 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 1 | 19.7 | 24.8 | 5.10 | B | 199 | - | - | 9:54 | 10:05 | 2.8 | 15.1 | 1.06 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 1 | 19.7 | 24.8 | 5.10 | C | 190.9 | 591.20 | 115.92 | 10:05 | 10:28 | 7.1 | 1.0 | 0.03 | - | - | - | - | - | - | |
| T-31+932.5 | T | 10-Jun-11 | 4 | 11.98 | 13.98 | 2.00 | MF | 60.0 | 60.0 | 30.0 | 10:05 | 10:32 | 3.6 | 0.7 | 0.10 | - | - | - | - | - | - | |
| | | 08-May-11 | 2,3 | 14.48 | 19.48 | 5.00 | A | 0.6 | 0.6 | 0.1 | 21:39 | 21:51 | 4.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 09-May-11 | 2 | 15.48 | 19.50 | 4.02 | A | 115.6 | 115.6 | 28.8 | 14:20 | 14:56 | 4.2 | 0.4 | 0.03 | 31.0 | - | 1.62 | -2.5 | 10.1 | 16.1 | |
| | | 09-May-11 | 1 | 19.50 | 24.50 | 5.00 | A | 40.3 | 40.3 | 8.1 | 13:48 | 14:06 | 7.1 | 0.2 | 0.00 | - | - | - | - | - | - | |
| Q-31+933.25 | Q | 06-Jul-11 | 4 | 11.4 | 13.4 | 2.00 | MF | 34.7 | 34.70 | 17.35 | 15:25 | 15:40 | 3.7 | 0.2 | 0.02 | 29.9 | - | 1.5 | 12.4 | 11.7 | 13.6 | |
| | | 30-Jun-11 | 3 | 13.9 | 14.9 | 1.00 | A | 155.8 | - | - | 20:04 | 20:49 | 4.3 | 3.4 | 0.81 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 3 | 13.9 | 14.9 | 1.00 | B | 25.6 | 181.40 | 181.40 | 20:49 | 21:08 | 4.0 | 0.4 | 0.10 | - | 5.0 | - | - | - | - | |
| | | 30-Jun-11 | 2 | 14.9 | 18.9 | 4.00 | A | 26.9 | 26.90 | 6.73 | 19:47 | 19:58 | 4.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 1 | 18.9 | 24 | 5.10 | A | 215 | - | - | 18:43 | 19:06 | 2.7 | 12.8 | 1.03 | 31.5 | 4.0 | 1.6 | 14.8 | 9.4 | 17.9 | |
| | | 30-Jun-11 | 1 | 18.9 | 24 | 5.10 | B | 191 | - | - | 19:06 | 19:21 | 2.7 | 12.2 | 0.80 | 38.1 | - | 1.6 | 14.8 | 9.4 | 17.6 | |
| | | 30-Jun-11 | 1 | 18.9 | 24 | 5.10 | C | 73.3 | 479.30 | 93.98 | 19:21 | 19:38 | 7.2 | 0.3 | 0.01 | 48.0 | - | 1.7 | 14.8 | 9.4 | 17.8 | |
| P-31+934 | P | 02-Jun-11 | 4 | 11.47 | 13.47 | 2.00 | B | 151.8 | - | - | 1:31 | 1:58 | 2.1 | 12.5 | 3.04 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 11.47 | 13.47 | 2.00 | C | 172.6 | - | - | 1:58 | 2:11 | 2.7 | 16.6 | 2.64 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 11.47 | 13.47 | 2.00 | D | 154.6 | - | - | 2:11 | 2:21 | 3.3 | 14.0 | 2.22 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 11.47 | 13.47 | 2.00 | X | 115.6 | 594.6 | 297.3 | 2:21 | 2:45 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 3 | 13.97 | 14.97 | 1.00 | A | 160.4 | - | - | 9:28 | 9:56 | 2.9 | 12.0 | 4.17 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 3 | 13.97 | 14.97 | 1.00 | B | 177.6 | - | - | 9:56 | 10:16 | 4.6 | 16.5 | 3.64 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 3 | 13.97 | 14.97 | 1.00 | C | 133.1 | 471.1 | 471.1 | 10:16 | 10:33 | 4.3 | 1.1 | 0.23 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 14.97 | 19.00 | 4.03 | A | 212.5 | - | - | 7:44 | 8:13 | 0.0 | 15.1 | inf | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 14.97 | 19.00 | 4.03 | B | 201.5 | - | - | 8:13 | 8:26 | 0.6 | 21.6 | 9.19 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 14.97 | 19.00 | 4.03 | C | 192.7 | - | - | 8:26 | 8:35 | 1.6 | 20.7 | 3.26 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 14.97 | 19.00 | 4.03 | D | 187.0 | - | - | 8:35 | 8:44 | 3.6 | 19.9 | 1.37 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 14.97 | 19.00 | 4.03 | X | 457.3 | 1251.0 | 310.4 | 8:44 | 9:22 | 4.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 1 | 19.00 | 24.00 | 5.00 | A | 196.0 | - | - | 6:16 | 6:47 | 4.1 | 12.0 | 0.56 | 31.3 | 3.0 | 1.60 | 4.0 | 6.5 | 17.1 | |
| | | 23-Apr-11 | 1 | 19.00 | 24.00 | 5.00 | B | 211.4 | - | - | 6:47 | 7:01 | 7.1 | 14.9 | 0.44 | 37.4 | 2.0 | 1.63 | 3.7 | 7.1 | 18.2 | |
| | | 23-Apr-11 | 1 | 19.00 | 24.00 | 5.00 | C | 186.7 | - | - | 7:01 | 7:14 | 6.8 | 13.6 | 0.40 | 48.4 | - | 1.62 | 3.9 | 7.3 | 17.5 | |
| | | 23-Apr-11 | 1 | 19.00 | 24.00 | 5.00 | D | 195.0 | 789.1 | 157.8 | 7:14 | 7:38 | 6.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+934.75 | Q | 05-Jul-11 | 4 | 10.53 | 12.53 | 2.00 | MF | 29 | 29.00 | 14.50 | 14:33 | 14:47 | 3.6 | 0.6 | 0.09 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 3 | 13.03 | 14.03 | 1.00 | A | 179.1 | - | - | 8:05 | 8:31 | 3.2 | 12.5 | 3.91 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 3 | 13.03 | 14.03 | 1.00 | B | 145.1 | - | - | 8:31 | 8:41 | 4.2 | 14.9 | 3.13 | 38.9 | - | 1.6 | 19.0 | 14.6 | 20.8 | |
| | | 27-Jun-11 | 3 | 13.03 | 14.03 | 1.00 | C | 101.8 | 426.00 | 426.00 | 8:41 | 9:14 | 3.9 | 0.0 | 0.00 | 47.2 | - | 1.6 | 19.0 | 14.8 | 22.1 | |
| | | 27-Jun-11 | 2 | 14.03 | 18 | 3.97 | A | 125.1 | 125.10 | 31.51 | 7:25 | 8:00 | 4.1 | 1.9 | 0.12 | - | - | - | - | - | - | |
| | | 27-Jun-11 | 1 | 18 | 23.1 | 5.10 | A | 89.9 | 89.90 | 17.63 | 6:54 | 7:19 | 7.4 | 1.3 | 0.04 | 31.1 | 4.0 | 1.6 | 19.0 | 14.7 | 21.3 | |
| T-31+935.5 | T | 13-Jun-11 | 4 | 11.09 | 13.09 | 2.00 | MF | 79.0 | 79.0 | 39.5 | 17:04 | 17:27 | 3.5 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 13.59 | 14.59 | 1.00 | A | 41.0 | 41.0 | 41.0 | 21:18 | 21:34 | 4.0 | 0.6 | 0.14 | 31.8 | 6.0 | 1.61 | 9.6 | 11.1 | 20.6 | |
| | | 08-May-11 | 1,2 | 14.59 | 23.60 | 9.01 | A | 84.0 | - | - | 17:24 | 17:40 | 0.0 | 5.3 | inf | - | - | - | - | - | - | |
| | | 08-May-11 | 1,2 | 14.59 | 23.60 | 9.01 | B | 363.1 | - | - | 17:40 | 19:27 | 0.2 | 0.0 | 0.00 | - | - | - | - | - | - | Communicated to T-31+829.5 and T-31+832.5 |
| | | 08-May-11 | 1,2 | 14.59 | 23.60 | 9.01 | C | 36.9 | 484.0 | 53.7 | 19:27 | 19:45 | 4.2 | 0.8 | 0.02 | 45.4 | 1.0 | 1.67 | 18.7 | 8.7 | 20.2 | |
| | | 09-May-11 | 1 | 18.60 | 23.60 | 5.00 | A | 28.7 | 28.7 | 5.7 | 10:56 | 11:11 | 7.3 | 0.3 | 0.01 | - | - | - | - | - | - | |
| Q-31+936.25 | Q | 06-Jul-11 | 4 | 10.25 | 12.25 | 2.00 | MF | 26.7 | 26.70 | 13.35 | 15:41 | 15:54 | 3.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 3 | 12.75 | 13.75 | 1.00 | A | 9.3 | 9.30 | 9.30 | 22:45 | 22:57 | 3.9 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 2 | 13.75 | 17.8 | 4.05 | A | 27.9 | 27.90 | 6.89 | 22:30 | 22:41 | 4.1 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 1 | 17.8 | 22.8 | 5.00 | A | 139.5 | 139.50 | 27.90 | 21:40 | 22:25 | 7.0 | 0.6 | 0.02 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+937 | S | 07-Jun-10 | 4 | 10.64 | 12.64 | 2.00 | B | 123.4 | 123.4 | 61.7 | 11:47 | 12:15 | 3.9 | 0.6 | 0.08 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 3 | 13.14 | 14.14 | 1.00 | A | 155.0 | - | - | 3:09 | 3:35 | 5.6 | 20.0 | 3.68 | 31.5 | - | 1.65 | - | - | 18.9 | |
| | | 30-Apr-11 | 3 | 13.14 | 14.14 | 1.00 | B | 172.6 | - | - | 3:35 | 3:50 | 1.2 | 6.2 | 5.27 | 35.4 | - | 1.64 | - | - | 17.5 | |
| | | 30-Apr-11 | 3 | 13.14 | 14.14 | 1.00 | C | 160.0 | - | - | 3:50 | 4:10 | 4.6 | 9.7 | 2.11 | 46.0 | - | 1.67 | - | - | 19.1 | |
| | | 30-Apr-11 | 3 | 13.14 | 14.14 | 1.00 | D | 113.9 | 601.5 | 601.5 | 4:10 | 4:22 | 3.8 | 10.7 | 2.86 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 2 | 14.14 | 18.10 | 3.96 | C | 181.4 | - | - | 0:10 | 0:26 | 0.9 | 9.8 | 1.29 | 46.0 | 2.0 | 1.68 | 21.9 | 9.4 | 20.1 | |
| | | 30-Apr-11 | 2 | 14.14 | 18.10 | 3.96 | D | 219.0 | - | - | 0:26 | 0:41 | 1.3 | 13.4 | 2.91 | 95.0 | - | 1.70 | 21.9 | 10.5 | 21.0 | |
| | | 30-Apr-11 | 2 | 14.14 | 18.10 | 3.96 | X | 257.0 | 1057.0 | 266.9 | 0:41 | 1:15 | 4.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 2 | 14.14 | 18.10 | 3.96 | A | 201.0 | - | - | 23:26 | 23:54 | 0.0 | 12.0 | inf | - | - | - | - | - | - | |
| | | 30-Apr-11 | 2 | 14.14 | 18.10 | 3.96 | B | 198.6 | - | - | 23:54 | 0:10 | 0.0 | 12.7 | inf | - | - | - | - | - | - | |
| | | 30-Apr-11 | 1 | 18.10 | 23.10 | 5.00 | A | 207.3 | - | - | 22:15 | 22:43 | 4.0 | 12.4 | 0.60 | 30.3 | 3.0 | 1.60 | 15.1 | 16.2 | 17.3 | |
| | | 30-Apr-11 | 1 | 18.10 | 23.10 | 5.00 | B | 375.3 | 582.6 | 116.5 | 22:43 | 23:22 | 7.3 | 6.2 | 0.17 | - | - | - | - | - | - | |
| T-31+938.5 | T | 10-Jun-11 | 4 | 10.58 | 12.58 | 2.00 | MF | 180.0 | - | - | 10:35 | 10:56 | 2.6 | 15.2 | 3.33 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 4 | 10.58 | 12.58 | 2.00 | B | 160.0 | - | - | 10:56 | 11:05 | 2.4 | 20.4 | 2.39 | 34.1 | 7.0 | 1.62 | 6.1 | 13.4 | 13.3 | |
| | | 10-Jun-11 | 4 | 10.58 | 12.58 | 2.00 | C | 160.0 | - | - | 11:05 | 11:13 | 3.1 | 20.9 | 3.12 | 46.8 | - | 1.63 | 6.1 | 13.4 | 14.1 | |
| | | 10-Jun-11 | 4 | 10.58 | 12.58 | 2.00 | D | 220.0 | - | - | 11:13 | 11:24 | 3.1 | 20.3 | 3.05 | 59.6 | - | 1.66 | 6.1 | 13.4 | 14.0 | |
| | | 10-Jun-11 | 4 | 10.58 | 12.58 | 2.00 | X | 155.0 | 875.0 | 437.5 | 11:24 | 11:37 | 3.5 | 7.7 | 1.09 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 13.08 | 14.08 | 1.00 | A | 6.3 | 6.3 | 6.3 | 3:24 | 3:36 | 4.1 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 08-May-11 | 2 | 14.08 | 18.10 | 4.02 | A | 24.8 | 24.8 | 6.2 | 3:07 | 3:19 | 4.3 | 0.5 | 0.03 | 32.6 | - | 1.58 | 15.7 | 8.5 | 22.6 | |
| | | 08-May-11 | 1 | 18.10 | 23.10 | 5.00 | A | 92.7 | 92.7 | 18.5 | 2:32 | 3:03 | 7.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+940 | P | 02-Jun-11 | 4 | 10.64 | 12.64 | 2.00 | B | 156.5 | - | - | 2:56 | 3:21 | 2.6 | 10.4 | 2.14 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 10.64 | 12.64 | 2.00 | C | 158.1 | - | - | 3:21 | 3:33 | 3.0 | 15.7 | 2.23 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 10.64 | 12.64 | 2.00 | D | 163.9 | - | - | 3:33 | 3:45 | 3.3 | 13.1 | 2.38 | - | - | - | - | - | - | |
| | | 02-Jun-11 | 4 | 10.64 | 12.64 | 2.00 | X | 107.1 | 585.6 | 292.8 | 3:45 | 4:08 | 4.3 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 3 | 13.14 | 14.14 | 1.00 | A | 19.2 | 19.2 | 19.2 | 15:29 | 15:45 | 4.7 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.14 | 18.10 | 3.96 | A | 205.6 | - | - | 14:12 | 14:40 | 0.1 | 15.1 | 61.26 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.14 | 18.10 | 3.96 | B | 193.9 | - | - | 14:40 | 14:51 | 1.0 | 20.8 | 5.36 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.14 | 18.10 | 3.96 | C | 202.3 | - | - | 14:51 | 15:01 | 0.9 | 21.7 | 5.77 | 40.3 | - | 1.54 | -8.5 | 6.3 | 10.6 | |
| | | 24-Apr-11 | 2 | 14.14 | 18.10 | 3.96 | D | 209.2 | - | - | 15:01 | 15:11 | 3.2 | 21.7 | 1.64 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.14 | 18.10 | 3.96 | X | 117.0 | 928.0 | 234.3 | 15:11 | 15:24 | 4.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 1 | 18.10 | 23.30 | 5.20 | A | 31.2 | 31.2 | 6.0 | 13:52 | 14:07 | 7.5 | 0.4 | 0.01 | 33.7 | - | 1.64 | -4.4 | 6.3 | 10.5 | Communicated to P-31+934 and P-31+946 |
| T-31+941.5 | T | 13-Jun-11 | 4 | 10.92 | 12.92 | 2.00 | MF | 120.4 | 120.4 | 60.2 | 16:27 | 17:00 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 13.42 | 14.42 | 1.00 | A | 79.1 | - | - | 19:59 | 20:13 | 0.0 | 5.3 | inf | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 13.42 | 14.42 | 1.00 | B | 395.3 | - | - | 20:13 | 20:54 | 3.9 | 7.0 | 1.81 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 13.42 | 14.42 | 1.00 | C | 83.6 | 558.0 | 558.0 | 20:54 | 21:10 | 4.1 | 3.1 | 0.75 | - | - | - | - | - | - | |
| | | 08-May-11 | 2 | 14.08 | 18.08 | 4.00 | A | 208.7 | - | - | 14:40 | 15:17 | 0.0 | 11.8 | inf | 32.7 | - | 1.61 | 10.3 | 7.1 | 16.7 | |
| | | 08-May-11 | 2 | 14.08 | 18.08 | 4.00 | B | 303.9 | - | - | 15:17 | 15:41 | 0.7 | 12.0 | 4.41 | 38.0 | - | 1.63 | 10.2 | 7.2 | 20.0 | |
| | | 08-May-11 | 2 | 14.08 | 18.08 | 4.00 | C | 510.4 | - | - | 15:41 | 16:33 | 2.5 | 16.8 | 1.94 | 43.0 | - | 1.65 | 10.2 | 7.2 | 17.4 | |
| | | 08-May-11 | 2 | 14.08 | 18.08 | 4.00 | D | 287.0 | 1310.0 | 327.5 | 16:33 | 17:04 | 4.2 | 0.4 | 0.03 | - | - | - | - | - | - | |
| | | 09-May-11 | 1 | 16.40 | 23.50 | 7.10 | A | 114.1 | 114.1 | 16.1 | 10:08 | 10:36 | 7.5 | 1.6 | 0.03 | - | - | - | - | - | - | |
| S-31+943 | S | 07-Jun-10 | 4 | 10.30 | 12.30 | 2.00 | B | 57.4 | 57.4 | 28.7 | 13:57 | 14:18 | 3.9 | 0.7 | 0.09 | 32.5 | 6.0 | 1.62 | - | 10.5 | 15.0 | |
| | | 01-May-11 | 3 | 12.53 | 13.53 | 1.00 | A | 14.5 | 14.5 | 14.5 | 7:48 | 8:03 | 4.4 | 0.2 | 0.24 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.53 | 17.50 | 3.97 | A | 262.3 | - | - | 5:29 | 6:21 | 0.1 | 15.4 | 34.02 | 30.1 | - | 1.59 | 13.1 | 6.3 | 18.5 | |
| | | 01-May-11 | 2 | 13.53 | 17.50 | 3.97 | B | 158.7 | - | - | 6:21 | 6:30 | 0.1 | 17.8 | 33.88 | 34.8 | 2.0 | 1.63 | 13.0 | 6.2 | 17.3 | |
| | | 01-May-11 | 2 | 13.53 | 17.50 | 3.97 | C | 187.4 | - | - | 6:30 | 6:39 | 0.8 | 19.8 | 6.45 | 47.7 | - | 1.62 | 12.9 | 6.3 | 17.6 | |
| | | 01-May-11 | 2 | 13.53 | 17.50 | 3.97 | D | 192.6 | - | - | 6:39 | 6:50 | 1.7 | 20.1 | 3.03 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.53 | 17.50 | 3.97 | X | 606.0 | 1407.0 | 354.4 | 6:50 | 7:39 | 4.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Apr-11 | 1 | 17.50 | 22.50 | 5.00 | A | 24.5 | 24.5 | 4.9 | 4:45 | 5:22 | 8.1 | 0.6 | 0.01 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+943.75 | Q | 05-Jul-11 | 4 | 10.03 | 12.03 | 2.00 | MF | 55.5 | 55.50 | 27.75 | 14:49 | 15:10 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 3 | 12.53 | 13.53 | 1.00 | A | 16.3 | 16.30 | 16.30 | 11:45 | 11:59 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 2 | 13.53 | 17.5 | 3.97 | A | 230.9 | - | - | 10:46 | 11:14 | 2.6 | 12.7 | 1.78 | 36.4 | - | 1.6 | 12.8 | 10.0 | 13.8 | |
| | | 28-Jun-11 | 2 | 13.53 | 17.5 | 3.97 | B | 175.9 | - | - | 11:14 | 11:26 | 3.3 | 19.3 | 1.49 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 2 | 13.53 | 17.5 | 3.97 | C | 89.9 | 496.70 | 125.11 | 11:26 | 11:43 | 4.1 | 0.9 | 0.05 | 44.9 | - | 1.7 | 10.2 | 10.3 | 11.9 | |
| | | 28-Jun-11 | 1 | 17.5 | 22.6 | 5.10 | A | 44.1 | 44.10 | 8.65 | 10:29 | 10:43 | 7.1 | 1.9 | 0.05 | - | - | - | - | - | - | |
| T-31+944.5 | T | 10-Jun-11 | 4 | 10.31 | 12.31 | 2.00 | MF | 72.9 | 72.9 | 36.5 | 23:13 | 23:36 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 12.81 | 13.81 | 1.00 | A | 80.1 | 80.1 | 80.1 | 0:48 | 1:22 | 3.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 08-May-11 | 2 | 13.81 | 17.80 | 3.99 | A | 192.9 | - | - | 23:15 | 23:40 | 0.0 | 11.6 | inf | - | - | - | - | - | - | |
| | | 08-May-11 | 2 | 13.81 | 17.80 | 3.99 | B | 186.8 | - | - | 23:40 | 23:53 | 0.9 | 15.0 | 4.26 | - | - | - | - | - | - | Communicated to T-31+947.5 |
| | | 08-May-11 | 2 | 13.81 | 17.80 | 3.99 | C | 199.6 | - | - | 23:53 | 0:07 | 2.4 | 15.4 | 1.60 | - | - | - | - | - | - | |
| | | 08-May-11 | 2 | 13.81 | 17.80 | 3.99 | D | 173.2 | - | - | 0:07 | 0:21 | 2.6 | 15.8 | 1.44 | - | - | - | - | - | - | |
| | | 08-May-11 | 2 | 13.81 | 17.80 | 3.99 | X | 171.5 | 924.0 | 231.6 | 0:21 | 0:40 | 4.1 | 1.4 | 0.09 | - | - | - | - | - | - | |
| | | 08-May-11 | 1 | 17.80 | 22.90 | 5.10 | A | 39.2 | 39.2 | 7.7 | 22:57 | 23:11 | 6.9 | 0.2 | 0.01 | - | - | - | - | - | - | |
| Q-31+945.25 | Q | 06-Jul-11 | 4 | 10.46 | 12.46 | 2.00 | MF | 33.4 | 33.40 | 16.70 | 15:56 | 16:10 | 3.8 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 12.96 | 13.96 | 1.00 | A | 55.9 | 55.90 | 55.90 | 14:56 | 15:25 | 4.0 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 2 | 13.96 | 18 | 4.04 | A | 19.9 | 19.90 | 4.93 | 14:42 | 14:54 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 1 | 18 | 23.5 | 5.50 | A | 87.8 | 87.80 | 15.96 | 14:15 | 14:38 | 6.8 | 2.9 | 0.09 | - | - | - | - | - | - | |
| P-31+946 | P | 02-Jun-11 | 4 | 10.48 | 12.48 | 2.00 | B | 151.2 | - | - | 4:24 | 4:50 | 1.2 | 12.1 | 5.25 | 36.1 | 1.0 | 1.60 | 2.1 | 12.4 | 13.0 | |
| | | 02-Jun-11 | 4 | 10.48 | 12.48 | 2.00 | C | 165.6 | - | - | 4:50 | 5:03 | 2.3 | 15.1 | 3.23 | 48.0 | - | 1.63 | 2.0 | 12.3 | 12.8 | |
| | | 02-Jun-11 | 4 | 10.48 | 12.48 | 2.00 | D | 155.3 | - | - | 5:03 | 5:14 | 2.9 | 15.2 | 2.64 | 66.7 | - | 1.65 | 2.0 | 12.0 | 13.6 | |
| | | 02-Jun-11 | 4 | 10.48 | 12.48 | 2.00 | X | 85.0 | 557.1 | 278.6 | 5:14 | 5:30 | 4.0 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 3 | 12.98 | 13.98 | 1.00 | A | 2.5 | 2.5 | 2.5 | 22:18 | 22:31 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 13.98 | 18.00 | 4.02 | A | 202.5 | - | - | 19:56 | 20:21 | 0.2 | 12.3 | 18.03 | 33.0 | 4.0 | 1.59 | -12.4 | 4.5 | 9.6 | |
| | | 23-Apr-11 | 2 | 13.98 | 18.00 | 4.02 | B | 203.1 | - | - | 20:21 | 20:36 | 2.5 | 12.6 | 1.38 | 37.0 | 7.0 | 1.60 | -12.4 | 6.5 | 9.0 | |
| | | 23-Apr-11 | 2 | 13.98 | 18.00 | 4.02 | C | 191.8 | - | - | 20:36 | 20:53 | 4.4 | 11.6 | 0.66 | 55.0 | - | 1.70 | -12.4 | 6.8 | 10.5 | |
| | | 23-Apr-11 | 2 | 13.98 | 18.00 | 4.02 | D | 167.6 | - | - | 20:53 | 21:13 | 3.9 | 8.8 | 0.59 | 64.5 | - | 1.69 | -9.4 | 7.0 | 12.4 | |
| | | 23-Apr-11 | 2 | 13.98 | 18.00 | 4.02 | X | 32.0 | 797.0 | 198.3 | 21:13 | 21:22 | 4.3 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 1 | 18.00 | 23.00 | 5.00 | A | 216.1 | 216.1 | 43.2 | 17:22 | 17:59 | 6.9 | 5.4 | 0.16 | - | - | - | - | - | - | |
| Q-31+946.75 | Q | 05-Jul-11 | 4 | 10.18 | 12.18 | 2.00 | MF | 37 | 37.00 | 18.50 | 15:12 | 15:28 | 3.3 | 0.5 | 0.07 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 3 | 12.68 | 13.68 | 1.00 | A | 7 | 7.00 | 7.00 | 9:56 | 10:10 | 4.0 | 0.7 | 0.17 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 2 | 13.68 | 17.7 | 4.02 | A | 6.8 | 6.80 | 1.69 | 9:39 | 9:52 | 4.3 | 0.6 | 0.03 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 1 | 17.7 | 22.7 | 5.00 | A | 89.5 | 89.50 | 17.90 | 9:11 | 9:34 | 6.7 | 3.1 | 0.09 | - | - | - | - | - | - | |
| T-31+947.5 | T | 13-Jun-11 | 4 | 10.20 | 12.20 | 2.00 | MF | 81.8 | 81.8 | 40.9 | 16:00 | 16:24 | 3.6 | 0.9 | 0.12 | - | - | - | - | - | - | |
| | | 08-May-11 | 3 | 12.70 | 13.70 | 1.00 | A | 19.2 | 19.2 | 19.2 | 1:24 | 1:38 | 4.0 | 0.2 | 0.00 | - | - | - | - | - | - | |
| | | 09-May-11 | 1,2 | 13.70 | 22.80 | 9.10 | A | 33.6 | - | - | 20:57 | 21:40 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-May-11 | 1,2 | 13.70 | 22.80 | 9.10 | A | 2.1 | 35.7 | 3.9 | 22:24 | 22:36 | 5.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-May-11 | 1 | 17.70 | 22.80 | 5.10 | A | 209.1 | - | - | 19:43 | 20:16 | 6.5 | 12.2 | 0.37 | 32.4 | 4.0 | 1.62 | 0.2 | 7.9 | 12.7 | By-pass inside casing; packer damaged / |
| | | 09-May-11 | 1 | 17.70 | 22.80 | 5.10 | B | 230.3 | 439.4 | 86.2 | 20:16 | 20:52 | 0.2 | 0.0 | 0.01 | 37.6 | - | 1.63 | 0.3 | 7.8 | 14.2 | replaced; Stage 1, 2 combined. |
| Q-31+948.25 | Q | 06-Jul-11 | 4 | 10.38 | 12.38 | 2.00 | MF | 45.5 | 45.50 | 22.75 | 16:12 | 16:28 | 3.4 | 0.3 | 0.05 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 12.88 | 13.88 | 1.00 | A | 157.4 | - | - | 11:29 | 11:52 | 2.2 | 11.8 | 5.37 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 12.88 | 13.88 | 1.00 | B | 158.1 | 315.50 | 315.50 | 11:52 | 12:18 | 4.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 2 | 13.88 | 17.9 | 4.02 | A | 23.6 | 23.60 | 5.87 | 11:15 | 11:26 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 1 | 17.9 | 23 | 5.10 | A | 133.7 | 133.70 | 26.22 | 10:41 | 11:13 | 6.9 | 0.1 | 0.00 | 31.4 | - | 1.6 | 11.0 | 10.8 | 11.3 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+949 | S | 07-Jun-10 | 4 | 10.38 | 12.38 | 2.00 | B | 73.2 | 73.2 | 36.6 | 14:20 | 14:42 | 3.9 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 12.88 | 13.88 | 1.00 | A | 154.5 | - | - | 10:34 | 11:02 | 3.4 | 13.0 | 3.80 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 12.88 | 13.88 | 1.00 | B | 175.5 | - | - | 11:02 | 11:17 | 3.1 | 12.4 | 3.98 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 12.88 | 13.88 | 1.00 | C | 142.1 | - | - | 11:17 | 11:31 | 4.3 | 9.6 | 2.24 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 12.88 | 13.88 | 1.00 | D | 24.4 | 496.5 | 496.5 | 11:31 | 11:45 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.88 | 17.90 | 4.02 | A | 192.3 | - | - | 8:58 | 9:25 | 1.5 | 12.1 | 1.96 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.88 | 17.90 | 4.02 | B | 285.2 | - | - | 9:25 | 9:39 | 2.5 | 23.1 | 2.25 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.88 | 17.90 | 4.02 | C | 124.3 | - | - | 9:39 | 9:48 | 2.6 | 21.2 | 2.27 | 71.6 | - | 1.65 | 23.2 | 4.5 | 19.2 | |
| | | 01-May-11 | 2 | 13.88 | 17.90 | 4.02 | D | 191.2 | - | - | 9:48 | 9:57 | 3.0 | 20.6 | 1.71 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.88 | 17.90 | 4.02 | X | 370.0 | 1163.0 | 289.3 | 9:57 | 10:30 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-11 | 1 | 17.90 | 21.30 | 3.40 | A | 33.4 | 33.4 | 9.8 | 8:36 | 8:52 | 6.7 | 0.3 | 0.01 | - | - | - | - | - | - | |
| T-31+950.5 | T | 10-Jun-11 | 4 | 10.08 | 12.08 | 2.00 | MF | 161.7 | - | - | 21:57 | 22:07 | 3.8 | 4.9 | 0.69 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 4 | 10.08 | 12.08 | 2.00 | B | 78.9 | 240.6 | 120.3 | 22:07 | 22:58 | 3.5 | 1.2 | 0.17 | - | - | - | - | - | - | |
| | | 09-May-11 | 3 | 12.58 | 13.58 | 1.00 | A | 16.7 | 16.7 | 16.7 | 9:03 | 9:17 | 4.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 09-May-11 | 2 | 13.58 | 17.60 | 4.02 | A | 225.4 | - | - | 7:49 | 8:21 | 1.1 | 11.4 | 0.89 | - | - | - | - | - | - | |
| | | 09-May-11 | 2 | 13.58 | 17.60 | 4.02 | B | 220.4 | - | - | 8:21 | 8:42 | 2.9 | 9.0 | 0.78 | 37.9 | - | 1.65 | -1.0 | 14.0 | 16.2 | |
| | | 09-May-11 | 2 | 13.58 | 17.60 | 4.02 | C | 35.7 | 481.5 | 119.8 | 8:42 | 8:58 | 4.3 | 0.2 | 0.01 | 49.3 | - | 1.66 | -1.0 | 14.0 | 15.3 | |
| | | 09-May-11 | 1 | 17.60 | 22.60 | 5.00 | A | 121.2 | 121.2 | 24.2 | 7:14 | 7:43 | 7.1 | 4.0 | 0.11 | 31.2 | 4.0 | 1.63 | 11.3 | 14.0 | 18.9 | |
| P-31+952 | P | 03-Jun-11 | 4 | 10.51 | 12.51 | 2.00 | B | 163.3 | - | - | 2:37 | 3:03 | 1.9 | 12.4 | 3.15 | 36.4 | 2.5 | 1.61 | 7.7 | 8.5 | 14.0 | |
| | | 03-Jun-11 | 4 | 10.51 | 12.51 | 2.00 | C | 188.0 | - | - | 3:03 | 3:13 | 2.6 | 15.6 | 3.47 | 41.5 | - | 1.63 | 7.7 | 8.5 | 15.2 | |
| | | 03-Jun-11 | 4 | 10.51 | 12.51 | 2.00 | D | 321.2 | 672.5 | 336.3 | 3:13 | 4:16 | 3.8 | 0.8 | 0.10 | 71.2 | - | 1.66 | 3.0 | 8.4 | 14.3 | |
| | | 24-Apr-11 | 3 | 13.01 | 14.01 | 1.00 | A | 14.0 | 14.0 | 14.0 | 6:48 | 7:05 | 4.3 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 14.01 | 18.00 | 3.99 | A | 194.7 | - | - | 3:15 | 3:39 | 0.3 | 12.1 | 10.81 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 14.01 | 18.00 | 3.99 | B | 212.2 | - | - | 3:39 | 3:57 | 0.3 | 12.6 | 15.31 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 14.01 | 18.00 | 3.99 | C | 193.0 | - | - | 3:57 | 4:13 | 1.3 | 11.3 | 2.18 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 14.01 | 18.00 | 3.99 | D | 206.1 | - | - | 4:13 | 4:31 | 2.4 | 12.0 | 1.20 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 2 | 14.01 | 18.00 | 3.99 | X | 155.0 | 961.0 | 240.9 | 4:31 | 5:04 | 4.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-Apr-11 | 1 | 18.00 | 23.20 | 5.20 | A | 31.2 | 31.2 | 6.0 | 2:37 | 2:53 | 6.7 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-31+953.5 | T | 13-Jun-11 | 4 | 10.74 | 12.74 | 2.00 | MF | 79.6 | 79.6 | 39.8 | 15:35 | 15:57 | 3.5 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 11-May-11 | 3 | 13.24 | 14.24 | 1.00 | A | 43.4 | 43.4 | 43.4 | 17:17 | 17:42 | 4.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 10-May-11 | 2,3 | 13.24 | 18.20 | 4.96 | A | 346.2 | - | - | 5:10 | 5:33 | 0.8 | 12.0 | 3.46 | - | - | - | - | - | - | By-pass; packer raised 1 m |
| | | 10-May-11 | 2,3 | 13.24 | 18.20 | 4.96 | B | 201.2 | - | - | 5:33 | 5:49 | 1.8 | 12.5 | 1.78 | 37.3 | - | 1.63 | 19.6 | 12.9 | 21.7 | |
| | | 10-May-11 | 2,3 | 13.24 | 18.20 | 4.96 | C | 129.6 | 677.0 | 136.5 | 5:49 | 6:12 | 4.4 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 10-May-11 | 1 | 18.20 | 23.60 | 5.40 | A | 30.1 | 30.1 | 5.6 | 3:10 | 3:22 | 7.0 | 0.0 | 0.00 | 31.1 | - | 1.62 | 13.2 | 9.5 | 16.5 | |
| S-31+955 | S | 07-Jun-10 | 4 | 10.53 | 12.53 | 2.00 | B | 71.4 | 71.4 | 35.7 | 14:47 | 15:14 | 4.6 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 13.03 | 14.03 | 1.00 | A | 30.9 | - | - | 17:15 | 17:30 | 4.4 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 13.03 | 14.03 | 1.00 | A | 32.4 | 63.3 | 63.3 | 16:21 | 16:39 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 14.03 | 18.00 | 3.97 | A | 221.0 | - | - | 14:56 | 15:22 | 0.0 | 17.2 | inf | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 14.03 | 18.00 | 3.97 | B | 193.0 | - | - | 15:22 | 15:32 | 0.1 | 18.0 | 38.95 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 14.03 | 18.00 | 3.97 | C | 192.9 | - | - | 15:32 | 15:42 | 0.5 | 20.6 | 9.37 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 14.03 | 18.00 | 3.97 | D | 201.7 | - | - | 15:42 | 15:53 | 1.1 | 17.0 | 3.96 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 14.03 | 18.00 | 3.97 | X | 1085.4 | 1894.0 | - | 15:53 | 17:09 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 14.03 | 18.00 | 3.97 | A | 195.5 | - | - | 15:01 | 15:27 | 1.4 | 9.9 | 2.02 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 14.03 | 18.00 | 3.97 | B | 215.0 | - | - | 15:27 | 15:41 | 2.3 | 16.1 | 1.81 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 14.03 | 18.00 | 3.97 | C | 218.4 | - | - | 15:41 | 15:53 | 4.1 | 9.1 | 0.64 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 14.03 | 18.00 | 3.97 | D | 153.2 | - | - | 15:53 | 16:02 | 4.0 | 12.2 | 0.96 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 14.03 | 18.00 | 3.97 | X | 9.3 | 791.4 | 676.4 | 16:02 | 16:15 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-11 | 1 | 18.00 | 23.00 | 5.00 | A | 211.3 | - | - | 14:17 | 14:44 | 0.0 | 15.0 | inf | 32.9 | - | 1.58 | 23.0 | 5.2 | 19.6 | By-pass inside casing. |
| | | 01-May-11 | 1 | 18.00 | 23.00 | 5.00 | B | 101.9 | 313.2 | 62.6 | 14:44 | 14:50 | 0.0 | 17.2 | inf | 35.4 | - | 1.61 | 23.4 | 5.2 | 18.9 | |
| | | 03-May-11 | 1 | 18.00 | 23.00 | 5.00 | A | 194.3 | - | - | 13:46 | 14:12 | 0.0 | 12.5 | inf | 33.0 | - | 1.65 | 0.1 | 14.6 | 19.3 | |
| | | 03-May-11 | 1 | 18.00 | 23.00 | 5.00 | B | 207.5 | - | - | 14:12 | 14:27 | 0.0 | 14.9 | inf | 37.2 | - | 1.68 | 0.1 | 14.6 | 13.3 | |
| | | 03-May-11 | 1 | 18.00 | 23.00 | 5.00 | C | 203.7 | - | - | 14:27 | 14:40 | 7.2 | 12.2 | 0.28 | 48.0 | - | 1.66 | 0.1 | 14.6 | 14.8 | |
| | | 03-May-11 | 1 | 18.00 | 23.00 | 5.00 | D | 41.7 | 647.2 | 129.4 | 14:40 | 14:53 | 7.4 | 0.1 | 0.02 | 53.9 | - | 1.64 | 0.1 | 14.6 | 13.3 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+956.5 | T | 10-Jun-11 | 4 | 11.04 | 13.04 | 2.00 | MF | 163.0 | - | - | 20:12 | 20:33 | 3.0 | 12.6 | 2.03 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 4 | 11.04 | 13.04 | 2.00 | B | 177.0 | - | - | 20:33 | 20:46 | 3.3 | 15.1 | 2.27 | 33.2 | 4.0 | 1.62 | 5.6 | 11.3 | 12.9 | |
| | | 10-Jun-11 | 4 | 11.04 | 13.04 | 2.00 | C | 144.0 | - | - | 20:46 | 20:55 | 3.7 | 15.8 | 2.20 | 45.5 | - | 1.64 | 5.6 | 11.3 | 13.2 | |
| | | 10-Jun-11 | 4 | 11.04 | 13.04 | 2.00 | D | 159.0 | - | - | 20:55 | 21:15 | 3.6 | 0.3 | 0.31 | 61.3 | - | 1.67 | 3.6 | 12.4 | 14.1 | |
| | | 10-Jun-11 | 4 | 11.04 | 13.04 | 2.00 | X | 79.1 | 722.1 | 361.1 | 21:15 | 21:44 | 3.6 | 2.2 | 0.17 | - | - | - | - | - | - | |
| | | 11-May-11 | 3 | 13.54 | 14.54 | 1.00 | A | 50.5 | 50.5 | 50.5 | 17:49 | 18:14 | 4.1 | 0.2 | 0.06 | 30.9 | 3.0 | 1.61 | 3.6 | 11.4 | 18.6 | |
| | | 11-May-11 | 2 | 14.54 | 18.50 | 3.96 | A | 66.3 | 66.3 | 16.7 | 7:58 | 8:18 | 4.6 | 1.5 | 0.08 | - | - | - | - | - | - | |
| | | 11-May-11 | 1 | 18.50 | 23.70 | 5.20 | A | 56.3 | 56.3 | 10.8 | 6:50 | 7:52 | 7.1 | 1.0 | 0.03 | 31.5 | 4.0 | 1.63 | 14.7 | 10.2 | 18.1 | |
| P-31+958 | P | 03-Jun-11 | 4 | 10.48 | 12.48 | 2.00 | B | 84.6 | 84.6 | 42.3 | 4:23 | 4:58 | 4.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 3 | 13.21 | 14.21 | 1.00 | A | 182.7 | - | - | 10:25 | 10:53 | 0.0 | 12.6 | inf | 32.3 | 2.0 | 1.62 | -15.0 | 4.6 | 11.1 | |
| | | 24-Apr-11 | 3 | 13.21 | 14.21 | 1.00 | B | 141.0 | - | - | 10:53 | 11:02 | 0.0 | 18.1 | inf | - | - | - | - | - | - | |
| | | 24-Apr-11 | 3 | 13.21 | 14.21 | 1.00 | C | 168.1 | - | - | 11:02 | 11:11 | 0.6 | 21.1 | 35.51 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 3 | 13.21 | 14.21 | 1.00 | D | 160.2 | - | - | 11:11 | 11:19 | 1.1 | 21.7 | 21.51 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 3 | 13.21 | 14.21 | 1.00 | X | 154.0 | 806.0 | 806.0 | 11:19 | 11:26 | 1.7 | 21.4 | 13.01 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.21 | 18.20 | 3.99 | A | 223.0 | - | - | 8:03 | 8:44 | 0.0 | 12.4 | inf | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.21 | 18.20 | 3.99 | B | 223.2 | - | - | 8:44 | 9:05 | 0.0 | 21.5 | inf | 41.3 | 1.5 | 1.69 | -8.0 | 6.6 | 16.9 | |
| | | 24-Apr-11 | 2 | 14.21 | 18.20 | 3.99 | C | 156.5 | - | - | 9:05 | 9:13 | 0.0 | 20.7 | inf | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.21 | 18.20 | 3.99 | D | 240.3 | - | - | 9:13 | 9:25 | 0.1 | 21.5 | 62.99 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.21 | 18.20 | 3.99 | X | 1123.0 | 1966.0 | 492.7 | 9:25 | 10:18 | 0.9 | 20.4 | 5.46 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 1 | 18.20 | 23.30 | 5.10 | A | 139.2 | 139.2 | 27.3 | 7:23 | 7:56 | 6.7 | 0.6 | 0.02 | - | - | - | - | - | - | |
| Q-31+958.75 | Q | 05-Jul-11 | 4 | 10.3 | 12.3 | 2.00 | MF | 41.7 | 41.70 | 20.85 | 15:30 | 15:47 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 3 | 12.8 | 13.8 | 1.00 | A | 21.2 | 21.20 | 21.20 | 17:26 | 17:45 | 3.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 2 | 13.8 | 17.8 | 4.00 | A | 34 | 34.00 | 8.50 | 17:10 | 17:23 | 4.0 | 1.3 | 0.08 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 1 | 17.8 | 22.9 | 5.10 | A | 198.8 | - | - | 16:24 | 16:52 | 6.5 | 15.1 | 0.45 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 1 | 17.8 | 22.9 | 5.10 | B | 90.7 | 289.50 | 56.76 | 16:52 | 17:06 | 6.8 | 5.5 | 0.16 | - | - | - | - | - | - | |
| T-31+959.5 | T | 13-Jun-11 | 4 | 10.51 | 12.51 | 2.00 | MF | 63.3 | 63.3 | 31.7 | 15:10 | 15:32 | 3.5 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 11-May-11 | 3 | 13.01 | 14.01 | 1.00 | A | 0.6 | 0.6 | 0.6 | 18:29 | 18:40 | 4.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-May-11 | 1 | 18.00 | 23.10 | 5.10 | A | 161.7 | - | - | 8:35 | 9:12 | 2.3 | 9.1 | 0.79 | - | - | - | - | - | - | Communicated to T-31+962.5 |
| | | 11-May-11 | 1 | 18.00 | 23.10 | 5.10 | B | 221.4 | - | - | 9:12 | 9:41 | 5.3 | 10.0 | 0.36 | 38.5 | - | 1.65 | 16.8 | 8.8 | 18.7 | By-pass |
| | | 11-May-11 | 1 | 18.00 | 23.10 | 5.10 | C | 149.1 | 532.2 | 104.4 | 9:41 | 9:55 | 7.1 | 10.3 | 0.28 | 48.0 | - | 1.66 | 16.8 | 8.8 | 19.1 | |
| Q-31+960.25 | Q | 06-Jul-11 | 4 | 10.55 | 12.55 | 2.00 | MF | 37.9 | 37.90 | 18.95 | 16:30 | 16:44 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 3 | 13.05 | 14.05 | 1.00 | A | 76.1 | 76.10 | 76.10 | 3:33 | 4:10 | 3.9 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 2 | 14.05 | 18.1 | 4.05 | A | 91.8 | 91.80 | 22.67 | 3:04 | 3:28 | 4.1 | 1.6 | 0.10 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 1 | 18.1 | 23.1 | 5.00 | A | 29.2 | 29.20 | 5.84 | 2:46 | 2:57 | 7.0 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 1C | 23.1 | 28.2 | 5.10 | A | 33 | 33.00 | 6.47 | 2:24 | 2:36 | 10.2 | 0.5 | 0.01 | - | - | - | - | - | - | |
| S-31+961 | S | 07-Jun-10 | 4 | 11.02 | 13.02 | 2.00 | B | 160.0 | - | - | 15:39 | 16:03 | 2.7 | 12.3 | 2.13 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 11.02 | 13.02 | 2.00 | C | 240.5 | - | - | 16:03 | 16:20 | 3.7 | 15.0 | 2.05 | 47.2 | - | 1.64 | 6.2 | 11.0 | 17.1 | |
| | | 07-Jun-10 | 4 | 11.02 | 13.02 | 2.00 | D | 97.8 | 498.3 | 249.2 | 16:20 | 16:40 | 3.8 | 0.8 | 0.11 | 61.8 | - | 1.66 | 6.7 | 11.0 | 18.0 | |
| | | 01-May-11 | 3 | 13.52 | 14.52 | 1.00 | C | 144.9 | - | - | 0:01 | 0:18 | 4.4 | 6.3 | 1.52 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 13.52 | 14.52 | 1.00 | D | 32.4 | 502.3 | 502.3 | 0:18 | 0:37 | 4.7 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 13.52 | 14.52 | 1.00 | A | 163.4 | - | - | 23:04 | 23:43 | 1.1 | 9.4 | 9.39 | - | - | - | - | - | - | |
| | | 01-May-11 | 3 | 13.52 | 14.52 | 1.00 | B | 161.6 | - | - | 23:43 | 0:01 | 2.9 | 10.0 | 3.73 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 14.52 | 18.50 | 3.98 | A | 208.1 | - | - | 20:50 | 21:19 | 0.0 | 9.3 | inf | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 14.52 | 18.50 | 3.98 | B | 194.9 | - | - | 21:19 | 21:36 | 0.0 | 13.0 | inf | 36.7 | - | 1.65 | -13.3 | 8.5 | 14.0 | |
| | | 01-May-11 | 2 | 14.52 | 18.50 | 3.98 | C | 209.3 | - | - | 21:36 | 21:53 | 0.0 | 12.2 | inf | 46.9 | - | 1.64 | -5.3 | 7.0 | 13.9 | |
| | | 01-May-11 | 2 | 14.52 | 18.50 | 3.98 | D | 192.7 | - | - | 21:53 | 22:11 | 0.9 | 13.5 | 4.33 | 55.5 | - | 1.69 | 4.3 | 8.0 | 12.6 | |
| | | 01-May-11 | 2 | 14.52 | 18.50 | 3.98 | X | 261.0 | - | - | 22:11 | 22:32 | 3.3 | 13.7 | 0.72 | - | - | 1.77 | - | 20.5 | 20.5 | |
| | | 01-May-11 | 2 | 14.52 | 18.50 | 3.98 | X+ | 32.0 | 1098.0 | 275.9 | 22:32 | 22:47 | 4.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-May-11 | 1 | 18.50 | 23.50 | 5.00 | A | 204.4 | 204.4 | 40.9 | 20:08 | 20:40 | 7.1 | 3.5 | 0.10 | 31.0 | 4.0 | 1.63 | -6.4 | 8.4 | 14.5 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-31+961.75 | Q | 05-Jul-11 | 4 | 10.84 | 12.84 | 2.00 | MF | 30.6 | 30.60 | 15.30 | 15:50 | 16:06 | 3.4 | 0.9 | 0.13 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 3 | 13.34 | 14.34 | 1.00 | B | 18.5 | 18.50 | 18.50 | 21:09 | 21:24 | 3.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 2 | 14.34 | 18.3 | 3.96 | B | 37.9 | 37.90 | 9.57 | 20:53 | 21:04 | 4.5 | 0.5 | 0.03 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 1 | 18.3 | 23.4 | 5.10 | B | 199.5 | - | - | 18:59 | 19:21 | 0.1 | 12.8 | 50.62 | 38.4 | 4.0 | 1.6 | 11.0 | 11.4 | 17.9 | |
| | | 28-Jun-11 | 1 | 18.3 | 23.4 | 5.10 | C | 236.5 | - | - | 19:21 | 19:35 | 0.1 | 21.0 | 39.29 | 44.6 | - | 1.7 | 11.0 | 11.4 | 18.0 | |
| | | 28-Jun-11 | 1 | 18.3 | 23.4 | 5.10 | D | 178 | - | - | 19:35 | 19:44 | 0.5 | 20.5 | 7.53 | 61.0 | - | 1.7 | 11.0 | 11.4 | 18.0 | |
| | | 28-Jun-11 | 1 | 18.3 | 23.4 | 5.10 | X | 140.5 | 754.50 | 147.94 | 19:44 | 20:03 | 7.3 | 0.2 | 0.00 | - | - | - | - | - | - | |
| T-31+962.5 | T | 10-Jun-11 | 4 | 10.89 | 12.89 | 2.00 | MF | 79.3 | 79.3 | 39.7 | 19:46 | 20:10 | 3.5 | 0.5 | 0.06 | - | - | - | - | - | - | |
| | | 11-May-11 | 3 | 13.39 | 14.39 | 1.00 | A | 10.7 | 10.7 | 10.7 | 18:55 | 19:10 | 4.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-May-11 | 2 | 14.39 | 18.40 | 4.01 | A | 31.7 | 31.7 | 7.9 | 15:13 | 15:35 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-May-11 | 1 | 18.40 | 23.40 | 5.00 | A | 214.1 | 214.1 | 42.8 | 13:56 | 14:49 | 0.1 | 0.0 | 0.00 | 32.8 | - | 1.62 | 17.0 | 9.7 | 20.3 | |
| Q-31+963.25 | Q | 07-Jul-11 | 4 | 10.74 | 12.74 | 2.00 | MF | 19.7 | 19.70 | 9.85 | 7:09 | 7:23 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 13.24 | 14.24 | 1.00 | A | 5.5 | 5.50 | 5.50 | 8:21 | 8:34 | 4.1 | 0.7 | 0.18 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 2 | 14.24 | 18.2 | 3.96 | A | 47.8 | 47.80 | 12.07 | 8:00 | 8:19 | 4.1 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 1 | 18.2 | 23.2 | 5.00 | A | 228.3 | 228.30 | 45.66 | 7:18 | 7:58 | 6.8 | 0.2 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 1C | 23.2 | 28.8 | 5.60 | A | 22.6 | 22.60 | 4.04 | 7:01 | 7:15 | 10.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-31+964 | P | 03-Jun-11 | 4 | 10.66 | 12.66 | 2.00 | B | 63.2 | 63.2 | 31.6 | 5:01 | 5:26 | 4.0 | 0.5 | 0.06 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 3 | 13.16 | 14.16 | 1.00 | A | 156.9 | - | - | 19:39 | 20:03 | 0.0 | 12.4 | inf | 31.5 | - | 1.62 | 15.7 | 6.7 | 11.5 | |
| | | 24-Apr-11 | 3 | 13.16 | 14.16 | 1.00 | B | 166.1 | - | - | 20:03 | 20:13 | 0.0 | 18.2 | inf | 40.1 | - | 1.62 | -15.6 | 9.2 | 9.6 | |
| | | 24-Apr-11 | 3 | 13.16 | 14.16 | 1.00 | C | 279.9 | 602.9 | 602.9 | 20:13 | 20:29 | 0.2 | 16.0 | 71.63 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.16 | 18.20 | 4.04 | A | 211.5 | - | - | 17:24 | 17:53 | 0.0 | 10.1 | inf | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.16 | 18.20 | 4.04 | B | 192.6 | - | - | 17:53 | 18:10 | 0.0 | 12.7 | inf | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.16 | 18.20 | 4.04 | C | 202.3 | - | - | 18:10 | 18:27 | 0.0 | 12.6 | inf | 48.8 | 1.0 | 1.68 | -15.3 | 5.6 | 10.7 | |
| | | 24-Apr-11 | 2 | 14.16 | 18.20 | 4.04 | D | 195.6 | - | - | 18:27 | 18:41 | 0.0 | 18.9 | 63.03 | 60.3 | - | 1.68 | -15.3 | 5.6 | 10.0 | |
| | | 24-Apr-11 | 2 | 14.16 | 18.20 | 4.04 | X | 124.0 | 926.0 | 229.2 | 18:41 | 18:59 | 4.7 | 0.1 | 0.01 | 230.0 | - | - | 5.7 | 5.7 | 9.2 | |
| | | 24-Apr-11 | 1 | 18.20 | 23.30 | 5.10 | A | 209.9 | - | - | 16:21 | 16:46 | 0.0 | 6.0 | inf | - | - | - | - | - | - | |
| | | 24-Apr-11 | 1 | 18.20 | 23.30 | 5.10 | B | 195.0 | - | - | 16:46 | 17:00 | 4.4 | 19.4 | 0.81 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 1 | 18.20 | 23.30 | 5.10 | C | 176.3 | 581.2 | 114.0 | 17:00 | 17:19 | 7.0 | 0.3 | 0.01 | - | - | - | - | - | - | |
| T-31+965.5 | T | 13-Jun-11 | 4 | 10.18 | 12.18 | 2.00 | MF | 120.7 | 120.7 | 60.4 | 14:34 | 15:06 | 3.5 | 0.3 | 0.05 | - | - | - | - | - | - | |
| | | 11-May-11 | 3 | 12.43 | 13.43 | 1.00 | A | 45.6 | 45.6 | 45.6 | 19:21 | 20:16 | 4.7 | 0.5 | 0.10 | - | - | - | - | - | - | |
| | | 11-May-11 | 1,2 | 13.43 | 25.10 | 11.67 | A | 200.0 | - | - | 15:57 | 16:30 | 4.6 | 12.0 | 0.15 | - | - | - | - | - | - | |
| | | 11-May-11 | 1,2 | 13.43 | 25.10 | 11.67 | B | 27.8 | 227.8 | 19.5 | 16:30 | 16:40 | 4.7 | 1.4 | 0.03 | 40.1 | - | 1.65 | 2.0 | 11.0 | 17.3 | |
| Q-31+966.25 | Q | 06-Jul-11 | 4 | 10.46 | 12.46 | 2.00 | MF | 33.1 | 33.10 | 16.55 | 16:46 | 16:59 | 3.3 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 12.96 | 13.96 | 1.00 | A | 17.6 | 17.60 | 17.60 | 6:24 | 6:50 | 4.0 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 2 | 13.96 | 18 | 4.04 | A | 40.8 | 40.80 | 10.10 | 5:10 | 5:22 | 4.3 | 1.0 | 0.05 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 1 | 18 | 23.1 | 5.10 | A | 91.7 | 91.70 | 17.98 | 4:34 | 4:56 | 7.1 | 2.8 | 0.08 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+967 | S | 07-Jun-10 | 4 | 10.45 | 12.45 | 2.00 | B | 161.1 | - | - | 16:43 | 17:07 | 1.7 | 12.1 | 3.37 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 10.45 | 12.45 | 2.00 | C | 282.9 | - | - | 17:07 | 17:33 | 2.3 | 6.5 | 1.44 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 10.45 | 12.45 | 2.00 | D | 276.6 | - | - | 17:33 | 17:51 | 2.9 | 19.2 | 4.31 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 4 | 10.45 | 12.45 | 2.00 | X | 160.4 | 881.0 | 440.5 | 17:51 | 18:00 | 3.3 | 21.2 | 3.19 | - | - | - | - | - | - | |
| | | 03-May-11 | 3 | 12.95 | 13.95 | 1.00 | A | 13.3 | 13.3 | 13.3 | 21:17 | 21:33 | 4.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.66 | 16.00 | 2.34 | A | 202.0 | - | - | 2:49 | 3:28 | 1.8 | 12.8 | 1.81 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.66 | 16.00 | 2.34 | B | 198.4 | - | - | 3:28 | 3:46 | 0.3 | 7.6 | 7.07 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.66 | 16.00 | 2.34 | C | 197.1 | - | - | 3:46 | 4:03 | 2.6 | 10.1 | 0.73 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.66 | 16.00 | 2.34 | D | 184.5 | - | - | 4:03 | 4:18 | 2.6 | 12.9 | 1.37 | - | - | - | - | - | - | |
| | | 01-May-11 | 2 | 13.66 | 16.00 | 2.34 | X | 143.0 | 925.0 | 395.3 | 4:18 | 4:46 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 13.95 | 17.90 | 3.95 | A | 188.1 | - | - | 18:57 | 19:29 | 0.0 | 12.1 | inf | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 13.95 | 17.90 | 3.95 | B | 192.8 | - | - | 19:29 | 19:42 | 0.0 | 17.7 | inf | 35.6 | - | 1.63 | 17.4 | 10.5 | 15.2 | |
| | | 03-May-11 | 2 | 13.95 | 17.90 | 3.95 | C | 207.4 | - | - | 19:42 | 19:52 | 0.9 | 20.9 | 5.82 | 46.9 | - | 1.64 | 17.4 | 10.4 | 12.6 | |
| | | 03-May-11 | 2 | 13.95 | 17.90 | 3.95 | D | 216.7 | - | - | 19:52 | 20:11 | 0.9 | 21.6 | 6.40 | 63.0 | - | 1.66 | 17.4 | 10.2 | 14.1 | |
| | | 03-May-11 | 2 | 13.95 | 17.90 | 3.95 | X | 196.2 | - | - | 20:11 | 20:20 | 2.9 | 20.2 | 1.77 | - | - | - | - | - | - | |
| | | 03-May-11 | 2 | 13.95 | 17.90 | 3.95 | X+ | 657.8 | 1659.0 | 420.0 | 20:20 | 21:00 | 4.2 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 03-May-11 | 1 | 17.90 | 23.10 | 5.20 | A | 34.2 | 34.2 | 6.6 | 18:34 | 18:51 | 6.7 | 0.0 | 0.00 | 32.1 | 4.0 | 1.59 | 17.4 | 10.5 | 17.3 | |
| Q-31+967.75 | Q | 05-Jul-11 | 4 | 10.51 | 12.51 | 2.00 | MF | 24.9 | 24.90 | 12.45 | 16:09 | 16:23 | 3.6 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 3 | 13.01 | 14.01 | 1.00 | A | 160 | - | - | 23:12 | 23:34 | 3.0 | 12.0 | 4.00 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 3 | 13.01 | 14.01 | 1.00 | B | 159.6 | - | - | 23:34 | 23:48 | 3.7 | 12.4 | 3.29 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 3 | 13.01 | 14.01 | 1.00 | C | 94.8 | 414.40 | 414.40 | 23:48 | 0:28 | 4.0 | 0.9 | 0.23 | - | 5.0 | - | 12.9 | 8.6 | 17.3 | |
| | | 28-Jun-11 | 2 | 14.01 | 18.1 | 4.09 | A | 198.9 | - | - | 21:45 | 22:07 | 2.1 | 12.7 | 1.51 | 31.2 | 10.0 | 1.6 | 12.9 | 11.4 | 20.2 | |
| | | 28-Jun-11 | 2 | 14.01 | 18.1 | 4.09 | B | 201.1 | - | - | 22:07 | 22:23 | 3.7 | 11.9 | 0.85 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 2 | 14.01 | 18.1 | 4.09 | C | 200 | - | - | 22:23 | 22:40 | 4.3 | 10.0 | 0.61 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 2 | 14.01 | 18.1 | 4.09 | D | 66.2 | 666.20 | 162.89 | 22:40 | 23:02 | 4.3 | 1.8 | 0.10 | - | - | - | - | - | - | |
| T-31+968.5 | T | 10-Jun-11 | 4 | 10.46 | 12.46 | 2.00 | MF | 74.2 | 74.2 | 37.1 | 19:20 | 19:43 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 12.96 | 13.96 | 1.00 | A | 160.1 | - | - | 21:36 | 22:00 | 1.0 | 9.7 | 9.05 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 12.96 | 13.96 | 1.00 | B | 119.2 | - | - | 22:00 | 22:16 | 2.2 | 10.2 | 4.33 | 35.0 | 7.0 | 1.62 | 20.6 | 9.6 | 18.5 | By-pass between plastic and steel casing |
| | | 12-May-11 | 3 | 12.96 | 13.96 | 1.00 | C | 126.4 | - | - | 22:16 | 22:29 | 3.1 | 10.5 | 3.62 | 45.6 | - | 1.66 | 20.6 | 9.6 | 19.0 | |
| | | 12-May-11 | 3 | 12.96 | 13.96 | 1.00 | D | 57.1 | - | - | 22:29 | 22:36 | 4.1 | 1.4 | 0.35 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 12.96 | 13.96 | 1.00 | X | 3.5 | 466.3 | 466.3 | 22:36 | 22:47 | 4.3 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 11-May-11 | 2 | 13.96 | 18.00 | 4.04 | A | 200.4 | - | - | 21:30 | 21:53 | 0.0 | 12.5 | inf | - | - | - | - | - | - | Communicated to T-31+971.5 |
| | | 11-May-11 | 2 | 13.96 | 18.00 | 4.04 | B | 249.3 | - | - | 21:53 | 22:22 | 0.0 | 6.7 | inf | 37.4 | 4.0 | 1.63 | 0.8 | 9.4 | 15.6 | |
| | | 11-May-11 | 2 | 13.96 | 18.00 | 4.04 | C | 167.4 | - | - | 22:22 | 22:38 | 1.2 | 12.2 | 2.60 | 46.1 | - | 1.64 | 0.8 | 9.4 | 15.4 | Communicated to T-31+974.5 |
| | | 11-May-11 | 2 | 13.96 | 18.00 | 4.04 | D | 182.9 | - | - | 22:38 | 22:52 | 2.9 | 12.4 | 1.08 | 106.0 | - | 1.64 | 0.8 | 9.4 | 14.8 | |
| | | 11-May-11 | 2 | 13.96 | 18.00 | 4.04 | X | 117.0 | 917.0 | 227.0 | 22:52 | 23:47 | 4.4 | 0.5 | 0.03 | - | - | 1.69 | 3.4 | 9.7 | 15.9 | |
| | | 11-May-11 | 1 | 18.00 | 23.00 | 5.00 | A | 140.2 | 140.2 | 28.0 | 21:03 | 21:27 | 7.6 | 5.4 | 0.14 | - | - | - | - | - | - | |
| Q-31+969.25 | Q | 06-Jul-11 | 4 | 10.43 | 12.43 | 2.00 | MF | 44.4 | 44.40 | 22.20 | 17:01 | 17:17 | 3.2 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 12.93 | 13.93 | 1.00 | A | 163 | - | - | 16:01 | 16:24 | 2.2 | 11.9 | 5.46 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 12.93 | 13.93 | 1.00 | B | 155.9 | - | - | 16:24 | 16:34 | 3.1 | 15.0 | 4.67 | 37.3 | - | 1.6 | 13.0 | 8.9 | 15.2 | |
| | | 01-Jul-11 | 3 | 12.93 | 13.93 | 1.00 | C | 161.2 | 480.10 | 480.10 | 16:34 | 17:04 | 3.7 | 0.0 | 0.00 | 46.1 | - | 1.6 | 13.0 | 8.8 | 15.7 | |
| | | 01-Jul-11 | 2 | 13.93 | 18 | 4.07 | A | 23.5 | 23.50 | 5.77 | 15:46 | 15:59 | 4.2 | 0.0 | 0.00 | 30.6 | 4.5 | 1.6 | 13.2 | 8.8 | 15.5 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+970 | P | 04-Jun-11 | 4 | 10.84 | 12.84 | 2.00 | B | 200.6 | - | - | 8:05 | 8:37 | 2.2 | 15.3 | 3.57 | 37.1 | - | 1.60 | 1.9 | 7.9 | 11.2 | |
| | | 04-Jun-11 | 4 | 10.84 | 12.84 | 2.00 | C | 21.6 | 222.2 | 111.1 | 8:37 | 8:47 | 4.0 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 3 | 13.34 | 14.34 | 1.00 | A | 157.2 | - | - | 4:38 | 5:00 | 0.3 | 10.3 | 31.49 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 3 | 13.34 | 14.34 | 1.00 | B | 158.6 | - | - | 5:00 | 5:11 | 0.6 | 15.9 | 27.29 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 3 | 13.34 | 14.34 | 1.00 | C | 181.0 | - | - | 5:11 | 5:24 | 1.5 | 17.8 | 11.27 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 3 | 13.34 | 14.34 | 1.00 | D | 105.5 | 602.3 | 602.3 | 5:24 | 5:33 | 1.0 | 10.4 | 10.54 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.34 | 18.30 | 3.96 | A | 149.8 | - | - | 2:23 | 2:44 | 0.4 | 4.0 | 2.13 | - | - | - | - | - | - | Stage repeated after equipment maintenance |
| | | 24-Apr-11 | 2 | 14.34 | 18.30 | 3.96 | B | 262.5 | - | - | 2:44 | 3:05 | 0.0 | 15.6 | inf | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.34 | 18.30 | 3.96 | C | 191.0 | - | - | 3:05 | 3:17 | 0.0 | 18.6 | inf | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.34 | 18.30 | 3.96 | D | 193.5 | - | - | 3:17 | 3:28 | 0.6 | 15.3 | 7.09 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.34 | 18.30 | 3.96 | X | 769.2 | 1566.0 | 502.0 | 3:28 | 4:29 | 0.8 | 13.9 | 4.49 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.34 | 18.30 | 3.96 | A | 199.6 | - | - | 23:04 | 23:32 | 0.0 | 9.8 | inf | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.34 | 18.30 | 3.96 | B | 199.7 | - | - | 23:32 | 23:47 | 0.7 | 19.7 | 7.61 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 2 | 14.34 | 18.30 | 3.96 | C | 22.6 | 421.9 | 106.5 | 23:47 | 23:51 | 0.0 | 0.1 | inf | - | - | - | - | - | - | |
| | | 24-Apr-11 | 1 | 18.30 | 23.40 | 5.10 | A | 201.1 | - | - | 21:44 | 22:10 | 3.4 | 12.6 | 0.75 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 1 | 18.30 | 23.40 | 5.10 | B | 194.4 | - | - | 22:10 | 22:22 | 7.1 | 12.3 | 0.81 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 1 | 18.30 | 23.40 | 5.10 | C | 205.0 | - | - | 22:22 | 22:39 | 4.4 | 11.7 | 0.51 | - | - | - | - | - | - | |
| | | 24-Apr-11 | 1 | 18.30 | 23.40 | 5.10 | D | 119.4 | 719.9 | 141.2 | 22:39 | 22:54 | 6.4 | 6.9 | 0.21 | - | - | - | - | - | - | |
| Q-31+970.75 | Q | 05-Jul-11 | 4 | 11.22 | 13.22 | 2.00 | MF | 59.3 | 59.30 | 29.65 | 16:27 | 16:49 | 3.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 3 | 13.72 | 14.72 | 1.00 | A | 21.4 | 21.40 | 21.40 | 3:26 | 3:42 | 3.8 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 2 | 14.72 | 18.8 | 4.08 | A | 197.9 | 197.90 | 48.50 | 2:23 | 3:18 | 4.2 | 0.6 | 0.04 | 31.6 | - | 1.6 | 15.0 | 8.6 | 16.8 | Communicated to Q-31+973.75 |
| T-31+971.5 | T | 13-Jun-11 | 4 | 11.50 | 13.50 | 2.00 | MF | 80.9 | 80.9 | 40.5 | 14:07 | 14:30 | 3.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 14.00 | 15.00 | 1.00 | A | 19.9 | 19.9 | 19.9 | 23:02 | 23:14 | 3.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 11-May-11 | 2 | 15.00 | 19.00 | 4.00 | A | 210.6 | - | - | 2:27 | 3:17 | 3.1 | 11.5 | 0.71 | - | - | - | - | - | - | |
| | | 11-May-11 | 2 | 15.00 | 19.00 | 4.00 | B | 190.6 | - | - | 3:17 | 3:35 | 4.4 | 7.9 | 0.35 | 36.4 | - | 1.62 | 21.4 | 14.6 | 17.3 | |
| | | 11-May-11 | 2 | 15.00 | 19.00 | 4.00 | C | 26.9 | 428.1 | 107.0 | 3:35 | 3:47 | 4.3 | 0.1 | 0.01 | 46.8 | 3.0 | 1.66 | 21.4 | 14.6 | 17.5 | |
| | | 11-May-11 | 1 | 19.00 | 24.10 | 5.10 | A | 25.1 | 25.1 | 4.9 | 2:10 | 2:21 | 7.4 | 0.0 | 0.00 | 31.0 | - | 1.61 | 15.8 | 9.6 | 15.5 | |
| Q-31+972.25 | Q | 06-Jul-11 | 4 | 11.12 | 13.12 | 2.00 | MF | 36.8 | 36.80 | 18.40 | 17:19 | 17:33 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 13.62 | 14.62 | 1.00 | A | 13.4 | 13.40 | 13.40 | 18:22 | 18:35 | 4.2 | 0.0 | 0.00 | 30.6 | 4.0 | 1.6 | 12.9 | 8.6 | 15.6 | |
| | | 01-Jul-11 | 2 | 14.62 | 18.8 | 4.18 | A | 189.3 | 189.30 | 45.29 | 17:12 | 17:54 | 4.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-31+973 | S | 07-Jun-11 | 4 | 11.35 | 13.35 | 2.00 | B | 87.2 | 87.2 | 43.6 | 18:54 | 19:18 | 4.2 | 0.5 | 0.06 | 38.1 | 4.0 | 1.61 | 4.9 | 8.4 | 14.0 | |
| | | 02-May-11 | 3 | 13.85 | 14.85 | 1.00 | A | 31.1 | 31.1 | 31.1 | 9:53 | 10:07 | 4.6 | 0.8 | 0.18 | - | - | - | - | - | - | |
| | | 02-May-11 | 2 | 14.85 | 18.80 | 3.95 | A | 239.0 | - | - | 7:46 | 8:24 | 0.0 | 13.0 | inf | - | - | - | - | - | - | |
| | | 02-May-11 | 2 | 14.85 | 18.80 | 3.95 | B | 188.8 | - | - | 8:24 | 8:37 | 0.0 | 16.4 | inf | - | - | - | - | - | - | |
| | | 02-May-11 | 2 | 14.85 | 18.80 | 3.95 | C | 235.0 | - | - | 8:37 | 8:50 | 0.6 | 20.7 | 8.30 | 48.7 | - | 1.63 | 7.4 | 6.1 | 16.2 | |
| | | 02-May-11 | 2 | 14.85 | 18.80 | 3.95 | D | 167.2 | - | - | 8:50 | 8:57 | 1.1 | 20.3 | 4.61 | 72.4 | - | 1.66 | 7.2 | 6.8 | 15.4 | |
| | | 02-May-11 | 2 | 14.85 | 18.80 | 3.95 | X | 615.0 | 1445.0 | 365.8 | 8:57 | 9:44 | 4.4 | 0.5 | 0.03 | - | - | - | - | - | - | |
| | | 02-May-11 | 1 | 18.80 | 23.80 | 5.00 | A | 226.1 | - | - | 6:52 | 7:26 | 6.3 | 7.2 | 0.22 | 31.6 | 3.5 | 1.63 | 7.6 | 6.8 | 15.8 | |
| | | 02-May-11 | 1 | 18.80 | 23.80 | 5.00 | B | 26.7 | 252.8 | 50.6 | 7:26 | 7:37 | 7.1 | 0.1 | 0.00 | 36.4 | 10.0 | 1.65 | 7.6 | 6.8 | 14.3 | |
| Q-31+973.75 | Q | 05-Jul-11 | 4 | 11.07 | 13.07 | 2.00 | MF | 26.8 | 26.80 | 13.40 | 16:52 | 17:05 | 3.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 3 | 13.57 | 14.57 | 1.00 | A | 18.5 | 18.50 | 18.50 | 4:06 | 4:22 | 4.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 2 | 14.57 | 18.6 | 4.03 | A | 11.7 | 11.70 | 2.90 | 3:48 | 4:00 | 4.4 | 0.7 | 0.04 | - | - | - | - | - | - | |
| T-31+974.5 | T | 10-Jun-11 | 4 | 10.99 | 12.99 | 2.00 | MF | 82.4 | 82.4 | 41.2 | 18:44 | 19:16 | 3.6 | 0.5 | 0.07 | 29.7 | 4.0 | 1.45 | 5.1 | 11.1 | 10.2 | |
| | | 12-May-11 | 3 | 13.49 | 14.49 | 1.00 | A | 17.4 | 17.4 | 17.4 | 20:33 | 20:46 | 4.2 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 12-May-11 | 2 | 14.49 | 18.50 | 4.01 | A | 27.5 | 27.5 | 6.9 | 20:17 | 20:30 | 4.4 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 12-May-11 | 1 | 18.50 | 23.50 | 5.00 | A | 30.1 | 30.1 | 6.0 | 19:58 | 20:12 | 7.2 | 0.2 | 0.00 | 31.0 | 3.0 | 1.61 | 17.3 | 9.3 | 17.2 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-31+976 | P | 04-Jun-11 | 4 | 11.14 | 13.14 | 2.00 | B | 47.8 | 47.8 | 23.9 | 14:14 | 14:37 | 4.0 | 1.2 | 0.14 | 33.1 | - | 1.59 | 2.4 | 11.1 | 13.6 | |
| | | 25-Apr-11 | 3 | 13.64 | 14.64 | 1.00 | A | 11.8 | 11.8 | 11.8 | 9:30 | 9:59 | 4.4 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 2 | 14.64 | 17.60 | 2.96 | A | 26.2 | 26.2 | 8.9 | 9:09 | 9:24 | 4.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 1 | 17.60 | 23.70 | 6.10 | A | 197.7 | - | - | 6:32 | 7:01 | 0.3 | 18.3 | 11.76 | 31.6 | - | 1.59 | -4.3 | 6.1 | 14.3 | |
| | | 25-Apr-11 | 1 | 17.60 | 23.70 | 6.10 | B | 190.1 | - | - | 7:01 | 7:13 | 0.2 | 17.6 | 17.06 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 1 | 17.60 | 23.70 | 6.10 | C | 210.3 | - | - | 7:13 | 7:23 | 1.1 | 20.0 | 3.64 | 47.9 | - | 1.64 | -4.2 | 6.0 | 15.6 | |
| | | 25-Apr-11 | 1 | 17.60 | 23.70 | 6.10 | D | 197.4 | - | - | 7:23 | 7:33 | 1.9 | 17.7 | 1.85 | 64.3 | - | 1.66 | -4.0 | 6.1 | 16.1 | Communicated to P-31+982; |
| | | 25-Apr-11 | 1 | 17.60 | 23.70 | 6.10 | X | 1193.5 | 1989.0 | 326.1 | 7:33 | 9:03 | 3.4 | 13.5 | 0.64 | - | - | - | - | - | - | By-pass: packer raised 1m. |
| Q-31+976.75 | Q | 05-Jul-11 | 4 | 11.8 | 13.8 | 2.00 | MF | 67.6 | 67.60 | 33.80 | 17:06 | 17:27 | 3.5 | 0.0 | 0.00 | 30.0 | - | 1.5 | 10.0 | 11.6 | 12.9 | |
| | | 29-Jun-11 | 2,3 | 14.3 | 19.3 | 5.00 | A | 204.7 | - | - | 4:59 | 5:46 | 2.1 | 12.7 | 1.26 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 2,3 | 14.3 | 19.3 | 5.00 | B | 65.3 | - | - | 5:46 | 5:51 | 0.4 | 12.5 | 7.28 | - | - | - | - | - | - | By-Pass Between Plastic And Steel Casing |
| | | 29-Jun-11 | 2,3 | 14.3 | 19.3 | 5.00 | D | 238.9 | 508.90 | 101.78 | 5:51 | 6:12 | 3.8 | 13.0 | 0.69 | - | - | - | - | - | - | |
| | | 28-Jun-11 | 1 | 19.3 | 24.5 | 5.20 | A | 35.4 | 35.40 | 6.81 | 4:39 | 4:50 | 7.0 | 0.7 | 0.02 | - | - | - | - | - | - | |
| T-31+977.5 | T | 13-Jun-11 | 4 | 11.78 | 13.78 | 2.00 | MF | 90.7 | 90.7 | 45.4 | 13:38 | 14:02 | 3.6 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 14.28 | 15.28 | 1.00 | A | 19.5 | 19.5 | 19.5 | 17:21 | 17:35 | 2.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-11 | 1,2 | 15.28 | 24.30 | 9.02 | A | 28.7 | 28.7 | 3.2 | 14:06 | 14:20 | 5.3 | 0.2 | 0.00 | 33.7 | 4.0 | 1.64 | 18.7 | 8.0 | 18.9 | |
| S-31+979 | S | 07-Jun-11 | 4 | 11.75 | 13.75 | 2.00 | B | 97.8 | 97.8 | 48.9 | 19:31 | 19:58 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 14.25 | 15.25 | 1.00 | A | 48.8 | 48.8 | 48.8 | 14:27 | 15:11 | 4.4 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 02-May-11 | 2 | 15.25 | 19.30 | 4.05 | A | 196.8 | - | - | 13:04 | 13:33 | 0.7 | 9.0 | 3.08 | 32.0 | 1.0 | 1.54 | 3.0 | 20.1 | 12.0 | |
| | | 02-May-11 | 2 | 15.25 | 19.30 | 4.05 | B | 197.6 | - | - | 13:33 | 13:45 | 2.2 | 20.5 | 2.32 | 36.0 | - | 1.56 | 3.0 | 11.1 | 11.3 | |
| | | 02-May-11 | 2 | 15.25 | 19.30 | 4.05 | C | 209.3 | - | - | 13:45 | 13:56 | 2.9 | 23.9 | 2.08 | 46.0 | - | 1.64 | -12.0 | 8.0 | 12.0 | |
| | | 02-May-11 | 2 | 15.25 | 19.30 | 4.05 | D | 257.3 | - | - | 13:56 | 14:09 | 4.2 | 18.6 | 0.74 | 46.0 | - | 1.65 | -10.6 | 7.1 | 12.0 | |
| | | 02-May-11 | 2 | 15.25 | 19.30 | 4.05 | X | 21.0 | 882.0 | 217.8 | 14:09 | 14:22 | 4.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-11 | 1 | 19.30 | 24.30 | 5.00 | A | 13.5 | 13.5 | 2.7 | 10:38 | 10:50 | 6.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| Q-31+979.75 | Q | 05-Jul-11 | 4 | 11.83 | 13.83 | 2.00 | MF | 75.2 | 75.20 | 37.60 | 20:32 | 20:55 | 3.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 3 | 14.3 | 15.3 | 1.00 | A | 21.8 | 21.80 | 21.80 | 8:11 | 8:29 | 4.1 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 2 | 15.3 | 19.3 | 4.00 | A | 39.3 | 39.30 | 9.83 | 7:55 | 8:07 | 4.3 | 1.6 | 0.09 | 31.6 | - | 1.6 | 11.7 | 10.4 | 11.9 | |
| | | 29-Jun-11 | 1 | 19.3 | 24.4 | 5.10 | A | 27.3 | 27.30 | 5.35 | 7:37 | 7:50 | 7.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+980.5 | T | 10-Jun-11 | 4 | 11.63 | 13.63 | 2.00 | MF | 81.9 | 81.9 | 41.0 | 17:07 | 17:32 | 3.5 | 0.8 | 0.11 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 14.13 | 15.13 | 1.00 | A | 22.4 | 22.4 | 22.4 | 17:44 | 18:09 | 4.2 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 12-May-11 | 1,2 | 15.13 | 24.20 | 9.07 | A | 197.6 | - | - | 14:34 | 15:17 | 3.1 | 4.4 | 0.34 | - | - | - | - | - | - | Communicated to T-31+983.5 |
| | | 12-May-11 | 1,2 | 15.13 | 24.20 | 9.07 | B | 255.2 | 452.8 | 49.9 | 15:17 | 15:50 | 5.4 | 5.6 | 0.20 | 35.5 | - | 1.65 | 18.7 | 8.0 | 20.4 | |
| P-31+982 | P | 04-Jun-11 | 4 | 11.17 | 13.17 | 2.00 | B | 178.5 | - | - | 14:43 | 15:09 | 1.7 | 15.6 | 5.90 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 4 | 11.17 | 13.17 | 2.00 | C | 265.9 | - | - | 15:09 | 15:22 | 2.7 | 24.4 | 5.32 | 50.2 | - | 1.63 | 2.6 | 10.5 | 13.1 | |
| | | 04-Jun-11 | 4 | 11.17 | 13.17 | 2.00 | D | 287.9 | - | - | 15:22 | 15:36 | 3.6 | 22.8 | 3.79 | 71.0 | - | 1.65 | 2.6 | 10.5 | 12.6 | |
| | | 04-Jun-11 | 4 | 11.17 | 13.17 | 2.00 | X | 150.7 | 883.0 | 441.5 | 15:36 | 15:53 | 3.9 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 17-May-11 | 3 | 13.67 | 14.67 | 1.00 | A | 30.4 | 30.4 | 30.4 | 17:25 | 17:37 | 4.7 | 0.5 | 0.10 | - | - | - | - | - | - | |
| | | 17-May-11 | 2 | 14.67 | 18.70 | 4.03 | A | 30.9 | 30.9 | 7.7 | 17:11 | 17:23 | 4.6 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 17-May-11 | 1 | 18.70 | 23.70 | 5.00 | A | 47.0 | 47.0 | 9.4 | 16:44 | 17:03 | 6.9 | 0.3 | 0.01 | - | - | - | - | - | - | |
| T-31+983.5 | T | 13-Jun-11 | 4 | 13.40 | 15.40 | 2.00 | MF | 103.2 | 103.2 | 51.6 | 11:10 | 11:37 | 3.6 | 1.4 | 0.20 | - | - | - | - | - | - | |
| | | 12-May-11 | 3 | 15.90 | 16.90 | 1.00 | A | 14.2 | 14.2 | 14.2 | 18:29 | 18:41 | 4.0 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 12-May-11 | 2 | 16.90 | 20.90 | 4.00 | A | 49.1 | 49.1 | 12.3 | 16:30 | 16:46 | 4.6 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 12-May-11 | 1 | 20.90 | 26.00 | 5.10 | A | 26.1 | 26.1 | 5.1 | 16:09 | 16:23 | 7.7 | 0.4 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-31+985 | S | 07-Jun-11 | 4 | 10.64 | 12.65 | 2.01 | B | 134.9 | 134.9 | 67.1 | 20:01 | 20:47 | 4.2 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 13.14 | 14.14 | 1.00 | A | 171.2 | - | - | 18:14 | 18:40 | 3.2 | 12.2 | 3.79 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 13.14 | 14.14 | 1.00 | B | 141.0 | - | - | 18:40 | 18:50 | 4.2 | 18.1 | 4.31 | 36.3 | 3.0 | 1.61 | 2.5 | 7.4 | 13.6 | |
| | | 02-May-11 | 3 | 13.14 | 14.14 | 1.00 | C | 163.9 | - | - | 18:50 | 18:59 | 3.7 | 18.5 | 4.93 | 45.7 | - | 1.62 | 2.5 | 7.4 | 11.8 | |
| | | 02-May-11 | 3 | 13.14 | 14.14 | 1.00 | D | 206.4 | 682.5 | 682.5 | 18:59 | 19:26 | 4.7 | 0.1 | 0.02 | 64.2 | - | 1.64 | 2.5 | 7.4 | 13.2 | |
| | | 02-May-11 | 1,2 | 14.14 | 23.14 | 9.00 | A | 196.1 | - | - | 16:11 | 16:42 | 0.0 | 12.1 | inf | - | - | - | - | - | - | |
| | | 02-May-11 | 1,2 | 14.14 | 23.14 | 9.00 | B | 216.4 | - | - | 16:42 | 16:57 | 0.0 | 21.7 | inf | - | - | - | - | - | - | |
| | | 02-May-11 | 1,2 | 14.14 | 23.14 | 9.00 | C | 184.3 | - | - | 16:57 | 17:07 | 0.8 | 22.2 | 2.97 | - | - | - | - | - | - | |
| | | 02-May-11 | 1,2 | 14.14 | 23.14 | 9.00 | D | 242.2 | - | - | 17:07 | 17:16 | 3.5 | 25.9 | 0.83 | - | - | - | - | - | - | |
| | | 02-May-11 | 1,2 | 14.14 | 23.14 | 9.00 | X | 269.0 | 1108.0 | 123.1 | 17:16 | 17:56 | 4.1 | 1.9 | 0.05 | - | - | - | - | - | - | |
| Q-31+985.75 | Q | 05-Jul-11 | 4 | 11.96 | 13.96 | 2.00 | MF | 86.3 | 86.30 | 43.15 | 20:10 | 20:29 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 3 | 14.46 | 15.46 | 1.00 | A | 38 | 38.00 | 38.00 | 10:22 | 10:34 | 3.8 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 2 | 15.46 | 19.5 | 4.04 | A | 27.4 | 27.40 | 6.78 | 10:04 | 10:18 | 4.1 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 1 | 19.5 | 24.5 | 5.00 | A | 257.3 | 257.30 | 51.46 | 9:08 | 9:55 | 7.0 | 0.9 | 0.02 | - | - | - | - | - | - | |
| T-31+986.5 | T | 10-Jun-11 | 4 | 11.85 | 13.85 | 2.00 | MF | 161.0 | 161.0 | 80.5 | 16:25 | 17:01 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-May-11 | 3 | 14.35 | 15.35 | 1.00 | A | 36.8 | 36.8 | 36.8 | 14:18 | 14:43 | 4.1 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 12-May-11 | 2 | 15.35 | 19.40 | 4.05 | A | 203.3 | - | - | 1:05 | 1:29 | 3.9 | 12.9 | 0.73 | 31.4 | - | 1.62 | 8.5 | 9.0 | 16.1 | Collapse, no Stage 1 |
| | | 12-May-11 | 2 | 15.35 | 19.40 | 4.05 | B | 155.9 | 359.2 | 88.7 | 1:29 | 1:51 | 5.8 | 1.8 | 0.08 | 37.2 | - | 1.63 | 8.5 | 9.0 | 16.2 | |
| Q-31+987.25 | Q | 06-Jul-11 | 4 | 12.41 | 14.41 | 2.00 | MF | 29.6 | 29.60 | 14.80 | 17:35 | 17:48 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 14.91 | 15.91 | 1.00 | A | 14.8 | 14.80 | 14.80 | 19:54 | 20:09 | 4.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 2 | 15.91 | 19.9 | 3.99 | A | 29.3 | 29.30 | 7.34 | 19:34 | 19:49 | 4.4 | 0.4 | 0.02 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 1 | 19.9 | 25 | 5.10 | A | 31.2 | 31.20 | 6.12 | 19:14 | 19:29 | 7.0 | 0.5 | 0.01 | - | - | - | - | - | - | |
| P-31+988 | P | 04-Jun-11 | 4 | 11.17 | 13.17 | 2.00 | B | 29.6 | 29.6 | 14.8 | 16:48 | 17:02 | 4.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 3 | 14.86 | 15.89 | 1.03 | A | 162.4 | - | - | 15:05 | 15:31 | 2.0 | 11.9 | 6.05 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 3 | 14.86 | 15.89 | 1.03 | B | 154.0 | - | - | 15:31 | 15:41 | 2.4 | 14.5 | 6.07 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 3 | 14.86 | 15.89 | 1.03 | C | 165.9 | - | - | 15:41 | 15:50 | 3.1 | 19.8 | 6.47 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 3 | 14.86 | 15.89 | 1.03 | D | 182.5 | - | - | 15:50 | 16:00 | 4.6 | 17.7 | 3.85 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 3 | 14.86 | 15.89 | 1.03 | X | 141.2 | 806.0 | 782.5 | 16:00 | 16:08 | 4.7 | 15.3 | 3.27 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 2 | 15.89 | 19.90 | 4.01 | A | 205.1 | - | - | 13:32 | 14:01 | 0.0 | 15.4 | inf | 35.0 | - | 1.69 | -1.7 | 7.3 | 17.3 | |
| | | 25-Apr-11 | 2 | 15.89 | 19.90 | 4.01 | B | 210.9 | - | - | 14:01 | 14:13 | 1.2 | 20.4 | 4.18 | 38.6 | - | 1.67 | -15.1 | 10.0 | 12.6 | |
| | | 25-Apr-11 | 2 | 15.89 | 19.90 | 4.01 | C | 188.6 | - | - | 14:13 | 14:23 | 3.3 | 21.8 | 1.32 | 49.5 | - | 1.70 | -15.1 | 10.0 | 9.7 | |
| | | 25-Apr-11 | 2 | 15.89 | 19.90 | 4.01 | D | 195.4 | - | - | 14:23 | 14:34 | 4.1 | 11.7 | 0.74 | 64.3 | 1.0 | 1.71 | -14.8 | 5.8 | 7.9 | |
| | | 25-Apr-11 | 2 | 15.89 | 19.90 | 4.01 | X | 99.0 | 899.0 | 224.2 | 14:34 | 15:00 | 4.1 | 0.0 | 0.00 | - | - | - | - | - | - | Communicated to P-31+994 |
| | | 25-Apr-11 | 1 | 19.90 | 24.90 | 5.00 | A | 155.7 | 155.7 | 31.1 | 11:05 | 11:39 | 7.0 | 1.0 | 0.03 | - | - | - | - | - | - | |
| T-31+989.5 | T | 13-Jun-11 | 4 | 11.83 | 13.83 | 2.00 | MF | 70.2 | 70.2 | 35.1 | 10:42 | 11:04 | 3.7 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 14-May-11 | 3 | 14.33 | 15.33 | 1.00 | A | 34.8 | 34.8 | 34.8 | 13:46 | 14:08 | 4.3 | 0.2 | 0.06 | 32.0 | 5.0 | 1.60 | 16.7 | 5.0 | 14.3 | |
| | | 12-May-11 | 2 | 15.33 | 19.30 | 3.97 | A | 30.4 | 30.4 | 7.7 | 2:39 | 2:54 | 3.9 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 12-May-11 | 1 | 19.30 | 24.40 | 5.10 | A | 26.4 | 26.4 | 5.2 | 2:18 | 2:36 | 7.3 | 0.1 | 0.00 | - | - | - | - | - | - | |
| S-31+991 | S | 07-Jun-11 | 4 | 11.94 | 13.94 | 2.00 | B | 166.0 | - | - | 20:45 | 21:06 | 1.4 | 11.8 | 4.48 | - | - | - | - | - | - | |
| | | 07-Jun-11 | 4 | 11.94 | 13.94 | 2.00 | C | 155.5 | - | - | 21:06 | 21:16 | 2.1 | 15.1 | 3.10 | 48.0 | 4.0 | 1.63 | 4.7 | 8.4 | 13.0 | |
| | | 07-Jun-11 | 4 | 11.94 | 13.94 | 2.00 | D | 158.5 | - | - | 21:16 | 21:27 | 2.9 | 15.4 | 2.38 | 61.8 | - | 1.66 | 6.7 | 11.0 | 13.0 | |
| | | 07-Jun-11 | 4 | 11.94 | 13.94 | 2.00 | X | 399.0 | 879.0 | 439.5 | 21:27 | 21:54 | 3.7 | 14.2 | 1.90 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 14.44 | 15.44 | 1.00 | A | 60.0 | 60.0 | 60.0 | 20:58 | 21:34 | 4.5 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 02-May-11 | 2 | 15.44 | 19.40 | 3.96 | A | 141.6 | 141.6 | 35.8 | 20:18 | 20:54 | 4.1 | 2.9 | 0.18 | - | - | - | - | - | - | |
| | | 02-May-11 | 1 | 19.40 | 24.40 | 5.00 | A | 32.6 | 32.6 | 6.5 | 19:58 | 20:11 | 6.6 | 0.4 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-31+992.5 | T | 10-Jun-11 | 4 | 12.46 | 14.46 | 2.00 | MF | 180.0 | - | - | 15:18 | 15:39 | 3.1 | 15.9 | 2.72 | - | - | - | - | - | - | |
| | | 10-Jun-11 | 4 | 12.46 | 14.46 | 2.00 | B | 160.0 | - | - | 15:39 | 15:49 | 3.1 | 20.1 | 3.24 | 36.2 | 6.4 | 1.62 | 6.9 | 10.3 | 16.7 | |
| | | 10-Jun-11 | 4 | 12.46 | 14.46 | 2.00 | C | 160.0 | - | - | 15:49 | 15:59 | 3.3 | 10.5 | 1.42 | 47.2 | - | 1.64 | 6.9 | 10.3 | 16.9 | |
| | | 10-Jun-11 | 4 | 12.46 | 14.46 | 2.00 | D | 66.9 | 566.9 | 283.5 | 15:59 | 16:18 | 3.6 | 0.1 | 0.01 | 63.6 | - | 1.67 | 6.9 | 10.3 | 16.4 | |
| | | 15-May-11 | 3 | 14.96 | 15.96 | 1.00 | A | 32.4 | 32.4 | 32.4 | 14:00 | 14:16 | 4.2 | 0.1 | 0.03 | 32.0 | 3.2 | 1.62 | 5.0 | 6.2 | 12.0 | |
| | | 16-May-11 | 2 | 15.96 | 20.00 | 4.04 | A | 32.4 | 32.4 | 8.0 | 3:49 | 4:02 | 4.6 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 16-May-11 | 1 | 20.00 | 25.00 | 5.00 | A | 28.0 | 28.0 | 5.6 | 3:30 | 3:44 | 7.4 | 0.2 | 0.00 | - | - | - | - | - | - | |
| P-31+994 | P | 04-Jun-11 | 4 | 12.43 | 14.43 | 2.00 | B | 93.2 | 93.2 | 46.6 | 19:10 | 19:36 | 3.6 | 1.0 | 0.13 | 36.2 | 1.0 | 1.59 | 3.5 | 10.5 | 12.4 | |
| | | 14-May-11 | 3 | 14.96 | 15.96 | 1.00 | A | 79.0 | 79.0 | 79.0 | 21:33 | 22:10 | 5.4 | 0.7 | 0.14 | 32.1 | 3.0 | 1.60 | 17.6 | 17.8 | 15.5 | |
| T-31+995.5 | T | 13-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | MF | 180.0 | - | - | 9:29 | 9:51 | 2.6 | 15.1 | 2.66 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | B | 160.0 | - | - | 9:51 | 9:59 | 2.8 | 20.2 | 3.90 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | C | 160.0 | - | - | 9:59 | 10:07 | 2.7 | 20.4 | 3.76 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | D | 220.0 | - | - | 10:07 | 10:19 | 3.2 | 20.0 | 2.81 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | X | 98.0 | 818.0 | 409.0 | 10:19 | 10:33 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 15.07 | 16.07 | 1.00 | A | 25.0 | 25.0 | 25.0 | 14:24 | 14:39 | 3.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-11 | 2 | 16.07 | 20.10 | 4.03 | A | 64.2 | 64.2 | 15.9 | 4:41 | 4:22 | 4.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-11 | 1 | 20.10 | 25.10 | 5.00 | A | 30.9 | 30.9 | 6.2 | 4:19 | 4:35 | 7.9 | 0.1 | 0.00 | - | - | - | - | - | - | |
| S-31+997 | S | 07-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | B | 161.4 | - | - | 22:33 | 22:54 | 2.8 | 12.8 | 2.67 | - | - | - | - | - | - | |
| | | 07-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | C | 153.8 | - | - | 22:54 | 23:06 | 3.9 | 1.9 | 0.36 | - | - | - | - | - | - | |
| | | 07-Jun-11 | 4 | 12.57 | 14.57 | 2.00 | D | 36.8 | 352.0 | 176.0 | 23:06 | 23:32 | 4.3 | 0.3 | 0.04 | - | - | - | - | - | - | |
| | | 14-May-11 | 3 | 15.07 | 16.07 | 1.00 | A | 26.5 | 26.5 | 26.5 | 11:30 | 11:49 | 5.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 12-May-11 | 2 | 16.07 | 20.10 | 4.03 | A | 203.4 | - | - | 4:07 | 4:29 | 3.4 | 12.8 | 0.93 | - | - | - | - | - | - | |
| | | 12-May-11 | 2 | 16.07 | 20.10 | 4.03 | B | 239.4 | 442.8 | 109.9 | 4:29 | 5:07 | 4.1 | 3.3 | 0.20 | - | - | - | - | - | - | |
| | | 12-May-11 | 1 | 20.10 | 25.10 | 5.00 | A | 113.0 | 113.0 | 22.6 | 3:39 | 4:00 | 6.7 | 1.0 | 0.03 | - | - | - | - | - | - | |
| Q-31+997.75 | Q | 05-Jul-11 | 4 | 13.2 | 15.2 | 2.00 | MF | 70.9 | 70.90 | 35.45 | 19:48 | 19:54 | 3.7 | 0.0 | 0.00 | 30.0 | 6.0 | 1.5 | 16.5 | 10.7 | 18.0 | |
| | | 29-Jun-11 | 3 | 15.7 | 16.8 | 1.10 | A | 28.4 | 28.40 | 25.82 | 8:41 | 8:59 | 4.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-31+998.5 | T | 10-Jun-11 | 4 | 12.87 | 14.87 | 2.00 | MF | 79.8 | 79.8 | 39.9 | 14:51 | 15:15 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 15.37 | 16.37 | 1.00 | A | 225.5 | - | - | 14:48 | 15:14 | 1.5 | 12.5 | 9.79 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 15.37 | 16.37 | 1.00 | B | 165.1 | - | - | 15:14 | 15:25 | 1.4 | 1.2 | 3.80 | 36.2 | - | 1.64 | 18.1 | 9.1 | 17.2 | |
| | | 15-May-11 | 3 | 15.37 | 16.37 | 1.00 | C | 209.4 | - | - | 15:25 | 16:07 | 3.6 | 12.7 | 3.92 | 46.4 | - | 1.68 | 17.4 | 9.1 | 15.3 | |
| | | 15-May-11 | 3 | 15.37 | 16.37 | 1.00 | D | 208.0 | - | - | 16:07 | 16:24 | 4.4 | 11.0 | 3.20 | 51.7 | - | 1.71 | 7.5 | 6.7 | 16.4 | |
| | | 15-May-11 | 3 | 15.37 | 16.37 | 1.00 | X | 44.0 | 852.0 | 852.0 | 16:24 | 16:40 | 3.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-11 | 2 | 16.37 | 20.40 | 4.03 | A | 30.4 | 30.4 | 7.5 | 7:58 | 8:11 | 4.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-11 | 1 | 20.40 | 25.60 | 5.20 | A | 15.9 | 15.9 | 3.1 | 7:41 | 7:54 | 7.1 | 0.2 | 0.00 | - | - | - | - | - | - | |
| Q-31+999.25 | Q | 06-Jul-11 | 4 | 13.28 | 15.28 | 2.00 | MF | 36 | 36.00 | 18.00 | 17:51 | 18:05 | 3.6 | 0.4 | 0.05 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 15.78 | 16.8 | 1.02 | A | 27.3 | 27.30 | 26.76 | 20:21 | 20:36 | 4.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-32+000 | P | 04-Jun-11 | 4 | 13.63 | 15.63 | 2.00 | B | 105.7 | 105.7 | 52.9 | 19:41 | 20:12 | 3.6 | 0.6 | 0.08 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 3 | 16.13 | 17.13 | 1.00 | A | 163.4 | - | - | 20:43 | 21:07 | 2.1 | 12.3 | 5.81 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 3 | 16.13 | 17.13 | 1.00 | B | 155.4 | - | - | 21:07 | 21:20 | 3.3 | 11.8 | 3.63 | 39.4 | - | 1.65 | -15.4 | 10.4 | 14.2 | |
| | | 25-Apr-11 | 3 | 16.13 | 17.13 | 1.00 | C | 154.7 | - | - | 21:20 | 21:35 | 4.4 | 10.0 | 2.22 | 47.3 | 1.0 | 1.68 | -14.7 | 8.3 | 14.6 | |
| | | 25-Apr-11 | 3 | 16.13 | 17.13 | 1.00 | D | 70.2 | 543.7 | 543.7 | 21:35 | 21:55 | 4.6 | 0.0 | 0.00 | 81.0 | - | 1.70 | -14.4 | 8.3 | 13.5 | |
| | | 25-Apr-11 | 2 | 17.13 | 21.10 | 3.97 | A | 29.6 | 29.6 | 7.5 | 20:20 | 20:36 | 4.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 25-Apr-11 | 1 | 21.10 | 26.20 | 5.10 | A | 116.8 | 116.8 | 22.9 | 19:40 | 20:07 | 6.8 | 1.8 | 0.05 | 32.6 | 4.0 | 1.65 | -15.4 | 10.4 | 15.8 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-32+001.5 | T | 13-Jun-11 | 4 | 13.56 | 15.56 | 2.00 | MF | 180.0 | - | - | 8:25 | 8:46 | 2.2 | 15.2 | 3.46 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 4 | 13.56 | 15.56 | 2.00 | B | 160.0 | - | - | 8:46 | 8:55 | 2.2 | 20.4 | 4.47 | 36.4 | - | 1.63 | 4.1 | 8.2 | 11.7 | |
| | | 13-Jun-11 | 4 | 13.56 | 15.56 | 2.00 | C | 160.0 | - | - | 8:55 | 9:03 | 2.7 | 20.2 | 4.13 | 47.0 | - | 1.64 | 4.1 | 8.2 | 12.3 | |
| | | 13-Jun-11 | 4 | 13.56 | 15.56 | 2.00 | D | 220.0 | - | - | 9:03 | 9:14 | 2.6 | 19.6 | 3.55 | 63.4 | - | 1.67 | 4.1 | 8.2 | 12.1 | |
| | | 13-Jun-11 | 4 | 13.56 | 15.56 | 2.00 | X | 101.0 | 821.0 | 410.5 | 9:14 | 9:20 | 2.6 | 20.2 | 3.03 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 16.06 | 17.07 | 1.01 | A | 32.4 | 32.4 | 32.1 | 20:18 | 20:35 | 4.4 | 1.0 | 0.22 | - | - | - | - | - | - | |
| | | 17-May-11 | 2 | 17.06 | 21.10 | 4.04 | A | 36.2 | 36.2 | 9.0 | 7:05 | 7:25 | 3.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-11 | 1 | 21.10 | 26.10 | 5.00 | A | 39.9 | 39.9 | 8.0 | 6:39 | 6:58 | 7.1 | 0.0 | 0.00 | 32.4 | 9.0 | 1.62 | 17.4 | 5.7 | 14.8 | |
| S-32+003 | S | 07-Jun-11 | 4 | 13.46 | 15.46 | 2.00 | B | 96.4 | 96.4 | 48.2 | 1:10 | 1:35 | 4.3 | 0.8 | 0.09 | 37.7 | - | 1.60 | 2.0 | 12.8 | 14.5 | |
| | | 13-May-11 | 3 | 15.96 | 18.00 | 2.04 | A | 36.5 | 36.5 | 17.9 | 7:23 | 7:44 | 4.3 | 0.2 | 0.02 | 31.6 | 2.0 | 1.63 | 9.4 | 8.9 | 13.7 | |
| | | 15-May-11 | 2 | 16.96 | 21.00 | 4.04 | A | 132.3 | - | - | 11:00 | 11:18 | 0.1 | 9.4 | 37.64 | - | - | - | - | - | - | Communicated to T-32+001.5 |
| | | 15-May-11 | 2 | 16.96 | 21.00 | 4.04 | B | 206.9 | 339.2 | 84.0 | 11:18 | 11:49 | 4.4 | 0.1 | 0.01 | 35.8 | 5.0 | 1.66 | 6.0 | 8.7 | 17.0 | |
| T-32+004.5 | T | 10-Jun-11 | 4 | 13.30 | 15.30 | 2.00 | MF | 152.9 | 152.9 | 76.5 | 14:08 | 14:48 | 3.6 | 1.1 | 0.16 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 15.63 | 16.63 | 1.00 | A | 24.3 | - | - | 16:56 | 17:11 | 4.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-11 | 3 | 15.63 | 16.63 | 1.00 | A | 25.8 | 50.1 | 50.1 | 10:15 | 10:30 | 4.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-11 | 2 | 16.63 | 20.60 | 3.97 | A | 27.1 | 27.1 | 6.8 | 10:00 | 10:13 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-11 | 1 | 20.60 | 25.80 | 5.20 | A | 27.8 | 27.8 | 5.3 | 9:33 | 9:50 | 7.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-32+006 | P | 04-Jun-11 | 4 | 13.53 | 15.53 | 2.00 | B | 159.7 | - | - | 20:14 | 20:39 | 2.1 | 13.4 | 3.94 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 4 | 13.53 | 15.53 | 2.00 | C | 242.3 | - | - | 20:39 | 20:56 | 2.5 | 14.3 | 2.74 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 4 | 13.53 | 15.53 | 2.00 | D | 316.3 | - | - | 20:56 | 21:18 | 4.0 | 3.5 | 0.45 | 73.6 | - | 1.65 | 3.5 | 10.4 | 13.2 | |
| | | 04-Jun-11 | 4 | 13.53 | 15.53 | 2.00 | X | 36.0 | 754.3 | 377.2 | 21:18 | 21:37 | 4.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 16.03 | 17.03 | 1.00 | A | 151.9 | - | - | 23:11 | 23:36 | 4.2 | 11.7 | 2.88 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 16.03 | 17.03 | 1.00 | B | 167.4 | - | - | 23:36 | 23:51 | 4.7 | 8.1 | 1.67 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 16.03 | 17.03 | 1.00 | C | 32.1 | 351.4 | 351.4 | 23:51 | 0:08 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-11 | 2 | 17.03 | 21.00 | 3.97 | A | 57.4 | 57.4 | 14.5 | 22:49 | 23:07 | 4.1 | 2.0 | 0.06 | - | - | - | - | - | - | |
| | | 02-May-11 | 1 | 21.00 | 26.90 | 5.90 | A | 84.3 | 84.3 | 14.3 | 22:20 | 22:42 | 6.9 | 2.4 | 0.06 | 31.9 | - | 1.63 | 2.6 | 7.4 | 16.0 | |
| Q-32+006.75 | Q | 05-Jul-11 | 4 | 14.09 | 16.09 | 2.00 | MF | 91.4 | 91.40 | 45.70 | 19:23 | 19:44 | 3.6 | 1.3 | 0.17 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 3 | 16.59 | 17.7 | 1.11 | A | 28.6 | 28.60 | 25.77 | 10:43 | 10:59 | 4.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-32+007.5 | T | 06-Jul-11 | 4 | 12.62 | 14.62 | 2.00 | MF | 99.9 | 99.9 | 50.0 | 7:23 | 7:36 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-11 | 3 | 15.12 | 16.30 | 1.18 | A | 200.0 | - | - | 13:57 | 14:26 | 2.4 | 12.3 | 3.92 | 31.6 | 6.0 | 1.61 | 16.1 | 8.2 | 17.9 | |
| | | 17-May-11 | 3 | 15.12 | 16.30 | 1.18 | B | 201.4 | - | - | 14:26 | 14:41 | 4.6 | 18.3 | 4.32 | 39.8 | - | 1.63 | 25.7 | 7.5 | 17.7 | |
| | | 17-May-11 | 3 | 15.12 | 16.30 | 1.18 | C | 198.6 | - | - | 14:41 | 14:50 | 3.3 | 19.6 | 4.68 | 51.7 | - | 1.68 | 23.1 | 8.1 | 16.9 | |
| | | 17-May-11 | 3 | 15.12 | 16.30 | 1.18 | D | 187.0 | 787.0 | 666.9 | 14:50 | 15:02 | 5.4 | 20.1 | 3.18 | 67.4 | - | 1.71 | 20.1 | 8.2 | 16.1 | |
| | | 25-May-11 | 3 | 15.12 | 16.12 | 1.00 | A | 23.5 | 23.5 | 23.5 | 3:29 | 3:48 | 4.4 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 25-May-11 | 2 | 16.12 | 20.10 | 3.98 | A | 78.7 | 78.7 | 19.8 | 3:02 | 3:25 | 4.8 | 1.4 | 0.08 | 32.6 | - | 1.58 | 16.8 | 8.9 | 19.7 | |
| | | 25-May-11 | 1 | 20.10 | 25.10 | 5.00 | A | 12.1 | 12.1 | 2.4 | 2:45 | 2:57 | 7.8 | 0.5 | 0.01 | - | - | - | - | - | - | |
| | | 25-May-11 | 1C | 25.10 | 30.30 | 5.20 | A | 57.5 | 57.5 | 11.1 | 2:03 | 2:18 | 10.3 | 1.4 | 0.03 | - | - | - | - | - | - | |
| Q-32+008.25 | Q | 01-Jul-11 | 3 | 15.65 | 16.7 | 1.05 | A | 37.5 | 37.50 | 35.71 | 20:58 | 21:18 | 5.1 | 0.1 | 0.01 | - | - | - | - | - | - | |
| S-32+009 | S | 24-Jun-11 | 4 | 12.12 | 14.12 | 2.00 | B | 76.9 | 76.9 | 38.5 | 9:45 | 10:10 | 4.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-May-11 | 3 | 14.62 | 16.70 | 2.08 | A | 60.8 | 60.8 | 29.2 | 10:50 | 11:15 | 4.6 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 14-May-11 | 2 | 15.62 | 19.60 | 3.98 | A | 163.1 | - | - | 4:19 | 4:41 | 2.3 | 12.0 | 1.25 | - | - | - | - | - | - | |
| | | 14-May-11 | 2 | 15.62 | 19.60 | 3.98 | B | 205.7 | - | - | 4:41 | 4:58 | 3.9 | 12.0 | 0.83 | - | - | - | - | - | - | |
| | | 14-May-11 | 2 | 15.62 | 19.60 | 3.98 | C | 170.5 | 539.3 | 135.5 | 4:58 | 5:28 | 5.1 | 0.6 | 0.03 | 46.2 | 1.0 | 1.66 | 20.4 | 9.7 | 19.4 | |
| | | 14-May-11 | 1 | 19.60 | 24.60 | 5.00 | A | 36.9 | 36.9 | 7.4 | 4:01 | 4:15 | 7.4 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 14-May-11 | 1C | 24.60 | 29.62 | 5.02 | A | 28.3 | 28.3 | 5.6 | 3:45 | 3:57 | 10.6 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-32+010.5 | T | 29-Jun-11 | 4 | 11.84 | 13.84 | 2.00 | MF | 31.2 | 31.2 | 15.6 | 17:01 | 17:24 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-11 | 3 | 14.34 | 15.60 | 1.26 | A | 135.3 | - | - | 15:37 | 16:24 | 5.1 | 1.1 | 0.17 | - | - | - | - | - | - | |
| | | 24-May-11 | 3 | 14.34 | 15.34 | 1.00 | A | 25.9 | 161.2 | 161.2 | 10:16 | 10:32 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-May-11 | 2 | 15.34 | 19.30 | 3.96 | A | 58.3 | 58.3 | 14.7 | 9:50 | 10:11 | 4.9 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 24-May-11 | 1 | 19.30 | 24.30 | 5.00 | A | 94.9 | 94.9 | 19.0 | 9:14 | 9:37 | 7.7 | 5.1 | 0.13 | - | - | - | - | - | - | |
| | | 24-May-11 | 1C | 24.30 | 29.40 | 5.10 | A | 177.4 | 292.5 | 57.4 | 8:24 | 8:54 | 10.0 | 8.9 | 0.19 | 33.0 | 3.0 | 1.60 | 10.5 | 12.0 | 17.0 | |
| | | 24-May-11 | 1C | 24.30 | 29.40 | 5.10 | B | 115.1 | - | - | 8:54 | 9:10 | 10.0 | 7.1 | 0.14 | 40.2 | - | 1.59 | 12.9 | 12.5 | 17.1 | |
| P-32+012 | P | 18-Jun-11 | 4 | 14.75 | 16.75 | 2.00 | B | 160.0 | - | - | 10:39 | 10:59 | 5.5 | 15.9 | 5.49 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 18-Jun-11 | 4 | 14.75 | 16.75 | 2.00 | D | 135.0 | - | - | 10:59 | 11:08 | 2.5 | 18.4 | 2.52 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 14.75 | 16.75 | 2.00 | X | 177.0 | 472.0 | 236.0 | 11:08 | 11:26 | 5.0 | 10.8 | 1.07 | - | - | - | - | - | - | |
| | | 02-May-11 | 3 | 17.25 | 18.25 | 1.00 | A | 55.0 | 55.0 | 55.0 | 4:51 | 5:12 | 3.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-11 | 2 | 18.25 | 22.30 | 4.05 | A | 68.9 | 68.9 | 17.0 | 4:29 | 4:46 | 4.9 | 1.6 | 0.08 | - | - | - | - | - | - | |
| | | 02-May-11 | 1 | 22.30 | 27.30 | 5.00 | A | 40.5 | 40.5 | 8.1 | 4:08 | 4:23 | 7.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-May-11 | 1C | 27.30 | 32.40 | 5.10 | A | 123.4 | 123.4 | 24.2 | 3:27 | 4:01 | 10.3 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-32+013.5 | T | 05-Jul-11 | 4 | 14.95 | 16.95 | 2.00 | MF | 76.3 | 76.3 | 38.2 | 21:00 | 21:23 | 4.7 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 18-May-11 | 3 | 17.45 | 18.60 | 1.15 | A | 38.5 | - | - | 19:20 | 19:51 | 4.4 | 0.2 | 0.03 | 31.6 | 4.0 | 1.61 | 14.9 | 10.2 | 16.1 | |
| | | 25-May-11 | 3 | 17.45 | 18.45 | 1.00 | A | 14.4 | 52.9 | 52.9 | 22:28 | 22:55 | 4.7 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 25-May-11 | 2 | 18.45 | 22.50 | 4.05 | A | 20.4 | 20.4 | 5.0 | 22:05 | 22:24 | 4.7 | 0.5 | 0.03 | - | - | - | - | - | - | |
| | | 25-May-11 | 1 | 22.50 | 27.50 | 5.00 | A | 49.4 | 49.4 | 9.9 | 21:32 | 21:59 | 8.1 | 1.1 | 0.03 | - | - | - | - | - | - | |
| | | 25-May-11 | 1C | 27.50 | 32.60 | 5.10 | A | 217.8 | 217.8 | 42.7 | 20:52 | 21:25 | 10.2 | 5.4 | 0.10 | - | - | - | - | - | - | |
| S-32+015 | S | 24-Jun-11 | 4 | 15.13 | 17.13 | 2.00 | B | 84.1 | - | - | 8:46 | 9:02 | 2.2 | 6.9 | 3.14 | 38.6 | - | 1.65 | 7.9 | 10.3 | 14.9 | By-pass between plastic and steel casing |
| | | 24-Jun-11 | 4 | 15.13 | 17.13 | 2.00 | D | 80.1 | - | - | 9:02 | 9:17 | 3.9 | 6.2 | 1.08 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 4 | 15.13 | 17.13 | 2.00 | X | 69.4 | 233.6 | 116.8 | 9:17 | 9:24 | 3.4 | 6.9 | 1.35 | - | - | - | - | - | - | |
| | | 14-May-11 | 3 | 17.63 | 18.70 | 1.07 | A | 17.7 | 17.7 | 16.5 | 23:09 | 23:23 | 4.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-11 | 2 | 18.63 | 22.60 | 3.97 | A | 53.0 | 53.0 | 13.4 | 9:05 | 9:20 | 4.7 | 2.6 | 0.14 | - | - | - | - | - | - | |
| | | 16-May-11 | 1 | 22.60 | 27.60 | 5.00 | A | 67.9 | 67.9 | 13.6 | 8:42 | 9:00 | 7.2 | 3.2 | 0.09 | - | - | - | - | - | - | |
| | | 16-May-11 | 1C | 27.60 | 32.70 | 5.10 | A | 28.3 | 28.3 | 5.5 | 8:20 | 8:38 | 10.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-32+016.5 | T | 29-Jun-11 | 4 | 15.30 | 17.30 | 2.00 | MF | 23.4 | 23.4 | 11.7 | 17:26 | 17:42 | 4.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-May-11 | 3 | 17.80 | 18.90 | 1.10 | A | 33.6 | - | - | 20:06 | 20:23 | 4.9 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 23-May-11 | 3 | 17.80 | 18.80 | 1.00 | A | 23.3 | 56.9 | 56.9 | 17:26 | 17:42 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 23-May-11 | 2 | 18.80 | 22.80 | 4.00 | A | 28.2 | 28.2 | 7.1 | 17:04 | 17:20 | 4.8 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 23-May-11 | 1 | 22.80 | 27.80 | 5.00 | A | 29.9 | 29.9 | 6.0 | 16:40 | 16:57 | 7.7 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 23-May-11 | 1C | 27.80 | 33.90 | 6.10 | A | 17.5 | 17.5 | 2.9 | 16:13 | 16:32 | 10.0 | 0.0 | 0.00 | 32.4 | 3.5 | 1.59 | 13.7 | 13.0 | 17.6 | |
| P-32+018 | P | 18-Jun-11 | 4 | 15.01 | 17.01 | 2.00 | B | 126.4 | 126.4 | 63.2 | 10:05 | 10:32 | 4.9 | 2.3 | 0.23 | - | - | - | - | - | - | |
| | | 13-May-11 | 3 | 17.51 | 18.51 | 1.00 | A | 49.3 | 49.3 | 49.3 | 11:28 | 11:47 | 4.4 | 0.6 | 0.13 | - | - | - | - | - | - | |
| | | 13-May-11 | 2 | 18.51 | 22.50 | 3.99 | A | 40.6 | 40.6 | 10.2 | 10:17 | 10:32 | 4.3 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 13-May-11 | 1 | 22.50 | 27.50 | 5.00 | A | 200.4 | - | - | 8:57 | 9:29 | 0.0 | 12.1 | inf | - | - | - | - | - | - | |
| | | 13-May-11 | 1 | 22.50 | 27.50 | 5.00 | B | 206.5 | - | - | 9:29 | 9:45 | 0.7 | 20.8 | 7.10 | 36.5 | 4.3 | 1.65 | 9.4 | 8.9 | 15.0 | |
| | | 13-May-11 | 1 | 22.50 | 27.50 | 5.00 | C | 201.3 | - | - | 9:45 | 9:55 | 6.7 | 26.5 | 0.71 | 45.1 | - | 1.68 | 2.5 | 8.1 | 15.8 | |
| | | 13-May-11 | 1 | 22.50 | 27.50 | 5.00 | D | 91.9 | 700.1 | 140.0 | 9:55 | 10:12 | 8.8 | 2.0 | 0.05 | 67.3 | - | 1.69 | 2.5 | 8.1 | 16.2 | |
| | | 13-May-11 | 1C | 27.50 | 32.50 | 5.00 | A | 33.4 | 33.4 | 6.7 | 8:37 | 8:52 | 9.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-32+019.5 | T | 05-Jul-11 | 4 | 15.01 | 17.01 | 2.00 | MF | 37.8 | 37.8 | 18.9 | 21:26 | 21:40 | 4.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-May-11 | 3 | 17.51 | 18.70 | 1.19 | A | 31.8 | - | - | 20:36 | 20:51 | 5.1 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 25-May-11 | 3 | 17.51 | 18.51 | 1.00 | A | 19.9 | 51.7 | 51.7 | 20:15 | 20:27 | 4.3 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 25-May-11 | 2 | 18.51 | 22.50 | 3.99 | A | 39.9 | 39.9 | 10.0 | 20:00 | 20:13 | 4.7 | 0.7 | 0.04 | - | - | - | - | - | - | |
| | | 25-May-11 | 1 | 22.50 | 27.50 | 5.00 | A | 55.0 | 55.0 | 11.0 | 19:36 | 19:55 | 7.7 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 25-May-11 | 1C | 27.50 | 32.70 | 5.20 | A | 66.1 | 66.1 | 12.7 | 19:10 | 19:32 | 10.2 | 0.3 | 0.00 | 31.9 | 3.5 | 1.61 | 17.1 | 8.0 | 18.1 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-32+021 | S | 24-Jun-11 | 4 | 15.13 | 17.13 | 2.00 | B | 163.2 | - | - | 7:52 | 8:17 | 3.3 | 12.1 | 2.21 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 4 | 15.13 | 17.13 | 2.00 | C | 205.4 | 368.6 | 184.3 | 8:17 | 8:43 | 4.8 | 0.4 | 0.06 | 48.0 | 3.0 | 1.66 | 7.3 | 10.0 | 14.0 | |
| | | 14-May-11 | 3 | 17.63 | 18.71 | 1.08 | A | 163.7 | - | - | 23:32 | 23:55 | 5.2 | 4.8 | 0.87 | - | - | - | - | - | - | |
| | | 14-May-11 | 3 | 17.63 | 18.71 | 1.08 | B | 37.5 | 201.2 | 185.9 | 23:55 | 0:17 | 5.3 | 0.6 | 0.11 | 36.0 | - | 1.62 | 16.9 | 17.6 | 15.9 | |
| | | 16-May-11 | 3 | 17.63 | 18.63 | 1.00 | A | 28.7 | 28.7 | 28.7 | 11:43 | 11:56 | 4.9 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 16-May-11 | 2 | 18.63 | 22.60 | 3.97 | A | 190.7 | - | - | 10:28 | 11:00 | 3.6 | 9.9 | 0.70 | - | - | - | - | - | - | |
| | | 16-May-11 | 2 | 18.63 | 22.60 | 3.97 | B | 199.4 | - | - | 11:00 | 11:23 | 4.5 | 5.9 | 0.36 | 32.0 | 5.0 | 1.58 | 28.0 | 8.3 | 15.7 | |
| | | 16-May-11 | 2 | 18.63 | 22.60 | 3.97 | C | 18.7 | 408.8 | 103.0 | 11:23 | 11:37 | 4.3 | 0.1 | 0.01 | 48.0 | - | 1.66 | 28.0 | 8.3 | 17.4 | |
| | | 16-May-11 | 1 | 22.60 | 27.60 | 5.00 | A | 49.5 | 49.5 | 9.9 | 10:05 | 10:23 | 7.4 | 1.3 | 0.03 | - | - | - | - | - | - | |
| | | 16-May-11 | 1C | 27.60 | 32.70 | 5.10 | A | 85.2 | 85.2 | 16.7 | 9:36 | 9:58 | 9.9 | 2.0 | 0.02 | - | - | - | - | - | - | |
| T-32+022.5 | T | 29-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | MF | 26.8 | 26.8 | 13.4 | 17:45 | 18:00 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-May-11 | 3 | 18.52 | 19.60 | 1.08 | A | 50.0 | - | - | 21:16 | 21:41 | 5.0 | 0.0 | 0.01 | - | - | - | - | - | - | |
| | | 23-May-11 | 3 | 18.52 | 19.52 | 1.00 | A | 25.1 | 75.1 | 75.1 | 7:58 | 8:18 | 4.5 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 23-May-11 | 2 | 19.52 | 23.50 | 3.98 | A | 29.6 | 29.6 | 7.4 | 7:44 | 7:56 | 5.2 | 0.5 | 0.02 | - | - | - | - | - | - | |
| | | 23-May-11 | 1 | 23.50 | 28.50 | 5.00 | A | 55.5 | 55.5 | 11.1 | 7:25 | 7:42 | 8.1 | 0.7 | 0.02 | - | - | - | - | - | - | |
| | | 23-May-11 | 1C | 28.50 | 33.60 | 5.10 | A | 199.9 | - | - | 6:48 | 7:13 | 9.9 | 11.2 | 0.22 | 31.0 | - | 1.60 | 8.9 | 13.1 | 15.2 | |
| | | 23-May-11 | 1C | 28.50 | 33.60 | 5.10 | B | 83.3 | 283.2 | 55.5 | 7:13 | 7:20 | 10.8 | 11.2 | 0.20 | 40.9 | - | 1.61 | 11.6 | 8.9 | 16.2 | |
| P-32+024 | P | 18-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | B | 160.0 | - | - | 9:03 | 9:24 | 2.1 | 9.2 | 2.21 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | C | 160.0 | - | - | 9:24 | 9:36 | 2.4 | 20.4 | 4.13 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | D | 200.0 | - | - | 9:36 | 9:45 | 2.3 | 19.8 | 4.35 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | X | 287.0 | 807.0 | 403.5 | 9:45 | 10:00 | 3.4 | 21.5 | 3.16 | - | - | - | - | - | - | |
| | | 13-May-11 | 3 | 18.52 | 19.52 | 1.00 | A | 177.3 | 177.3 | 177.3 | 16:29 | 17:23 | 5.3 | 0.1 | 0.01 | - | - | - | - | - | - | Communicated to P-32+030 |
| | | 13-May-11 | 2 | 19.52 | 23.50 | 3.98 | A | 198.9 | - | - | 14:38 | 15:09 | 0.0 | 12.9 | inf | - | - | - | - | - | - | |
| | | 13-May-11 | 2 | 19.52 | 23.50 | 3.98 | B | 215.4 | - | - | 15:09 | 15:26 | 0.0 | 16.5 | inf | 37.0 | - | 1.62 | 1.7 | 7.5 | 15.2 | |
| | | 13-May-11 | 2 | 19.52 | 23.50 | 3.98 | C | 210.8 | - | - | 15:26 | 15:43 | 0.0 | 19.9 | inf | 48.0 | - | 1.65 | 1.7 | 8.0 | 12.9 | |
| | | 13-May-11 | 2 | 19.52 | 23.50 | 3.98 | D | 204.9 | - | - | 15:43 | 15:50 | 1.0 | 18.5 | 4.25 | 65.0 | - | 1.65 | 1.7 | 8.0 | 13.9 | |
| | | 13-May-11 | 2 | 19.52 | 23.50 | 3.98 | X | 326.0 | 1156.0 | 290.5 | 15:50 | 16:17 | 4.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 13-May-11 | 1 | 23.50 | 28.50 | 5.00 | A | 26.5 | 26.5 | 5.3 | 14:19 | 14:34 | 7.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-May-11 | 1C | 28.50 | 33.60 | 5.10 | A | 32.9 | 32.9 | 6.5 | 13:59 | 14:15 | 10.2 | 0.0 | 0.00 | 32.9 | 2.0 | 1.62 | 1.7 | 7.5 | 12.3 | |
| T-32+025.5 | T | 05-Jul-11 | 4 | 15.74 | 17.74 | 2.00 | MF | 57.1 | 57.1 | 28.6 | 21:42 | 22:04 | 4.6 | 0.0 | 0.02 | - | - | - | - | - | - | |
| | | 18-May-11 | 3 | 18.24 | 19.40 | 1.16 | A | 38.8 | - | - | 21:52 | 22:32 | 5.1 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 28-May-11 | 3 | 18.24 | 19.24 | 1.00 | A | 6.4 | 45.2 | 45.2 | 23:08 | 23:19 | 4.3 | 0.3 | 0.08 | - | - | - | - | - | - | |
| | | 28-May-11 | 2 | 19.24 | 23.20 | 3.96 | A | 13.5 | 13.5 | 3.4 | 22:45 | 22:57 | 4.6 | 0.8 | 0.05 | 31.9 | 3.0 | 1.60 | 14.4 | 12.6 | 23.4 | |
| | | 28-May-11 | 1 | 23.20 | 28.20 | 5.00 | A | 38.9 | 38.9 | 7.8 | 22:27 | 22:40 | 7.8 | 1.8 | 0.05 | - | - | - | - | - | - | |
| | | 28-May-11 | 1C | 28.20 | 33.40 | 5.20 | A | 110.1 | 110.1 | 21.2 | 21:53 | 22:22 | 10.1 | 0.9 | 0.02 | - | - | - | - | - | - | |
| S-32+027 | S | 24-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | B | 161.3 | - | - | 6:27 | 6:55 | 1.3 | 8.9 | 4.63 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 24-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | D | 141.2 | - | - | 6:55 | 7:11 | 3.4 | 9.1 | 1.80 | - | - | - | - | - | - | |
| | | 24-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | X | 66.4 | 368.9 | 184.5 | 7:11 | 7:31 | 5.0 | 0.7 | 0.10 | - | - | - | - | - | - | |
| | | 14-May-11 | 3 | 18.52 | 19.58 | 1.06 | A | 159.5 | - | - | 2:19 | 2:47 | 5.7 | 7.4 | 1.24 | 31.6 | - | 1.59 | 16.3 | 17.6 | 15.6 | |
| | | 14-May-11 | 3 | 18.52 | 19.58 | 1.06 | B | 41.4 | 200.9 | 189.3 | 2:47 | 3:08 | 5.2 | 0.0 | 0.00 | 36.4 | 6.0 | 1.63 | 17.4 | 7.4 | 18.6 | |
| | | 16-May-11 | 3 | 18.52 | 19.52 | 1.00 | A | 41.5 | 41.5 | 41.5 | 15:30 | 15:48 | 5.1 | 0.5 | 0.10 | - | - | - | - | - | - | |
| | | 16-May-11 | 2 | 19.52 | 23.50 | 3.98 | A | 198.4 | - | - | 14:42 | 15:13 | 4.3 | 10.0 | 0.52 | - | - | - | - | - | - | |
| | | 16-May-11 | 2 | 19.52 | 23.50 | 3.98 | B | 32.0 | 230.4 | 57.9 | 15:13 | 15:26 | 4.5 | 1.0 | 0.05 | 35.0 | - | 1.65 | 16.0 | 8.0 | 14.9 | |
| | | 16-May-11 | 1 | 23.50 | 28.50 | 5.00 | A | 24.9 | 24.9 | 5.0 | 14:25 | 14:38 | 7.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-11 | 1C | 28.50 | 33.60 | 5.10 | A | 45.0 | 45.0 | 8.8 | 14:04 | 14:22 | 9.2 | 0.1 | 0.00 | 32.9 | 3.0 | 1.62 | 14.2 | 8.9 | 16.1 | |
| T-32+028.5 | T | 29-Jun-11 | 4 | 15.74 | 17.74 | 2.00 | MF | 71.4 | 71.4 | 35.7 | 18:08 | 18:33 | 4.3 | 0.1 | 0.01 | 31.6 | 3.0 | 1.46 | 12.8 | 9.6 | 18.3 | |
| | | 18-May-11 | 3 | 18.24 | 19.40 | 1.16 | A | 41.6 | - | - | 23:06 | 23:22 | 5.0 | 0.2 | 0.03 | - | - | - | - | - | - | |
| | | 25-May-11 | 3 | 18.24 | 19.24 | 1.00 | A | 20.5 | 62.1 | 62.1 | 16:25 | 16:42 | 4.5 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 25-May-11 | 2 | 19.24 | 23.20 | 3.96 | A | 140.1 | 140.1 | 35.4 | 15:42 | 16:20 | 4.9 | 0.6 | 0.03 | - | - | - | - | - | - | |
| | | 25-May-11 | 1 | 23.20 | 28.20 | 5.00 | A | 19.4 | 19.4 | 3.9 | 15:16 | 15:33 | 7.6 | 0.3 | 0.00 | - | - | - | - | - | - | |
| | | 25-May-11 | 1C | 28.20 | 33.30 | 5.10 | A | 15.1 | 15.1 | 3.0 | 14:49 | 15:09 | 10.5 | 0.0 | 0.00 | 34.7 | - | 1.62 | 15.3 | 13.9 | 19.9 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-32+030 | P | 18-Jun-11 | 4 | 16.68 | 18.68 | 2.00 | B | 160.0 | - | - | 8:12 | 8:34 | 1.4 | 15.3 | 4.93 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 18-Jun-11 | 4 | 16.68 | 18.68 | 2.00 | C | 107.0 | - | - | 8:34 | 8:39 | 1.8 | 18.4 | 5.20 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 16.68 | 18.68 | 2.00 | D | 133.0 | - | - | 8:39 | 8:46 | 2.0 | 20.1 | 4.99 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 16.68 | 18.68 | 2.00 | X | 193.0 | 593.0 | 296.5 | 8:46 | 8:56 | 1.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 14-May-11 | 3 | 19.18 | 20.18 | 1.00 | A | 21.5 | 21.5 | 21.5 | 10:57 | 11:11 | 5.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-May-11 | 2 | 20.18 | 24.20 | 4.02 | A | 195.3 | - | - | 21:47 | 22:13 | 2.7 | 12.5 | 1.35 | - | - | - | - | - | - | |
| | | 13-May-11 | 2 | 20.18 | 24.20 | 4.02 | B | 398.4 | - | - | 22:13 | 22:45 | 2.4 | 11.9 | 1.17 | 37.4 | - | 1.62 | 15.3 | 7.5 | 17.5 | |
| | | 13-May-11 | 2 | 20.18 | 24.20 | 4.02 | C | 207.3 | - | - | 22:45 | 23:01 | 5.0 | 10.8 | 0.47 | 46.3 | - | 1.64 | 15.2 | 7.4 | 14.8 | |
| | | 13-May-11 | 2 | 20.18 | 24.20 | 4.02 | D | 23.0 | 824.0 | 205.0 | 23:01 | 23:14 | 4.8 | 0.0 | 0.00 | 62.2 | 2.0 | 1.68 | 14.8 | 9.4 | 16.3 | |
| | | 13-May-11 | 1 | 24.20 | 29.20 | 5.00 | A | 61.7 | 61.7 | 12.3 | 21:01 | 21:25 | 7.6 | 1.4 | 0.04 | - | - | - | - | - | - | |
| | | 13-May-11 | 1C | 29.20 | 34.40 | 5.20 | A | 24.7 | 24.7 | 4.8 | 20:40 | 20:54 | 9.9 | 0.0 | 0.00 | 31.2 | 3.0 | 1.61 | 24.3 | 5.2 | 15.2 | |
| T-32+031.5 | T | 05-Jul-11 | 4 | 17.56 | 19.56 | 2.00 | MF | 46.9 | 46.9 | 23.5 | 22:08 | 22:20 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-May-11 | 3 | 21.06 | 22.06 | 1.00 | A | 25.6 | 25.6 | 25.6 | 21:06 | 21:25 | 4.6 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 28-May-11 | 2 | 22.06 | 26.10 | 4.04 | A | 31.6 | 31.6 | 7.8 | 20:45 | 20:58 | 4.7 | 0.5 | 0.03 | - | - | - | - | - | - | |
| | | 28-May-11 | 1 | 26.10 | 31.10 | 5.00 | A | 14.5 | 14.5 | 2.9 | 20:27 | 20:39 | 7.8 | 0.8 | 0.02 | - | - | - | - | - | - | |
| | | 28-May-11 | 1C | 31.10 | 36.20 | 5.10 | A | 34.8 | 34.8 | 6.8 | 20:12 | 20:25 | 9.9 | 0.3 | 0.06 | - | - | - | - | - | - | |
| S-32+033 | S | 23-Jun-11 | 4 | 17.32 | 19.32 | 2.00 | B | 164.2 | - | - | 16:08 | 16:37 | 2.1 | 8.8 | 2.95 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 17.32 | 19.32 | 2.00 | C | 248.0 | - | - | 16:37 | 16:55 | 4.3 | 17.5 | 2.89 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 17.32 | 19.32 | 2.00 | D | 312.2 | 724.4 | 362.2 | 16:55 | 17:31 | 4.9 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 18-May-11 | 3 | 19.82 | 20.90 | 1.08 | A | 71.3 | - | - | 23:31 | 23:55 | 5.2 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 22-May-11 | 3 | 19.82 | 20.82 | 1.00 | A | 29.1 | 100.4 | 100.4 | 4:29 | 4:43 | 5.1 | 0.6 | 0.12 | - | - | - | - | - | - | |
| | | 22-May-11 | 2 | 20.82 | 24.80 | 3.98 | A | 41.1 | 41.1 | 10.3 | 4:09 | 4:25 | 5.2 | 0.5 | 0.02 | - | - | - | - | - | - | |
| | | 22-May-11 | 1 | 24.80 | 29.80 | 5.00 | A | 64.0 | 64.0 | 12.8 | 3:48 | 4:05 | 8.2 | 1.9 | 0.05 | - | - | - | - | - | - | |
| | | 22-May-11 | 1C | 29.80 | 34.90 | 5.10 | A | 45.2 | 45.2 | 8.9 | 3:30 | 3:44 | 10.7 | 0.6 | 0.01 | - | - | - | - | - | - | |
| T-32+034.5 | T | 29-Jun-11 | 4 | 18.41 | 20.41 | 2.00 | MF | 190.5 | 190.5 | 95.3 | 18:47 | 19:23 | 4.6 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 25-May-11 | 3 | 20.91 | 21.91 | 1.00 | A | 161.2 | 161.2 | 161.2 | 11:57 | 12:40 | 4.4 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 25-May-11 | 2 | 21.91 | 25.90 | 3.99 | A | 167.3 | 167.3 | 41.9 | 11:06 | 11:48 | 4.8 | 0.6 | 0.03 | - | - | - | - | - | - | |
| | | 25-May-11 | 1 | 25.90 | 30.90 | 5.00 | A | 53.5 | 53.5 | 10.7 | 10:39 | 10:59 | 7.6 | 0.9 | 0.02 | - | - | - | - | - | - | |
| | | 25-May-11 | 1C | 30.90 | 36.00 | 5.10 | A | 23.8 | 23.8 | 4.7 | 10:15 | 10:31 | 10.1 | 1.0 | 0.21 | 33.5 | 4.0 | 1.61 | 18.6 | 12.1 | 20.6 | |
| P-32+036 | P | 18-Jun-11 | 4 | 17.89 | 19.89 | 2.00 | B | 172.0 | - | - | 7:20 | 7:42 | 0.8 | 12.5 | 9.53 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 18-Jun-11 | 4 | 17.89 | 19.89 | 2.00 | D | 130.7 | - | - | 7:42 | 7:51 | 1.5 | 18.7 | 3.99 | - | - | - | - | - | - | |
| | | 18-Jun-11 | 4 | 17.89 | 19.89 | 2.00 | X | 104.3 | 407.0 | 203.5 | 7:51 | 7:56 | 2.0 | 5.0 | 1.27 | - | - | - | - | - | - | |
| | | 13-May-11 | 3 | 20.39 | 21.99 | 1.60 | A | 41.3 | 41.3 | 25.8 | 1:21 | 1:38 | 4.9 | 0.4 | 0.08 | 31.1 | - | 1.61 | 14.4 | 7.1 | 14.8 | |
| | | 16-May-11 | 2 | 21.39 | 25.40 | 4.01 | A | 201.5 | - | - | 20:21 | 21:05 | 0.0 | 12.0 | inf | - | - | - | - | - | - | |
| | | 16-May-11 | 2 | 21.39 | 25.40 | 4.01 | B | 201.1 | - | - | 21:05 | 21:18 | 0.0 | 20.9 | inf | 35.9 | 5.0 | 1.62 | 24.4 | 7.9 | 19.5 | |
| | | 16-May-11 | 2 | 21.39 | 25.40 | 4.01 | C | 157.3 | 559.9 | 139.6 | 21:18 | 21:39 | 5.4 | 0.7 | 0.03 | 46.4 | - | 1.64 | 24.4 | 7.9 | 19.5 | |
| | | 16-May-11 | 1 | 25.40 | 30.40 | 5.00 | A | 178.0 | 178.0 | 35.6 | 19:41 | 20:15 | 7.5 | 6.6 | 0.18 | - | - | - | - | - | - | |
| | | 16-May-11 | 1C | 30.40 | 35.50 | 5.10 | A | 122.5 | 122.5 | 24.0 | 19:12 | 19:35 | 10.4 | 2.8 | 0.05 | 32.1 | 4.0 | 1.60 | 20.4 | 7.3 | 16.9 | |
| T-32+037.5 | T | 05-Jul-11 | 4 | 17.90 | 19.90 | 2.00 | MF | 38.8 | 38.8 | 19.4 | 22:22 | 22:36 | 4.7 | 0.7 | 0.08 | - | - | - | - | - | - | |
| | | 28-May-11 | 3 | 20.40 | 21.40 | 1.00 | A | 158.5 | - | - | 15:30 | 16:13 | 4.5 | 1.2 | 0.32 | - | - | - | - | - | - | |
| | | 28-May-11 | 3 | 20.40 | 21.40 | 1.00 | B | 10.4 | 168.9 | 168.9 | 16:13 | 16:25 | 4.6 | 0.1 | 0.16 | 34.0 | 4.0 | 1.60 | 7.5 | 11.9 | 21.3 | |
| | | 28-May-11 | 2 | 21.40 | 25.40 | 4.00 | A | 23.9 | 23.9 | 6.0 | 15:04 | 15:24 | 4.9 | 0.4 | 0.02 | - | - | - | - | - | - | |
| | | 28-May-11 | 1 | 25.40 | 30.20 | 4.80 | A | 70.5 | 70.5 | 14.7 | 14:30 | 14:57 | 7.8 | 0.9 | 0.02 | 32.0 | - | 1.59 | 2.0 | 9.6 | 14.7 | Packer stuck down hole. Re-drilled. |
| | | 28-May-11 | 1C | 30.40 | 35.60 | 5.20 | A | 32.2 | 32.2 | 6.2 | 10:15 | 10:38 | 10.2 | 0.5 | 0.01 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| S-32+039 | S | 23-Jun-11 | 4 | 19.16 | 21.16 | 2.00 | B | 161.8 | - | - | 14:45 | 15:09 | 5.0 | 13.5 | 1.78 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 19.16 | 21.16 | 2.00 | C | 149.2 | 311.0 | 155.5 | 15:09 | 15:40 | 5.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 18-May-11 | 3 | 21.66 | 22.70 | 1.04 | A | 23.9 | - | - | 1:36 | 1:50 | 5.8 | 0.0 | 0.00 | 31.4 | - | 1.60 | 27.4 | 10.4 | 18.1 | |
| | | 22-May-11 | 3 | 21.66 | 22.66 | 1.00 | A | 30.5 | 54.4 | 54.4 | 10:29 | 10:46 | 5.0 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 22-May-11 | 2 | 22.66 | 26.70 | 4.04 | A | 200.3 | - | - | 9:35 | 10:01 | 0.0 | 13.1 | inf | - | - | - | - | - | - | |
| | | 22-May-11 | 2 | 22.66 | 26.70 | 4.04 | B | 201.7 | - | - | 10:01 | 10:15 | 5.2 | 16.3 | 0.79 | 36.4 | - | 1.62 | 21.3 | 11.4 | 20.1 | |
| | | 22-May-11 | 2 | 22.66 | 26.70 | 4.04 | C | 36.9 | 438.9 | 108.6 | 10:15 | 10:26 | 4.7 | 0.5 | 0.03 | 43.8 | - | 1.65 | 20.8 | 11.8 | 19.2 | |
| | | 22-May-11 | 1 | 26.70 | 31.70 | 5.00 | A | 105.7 | 105.7 | 21.1 | 9:04 | 9:29 | 7.1 | 4.3 | 0.12 | - | - | - | - | - | - | |
| | | 22-May-11 | 1C | 31.70 | 36.70 | 5.00 | A | 25.2 | 25.2 | 5.0 | 8:46 | 8:58 | 10.2 | 0.5 | 0.01 | 32.0 | - | 1.60 | 21.3 | 11.4 | 19.2 | |
| T-32+040.5 | T | 29-Jun-11 | 4 | 19.48 | 21.48 | 2.00 | MF | 187.0 | - | - | 19:29 | 19:56 | 4.6 | 11.6 | 1.37 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 4 | 19.48 | 21.48 | 2.00 | B | 48.5 | 235.5 | 117.8 | 19:56 | 20:20 | 4.6 | 0.3 | 0.03 | 36.6 | - | 1.64 | 9.9 | 9.6 | 18.3 | |
| | | 24-May-11 | 3 | 21.98 | 22.98 | 1.00 | A | 14.9 | 14.9 | 14.9 | 5:09 | 5:22 | 4.6 | 0.6 | 0.12 | - | - | - | - | - | - | |
| | | 24-May-11 | 2 | 22.98 | 27.00 | 4.02 | A | 55.6 | 55.6 | 13.8 | 4:49 | 5:07 | 4.8 | 0.6 | 0.03 | - | - | - | - | - | - | |
| | | 24-May-11 | 1 | 27.00 | 32.00 | 5.00 | A | 25.8 | 25.8 | 5.2 | 4:33 | 4:45 | 7.7 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 24-May-11 | 1C | 32.00 | 37.00 | 5.00 | A | 24.2 | 24.2 | 4.8 | 4:13 | 4:26 | 9.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-32+042 | P | 18-Jun-11 | 4 | 17.06 | 19.06 | 2.00 | B | 160.0 | - | - | 6:22 | 6:42 | 3.5 | 15.8 | 2.24 | 37.5 | 4.0 | 1.61 | 10.6 | 12.8 | 16.8 | By-pass between plastic and steel casing |
| | | 18-Jun-11 | 4 | 17.06 | 19.06 | 2.00 | C | 160.0 | - | - | 6:42 | 6:52 | 3.7 | 18.1 | 2.53 | 45.1 | - | 1.63 | 10.6 | 12.8 | 17.0 | |
| | | 18-Jun-11 | 4 | 17.06 | 19.06 | 2.00 | D | 200.0 | - | - | 6:52 | 7:02 | 4.1 | 20.1 | 2.57 | 63.8 | - | 1.66 | 10.6 | 12.8 | 15.4 | |
| | | 18-Jun-11 | 4 | 17.06 | 19.06 | 2.00 | X | 228.8 | 748.8 | 374.4 | 7:02 | 7:17 | 5.1 | 14.1 | 1.40 | - | - | - | - | - | - | |
| | | 13-May-11 | 3 | 19.56 | 20.70 | 1.14 | A | 156.8 | - | - | 2:01 | 2:37 | 4.8 | 3.5 | 0.74 | - | - | - | - | - | - | |
| | | 13-May-11 | 3 | 19.56 | 20.70 | 1.14 | B | 159.9 | - | - | 2:37 | 3:36 | 5.0 | 2.5 | 0.47 | 38.4 | 1.0 | 1.63 | 14.2 | 7.3 | 17.5 | |
| | | 13-May-11 | 3 | 19.56 | 20.70 | 1.14 | C | 66.4 | 383.1 | 336.1 | 3:36 | 4:15 | 5.2 | 0.2 | 0.04 | 46.0 | - | 1.66 | 14.2 | 7.8 | 18.1 | |
| | | 16-May-11 | 3 | 19.56 | 20.56 | 1.00 | A | 14.0 | 14.0 | 14.0 | 2:13 | 2:29 | 4.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 16-May-11 | 2 | 20.56 | 24.60 | 4.04 | A | 27.9 | 27.9 | 6.9 | 1:55 | 2:10 | 4.9 | 0.2 | 0.01 | 30.1 | - | 1.62 | 16.2 | 7.2 | 16.4 | |
| | | 16-May-11 | 1 | 24.60 | 29.60 | 5.00 | A | 208.9 | - | - | 22:51 | 23:15 | 0.0 | 12.6 | inf | - | - | - | - | - | - | |
| | | 16-May-11 | 1 | 24.60 | 29.60 | 5.00 | B | 191.1 | - | - | 23:15 | 23:32 | 7.9 | 11.6 | 0.73 | - | - | - | - | - | - | |
| | | 16-May-11 | 1 | 24.60 | 29.60 | 5.00 | C | 128.4 | 528.4 | 105.7 | 23:32 | 23:51 | 7.9 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 16-May-11 | 1C | 29.60 | 34.60 | 5.00 | A | 211.9 | - | - | 22:02 | 22:32 | 8.9 | 10.1 | 0.23 | - | - | - | - | - | - | |
| | | 16-May-11 | 1C | 29.60 | 34.60 | 5.00 | B | 98.1 | 310.0 | 62.0 | 22:32 | 22:45 | 10.8 | 4.9 | 0.09 | - | - | - | - | - | - | |
| T-32+043.5 | T | 06-Jul-11 | 4 | 17.11 | 19.11 | 2.00 | MF | 60.5 | 60.5 | 30.3 | 7:40 | 8:01 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 28-May-11 | 3 | 19.61 | 20.61 | 1.00 | A | 30.9 | 30.9 | 30.9 | 9:01 | 9:23 | 4.5 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 28-May-11 | 2 | 20.61 | 24.60 | 3.99 | A | 186.2 | 186.2 | 46.7 | 8:12 | 8:54 | 4.8 | 1.6 | 0.08 | - | - | - | - | - | - | |
| | | 28-May-11 | 1 | 24.60 | 29.60 | 5.00 | A | 87.5 | 87.5 | 17.5 | 7:37 | 8:06 | 7.7 | 2.0 | 0.05 | - | - | - | - | - | - | |
| | | 28-May-11 | 1C | 29.60 | 34.60 | 5.00 | A | 23.3 | 23.3 | 4.7 | 7:15 | 7:30 | 10.0 | 0.5 | 0.01 | 34.0 | 3.5 | 1.60 | 10.7 | 14.6 | 14.2 | |
| S-32+045 | S | 23-Jun-11 | 4 | 17.83 | 19.83 | 2.00 | B | 193.7 | - | - | 13:45 | 14:11 | 2.3 | 11.8 | 3.41 | 35.6 | - | 1.65 | 11.1 | 9.8 | 16.8 | |
| | | 23-Jun-11 | 4 | 17.83 | 19.83 | 2.00 | C | 187.0 | 380.7 | 190.4 | 14:11 | 14:42 | 5.0 | 0.0 | 0.00 | 47.2 | - | 1.66 | 11.0 | 9.4 | 19.7 | |
| | | 18-May-11 | 3 | 20.33 | 21.40 | 1.07 | A | 161.1 | - | - | 2:11 | 2:33 | 3.6 | 10.6 | 3.97 | - | - | - | - | - | - | Communicated to P-32+048 |
| | | 18-May-11 | 3 | 20.33 | 21.40 | 1.07 | B | 74.8 | 235.9 | 220.5 | 2:33 | 2:53 | 5.4 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 22-May-11 | 3 | 20.33 | 21.33 | 1.00 | A | 23.9 | 23.9 | 23.9 | 15:22 | 15:36 | 5.6 | 0.6 | 0.10 | - | - | - | - | - | - | |
| | | 22-May-11 | 2 | 21.33 | 25.30 | 3.97 | A | 34.3 | 34.3 | 8.6 | 15:01 | 15:16 | 4.9 | 1.2 | 0.06 | - | - | - | - | - | - | |
| | | 22-May-11 | 1 | 25.30 | 30.30 | 5.00 | A | 200.2 | - | - | 14:08 | 14:31 | 4.6 | 14.4 | 0.56 | 31.9 | - | 1.61 | 23.4 | 10.1 | 21.7 | |
| | | 22-May-11 | 1 | 25.30 | 30.30 | 5.00 | B | 114.9 | 315.1 | 63.0 | 14:31 | 14:53 | 7.6 | 0.4 | 0.01 | 34.0 | - | 1.62 | 19.2 | 10.3 | 19.6 | |
| | | 22-May-11 | 1C | 30.30 | 35.40 | 5.10 | A | 192.7 | - | - | 11:08 | 11:43 | 9.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 22-May-11 | 1C | 30.30 | 35.40 | 5.10 | B | 1.4 | 194.1 | 38.1 | 11:43 | 11:50 | 10.9 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-32+046.5 | T | 29-May-11 | 1B | 35.40 | 40.30 | 4.90 | A | 168.3 | - | - | 13:37 | 14:05 | 1.2 | 11.9 | 2.12 | 32.0 | - | 1.59 | 10.8 | 10.3 | 16.4 | By-Pass. Outside Casing. |
| | | 29-May-11 | 1B | 35.40 | 40.30 | 4.90 | B | 169.7 | - | - | 14:05 | 14:16 | 4.2 | 20.9 | 1.01 | 37.0 | 3.5 | 1.61 | 11.9 | 10.2 | 14.9 | |
| | | 29-May-11 | 1B | 35.40 | 40.30 | 4.90 | C | 204.8 | - | - | 14:16 | 14:26 | 6.0 | 20.4 | 0.69 | 51.0 | 3.0 | 1.63 | 12.1 | 8.6 | 15.3 | Hole Abandoned. Packer stuck downhole. |
| | | 29-May-11 | 1B | 35.40 | 40.30 | 4.90 | D | 533.2 | 1076.0 | 219.6 | 14:26 | 14:59 | 12.8 | 6.1 | 0.09 | 66.0 | - | 1.64 | 12.1 | 9.3 | 16.6 | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| Q-32+047.25 | Q | 29-Jun-11 | 4 | 17.52 | 19.52 | 2.00 | MF | 184.6 | - | - | 20:30 | 20:53 | 3.9 | 12.7 | 1.97 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 4 | 17.52 | 19.52 | 2.00 | B | 90.8 | 275.40 | 137.70 | 20:53 | 21:15 | 4.6 | 0.5 | 0.05 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 3 | 20.02 | 21.02 | 1.00 | A | 19.6 | 19.60 | 19.60 | 23:47 | 0:00 | 4.7 | 0.3 | 0.06 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 3 | 20.02 | 21.02 | 1.00 | A | 6.6 | 6.60 | 6.60 | 3:54 | 4:06 | 4.8 | 0.5 | 0.10 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 2 | 21.02 | 25 | 3.98 | A | 64.2 | 64.20 | 16.13 | 23:24 | 23:44 | 4.9 | 0.9 | 0.05 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 2 | 21.02 | 25 | 3.98 | A | 7.3 | 7.30 | 1.83 | 3:38 | 3:50 | 5.0 | 1.0 | 0.05 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1 | 25 | 30 | 5.00 | A | 77.2 | 77.20 | 15.44 | 3:09 | 3:33 | 7.6 | 0.8 | 0.02 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1B | 35 | 40.1 | 5.10 | A | 65.9 | 65.90 | 12.92 | 2:24 | 2:48 | 12.8 | 0.1 | 0.00 | 31.5 | - | 1.6 | 12.6 | 8.7 | 16.1 | |
| | | 05-Jun-11 | 1C | 30 | 35 | 5.00 | A | 2.5 | 2.50 | 0.50 | 2:52 | 3:03 | 9.9 | 0.2 | 0.00 | - | - | - | - | - | - | |
| P-32+048 | P | 17-Jun-11 | 4 | 16.89 | 18.89 | 2.00 | B | 142.9 | 142.9 | 71.5 | 4:42 | 5:10 | 4.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 19.39 | 21.27 | 1.88 | A | 49.2 | 49.2 | 26.2 | 8:40 | 9:01 | 5.2 | 0.4 | 0.04 | 32.1 | 4.7 | 1.61 | 13.5 | 8.7 | 17.5 | |
| | | 17-May-11 | 1 | 24.39 | 29.39 | 5.00 | A | 201.9 | - | - | 20:47 | 21:15 | 0.0 | 12.5 | inf | - | - | - | - | - | - | |
| | | 17-May-11 | 1 | 24.39 | 29.39 | 5.00 | B | 206.1 | - | - | 21:15 | 21:25 | 0.0 | 17.7 | inf | 37.1 | - | 1.62 | 18.1 | 7.3 | 18.1 | |
| | | 17-May-11 | 1 | 24.39 | 29.39 | 5.00 | C | 177.7 | 585.7 | 117.1 | 21:25 | 21:49 | 4.9 | 0.2 | 0.01 | 46.3 | - | 1.66 | 10.3 | 8.4 | 18.4 | |
| | | 17-May-11 | 1C | 29.39 | 34.39 | 5.00 | A | 33.4 | 33.4 | 6.7 | 20:18 | 20:32 | 8.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-11 | 1B | 34.39 | 39.40 | 5.01 | A | 29.2 | 29.2 | 5.8 | 19:55 | 20:10 | 10.4 | 0.0 | 0.00 | 31.6 | 5.0 | 1.61 | 18.1 | 7.2 | 14.1 | |
| T-32+049.5 | T | 06-Jul-11 | 4 | 16.05 | 18.05 | 2.00 | MF | 29.4 | 29.4 | 14.7 | 8:05 | 8:21 | 5.0 | 0.7 | 0.07 | - | - | - | - | - | - | |
| | | 27-May-11 | 3 | 18.55 | 19.55 | 1.00 | A | 3.3 | 3.3 | 3.3 | 5:13 | 5:25 | 4.6 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 27-May-11 | 2 | 19.55 | 23.50 | 3.95 | A | 6.1 | 6.1 | 1.5 | 4:55 | 5:07 | 4.9 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 27-May-11 | 1 | 23.50 | 27.50 | 4.00 | A | 12.0 | 12.0 | 3.0 | 4:34 | 4:50 | 7.7 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 27-May-11 | 1B, 1C | 27.50 | 38.60 | 11.10 | A | 122.4 | - | - | 3:13 | 3:34 | 0.0 | 8.8 | inf | - | - | - | - | - | - | By-pass. Grouted stages together. |
| | | 27-May-11 | 1B, 1C | 27.50 | 38.60 | 11.10 | A | 41.9 | - | - | 3:40 | 3:48 | 4.8 | 7.3 | 0.14 | - | - | - | - | - | - | |
| | | 27-May-11 | 1B, 1C | 27.50 | 38.60 | 11.10 | A | 55.9 | 220.2 | 19.8 | 3:55 | 4:28 | 10.1 | 0.9 | 0.02 | - | - | - | - | - | - | |
| S-32+051 | S | 23-Jun-11 | 4 | 19.53 | 21.53 | 2.00 | B | 155.2 | - | - | 10:19 | 10:42 | 5.1 | 9.4 | 1.22 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 19.53 | 21.53 | 2.00 | C | 113.8 | 269.0 | 134.5 | 10:42 | 11:28 | 4.8 | 0.8 | 0.10 | - | - | - | - | - | - | |
| | | 22-May-11 | 3 | 22.03 | 23.20 | 1.17 | A | 198.7 | - | - | 16:00 | 16:28 | 0.0 | 11.8 | inf | - | - | - | - | - | - | |
| | | 22-May-11 | 3 | 22.03 | 23.20 | 1.17 | B | 202.4 | - | - | 16:28 | 16:45 | 0.0 | 16.4 | inf | - | - | - | - | - | - | |
| | | 22-May-11 | 3 | 22.03 | 23.20 | 1.17 | C | 195.9 | - | - | 16:45 | 17:02 | 2.6 | 11.9 | 3.92 | 57.0 | - | 1.64 | 15.0 | 9.1 | 18.7 | |
| | | 22-May-11 | 3 | 22.03 | 23.20 | 1.17 | D | 176.7 | - | - | 17:02 | 17:16 | 5.9 | 6.4 | 0.86 | 62.0 | - | 1.66 | 15.2 | 9.1 | 19.0 | |
| | | 22-May-11 | 3 | 22.03 | 23.20 | 1.17 | X | 6.5 | 780.2 | 666.8 | 17:16 | 17:24 | 5.3 | 0.3 | 0.05 | - | - | - | - | - | - | |
| | | 24-May-11 | 3 | 22.03 | 23.03 | 1.00 | A | 13.6 | 13.6 | 13.6 | 3:15 | 3:28 | 4.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-May-11 | 2 | 23.03 | 27.00 | 3.97 | A | 24.0 | 24.0 | 6.0 | 2:58 | 3:12 | 4.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-May-11 | 1 | 27.00 | 32.00 | 5.00 | A | 199.3 | - | - | 2:05 | 2:32 | 5.9 | 11.8 | 0.41 | - | - | - | - | - | - | |
| | | 24-May-11 | 1 | 27.00 | 32.00 | 5.00 | B | 170.7 | 370.0 | 74.0 | 2:32 | 2:54 | 7.9 | 0.4 | 0.01 | 36.9 | - | 1.62 | 15.6 | 12.8 | 21.2 | |
| | | 24-May-11 | 1C | 32.00 | 37.00 | 5.00 | A | 21.6 | 21.6 | 4.3 | 1:47 | 2:01 | 10.1 | 0.3 | 0.01 | 32.2 | - | 1.42 | 18.9 | 13.0 | 24.1 | |
| | | 24-May-11 | 1B | 37.00 | 42.10 | 5.10 | A | 28.7 | 28.7 | 5.6 | 1:29 | 1:43 | 12.8 | 0.1 | 0.00 | - | - | - | - | - | - | |
| T-32+052.5 | T | 29-Jun-11 | 4 | 18.31 | 20.31 | 2.00 | MF | 188.7 | 188.7 | 94.4 | 21:22 | 22:08 | 4.7 | 0.4 | 0.04 | - | - | - | - | - | - | |
| | | 29-May-11 | 3 | 20.81 | 21.81 | 1.00 | A | 13.9 | 13.9 | 13.9 | 21:45 | 22:07 | 4.4 | 0.4 | 0.10 | - | - | - | - | - | - | |
| | | 29-May-11 | LB, 1C, 1, | 21.81 | 40.90 | 19.09 | A | 73.7 | - | - | 20:21 | 20:39 | 1.0 | 3.8 | 0.21 | - | - | - | - | - | - | By-Pass. Combined stages. |
| | | 29-May-11 | LB, 1C, 1, | 21.81 | 40.90 | 19.09 | A | 15.6 | - | - | 20:43 | 20:53 | 1.4 | 3.7 | 0.14 | - | - | - | - | - | - | Continiued By-Pass. Combined stages. |
| | | 29-May-11 | LB, 1C, 1, | 21.81 | 40.90 | 19.09 | A | 21.6 | - | - | 21:01 | 21:11 | 2.9 | 5.1 | 0.09 | - | - | - | - | - | - | Continiued By-Pass. Combined stages. |
| | | 29-May-11 | LB, 1C, 1, | 21.81 | 40.90 | 19.09 | A | 21.7 | 132.6 | 6.9 | 21:17 | 21:42 | 4.7 | 0.5 | 0.01 | - | - | - | - | - | - | |
| Q-32+053.25 | Q | 06-Jul-11 | 4 | 20.29 | 22.29 | 2.00 | MF | 22.3 | 22.30 | 11.15 | 11:34 | 11:48 | 4.5 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 3 | 22.79 | 23.79 | 1.00 | A | 15.3 | 15.30 | 15.30 | 22:59 | 23:12 | 4.5 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 3 | 22.79 | 23.79 | 1.00 | A | 8.1 | 8.10 | 8.10 | 23:47 | 0:03 | 4.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 2 | 23.79 | 27.8 | 4.01 | A | 120.9 | 120.90 | 30.15 | 22:18 | 22:56 | 4.8 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 2 | 23.79 | 27.8 | 4.01 | A | 11.4 | 11.40 | 2.84 | 23:32 | 23:44 | 5.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1 | 27.8 | 32.8 | 5.00 | A | 6.7 | 6.70 | 1.34 | 23:16 | 23:27 | 7.5 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1C | 32.8 | 37.8 | 5.00 | A | 15.9 | 15.90 | 3.18 | 23:00 | 23:12 | 10.3 | 0.8 | 0.02 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1B | 37.8 | 43 | 5.20 | A | 65.9 | 65.90 | 12.67 | 22:35 | 22:57 | 12.6 | 1.4 | 0.02 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-32+054 | P | 17-Jun-11 | 4 | 19.48 | 21.48 | 2.00 | B | 199.6 | 199.6 | 99.8 | 4:00 | 4:40 | 4.9 | 1.9 | 0.19 | - | - | - | - | - | - | |
| | | 14-May-11 | 3 | 21.98 | 23.06 | 1.08 | A | 198.6 | - | - | 6:14 | 6:44 | 0.0 | 12.2 | inf | 32.0 | 4.0 | 1.65 | 17.0 | 5.0 | 15.2 | |
| | | 14-May-11 | 3 | 21.98 | 23.06 | 1.08 | B | 198.5 | - | - | 6:44 | 7:05 | 0.0 | 15.8 | inf | 36.0 | - | 1.63 | 17.0 | 5.0 | 12.6 | |
| | | 14-May-11 | 3 | 21.98 | 23.06 | 1.08 | C | 193.3 | - | - | 7:05 | 7:18 | 0.2 | 16.1 | 79.14 | 48.0 | - | 1.69 | 25.0 | 5.0 | 20.6 | |
| | | 14-May-11 | 3 | 21.98 | 23.06 | 1.08 | D | 210.6 | - | - | 7:18 | 7:31 | 4.0 | 16.4 | 4.75 | 75.0 | - | 1.69 | 25.0 | 5.0 | 18.7 | |
| | | 14-May-11 | 3 | 21.98 | 23.06 | 1.08 | X | 62.0 | 863.0 | 800.5 | 7:31 | 7:46 | 5.4 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 19-May-11 | 3 | 21.98 | 22.98 | 1.00 | A | 1.5 | 1.5 | 1.5 | 16:07 | 16:17 | 5.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-May-11 | 2 | 22.98 | 28.48 | 5.50 | A | 202.1 | - | - | 22:18 | 22:43 | 0.0 | 21.6 | inf | - | - | - | - | - | - | |
| | | 17-May-11 | 2 | 22.98 | 28.48 | 5.50 | B | 199.5 | - | - | 22:43 | 22:52 | 0.8 | 18.0 | 3.25 | - | - | - | - | - | - | |
| | | 17-May-11 | 2 | 22.98 | 28.48 | 5.50 | C | 147.9 | 549.5 | 104.3 | 22:52 | 23:14 | 6.0 | 0.6 | 0.02 | - | - | - | - | - | - | |
| | | 19-May-11 | 2 | 22.98 | 27.00 | 4.02 | A | 23.9 | 23.9 | 5.9 | 15:40 | 15:52 | 5.1 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 19-May-11 | 1 | 27.00 | 32.00 | 5.00 | A | 200.9 | - | - | 14:35 | 15:02 | 7.5 | 11.4 | 0.32 | - | - | - | - | - | - | |
| | | 19-May-11 | 1 | 27.00 | 32.00 | 5.00 | B | 199.2 | - | - | 15:02 | 15:17 | 7.9 | 12.4 | 0.31 | 39.2 | - | 1.63 | 22.1 | 12.4 | 18.7 | |
| | | 19-May-11 | 1 | 27.00 | 32.00 | 5.00 | C | 58.3 | 458.4 | 91.7 | 15:17 | 15:31 | 7.4 | 1.1 | 0.03 | 50.1 | - | 1.63 | 18.2 | 11.5 | 20.1 | |
| | | 19-May-11 | 1C | 32.00 | 37.00 | 5.00 | A | 26.2 | 26.2 | 5.2 | 14:16 | 14:27 | 10.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 19-May-11 | 1B | 37.00 | 42.00 | 5.00 | A | 28.3 | 28.3 | 5.7 | 13:44 | 14:05 | 12.6 | 0.0 | 0.00 | 33.1 | - | 1.61 | 20.1 | 11.1 | 17.8 | Stage potentially collapsed. |
| T-32+055.2 | T | 06-Jul-11 | 4 | 13.24 | 15.24 | 2.00 | MF | 144.3 | 144.3 | 72.2 | 8:29 | 8:52 | 4.3 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 27-May-11 | 3 | 18.55 | 19.55 | 1.00 | A | 8.9 | 8.9 | 8.9 | 2:21 | 2:35 | 4.8 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 27-May-11 | 2 | 19.55 | 23.50 | 3.95 | A | 7.4 | 7.4 | 1.9 | 2:03 | 2:15 | 5.2 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 27-May-11 | 1C, 1 | 23.50 | 33.50 | 10.00 | A | 23.5 | 23.5 | 2.4 | 1:39 | 1:57 | 7.8 | 0.6 | 0.01 | 34.1 | 3.0 | 1.63 | 3.0 | 8.8 | 15.6 | By-pass. Grouted stages together. |
| | | 27-May-11 | 1B | 33.50 | 38.60 | 5.10 | A | 184.1 | 184.1 | 36.1 | 22:34 | 23:13 | 12.5 | 7.4 | 0.12 | - | - | - | - | - | - | |
| S-32+057 | S | 23-Jun-11 | 4 | 15.36 | 17.36 | 2.00 | B | 133.7 | 133.7 | 66.9 | 9:45 | 10:15 | 5.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 22-May-11 | 3 | 17.86 | 18.90 | 1.04 | A | 165.8 | - | - | 19:01 | 19:38 | 1.3 | 12.1 | 9.29 | 31.6 | 4.0 | 1.61 | 10.7 | 9.1 | 14.4 | |
| | | 22-May-11 | 3 | 17.86 | 18.90 | 1.04 | B | 123.1 | 288.9 | 277.8 | 19:38 | 19:59 | 5.3 | 0.7 | 0.13 | 35.4 | 2.0 | 1.63 | 10.7 | 9.1 | 15.4 | |
| | | 24-May-11 | 3 | 17.86 | 18.86 | 1.00 | A | 8.0 | 8.0 | 8.0 | 21:54 | 22:07 | 5.1 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 24-May-11 | 2 | 18.86 | 22.90 | 4.04 | A | 8.1 | 8.1 | 2.0 | 21:39 | 21:50 | 4.9 | 0.5 | 0.03 | - | - | - | - | - | - | |
| | | 24-May-11 | 1 | 22.90 | 27.90 | 5.00 | A | 26.3 | 26.3 | 5.3 | 21:21 | 21:34 | 7.6 | 1.0 | 0.03 | - | - | - | - | - | - | |
| | | 24-May-11 | 1C | 27.90 | 32.90 | 5.00 | A | 114.8 | 114.8 | 23.0 | 20:50 | 21:17 | 9.8 | 2.0 | 0.04 | 31.8 | 2.5 | 1.58 | 18.6 | 11.4 | 19.4 | |
| | | 24-May-11 | 1B | 32.90 | 37.90 | 5.00 | A | 81.3 | 81.3 | 16.3 | 20:27 | 20:45 | 12.9 | 2.7 | 0.04 | - | - | - | - | - | - | |
| T-32+058.5 | T | 29-Jun-11 | 4 | 18.61 | 20.61 | 2.00 | MF | 68.3 | 68.3 | 34.2 | 22:10 | 22:33 | 4.6 | 0.5 | 0.05 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 3 | 21.11 | 22.11 | 1.00 | A | 18.9 | - | - | 21:24 | 21:38 | 4.4 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 3 | 21.11 | 22.11 | 1.00 | A | 25.9 | 44.8 | 44.8 | 21:36 | 22:02 | 4.6 | 0.8 | 0.17 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 2 | 22.11 | 26.10 | 3.99 | A | 157.6 | - | - | 20:47 | 21:20 | 4.7 | 0.9 | 0.05 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 2 | 22.11 | 26.10 | 3.99 | A | 104.1 | 261.7 | 65.6 | 21:04 | 21:31 | 4.5 | 1.5 | 0.09 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1 | 26.10 | 31.10 | 5.00 | A | 5.2 | 5.2 | 1.0 | 20:47 | 20:59 | 7.5 | 0.3 | 0.01 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1C | 31.10 | 36.10 | 5.00 | A | 11.3 | 11.3 | 2.3 | 20:29 | 21:42 | 9.6 | 0.4 | 0.01 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1B | 36.10 | 41.20 | 5.10 | A | 193.7 | - | - | 19:16 | 19:43 | 1.1 | 12.1 | 2.26 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1B | 36.10 | 41.20 | 5.10 | B | 211.0 | - | - | 19:43 | 20:02 | 10.2 | 14.4 | 0.28 | 36.9 | 5.5 | 1.65 | 12.6 | 8.0 | 15.4 | |
| | | 05-Jun-11 | 1B | 36.10 | 41.20 | 5.10 | C | 107.5 | 512.2 | 100.4 | 20:02 | 20:20 | 11.9 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-32+060 | P | 17-Jun-11 | 4 | 16.09 | 18.09 | 2.00 | B | 160.6 | - | - | 3:20 | 3:43 | 5.2 | 6.5 | 1.42 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 4 | 16.09 | 18.09 | 2.00 | C | 16.1 | 176.7 | 88.4 | 3:43 | 3:54 | 5.2 | 0.8 | 0.08 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 18.59 | 21.32 | 2.73 | A | 56.9 | - | - | 9:13 | 9:33 | 5.1 | 0.7 | 0.05 | - | - | - | - | - | - | |
| | | 17-May-11 | 3 | 16.87 | 17.87 | 1.00 | A | 30.7 | 30.7 | 30.7 | 3:55 | 4:12 | 5.7 | 1.0 | 0.18 | - | - | - | - | - | - | |
| | | 19-May-11 | 3 | 18.59 | 19.59 | 1.00 | A | 26.2 | 83.1 | 83.1 | 19:39 | 19:51 | 5.0 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 17-May-11 | 2 | 17.87 | 21.90 | 4.03 | A | 52.3 | 52.3 | 13.0 | 3:28 | 3:52 | 4.9 | 1.4 | 0.07 | - | - | - | - | - | - | |
| | | 19-May-11 | 2 | 19.59 | 23.60 | 4.01 | A | 27.1 | 27.1 | 6.8 | 19:24 | 19:37 | 4.9 | 0.4 | 0.02 | - | - | - | - | - | - | |
| | | 17-May-11 | 1 | 21.90 | 27.30 | 5.40 | A | 206.1 | - | - | 1:16 | 1:39 | 0.0 | 2.3 | inf | 30.6 | - | 1.60 | 8.1 | 7.4 | 13.9 | |
| | | 17-May-11 | 1 | 21.90 | 27.30 | 5.40 | B | 197.6 | - | - | 1:39 | 1:53 | 0.0 | 20.7 | inf | 36.4 | 5.0 | 1.62 | 8.1 | 7.4 | 13.2 | |
| | | 17-May-11 | 1 | 21.90 | 27.30 | 5.40 | C | 200.5 | - | - | 1:53 | 2:03 | 0.0 | 17.3 | inf | - | - | 1.66 | 8.1 | 7.4 | 13.3 | |
| | | 17-May-11 | 1 | 21.90 | 27.30 | 5.40 | D | 201.8 | - | - | 2:03 | 2:13 | 0.0 | 21.2 | 299.01 | 72.0 | - | 1.68 | 8.1 | 7.4 | 13.5 | |
| | | 17-May-11 | 1 | 21.90 | 27.30 | 5.40 | X | 343.0 | 1149.0 | 212.8 | 2:13 | 2:46 | 8.1 | 0.6 | 0.01 | - | - | - | - | - | - | |
| | | 19-May-11 | 1 | 23.60 | 28.60 | 5.00 | A | 56.7 | 56.7 | 11.3 | 19:04 | 19:20 | 7.7 | 0.6 | 0.02 | - | - | - | - | - | - | |
| | | 19-May-11 | 1C | 28.60 | 33.60 | 5.00 | A | 216.5 | - | - | 17:35 | 18:29 | 0.0 | 9.5 | inf | 31.4 | 1.0 | 1.60 | 16.4 | 17.4 | 22.5 | |
| | | 19-May-11 | 1C | 28.60 | 33.60 | 5.00 | B | 183.7 | - | - | 18:29 | 18:44 | 8.7 | 12.3 | 0.28 | 36.4 | - | 1.63 | 16.4 | 11.4 | 21.4 | |
| | | 19-May-11 | 1C | 28.60 | 33.60 | 5.00 | C | 82.0 | 482.2 | 96.4 | 18:44 | 18:57 | 11.0 | 0.7 | 0.01 | 48.7 | - | 1.66 | 16.3 | 11.4 | 20.0 | |
| | | 19-May-11 | 1B | 33.60 | 38.60 | 5.00 | A | 203.5 | - | - | 16:49 | 17:15 | 5.9 | 12.7 | 0.43 | - | - | - | - | - | - | |
| | | 19-May-11 | 1B | 33.60 | 38.60 | 5.00 | B | 129.7 | 333.2 | 66.6 | 17:15 | 17:28 | 12.8 | 3.6 | 0.06 | - | - | - | - | - | - | |
| T-32+061.5 | T | 06-Jul-11 | 4 | 18.88 | 20.88 | 2.00 | MF | 187.4 | 187.4 | 93.7 | 8:56 | 9:12 | 5.0 | 0.4 | 0.04 | - | - | - | - | - | - | |
| T-32+061.5 | T | 30-May-11 | 3 | 21.38 | 22.38 | 1.00 | A | 21.6 | 21.6 | 21.6 | 22:34 | 22:48 | 4.5 | 0.2 | 0.05 | - | - | - | - | - | - | |
| T-32+061.5 | T | 30-May-11 | 2 | 22.38 | 26.40 | 4.02 | A | 35.6 | - | - | 22:16 | 22:29 | 4.9 | 0.6 | 0.03 | 35.5 | 1.0 | 1.63 | 7.4 | 9.9 | 23.3 | |
| T-32+061.5 | T | 01-Jun-11 | 2 | 22.38 | 26.40 | 4.02 | A | 9.1 | 44.7 | 11.1 | 22:50 | 23:03 | 4.9 | 0.8 | 0.04 | - | - | - | - | - | - | |
| T-32+061.5 | T | 01-Jun-11 | 1 | 26.40 | 31.40 | 5.00 | A | 8.9 | 8.9 | 1.8 | 22:32 | 22:44 | 7.6 | 0.5 | 0.01 | - | - | - | - | - | - | |
| T-32+061.5 | T | 01-Jun-11 | 1C | 31.40 | 36.40 | 5.00 | A | 30.0 | 30.0 | 6.0 | 22:08 | 22:23 | 9.9 | 0.9 | 0.02 | - | - | - | - | - | - | |
| T-32+061.5 | T | 01-Jun-11 | 1B | 36.40 | 41.40 | 5.00 | A | 84.6 | 84.6 | 16.9 | 21:41 | 22:04 | 12.0 | 2.1 | 0.04 | 33.3 | 2.0 | 1.65 | 10.3 | 10.9 | 22.8 | |
| S-32+063 | S | 23-Jun-11 | 4 | 20.37 | 22.37 | 2.00 | B | 188.6 | - | - | 8:14 | 8:40 | 2.8 | 11.7 | 2.29 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 20.37 | 22.37 | 2.00 | C | 254.5 | - | - | 8:40 | 9:02 | 4.7 | 7.9 | 1.13 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 20.37 | 22.37 | 2.00 | D | 45.8 | 488.9 | 244.5 | 9:02 | 9:27 | 4.9 | 0.4 | 0.05 | - | - | - | - | - | - | |
| | | 22-May-11 | 3 | 20.27 | 21.30 | 1.03 | A | 160.6 | - | - | 20:20 | 20:44 | 4.3 | 9.7 | 2.19 | - | - | - | - | - | - | |
| | | 22-May-11 | 3 | 20.27 | 21.30 | 1.03 | B | 76.2 | 236.8 | 229.9 | 20:44 | 21:12 | 5.2 | 0.7 | 0.14 | - | - | - | - | - | - | |
| | | 24-May-11 | 3 | 20.27 | 21.00 | 0.73 | A | 14.9 | 14.9 | 20.4 | 14:00 | 14:18 | 5.3 | 0.1 | 0.03 | 35.0 | - | 1.62 | 13.1 | 13.2 | 18.2 | |
| | | 28-May-11 | 3 | 20.27 | 21.27 | 1.00 | A | 6.2 | 6.2 | 6.2 | 4:22 | 4:54 | 4.9 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 28-May-11 | 2 | 21.27 | 25.30 | 4.03 | A | 3.8 | 3.8 | 0.9 | 4:01 | 4:16 | 5.1 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 28-May-11 | 1 | 25.30 | 30.30 | 5.00 | A | 35.5 | 35.5 | 7.1 | 3:34 | 3:54 | 7.6 | 0.3 | 0.01 | 31.9 | - | 1.65 | 15.0 | 8.8 | 21.2 | |
| | | 28-May-11 | 1C | 30.30 | 36.30 | 6.00 | A | 31.5 | 31.5 | 5.3 | 3:11 | 3:25 | 10.0 | 0.7 | 0.01 | - | - | - | - | - | - | |
| | | 28-May-11 | 1B | 36.30 | 40.30 | 4.00 | A | 192.8 | - | - | 2:20 | 2:50 | 9.9 | 11.9 | 0.24 | - | - | - | - | - | - | |
| | | 28-May-11 | 1B | 36.30 | 40.30 | 4.00 | B | 105.9 | 298.7 | 74.7 | 2:50 | 3:04 | 12.6 | 5.2 | 0.08 | 36.6 | 5.0 | 1.65 | 16.4 | 8.7 | 18.1 | |
| T-32+064.5 | T | 29-Jun-11 | 4 | 21.26 | 23.26 | 2.00 | MF | 188.5 | - | - | 22:35 | 22:58 | 4.7 | 7.3 | 1.11 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 4 | 21.26 | 23.26 | 2.00 | B | 48.0 | 236.5 | 118.3 | 22:58 | 23:17 | 4.7 | 1.0 | 0.11 | - | 5.0 | - | - | - | - | |
| | | 03-Jun-11 | 3 | 23.76 | 24.76 | 1.00 | A | 13.5 | - | - | 20:20 | 20:33 | 4.8 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 3 | 23.76 | 24.76 | 1.00 | A | 15.3 | 28.8 | 28.8 | 9:06 | 9:20 | 4.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 2 | 24.76 | 28.80 | 4.04 | A | 105.3 | - | - | 19:47 | 20:17 | 4.6 | 0.3 | 0.01 | 32.8 | 3.5 | 1.62 | 12.5 | 14.1 | 16.7 | |
| | | 05-Jun-11 | 2 | 24.76 | 28.80 | 4.04 | A | 16.0 | 121.3 | 30.0 | 8:48 | 9:03 | 4.8 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1 | 28.80 | 33.80 | 5.00 | A | 9.8 | 9.8 | 2.0 | 8:18 | 8:31 | 7.7 | 0.5 | 0.01 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1C | 33.80 | 38.80 | 5.00 | A | 23.9 | 23.9 | 4.8 | 7:59 | 8:14 | 10.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1B | 38.80 | 43.90 | 5.10 | A | 78.0 | 78.0 | 15.3 | 7:24 | 7:52 | 12.6 | 2.3 | 0.04 | 33.2 | 4.0 | 1.61 | 8.5 | 16.9 | 15.3 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-32+065.7 | P | 17-Jun-11 | 4 | 20.15 | 22.15 | 2.00 | B | 164.5 | - | - | 1:29 | 1:50 | 0.4 | 12.7 | 17.39 | 37.2 | 4.0 | 1.61 | 10.5 | 13.8 | 16.6 | Water noted raising in adjacent casings |
| | | 17-Jun-11 | 4 | 20.15 | 22.15 | 2.00 | C | 170.4 | - | - | 1:50 | 2:03 | 1.5 | 15.7 | 4.95 | 37.0 | - | 1.63 | 10.2 | 12.9 | 14.8 | |
| | | 17-Jun-11 | 4 | 20.15 | 22.15 | 2.00 | D | 145.6 | - | - | 2:03 | 2:13 | 5.1 | 13.3 | 1.30 | 60.8 | - | 1.64 | 11.4 | 13.6 | 18.8 | |
| | | 17-Jun-11 | 4 | 20.15 | 22.15 | 2.00 | X | 264.9 | 745.4 | 372.7 | 2:13 | 3:06 | 4.7 | 0.5 | 0.06 | - | - | - | - | - | - | |
| | | 27-May-11 | 3 | 22.92 | 23.92 | 1.00 | A | 29.5 | 29.5 | 29.5 | 21:34 | 21:53 | 5.0 | 0.4 | 0.08 | - | - | - | - | - | - | |
| | | 27-May-11 | 2 | 23.92 | 27.90 | 3.98 | A | 209.1 | - | - | 20:21 | 20:48 | 0.4 | 12.1 | 12.87 | - | - | - | - | - | - | |
| | | 27-May-11 | 2 | 23.92 | 27.90 | 3.98 | B | 210.5 | - | - | 20:48 | 21:01 | 3.5 | 19.0 | 1.53 | 37.4 | 1.5 | 1.62 | 8.9 | 9.0 | 15.2 | |
| | | 27-May-11 | 2 | 23.92 | 27.90 | 3.98 | C | 179.4 | - | - | 21:01 | 21:12 | 5.1 | 10.2 | 0.56 | 37.8 | - | 1.61 | - | 9.4 | 14.4 | |
| | | 27-May-11 | 2 | 23.92 | 27.90 | 3.98 | D | 45.1 | 644.1 | 161.8 | 21:12 | 21:27 | 4.8 | 0.6 | 0.03 | 53.6 | - | 1.64 | - | 9.4 | 14.3 | |
| | | 27-May-11 | 1 | 27.90 | 32.90 | 5.00 | A | 66.0 | 66.0 | 13.2 | 20:01 | 20:15 | 7.7 | 4.1 | 0.11 | - | - | - | - | - | - | |
| | | 27-May-11 | 1C | 32.90 | 38.00 | 5.10 | A | 146.7 | 146.7 | 28.8 | 19:29 | 19:52 | 10.2 | 5.8 | 0.11 | 32.0 | 4.5 | 1.63 | 8.3 | 9.3 | 16.6 | |
| P-32+066 | P | 14-May-11 | 3 | 22.92 | 24.01 | 1.09 | A | 194.5 | - | - | 8:09 | 8:40 | 0.1 | 12.3 | 86.80 | - | - | - | - | - | - | By-pass between plastic and steel casing |
| | | 14-May-11 | 3 | 22.92 | 24.01 | 1.09 | C | 117.7 | 312.2 | 286.4 | 8:40 | 9:10 | 4.9 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 18-May-11 | 3 | 22.92 | 23.92 | 1.00 | A | 24.1 | 24.1 | 24.1 | 15:47 | 16:01 | 5.0 | 0.1 | 0.02 | - | - | - | - | - | | |
| | | 18-May-11 | 2 | 23.92 | 27.90 | 3.98 | A | 28.8 | 28.8 | 7.2 | 15:28 | 15:44 | 4.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 20-May-11 | 1B | 37.90 | 43.00 | 5.10 | A | 26.4 | 26.4 | 5.2 | 13:29 | 13:46 | 12.8 | 0.0 | 0.00 | - | - | - | - | - | - | Packer lost down hole. |
| T-32+067.5 | T | 06-Jul-11 | 4 | 19.93 | 21.93 | 2.00 | MF | 48.6 | 48.6 | 24.3 | 9:15 | 9:32 | 4.9 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-May-11 | 3 | 22.43 | 23.43 | 1.00 | A | 93.8 | - | - | 21:03 | 21:55 | 4.5 | 0.3 | 0.06 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 3 | 22.43 | 23.43 | 1.00 | A | 16.7 | - | - | 13:05 | 13:21 | 4.5 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 3 | 22.43 | 23.43 | 1.00 | A | 12.4 | 122.9 | 122.9 | 20:21 | 20:33 | 4.3 | 0.1 | 0.03 | - | - | - | - | - | - | Re-grouted due to possible communication |
| | | 30-May-11 | 2 | 23.43 | 27.40 | 3.97 | A | 26.4 | - | - | 20:44 | 20:57 | 4.8 | 0.1 | 0.00 | - | - | - | - | - | - | during casing installation. |
| | | 01-Jun-11 | 2 | 23.43 | 27.40 | 3.97 | A | 17.3 | 43.7 | 11.0 | 12:43 | 12:58 | 4.8 | 0.7 | 0.02 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 1 | 27.40 | 32.40 | 5.00 | A | 31.2 | 31.2 | 6.2 | 12:14 | 12:36 | 7.5 | 1.2 | 0.03 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 1C | 32.40 | 37.40 | 5.00 | A | 59.4 | 59.4 | 11.9 | 11:46 | 12:09 | 10.4 | 1.8 | 0.04 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 1B | 37.40 | 42.50 | 5.10 | A | 303.6 | 303.6 | 59.5 | 10:56 | 11:36 | 12.6 | 7.5 | 0.12 | - | - | - | - | - | - | |
| S-32+069 | S | 23-Jun-11 | 4 | 15.79 | 17.79 | 2.00 | B | 157.4 | - | - | 7:17 | 7:41 | 4.4 | 12.1 | 1.97 | - | - | - | - | - | - | |
| | | 23-Jun-11 | 4 | 15.79 | 17.79 | 2.00 | C | 121.4 | 278.8 | 139.4 | 7:41 | 8:10 | 4.8 | 0.6 | 0.08 | 43.4 | - | 1.67 | 11.4 | 9.7 | 17.1 | |
| | | 22-May-11 | 3 | 18.29 | 19.30 | 1.01 | A | 35.5 | - | - | 21:24 | 21:38 | 5.7 | 0.6 | 0.10 | - | - | - | - | - | - | |
| | | 24-May-11 | 3 | 18.29 | 19.29 | 1.00 | A | 13.6 | 49.1 | 49.1 | 17:02 | 17:18 | 4.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-May-11 | 2 | 19.29 | 23.30 | 4.01 | A | 16.5 | 16.5 | 4.1 | 16:42 | 16:57 | 4.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-May-11 | 1 | 23.30 | 28.30 | 5.00 | A | 15.4 | 15.4 | 3.1 | 16:20 | 16:37 | 7.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 24-May-11 | 1C | 28.30 | 38.30 | 10.00 | A | 181.6 | - | - | 14:37 | 15:06 | 0.0 | 13.1 | inf | - | - | - | - | - | - | |
| | | 24-May-11 | 1C | 28.30 | 38.30 | 10.00 | B | 171.5 | - | - | 15:06 | 15:17 | 0.0 | 20.7 | inf | 36.2 | 3.5 | 1.60 | 12.8 | 12.6 | 18.1 | |
| | | 24-May-11 | 1C | 28.30 | 38.30 | 10.00 | C | 106.0 | - | - | 15:17 | 15:22 | 0.0 | 20.0 | inf | 47.1 | - | 1.59 | 37.6 | 12.1 | 20.2 | |
| | | 24-May-11 | 1C | 28.30 | 38.30 | 10.00 | D | 746.9 | 1206.0 | 120.6 | 15:22 | 16:09 | 10.1 | 0.2 | 0.00 | 66.4 | - | 1.60 | 38.2 | 12.2 | 21.2 | |
| | | 29-May-11 | 1B | 33.30 | 36.30 | 3.00 | A | 46.5 | 46.5 | 15.5 | 8:37 | 9:17 | 12.7 | 0.1 | 0.00 | 32.0 | - | 1.57 | 12.5 | 10.1 | 16.1 | Re-grouted. |
| T-32+070.5 | T | 29-Jun-11 | 4 | 21.46 | 23.46 | 2.00 | MF | 186.3 | - | - | 23:19 | 23:43 | 1.6 | 12.5 | 3.96 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 4 | 21.46 | 23.46 | 2.00 | B | 196.8 | - | - | 23:43 | 23:56 | 4.6 | 13.0 | 1.56 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 4 | 21.46 | 23.46 | 2.00 | C | 120.9 | 504.0 | 252.0 | 23:56 | 0:23 | 4.7 | 0.8 | 0.09 | 46.5 | - | 1.67 | 9.9 | 9.6 | 19.5 | |
| | | 03-Jun-11 | 3 | 23.96 | 24.96 | 1.00 | A | 41.2 | - | - | 17:24 | 17:46 | 4.3 | 0.5 | 0.13 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 3 | 23.96 | 24.96 | 1.00 | A | 17.3 | 58.5 | 58.5 | 11:09 | 11:23 | 4.7 | 0.1 | 0.02 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 2 | 24.96 | 29.00 | 4.04 | A | 58.6 | - | - | 17:02 | 17:19 | 5.0 | 1.2 | 0.06 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 2 | 24.96 | 29.00 | 4.04 | A | 16.4 | 75.0 | 18.6 | 10:51 | 11:06 | 5.0 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1 | 29.00 | 34.00 | 5.00 | A | 29.1 | 29.1 | 5.8 | 10:30 | 10:44 | 7.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1C | 34.00 | 39.00 | 5.00 | A | 17.0 | 17.0 | 3.4 | 10:06 | 10:20 | 10.3 | 0.2 | 0.00 | - | - | - | - | - | - | |
| | | 05-Jun-11 | 1B | 39.00 | 44.00 | 5.00 | A | 26.6 | 26.6 | 5.3 | 9:45 | 10:00 | 12.6 | 0.0 | 0.00 | - | - | - | - | - | - | |

Golder Associates

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

AEM

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-32+072 | P | 17-Jun-11 | 4 | 14.08 | 16.08 | 2.00 | B | 209.5 | - | - | 22:06 | 22:31 | 3.7 | 15.8 | 2.95 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 4 | 14.08 | 16.08 | 2.00 | C | 152.6 | - | - | 22:31 | 22:40 | 3.9 | 14.9 | 1.86 | 46.2 | 2.0 | 1.64 | 10.2 | 12.1 | 20.2 | |
| | | 17-Jun-11 | 4 | 14.08 | 16.08 | 2.00 | D | 199.1 | - | - | 22:40 | 22:53 | 5.0 | 14.3 | 1.42 | 62.3 | - | 1.66 | 10.4 | 12.2 | 19.9 | |
| | | 17-Jun-11 | 4 | 14.08 | 16.08 | 2.00 | X | 134.2 | 695.4 | 347.7 | 22:53 | 23:15 | 5.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 16.58 | 19.40 | 2.82 | A | 89.5 | - | - | 22:05 | 22:29 | 5.0 | 0.9 | 0.06 | 32.7 | 4.0 | 1.61 | 9.2 | 7.8 | 15.4 | |
| | | 18-May-11 | 3 | 16.58 | 17.58 | 1.00 | A | 12.8 | 102.3 | 102.3 | 10:12 | 10:25 | 4.5 | 0.3 | 0.07 | - | - | - | - | - | - | |
| | | 18-May-11 | 2 | 17.58 | 21.60 | 4.02 | A | 34.6 | 34.6 | 8.6 | 9:50 | 10:06 | 4.9 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 18-May-11 | 1 | 21.60 | 26.60 | 5.00 | A | 148.0 | 148.0 | 29.6 | 9:19 | 9:47 | 7.0 | 4.2 | 0.12 | - | - | - | - | - | - | |
| | | 18-May-11 | 1C | 26.60 | 31.60 | 5.00 | A | 200.1 | - | - | 7:35 | 8:05 | 0.0 | 10.7 | inf | - | - | - | - | - | - | |
| | | 18-May-11 | 1C | 26.60 | 31.60 | 5.00 | B | 204.8 | - | - | 8:05 | 8:19 | 0.0 | 23.0 | inf | 39.1 | - | 1.68 | 12.1 | 8.4 | 15.6 | |
| | | 18-May-11 | 1C | 26.60 | 31.60 | 5.00 | C | 207.5 | - | - | 8:19 | 8:31 | 2.2 | 20.0 | 1.82 | 47.6 | - | 1.68 | 12.1 | 8.4 | 15.6 | |
| | | 18-May-11 | 1C | 26.60 | 31.60 | 5.00 | D | 210.6 | - | - | 8:31 | 8:41 | 3.7 | 5.6 | 0.24 | 71.4 | - | 1.69 | 12.3 | 8.4 | - | |
| | | 18-May-11 | 1C | 26.60 | 31.60 | 5.00 | X | 197.0 | 1020.0 | 204.0 | 8:41 | 8:57 | 10.2 | 0.2 | 0.00 | - | - | - | - | - | - | |
| | | 18-May-11 | 1B | 31.60 | 36.80 | 5.20 | A | 31.4 | 31.4 | 6.0 | 6:59 | 7:17 | 13.3 | 0.3 | 0.00 | 33.1 | - | 1.65 | 8.4 | 8.1 | 14.2 | |
| T-32+073.5 | T | 06-Jul-11 | 4 | 19.50 | 21.50 | 2.00 | MF | 39.2 | 39.2 | 19.6 | 9:33 | 9:53 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-May-11 | 3 | 22.00 | 23.00 | 1.00 | A | 18.3 | - | - | 20:13 | 20:27 | 4.6 | 0.2 | 0.05 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 3 | 22.00 | 23.00 | 1.00 | A | 24.5 | 42.8 | 42.8 | 10:11 | 10:26 | 4.6 | 0.8 | 0.17 | - | - | - | - | - | - | |
| | | 30-May-11 | 2 | 23.00 | 27.00 | 4.00 | A | 73.6 | - | - | 19:41 | 20:07 | 4.6 | 0.9 | 0.05 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 2 | 23.00 | 27.00 | 4.00 | A | 24.8 | 98.4 | 24.6 | 9:53 | 10:07 | 4.9 | 1.0 | 0.05 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 1 | 27.00 | 32.00 | 5.00 | A | 51.2 | 51.2 | 10.2 | 9:32 | 9:47 | 7.5 | 2.6 | 0.07 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 1C | 32.00 | 37.20 | 5.20 | A | 127.7 | 127.7 | 24.6 | 8:58 | 9:26 | 10.0 | 5.6 | 0.11 | 31.7 | 3.5 | 1.59 | 2.3 | 13.6 | 16.3 | |
| S-32+075 | S | 23-Jun-11 | 4 | 16.02 | 18.02 | 2.00 | B | 139.0 | 139.0 | 69.5 | 6:23 | 7:14 | 4.6 | 0.5 | 0.07 | 39.6 | 3.0 | 1.64 | 11.0 | 9.9 | 15.7 | |
| | | 24-May-11 | 3 | 18.52 | 19.52 | 1.00 | A | 13.8 | - | - | 18:54 | 19:07 | 4.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 27-May-11 | 3 | 18.52 | 19.52 | 1.00 | A | 20.3 | 34.1 | 34.1 | 18:07 | 18:23 | 4.9 | 0.5 | 0.10 | - | - | - | - | - | - | |
| | | 24-May-11 | 2 | 19.52 | 23.70 | 4.18 | A | 201.6 | - | - | 17:45 | 18:16 | 0.0 | 14.8 | inf | - | - | - | - | - | - | |
| | | 24-May-11 | 2 | 19.52 | 23.70 | 4.18 | B | 191.4 | - | - | 18:16 | 18:27 | 3.0 | 20.8 | 1.89 | 37.6 | 2.5 | 1.59 | 18.7 | 11.6 | 18.6 | |
| | | 24-May-11 | 2 | 19.52 | 23.70 | 4.18 | C | 189.8 | 582.8 | 139.4 | 18:27 | 18:48 | 5.0 | 0.5 | 0.02 | 47.2 | - | 1.63 | 18.7 | 11.6 | 19.4 | |
| | | 27-May-11 | 2 | 19.52 | 23.50 | 3.98 | A | 19.5 | 19.5 | 4.9 | 17:18 | 17:45 | 4.8 | 1.3 | 0.07 | - | - | - | - | - | - | |
| | | 27-May-11 | 1 | 23.50 | 28.50 | 5.00 | A | 80.3 | 80.3 | 16.1 | 16:49 | 17:14 | 7.7 | 2.4 | 0.06 | - | - | - | - | - | - | |
| | | 27-May-11 | 1C | 28.50 | 33.70 | 5.20 | A | 45.1 | 45.1 | 8.7 | 16:27 | 16:43 | 7.7 | 1.8 | 0.04 | - | - | - | - | - | - | |
| T-32+076.5 | T | 29-Jun-11 | 4 | 20.49 | 22.49 | 2.00 | MF | 96.6 | 96.6 | 48.3 | 2:16 | 2:44 | 4.4 | 2.3 | 0.26 | 30.8 | - | 1.44 | 13.9 | 9.6 | 14.2 | |
| | | 07-Jun-10 | 3 | 22.99 | 23.99 | 1.00 | A | 18.8 | 38.2 | 38.2 | 10:51 | 11:08 | 4.4 | 0.5 | 0.12 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 3 | 22.99 | 23.99 | 1.00 | A | 19.4 | - | - | 5:34 | 5:47 | 4.5 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 2 | 23.99 | 28.00 | 4.01 | A | 14.3 | 117.1 | 29.2 | 10:28 | 10:42 | 4.9 | 0.4 | 0.02 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 2 | 23.99 | 28.00 | 4.01 | A | 102.8 | - | - | 5:02 | 5:31 | 4.6 | 1.3 | 0.07 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 1 | 28.00 | 33.00 | 5.00 | A | 17.0 | 17.0 | 3.4 | 10:03 | 10:17 | 7.9 | 0.1 | 0.00 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 1C | 33.00 | 38.00 | 5.00 | A | 96.9 | 96.9 | 19.4 | 9:05 | 9:48 | 10.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-32+078 | P | 17-Jun-11 | 4 | 15.64 | 17.64 | 2.00 | B | 93.2 | 93.2 | 46.6 | 21:40 | 22:05 | 5.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 18.14 | 19.20 | 1.06 | A | 24.9 | - | - | 22:39 | 22:53 | 5.2 | 0.3 | 0.05 | - | - | - | - | - | - | |
| | | 18-May-11 | 3 | 18.14 | 19.14 | 1.00 | A | 28.7 | - | - | 15:00 | 15:14 | 5.0 | 0.4 | 0.07 | - | - | - | - | - | - | |
| | | 22-May-11 | 3 | 18.14 | 19.14 | 1.00 | A | 16.5 | 70.1 | 70.1 | 2:07 | 2:20 | 5.4 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 18-May-11 | 2 | 19.14 | 23.10 | 3.96 | A | 200.1 | - | - | 13:45 | 14:13 | 0.1 | 12.3 | 28.24 | 32.1 | - | 1.63 | 8.6 | 20.2 | 16.4 | |
| | | 18-May-11 | 2 | 19.14 | 23.10 | 3.96 | B | 204.4 | - | - | 14:13 | 14:28 | 0.6 | 19.6 | 8.29 | 38.1 | - | 1.64 | 21.4 | 7.5 | 3.5 | |
| | | 18-May-11 | 2 | 19.14 | 23.10 | 3.96 | C | 195.8 | - | - | 14:28 | 14:38 | 4.3 | 18.6 | 1.08 | 47.0 | - | 1.66 | 17.1 | 7.1 | 15.3 | |
| | | 18-May-11 | 2 | 19.14 | 23.10 | 3.96 | D | 81.2 | 681.5 | 172.1 | 14:38 | 14:54 | 4.5 | 0.4 | 0.02 | 85.1 | - | 1.68 | 17.1 | 7.1 | 14.8 | |
| | | 22-May-11 | 2 | 19.14 | 23.10 | 3.96 | A | 26.6 | 26.6 | 6.7 | 1:50 | 2:05 | 4.8 | 0.2 | 0.01 | 30.0 | - | 1.60 | 17.3 | 9.8 | 16.8 | |
| | | 22-May-11 | 1 | 23.10 | 28.10 | 5.00 | A | 195.6 | - | - | 22:48 | 23:16 | 5.3 | 12.2 | 0.43 | - | - | - | - | - | - | |
| | | 22-May-11 | 1 | 23.10 | 28.10 | 5.00 | B | 208.7 | - | - | 23:16 | 23:33 | 7.2 | 12.3 | 0.34 | - | - | - | - | - | - | |
| | | 22-May-11 | 1 | 23.10 | 28.10 | 5.00 | C | 95.7 | 500.0 | 100.0 | 23:33 | 23:48 | 7.4 | 0.2 | 0.01 | 49.7 | 2.0 | 1.66 | 10.9 | 6.3 | 16.4 | |
| | | 22-May-11 | 1C | 28.10 | 33.20 | 5.10 | A | 68.1 | 68.1 | 13.4 | 22:28 | 22:44 | 10.8 | 3.8 | 0.07 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-32+079.5 | T | 06-Jul-11 | 4 | 15.35 | 17.35 | 2.00 | MF | 40.1 | 40.1 | 20.1 | 9:55 | 10:17 | 4.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 3 | 17.85 | 18.85 | 1.00 | A | 29.7 | - | - | 19:48 | 20:05 | 4.5 | 0.3 | 0.06 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 3 | 17.85 | 18.85 | 1.00 | A | 29.0 | 58.7 | 58.7 | 14:40 | 14:54 | 4.7 | 0.5 | 0.11 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 2 | 18.85 | 22.90 | 4.05 | A | 45.1 | - | - | 19:25 | 19:43 | 4.5 | 0.5 | 0.03 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 2 | 18.85 | 22.90 | 4.05 | A | 25.4 | 70.5 | 17.4 | 14:10 | 14:36 | 4.6 | 0.2 | 0.01 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 1 | 22.90 | 27.90 | 5.00 | A | 95.5 | 95.5 | 19.1 | 11:30 | 11:53 | 7.5 | 0.8 | 0.02 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 1C | 27.90 | 32.90 | 5.00 | A | 209.6 | - | - | 10:38 | 11:07 | 9.0 | 12.3 | 0.28 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 1C | 27.90 | 32.90 | 5.00 | B | 98.7 | 308.3 | 61.7 | 11:07 | 11:22 | 10.4 | 0.4 | 0.01 | - | - | - | - | - | - | |
| S-32+081 | S | 22-Jun-11 | 4 | 14.87 | 16.37 | 1.50 | B | 155.8 | - | - | 15:43 | 16:07 | 0.2 | 9.0 | 27.40 | - | - | - | - | - | - | |
| | | 22-Jun-11 | 4 | 14.87 | 16.37 | 1.50 | C | 251.5 | - | - | 16:07 | 16:25 | 2.9 | 15.6 | 2.14 | 47.9 | - | 1.65 | 16.3 | 12.1 | 23.6 | |
| | | 22-Jun-11 | 4 | 14.87 | 16.37 | 1.50 | D | 86.5 | 493.8 | 329.2 | 16:25 | 16:46 | 4.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 29-May-11 | 3 | 16.87 | 17.87 | 1.00 | A | 54.2 | - | - | 2:09 | 2:34 | 5.0 | 0.6 | 0.11 | 33.7 | 3.0 | 1.65 | 12.8 | 12.4 | 19.9 | |
| | | 31-May-11 | 3 | 16.87 | 17.87 | 1.00 | A | 19.1 | 73.3 | 73.3 | 16:07 | 16:23 | 5.0 | 0.5 | 0.10 | - | - | - | - | - | - | |
| | | 29-May-11 | 2 | 17.87 | 21.90 | 4.03 | A | 20.5 | - | - | 1:50 | 2:03 | 4.8 | 0.5 | 0.02 | - | - | - | - | - | - | |
| | | 31-May-11 | 2 | 17.87 | 21.90 | 4.03 | A | 29.1 | 49.6 | 12.3 | 15:42 | 15:57 | 4.9 | 0.9 | 0.05 | - | - | - | - | - | - | |
| | | 31-May-11 | 1 | 21.90 | 26.90 | 5.00 | A | 44.6 | 44.6 | 8.9 | 15:16 | 15:34 | 7.5 | 0.9 | 0.02 | - | - | - | - | - | - | |
| | | 31-May-11 | 1C | 26.90 | 37.10 | 10.20 | A | 244.6 | 244.6 | 24.0 | 14:27 | 15:06 | 10.0 | 5.7 | 0.05 | 34.0 | 3.0 | 1.61 | 17.8 | 10.3 | 16.5 | |
| T-32+082.5 | T | 29-Jun-11 | 4 | 13.80 | 15.80 | 2.00 | MF | 191.2 | - | - | 2:46 | 3:07 | 2.7 | 15.7 | 4.40 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 4 | 13.80 | 15.80 | 2.00 | B | 175.6 | - | - | 3:07 | 3:18 | 1.9 | 15.5 | 3.93 | 37.3 | - | 1.64 | 15.5 | 9.5 | 17.0 | |
| | | 29-Jun-11 | 4 | 13.80 | 15.80 | 2.00 | C | 135.0 | - | - | 3:18 | 3:27 | 2.7 | 15.5 | 2.58 | 46.7 | 3.0 | 1.67 | 15.5 | 9.5 | - | |
| | | 29-Jun-11 | 4 | 13.80 | 15.80 | 2.00 | D | 182.5 | - | - | 3:27 | 3:39 | 2.9 | 16.0 | 2.80 | 64.8 | - | 1.70 | 15.5 | 13.4 | 17.7 | |
| | | 29-Jun-11 | 4 | 13.80 | 15.80 | 2.00 | X | 126.7 | 811.0 | 405.5 | 3:39 | 3:47 | 3.7 | 16.5 | 2.23 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 3 | 16.30 | 17.30 | 1.00 | A | 18.2 | 49.7 | 49.7 | 8:18 | 8:34 | 4.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 3 | 16.30 | 17.30 | 1.00 | A | 31.5 | - | - | 4:27 | 4:51 | 4.4 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 2 | 17.30 | 21.30 | 4.00 | A | 19.7 | 47.5 | 11.9 | 7:56 | 8:10 | 4.8 | 0.4 | 0.02 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 2 | 17.30 | 21.30 | 4.00 | A | 27.8 | - | - | 4:13 | 4:26 | 4.7 | 1.6 | 0.08 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 1 | 21.30 | 26.30 | 5.00 | A | 65.3 | 65.3 | 13.1 | 7:27 | 7:50 | 7.6 | 0.9 | 0.02 | - | - | - | - | - | - | |
| | | 07-Jun-10 | 1C | 26.30 | 31.40 | 5.10 | A | 54.3 | 54.3 | 10.6 | 7:03 | 7:22 | 9.8 | 2.6 | 0.05 | 31.4 | 3.5 | 1.61 | 10.5 | 10.0 | 14.9 | |
| P-32+084 | P | 17-Jun-11 | 4 | 13.41 | 15.41 | 2.00 | B | 74.9 | 74.9 | 37.5 | 21:18 | 21:39 | 5.1 | 0.9 | 0.09 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 15.91 | 16.98 | 1.07 | A | 32.1 | 32.1 | 30.0 | 23:03 | 23:15 | 5.1 | 0.3 | 0.06 | - | - | - | - | - | - | |
| | | 27-May-11 | 3 | 14.90 | 15.90 | 1.00 | A | 14.2 | 14.2 | 14.2 | 14:19 | 14:35 | 4.5 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 27-May-11 | 2 | 15.90 | 20.90 | 5.00 | A | 14.1 | 14.1 | 2.8 | 14:01 | 14:15 | 4.8 | 0.1 | 0.01 | - | - | - | - | - | - | |
| | | 27-May-11 | 1 | 20.90 | 25.90 | 5.00 | A | 19.2 | 19.2 | 3.8 | 13:35 | 13:55 | 7.5 | 0.2 | 0.00 | 33.1 | - | 1.59 | 11.4 | 11.8 | 19.9 | |
| | | 27-May-11 | 1C | 25.90 | 31.00 | 5.10 | A | 152.4 | - | - | 9:06 | 9:32 | 0.0 | 12.1 | inf | 31.8 | 4.0 | 1.60 | 0.2 | 10.8 | 17.8 | |
| | | 27-May-11 | 1C | 25.90 | 31.00 | 5.10 | B | 181.3 | - | - | 9:32 | 9:43 | 0.0 | 20.4 | inf | 38.1 | 1.5 | 1.61 | 2.3 | 10.3 | 15.6 | |
| | | 27-May-11 | 1C | 25.90 | 31.00 | 5.10 | C | 159.6 | - | - | 9:43 | 9:51 | 0.0 | 20.4 | inf | 49.5 | - | 1.62 | 1.1 | 10.1 | 15.8 | |
| | | 27-May-11 | 1C | 25.90 | 31.00 | 5.10 | D | 842.7 | 1336.0 | 262.0 | 9:51 | 11:01 | 10.2 | 0.0 | 0.00 | 68.9 | - | 1.64 | 0.9 | 10.0 | 15.5 | |
| T-32+085.5 | T | 06-Jul-11 | 4 | 14.04 | 16.04 | 2.00 | MF | 31.0 | 31.0 | 15.5 | 10:20 | 10:37 | 4.7 | 0.6 | 0.06 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 3 | 16.54 | 17.54 | 1.00 | A | 4.0 | 4.0 | 4.0 | 3:16 | 3:27 | 4.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 2 | 17.54 | 21.50 | 3.96 | A | 4.9 | 4.9 | 1.2 | 2:58 | 3:10 | 4.8 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 1 | 21.50 | 26.50 | 5.00 | A | 64.0 | 64.0 | 12.8 | 2:22 | 2:50 | 7.6 | 1.1 | 0.03 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 1C | 26.50 | 31.60 | 5.10 | A | 221.8 | - | - | 1:33 | 2:02 | 9.1 | 13.1 | 0.25 | 31.6 | 6.0 | 1.59 | 10.3 | 10.9 | 22.8 | |
| | | 01-Jun-11 | 1C | 26.50 | 31.60 | 5.10 | B | 61.6 | 283.4 | 55.6 | 2:02 | 2:13 | 9.6 | 2.7 | 0.05 | 36.9 | - | 1.65 | 10.2 | 9.9 | 18.9 | |
| S-32+087 | S | 22-Jun-11 | 4 | 14.43 | 15.93 | 1.50 | B | 124.4 | 124.4 | 82.9 | 14:39 | 17:10 | 4.8 | 0.1 | 0.02 | 37.6 | - | 1.63 | 16.4 | 12.1 | 22.8 | |
| | | 29-May-11 | 3 | 16.43 | 17.43 | 1.00 | A | 59.5 | - | - | 3:15 | 3:54 | 5.1 | 1.0 | 0.20 | - | - | - | - | - | - | |
| | | 31-May-11 | 3 | 16.43 | 17.43 | 1.00 | A | 27.3 | 86.8 | 86.8 | 20:23 | 20:43 | 5.0 | 0.2 | 0.04 | - | - | - | - | - | - | |
| | | 29-May-11 | 2 | 17.43 | 21.40 | 3.97 | A | 54.5 | - | - | 2:55 | 3:10 | 4.6 | 1.4 | 0.07 | - | - | - | - | - | - | |
| | | 31-May-11 | 2 | 17.43 | 21.40 | 3.97 | A | 22.3 | 76.8 | 19.3 | 20:06 | 20:18 | 4.7 | 0.4 | 0.02 | - | - | - | - | - | - | |
| | | 31-May-11 | 1 | 21.40 | 26.40 | 5.00 | A | 79.9 | 79.9 | 16.0 | 19:34 | 19:57 | 7.9 | 1.0 | 0.03 | 34.2 | 2.5 | 1.64 | 12.3 | 11.0 | 18.3 | |
| | | 31-May-11 | 1C | 26.40 | 31.40 | 5.00 | A | 152.3 | 152.3 | 30.5 | 18:05 | 19:24 | 10.3 | 3.6 | 0.07 | - | - | - | - | - | - | |
| | | 31-May-11 | 1B | 31.40 | 36.70 | 5.30 | A | 71.6 | 71.6 | 13.5 | 17:12 | 17:38 | 12.5 | 0.3 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-32+088.5 | T | 03-Jun-11 | 3 | 16.03 | 17.31 | 1.28 | A | 30.7 | - | - | 15:45 | 16:00 | 4.6 | 0.6 | 0.12 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 3 | 16.03 | 17.03 | 1.00 | A | 7.8 | 38.5 | 38.5 | 3:41 | 3:52 | 4.2 | 0.4 | 0.09 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 2 | 17.03 | 21.00 | 3.97 | A | 43.2 | - | - | 15:23 | 15:41 | 4.8 | 0.7 | 0.04 | 30.7 | - | 1.59 | 9.7 | 11.9 | 15.8 | |
| | | 04-Jun-11 | 2 | 17.03 | 21.00 | 3.97 | A | 9.6 | 52.8 | 13.3 | 3:25 | 3:37 | 4.8 | 0.5 | 0.03 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 1 | 21.00 | 26.00 | 5.00 | A | 23.9 | 23.9 | 4.8 | 3:07 | 3:20 | 7.9 | 0.6 | 0.01 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 1C | 26.00 | 31.10 | 5.10 | A | 69.0 | 69.0 | 13.5 | 2:42 | 3:05 | 10.1 | 1.0 | 0.02 | - | - | - | - | - | - | |
| P-32+090 | P | 17-Jun-11 | 4 | 13.84 | 15.84 | 2.00 | A | 150.1 | - | - | 20:40 | 21:02 | 4.9 | 3.4 | 0.37 | 31.3 | - | 1.59 | 9.3 | 11.8 | 20.1 | |
| | | 17-Jun-11 | 4 | 13.84 | 15.84 | 2.00 | B | 24.0 | 174.1 | 87.1 | 21:02 | 21:16 | 5.0 | 1.1 | 0.11 | 36.5 | - | 1.61 | 9.1 | 11.9 | 19.3 | |
| | | 15-May-11 | 3 | 16.34 | 17.37 | 1.03 | A | 162.7 | - | - | 23:40 | 0:02 | 5.0 | 9.6 | 2.27 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 16.34 | 17.37 | 1.03 | B | 124.8 | 287.5 | 279.1 | 0:02 | 1:00 | 5.1 | 0.3 | 0.06 | 36.4 | 2.0 | 1.63 | 9.8 | 7.9 | 15.6 | |
| | | 26-May-11 | 3 | 16.34 | 17.34 | 1.00 | A | 21.6 | 21.6 | 21.6 | 17:12 | 17:35 | 2.4 | 0.2 | 0.10 | - | - | - | - | - | - | |
| | | 26-May-11 | 2 | 17.34 | 21.30 | 3.96 | A | 27.5 | 27.5 | 6.9 | 16:52 | 17:06 | 2.6 | 0.9 | 0.09 | - | - | - | - | - | - | |
| | | 26-May-11 | 1 | 21.30 | 26.50 | 5.20 | A | 152.8 | - | - | 15:42 | 16:08 | 0.2 | 12.1 | 13.22 | 32.7 | 3.5 | 1.58 | 1.5 | 11.9 | 16.6 | |
| | | 26-May-11 | 1 | 21.30 | 26.50 | 5.20 | B | 165.9 | - | - | 16:08 | 16:19 | 2.4 | 18.6 | 1.54 | 38.0 | - | 1.59 | 25.2 | 10.1 | 14.5 | |
| | | 26-May-11 | 1 | 21.30 | 26.50 | 5.20 | C | 144.4 | - | - | 16:19 | 16:28 | 5.4 | 13.2 | 0.47 | 47.0 | - | 1.63 | 21.6 | 9.0 | 14.5 | |
| | | 26-May-11 | 1 | 21.30 | 26.50 | 5.20 | D | 37.3 | 500.4 | 96.2 | 16:28 | 16:42 | 5.4 | 0.0 | 0.00 | 67.0 | - | 1.64 | 21.6 | 9.0 | 14.1 | |
| T-32+091.5 | T | 06-Jul-11 | 4 | 13.38 | 15.38 | 2.00 | MF | 84.2 | 84.2 | 42.1 | 10:42 | 11:01 | 4.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 3 | 15.89 | 16.89 | 1.00 | A | 2.2 | 2.2 | 2.2 | 4:30 | 4:42 | 1.9 | 0.2 | 0.10 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 2 | 16.88 | 20.90 | 4.02 | A | 5.3 | 5.3 | 1.3 | 4:14 | 4:25 | 2.5 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 01-Jun-11 | 1 | 20.90 | 25.90 | 5.00 | A | 77.9 | 77.9 | 15.6 | 3:47 | 4:08 | 5.8 | 1.2 | 0.04 | - | - | - | - | - | - | |
| S-32+093 | S | 29-Jun-11 | 4 | 13.20 | 15.20 | 2.00 | B | 166.0 | - | - | 3:56 | 4:17 | 4.4 | 15.9 | 2.58 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 4 | 13.20 | 15.20 | 2.00 | C | 156.1 | - | - | 4:17 | 4:29 | 4.7 | 15.7 | 1.44 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 4 | 13.20 | 15.20 | 2.00 | D | 159.8 | - | - | 4:29 | 4:41 | 5.1 | 13.7 | 0.92 | - | - | - | - | - | - | |
| | | 29-Jun-11 | 4 | 13.20 | 15.20 | 2.00 | X | 305.0 | 786.9 | 393.5 | 4:41 | 5:10 | 4.5 | 10.6 | 1.16 | - | - | - | - | - | - | |
| | | 30-May-11 | 3 | 15.70 | 16.70 | 1.00 | A | 35.0 | - | - | 11:12 | 11:36 | 2.7 | 0.3 | 0.12 | - | - | - | - | - | - | |
| | | 31-May-11 | 3 | 15.70 | 16.70 | 1.00 | A | 23.7 | 58.7 | 58.7 | 23:33 | 23:55 | 2.5 | 0.3 | 0.10 | - | - | - | - | - | - | |
| | | 30-May-11 | 2 | 16.70 | 20.70 | 4.00 | A | 182.4 | 192.8 | 48.2 | 10:25 | 11:08 | 2.5 | 0.7 | 0.07 | 32.0 | 3.0 | 1.61 | 13.7 | 11.1 | 18.5 | |
| | | 31-May-11 | 2 | 16.70 | 20.70 | 4.00 | A | 10.4 | - | - | 23:17 | 23:29 | 2.9 | 0.5 | 0.04 | - | - | - | - | - | - | |
| | | 31-May-11 | 1 | 20.70 | 25.70 | 5.00 | A | 41.5 | 41.5 | 8.3 | 22:55 | 23:09 | 5.4 | 0.8 | 0.03 | - | - | - | - | - | - | |
| | | 31-May-11 | 1C | 25.70 | 30.80 | 5.10 | A | 126.2 | 126.2 | 24.7 | 22:19 | 22:48 | 7.8 | 2.9 | 0.07 | - | - | - | - | - | - | |
| T-32+094.5 | T | 07-Jun-10 | 3 | 15.87 | 16.87 | 1.00 | A | 27.0 | 27.0 | 27.0 | 14:33 | 14:58 | 2.2 | 0.3 | 0.12 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 2,3 | 15.87 | 20.90 | 5.03 | A | 170.0 | - | - | 3:09 | 3:32 | 1.6 | 12.4 | 1.49 | - | - | - | - | - | - | Burst Packer. Pulled up 1 m. |
| | | 12-Jun-11 | 2,3 | 15.87 | 20.90 | 5.03 | B | 154.0 | - | - | 3:32 | 3:46 | 2.4 | 5.2 | 0.43 | - | - | - | - | - | - | Grouted Stages 2 and 3 together. |
| | | 12-Jun-11 | 2,3 | 15.87 | 20.90 | 5.03 | C | 18.7 | 342.7 | 68.1 | 3:46 | 4:05 | 2.3 | 0.2 | 0.02 | 46.1 | 4.0 | 1.64 | 8.1 | 8.9 | 15.2 | |
| | | 07-Jun-10 | 2 | 16.87 | 21.00 | 4.13 | A | 52.5 | 52.5 | 12.7 | 14:06 | 14:28 | 2.6 | 1.5 | 0.14 | 32.8 | 4.0 | 1.60 | 10.8 | 7.7 | 13.9 | |
| | | 12-Jun-11 | 1 | 20.90 | 26.00 | 5.10 | A | 161.9 | - | - | 1:46 | 2:12 | 3.9 | 12.7 | 0.66 | 31.2 | 5.0 | 1.61 | 9.5 | 9.5 | 14.1 | |
| | | 12-Jun-11 | 1 | 20.90 | 26.00 | 5.10 | B | 142.3 | 304.2 | 59.6 | 2:12 | 2:31 | 5.5 | 3.2 | 0.12 | 36.7 | - | 1.62 | 9.0 | 9.1 | 14.3 | |
| P-32+096 | P | 22-Jun-11 | 4 | 13.32 | 14.82 | 1.50 | B | 143.5 | 143.5 | 95.7 | 5:56 | 7:20 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 15.32 | 16.36 | 1.04 | A | 155.2 | - | - | 2:51 | 3:12 | 0.0 | 10.7 | inf | - | - | - | - | - | - | Communicated to P-32+102 |
| | | 15-May-11 | 3 | 15.32 | 16.36 | 1.04 | B | 171.3 | - | - | 3:12 | 3:26 | 0.8 | 13.0 | 18.76 | - | - | - | - | - | - | |
| | | 15-May-11 | 3 | 15.32 | 16.36 | 1.04 | C | 131.9 | - | - | 3:26 | 3:44 | 2.8 | 3.8 | 1.38 | 43.9 | 2.0 | 1.66 | 9.2 | 11.6 | 18.3 | |
| | | 15-May-11 | 3 | 15.32 | 16.36 | 1.04 | D | 13.3 | 471.7 | 453.6 | 3:44 | 4:05 | 2.8 | 0.0 | 0.00 | 61.0 | - | 1.69 | 9.2 | 11.6 | 19.3 | |
| | | 26-May-11 | 3 | 15.32 | 16.32 | 1.00 | A | 153.6 | 153.6 | 153.6 | 14:35 | 15:18 | 2.5 | 0.2 | 0.07 | - | - | - | - | - | - | |
| | | 26-May-11 | 2 | 16.32 | 20.30 | 3.98 | A | 64.4 | 64.4 | 16.2 | 14:02 | 14:29 | 2.5 | 1.4 | 0.14 | - | - | - | - | - | - | |
| | | 26-May-11 | 1 | 20.30 | 25.40 | 5.10 | A | 145.7 | - | - | 10:13 | 10:39 | 0.0 | 12.1 | inf | 30.8 | 3.5 | 1.59 | 7.4 | 9.2 | 15.1 | |
| | | 26-May-11 | 1 | 20.30 | 25.40 | 5.10 | B | 220.4 | - | - | 10:39 | 10:52 | 0.0 | 20.9 | inf | 35.0 | 4.0 | 1.58 | 7.0 | 9.7 | 15.6 | |
| | | 26-May-11 | 1 | 20.30 | 25.40 | 5.10 | C | 135.8 | - | - | 10:52 | 10:59 | 0.0 | 20.8 | inf | 41.0 | - | 1.60 | -1.1 | 9.4 | 14.7 | |
| | | 26-May-11 | 1 | 20.30 | 25.40 | 5.10 | D | 900.1 | 1402.0 | 274.9 | 10:59 | 11:55 | 5.4 | 0.0 | 0.00 | 77.0 | - | 1.65 | 6.0 | 9.2 | 15.5 | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-32+097.5 | T | 06-Jul-11 | 4 | 13.94 | 15.94 | 2.00 | MF | 98.4 | 98.4 | 49.2 | 11:05 | 11:27 | 4.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 3 | 16.44 | 17.44 | 1.00 | A | 27.8 | 27.8 | 27.8 | 20:13 | 20:27 | 4.8 | 0.3 | 0.06 | - | - | - | - | - | - | |
| | | 12-Jun-11 | 2,3 | 16.44 | 20.30 | 3.86 | A | 50.2 | - | - | 4:17 | 4:33 | 2.6 | 1.0 | 0.10 | - | - | - | - | - | - | Grouted Stages 2 and 3 together. |
| | | 12-Jun-11 | 2,3 | 16.44 | 20.30 | 3.86 | A | 18.3 | 68.5 | 17.7 | 4:35 | 4:50 | 2.2 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 2 | 17.44 | 21.40 | 3.96 | A | 29.3 | 29.3 | 7.4 | 19:55 | 20:09 | 4.9 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 17-Jun-11 | 1 | 21.40 | 26.60 | 5.20 | A | 34.3 | 34.3 | 6.6 | 19:36 | 19:50 | 7.7 | 0.4 | 0.01 | 31.8 | 4.0 | 1.62 | 10.6 | 16.0 | 16.0 | |
| S-32+099 | S | 30-Jun-11 | 4 | 14.17 | 16.17 | 2.00 | A | 66.6 | - | - | 6:16 | 6:30 | 0.8 | 5.8 | 3.45 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 4 | 14.17 | 16.17 | 2.00 | B | 158.2 | - | - | 6:30 | 6:45 | 1.4 | 14.9 | 5.36 | 35.8 | - | 1.63 | 12.5 | 10.1 | 12.9 | |
| | | 30-Jun-11 | 4 | 14.17 | 16.17 | 2.00 | C | 177.7 | - | - | 6:45 | 6:54 | 2.0 | 20.1 | 5.00 | 47.9 | - | 1.65 | 12.4 | 10.0 | 12.9 | |
| | | 30-Jun-11 | 4 | 14.17 | 16.17 | 2.00 | D | 320.5 | - | - | 6:54 | 7:10 | 4.4 | 20.9 | 2.36 | 67.6 | - | 1.65 | 12.5 | 10.2 | 13.1 | |
| | | 30-Jun-11 | 4 | 14.17 | 16.17 | 2.00 | X | 46.5 | 769.5 | 384.8 | 7:10 | 7:20 | 4.8 | 0.9 | 0.10 | - | - | - | 12.0 | 10.0 | 13.8 | |
| | | 03-Jun-11 | 3 | 16.67 | 17.67 | 1.00 | A | 18.8 | - | - | 9:26 | 9:39 | 2.5 | 0.4 | 0.17 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 3 | 16.67 | 17.67 | 1.00 | A | 1.6 | 20.4 | 20.4 | 2:16 | 2:27 | 2.4 | 0.1 | 0.06 | - | - | - | - | - | - | |
| | | 03-Jun-11 | 2 | 17.67 | 21.80 | 4.13 | A | 204.6 | - | - | 8:24 | 8:56 | 2.2 | 8.4 | 0.89 | 31.2 | 2.0 | 1.60 | 20.9 | 11.7 | 19.5 | |
| | | 03-Jun-11 | 2 | 17.67 | 21.80 | 4.13 | B | 67.9 | 272.5 | 66.0 | 8:56 | 9:20 | 2.6 | 0.2 | 0.02 | 32.4 | 4.0 | 1.59 | 8.7 | 12.7 | 18.9 | |
| | | 04-Jun-11 | 2 | 17.67 | 21.17 | 3.50 | A | 23.5 | 23.5 | 6.7 | 1:56 | 2:14 | 2.0 | 0.6 | 0.07 | - | - | - | - | - | - | |
| | | 04-Jun-11 | 1 | 21.17 | 26.70 | 5.53 | A | 239.0 | - | - | 22:43 | 23:14 | 3.6 | 12.8 | 0.71 | 31.6 | - | 1.61 | 10.8 | 12.5 | 14.1 | |
| | | 04-Jun-11 | 1 | 21.17 | 26.70 | 5.53 | B | 160.4 | - | - | 23:14 | 23:28 | 5.4 | 9.2 | 0.35 | 37.4 | 1.0 | 1.60 | 10.7 | 12.6 | 16.4 | |
| | | 04-Jun-11 | 1 | 21.17 | 26.70 | 5.53 | C | 135.1 | 534.5 | 96.7 | 23:28 | 23:55 | 5.1 | 1.1 | 0.04 | - | - | - | - | - | - | |
| T-32+100.5 | T | 07-Jun-11 | 3 | 15.07 | 16.07 | 1.00 | A | 16.6 | - | - | 16:38 | 16:57 | 2.0 | 0.2 | 0.09 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 3 | 15.07 | 16.07 | 1.00 | A | 18.9 | 35.5 | 35.5 | 6:18 | 6:50 | 2.0 | 0.3 | 0.13 | - | - | - | - | - | - | |
| | | 07-Jun-11 | 2 | 16.07 | 20.10 | 4.03 | A | 179.8 | - | - | 15:11 | 15:39 | 0.0 | 12.5 | inf | - | - | - | - | - | - | |
| | | 07-Jun-11 | 2 | 16.07 | 20.10 | 4.03 | B | 163.0 | - | - | 15:39 | 15:49 | 0.0 | 17.4 | inf | 37.8 | - | 1.61 | 12.8 | 8.9 | 16.3 | |
| | | 07-Jun-11 | 2 | 16.07 | 20.10 | 4.03 | C | 156.5 | - | - | 15:49 | 16:00 | 0.7 | 10.7 | 3.80 | 50.8 | - | 1.65 | 12.6 | 8.8 | 14.1 | |
| | | 07-Jun-11 | 2 | 16.07 | 20.10 | 4.03 | D | 196.2 | - | - | 16:00 | 16:11 | 2.6 | 17.4 | 1.53 | 76.3 | - | 1.66 | 12.9 | 8.5 | 15.2 | |
| | | 07-Jun-11 | 2 | 16.07 | 20.10 | 4.03 | X | 40.7 | 736.2 | 182.7 | 16:11 | 16:24 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 2 | 16.07 | 20.10 | 4.03 | A | 25.2 | 25.2 | 6.3 | 5:54 | 6:07 | 2.1 | 0.2 | 0.02 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 1 | 20.10 | 25.10 | 5.00 | A | 161.5 | - | - | 5:03 | 5:25 | 5.6 | 9.7 | 0.34 | - | - | - | - | - | - | |
| | | 13-Jun-11 | 1 | 20.10 | 25.10 | 5.00 | B | 117.3 | 278.8 | 55.8 | 5:25 | 5:46 | 5.8 | 0.4 | 0.01 | - | - | - | - | - | - | |
| P-32+101.7 (P-32+102) | P | 21-Jun-11 | 4 | 16.22 | 17.72 | 1.50 | MF | 107.0 | 107.0 | 71.3 | 5:25 | 5:51 | 3.2 | 0.2 | 0.05 | 30.9 | - | 1.45 | 18.4 | 12.4 | 22.6 | |
| | | 30-May-11 | 3 | 18.22 | 19.22 | 1.00 | A | 18.7 | - | - | 15:30 | 15:47 | 2.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 31-May-11 | 3 | 18.22 | 19.22 | 1.00 | A | 1.4 | 20.1 | 20.1 | 5:18 | 5:30 | 2.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-May-11 | 2 | 19.22 | 23.20 | 3.98 | A | 239.4 | - | - | 14:12 | 15:14 | 2.7 | 0.0 | 0.00 | 33.0 | - | 1.61 | 15.4 | 9.9 | 19.2 | |
| | | 31-May-11 | 2 | 19.22 | 23.20 | 3.98 | A | 30.6 | 270.0 | 67.8 | 5:04 | 5:16 | 2.7 | 0.3 | 0.03 | - | - | - | - | - | - | |
| | | 31-May-11 | 1 | 23.20 | 28.20 | 5.00 | A | 93.1 | 93.1 | 18.6 | 4:36 | 5:00 | 5.2 | 1.1 | 0.04 | - | - | - | - | - | - | |
| | | 31-May-11 | 1C | 28.20 | 32.20 | 4.00 | A | 64.1 | 64.1 | 16.0 | 2:40 | 2:57 | 8.1 | 0.0 | 0.00 | 31.4 | 6.5 | 1.61 | 13.2 | 10.8 | 17.7 | |
| | | 16-May-11 | 3 | 14.26 | 15.30 | 1.04 | A | 24.9 | 24.9 | 23.9 | 6:55 | 7:09 | 2.5 | 0.0 | 0.00 | 34.1 | 12.0 | 1.61 | 28.7 | 8.3 | 17.1 | |
| T-32+103.5 | T | 07-Jul-11 | 4 | 12.59 | 14.59 | 2.00 | MF | 179.2 | - | - | 7:51 | 8:18 | 3.4 | 13.4 | 1.99 | - | - | - | - | - | - | |
| | | 07-Jul-11 | 4 | 12.59 | 14.59 | 2.00 | B | 172.5 | 351.7 | 175.9 | 8:18 | 8:41 | 4.2 | 0.0 | 0.00 | 37.6 | - | 1.64 | 13.0 | 10.2 | 14.1 | |
| | | 04-Jul-11 | 3 | 15.09 | 16.09 | 1.00 | A | 170.4 | - | - | 8:37 | 9:09 | 5.1 | 9.3 | 1.83 | - | - | - | - | - | - | |
| | | 04-Jul-11 | 3 | 15.09 | 16.09 | 1.00 | B | 139.0 | - | - | 9:09 | 9:23 | 5.2 | 8.6 | 1.86 | - | - | - | - | - | - | |
| | | 04-Jul-11 | 3 | 15.09 | 16.09 | 1.00 | C | 33.0 | 342.4 | 342.4 | 9:23 | 9:40 | 5.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 04-Jul-11 | 2 | 16.09 | 21.59 | 5.50 | A | 190.2 | - | - | 7:10 | 7:42 | 0.3 | 6.5 | 4.69 | 31.3 | - | 1.63 | 11.0 | 10.1 | 11.8 | |
| | | 04-Jul-11 | 2 | 16.09 | 21.59 | 5.50 | B | 209.3 | - | - | 7:42 | 8:00 | 2.6 | 15.2 | 1.09 | 38.7 | - | 1.64 | 11.0 | 10.0 | 12.1 | |
| | | 04-Jul-11 | 2 | 16.09 | 21.59 | 5.50 | C | 242.6 | 642.1 | 116.7 | 8:00 | 8:31 | 5.5 | 0.3 | 0.01 | 47.8 | - | 1.64 | 11.7 | 10.2 | 12.7 | |
| S-32+105 | S | 01-Jul-11 | 2, 3 | 15.09 | 20.09 | 5.00 | A | 144.2 | - | - | 3:54 | 4:36 | 0.0 | 0.0 | inf | - | - | - | - | - | - | By-pass within casing: packer moved up |
| | | 01-Jul-11 | 2, 3 | 15.09 | 20.09 | 5.00 | B | 153.5 | - | - | 4:40 | 5:01 | 5.6 | 10.6 | 1.89 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 2, 3 | 15.09 | 20.09 | 5.00 | C | 120.2 | 417.9 | 83.6 | 5:01 | 5:28 | 5.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 1 | 20.09 | 25.10 | 5.01 | A | 19.9 | 19.9 | 4.0 | 3:30 | 3:44 | 8.2 | 0.0 | 0.00 | - | - | - | - | - | - | |

**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| T-32+106.5 | T | 07-Jul-11 | 4 | 10.97 | 12.97 | 2.00 | MF | 155.9 | 155.9 | 78.0 | 8:46 | 9:25 | 2.4 | 0.4 | 0.07 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 3 | 13.47 | 14.47 | 1.00 | A | 12.6 | 12.6 | 12.6 | 4:38 | 4:50 | 3.1 | 0.5 | 0.17 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 2 | 14.47 | 18.90 | 4.43 | A | 43.0 | 43.0 | 9.7 | 4:17 | 4:35 | 3.7 | 0.4 | 0.02 | - | - | - | - | - | - | |
| P-32+108 | P | 30-Jun-11 | 3 | 11.60 | 12.61 | 1.01 | A | 14.9 | 14.9 | 14.8 | 8:33 | 8:45 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 2 | 12.61 | 16.60 | 3.99 | A | 26.6 | 26.6 | 6.7 | 8:18 | 8:30 | 3.5 | 0.3 | 0.02 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 1 | 16.60 | 21.80 | 5.20 | A | 60.4 | 60.4 | 11.6 | 7:58 | 8:15 | 5.7 | 1.6 | 0.05 | 31.4 | 4.0 | 1.64 | 12.0 | 10.0 | 13.8 | |
| T-32+109.5 | T | 07-Jul-11 | 4 | 8.07 | 10.07 | 2.00 | MF | 76.8 | 76.8 | 38.4 | 9:28 | 9:47 | 2.3 | 0.5 | 0.10 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 3 | 10.57 | 11.57 | 1.00 | A | 16.4 | 16.4 | 16.4 | 3:48 | 4:08 | 3.3 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 2 | 11.57 | 16.20 | 4.63 | A | 39.8 | 39.8 | 8.6 | 3:27 | 3:45 | 3.9 | 0.1 | 0.01 | - | - | - | - | - | - | |
| S-32+111 | S | 02-Jul-11 | 3 | 8.84 | 9.84 | 1.00 | A | 161.6 | - | - | 7:28 | 7:51 | 1.1 | 11.8 | 10.41 | - | - | - | - | - | - | |
| | | 02-Jul-11 | 3 | 8.84 | 9.84 | 1.00 | B | 161.3 | - | - | 7:51 | 8:01 | 1.7 | 18.2 | 10.82 | 36.7 | - | 1.63 | 12.4 | 9.3 | 14.2 | |
| | | 02-Jul-11 | 3 | 8.84 | 9.84 | 1.00 | C | 162.6 | - | - | 8:01 | 8:09 | 2.9 | 19.4 | 7.61 | 45.6 | - | 1.65 | 12.8 | 9.5 | 14.7 | |
| | | 02-Jul-11 | 3 | 8.84 | 9.84 | 1.00 | D | 233.9 | - | - | 8:09 | 8:26 | 2.4 | 18.5 | 7.84 | 73.8 | - | 1.65 | 13.1 | 9.9 | 14.8 | |
| | | 02-Jul-11 | 3 | 8.84 | 9.84 | 1.00 | X | 198.6 | 918.0 | 918.0 | 8:26 | 8:38 | 3.2 | 9.3 | 2.94 | - | - | - | - | - | - | |
| | | 02-Jul-11 | 2 | 9.84 | 13.84 | 4.00 | A | 46.4 | 46.4 | 11.6 | 7:05 | 7:26 | 3.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 02-Jul-11 | 1 | 13.84 | 19.00 | 5.16 | A | 64.2 | 64.2 | 12.4 | 6:31 | 7:04 | 5.7 | 0.7 | 0.01 | 32.9 | 4.0 | 1.62 | 12.0 | 9.1 | 13.6 | |
| T-32+112.5 | T | 07-Jul-11 | 4 | 6.90 | 8.90 | 2.00 | MF | 39.4 | 39.4 | 19.7 | 9:49 | 10:03 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 3 | 9.40 | 10.40 | 1.00 | A | 12.4 | 12.4 | 12.4 | 3:07 | 3:20 | 3.1 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 2 | 10.40 | 14.50 | 4.10 | A | 44.4 | 44.4 | 10.8 | 2:46 | 3:05 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-32+114 | P | 30-Jun-11 | 3 | 9.86 | 10.86 | 1.00 | A | 12.9 | 12.9 | 12.9 | 9:36 | 9:49 | 3.4 | 0.1 | 0.03 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 2 | 10.86 | 14.90 | 4.04 | A | 25.9 | 25.9 | 6.4 | 9:20 | 9:34 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 1 | 14.90 | 20.00 | 5.10 | A | 104.1 | 104.1 | 20.4 | 8:51 | 9:18 | 5.3 | 2.6 | 0.10 | - | - | - | - | - | - | |
| T-32+115.5 | T | 07-Jul-11 | 4 | 6.60 | 8.60 | 2.00 | MF | 36.5 | 36.5 | 18.3 | 10:05 | 10:21 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 2,3 | 9.10 | 14.20 | 5.10 | A | 155.5 | - | - | 22:47 | 23:07 | 2.2 | 12.3 | 5.61 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 2,3 | 9.10 | 14.20 | 5.10 | B | 165.1 | - | - | 23:07 | 23:23 | 3.0 | 10.8 | 4.36 | - | 3.0 | - | - | - | - | |
| | | 03-Jul-11 | 2,3 | 9.10 | 14.20 | 5.10 | C | 159.3 | - | - | 23:23 | 0:02 | 3.3 | 4.6 | 1.57 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 2,3 | 9.10 | 14.20 | 5.10 | D | 72.5 | 552.4 | 108.3 | 0:02 | 0:57 | 3.1 | 1.1 | 0.34 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 2 | 10.10 | 14.20 | 4.10 | A | 215.3 | - | - | 20:50 | 21:15 | 0.4 | 15.5 | 10.33 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 2 | 10.10 | 14.20 | 4.10 | B | 185.8 | - | - | 21:15 | 21:28 | 1.0 | 12.6 | 3.04 | 37.3 | - | 1.66 | 16.7 | 8.8 | 16.5 | |
| | | 03-Jul-11 | 2 | 10.10 | 14.20 | 4.10 | C | 203.5 | - | - | 21:28 | 21:43 | 2.0 | 12.4 | 1.71 | 46.4 | - | 1.67 | 16.7 | 8.8 | 18.5 | Packer lifted from hole and could not |
| | | 03-Jul-11 | 2 | 10.10 | 14.20 | 4.10 | D | 479.4 | - | - | 21:43 | 22:22 | 3.1 | 13.2 | 1.27 | 61.5 | - | 1.71 | 16.7 | 8.8 | 17.6 | be pushed back down from pressure. |
| | | 03-Jul-11 | 2 | 10.10 | 14.20 | 4.10 | E | 94.0 | 1178.0 | 287.3 | 22:22 | 22:29 | 3.5 | 10.2 | 0.72 | 59.7 | - | 1.69 | 16.7 | 8.8 | 17.5 | Stage 2, 3 combined thereafter. |
| S-32+117 | S | 01-Jul-11 | 3 | 8.17 | 9.17 | 1.00 | A | 162.0 | - | - | 23:30 | 23:51 | 1.2 | 10.3 | 7.70 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 8.17 | 9.17 | 1.00 | B | 131.7 | - | - | 23:51 | 0:04 | 1.9 | 10.2 | 5.58 | 37.2 | 3.0 | 1.64 | 9.7 | 10.3 | 19.3 | |
| | | 01-Jul-11 | 3 | 8.17 | 9.17 | 1.00 | C | 157.1 | - | - | 0:04 | 0:18 | 1.8 | 9.7 | 5.99 | 45.3 | - | 1.68 | 9.7 | 10.3 | 18.3 | |
| | | 01-Jul-11 | 3 | 8.17 | 9.17 | 1.00 | D | 87.0 | - | - | 0:18 | 0:27 | 2.8 | 12.1 | 4.44 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 3 | 8.17 | 9.17 | 1.00 | X | 126.7 | 664.5 | 664.5 | 0:27 | 0:39 | 3.3 | 12.5 | 3.77 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 2 | 9.17 | 13.30 | 4.13 | A | 41.0 | 41.0 | 9.9 | 23:12 | 23:28 | 3.6 | 0.0 | 0.00 | - | - | - | - | - | - | |
| T-32+118.5 | T | 07-Jul-11 | 4 | 5.53 | 7.53 | 2.00 | MF | 44.8 | 44.8 | 22.4 | 10:26 | 10:43 | 2.4 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 3 | 8.03 | 9.03 | 1.00 | A | 11.2 | 11.2 | 11.2 | 20:31 | 20:43 | 3.2 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 03-Jul-11 | 2 | 9.03 | 13.20 | 4.17 | A | 38.6 | 38.6 | 9.3 | 20:11 | 20:28 | 3.6 | 0.2 | 0.01 | 32.1 | 5.0 | 1.62 | 16.7 | 8.8 | 17.8 | |
| P-32+120 | P | 30-Jun-11 | 3 | 7.62 | 8.62 | 1.00 | A | 14.3 | 14.3 | 14.3 | 10:10 | 10:23 | 3.8 | 0.2 | 0.06 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 2 | 8.62 | 12.70 | 4.08 | A | 55.2 | 55.2 | 13.5 | 9:53 | 10:08 | 3.4 | 0.1 | 0.01 | - | - | - | - | - | - | |
| S-32+123 | S | 01-Jul-11 | 3 | 7.22 | 8.22 | 1.00 | A | 19.6 | 19.6 | 19.6 | 22:50 | 23:04 | 3.7 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 2 | 8.22 | 12.30 | 4.08 | A | 35.8 | 35.8 | 8.8 | 22:31 | 22:45 | 3.7 | 0.0 | 0.00 | - | - | - | - | - | - | |

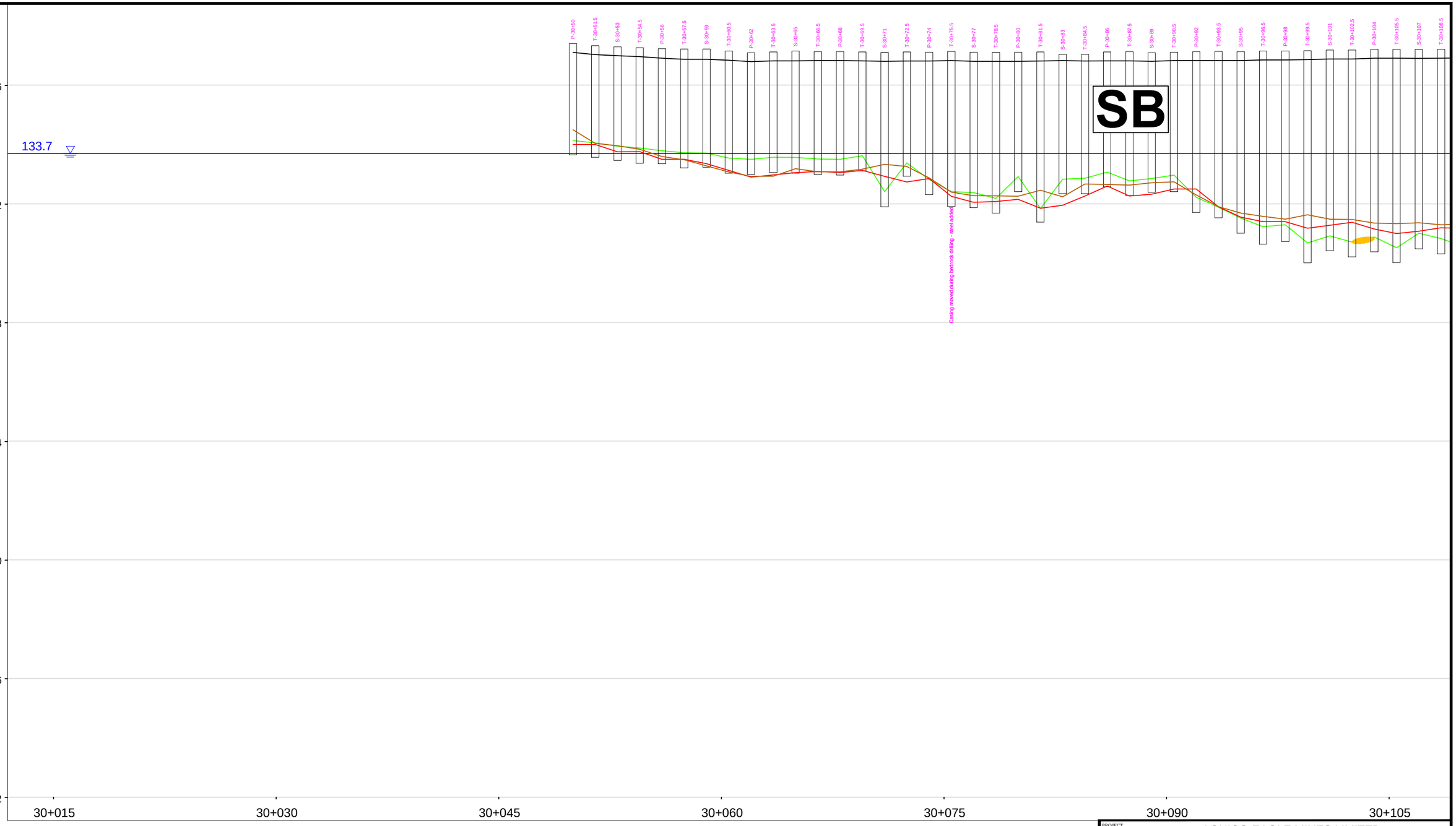
**TABLE E1-3.2**
**SUMMARY OF BAY GOOSE DIKE BEDROCK / CONTACT GROUTING QA AND QUANTITIES**

| Hole | Order (P, S, T, Q) | Date | Stage | | | | Take | | | | Duration | | Termination | | | QA | | | Temperatures | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stage # | From | To | Length | Mix | Volume | $V_{TOTAL}$ | Take | Start | End | $P_{FINAL}$ | $Q_{FINAL}$ | Penetrab | Marsh | Bleed | Specific Gravity | Cement | Water | Mix | |
| | | (dd-mmm-yy) | | (m) | (m) | (m) | | (L) | (L) | (L/m) | (hh:mm) | (hh:mm) | (bar) | (L/min/m) | (L/min/m/bar) | (sec) | (%) | (g/cc) | (Celcius) | (Celcius) | (Celcius) | |
| P-32+126 | P | 30-Jun-11 | 3 | 8.07 | 9.07 | 1.00 | A | 15.3 | 15.3 | 15.3 | 10:53 | 11:05 | 3.7 | 0.3 | 0.09 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 2 | 9.07 | 13.02 | 3.95 | A | 58.0 | 58.0 | 14.7 | 10:35 | 10:51 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| S-32+129 | S | 01-Jul-11 | 3 | 7.09 | 8.09 | 1.00 | A | 16.5 | 16.5 | 16.5 | 22:11 | 22:23 | 4.0 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 01-Jul-11 | 2 | 8.09 | 12.20 | 4.11 | A | 35.8 | 35.8 | 8.7 | 21:54 | 22:08 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| P-32+132 | P | 30-Jun-11 | 3 | 7.03 | 8.03 | 1.00 | A | 13.4 | 13.4 | 13.4 | 11:24 | 11:36 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |
| | | 30-Jun-11 | 2 | 8.03 | 19.10 | 11.07 | A | 25.4 | 25.4 | 2.3 | 11:08 | 11:22 | 3.5 | 0.0 | 0.00 | - | - | - | - | - | - | |

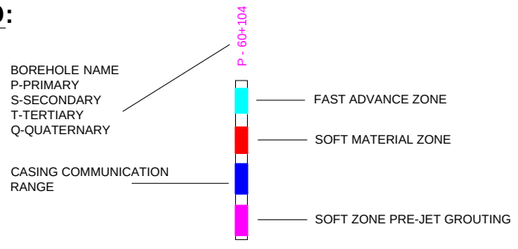
# E1-4 Progress Cross Sections

- Casing Installation Cross Section
- Grout Take Cross Section

## Casing Installation Cross Section




## LEGEND:




- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN
- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

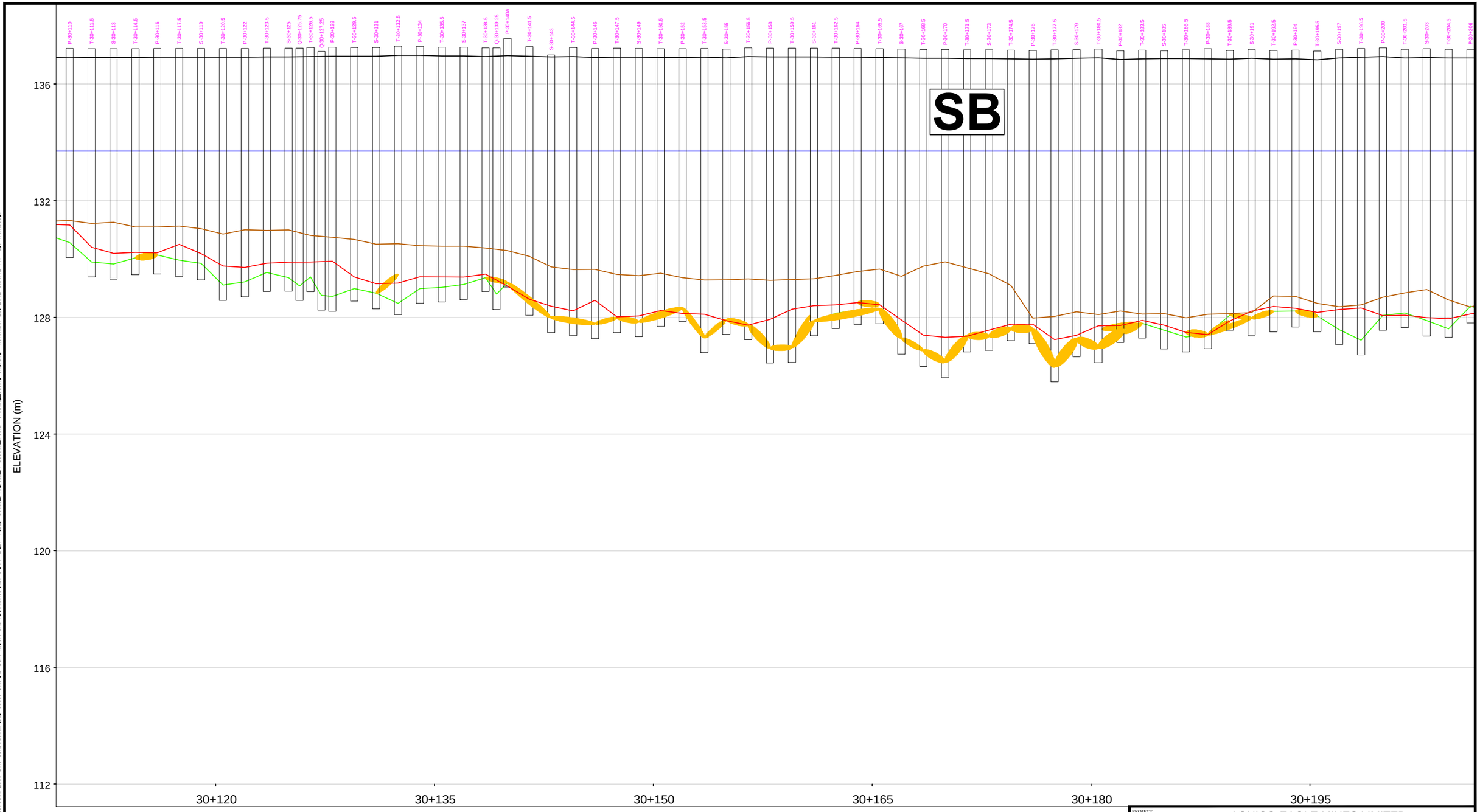
Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

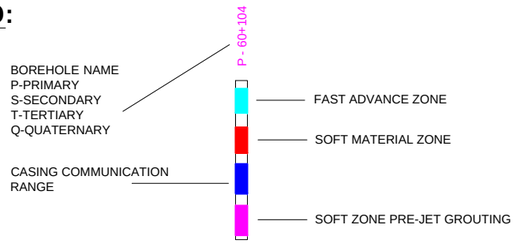
FIGURE E1 - 4.1

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP EVE1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough

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## LEGEND:




- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN
- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

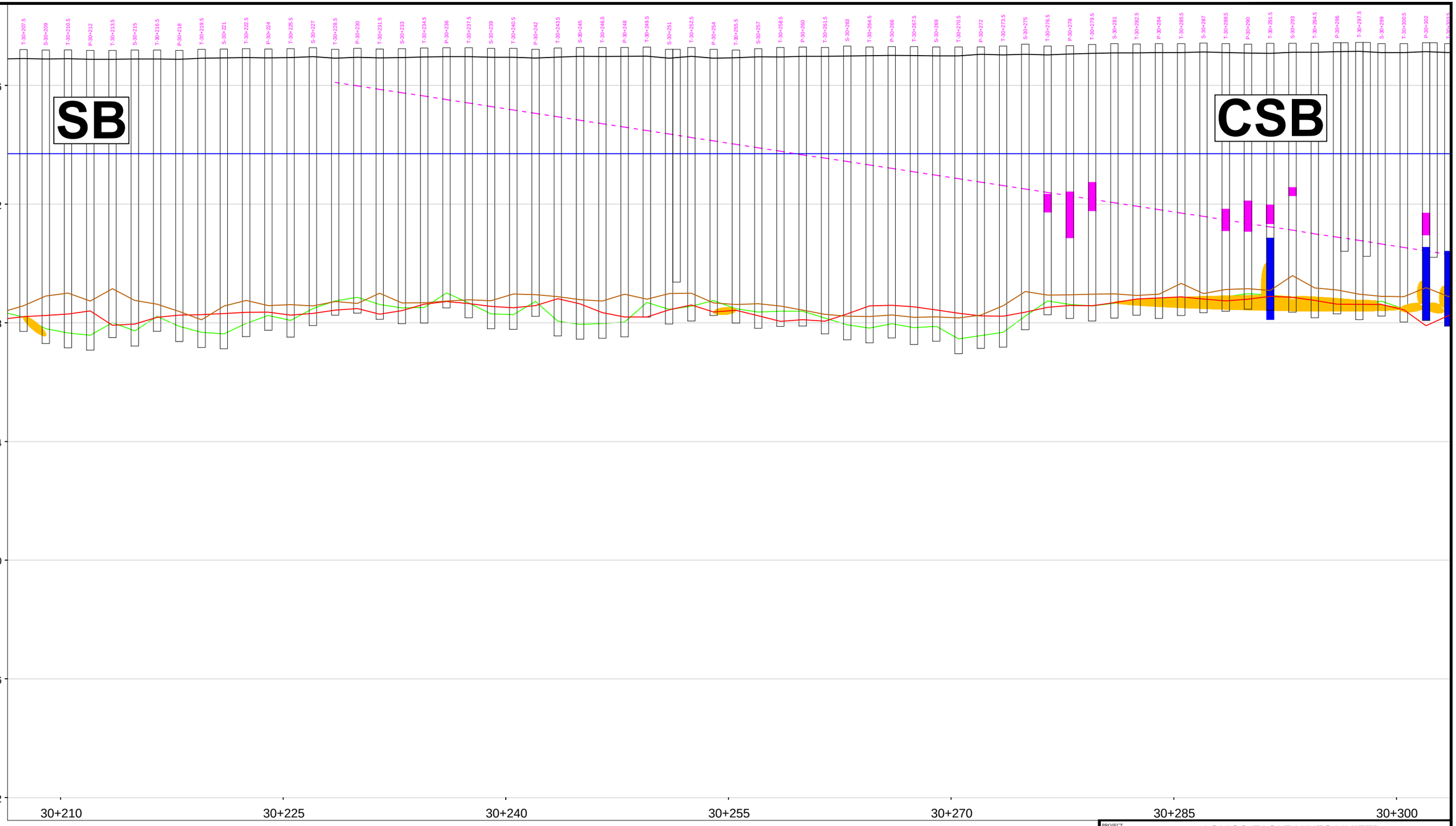
TITLE

# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.2




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CASING COMMUNICATION RANGE

P - 60+104

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.3

Drawing File: C:\Vicky_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:36:12 PM By: vrombough

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ELEVATION (m)

136
132
128
124
120
116
112

30+315
30+330
30+345
30+360
30+375
30+390

S-30+305 T-30+306.5 P-30+308 T-30+309.5 S-30+311 T-30+312.5 P-30+314 T-30+315.5 S-30+317 T-30+318.5 P-30+320 T-30+321.5 S-30+323 T-30+324.5 P-30+326 T-30+327.5 S-30+329 T-30+330.5 P-30+332 T-30+333.5 S-30+335 T-30+336.5 P-30+338 T-30+339.5 S-30+341 T-30+342.5 P-30+344 T-30+345.5 S-30+347 T-30+348.5 P-30+350 T-30+351.5 S-30+353 P-30+353A T-30+354.5 P-30+356 T-30+357.5 S-30+359 T-30+360.5 P-30+362 T-30+363.5 S-30+365 T-30+366.5 P-30+368 T-30+369.5 S-30+371 T-30+372.5 P-30+374 T-30+375.5 S-30+377 T-30+378.5 P-30+380 T-30+381.5 S-30+383 T-30+384.5 P-30+386 T-30+387.5 S-30+389 T-30+390.5 P-30+392 T-30+393.5 S-30+395 T-30+396.5A P-30+398 T-30+399.5A S-30+401

**CSB**

**SB**

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

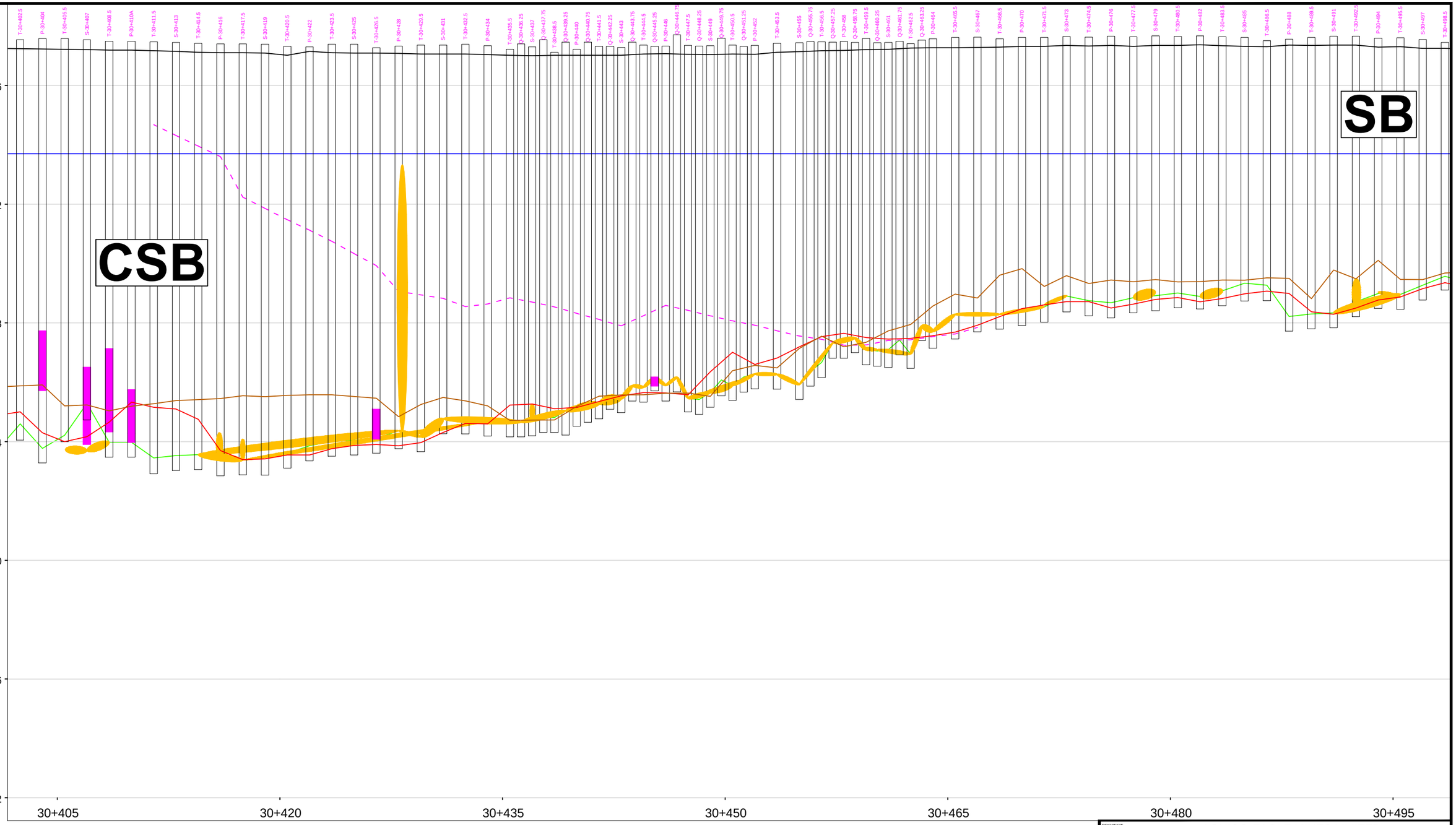
TITLE

# BAY-GOOSE DIKE CASING INSTALLATION CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.4




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.5

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ELEVATION (m)

136
132
128
124
120
116
112

30+510
30+525
30+540
30+555
30+570
30+585

SB

P-30+500 T-30+501.5 S-30+503 T-30+504.5 P-30+506 T-30+507.5 S-30+509 T-30+510.5 P-30+512 T-30+513.5 S-30+515 T-30+516.5 P-30+518 T-30+519.5 S-30+521 T-30+522.5 P-30+524 Q-30+524.75 T-30+525.5 Q-30+526.25 S-30+527 T-30+528.5 P-30+530 T-30+531.5 S-30+533 T-30+534.5 P-30+536 T-30+537.5 S-30+539 T-30+540.5 P-30+542 T-30+543.5 S-30+545 T-30+546.5 P-30+548 T-30+549.5 S-30+551 Q-30+551.75 T-30+552.5 Q-30+553.25 P-30+554 T-30+555.5 S-30+557 T-30+558.5 P-30+560 T-30+561.5 S-30+563 T-30+564.5 P-30+566 T-30+567.5 S-30+569 T-30+570.5 P-30+572 T-30+573.5 S-30+575 T-30+576.5 P-30+578 T-30+579.5 S-30+581 T-30+582.5 P-30+584 T-30+585.5 S-30+587 Q-30+587.75 T-30+588.5 Q-30+589.25 P-30+590 T-30+591.5 S-30+593 T-30+594.5 P-30+596

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

FAST ADVANCE ZONE
SOFT MATERIAL ZONE
SOFT ZONE PRE-JET GROUTING

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
INTERPRETED BEDROCK (JET DRILLING)
BEDROCK (2010 INVESTIGATION)
TOP OF JET GROUT CURTAIN

CASING COMMUNICATION
TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

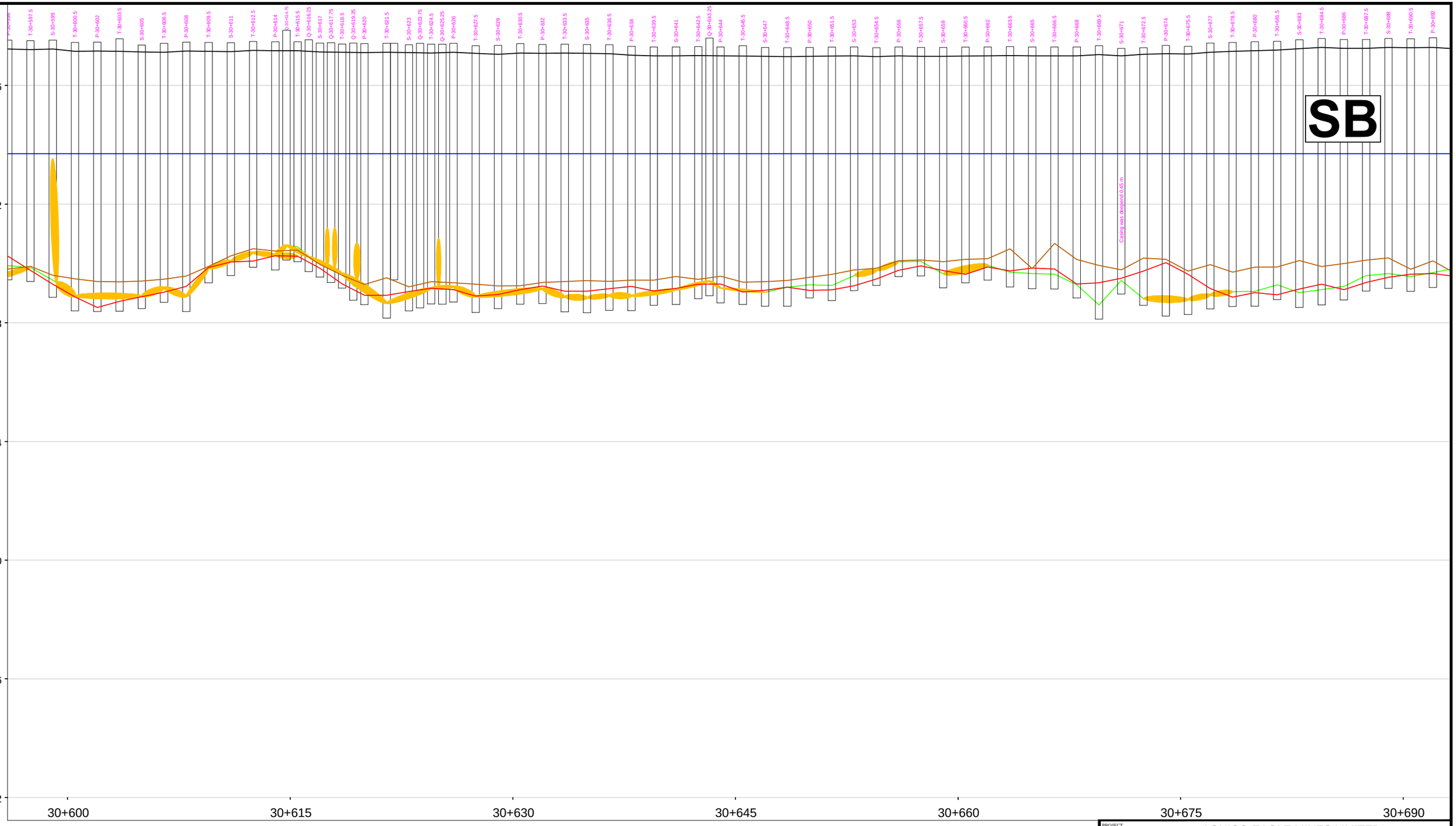
TITLE

# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.6




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

FAST ADVANCE ZONE

SOFT MATERIAL ZONE

SOFT ZONE PRE-JET GROUTING

SURVEYED DIKE CREST

LAKE LEVEL: ~133.7m

ORIGINAL TRENCH (SOUNDING)

BASE OF CUT-OFF WALL (SOUNDING)

INTERPRETED BEDROCK (DRILLING)

INTERPRETED BEDROCK (JET DRILLING)

BEDROCK (2010 INVESTIGATION)

TOP OF JET GROUT CURTAIN

CASING COMMUNICATION

TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED

3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.7

Drawing File: C:\Vicky_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough

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ELEVATION (m)

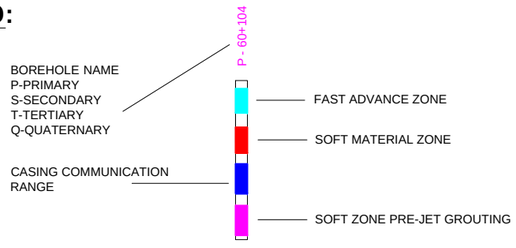
136
132
128
124
120
116
112

30+705 30+715 30+735 30+750 30+765 30+780

S-30+695 T-30+696.5 P-30+698 T-30+699.5 S-30+701 T-30+702.5 P-30+704 T-30+705.5 S-30+707 T-30+707.75 T-30+708.5 P-30+709.25 P-30+710 T-30+711.5 S-30+713 T-30+714.5 P-30+716 T-30+717.5 S-30+719 T-30+720.5 P-30+722 T-30+722.75 T-30+723.5 Q-30+724.25 S-30+725 T-30+726.5 P-30+728 T-30+729.5 S-30+731 T-30+732.5 P-30+734 T-30+735.5 S-30+737 T-30+738.5 P-30+740 T-30+740.75 T-30+741.5 S-30+743 T-30+744.5 P-30+746 T-30+747.5 S-30+749 T-30+750.5 P-30+752 T-30+753.5 S-30+755 T-30+756.5 P-30+758 T-30+759.5 S-30+761 T-30+762.5 P-30+764 T-30+765.5 S-30+767 T-30+768.5 P-30+770 T-30+771.5 S-30+773 T-30+774.5 P-30+776 T-30+777.5 S-30+779 T-30+780.5 P-30+782 T-30+783.5 S-30+785 T-30+786.5 P-30+788 T-30+789.5

**SB**

## LEGEND:




- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

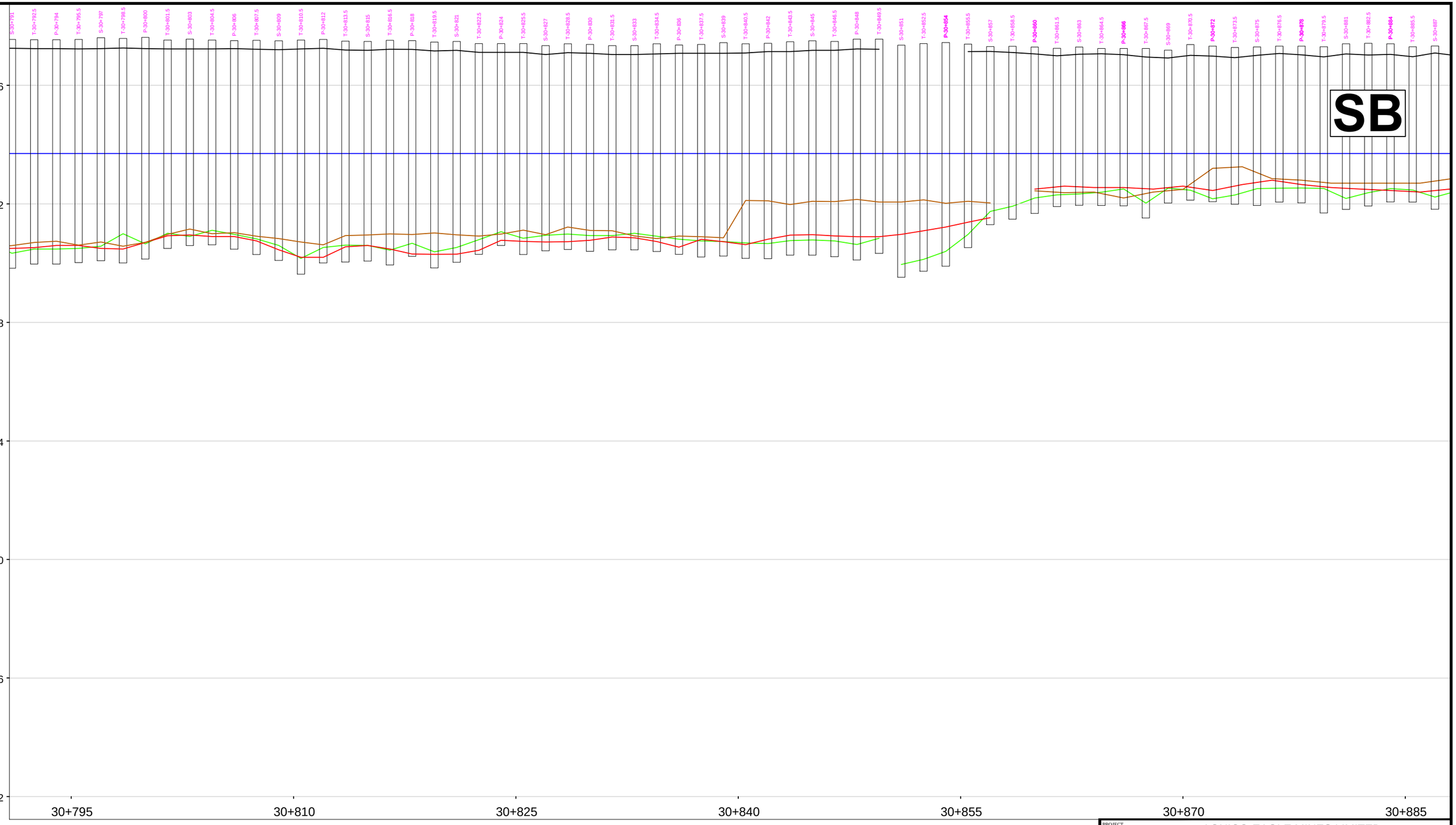
TITLE

# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.8




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

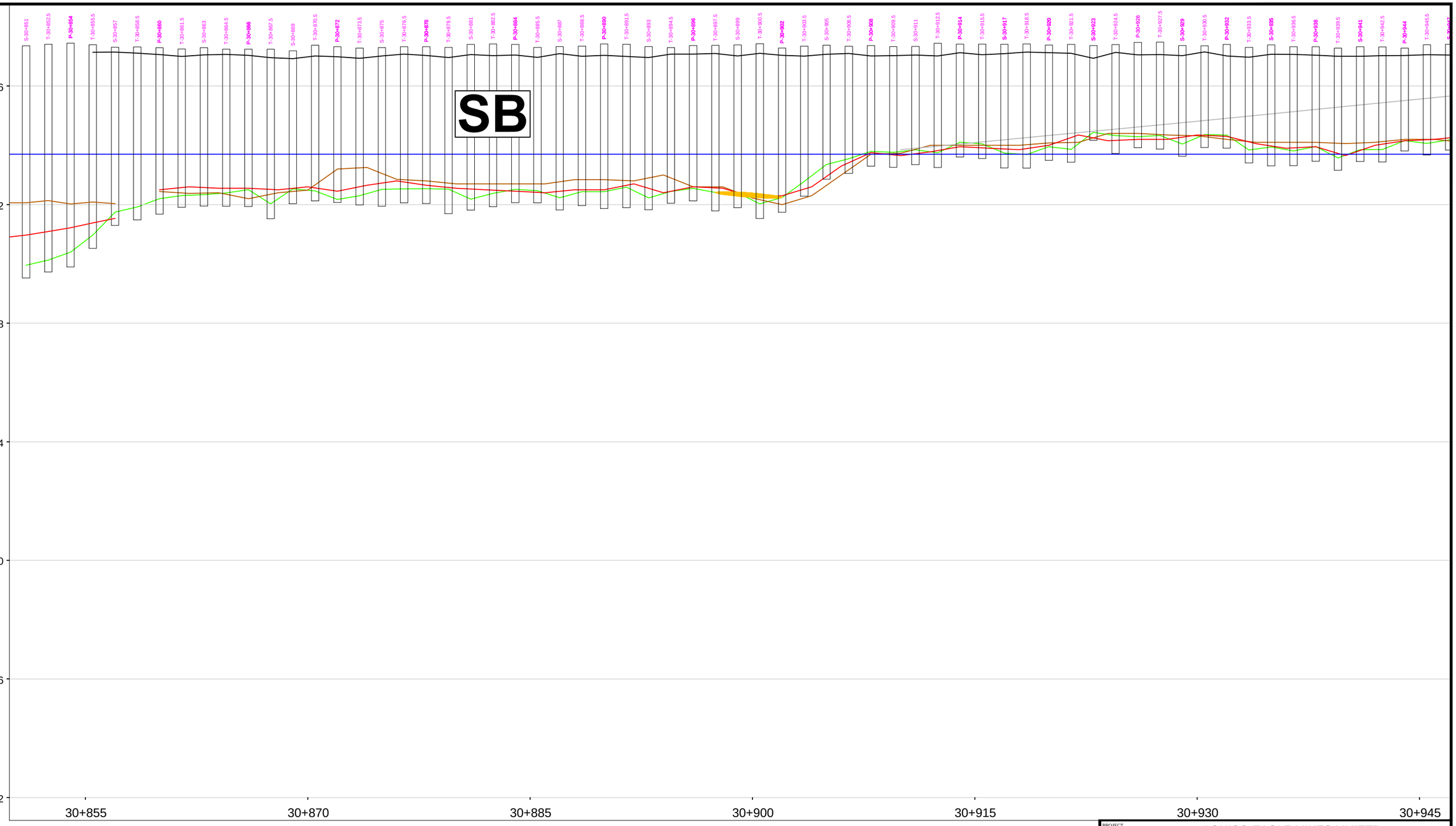
TITLE
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.9

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## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

FAST ADVANCE ZONE

SOFT MATERIAL ZONE

SOFT ZONE PRE-JET GROUTING

SURVEYED DIKE CREST

LAKE LEVEL: ~133.7m

ORIGINAL TRENCH (SOUNDING)

BASE OF CUT-OFF WALL (SOUNDING)

INTERPRETED BEDROCK (DRILLING)

INTERPRETED BEDROCK (JET DRILLING)

BEDROCK (2010 INVESTIGATION)

TOP OF JET GROUT CURTAIN

CASING COMMUNICATION

TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED

3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.10

Drawing File: G:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough

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ELEVATION (m)

136
132
128
124
120
116
112

30+945 30+960 30+975 30+990 31+005 31+020 31+035

S-30+941 T-30+942.5 P-30+944 T-30+945.5 S-30+947 T-30+948.5 P-30+950 T-30+951.5 S-30+953 T-30+954.5 P-30+956 T-30+957.5 S-30+959 T-30+960.5 P-30+962 T-30+963.5 S-30+965 T-30+966.5 P-30+968 T-30+969.5 S-30+971 T-30+972.5 P-30+974 T-30+975.5 S-30+977 T-30+978.5 P-30+980 T-30+981.5 S-30+983 T-30+984.5 P-30+986 T-30+987.5 S-30+989 T-30+990.5 P-30+992 Q-30+992.75 T-30+993.5 Q-30+994.25 S-30+995 Q-30+995.75 T-30+996.5 Q-30+997.25 P-30+998 Q-30+998.75 T-30+999.5 Q-31+000.25 S-31+001 Q-31+001.75 T-31+002.5 Q-31+003.25 P-31+004 Q-31+004.75 T-31+005.5 Q-31+006.25 S-31+007 Q-31+007.75 T-31+008.5 Q-31+009.25 P-31+010 Q-31+010.75 T-31+011.5 Q-31+012.25 S-31+013 Q-31+013.75 T-31+014.5 Q-31+015.25 P-31+016 Q-31+016.75 T-31+017.5 Q-31+018.25 S-31+019 Q-31+019.75 T-31+020.5 Q-31+021.25 P-31+022 Q-31+022.75 T-31+023.5 Q-31+024.25 S-31+025 Q-31+025.75 T-31+026.5 Q-31+027.25 P-31+028 Q-31+028.75 T-31+029.5 Q-31+030.25 S-31+031 T-31+032.5 P-31+034 Q-31+034.75 T-31+035.5 Q-31+036.25 S-31+037

SB

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

FAST ADVANCE ZONE
SOFT MATERIAL ZONE
SOFT ZONE PRE-JET GROUTING

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
INTERPRETED BEDROCK (JET DRILLING)
BEDROCK (2010 INVESTIGATION)
TOP OF JET GROUT CURTAIN

CASING COMMUNICATION
TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.11

Drawing File: C:\Victor_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Boy Goose Dike\As-Built Report and Appendices\Rev 0\APP EVE1-4\Boy-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough

ELEVATION (m)

136
132
128
124
120
116
112

31+035 31+050 31+065 31+080 31+095 31+110 31+125

SB

S-31+031 T-31+032.5 P-31+034 Q-31+034.75 T-31+035.5 Q-31+036.25 S-31+037 Q-31+037.75 T-31+038.5 Q-31+039.25 P-31+040 T-31+041.5 S-31+043 Q-31+043.75 T-31+044.5 Q-31+046.25 P-31+046 Q-31+046.75 T-31+047.5 Q-31+048.25 S-31+049 Q-31+049.75 T-31+050.5 Q-31+051.25 P-31+052 Q-31+052.75 T-31+053.5 Q-31+054.25 S-31+055 Q-31+055.75 T-31+056.5 Q-31+057.25 P-31+058 Q-31+058.75 T-31+059.5 Q-31+060.25 S-31+061 T-31+062.5 P-31+064 Q-31+064.75 T-31+065.5 Q-31+066.25 S-31+067 T-31+068.5 P-31+070 T-31+071.5 S-31+073 Q-31+073.75 T-31+074.5 Q-31+075.25 P-31+076 Q-31+076.75 T-31+077.5 Q-31+078.25 S-31+079 T-31+080.5 P-31+082 T-31+083.5 S-31+085 Q-31+086.75 T-31+086.5 Q-31+087.25 P-31+088 Q-31+088.75 T-31+089.5 Q-31+090.25 S-31+091 Q-31+091.75 T-31+092.5 Q-31+093.25 P-31+094 Q-31+094.75 T-31+095.5 Q-31+096.25 S-31+097 Q-31+097.75 T-31+098.5 Q-31+099.25 P-31+100 Q-31+100.75 T-31+101.5 Q-31+102.25 S-31+103 Q-31+103.75 T-31+104.5 Q-31+105.25 P-31+106 Q-31+106.75 T-31+107.5 Q-31+108.25 S-31+109 Q-31+109.75 T-31+110.5 Q-31+111.25 P-31+112 T-31+113.5 S-31+115 Q-31+115.75 T-31+116.5 Q-31+117.25 P-31+118 T-31+119.5 S-31+121 Q-31+121.75 T-31+122.5 Q-31+123.25 P-31+124 Q-31+124.75 T-31+125.5 Q-31+126.25 S-31+127

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CASING COMMUNICATION RANGE

P - 60+104

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.12

Drawing File: C:\Victor_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP EVE1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough

ELEVATION (m)

136
132
128
124
120
116
112

31+125 31+140 31+155 31+170 31+185 31+200 31+215

SB

S-31+121 Q-31+121.75 T-31+122.5 Q-31+123.25 P-31+124 Q-31+124.75 T-31+125.5 Q-31+126.25 S-31+127 Q-31+127.75 T-31+128.5 Q-31+129.25 P-31+130 Q-31+130.75 T-31+131.5 Q-31+132.25 S-31+133 Q-31+133.75 T-31+134.5 Q-31+135.25 P-31+136 Q-31+136.75 T-31+137.5 Q-31+138.25 S-31+139 T-31+140.5 P-31+142 Q-31+142.75 T-31+143.5 Q-31+144.25 S-31+145 Q-31+145.75 T-31+146.5 Q-31+147.25 P-31+148 Q-31+148.75 T-31+149.5 Q-31+150.25 S-31+151 T-31+152.5 P-31+154 T-31+155.5 S-31+157 Q-31+157.75 T-31+158.5 Q-31+159.25 P-31+160 Q-31+160.75 T-31+161.5 Q-31+162.25 S-31+163 Q-31+163.75 T-31+164.5 Q-31+165.25 P-31+166 T-31+167.5 S-31+169 Q-31+169.75 T-31+170.5 Q-31+171.25 P-31+172 T-31+173.5 S-31+175 T-31+176.5 P-31+178 Q-31+178.75 T-31+179.5 Q-31+180.25 S-31+181 Q-31+181.75 T-31+182.5 Q-31+183.25 P-31+184 Q-31+184.75 T-31+185.5 Q-31+186.25 S-31+187 Q-31+187.75 T-31+188.5 Q-31+189.25 P-31+190 Q-31+190.75 T-31+191.5 Q-31+192.25 S-31+193 Q-31+193.75 T-31+194.5 Q-31+195.25 P-31+196 Q-31+196.75 T-31+197.5 Q-31+198.25 S-31+199 Q-31+199.75 T-31+200.5 Q-31+201.25 P-31+202 Q-31+202.75 T-31+203.5 Q-31+204.25 S-31+205 Q-31+205.75 T-31+206.5 Q-31+207.25 P-31+208 T-31+209.5 S-31+211 Q-31+211.75 T-31+212.5 Q-31+213.25 P-31+214 Q-31+214.75 T-31+215.5 Q-31+216.25

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

FAST ADVANCE ZONE
SOFT MATERIAL ZONE
SOFT ZONE PRE-JET GROUTING

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
INTERPRETED BEDROCK (JET DRILLING)
BEDROCK (2010 INVESTIGATION)
TOP OF JET GROUT CURTAIN

CASING COMMUNICATION
TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

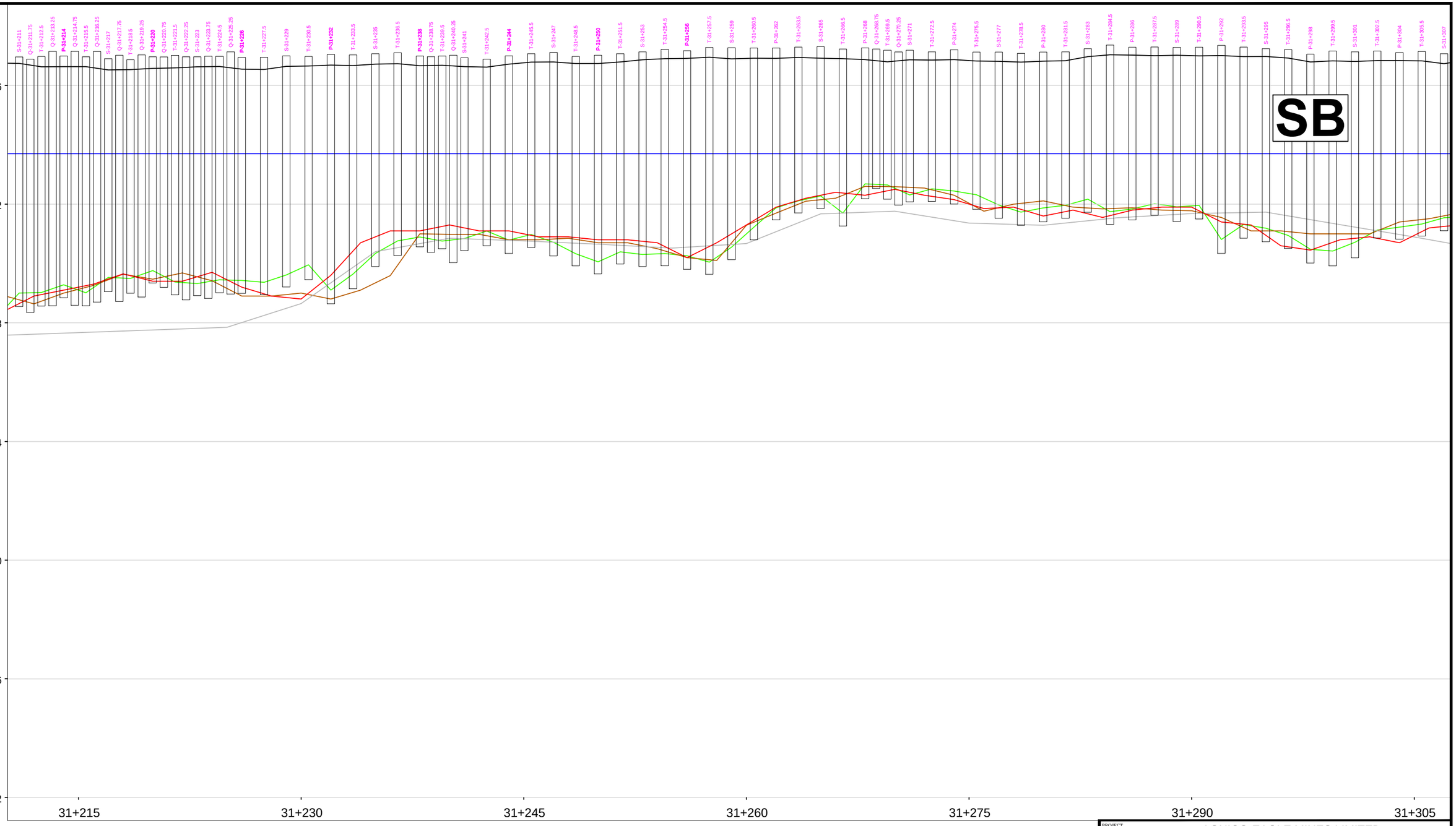
TITLE

# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.13




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

FAST ADVANCE ZONE

SOFT MATERIAL ZONE

SOFT ZONE PRE-JET GROUTING

SURVEYED DIKE CREST

LAKE LEVEL: ~133.7m

ORIGINAL TRENCH (SOUNDING)

BASE OF CUT-OFF WALL (SOUNDING)

INTERPRETED BEDROCK (DRILLING)

INTERPRETED BEDROCK (JET DRILLING)

BEDROCK (2010 INVESTIGATION)

TOP OF JET GROUT CURTAIN

CASING COMMUNICATION

TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED

3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.14

Drawing File: C:\Vctor_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough

Drawing File: C:\Victor_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP EVE1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough

ELEVATION (m)

136
132
128
124
120
116
112

31+305 31+320 31+335 31+350 31+365 31+380 31+395

T-31+302.5 P-31+304 T-31+305.5 S-31+307 T-31+308.5 P-31+310 T-31+311.5 S-31+313 T-31+314.5 P-31+316 T-31+317.5 S-31+319 Q-31+319.75 T-31+320.5 Q-31+321.25 P-31+322 T-31+323.5 S-31+325 T-31+326.5 P-31+328 T-31+329.5 S-31+331 T-31+332.5 P-31+334 T-31+335.5 S-31+337 T-31+338.5 P-31+340 T-31+341.5 S-31+343 T-31+344.5 P-31+346 T-31+347.5 S-31+349 T-31+350.5 P-31+352 T-31+353.5 S-31+355 Q-31+355.75 T-31+356.5 Q-31+357.25 P-31+358 T-31+359.5 S-31+361 T-31+362.5 P-31+364 T-31+365.5 S-31+367 T-31+368.5 P-31+370 T-31+371.5 S-31+373 T-31+374.5 P-31+376 T-31+377.5 S-31+379 T-31+380.5 P-31+382 T-31+383.5 S-31+385 T-31+386.5 P-31+388 T-31+389.5 S-31+391 T-31+392.5 P-31+394 T-31+395.5 S-31+397 T-31+398.5

SB

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CASING COMMUNICATION RANGE

P - 60+104

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.15




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

FAST ADVANCE ZONE

SOFT MATERIAL ZONE

SOFT ZONE PRE-JET GROUTING

SURVEYED DIKE CREST

LAKE LEVEL: ~133.7m

ORIGINAL TRENCH (SOUNDING)

BASE OF CUT-OFF WALL (SOUNDING)

INTERPRETED BEDROCK (DRILLING)

INTERPRETED BEDROCK (JET DRILLING)

BEDROCK (2010 INVESTIGATION)

TOP OF JET GROUT CURTAIN

CASING COMMUNICATION

TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED

3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

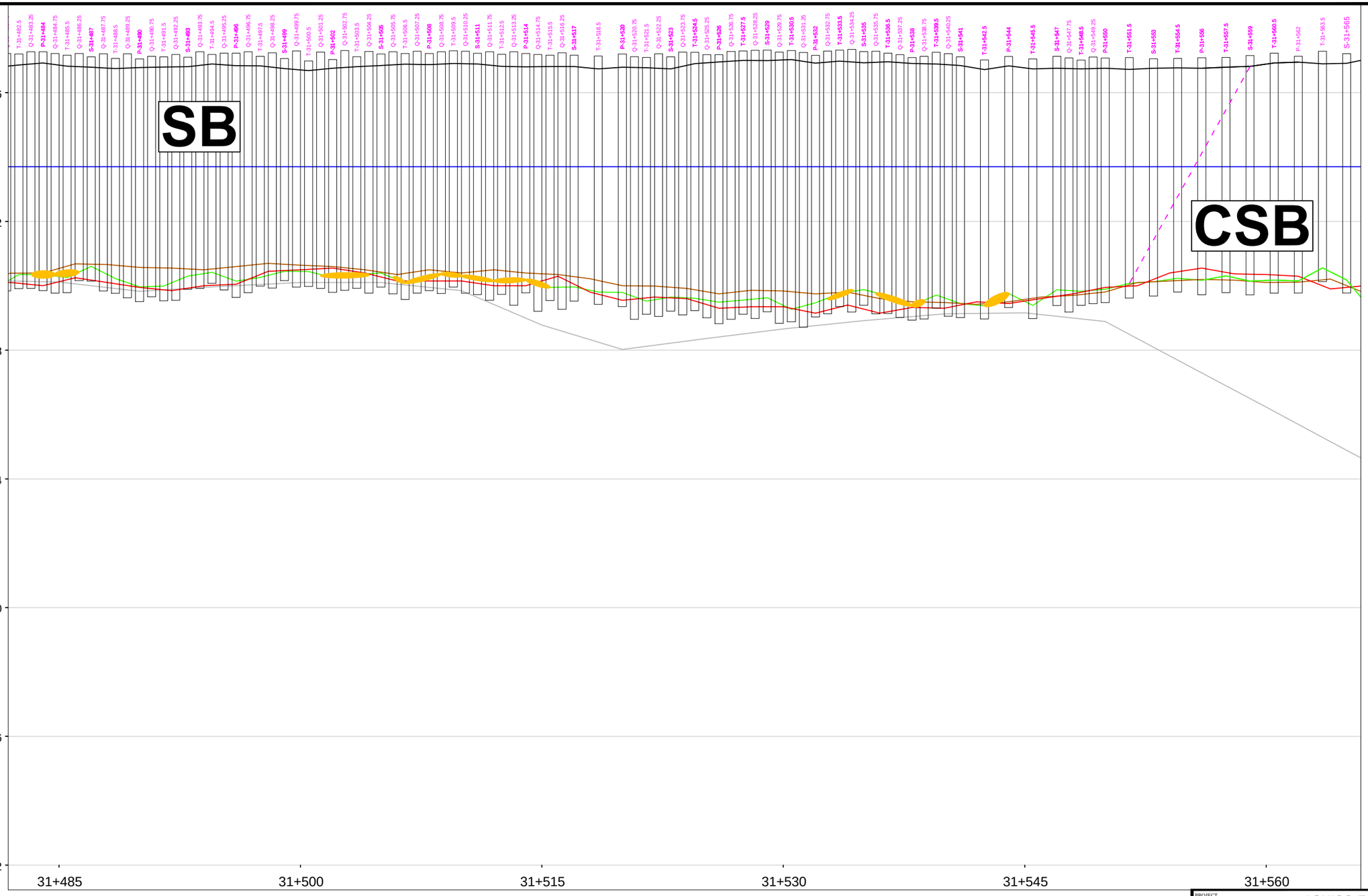
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.16

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough




JET GROUTED CHANNEL 3

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CASING COMMUNICATION RANGE

P - 60+104

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

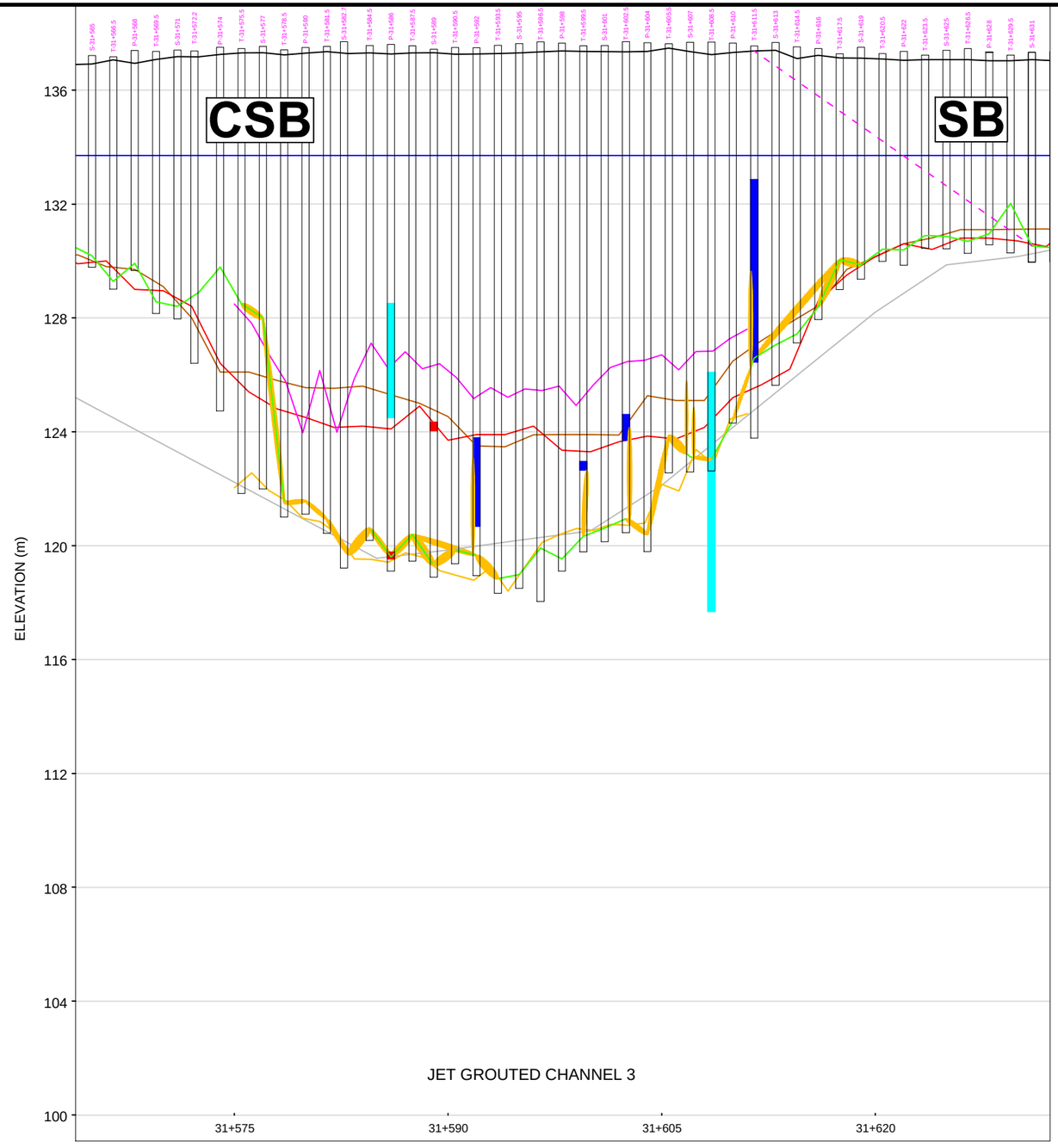
TITLE
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.17

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP EVE1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:36:12 PM By: vrombough




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

FAST ADVANCE ZONE

SOFT MATERIAL ZONE

SOFT ZONE PRE-JET GROUTING

SURVEYED DIKE CREST

LAKE LEVEL: ~133.7m

ORIGINAL TRENCH (SOUNDING)

BASE OF CUT-OFF WALL (SOUNDING)

INTERPRETED BEDROCK (DRILLING)

INTERPRETED BEDROCK (JET DRILLING)

BEDROCK (2010 INVESTIGATION)

TOP OF JET GROUT CURTAIN

CASING COMMUNICATION

TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED

3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

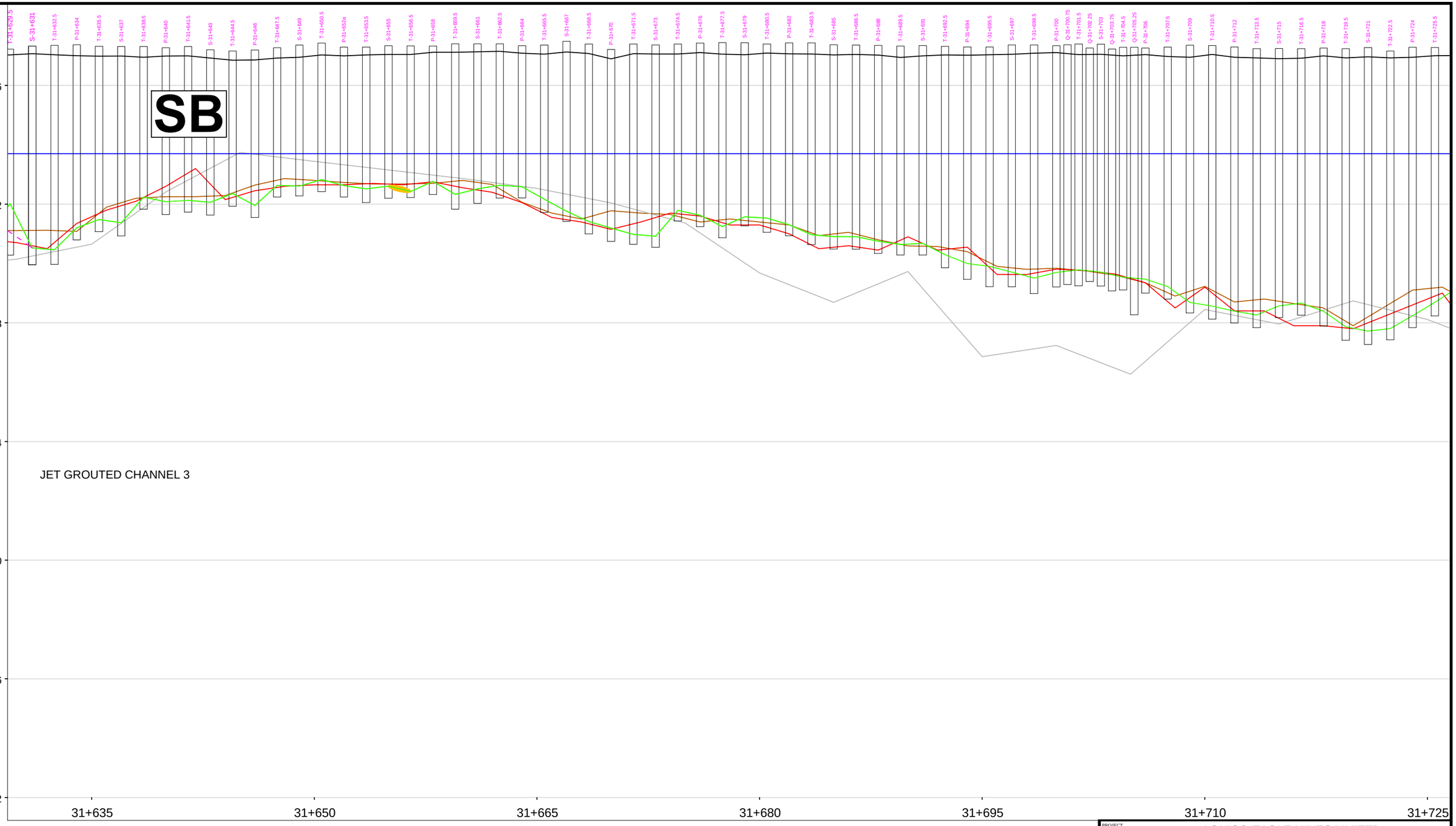
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.18

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

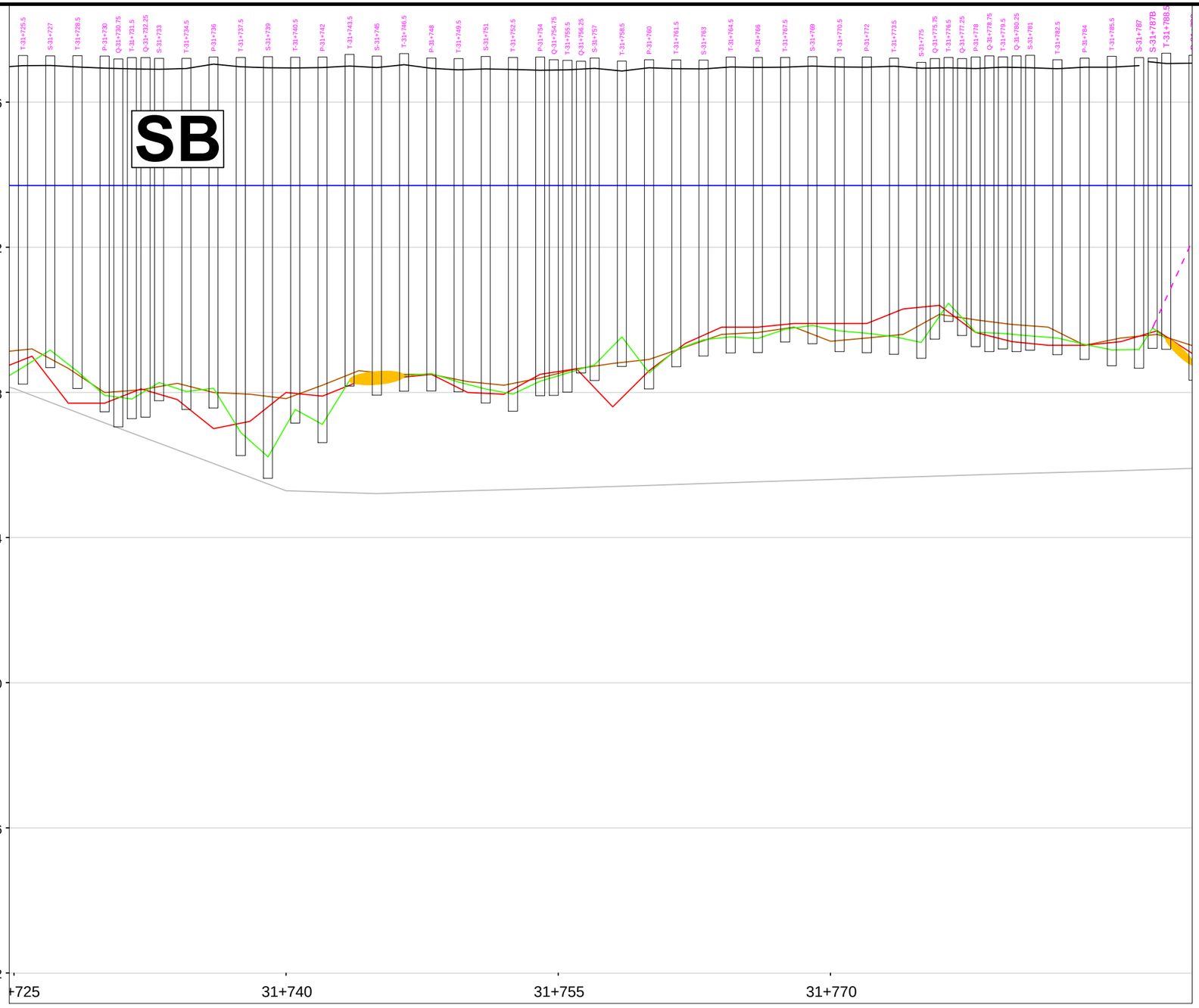
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.19

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP EVE1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough




JET GROUTED CHANNELS 2, 1-2, 1

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CASING COMMUNICATION RANGE

P - 60+104

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

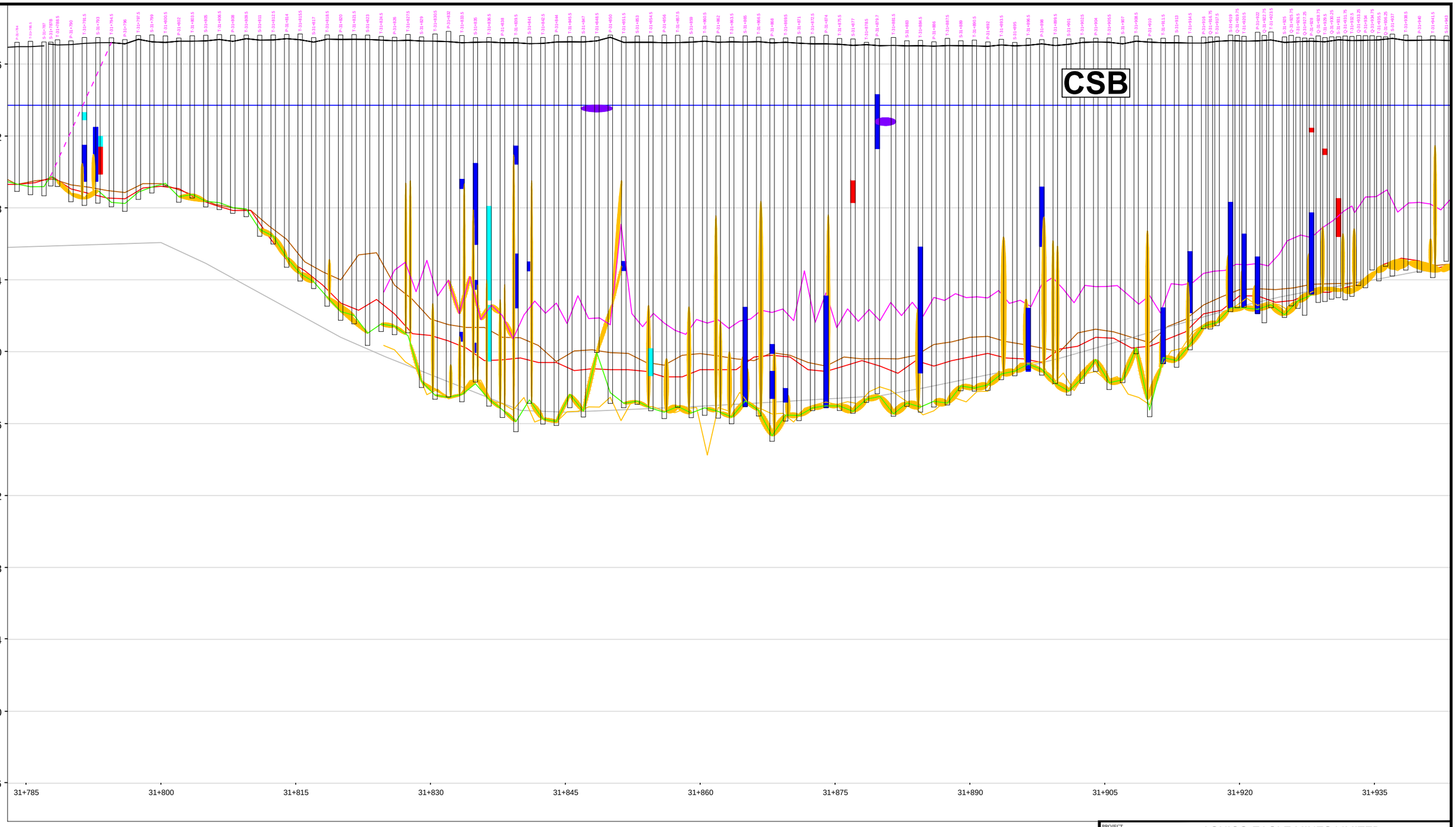
TITLE
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.20

Drawing File: C:\Vicky_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

FAST ADVANCE ZONE

SOFT MATERIAL ZONE

SOFT ZONE PRE-JET GROUTING

SURVEYED DIKE CREST

LAKE LEVEL: ~133.7m

ORIGINAL TRENCH (SOUNDING)

BASE OF CUT-OFF WALL (SOUNDING)

INTERPRETED BEDROCK (DRILLING)

INTERPRETED BEDROCK (JET DRILLING)

BEDROCK (2010 INVESTIGATION)

TOP OF JET GROUT CURTAIN

CASING COMMUNICATION

TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED

3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

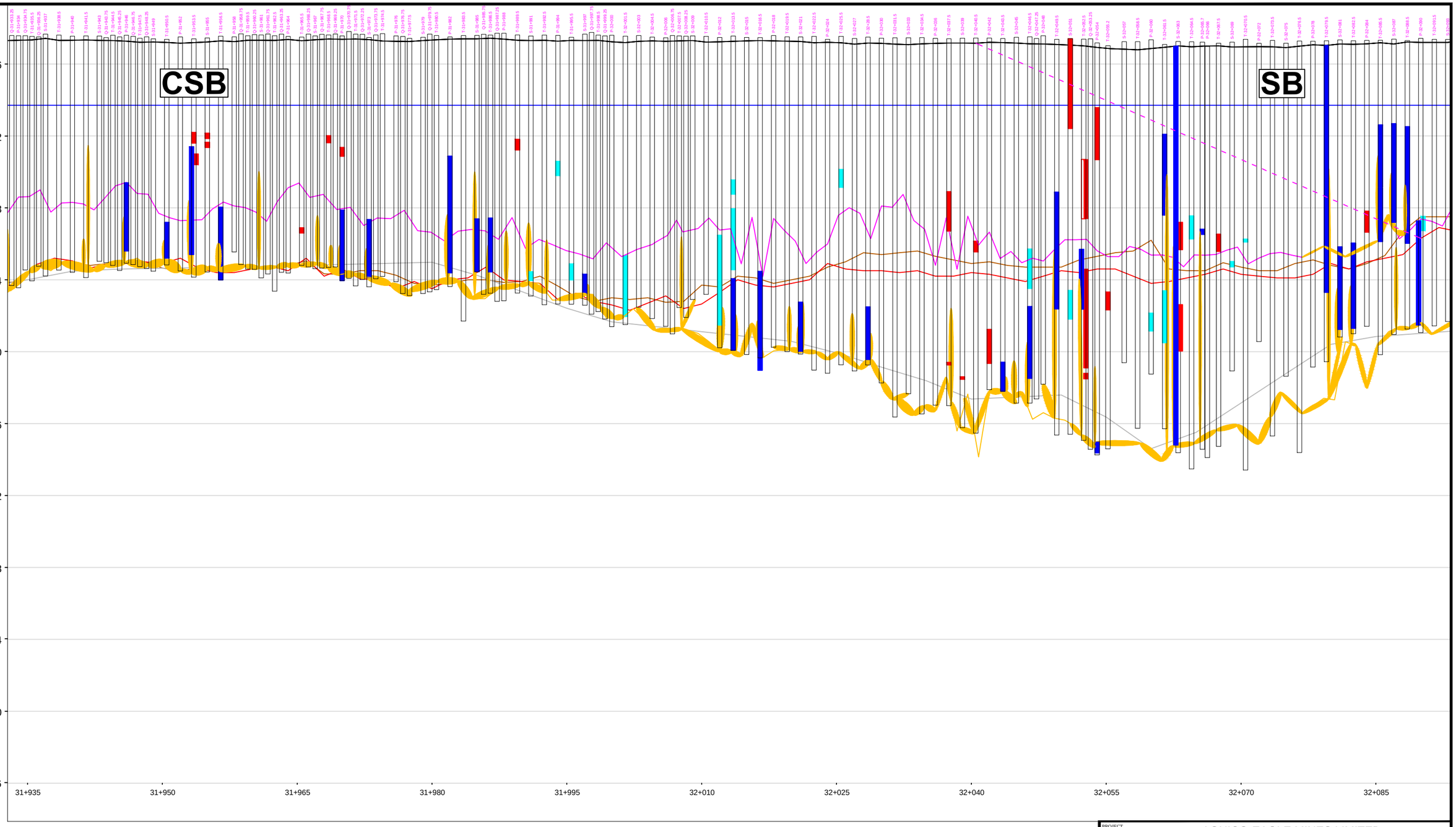
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.21

Drawing File: C:\Vicky_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:36:12 PM By: vrombough




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## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

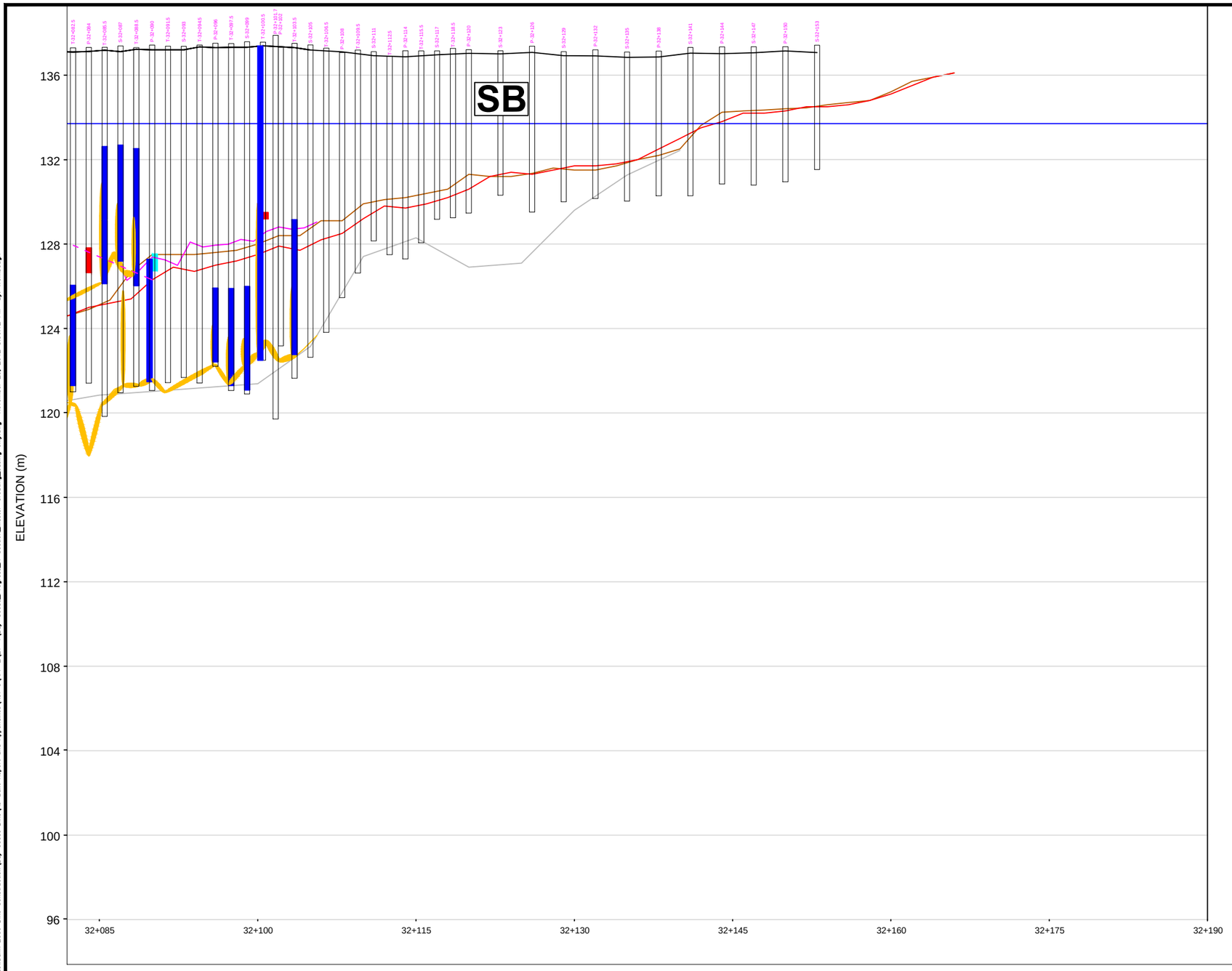
PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.22




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

CASING COMMUNICATION RANGE

- FAST ADVANCE ZONE
- SOFT MATERIAL ZONE
- SOFT ZONE PRE-JET GROUTING

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- CASING COMMUNICATION
- TRICONE COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
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0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# CASING INSTALLATION
# CROSS SECTION

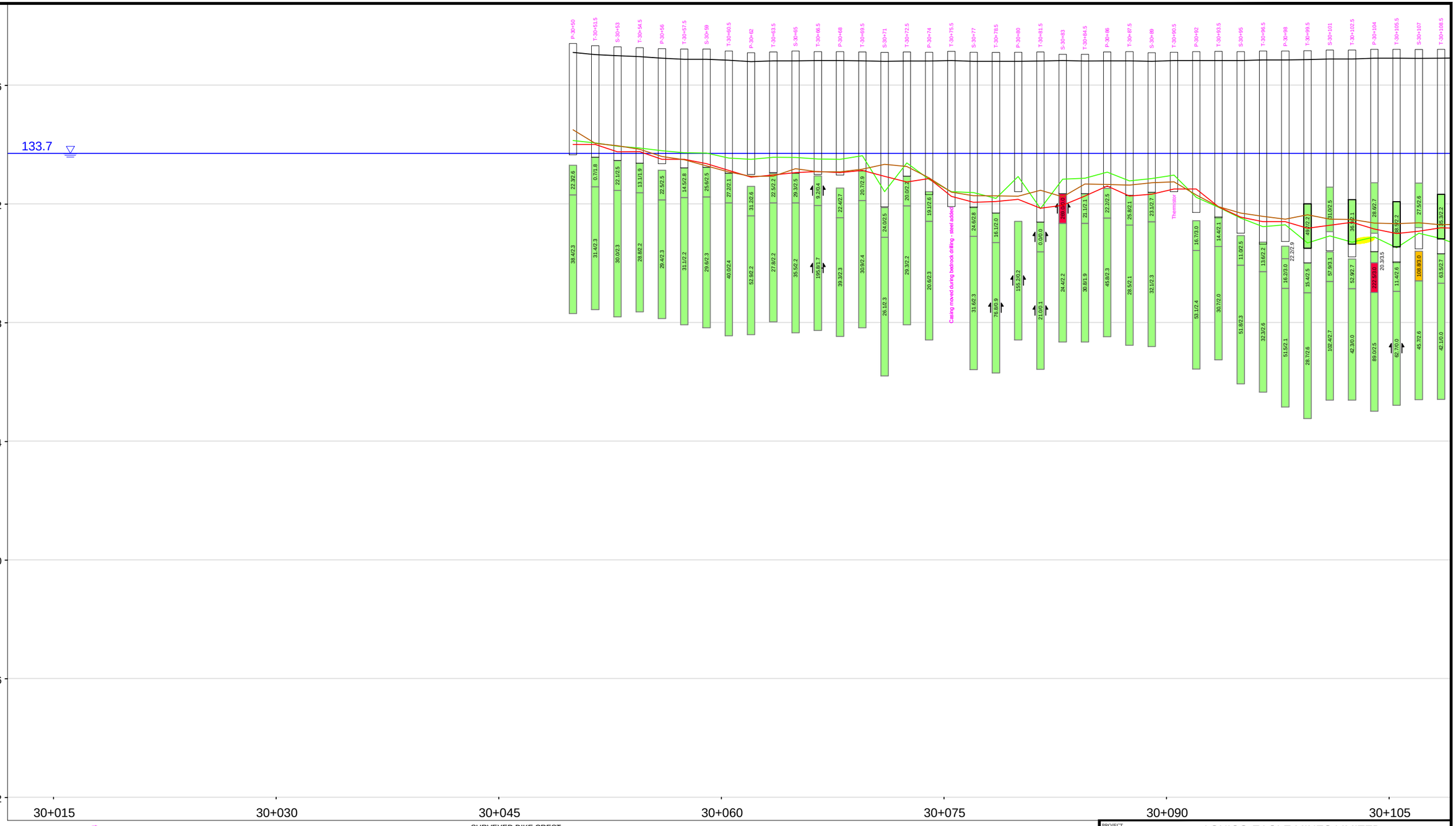
Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 20SEP11 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

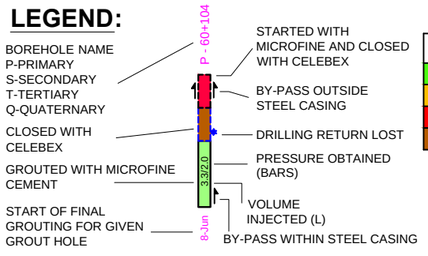
FIGURE E1 - 4.23

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP EVE1-4\Bay-Goose_Progress_X-Section_Master-Grouting_casing only.dwg November 29, 2012 5:38:12 PM By: vrombough

## Grout Take Cross Section




## LEGEND:




| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- BEDROCK (2010 INVESTIGATION)
- GROUTING COMMUNICATION
- CASING COMMUNICATION
- DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1-4.24

Drawing File: C:\Vicky_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Boy Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Boy-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough

Drawing File: G:\Active_2008\1428\08-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough

ELEVATION (m)

136
132
128
124
120
116
112

30+120 30+135 30+150 30+165 30+180 30+195

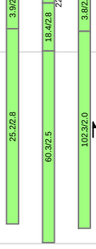
## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE




STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

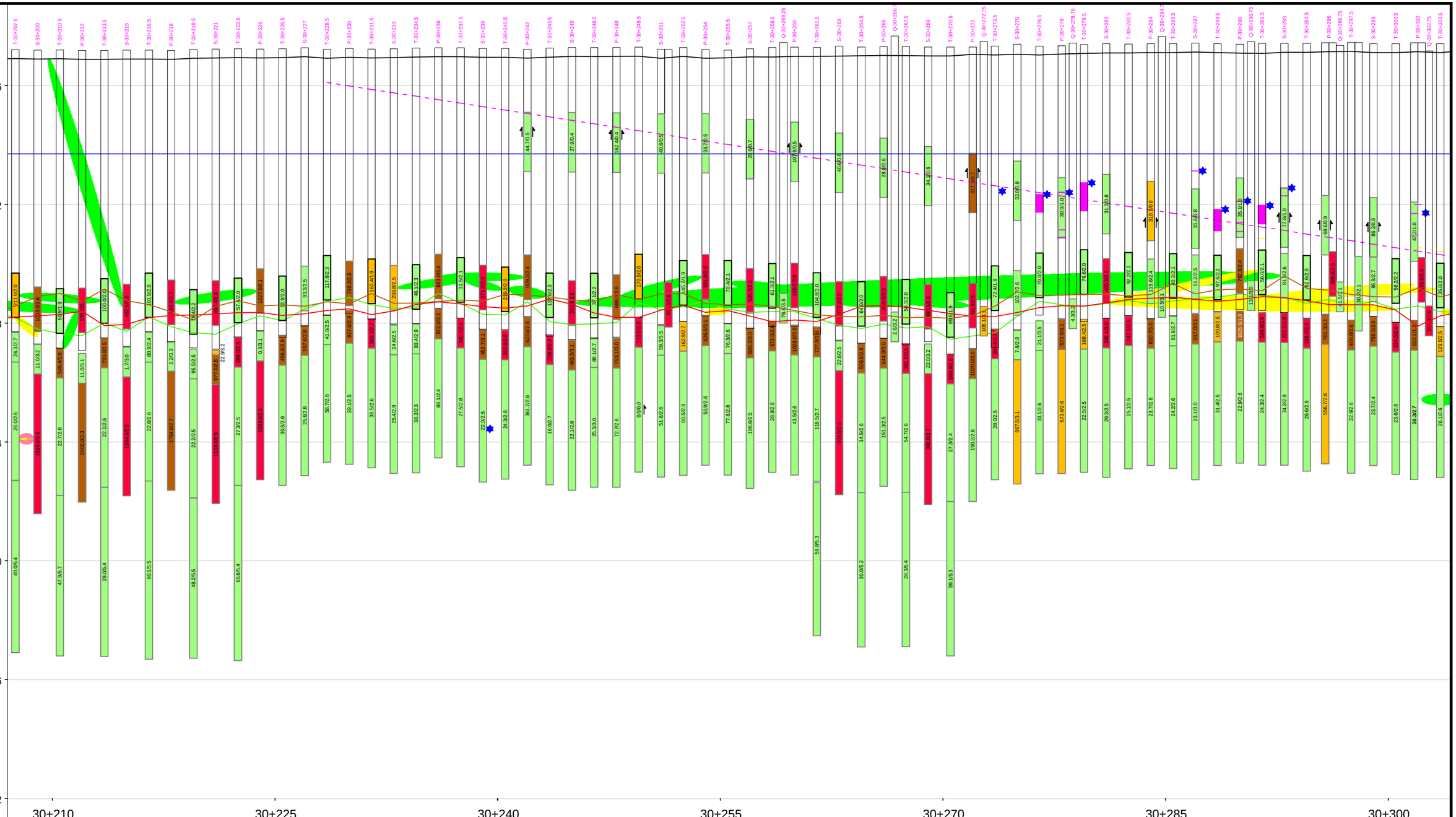
PROJECT
AEM
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.25



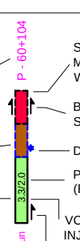

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE




STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
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3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.26

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough

Drawing File: O:\Active_2008\1428\08-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough

ELEVATION (m)

136
132
128
124
120
116
112

30+315
30+330
30+345
30+360
30+375
30+390

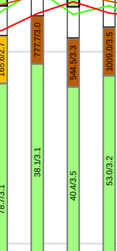
## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE




STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
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SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
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3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

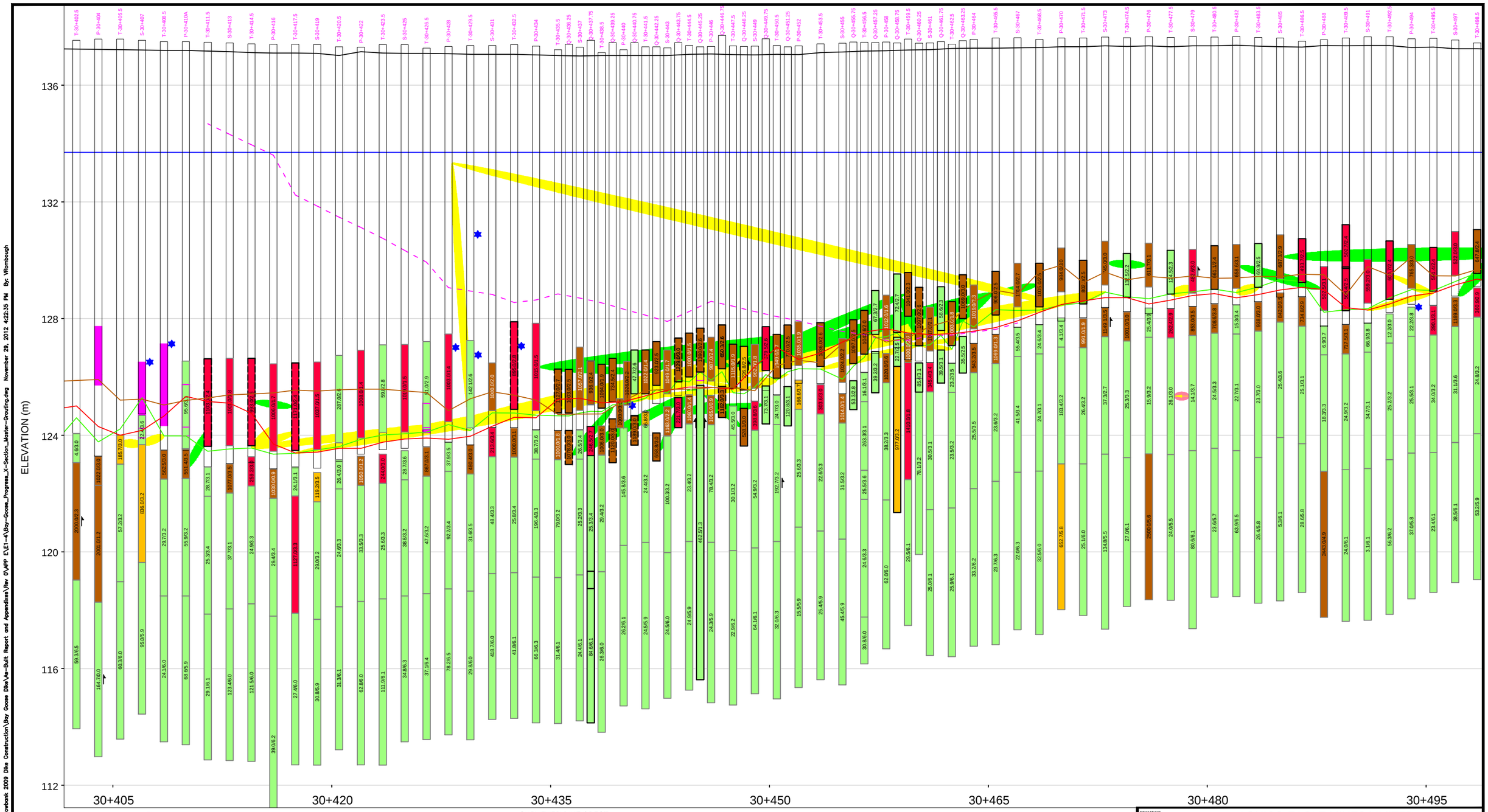
PROJECT
AEM
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.27




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE

STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
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- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- BEDROCK (2010 INVESTIGATION)
- GROUTING COMMUNICATION
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## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
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3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

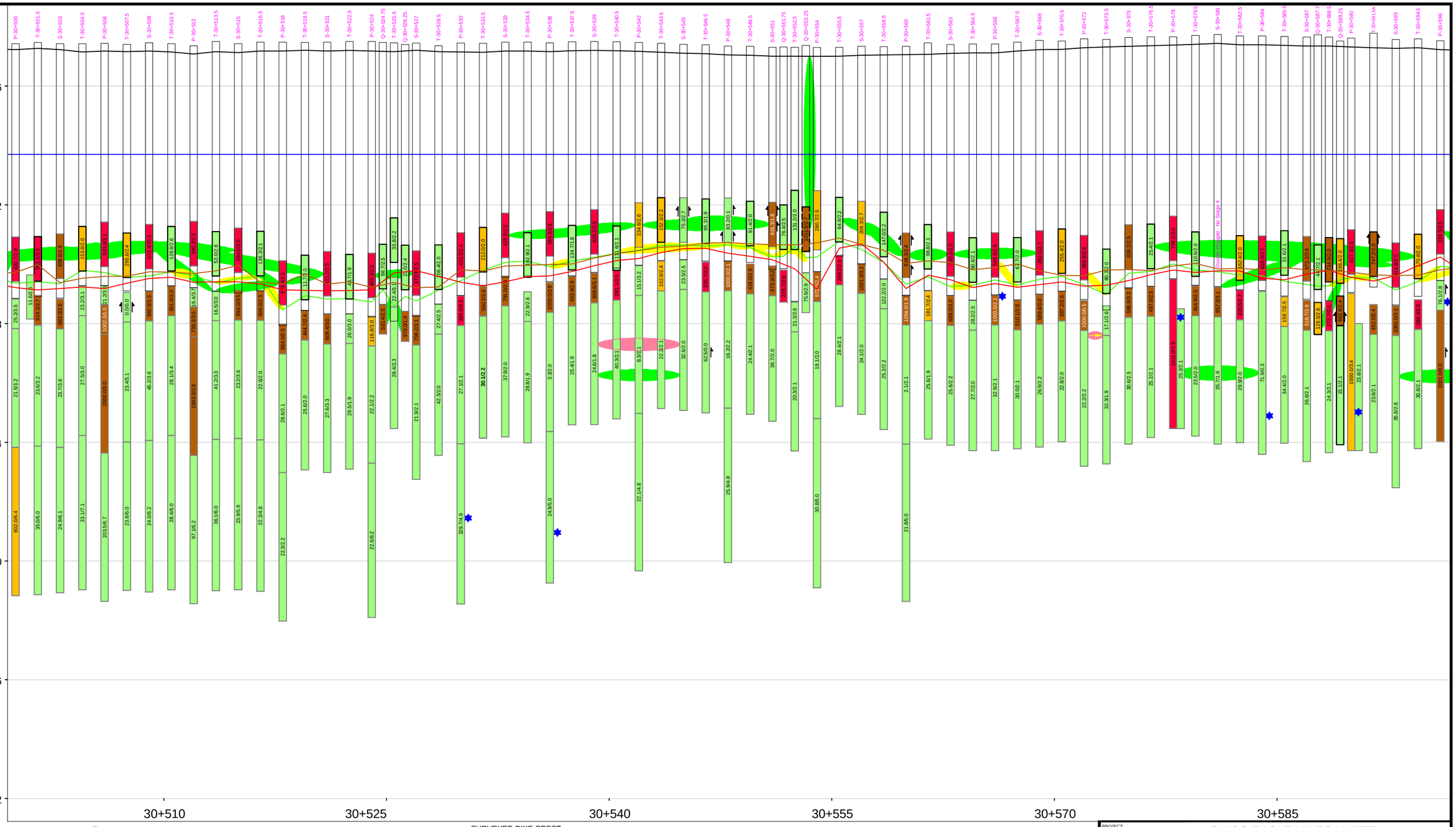
TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.28

Drawing File: G:\Active_2008\1428\08-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE

STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.29

Drawing File: C:\Vicky_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough

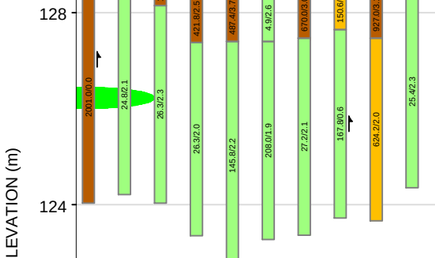
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ELEVATION (m)

136
132
128
124
120
116
112

30+600 30+615 30+630 30+645 30+660 30+675 30+690

## LEGEND:




| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- BEDROCK (2010 INVESTIGATION)
- GROUTING COMMUNICATION
- CASING COMMUNICATION
- DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | FIGURE E1 - 4.30 | | |
| REVIEW | FE | 01DEC12 | | | |

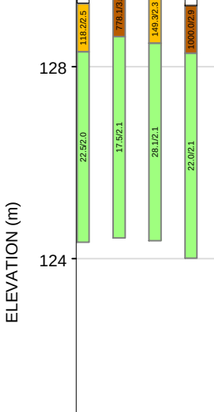
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ELEVATION (m)

136
132
128
124
120
116
112

30+705 30+715 30+735 30+750 30+765 30+780

## LEGEND:




BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE

STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AEM
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.31

Drawing File: C:\Vicky_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP EVE1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough

ELEVATION (m)

136
132
128
124
120
116
112

30+795 30+810 30+825 30+840 30+855 30+870 30+885

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE




STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.32

Drawing File: C:\Vicky_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP EVE1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VBrombough

ELEVATION (m)

136
132
128
124
120
116
112

30+855 30+870 30+885 30+900 30+915 30+930 30+945

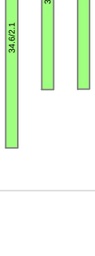
## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE




STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.33

Drawing File: O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VBrombough

ELEVATION (m)

136
132
128
124
120
116
112

30+945 30+960 30+975 30+990 31+005 31+020 31+035

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE

STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

P - 60+104
3.3/2.0
8-Jun

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
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3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | FIGURE E1 - 4.34 | | |
| REVIEW | FE | 01DEC12 | | | |

Drawing File: G:\Active__2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VBrombough

ELEVATION (m)

136
132
128
124
120
116
112

31+035 31+050 31+065 31+080 31+095 31+110 31+125

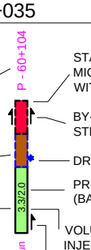
## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE




STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

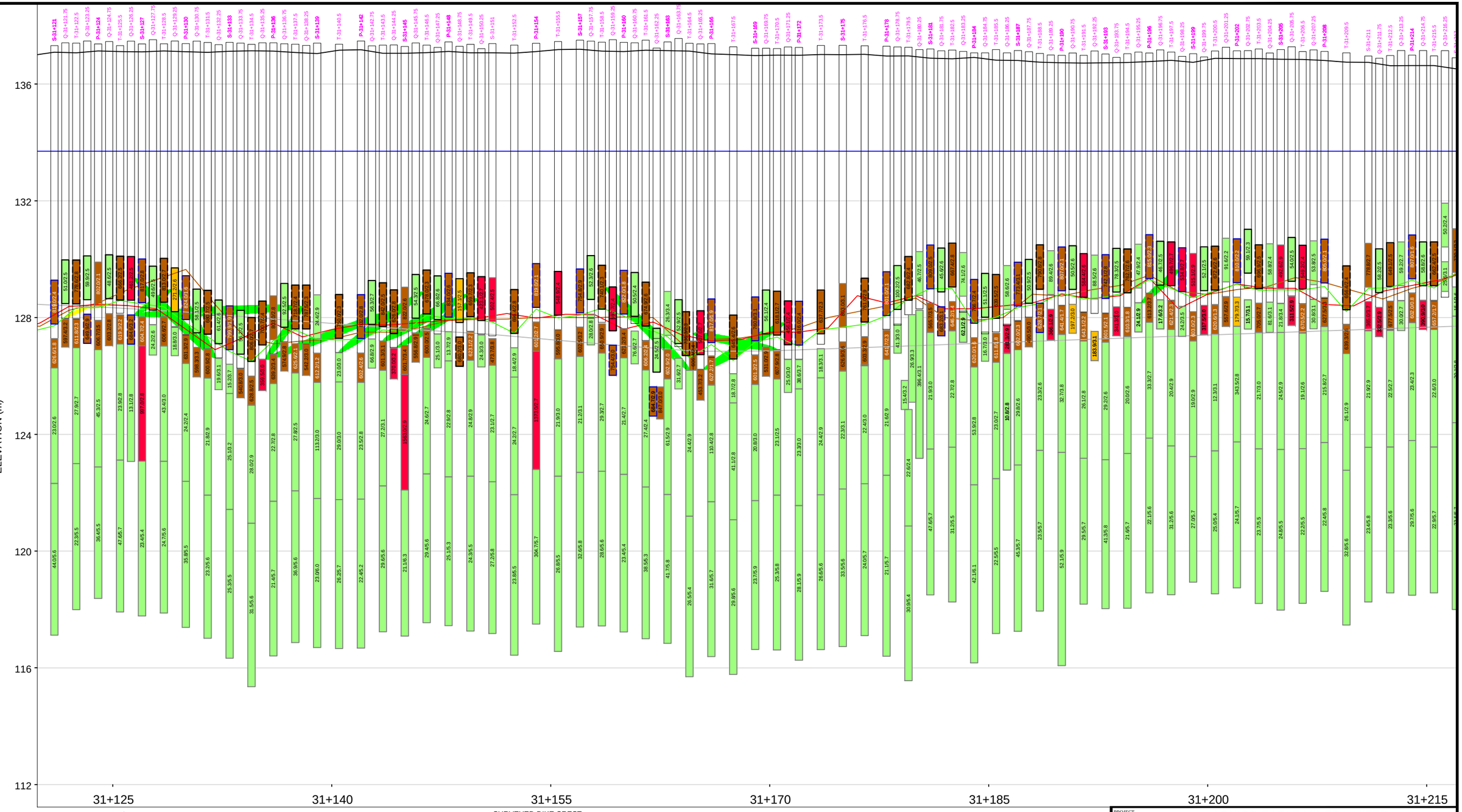
PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

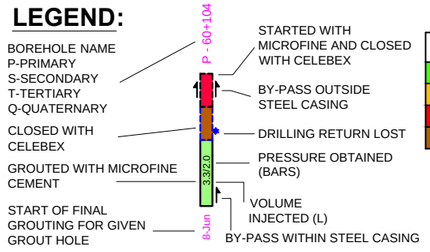
Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | FIGURE E1 - 4.35 | | |
| REVIEW | FE | 01DEC12 | | | |

Drawing File: G:\Active__2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VBrombough




## LEGEND:




| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- BEDROCK (2010 INVESTIGATION)
- GROUTING COMMUNICATION
- CASING COMMUNICATION
- DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

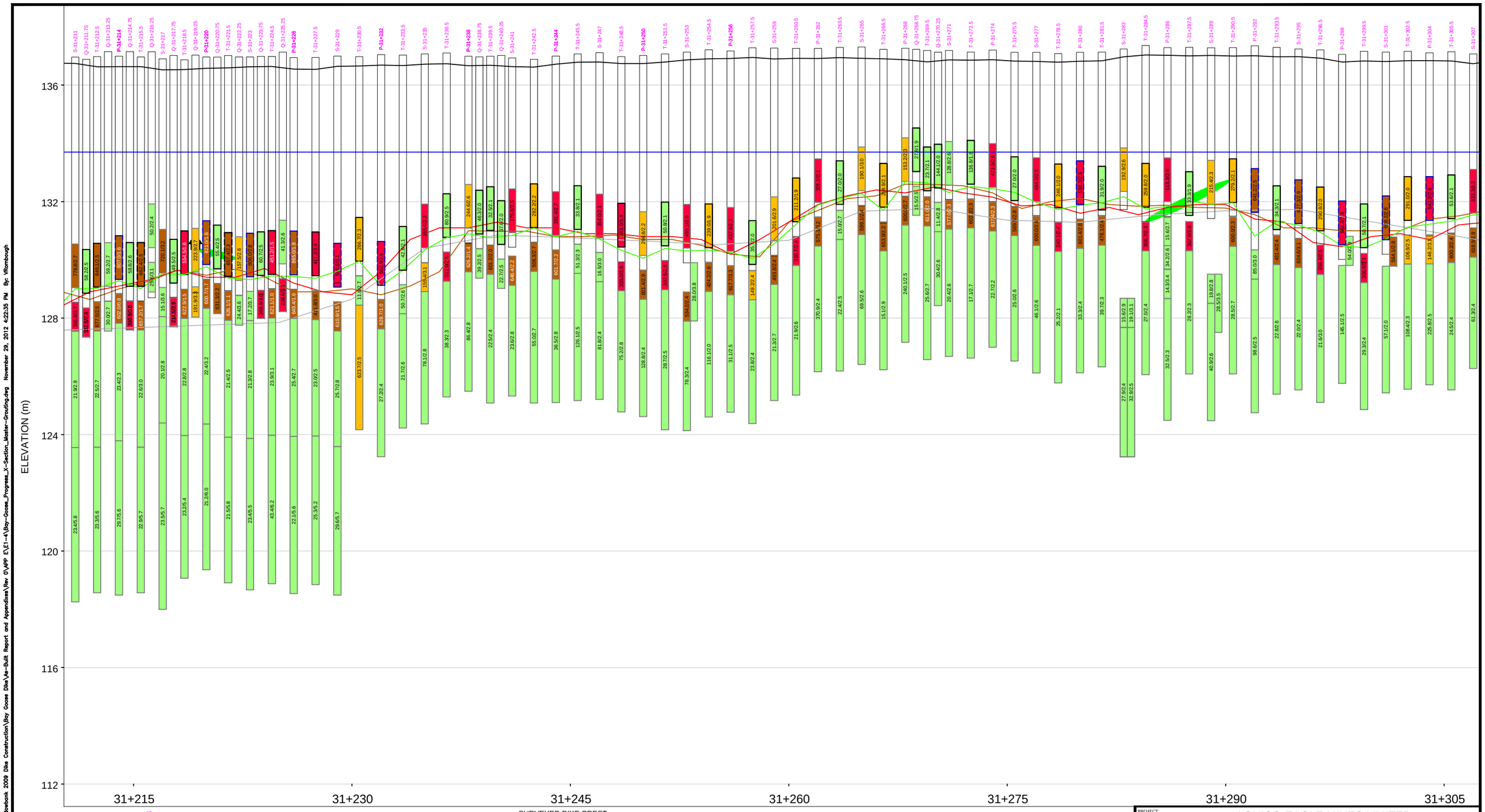
PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.36




## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE

STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
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SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
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3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.37

Drawing File: C:\Vicky_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VBrombough

Drawing File: O:\Active__2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough

ELEVATION (m)

136
132
128
124
120
116
112

31+305
31+320
31+335
31+350
31+365
31+380
31+395

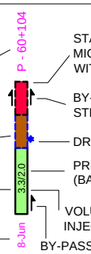
## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE




STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | FIGURE E1 - 4.38 | | |
| REVIEW | FE | 01DEC12 | | | |

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough

ELEVATION (m)

136
132
128
124
120
116
112

31+395
31+410
31+425
31+440
31+455
31+470
31+485

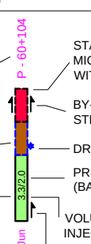
## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE




STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
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SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.39

Drawing File: C:\Vicky_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP EVE1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough

ELEVATION (m)

136
132
128
124
120
116
112

31+485 31+500 31+515 31+530 31+545 31+560

JET GROUTED CHANNEL 3

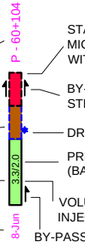
## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE




STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

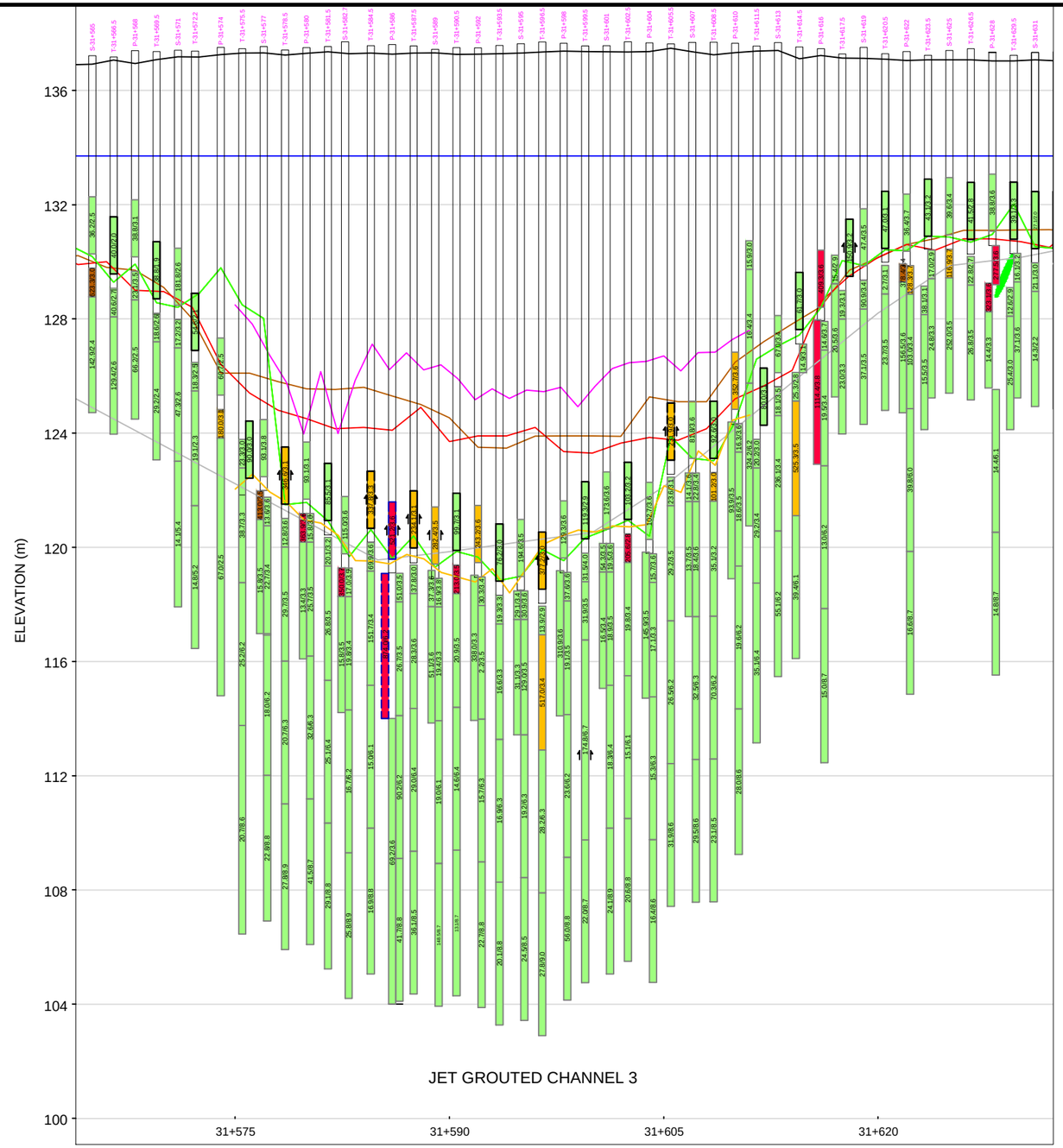
PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

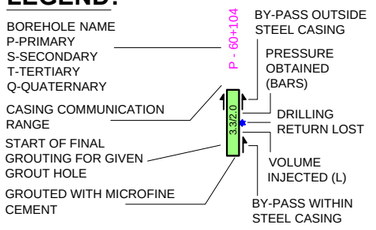
Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.40




## LEGEND:




| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- GROUTING COMMUNICATION
- CASING COMMUNICATION
- DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES
0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.41

Drawing File: O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VRombough

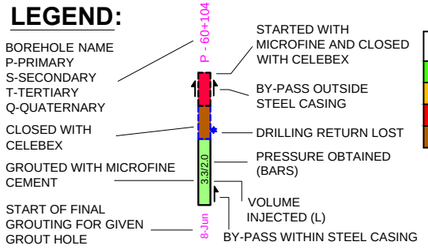
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ELEVATION (m)

136
132
128
124
120
116
112

31+635 31+650 31+665 31+680 31+695 31+710 31+725

## LEGEND:




| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- BEDROCK (2010 INVESTIGATION)
- GROUTING COMMUNICATION
- CASING COMMUNICATION
- DRILLING COMMUNICATION

## NOTES:

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3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

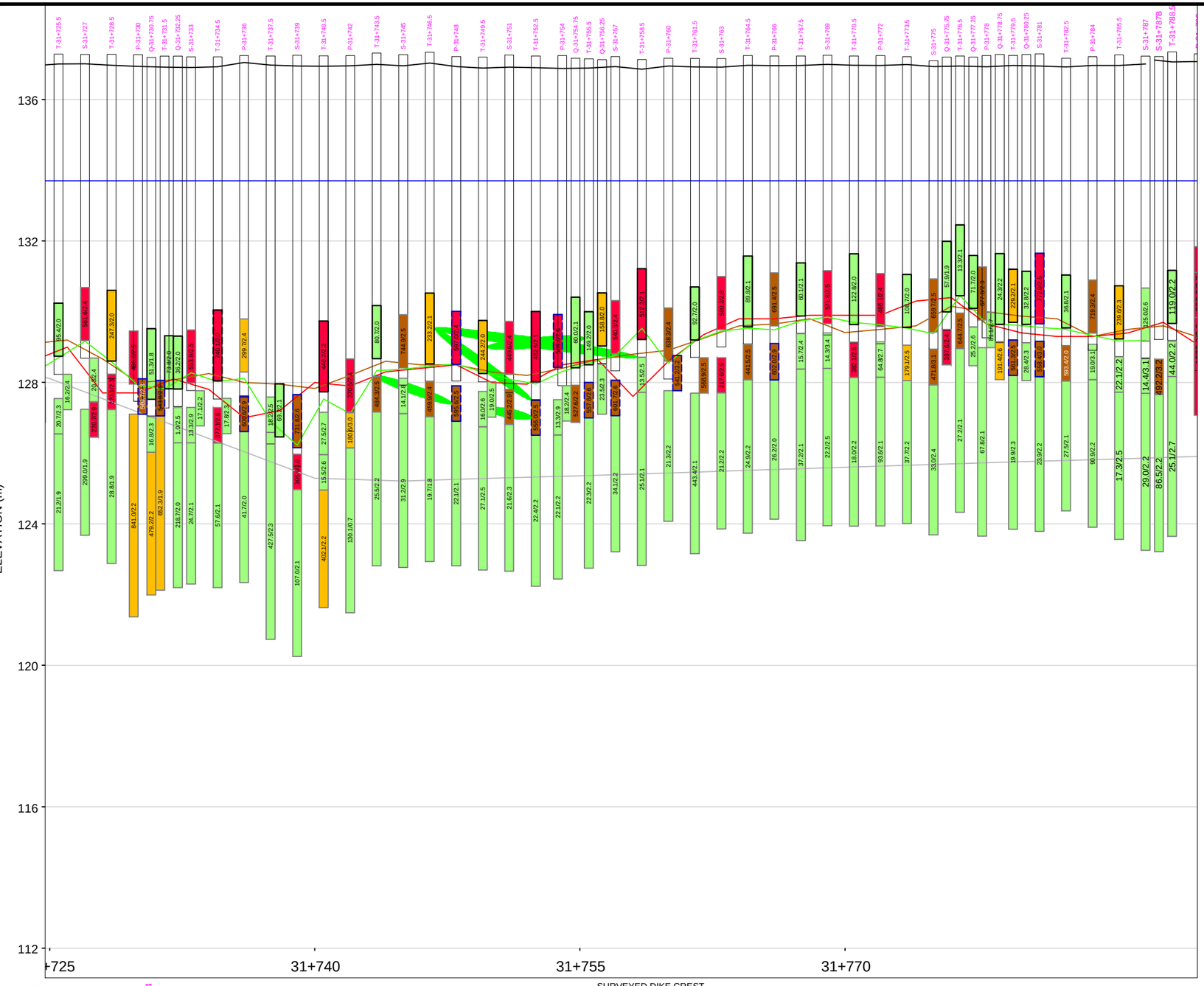
PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

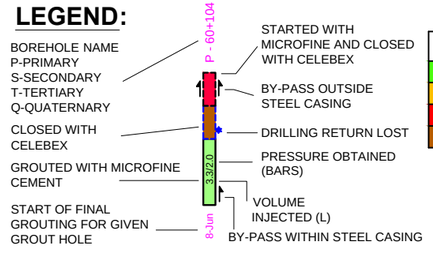
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| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | FIGURE E1 - 4.42 | | |
| REVIEW | FE | 01DEC12 | | | |

Drawing File: G:\Active_2008\1428\08-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VBrombough




JET GROUTED CHANNELS 2, 1-2, 1

## LEGEND:




| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- BEDROCK (2010 INVESTIGATION)
- GROUTING COMMUNICATION
- CASING COMMUNICATION
- DRILLING COMMUNICATION

## NOTES:

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3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

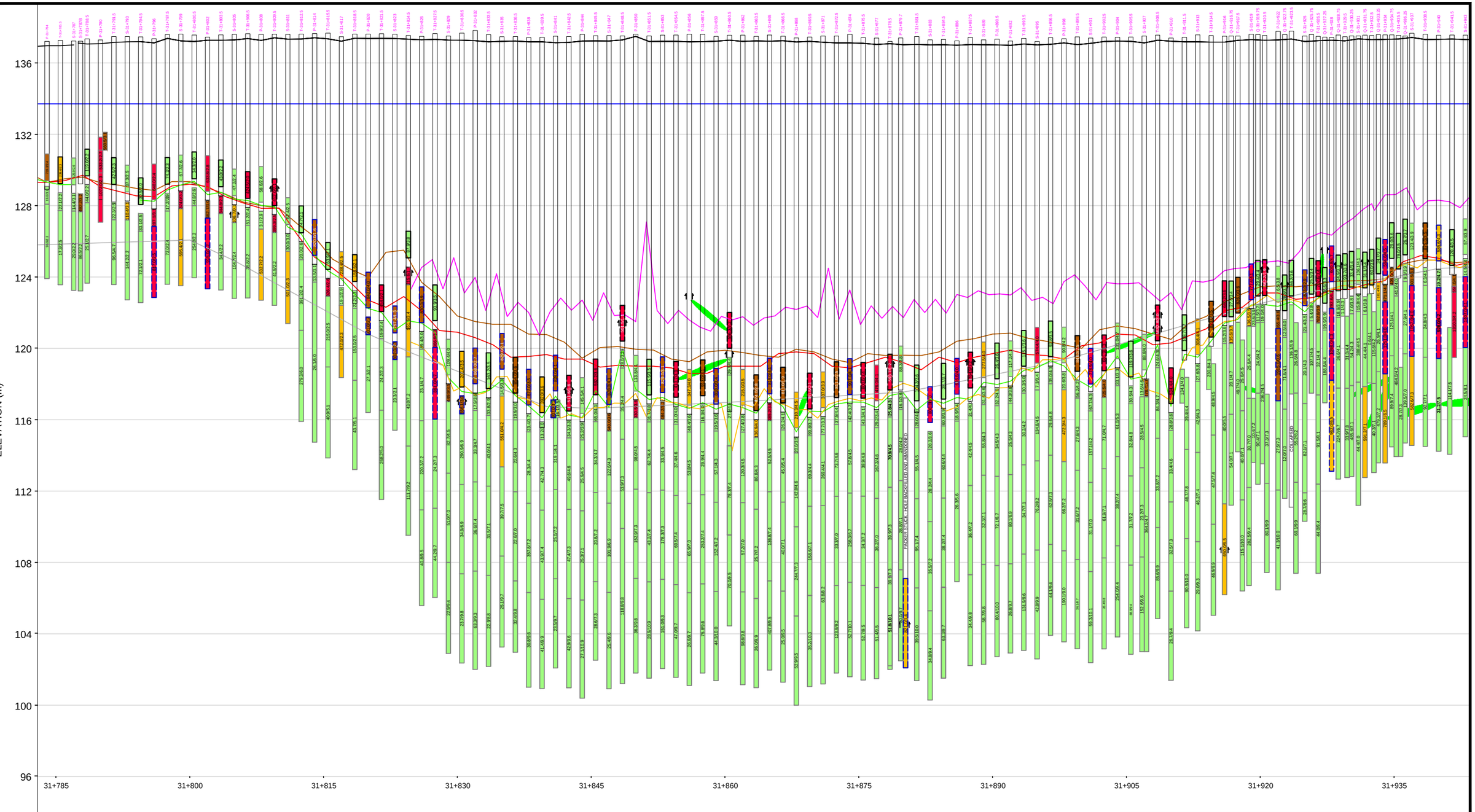
PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

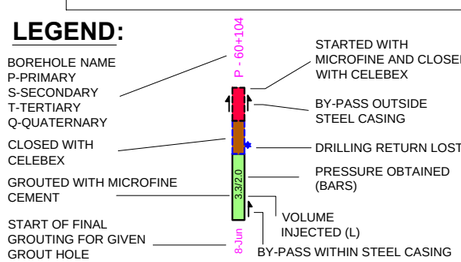
Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E1 - 4.43




## LEGEND:




| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

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- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- GROUTING COMMUNICATION
- CASING COMMUNICATION
- DRILLING COMMUNICATION

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

## NOTES:

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PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | FIGURE E1 - 4.44 | | |
| REVIEW | FE | 01DEC12 | | | |

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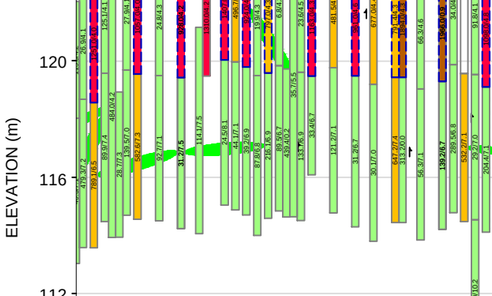
Drawing File: G:\Active__2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E1-4\Bay-Goose_Progress_X-Section_Master-Grouting.dwg November 29, 2012 4:22:35 PM By: VBrombough

ELEVATION (m)

136
132
128
124
120
116
112
108
104
100
96

31+935 31+950 31+965 31+980 31+995 32+010 32+025 32+040 32+055 32+070 32+085

## LEGEND:




| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

- SURVEYED DIKE CREST
- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- INTERPRETED BEDROCK (DRILLING)
- INTERPRETED BEDROCK (JET DRILLING)
- BEDROCK (2010 INVESTIGATION)
- TOP OF JET GROUT CURTAIN

- GROUTING COMMUNICATION
- CASING COMMUNICATION
- DRILLING COMMUNICATION

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

## NOTES:

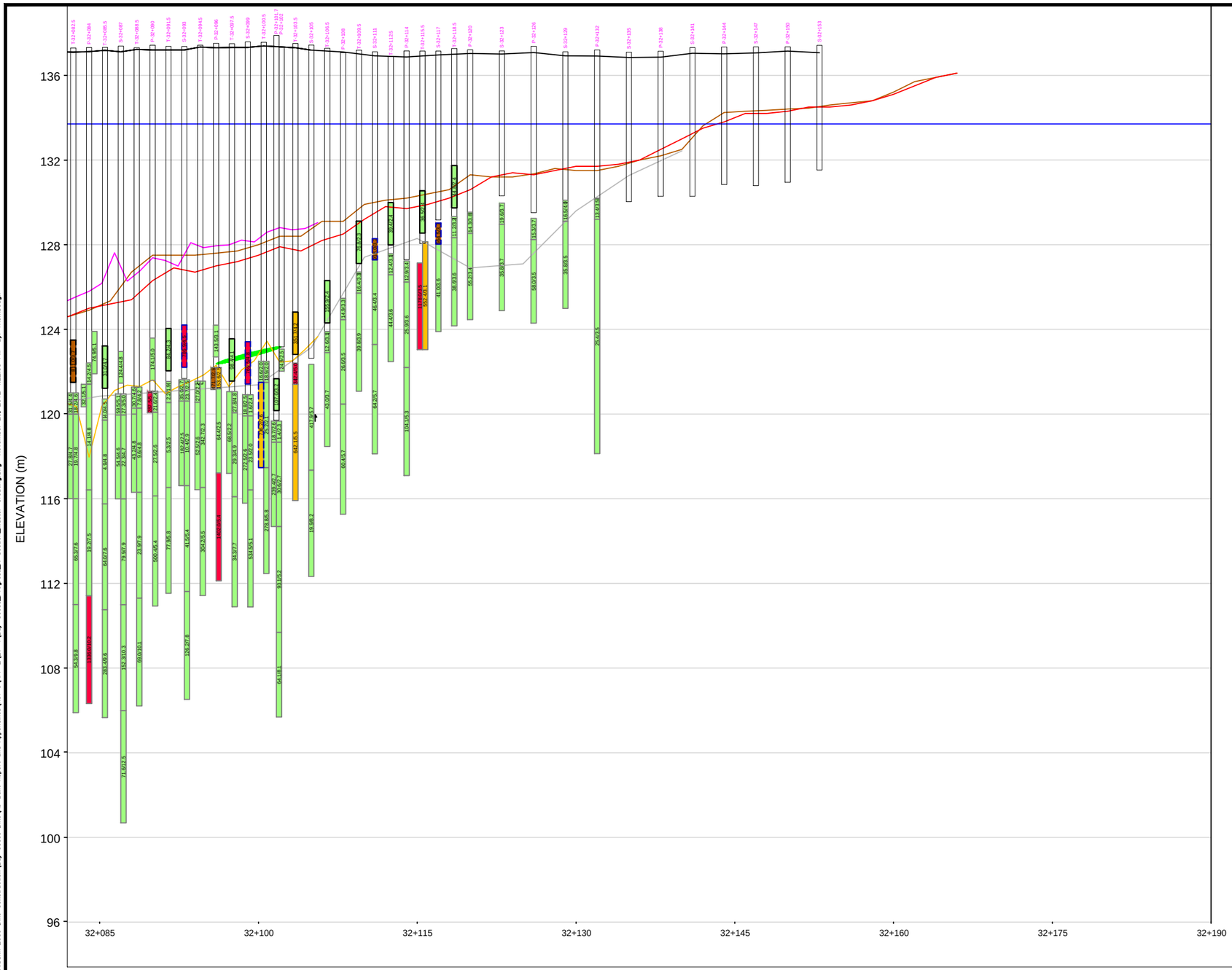
1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
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PROJECT
AEM
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | FIGURE E1 - 4.45 | | |
| REVIEW | FE | 01DEC12 | | | |



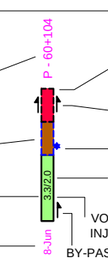

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

CLOSED WITH CELEBEX

GROUTED WITH MICROFINE CEMENT

START OF FINAL GROUTING FOR GIVEN GROUT HOLE




STARTED WITH MICROFINE AND CLOSED WITH CELEBEX

BY-PASS OUTSIDE STEEL CASING

DRILLING RETURN LOST

PRESSURE OBTAINED (BARS)

VOLUME INJECTED (L)

BY-PASS WITHIN STEEL CASING

| | | TAKE: L/m |
|---|---|---|
| VOL / P | LOW | < 100 |
| VOL / P | M.HIGH | 100< >200 |
| VOL / P | HIGH | 200< >400 |
| VOL / P | V.HIGH | >400 |

*White Numbers indicate > 80% of Pmax not achieved (Stage 3 & 4)
*Black Numbers indicate > 80% of Pmax achieved (Stage 3 & 4)

SURVEYED DIKE CREST
LAKE LEVEL: ~133.7m
ORIGINAL TRENCH (SOUNDING)
BASE OF CUT-OFF WALL (SOUNDING)
INTERPRETED BEDROCK (DRILLING)
INTERPRETED BEDROCK (JET DRILLING)
BEDROCK (2010 INVESTIGATION)
TOP OF JET GROUT CURTAIN

GROUTING COMMUNICATION
CASING COMMUNICATION
DRILLING COMMUNICATION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# GROUT TAKE CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | 2000 |
| DESIGN | VTR | 15APR10 | SCALE | AS SHOWN | REV. 0 |
| CADD | YEW | 15JUN12 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

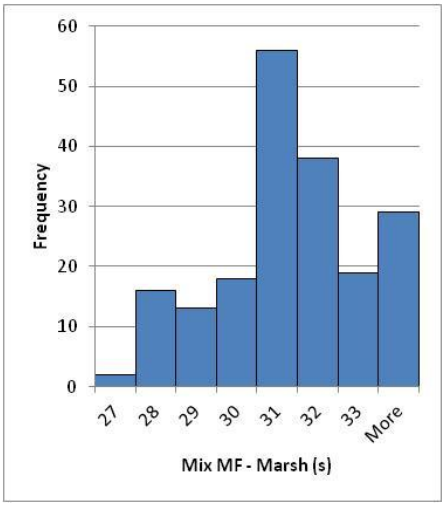
FIGURE E1 - 4.46

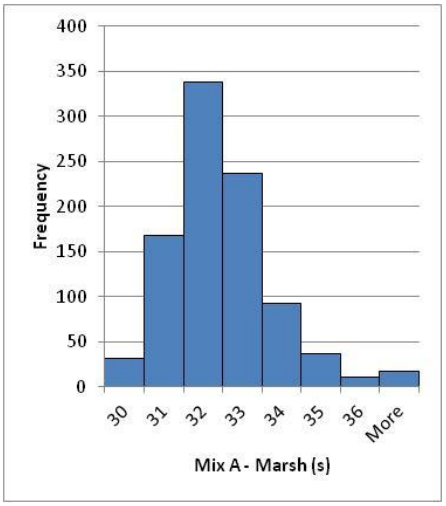
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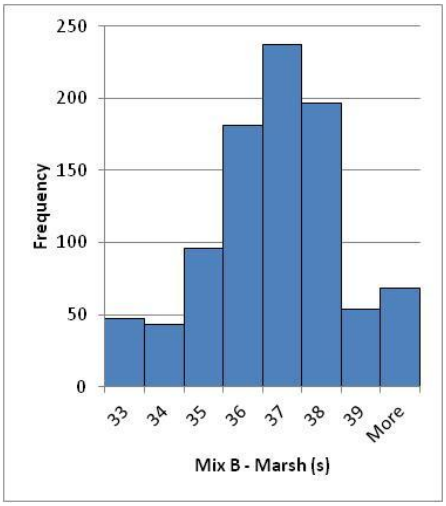
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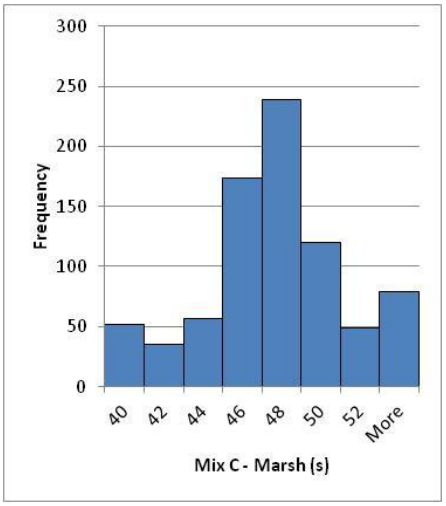
- Grout Quality Control Histograms
- Water Pressure Test Summary Table
- Water Pressure Test Summary Graphs
- Water Pressure Test Analyses

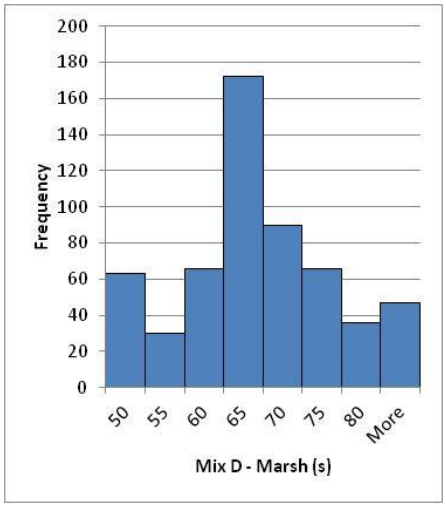
# Grout Quality Control Histograms

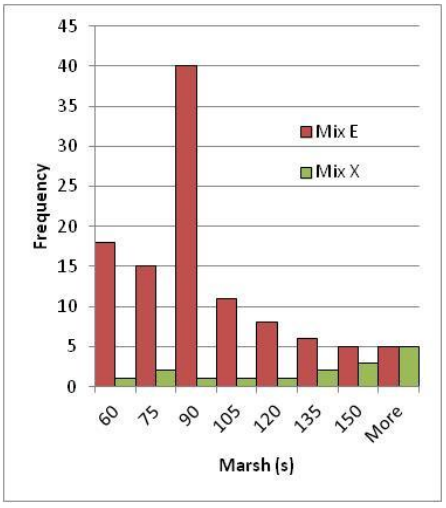



PROJECT

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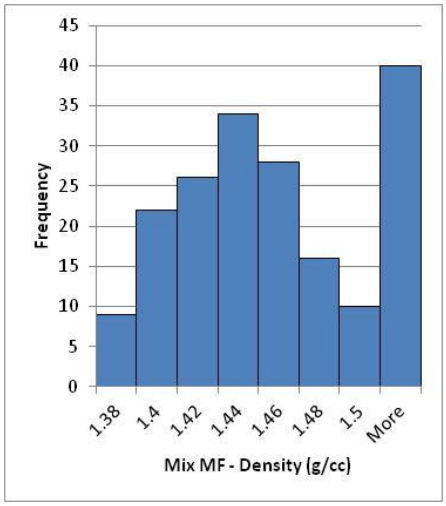
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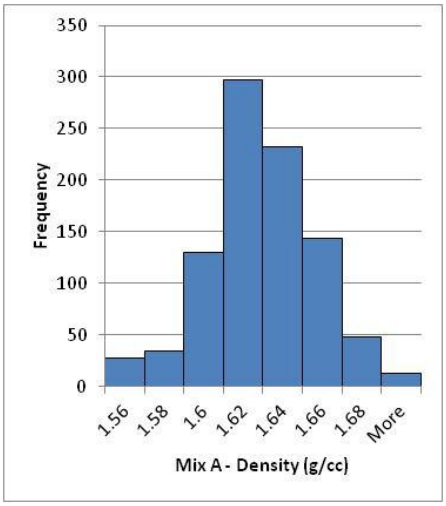
**BEDROCK / CONTACT GROUTING**
**QUALITY CONTROL - MARSH RESULTS**

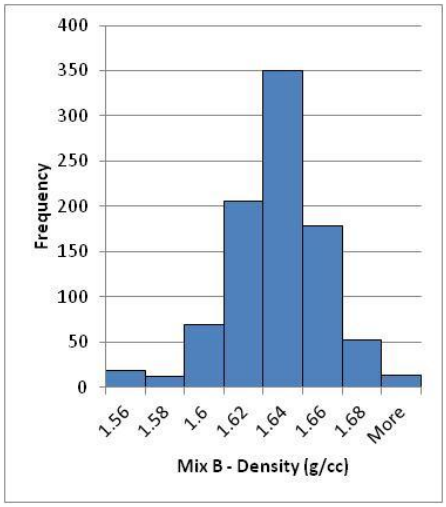
Golder Associates

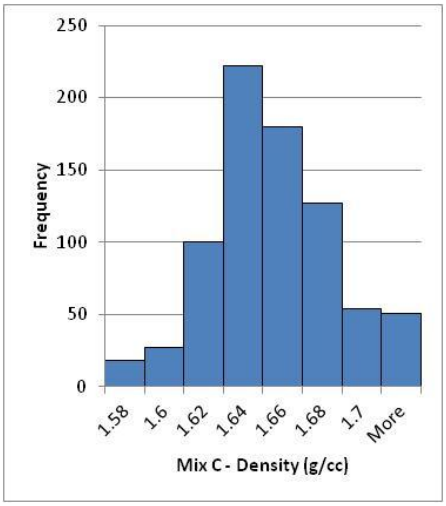
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|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 18JAN12 | SCALE N/A | REV. 0 |
| CADD | YEW | 18JAN12 | | |
| CHECK | GRB | 01DEC12 | **FIGURE E1-5.1** | |
| REVIEW | FE | 01DEC12 | | |

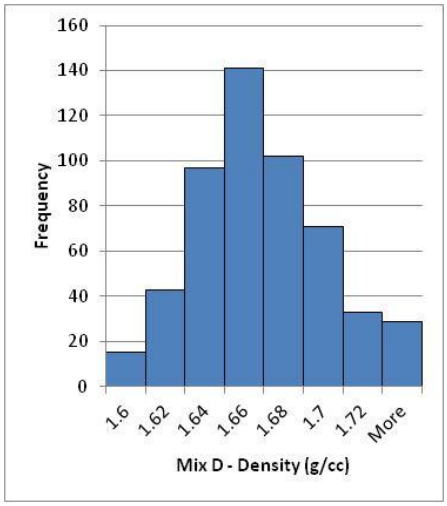
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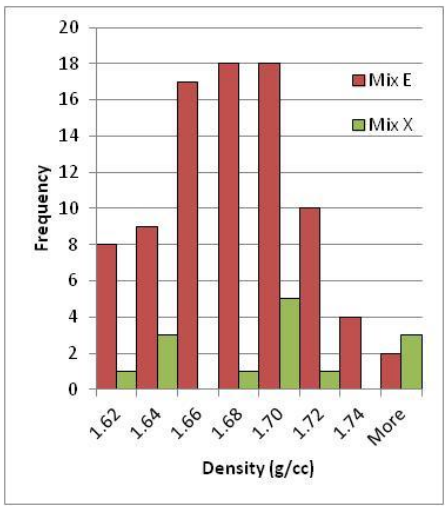



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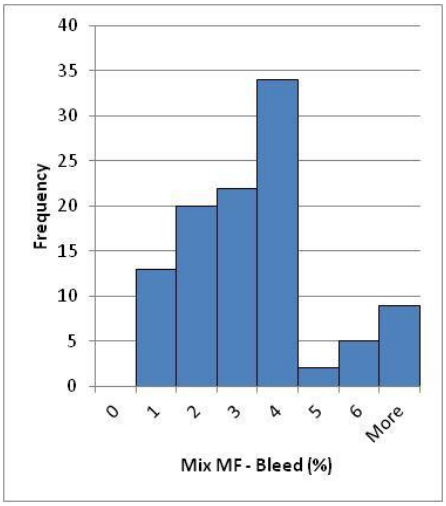
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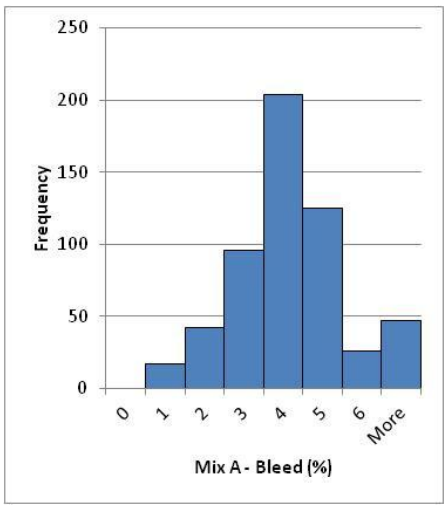
**BEDROCK / CONTACT GROUTING**
**QUALITY CONTROL - DENSITY RESULTS**

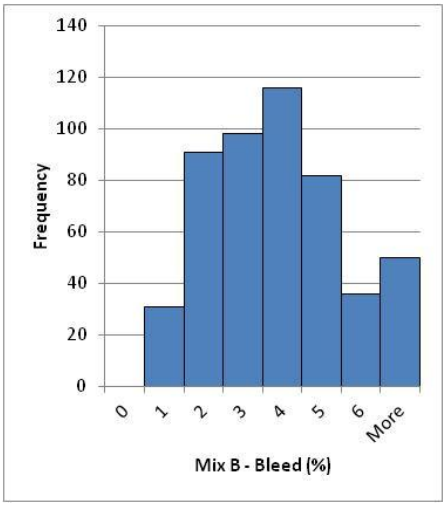
Golder Associates

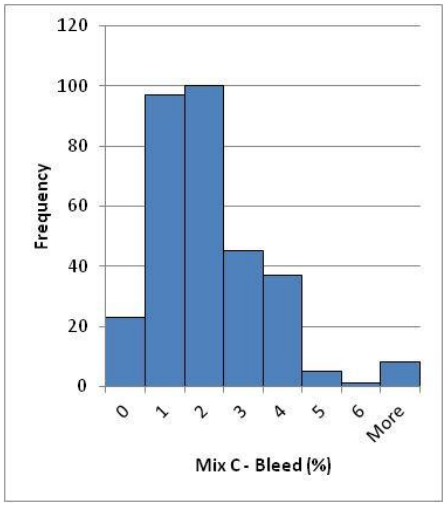
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|---|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | | |
| DESIGN | VTR | 18JAN12 | SCALE N/A | | REV. 0 |
| CADD | YEW | 18JAN12 | **FIGURE E1-5.2** | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

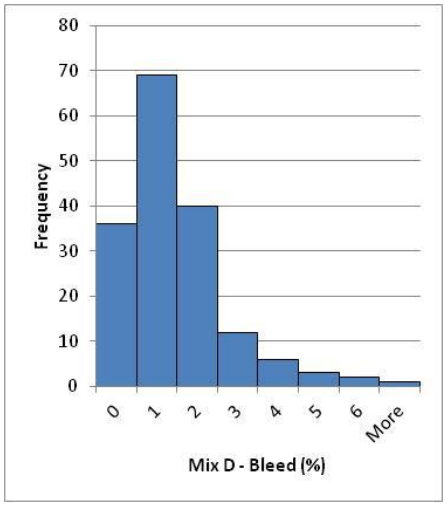
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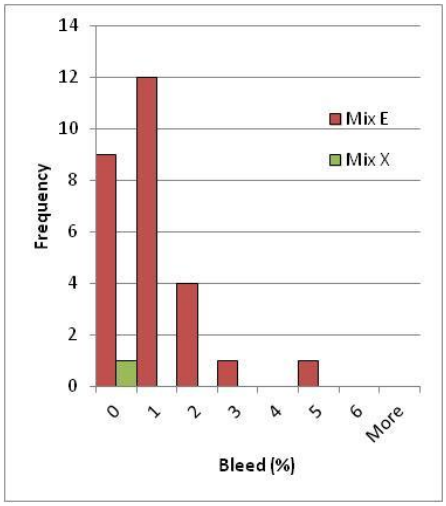



PROJECT

AEM

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MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

**BEDROCK / CONTACT GROUTING**
**QUALITY CONTROL - BLEED RESULTS**

Golder Associates

| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 18JAN12 | SCALE N/A | REV. 0 |
| CADD | YEW | 18JAN12 | | |
| CHECK | GRB | 01DEC12 | | |
| REVIEW | FE | 01DEC12 | | |

**FIGURE E1-5.3**

O:\Active_2009\1428109-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\1_Meadowbank Grouting QA Histograms.ppt

## Water Pressure Test Summary Table

## TABLE E1-5.1
## BAY-GOOSE DIKE - SUMMARY OF WATER PRESSURE TESTING RESULTS

| Order (P, S, T, Q) | Hole | Type | WATER PRESSURE TEST | | | | | | | GROUTING FOLLOWING WPT | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Date (dd-mmm-yy) | Stage | From (m) | To (m) | Analysis | Lugeons (uL) | Hydraulic Conductivity (m/sec) | Final Mix (type) | Final Volume (L) | Final Pressure (bar) | Final Penetrability (L/min/m/bar) | Final Flow Rate (L/min) | Closure (Y/N) | |
| Tertiary | T-30+093.5 | Bedrock | 02-May-10 | 2 | 6.58 | 10.4 | High Permeability | 10.3 | 1.2E-06 | A* | 30.7 | 2 | 0 | 0 | Y | |
| | | Contact | 02-May-10 | 3 | 5.58 | 6.58 | Low Permeability | 4.0 | 3.3E-07 | A* | 14.4 | 2.1 | 0 | 0 | Y | |
| | T-30+096.5 | Bedrock | 02-May-10 | 2 | 7.44 | 11.5 | Low Permeability | 2.6 | 3.0E-07 | A* | 32.3 | 2.6 | 0 | 0 | Y | |
| | T-30+099.5 | Bedrock | 02-May-10 | 2 | 8.16 | 12.4 | Low Permeability | 0.1 | 1.2E-08 | A | 28.7 | 2.6 | 0 | 0 | Y | |
| | T-30+102.5 | Bedrock | 02-May-10 | 2 | 8.04 | 11.8 | Low Permeability | 0.8 | 9.5E-08 | A* | 42.3 | -- | -- | -- | Y | Stage 2 backfilled |
| | T-30+105.5 | Bedrock | 03-May-10 | 2 | 8.16 | 12 | High Permeability | 108.7 | 1.3E-05 | A* | 62.7 | 0.0 | 6 | inf | N | By-pass during grouting |
| | | Contact | 03-May-10 | 3 | 7.16 | 8.16 | Low Permeability | 8.3 | 6.7E-07 | A* | 11.4 | 2.6 | 0 | 0 | Y | |
| | T-30+108.5 | Bedrock | 03-May-10 | 2 | 7.89 | 11.8 | Low Permeability | 2.7 | 3.1E-07 | A* | 42.1 | -- | -- | -- | Y | Stage 2 backfilled |
| | T-30+111.5 | Bedrock | 03-May-10 | 2 | 8.8 | 12.9 | Low Permeability | 3.2 | 3.8E-07 | A* | 40.8 | -- | -- | -- | Y | Stage 2 backfilled |
| | T-30+114.5 | Bedrock | 04-May-10 | 2 | 8.73 | 12.8 | Low Permeability | 0.5 | 5.7E-08 | A* | 25.2 | 2.8 | 0 | 0 | Y | |
| | T-30+117.5 | Bedrock | 04-May-10 | 2 | 8.79 | 12.8 | Low Permeability | 0.1 | 1.2E-08 | A* | 102.3 | 2 | 7.28 | 59.6 | N | By-pass during grouting |
| | | Contact | 04-May-10 | 3 | 7.79 | 8.79 | Low Permeability | 4.4 | 3.5E-07 | A* | 3.8 | 2.5 | 0.01 | 0 | Y | |
| | T-30+120.5 | Bedrock | 04-May-10 | 2 | 9.6 | 14.1 | Low Permeability | 0.00 | 3.8E-10 | A* | 51.6 | 2.6 | 0.03 | 0.4 | Y | |
| | T-30+123.5 | Contact | 04-May-10 | 2, 3 | 8.33 | 13.6 | High Permeability | 12.3 | 1.5E-06 | A*, A* | 277, 37.8 | 2.6, 2.4 | 0.04, 0.01 | 0.4, 0 | Y | By-pass (Stage 2). Pulled packer up 1m. |
| | T-30+129.5 | Bedrock | 04-May-10 | 2 | 9.69 | 14.7 | Low Permeability | 1.6 | 2.0E-07 | A* | 25 | 2.6 | 0 | 0 | Y | |
| | | Contact | 04-May-10 | 3 | 8.69 | 9.69 | High Permeability | 102.8 | 8.3E-06 | B | 527.4 | 2.5 | 0.08 | 0.2 | Y | |
| | T-30+144.5 | Bedrock | 06-May-10 | 1,2 | 10.87 | 20.0 | Low Permeability | 2 | 2.8E-07 | A*, A* | 425.7, 30.1 | 5.3, -- | 0.19, -- | 5.0 , -- | Y | Stage 2 backfilled |
| | | Contact | 06-May-10 | 3 | 9.87 | 10.87 | High permeability | 56.2 | 4.6E-06 | C | 415.9 | 2.4 | 0.1 | 0.3 | Y | |
| | T-30+147.5 | Bedrock | 06-May-10 | 1,2 | 10.73 | 19.9 | Low Permeability | 1.6 | 2.2E-07 | A*, A* | 16.9 , 31.9 | 0.3, -- | 0.01, -- | 0.3, -- | Y | Stage 2 backfilled |
| | | Contact | 06-May-10 | 3 | 9.73 | 10.73 | High permeability | 21.5 | 1.7E-06 | A* | 7.4 | 2.3 | 0.16 | 0.4 | Y | |
| | T-30+150.5 | Bedrock | 06-May-10 | 1,2 | 10.52 | 19.8 | Low Permeability | 2.1 | 2.9E-07 | A* | 56 | -- | -- | -- | Y | Stage 1,2 backfilled |
| | | Contact | 06-May-10 | 3 | 9.52 | 10.52 | High Permeability | 27.8 | 2.3E-06 | A* | 81.9 | 2.5 | 0.19 | 0.4 | Y | |
| | T-30+153.5 | Bedrock | 06-May-10 | 1,2 | 11.44 | 20.5 | Low Permeability | 5.7 | 7.9E-07 | A*, A* | 80.1, 30.9 | 5.4, 3.8 | 0.09, 0.05 | 2.4, 0.7 | Y | |
| | T-30+156.5 | Bedrock | 06-May-10 | 1,2 | 11.04 | 20.1 | High Permeability | 19.9 | 2.8E-06 | B, A* | 370.2, 26.4 | 5.7, 2.6 | 0.12, 0.03 | 3.5, 0.3 | Y | |
| | T-30+159.5 | Bedrock | 06-May-10 | 2 | 11.79 | 16.3 | Low Permeability | 0.1 | 1.7E-08 | A* | 30.9 | -- | -- | -- | Y | Stage 2 backfilled |
| | T-30+162.5 | Bedrock | 06-May-10 | 2 | 10.27 | 15.7 | Low Permeability | 2 | 2.5E-07 | A* | 51.6 | 2.6 | 0 | 0 | Y | |

Golder Associates

## TABLE E1-5.1
## BAY-GOOSE DIKE - SUMMARY OF WATER PRESSURE TESTING RESULTS

AEM

| Order (P, S, T, Q) | Hole | Type | WATER PRESSURE TEST | | | | | | | GROUTING FOLLOWING WPT | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Date (dd-mmm-yy) | Stage | From (m) | To (m) | Analysis | Lugeons (uL) | Hydraulic Conductivity (m/sec) | Final Mix (type) | Final Volume (L) | Final Pressure (bar) | Final Penetrability (L/min/m/bar) | Final Flow Rate (L/min) | Closure (Y/N) | |
| Quaternary | Q-30+127.25 | Bedrock | 09-Jul-10 | 2 | 9.87 | 14.2 | Low Permeability | 0.1 | 7.5E-09 | MF | 26.1 | 2.8 | 0.01 | 0.1 | Y | |
| | | Contact | 09-Jul-10 | 3 | 8.87 | 9.87 | Laminar | 36.8 | 3.1E-06 | MF | 53 | 2.5 | 0.15 | 0.4 | Y | |
| | Q-30+139.25 | Bedrock | 09-Jul-10 | 2 | 9.97 | 14.1 | Dilation | 0.2 | 1.7E-08 | MF | 48 | 2.7 | 0.02 | 0.1 | Y | |
| | | Contact | 09-Jul-10 | 3 | 8.97 | 9.97 | Laminar | 14.2 | 1.2E-06 | MF | 27.3 | 2.7 | 0.02 | 0.3 | Y | |
| | Q-30+437.75 | Contact | 16-Jul-10 | 3 | 13.24 | 14.24 | Void Filling | 6.9 | 5.6E-07 | A | 224.6 | 3 | 0.06 | 0.2 | Y | |
| | | Bedrock | 17-Jul-10 | 1 | 18.2 | 23.4 | Low Permeability | 0.03 | 4.4E-09 | MF | 84.6 | 6.1 | 0.06 | 1.8 | Y | Shut-in test |
| | | Bedrock | 17-Jul-10 | 2 | 14.24 | 18.2 | Low Permeability | 0.2 | 1.9E-08 | MF | 25.3 | 3.4 | 0 | 0 | Y | Shut-in test |
| | | Contact | 17-Jul-10 | 3 | 13.24 | 14.24 | Low Permeability | 0.5 | 3.8E-08 | MF | 21.9 | 2.7 | 0.06 | 0 | Y | Shut-in test |
| | | Contact | 18-Jul-10 | 4 | 10.99 | 12.49 | Washout | 3.9 | 3.6E-07 | E | 936 | 2.4 | 0.07 | 0.3 | Y | |
| | Q-30+445.25 | Bedrock | 13-Jul-10 | 1 | 16.6 | 21.7 | Low Permeability | 0.5 | 6.3E-08 | | | | | | | |
| | | Bedrock | 13-Jul-10 | 2 | 12.61 | 16.6 | Low Permeability | 0.1 | 1.5E-08 | D | 462.5 | 1.3 | 11.73 | 15.1 | N | Stages 1, 2 and 3 grouted together; by-pass during grouting |
| | | Contact | 13-Jul-10 | 3 | 11.61 | 12.61 | Dilation | 35.5 | 2.9E-06 | | | | | | | |
| | | Contact | 14-Jul-10 | 4 | 10.04 | 11.54 | Dilation | 3.7 | 3.4E-07 | X+ | 1390 | 2.6 | 3.33 | 13.2 | N | Reached volume limit during grouting |
| | Q-30+458.75 | Bedrock | 11-Jul-10 | 2 | 11.09 | 16.01 | Laminar | 11.7 | 1.4E-06 | E | 977 | 3.2 | 0.02 | 0.2 | Y | |
| | | Contact | 11-Jul-10 | 3 | 10.09 | 11.09 | Dilation | 66.3 | 5.4E-06 | MF | 22.7 | 2.5 | 0.06 | 0.2 | Y | |
| | | Contact | 13-Jul-10 | 4 | 7.92 | 9.92 | Washout | 6.1 | 6.1E-07 | MF | 72.4 | 2.7 | 0.04 | 0.2 | Y | |
| | Q-30+589.25 | Bedrock | 27-Jun-10 | 2 | 9.59 | 13.6 | Washout | 1.7 | 2.0E-07 | MF | 15.1 | 2.1 | 0.01 | 0.1 | Y | |
| | | Contact | 27-Jun-10 | 3 | 8.59 | 9.59 | Dilation | 2.7 | 2.1E-07 | C | 663.9 | 2.4 | 0.07 | 0.2 | Y | |
| | | Contact | 03-Jul-10 | 4 | 6.66 | 8.16 | Low Permeability | 4.1 | 3.7E-07 | MF | 186.4 | 2 | 0.04 | 0.1 | Y | |
| | Q-30+616.25 | Bedrock | 26-Jun-10 | 2 | 8.81 | 12.8 | Low Permeability | 0.1 | 1.1E-08 | A | 32.3 | -- | -- | -- | Y | Stage 2 backfilled |
| | | Contact | 26-Jun-10 | 3 | 7.81 | 8.81 | Dilation | 12.2 | 9.9E-07 | A | 68.3 | 2.6 | 0.02 | 0 | Y | |
| | | Contact | 04-Jul-10 | 4 | 5.82 | 7.32 | Dilation | 1.7 | 1.5E-07 | MF | 76.2 | 2.1 | 0.04 | 0.1 | Y | |
| | Q-30+625.25 | Bedrock | 26-Jun-10 | 2 | 9.76 | 13.8 | Low Permeability | 0.7 | 7.4E-08 | A | 32.1 | -- | -- | -- | Y | Stage 2 backfilled |
| | | Contact | 26-Jun-10 | 3 | 8.76 | 9.76 | Laminar | 6.1 | 5.2E-07 | A | 27.4 | 2.5 | 0.06 | 0.1 | Y | |
| | | Contact | 03-Jul-10 | 4 | 6.7 | 8.2 | Low Permeability | 0.1 | 6.1E-09 | MF | 66.1 | 2.3 | 0.04 | 0.1 | Y | Converted value from falling head test |
| | Q-30+709.25 | Bedrock | 25-Jun-10 | 2 | 11.06 | 15.01 | Low Permeability | 0.05 | 5.8E-09 | MF | 15.3 | 2.0 | 0.02 | 0.1 | Y | |
| | | Contact | 25-Jun-10 | 3 | 10.06 | 11.06 | Dilation | 13.3 | 1.2E-06 | C | 610.7 | 2.5 | 0.06 | 0.2 | Y | |
| | Q-30+724.25 | Bedrock | 25-Jun-10 | 2 | 10.83 | 14.4 | Low Permeability | 0.1 | 6.3E-09 | MF | 10.3 | 2 | 0.01 | 8.8 | Y | |
| | | Contact | 25-Jun-10 | 3 | 9.83 | 10.83 | Dilation | 4.8 | 4.3E-07 | A | 360.8 | 2.4 | 0 | 0 | Y | |
| | Q-30+997.25 | Bedrock | 09-Mar-11 | 2 | 5.22 | 9.5 | Low Permeability | 0.3 | 3.3E-08 | A | 22.00 | 2.6 | 0.00 | 0.0 | Y | |
| | | Contact | 09-Mar-11 | 3 | 4.22 | 5.22 | Low Permeability | 1.5 | 1.3E-07 | A | 1.70 | 3.3 | 0.01 | 0.0 | Y | |
| | Q-31+012.25 | Bedrock | 09-Mar-11 | 2 | 6.61 | 10.7 | Low Permeability | 0.2 | 2.0E-08 | A | 24.70 | 2.7 | 0.01 | 0.1 | Y | |
| | | Contact | 09-Mar-11 | 3 | 5.61 | 6.61 | Low Permeability | 0.3 | 3.0E-08 | A | 22.70 | 3.2 | 0.09 | 0.3 | Y | |
| | Q-31+036.25 | Bedrock | 14-Apr-11 | 2 | 9.49 | 12.0 | Void Filling | 9.6 | 1.0E-06 | A | 13.70 | 2.9 | 0.00 | 0.0 | Y | |
| | | Contact | 14-Apr-11 | 3 | 8.49 | 9.49 | Void Filling | 24 | 1.9E-06 | a | 41.90 | 2.7 | 0.15 | 0.4 | Y | |
| | Q-31+057.25 | Bedrock | 15-Apr-11 | 2 | 8.88 | 13.0 | Low Permeability | 0.3 | 3.3E-08 | A | 18.80 | 2.6 | 0.00 | 0.0 | Y | |
| | | Contact | 15-Apr-11 | 3 | 7.88 | 8.88 | Laminar flow | 3.0 | 2.4E-07 | A | 16.10 | 3.2 | 0.02 | 0.1 | Y | |
| | Q-31+108.25 | Bedrock | 30-Apr-11 | 1 | 14.4 | 19.4 | Low Permeability | 0.01 | 1.5E-09 | A | 8.10 | 5.5 | 0.00 | 0.1 | Y | Shut-in test |
| | | Bedrock | 30-Apr-11 | 2 | 10.43 | 14.4 | Low Permeability | 0.06 | 5.7E-09 | A | 16.30 | 2.8 | 0.05 | 0.6 | Y | Shut-in test |
| | | Contact | 30-Apr-11 | 3 | 9.43 | 10.43 | Dilation | 0.2 | 1.9E-08 | D | 580.00 | 3.0 | 0.01 | 0.0 | Y | |

Golder Associates

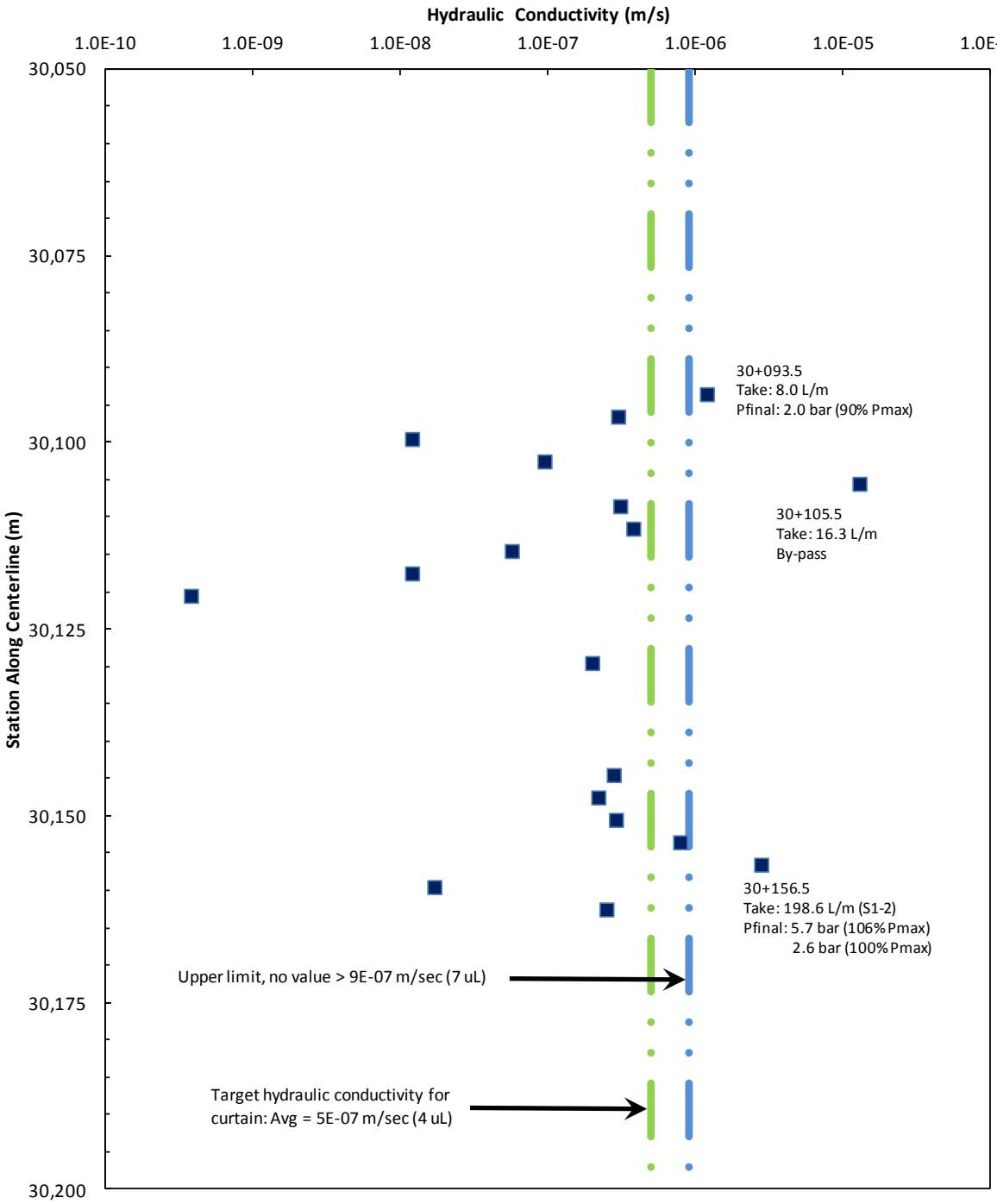
## TABLE E1-5.1
## BAY-GOOSE DIKE - SUMMARY OF WATER PRESSURE TESTING RESULTS

AEM

| Order (P, S, T, Q) | Hole | Type | WATER PRESSURE TEST | | | | | | | GROUTING FOLLOWING WPT | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Date (dd-mmm-yy) | Stage | From (m) | To (m) | Analysis | Lugeons (uL) | Hydraulic Conductivity (m/sec) | Final Mix (type) | Final Volume (L) | Final Pressure (bar) | Final Penetrability (L/min/m/bar) | Final Flow Rate (L/min) | Closure (Y/N) | |
| Quaternary | Q-31+126.25 | Bedrock | 30-Apr-11 | 2 | 10.38 | 14.4 | Low Permeability | 0.02 | 2.4E-09 | A | 13.10 | 2.8 | 0.01 | 0.1 | Y | Shut-in test |
| | | Contact | 30-Apr-11 | 3 | 9.38 | 10.38 | Dilation | 0.2 | 1.4E-08 | X | 684.60 | 3.2 | 0.00 | 0.0 | Y | |
| | Q-31+270.25 | Bedrock | 26-Jun-11 | 2 | 6.16 | 8.7 | Laminar Flow | 2.2 | 2.3E-07 | A | 30.40 | 2.6 | 0.10 | 0.6 | Y | |
| | | Contact | 26-Jun-11 | 3 | 5.16 | 6.16 | Laminar Flow | 9 | 7.2E-07 | A | 11.40 | 2.8 | 0.03 | 0.1 | Y | |
| | Q-31+357.25 | Bedrock | 26-Jun-11 | 2 | 8.7 | 11.2 | Low Permeability | 0.02 | 1.2E-09 | A | 11.70 | 2.5 | 0.00 | 0.0 | Y | |
| | | Contact | 26-Jun-11 | 3 | 7.7 | 8.7 | Dilation | 7.5 | 6.1E-07 | B | 189.60 | 2.6 | 0.00 | 0.0 | Y | |
| | Q-31+432.25 | Bedrock | 26-Jun-11 | 2 | 7.55 | 11 | Low permeability | 0.3 | 3.4E-08 | A | 22.90 | 3.2 | 0.00 | 0.0 | Y | |
| | | Contact | 26-Jun-11 | 3 | 6.55 | 7.55 | Low permeability | 1.1 | 9.2E-08 | A | 11.90 | 2.4 | 0.00 | 0.0 | Y | |
| | Q-31+483.25 | Bedrock | 24-Jun-11 | 2 | 8.34 | 10.9 | Dilation | 2.7 | 3.0E-07 | A | 84.20 | 2.4 | 0.17 | 1.0 | Y | |
| | | Contact | 24-Jun-11 | 3 | 7.34 | 8.34 | Laminar Flow | 5.6 | 4.9E-07 | A | 16.60 | 2.8 | 0.14 | 0.4 | Y | |
| | Q-31+511.75 | Bedrock | 22-Jun-11 | 2 | 8.72 | 11.3 | Low Permeability | 0.7 | 7.1E-08 | A | 22.40 | 2.4 | 0.00 | 0.0 | Y | |
| | | Contact | 22-Jun-11 | 3 | 7.72 | 8.72 | Laminar Flow | 3 | 2.4E-07 | A | 1.10 | 2.5 | 0.01 | 0.0 | Y | |
| | Q-31+534.25 | Bedrock | 24-Jun-11 | 2 | 9.16 | 11.7 | Low Permeability | 0.04 | 4.1E-09 | D | 472.30 | 2.4 | 0.00 | 0.0 | Y | |
| | | Contact | 24-Jun-11 | 3 | 8.16 | 9.16 | Dilation | 11.2 | 9.1E-07 | A | 6.10 | 2.6 | 0.01 | 0.0 | Y | |
| | Q-31+700.75 | Bedrock | 24-Jun-11 | 2 | 9.08 | 13.1 | Low Permeability | 0.5 | 6.3E-08 | A | 27.90 | 2.2 | 0.00 | 0.0 | Y | |
| | | Contact | 24-Jun-11 | 3 | 8.08 | 9.08 | Dilation | 0.2 | 1.6E-08 | C | 452.60 | 2.6 | 0.01 | 0.0 | Y | |
| | Q-31+730.75 | Bedrock | 25-Jun-11 | 2 | 11.16 | 15.2 | Low Permeability | 0.5 | 6.2E-08 | B | 479.20 | 2.2 | 0.00 | 0.0 | Y | |
| | | Contact | 25-Jun-11 | 3 | 10.16 | 11.16 | Laminar Flow | 7.3 | 6.1E-07 | A | 16.80 | 2.3 | 0.19 | 0.4 | Y | |
| | Q-31+775.75 | Contact | 25-Jun-11 | 3 | 7.7 | 8.7 | Low Permeability | 1.5 | 1.2E-07 | C | 397.60 | 2.4 | 0.00 | 0.0 | Y | |
| | Q-31+922.75 | Bedrock | 26-Jun-11 | 1 | 20.1 | 25.2 | Low Permeability | 0.4 | 4.4E-08 | A | 12.00 | 7.0 | 0.01 | 0.4 | Y | |
| | | Bedrock | 26-Jun-11 | 2 | 16.14 | 20.1 | Laminar Flow | 5.2 | 6.0E-07 | A | 71.60 | 4.1 | 0.09 | 1.5 | Y | |
| | | Contact | 26-Jun-11 | 3 | 15.14 | 16.14 | Laminar Flow | 20.2 | 1.6E-06 | A | 12.50 | 4.0 | 0.11 | 0.4 | Y | |
| | Q-31+934.75 | Bedrock | 26-Jun-11 | 1 | 18 | 23.1 | Laminar Flow | 2.3 | 2.7E-07 | A | 89.90 | 7.4 | 0.04 | 1.3 | Y | |
| | | Bedrock | 26-Jun-11 | 2 | 14.03 | 18 | Void Filling | 2.4 | 2.8E-07 | A | 125.10 | 4.1 | 0.12 | 1.9 | Y | |
| | | Contact | 27-Jun-11 | 3 | 13.03 | 14.03 | Laminar Flow | 10 | 8.0E-07 | C | 426.00 | 3.9 | 0.00 | 0.0 | Y | |
| | Q-31+948.25 | Bedrock | 01-Jul-11 | 1 | 17.9 | 23 | Low Permeability | 0.1 | 1.8E-08 | A | 133.70 | 6.9 | 0.00 | 0.1 | Y | |
| | | Bedrock | 01-Jul-11 | 2 | 13.88 | 17.9 | Laminar Flow | 1.9 | 2.2E-07 | A | 23.60 | 4.5 | 0.00 | 0.0 | Y | |
| | | Contact | 01-Jul-11 | 2, 3 | 12.88 | 17.9 | Wash-Out | 19.3 | 2.4E-06 | B | 315.50 | 4.0 | 0.03 | 0.1 | Y | |
| | Q-31+961.75 | Bedrock | 28-Jun-11 | 1 | 18.3 | 23.4 | -- | - | -- | X | 754.50 | 7.3 | 0.00 | 0.2 | Y | Could not reach required WPT pressure; stage 2 / 3 not attempted |
| | Q-31+970.75 | Bedrock | 28-Jun-11 | 2 | 14.72 | 18.8 | Wash-Out | 5.4 | 6.4E-07 | A | 197.90 | 4.2 | 0.04 | 0.6 | Y | |
| | | Contact | 28-Jun-11 | 3 | 13.72 | 14.72 | High Permeability | 34.7 | 3.0E-06 | A | 21.40 | 3.8 | 0.09 | 0.3 | Y | Grout communication to Q-31-972.25 |

NOTE: Closure criteria : Penetrability ≤ 0.25 L/min/m/bar @ Pmax

## Water Pressure Test Summary Graphs




PROJECT

AGNICO EAGLE MINES LIMITED
BAY GOOSE DIKE – GROUT CURTAIN
NUNAVUT

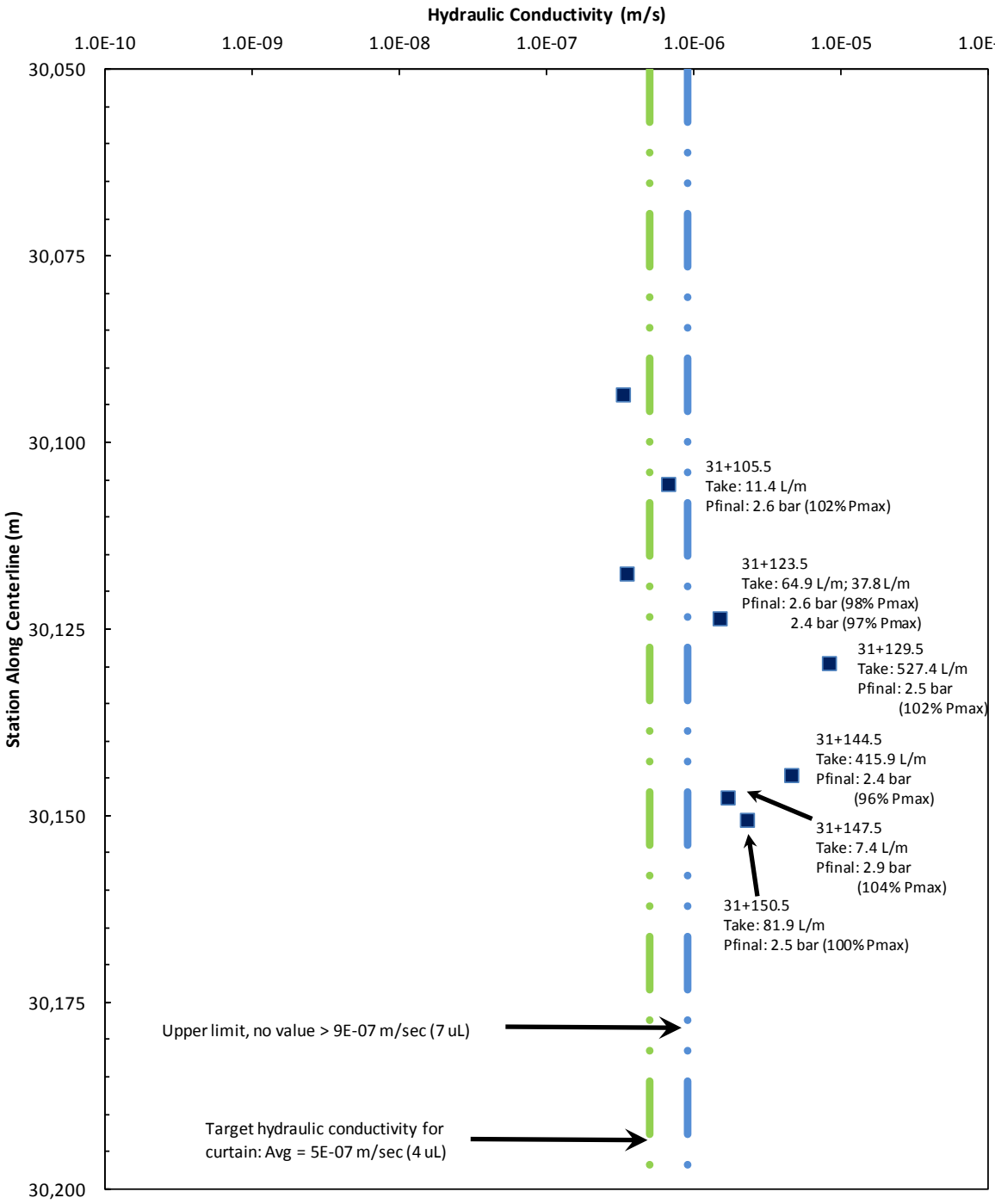
TITLE

**WATER PRESSURE TEST RESULTS**
**TERTIARY - STAGE 2**

Golder Associates

| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 28MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 28MAR12 | | |
| CHECK | GRB | 01DEC12 | **FIGURE E1-5.4** | |
| REVIEW | FE | 01DEC12 | | |

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PROJECT

AGNICO EAGLE MINES LIMITED
BAY GOOSE DIKE – GROUT CURTAIN
NUNAVUT

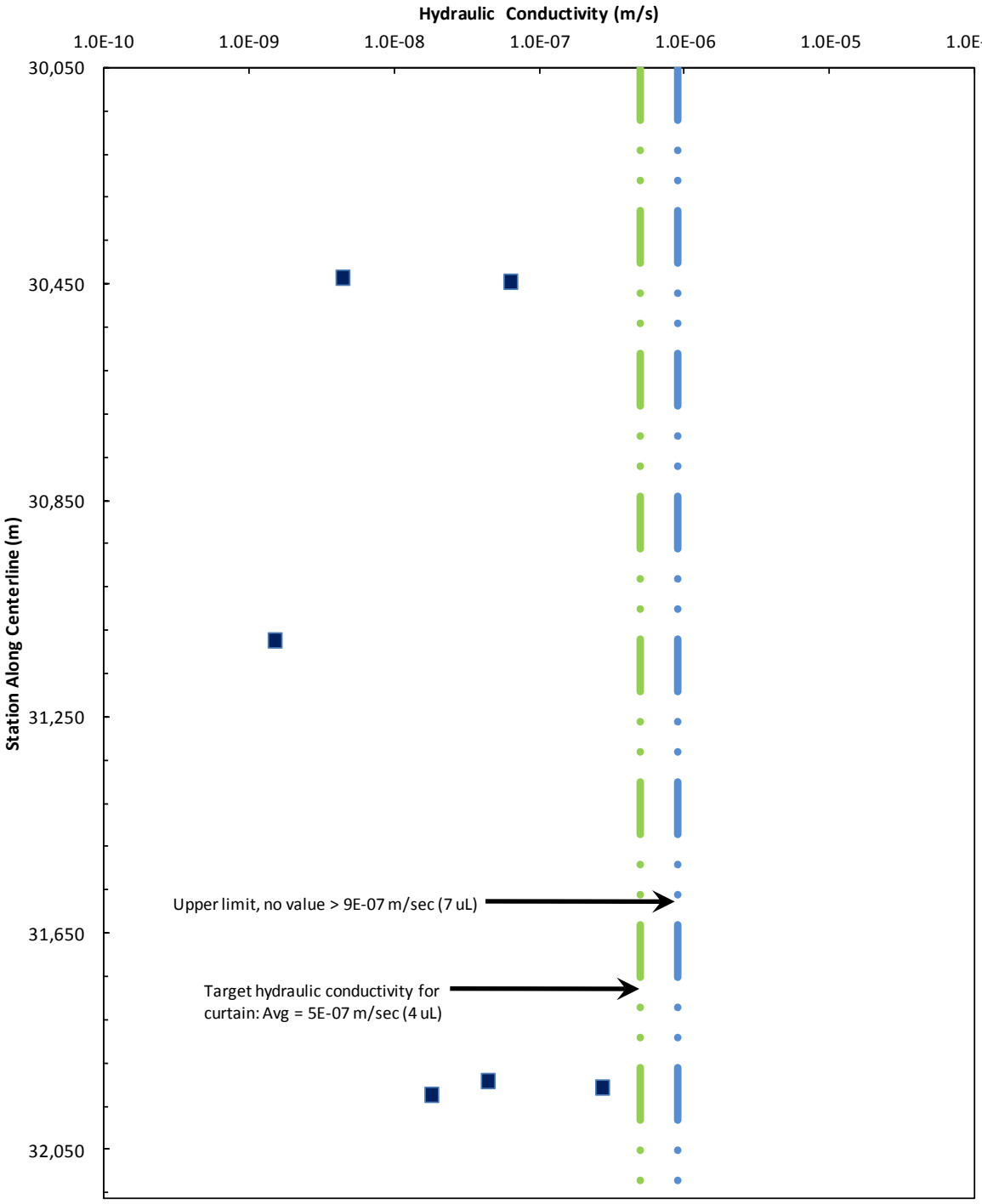
TITLE

# WATER PRESSURE TEST RESULTS
# TERTIARY - STAGE 3

Golder Associates

| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 28MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 28MAR12 | | |
| CHECK | GRB | 01DEC12 | **FIGURE E1-5.5** | |
| REVIEW | FE | 01DEC12 | | |

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PROJECT

AGNICO EAGLE MINES LIMITED
BAY GOOSE DIKE – GROUT CURTAIN
NUNAVUT

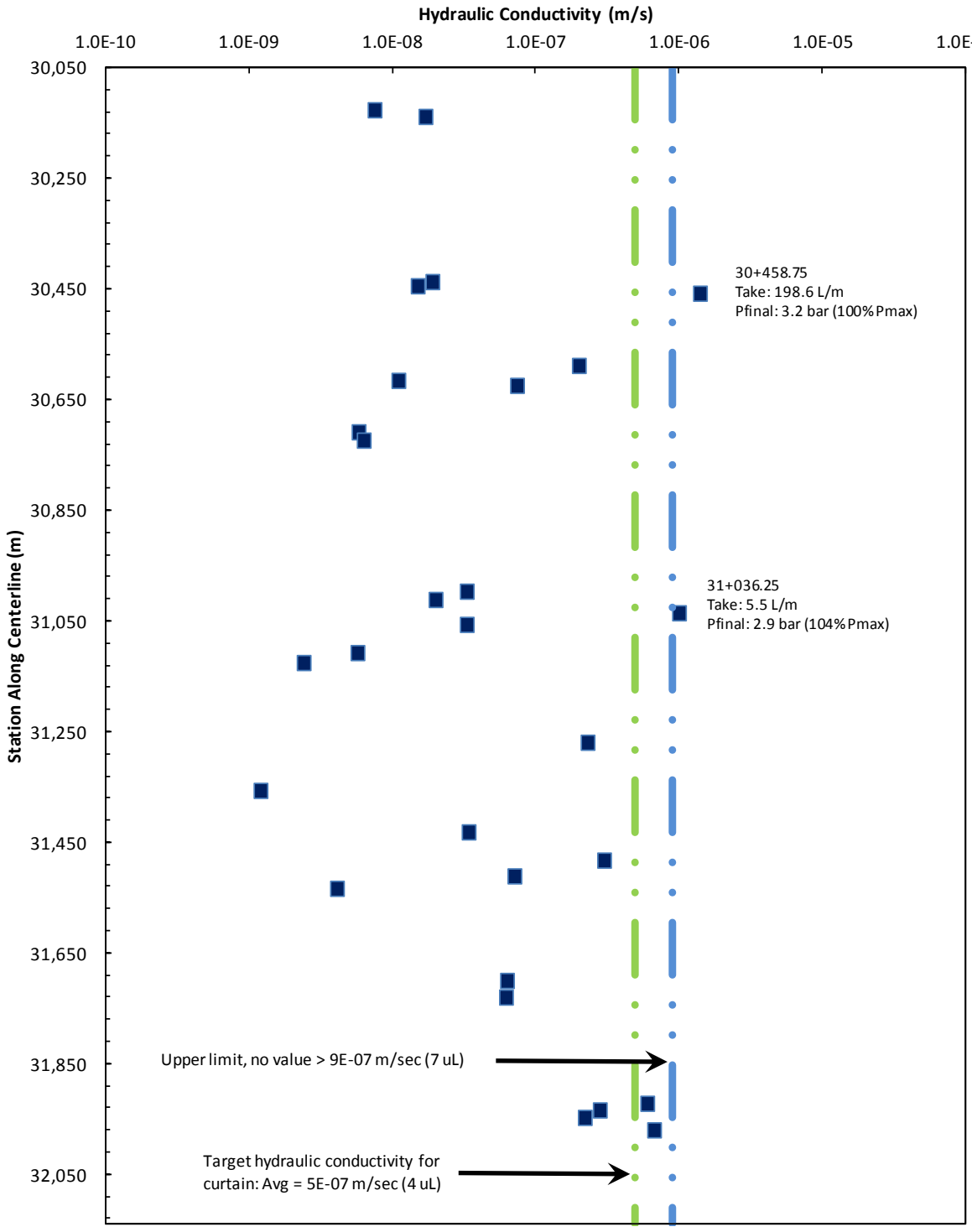
TITLE

# WATER PRESSURE TEST RESULTS QUATERNARY - STAGE 1

Golder Associates

| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 28MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 28MAR12 | | |
| CHECK | GRB | 01DEC12 | FIGURE E1-5.6 | |
| REVIEW | FE | 01DEC12 | | |

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PROJECT

AEM

AGNICO EAGLE MINES LIMITED
BAY GOOSE DIKE – GROUT CURTAIN
NUNAVUT

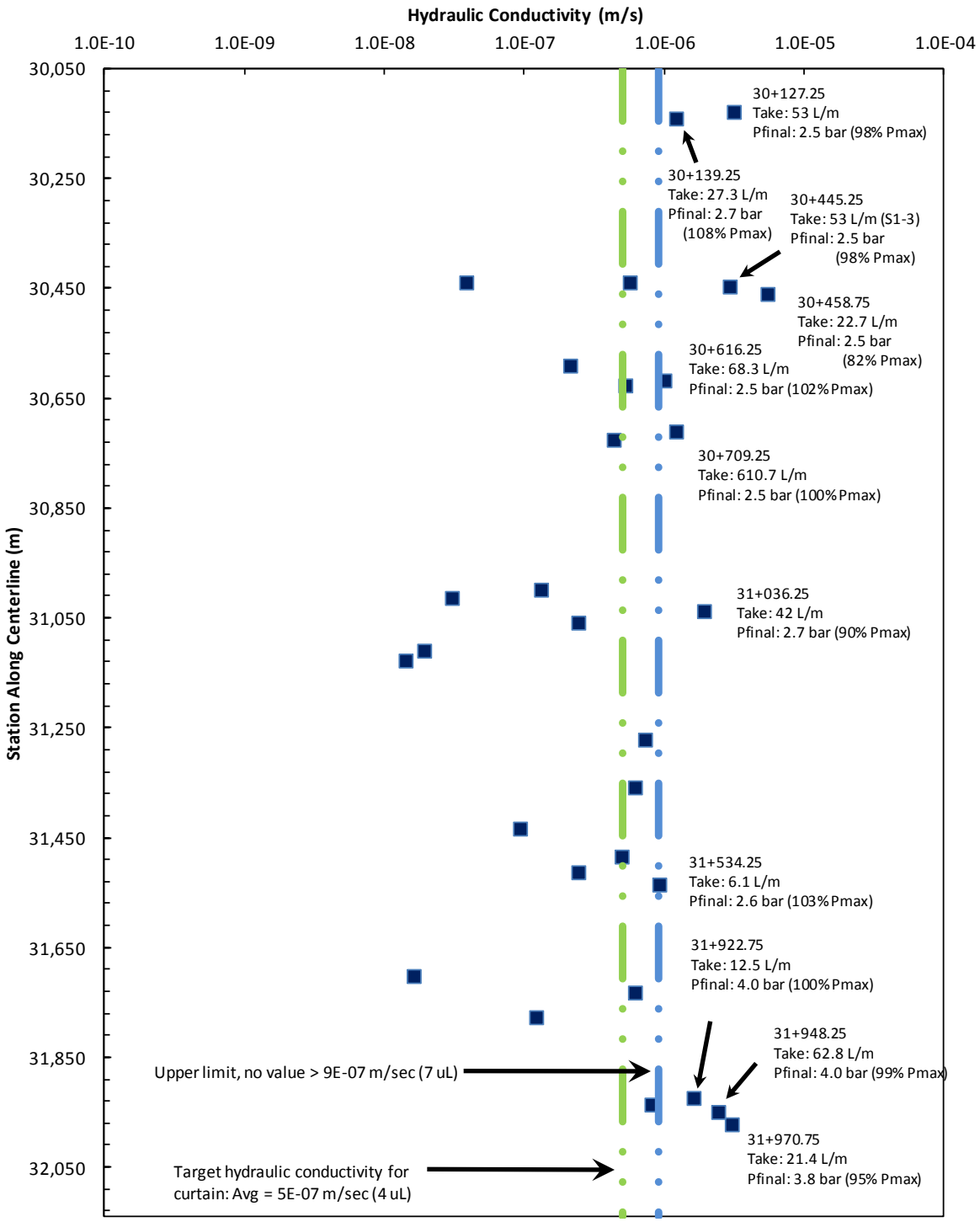
TITLE

# WATER PRESSURE TEST RESULTS QUATERNARY - STAGE 2

Golder Associates

| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 28MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 28MAR12 | | |
| CHECK | GRB | 01DEC12 | **FIGURE E1-5.7** | |
| REVIEW | FE | 01DEC12 | | |

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PROJECT

AEM

AGNICO EAGLE MINES LIMITED
BAY GOOSE DIKE – GROUT CURTAIN
NUNAVUT

TITLE

# WATER PRESSURE TEST RESULTS QUATERNARY - STAGE 3

Golder Associates

| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 28MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 28MAR12 | | |
| CHECK | GRB | 01DEC12 | | |
| REVIEW | FE | 01DEC12 | | |

**FIGURE E1-5.8**

O:\Active_2009\1428109-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\3_Meadowbank WPT Summary Graphs.ppt

# Water Pressure Test Analyses

# WATER PRESSURE TEST

Golder Associates

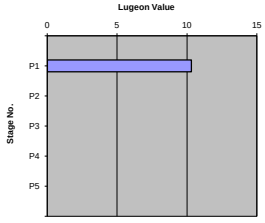
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+093.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 6.58 | Tested Length (m) : | 3.82 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 10.40 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | VR | Computed By : | VR | Rock tested : | | Checked By : | GRB | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 02-May-10 | Date : | 02-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 20.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 24.4 | | 4.00 | 4.00 | 1.05 | |
| | | 2 | 0:02:00 | 01:00 | 28.6 | | 4.20 | 4.20 | 1.10 | |
| | | 3 | 0:03:00 | 01:00 | 32.9 | | 4.30 | 4.30 | 1.13 | |
| | | 4 | 0:04:00 | 01:00 | 36.2 | | 3.30 | 3.30 | 0.86 | |
| P1 | 60 | 5 | 0:05:00 | 01:00 | 40.3 | | 4.10 | 4.10 | 1.07 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 19.90 | 5.21 | |
| | | | | | | | Average: | 3.980 | 1.042 | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

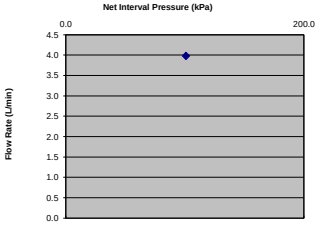
| Stage No. | Lugeon Value |
|---|---|
| P1 | 10.3 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 101.0 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.67 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 60 | kPa |
| Q | 3.98 | L/min |
| H | 10.3 | m |
| Interpreted Result | 10.3 | uL |

Reported Permeability at Stage P1

K = 1.2E-06 m/s

**Flow Type**

HIGH PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

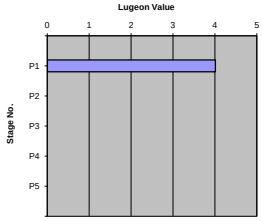
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+093.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 5.58 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 6.58 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 02-May-10 | Date : | 02-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 1.8 | | 1.80 | 1.80 | 1.80 | |
| | | 2 | 0:02:00 | 01:00 | 1.8 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 1.8 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 1.8 | | 0.00 | 0.00 | 0.00 | |
| P1 | 48 | 5 | 0:05:00 | 01:00 | 1.8 | | 0.00 | 0.00 | 0.00 | Stage 3 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.80 | 1.80 | |
| | | | | | | | Average: | 0.360 | 0.360 | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

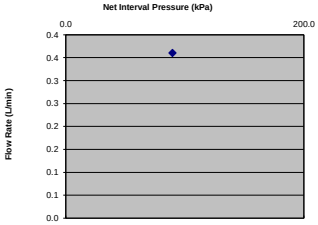
| Stage No. | Lugeon Value |
|---|---|
| P1 | 4.0 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 89.7 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 48 | kPa |
| Q | 0.36 | L/min |
| H | 9.1 | m |
| Interpreted Result | 4.0 | uL |

Reported Permeability at Stage P1

K = 3.3E-07 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

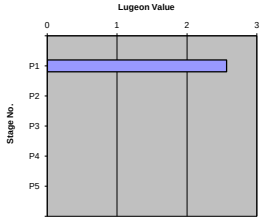
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+096.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.44 | Tested Length (m) : | 4.06 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 11.50 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 02-May-10 | Date : | 02-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 20.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 25.0 | | 5.00 | 5.00 | 1.23 | |
| | | 2 | 0:02:00 | 01:00 | 25.3 | | 0.30 | 0.30 | 0.07 | |
| | | 3 | 0:03:00 | 01:00 | 25.3 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 25.3 | | 0.00 | 0.00 | 0.00 | |
| P1 | 60 | 5 | 0:05:00 | 01:00 | 25.3 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.30 | 1.31 | |
| | | | | | | | Average: | 1.060 | 0.261 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

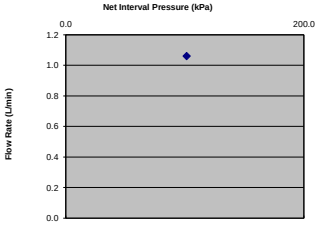
| Stage No. | Lugeon Value |
|---|---|
| P1 | 2.6 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 101.6 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.06 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 60 | kPa |
| Q | 1.06 | L/min |
| H | 10.4 | m |
| Interpreted Result | 2.6 | uL |

Reported Permeability at Stage P1

K = 3.0E-07 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

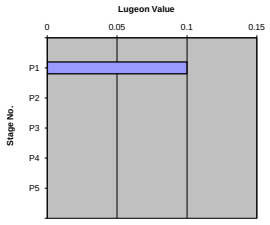
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | T-30+099.5 | Drilling Method : | Air-Rotary | | | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.16 | Tested Length (m) : | 4.24 | | | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 12.40 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Presumed Water Temperature : | 8 |
| Date : | 02-May-10 | Date : | 02-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | Casing Inner Diameter (mm ) : | 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| P1 | 100 | 0 | 0:00:00 | 0 | 14.7 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 14.7 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 14.8 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 14.9 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 15.0 | | 0.10 | 0.10 | 0.02 | |
| | | 5 | 0:05:00 | 01:00 | 15.0 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.30 | 0.07 | |
| | | | | | | | Average: | 0.060 | 0.014 | |
| | | | | | | | | | | c : 1 |
| P2 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P3 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P4 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P5 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

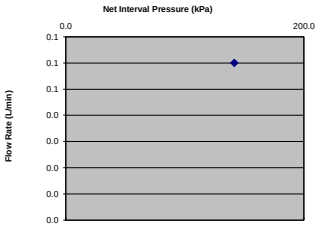
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.1 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 141.7 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 0.06 | L/min |
| H | 14.4 | m |
| Interpreted Result | 0.1 | uL |

Reported Permeability at Stage P1

K = 1.2E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

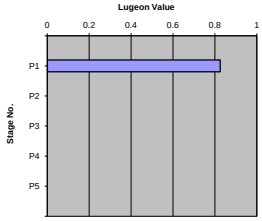
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+102.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.04 | Tested Length (m) : | 3.76 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 11.80 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 03-May-10 | Date : | 03-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 14.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 14.6 | | 0.20 | 0.20 | 0.05 | |
| | | 2 | 0:02:00 | 01:00 | 15.3 | | 0.70 | 0.70 | 0.19 | |
| | | 3 | 0:03:00 | 01:00 | 15.7 | | 0.40 | 0.40 | 0.11 | |
| | | 4 | 0:04:00 | 01:00 | 16.1 | | 0.40 | 0.40 | 0.11 | |
| P1 | 100 | 5 | 0:05:00 | 01:00 | 16.6 | | 0.50 | 0.50 | 0.13 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.20 | 0.59 | |
| | | | | | | | Average: | 0.440 | 0.117 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

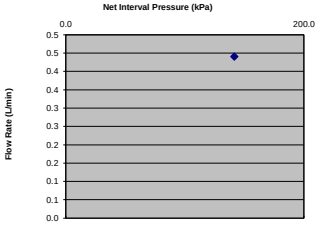
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.8 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 141.7 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 0.44 | L/min |
| H | 14.4 | m |
| Interpreted Result | 0.8 | uL |

Reported Permeability at Stage P1

K = 9.5E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

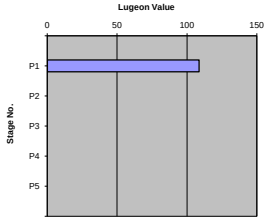
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | T-30+105.5 | Drilling Method : | Air-Rotary | | | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.16 | Tested Length (m) : | 3.84 | | | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 12.00 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Presumed Water Temperature : | 8 |
| Date : | 03-May-10 | Date : | 03-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | Casing Inner Diameter (mm ) : | 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| P1 | 100 | 0 | 0:00:00 | 0 | 0.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 70.0 | | 70.00 | 70.00 | 18.23 | |
| | | 2 | 0:02:00 | 01:00 | 94.0 | | 24.00 | 24.00 | 6.25 | |
| | | 3 | 0:03:00 | 01:00 | 128.3 | | 34.30 | 34.30 | 8.93 | |
| | | 4 | 0:04:00 | 01:00 | 158.7 | | 30.40 | 30.40 | 7.92 | |
| | | 5 | 0:05:00 | 01:00 | 188.0 | | 29.30 | 29.30 | 7.63 | Stage 2 (By-Pass Outside Casing) |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 188.00 | 48.96 | |
| | | | | | | | Average: | 37.600 | 9.792 | |
| | | | | | | | | | | c : 1 |
| P2 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P3 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P4 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P5 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

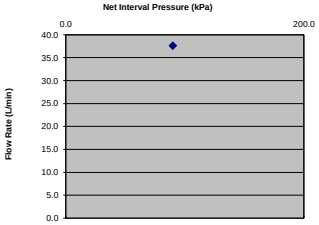
| Stage No. | Lugeon Value |
|---|---|
| P1 | 108.7 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 90.1 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 51.63 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 37.60 | L/min |
| H | 9.2 | m |
| Interpreted Result | 108.7 | uL |

Reported Permeability at Stage P1

K = 1.3E-05 m/s

**Flow Type**

HIGH PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

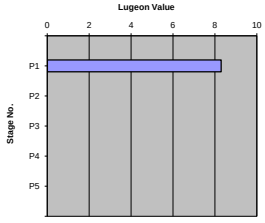
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+105.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.16 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 8.16 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 03-May-10 | Date : | 03-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 0.6 | | 0.60 | 0.60 | 0.60 | |
| | | 2 | 0:02:00 | 01:00 | 1.2 | | 0.60 | 0.60 | 0.60 | |
| | | 3 | 0:03:00 | 01:00 | 2.1 | | 0.90 | 0.90 | 0.90 | |
| | | 4 | 0:04:00 | 01:00 | 3.0 | | 0.90 | 0.90 | 0.90 | |
| P1 | 50 | 5 | 0:05:00 | 01:00 | 3.8 | | 0.80 | 0.80 | 0.80 | Stage 3 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.80 | 3.80 | |
| | | | | | | | Average: | 0.760 | 0.760 | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

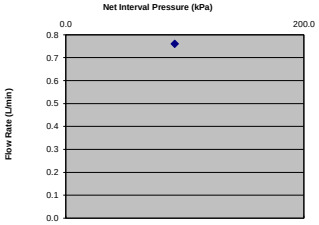
| Stage No. | Lugeon Value |
|---|---|
| P1 | 8.3 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 91.6 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Flow Type**

**LOW PERMEABILITY**

Comments

**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.03 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 50 | kPa |
| Q | 0.76 | L/min |
| H | 9.3 | m |
| Interpreted Result | 8.3 | uL |

Reported Permeability at Stage P1

K = 6.7E-07 m/s

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

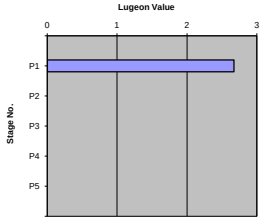
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+108.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.89 | Tested Length (m) : | 3.91 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 11.80 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 03-May-10 | Date : | 03-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 18.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 20.5 | | 2.50 | 2.50 | 0.64 | |
| | | 2 | 0:02:00 | 01:00 | 21.5 | | 1.00 | 1.00 | 0.26 | |
| | | 3 | 0:03:00 | 01:00 | 22.8 | | 1.30 | 1.30 | 0.33 | |
| | | 4 | 0:04:00 | 01:00 | 24.1 | | 1.30 | 1.30 | 0.33 | |
| P1 | 100 | 5 | 0:05:00 | 01:00 | 25.4 | | 1.30 | 1.30 | 0.33 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 7.40 | 1.89 | |
| | | | | | | | Average: | 1.480 | 0.379 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

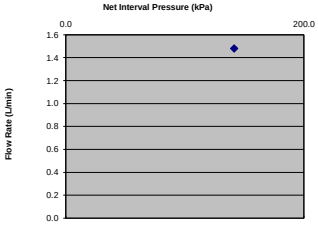
| Stage No. | Lugeon Value |
|---|---|
| P1 | 2.7 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 141.6 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.12 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 1.48 | L/min |
| H | 14.4 | m |
| Interpreted Result | 2.7 | uL |

Reported Permeability at Stage P1

K = 3.1E-07 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

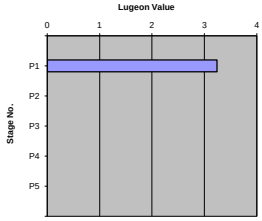
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+111.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.80 | Tested Length (m) : | 4.10 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 12.90 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 03-May-10 | Date : | 03-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 24.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 29.3 | | 5.20 | 5.20 | 1.27 | |
| | | 2 | 0:02:00 | 01:00 | 32.1 | | 2.80 | 2.80 | 0.68 | |
| | | 3 | 0:03:00 | 01:00 | 32.3 | | 0.20 | 0.20 | 0.05 | |
| | | 4 | 0:04:00 | 01:00 | 32.5 | | 0.20 | 0.20 | 0.05 | |
| P1 | 100 | 5 | 0:05:00 | 01:00 | 33.5 | | 1.00 | 1.00 | 0.24 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 9.40 | 2.29 | |
| | | | | | | | Average: | 1.880 | 0.459 | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

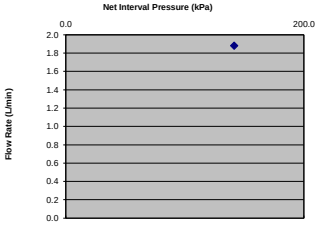
| Stage No. | Lugeon Value |
|---|---|
| P1 | 3.2 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 141.5 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.20 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 1.88 | L/min |
| H | 14.4 | m |
| Interpreted Result | 3.2 | uL |

Reported Permeability at Stage P1

K = 3.8E-07 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

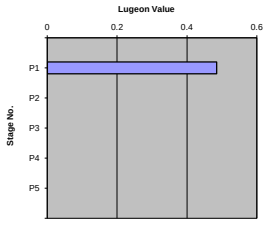
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+114.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.73 | Tested Length (m) : | 4.07 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 12.80 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 04-May-10 | Date : | 04-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 2.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 2.3 | | 0.30 | 0.30 | 0.07 | |
| | | 2 | 0:02:00 | 01:00 | 3.1 | | 0.80 | 0.80 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 3.2 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 3.3 | | 0.10 | 0.10 | 0.02 | |
| P1 | 100 | 5 | 0:05:00 | 01:00 | 3.4 | | 0.10 | 0.10 | 0.02 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.40 | 0.34 | |
| | | | | | | | Average: | 0.280 | 0.069 | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

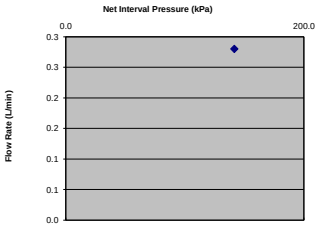
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.5 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 141.7 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 0.28 | L/min |
| H | 14.4 | m |
| Interpreted Result | 0.5 | uL |

Reported Permeability at Stage P1

K = 5.7E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

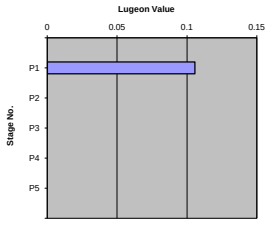
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+117.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.79 | Tested Length (m) : | 4.01 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 12.80 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 04-May-10 | Date : | 04-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| P1 | 100 | 0 | 0:00:00 | 0 | 7.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 7.4 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 7.5 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 7.6 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 7.6 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 7.7 | | 0.10 | 0.10 | 0.02 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.30 | 0.07 | |
| | | | | | | | Average: | 0.060 | 0.015 | |
| | | | | | | | | | | c : 1 |
| P2 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P3 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P4 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P5 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

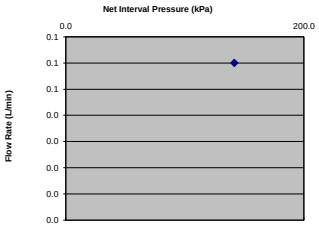
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.1 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 141.7 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 0.06 | L/min |
| H | 14.4 | m |
| Interpreted Result | 0.1 | uL |

Reported Permeability at Stage P1

K = 1.2E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

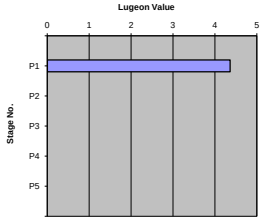
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+117.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.79 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 8.79 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 04-May-10 | Date : | 04-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 11.9 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 11.9 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 11.9 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 11.9 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 12.5 | | 0.60 | 0.60 | 0.60 | |
| P1 | 50 | 5 | 0:05:00 | 01:00 | 13.9 | | 1.40 | 1.40 | 1.40 | Stage 3 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.00 | 2.00 | |
| | | | | | | | Average: | 0.400 | 0.400 | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

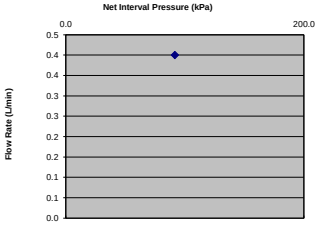
| Stage No. | Lugeon Value |
|---|---|
| P1 | 4.4 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 91.7 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 50 | kPa |
| Q | 0.40 | L/min |
| H | 9.3 | m |
| Interpreted Result | 4.4 | uL |

Reported Permeability at Stage P1

K = 3.5E-07 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

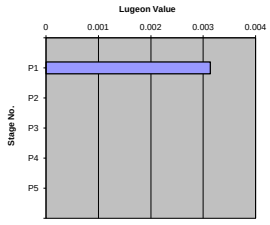
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+120.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.60 | Tested Length (m) : | 4.50 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 14.10 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 04-May-10 | Date : | 04-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 1.60 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 1.60 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 1.60 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 1.60 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 1.60 | | 0.00 | 0.00 | 0.00 | |
| P1 | 100 | 5 | 0:05:00 | 01:00 | 1.61 | | 0.01 | 0.01 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.01 | 0.00 | |
| | | | | | | | Average: | 0.002 | 0.000 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

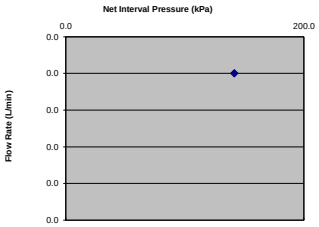
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.0 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 141.7 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 0.00 | L/min |
| H | 14.4 | m |
| Interpreted Result | 0.00 | uL |

Reported Permeability at Stage P1

K = 3.8E-10 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

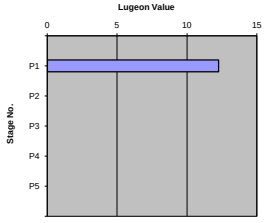
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | T-30+123.5 | Drilling Method : | Air-Rotary | | | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.33 | Tested Length (m) : | 5.27 | | | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 13.60 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Presumed Water Temperature : | 8 |
| Date : | 04-May-10 | Date : | 04-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | Casing Inner Diameter (mm ) : | 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| P1 | 100 | 0 | 0:00:00 | 0 | 66.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 75.3 | | 9.20 | 9.20 | 1.75 | |
| | | 2 | 0:02:00 | 01:00 | 84.2 | | 8.90 | 8.90 | 1.69 | |
| | | 3 | 0:03:00 | 01:00 | 93.0 | | 8.80 | 8.80 | 1.67 | |
| | | 4 | 0:04:00 | 01:00 | 102.1 | | 9.10 | 9.10 | 1.73 | |
| | | 5 | 0:05:00 | 01:00 | 110.8 | | 8.70 | 8.70 | 1.65 | Stage 2 and 3 (By-Pass during Stage 2) |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 44.70 | 8.48 | |
| | | | | | | | Average: | 8.940 | 1.696 | |
| | | | | | | | | | | c : 1 |
| P2 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P3 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P4 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P5 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

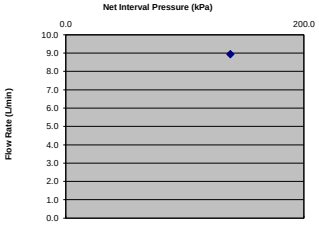
| Stage No. | Lugeon Value |
|---|---|
| P1 | 12.3 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 138.3 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 3.38 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 8.94 | L/min |
| H | 14.1 | m |
| Interpreted Result | 12.3 | uL |

Reported Permeability at Stage P1

K = 1.5E-06 m/s

**Flow Type**

HIGH PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

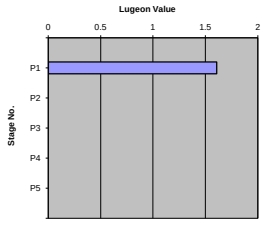
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+129.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.69 | Tested Length (m) : | 5.01 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 14.70 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 04-May-10 | Date : | 04-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| P1 | 100 | 0 | 0:00:00 | 0 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 6.2 | | 1.90 | 1.90 | 0.38 | |
| | | 2 | 0:02:00 | 01:00 | 7.2 | | 1.00 | 1.00 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 8.5 | | 1.30 | 1.30 | 0.26 | |
| | | 4 | 0:04:00 | 01:00 | 9.8 | | 1.30 | 1.30 | 0.26 | |
| | | 5 | 0:05:00 | 01:00 | 10.0 | | 0.20 | 0.20 | 0.04 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.70 | 1.14 | |
| | | | | | | | Average: | 1.140 | 0.228 | |
| | | | | | | | | | | c : 1 |
| P2 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P3 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P4 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P5 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

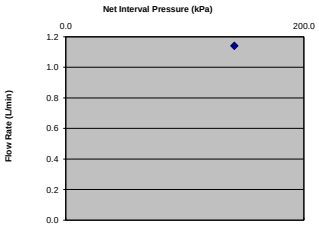
| Stage No. | Lugeon Value |
|---|---|
| P1 | 1.6 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 141.6 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.09 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 1.14 | L/min |
| H | 14.4 | m |
| Interpreted Result | 1.6 | uL |

Reported Permeability at Stage P1

K = 2.0E-07 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | T-30+129.5 | Drilling Method : | Air-Rotary | | | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.69 | Tested Length (m) : | 1.00 | | | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 9.69 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Presumed Water Temperature : | 8 |
| Date : | 04-May-10 | Date : | 04-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | Casing Inner Diameter (mm ) : | 20.0 |

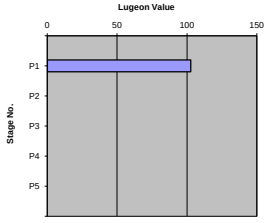
Vertical depth to Groundwater

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| P1 | 50 | 0 | 0:00:00 | 0 | 2.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 5.3 | | 3.30 | 3.30 | 3.30 | |
| | | 2 | 0:02:00 | 01:00 | 15.4 | | 10.10 | 10.10 | 10.10 | |
| | | 3 | 0:03:00 | 01:00 | 26.0 | | 10.60 | 10.60 | 10.60 | |
| | | 4 | 0:04:00 | 01:00 | 36.5 | | 10.50 | 10.50 | 10.50 | |
| | | 5 | 0:05:00 | 01:00 | 47.3 | | 10.80 | 10.80 | 10.80 | Stage 3 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 45.30 | 45.30 | |
| | | | | | | | Average: | 9.060 | 9.060 | |
| | | | | | | | | | | c : 1 |
| P2 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P3 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P4 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P5 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

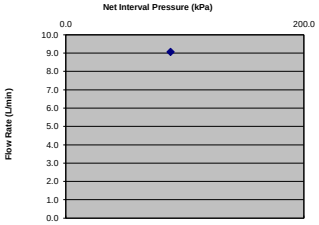
| Stage No. | Lugeon Value |
|---|---|
| P1 | 102.8 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 88.1 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 3.54 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 50 | kPa |
| Q | 9.06 | L/min |
| H | 9.0 | m |
| Interpreted Result | 102.8 | uL |

Reported Permeability at Stage P1

K = 8.3E-06 m/s

**Flow Type**

HIGH PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

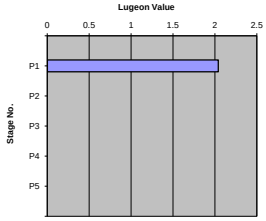
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+144.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.87 | Tested Length (m) : | 9.13 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 20.00 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 06-May-10 | Date : | 06-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| P1 | 200 | 0 | 0:00:00 | 0 | 2.9 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 7.2 | | 4.30 | 4.30 | 0.47 | |
| | | 2 | 0:02:00 | 01:00 | 11.7 | | 4.50 | 4.50 | 0.49 | |
| | | 3 | 0:03:00 | 01:00 | 16.1 | | 4.40 | 4.40 | 0.48 | |
| | | 4 | 0:04:00 | 01:00 | 20.4 | | 4.30 | 4.30 | 0.47 | |
| | | 5 | 0:05:00 | 01:00 | 25.3 | | 4.90 | 4.90 | 0.54 | Stage 1 and 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 22.40 | 2.45 | |
| | | | | | | | Average: | 4.480 | 0.491 | |
| | | | | | | | | | | c : 1 |
| P2 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P3 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P4 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P5 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

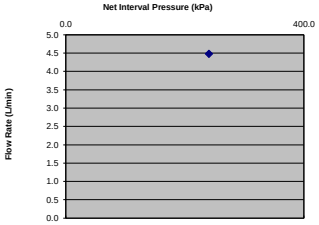
| Stage No. | Lugeon Value |
|---|---|
| P1 | 2.0 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 240.6 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 1.10 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 200 | kPa |
| Q | 4.48 | L/min |
| H | 24.5 | m |
| Interpreted Result | 2.0 | uL |

Reported Permeability at Stage P1

K = 2.8E-07 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

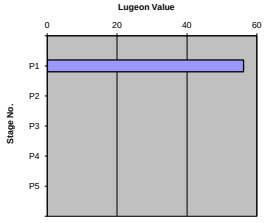
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+144.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.87 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 10.87 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 06-May-10 | Date : | 06-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 4.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 10.6 | | 6.60 | 6.60 | 6.60 | |
| | | 2 | 0:02:00 | 01:00 | 17.0 | | 6.40 | 6.40 | 6.40 | |
| | | 3 | 0:03:00 | 01:00 | 24.2 | | 7.20 | 7.20 | 7.20 | |
| | | 4 | 0:04:00 | 01:00 | 32.9 | | 8.70 | 8.70 | 8.70 | |
| P1 | 100 | 5 | 0:05:00 | 01:00 | 43.0 | | 10.10 | 10.10 | 10.10 | Stage 3 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 39.00 | 39.00 | |
| | | | | | | | Average: | 7.800 | 7.800 | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

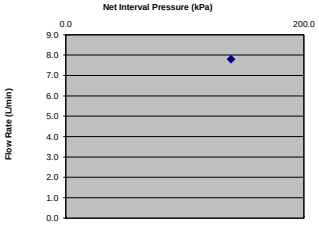
| Stage No. | Lugeon Value |
|---|---|
| P1 | 56.2 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 138.8 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 2.87 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 7.80 | L/min |
| H | 14.2 | m |
| Interpreted Result | 56.2 | uL |

Reported Permeability at Stage P1

K = 4.6E-06 m/s

**Flow Type**

**HIGH PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

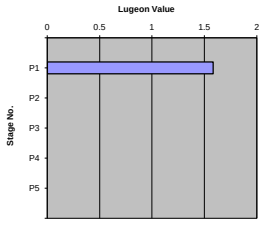
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+147.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.73 | Tested Length (m) : | 9.17 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 19.90 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 06-May-10 | Date : | 06-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 25.7 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 29.3 | | 3.60 | 3.60 | 0.39 | |
| | | 2 | 0:02:00 | 01:00 | 33.0 | | 3.70 | 3.70 | 0.40 | |
| | | 3 | 0:03:00 | 01:00 | 36.5 | | 3.50 | 3.50 | 0.38 | |
| | | 4 | 0:04:00 | 01:00 | 40.0 | | 3.50 | 3.50 | 0.38 | |
| P1 | 200 | 5 | 0:05:00 | 01:00 | 43.2 | | 3.20 | 3.20 | 0.35 | Stage 1 and 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 17.50 | 1.91 | |
| | | | | | | | Average: | 3.500 | 0.382 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

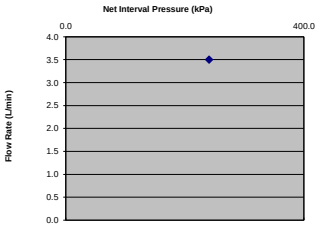
| Stage No. | Lugeon Value |
|---|---|
| P1 | 1.6 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 241.0 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Flow Type**

**LOW PERMEABILITY**

Comments

**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.69 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 200 | kPa |
| Q | 3.50 | L/min |
| H | 24.6 | m |
| Interpreted Result | 1.6 | uL |

Reported Permeability at Stage P1

K = 2.2E-07 m/s

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# WATER PRESSURE TEST

Golder Associates

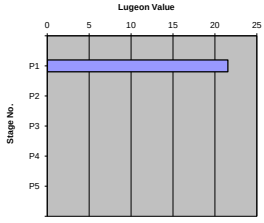
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+147.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.73 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 10.73 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 06-May-10 | Date : | 06-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 2.6 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 6.7 | | 4.10 | 4.10 | 4.10 | |
| | | 2 | 0:02:00 | 01:00 | 9.9 | | 3.20 | 3.20 | 3.20 | |
| | | 3 | 0:03:00 | 01:00 | 12.6 | | 2.70 | 2.70 | 2.70 | |
| | | 4 | 0:04:00 | 01:00 | 15.4 | | 2.80 | 2.80 | 2.80 | |
| P1 | 100 | 5 | 0:05:00 | 01:00 | 17.8 | | 2.40 | 2.40 | 2.40 | Stage 3 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 15.20 | 15.20 | |
| | | | | | | | Average: | 3.040 | 3.040 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

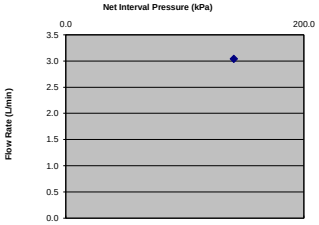
| Stage No. | Lugeon Value |
|---|---|
| P1 | 21.5 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 141.2 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.50 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 3.04 | L/min |
| H | 14.4 | m |
| Interpreted Result | 21.5 | uL |

Reported Permeability at Stage P1

K = 1.7E-06 m/s

**Flow Type**

HIGH PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

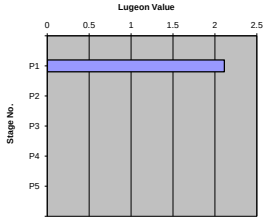
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+150.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.52 | Tested Length (m) : | 9.28 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 19.80 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 06-May-10 | Date : | 06-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 1.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 6.3 | | 5.20 | 5.20 | 0.56 | |
| | | 2 | 0:02:00 | 01:00 | 11.6 | | 5.30 | 5.30 | 0.57 | |
| | | 3 | 0:03:00 | 01:00 | 15.9 | | 4.30 | 4.30 | 0.46 | |
| | | 4 | 0:04:00 | 01:00 | 20.1 | | 4.20 | 4.20 | 0.45 | |
| P1 | 200 | 5 | 0:05:00 | 01:00 | 24.7 | | 4.60 | 4.60 | 0.50 | Stage 1 and 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 23.60 | 2.54 | |
| | | | | | | | Average: | 4.720 | 0.509 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

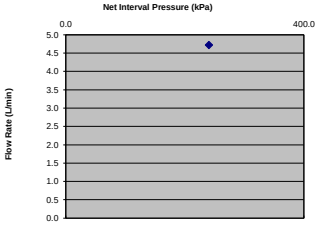
| Stage No. | Lugeon Value |
|---|---|
| P1 | 2.1 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 240.5 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 1.18 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 200 | kPa |
| Q | 4.72 | L/min |
| H | 24.5 | m |
| Interpreted Result | 2.1 | uL |

Reported Permeability at Stage P1

K = 2.9E-07 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

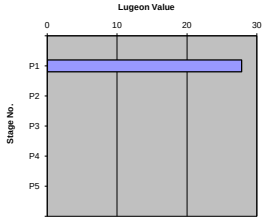
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+150.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.52 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 10.52 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 06-May-10 | Date : | 06-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 4.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 7.6 | | 3.60 | 3.60 | 3.60 | |
| | | 2 | 0:02:00 | 01:00 | 11.3 | | 3.70 | 3.70 | 3.70 | |
| | | 3 | 0:03:00 | 01:00 | 15.0 | | 3.70 | 3.70 | 3.70 | |
| | | 4 | 0:04:00 | 01:00 | 18.5 | | 3.50 | 3.50 | 3.50 | |
| P1 | 100 | 5 | 0:05:00 | 01:00 | 23.6 | | 5.10 | 5.10 | 5.10 | Stage 3 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 19.60 | 19.60 | |
| | | | | | | | Average: | 3.920 | 3.920 | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

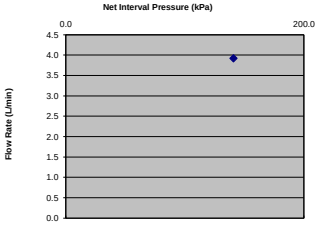
| Stage No. | Lugeon Value |
|---|---|
| P1 | 27.8 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 140.9 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.79 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 100 | kPa |
| Q | 3.92 | L/min |
| H | 14.4 | m |
| Interpreted Result | 27.8 | uL |

Reported Permeability at Stage P1

K = 2.3E-06 m/s

**Flow Type**

HIGH PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

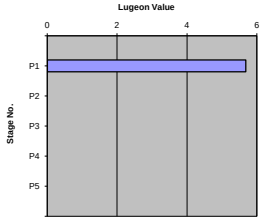
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+153.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 11.44 | Tested Length (m) : | 9.06 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 20.50 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 06-May-10 | Date : | 06-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| P1 | 200 | 0 | 0:00:00 | 0 | 4.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 16.1 | | 12.00 | 12.00 | 1.32 | |
| | | 2 | 0:02:00 | 01:00 | 16.2 | | 0.10 | 0.10 | 0.01 | |
| | | 3 | 0:03:00 | 01:00 | 28.0 | | 11.80 | 11.80 | 1.30 | |
| | | 4 | 0:04:00 | 01:00 | 46.1 | | 18.10 | 18.10 | 2.00 | |
| | | 5 | 0:05:00 | 01:00 | 64.5 | | 18.40 | 18.40 | 2.03 | Stage 1 and 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 60.40 | 6.67 | |
| | | | | | | | Average: | 12.080 | 1.333 | |
| | | | | | | | | | | c : 1 |
| P2 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P3 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P4 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| P5 | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

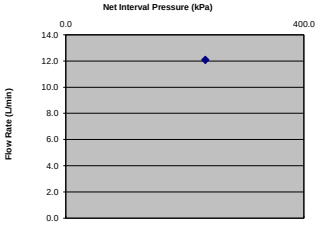
| Stage No. | Lugeon Value |
|---|---|
| P1 | 5.7 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 234.6 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 7.06 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 200 | kPa |
| Q | 12.08 | L/min |
| H | 23.9 | m |
| Interpreted Result | 5.7 | uL |

Reported Permeability at Stage P1

K = 7.9E-07 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

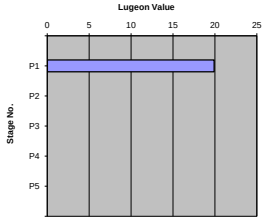
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+156.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 11.04 | Tested Length (m) : | 9.06 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 20.10 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 06-May-10 | Date : | 06-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 4.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 30.5 | | 26.40 | 26.40 | 2.91 | |
| | | 2 | 0:02:00 | 01:00 | 69.7 | | 39.20 | 39.20 | 4.33 | |
| | | 3 | 0:03:00 | 01:00 | 106.1 | | 36.40 | 36.40 | 4.02 | |
| | | 4 | 0:04:00 | 01:00 | 141.8 | | 35.70 | 35.70 | 3.94 | |
| P1 | 200 | 5 | 0:05:00 | 01:00 | 176.4 | | 34.60 | 34.60 | 3.82 | Stage 1 and 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 172.30 | 19.02 | |
| | | | | | | | Average: | 34.460 | 3.804 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

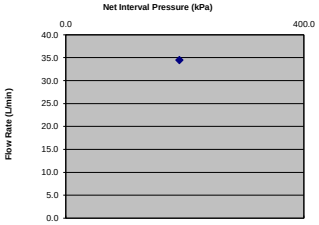
| Stage No. | Lugeon Value |
|---|---|
| P1 | 19.9 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 191.0 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 50.71 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 200 | kPa |
| Q | 34.46 | L/min |
| H | 19.5 | m |
| Interpreted Result | 19.9 | uL |

Reported Permeability at Stage P1

K = 2.8E-06 m/s

**Flow Type**

HIGH PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

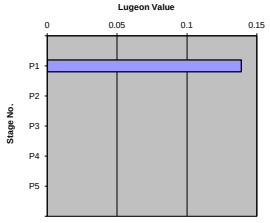
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+159.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 11.79 | Tested Length (m) : | 4.51 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 16.30 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 06-May-10 | Date : | 06-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 0.4 | | 0.30 | 0.30 | 0.07 | |
| | | 2 | 0:02:00 | 01:00 | 0.6 | | 0.20 | 0.20 | 0.04 | |
| | | 3 | 0:03:00 | 01:00 | 0.7 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| P1 | 150 | 5 | 0:05:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.60 | 0.13 | |
| | | | | | | | Average: | 0.120 | 0.027 | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | | | | | | |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

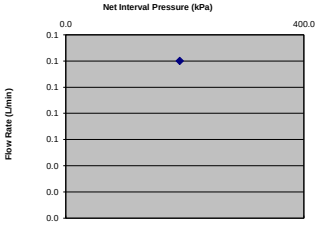
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.1 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 191.7 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 150 | kPa |
| Q | 0.12 | L/min |
| H | 19.5 | m |
| Interpreted Result | 0.1 | uL |

Reported Permeability at Stage P1

K = 1.7E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

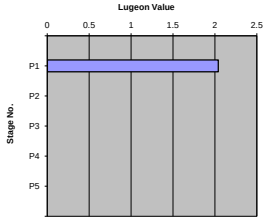
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | T-30+162.5 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.27 | Tested Length (m) : | 5.43 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 15.70 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | PB | Computed By : | PB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 06-May-10 | Date : | 06-May-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| P1 | 150 | 0 | 0:00:00 | 0 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 4.1 | | 3.40 | 3.40 | 0.63 | |
| | | 2 | 0:02:00 | 01:00 | 6.2 | | 2.10 | 2.10 | 0.39 | |
| | | 3 | 0:03:00 | 01:00 | 7.9 | | 1.70 | 1.70 | 0.31 | |
| | | 4 | 0:04:00 | 01:00 | 9.6 | | 1.70 | 1.70 | 0.31 | |
| | | 5 | 0:05:00 | 01:00 | 11.3 | | 1.70 | 1.70 | 0.31 | Stage 2 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 10.60 | 1.95 | |
| | | | | | | | Average: | 2.120 | 0.390 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P5 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

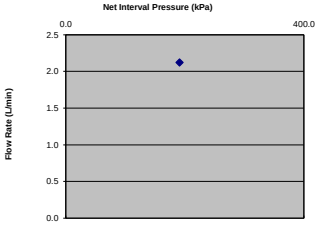
| Stage No. | Lugeon Value |
|---|---|
| P1 | 2.0 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 191.4 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.27 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 150 | kPa |
| Q | 2.12 | L/min |
| H | 19.5 | m |
| Interpreted Result | 2.0 | uL |

Reported Permeability at Stage P1

K = 2.5E-07 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

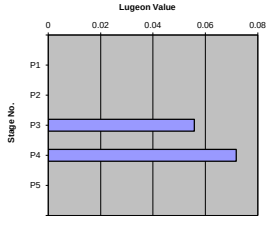
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-30+127.25 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.87 | Tested Length (m) : | 4.33 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 14.20 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Presumed Water Temperature : | 11 |
| Date : | 09-Jul-10 | Date : | 09-Jul-10 | Water Meter Reading in : | Litres | Checked By : VTR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P1 | | 5 | 0:05:00 | 01:00 | | | | | | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 2.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 2.2 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 2.3 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 2.3 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 2.4 | | 0.10 | 0.10 | 0.02 | |
| P3 | 124 | 5 | 0:05:00 | 01:00 | 2.4 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.20 | 0.05 | |
| | | | | | | | Average: | 0.040 | 0.009 | |
| | | 0 | 0:00:00 | 0 | 2.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 2.5 | | 0.10 | 0.10 | 0.02 | |
| | | 2 | 0:02:00 | 01:00 | 2.5 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 2.5 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 2.6 | | 0.10 | 0.10 | 0.02 | |
| P4 | 87 | 5 | 0:05:00 | 01:00 | 2.6 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.20 | 0.05 | |
| | | | | | | | Average: | 0.040 | 0.009 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

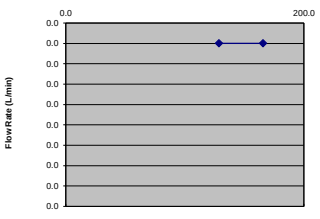
| Stage No. | Lugeon Value |
|---|---|
| P1 | -- |
| P2 | -- |
| P3 | 0.1 |
| P4 | 0.1 |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| -- |
| -- |
| 165.7 |
| 128.7 |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 106 | kPa |
| Q | 0.04 | L/min |
| H | 15.0 | m |
| Interpreted Result | 0.1 | uL |

Reported Permeability at Stage Average

K = 7.5E-09 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

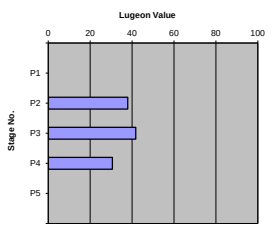
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+127.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.87 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 9.87 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 11 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Checked By : | VTR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 09-Jul-10 | Date : | 09-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P1 | | 5 | 0:05:00 | 01:00 | | | | | | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 13.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 15.6 | | 2.30 | 2.30 | 2.30 | |
| | | 2 | 0:02:00 | 01:00 | 18.1 | | 2.50 | 2.50 | 2.50 | |
| | | 3 | 0:03:00 | 01:00 | 20.0 | | 1.90 | 1.90 | 1.90 | |
| | | 4 | 0:04:00 | 01:00 | 23.5 | | 3.50 | 3.50 | 3.50 | |
| P2 | 28 | 5 | 0:05:00 | 01:00 | 26.4 | | 2.90 | 2.90 | 2.90 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 13.10 | 13.10 | |
| | | | | | | | Average: | 2.620 | 2.620 | |
| | | 0 | 0:00:00 | 0 | 56.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 62.9 | | 6.00 | 6.00 | 6.00 | |
| | | 2 | 0:02:00 | 01:00 | 66.8 | | 3.90 | 3.90 | 3.90 | |
| | | 3 | 0:03:00 | 01:00 | 69.0 | | 2.20 | 2.20 | 2.20 | |
| | | 4 | 0:04:00 | 01:00 | 73.1 | | 4.10 | 4.10 | 4.10 | |
| P3 | 60 | 5 | 0:05:00 | 01:00 | 77.9 | | 4.80 | 4.80 | 4.80 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 21.00 | 21.00 | |
| | | | | | | | Average: | 4.200 | 4.200 | |
| | | 0 | 0:00:00 | 0 | 82.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 84.4 | | 2.20 | 2.20 | 2.20 | |
| | | 2 | 0:02:00 | 01:00 | 85.7 | | 1.30 | 1.30 | 1.30 | |
| | | 3 | 0:03:00 | 01:00 | 87.7 | | 2.00 | 2.00 | 2.00 | |
| | | 4 | 0:04:00 | 01:00 | 89.6 | | 1.90 | 1.90 | 1.90 | |
| P4 | 20 | 5 | 0:05:00 | 01:00 | 91.6 | | 2.00 | 2.00 | 2.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 9.40 | 9.40 | |
| | | | | | | | Average: | 1.880 | 1.880 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

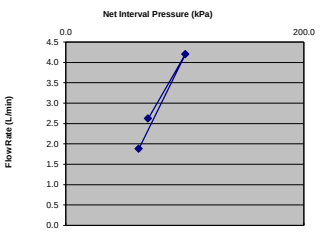
| Stage No. | Lugeon Value |
|---|---|
| P1 | -- |
| P2 | 37.9 |
| P3 | 41.8 |
| P4 | 30.7 |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| -- |
| 69.2 |
| 100.4 |
| 61.3 |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.47 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 36 | kPa |
| Q | 2.90 | L/min |
| H | 7.8 | m |
| Interpreted Result | 36.8 | uL |

Reported Permeability at Stage Average

K = 3.1E-06 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

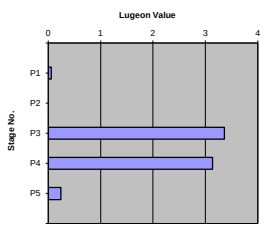
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-30+139.25 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.97 | Tested Length (m) : | 4.13 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 14.10 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Presumed Water Temperature : | 11 |
| Date : | 09-Jul-10 | Date : | 09-Jul-10 | Water Meter Reading in : | Litres | Checked By : VTR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 3.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 3.1 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 3.1 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 3.2 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 3.2 | | 0.00 | 0.00 | 0.00 | |
| P1 | 43 | 5 | 0:05:00 | 01:00 | 3.2 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.02 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 9.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 11.4 | | 2.30 | 2.30 | 0.56 | |
| | | 2 | 0:02:00 | 01:00 | 13.8 | | 2.40 | 2.40 | 0.58 | |
| | | 3 | 0:03:00 | 01:00 | 16.2 | | 2.40 | 2.40 | 0.58 | |
| | | 4 | 0:04:00 | 01:00 | 18.5 | | 2.30 | 2.30 | 0.56 | |
| P3 | 127 | 5 | 0:05:00 | 01:00 | 20.8 | | 2.30 | 2.30 | 0.56 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 11.70 | 2.83 | |
| | | | | | | | Average: | 2.340 | 0.567 | |
| | | 0 | 0:00:00 | 0 | 27.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 28.4 | | 1.00 | 1.00 | 0.24 | |
| | | 2 | 0:02:00 | 01:00 | 29.8 | | 1.40 | 1.40 | 0.34 | |
| | | 3 | 0:03:00 | 01:00 | 31.5 | | 1.70 | 1.70 | 0.41 | |
| | | 4 | 0:04:00 | 01:00 | 32.8 | | 1.30 | 1.30 | 0.31 | |
| P4 | 84 | 5 | 0:05:00 | 01:00 | 35.5 | | 2.70 | 2.70 | 0.65 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 8.10 | 1.96 | |
| | | | | | | | Average: | 1.620 | 0.392 | |
| | | 0 | 0:00:00 | 0 | 36.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 36.1 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 36.1 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 36.2 | | 0.10 | 0.10 | 0.02 | |
| P5 | 38 | 4 | 0:04:00 | 01:00 | 36.2 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 36.5 | | 0.30 | 0.30 | 0.07 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.40 | 0.10 | |
| | | | | | | | Average: | 0.080 | 0.019 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

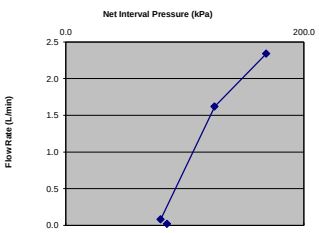
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.1 |
| P2 | -- |
| P3 | 3.4 |
| P4 | 3.1 |
| P5 | 0.2 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 85.0 |
| -- |
| 168.4 |
| 125.0 |
| 79.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Av P1, P5 | |
| Gauge Pressure | 41 | kPa |
| Q | 0.05 | L/min |
| H | 8.4 | m |
| Interpreted Result | 0.2 | uL |

Reported Permeability at Stage Av P1, P5

K = 1.7E-08 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

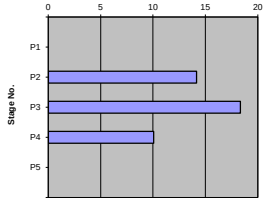
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-30+139.25 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.97 | Tested Length (m) : | 1.00 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 9.97 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Presumed Water Temperature : | 11 |
| Date : | 09-Jul-10 | Date : | 09-Jul-10 | Water Meter Reading in : | Litres | Checked By : VTR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P1 | | 5 | 0:05:00 | 01:00 | | | | | | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 3.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 4.4 | | 0.90 | 0.90 | 0.90 | |
| | | 2 | 0:02:00 | 01:00 | 5.4 | | 1.00 | 1.00 | 1.00 | |
| | | 3 | 0:03:00 | 01:00 | 6.1 | | 0.70 | 0.70 | 0.70 | |
| | | 4 | 0:04:00 | 01:00 | 7.4 | | 1.30 | 1.30 | 1.30 | |
| P2 | 29 | 5 | 0:05:00 | 01:00 | 8.5 | | 1.10 | 1.10 | 1.10 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.00 | 5.00 | |
| | | | | | | | Average: | 1.000 | 1.000 | |
| | | 0 | 0:00:00 | 0 | 10.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 12.6 | | 1.90 | 1.90 | 1.90 | |
| | | 2 | 0:02:00 | 01:00 | 14.5 | | 1.90 | 1.90 | 1.90 | |
| | | 3 | 0:03:00 | 01:00 | 16.3 | | 1.80 | 1.80 | 1.80 | |
| | | 4 | 0:04:00 | 01:00 | 18.1 | | 1.80 | 1.80 | 1.80 | |
| P3 | 60 | 5 | 0:05:00 | 01:00 | 20.0 | | 1.90 | 1.90 | 1.90 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 9.30 | 9.30 | |
| | | | | | | | Average: | 1.860 | 1.860 | |
| | | 0 | 0:00:00 | 0 | 20.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 21.5 | | 0.70 | 0.70 | 0.70 | |
| | | 2 | 0:02:00 | 01:00 | 22.0 | | 0.50 | 0.50 | 0.50 | |
| | | 3 | 0:03:00 | 01:00 | 22.6 | | 0.60 | 0.60 | 0.60 | |
| | | 4 | 0:04:00 | 01:00 | 23.4 | | 0.80 | 0.80 | 0.80 | |
| P4 | 22 | 5 | 0:05:00 | 01:00 | 24.0 | | 0.60 | 0.60 | 0.60 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.20 | 3.20 | |
| | | | | | | | Average: | 0.640 | 0.640 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

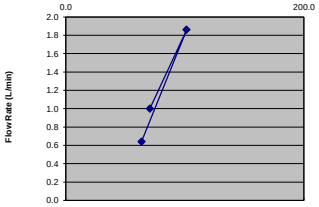
| Stage No. | Lugeon Value |
|---|---|
| P1 | -- |
| P2 | 14.2 |
| P3 | 18.3 |
| P4 | 10.1 |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| -- |
| 70.6 |
| 101.5 |
| 63.6 |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.10 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 37 | kPa |
| Q | 1.17 | L/min |
| H | 8.0 | m |
| Interpreted Result | 14.2 | uL |

Reported Permeability at Stage Average

K = 1.2E-06 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

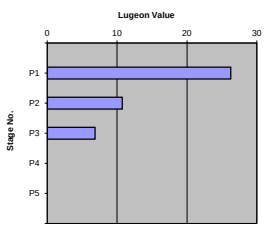
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-30+437.75 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 13.24 | Tested Length (m) : | 1.00 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 14.24 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | CL | Computed By : | CL | Rock tested : | | Presumed Water Temperature : | 15 |
| Date : | 16-Jul-10 | Date : | 16-Jul-10 | Water Meter Reading in : | Litres | Checked By : VTR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | 37.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 43.1 | | 5.60 | 5.60 | 5.60 | |
| | | 2 | 0:02:00 | 01:00 | 47.7 | | 4.60 | 4.60 | 4.60 | |
| | | 3 | 0:03:00 | 01:00 | 48.7 | | 1.00 | 1.00 | 1.00 | |
| | | 4 | 0:04:00 | 01:00 | 48.8 | | 0.10 | 0.10 | 0.10 | |
| P1 | 45 | 5 | 0:05:00 | 01:00 | 48.8 | | 0.00 | 0.00 | 0.00 | Stage 3 (First Test) |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 11.30 | 11.30 | |
| | | | | | | | Average: | 2.260 | 2.260 | |
| | | 0 | 0:00:00 | 0 | 52.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 54.3 | | 1.40 | 1.40 | 1.40 | |
| | | 2 | 0:02:00 | 01:00 | 55.8 | | 1.50 | 1.50 | 1.50 | |
| | | 3 | 0:03:00 | 01:00 | 57.4 | | 1.60 | 1.60 | 1.60 | |
| | | 4 | 0:04:00 | 01:00 | 58.8 | | 1.40 | 1.40 | 1.40 | |
| P2 | 93 | 5 | 0:05:00 | 01:00 | 60.1 | | 1.30 | 1.30 | 1.30 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 7.20 | 7.20 | |
| | | | | | | | Average: | 1.440 | 1.440 | |
| | | 0 | 0:00:00 | 0 | 61.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 62.1 | | 0.70 | 0.70 | 0.70 | |
| | | 2 | 0:02:00 | 01:00 | 62.7 | | 0.60 | 0.60 | 0.60 | |
| | | 3 | 0:03:00 | 01:00 | 63.3 | | 0.60 | 0.60 | 0.60 | |
| | | 4 | 0:04:00 | 01:00 | 64.1 | | 0.80 | 0.80 | 0.80 | |
| P3 | 46 | 5 | 0:05:00 | 01:00 | 64.4 | | 0.30 | 0.30 | 0.30 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.00 | 3.00 | |
| | | | | | | | Average: | 0.600 | 0.600 | |
| | | 0 | 0:00:00 | 0 | | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

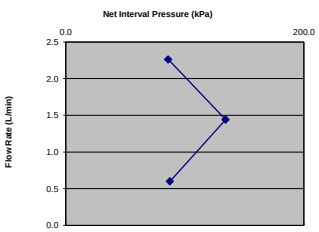
| Stage No. | Lugeon Value |
|---|---|
| P1 | 26.3 |
| P2 | 10.7 |
| P3 | 6.9 |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 86.0 |
| 134.2 |
| 87.4 |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.03 | kPa |
| Stage No. | P3 | |
| Gauge Pressure | 46 | kPa |
| Q | 0.60 | L/min |
| H | 8.9 | m |
| Interpreted Result | 6.9 | uL |

Reported Permeability at Stage P3

K = 5.6E-07 m/s

**Flow Type**

VOID FILLING

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

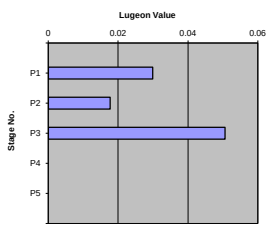
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+437.75 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 18.20 | Tested Length (m) : | 5.20 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 23.40 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 17-Jul-10 | Date : | 17-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.9 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 0.9 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 0.9 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 0.9 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 1.0 | | 0.10 | 0.10 | 0.02 | |
| P1 | 87 | 5 | 0:05:00 | 01:00 | 1.0 | | 0.00 | 0.00 | 0.00 | Stage 1 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.02 | |
| | | | | | | | Average: | 0.020 | 0.004 | |
| | | 0 | 0:00:00 | 0 | 1.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 1.0 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 1.0 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 1.1 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 1.1 | | 0.00 | 0.00 | 0.00 | |
| P2 | 175 | 5 | 0:05:00 | 01:00 | 1.1 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.02 | |
| | | | | | | | Average: | 0.020 | 0.004 | |
| | | 0 | 0:00:00 | 0 | 1.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 1.2 | | 0.10 | 0.10 | 0.02 | |
| | | 2 | 0:02:00 | 01:00 | 1.3 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 1.4 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 1.5 | | 0.10 | 0.10 | 0.02 | |
| P3 | 262 | 5 | 0:05:00 | 01:00 | 1.5 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.40 | 0.08 | |
| | | | | | | | Average: | 0.080 | 0.015 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

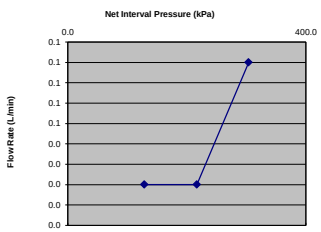
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.03 |
| P2 | 0.02 |
| P3 | 0.05 |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 128.7 |
| 216.7 |
| 303.7 |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 175 | kPa |
| Q | 0.04 | L/min |
| H | 22.1 | m |
| Interpreted Result | 0.03 | uL |

Reported Permeability at Stage Average

K = 4.4E-09 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments: Shut-in test carried out subsequent to constant head test

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

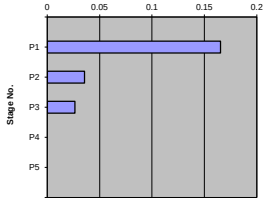
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+437.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 14.24 | Tested Length (m) : | 3.96 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 18.20 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 17-Jul-10 | Date : | 17-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 0.6 | | 0.20 | 0.20 | 0.05 | |
| | | 2 | 0:02:00 | 01:00 | 0.7 | | 0.10 | 0.10 | 0.03 | |
| | | 3 | 0:03:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| P1 | 50 | 5 | 0:05:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.30 | 0.08 | |
| | | | | | | | Average: | 0.060 | 0.015 | |
| | | 0 | 0:00:00 | 0 | 0.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 0.8 | | 0.10 | 0.10 | 0.03 | |
| | | 4 | 0:04:00 | 01:00 | 0.8 | | 0.00 | 0.00 | 0.00 | |
| P2 | 100 | 5 | 0:05:00 | 01:00 | 0.8 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | 0.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 0.8 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 0.8 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 0.9 | | 0.10 | 0.10 | 0.03 | |
| | | 4 | 0:04:00 | 01:00 | 0.9 | | 0.00 | 0.00 | 0.00 | |
| P3 | 150 | 5 | 0:05:00 | 01:00 | 0.9 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

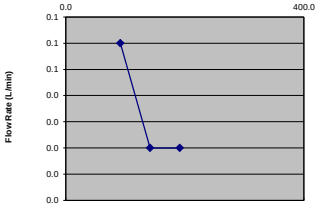
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.2 |
| P2 | 0.04 |
| P3 | 0.03 |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 91.7 |
| 141.7 |
| 191.7 |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 50 | kPa |
| Q | 0.06 | L/min |
| H | 9.3 | m |
| Interpreted Result | 0.2 | uL |

Reported Permeability at Stage P1

K = 1.9E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments: Shut-in test carried out subsequent to constant head test

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

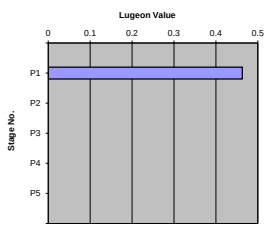
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+437.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 13.24 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 14.24 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 15 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 17-Jul-10 | Date : | 17-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 0.6 | | 0.20 | 0.20 | 0.20 | |
| | | 2 | 0:02:00 | 01:00 | 0.6 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 0.6 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 0.6 | | 0.00 | 0.00 | 0.00 | |
| P1 | 45 | 5 | 0:05:00 | 01:00 | 0.6 | | 0.00 | 0.00 | 0.00 | Stage 3 (Second Test) |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.20 | 0.20 | |
| | | | | | | | Average: | 0.040 | 0.040 | |
| | | 0 | 0:00:00 | 0 | 0.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| P2 | 93 | 5 | 0:05:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

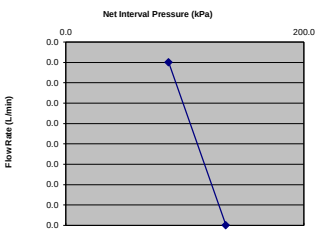
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.5 |
| P2 | 0.00 |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 86.4 |
| 134.4 |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 45 | kPa |
| Q | 0.04 | L/min |
| H | 8.8 | m |
| Interpreted Result | 0.5 | uL |

Reported Permeability at Stage P1

K = 3.8E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments: Shut-in test carried out subsequent to constant head test

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

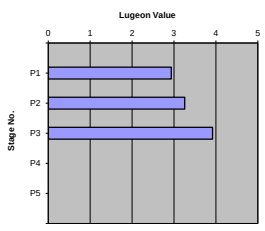
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+437.75 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.99 | Tested Length (m) : | 1.50 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 12.49 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 16 |
| Tested By : | CL | Computed By : | CL | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 18-Jul-10 | Date : | 18-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 47.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 47.4 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 47.4 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 47.5 | | 0.10 | 0.10 | 0.07 | |
| | | 4 | 0:04:00 | 01:00 | 48.2 | | 0.70 | 0.70 | 0.47 | |
| P1 | 40 | 5 | 0:05:00 | 01:00 | 49.2 | | 1.00 | 1.00 | 0.67 | Stage 4 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.80 | 1.20 | |
| | | | | | | | Average: | 0.360 | 0.240 | |
| | | 0 | 0:00:00 | 0 | 52.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 52.8 | | 0.10 | 0.10 | 0.07 | |
| | | 2 | 0:02:00 | 01:00 | 52.9 | | 0.10 | 0.10 | 0.07 | |
| | | 3 | 0:03:00 | 01:00 | 54.5 | | 1.60 | 1.60 | 1.07 | |
| | | 4 | 0:04:00 | 01:00 | 55.1 | | 0.60 | 0.60 | 0.40 | |
| P2 | 69 | 5 | 0:05:00 | 01:00 | 55.4 | | 0.30 | 0.30 | 0.20 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.70 | 1.80 | |
| | | | | | | | Average: | 0.540 | 0.360 | |
| | | 0 | 0:00:00 | 0 | 55.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 56.0 | | 0.60 | 0.60 | 0.40 | |
| | | 2 | 0:02:00 | 01:00 | 57.1 | | 1.10 | 1.10 | 0.73 | |
| | | 3 | 0:03:00 | 01:00 | 57.4 | | 0.30 | 0.30 | 0.20 | |
| | | 4 | 0:04:00 | 01:00 | 57.4 | | 0.00 | 0.00 | 0.00 | |
| P3 | 40 | 5 | 0:05:00 | 01:00 | 57.8 | | 0.40 | 0.40 | 0.27 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.40 | 1.60 | |
| | | | | | | | Average: | 0.480 | 0.320 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

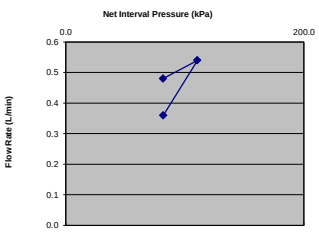
| Stage No. | Lugeon Value |
|---|---|
| P1 | 2.9 |
| P2 | 3.3 |
| P3 | 3.9 |
| P4 | |
| P5 | |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 81.8 |
| 110.5 |
| 81.7 |
| 0.0 |
| 0.0 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.02 | kPa |
| Stage No. | P3 | |
| Gauge Pressure | 40 | kPa |
| Q | 0.48 | L/min |
| H | 8.3 | m |
| Interpreted Result | 3.9 | uL |

Reported Permeability at Stage P3

K = 3.6E-07 m/s

**Flow Type**

WASH-OUT

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

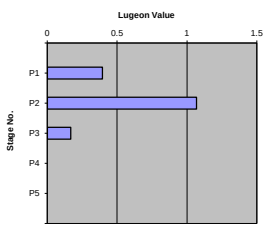
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+445.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 16.60 | Tested Length (m) : | 5.10 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 21.70 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 13-Jul-10 | Date : | 13-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 18.3 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 18.4 | | 0.10 | 0.10 | 0.02 | |
| | | 2 | 0:02:00 | 01:00 | 18.7 | | 0.30 | 0.30 | 0.06 | |
| | | 3 | 0:03:00 | 01:00 | 19.0 | | 0.30 | 0.30 | 0.06 | |
| | | 4 | 0:04:00 | 01:00 | 19.2 | | 0.20 | 0.20 | 0.04 | |
| P1 | 87 | 5 | 0:05:00 | 01:00 | 19.6 | | 0.40 | 0.40 | 0.08 | Stage 1 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.30 | 0.25 | |
| | | | | | | | Average: | 0.260 | 0.051 | |
| | | 0 | 0:00:00 | 0 | 21.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 24.6 | | 3.50 | 3.50 | 0.69 | |
| | | 2 | 0:02:00 | 01:00 | 25.0 | | 0.40 | 0.40 | 0.08 | |
| | | 3 | 0:03:00 | 01:00 | 25.6 | | 0.60 | 0.60 | 0.12 | |
| | | 4 | 0:04:00 | 01:00 | 26.3 | | 0.70 | 0.70 | 0.14 | |
| P2 | 175 | 5 | 0:05:00 | 01:00 | 27.0 | | 0.70 | 0.70 | 0.14 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.90 | 1.16 | |
| | | | | | | | Average: | 1.180 | 0.231 | |
| | | 0 | 0:00:00 | 0 | 28.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 29.4 | | 0.90 | 0.90 | 0.18 | |
| | | 2 | 0:02:00 | 01:00 | 29.8 | | 0.40 | 0.40 | 0.08 | |
| | | 3 | 0:03:00 | 01:00 | 29.8 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 29.8 | | 0.00 | 0.00 | 0.00 | |
| P3 | 262 | 5 | 0:05:00 | 01:00 | 29.8 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.30 | 0.25 | |
| | | | | | | | Average: | 0.260 | 0.051 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

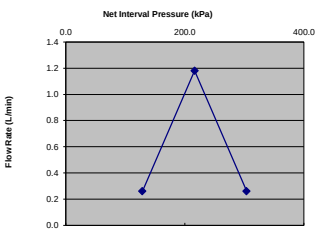
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.4 |
| P2 | 1.1 |
| P3 | 0.2 |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 128.7 |
| 216.5 |
| 303.7 |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.05 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 175 | kPa |
| Q | 0.57 | L/min |
| H | 22.1 | m |
| Interpreted Result | 0.5 | uL |

Reported Permeability at Stage Average

K = 6.3E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

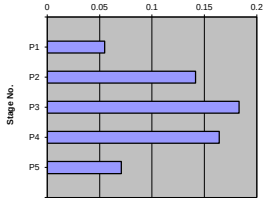
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+445.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 12.61 | Tested Length (m) : | 3.99 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 16.60 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 13-Jul-10 | Date : | 13-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 3.3 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 3.3 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 3.3 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 3.3 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 3.3 | | 0.00 | 0.00 | 0.00 | |
| P1 | 50 | 5 | 0:05:00 | 01:00 | 3.4 | | 0.10 | 0.10 | 0.03 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | 4.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 4.3 | | 0.10 | 0.10 | 0.03 | |
| | | 2 | 0:02:00 | 01:00 | 4.4 | | 0.10 | 0.10 | 0.03 | |
| | | 3 | 0:03:00 | 01:00 | 4.4 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 4.5 | | 0.10 | 0.10 | 0.03 | |
| P2 | 100 | 5 | 0:05:00 | 01:00 | 4.6 | | 0.10 | 0.10 | 0.03 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.40 | 0.10 | |
| | | | | | | | Average: | 0.080 | 0.020 | |
| | | 0 | 0:00:00 | 0 | 5.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.5 | | 0.10 | 0.10 | 0.03 | |
| | | 2 | 0:02:00 | 01:00 | 5.7 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 5.8 | | 0.10 | 0.10 | 0.03 | |
| | | 4 | 0:04:00 | 01:00 | 6.0 | | 0.20 | 0.20 | 0.05 | |
| P3 | 150 | 5 | 0:05:00 | 01:00 | 6.1 | | 0.10 | 0.10 | 0.03 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.70 | 0.18 | |
| | | | | | | | Average: | 0.140 | 0.035 | |
| | | 0 | 0:00:00 | 0 | 6.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 6.4 | | 0.10 | 0.10 | 0.03 | |
| | | 2 | 0:02:00 | 01:00 | 6.5 | | 0.10 | 0.10 | 0.03 | |
| | | 3 | 0:03:00 | 01:00 | 6.5 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 6.5 | | 0.00 | 0.00 | 0.00 | |
| P4 | 50 | 5 | 0:05:00 | 01:00 | 6.6 | | 0.10 | 0.10 | 0.03 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.30 | 0.08 | |
| | | | | | | | Average: | 0.060 | 0.015 | |
| | | 0 | 0:00:00 | 0 | 6.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 6.7 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 6.7 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 6.7 | | 0.00 | 0.00 | 0.00 | |
| P5 | 100 | 4 | 0:04:00 | 01:00 | 6.8 | | 0.10 | 0.10 | 0.03 | |
| | | 5 | 0:05:00 | 01:00 | 6.9 | | 0.10 | 0.10 | 0.03 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.20 | 0.05 | |
| | | | | | | | Average: | 0.040 | 0.010 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

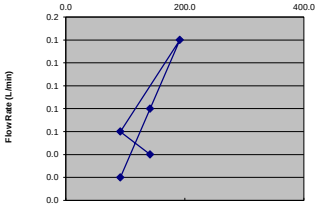
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.1 |
| P2 | 0.1 |
| P3 | 0.2 |
| P4 | 0.2 |
| P5 | 0.1 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 91.7 |
| 141.7 |
| 191.7 |
| 91.7 |
| 141.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 90 | kPa |
| Q | 0.07 | L/min |
| H | 13.4 | m |
| Interpreted Result | 0.1 | uL |

Reported Permeability at Stage Average

K = 1.5E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

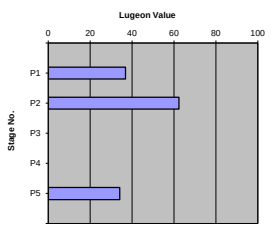
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+445.25 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 11.61 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 12.61 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 13-Jul-10 | Date : | 13-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 3.5 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 7.1 | | 3.60 | 3.60 | 3.60 | |
| | | 2 | 0:02:00 | 01:00 | 10.8 | | 3.70 | 3.70 | 3.70 | |
| | | 3 | 0:03:00 | 01:00 | 13.8 | | 3.00 | 3.00 | 3.00 | |
| | | 4 | 0:04:00 | 01:00 | 16.7 | | 2.90 | 2.90 | 2.90 | |
| P1 | 45 | 5 | 0:05:00 | 01:00 | 19.4 | | 2.70 | 2.70 | 2.70 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 15.90 | 15.90 | |
| | | | | | | | Average: | 3.180 | 3.180 | |
| | | 0 | 0:00:00 | 0 | 26.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 35.1 | | 8.40 | 8.40 | 8.40 | |
| | | 2 | 0:02:00 | 01:00 | 42.8 | | 7.70 | 7.70 | 7.70 | |
| | | 3 | 0:03:00 | 01:00 | 51.0 | | 8.20 | 8.20 | 8.20 | |
| | | 4 | 0:04:00 | 01:00 | 58.9 | | 7.85 | 7.85 | 7.85 | |
| P2 | 90 | 5 | 0:05:00 | 01:00 | 66.7 | | 7.85 | 7.85 | 7.85 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 40.00 | 40.00 | |
| | | | | | | | Average: | 8.000 | 8.000 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 71.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 74.8 | | 3.50 | 3.50 | 3.50 | |
| | | 2 | 0:02:00 | 01:00 | 77.9 | | 3.10 | 3.10 | 3.10 | |
| | | 3 | 0:03:00 | 01:00 | 80.8 | | 2.90 | 2.90 | 2.90 | |
| P5 | 45 | 4 | 0:04:00 | 01:00 | 83.5 | | 2.70 | 2.70 | 2.70 | |
| | | 5 | 0:05:00 | 01:00 | 86.0 | | 2.50 | 2.50 | 2.50 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 14.70 | 14.70 | |
| | | | | | | | Average: | 2.940 | 2.940 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

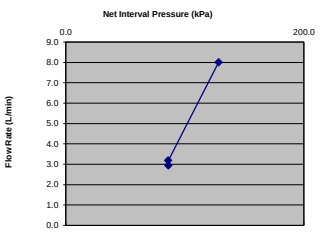
| Stage No. | Lugeon Value |
|---|---|
| P1 | 36.9 |
| P2 | 62.3 |
| P3 | -- |
| P4 | -- |
| P5 | 34.1 |

Lugeon Value Curve




| Net Pressures |
|---|
| 86.1 |
| 128.4 |
| -- |
| -- |
| 86.2 |

Flow vs. Pressure




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.57 | kPa |
| Stage No. | Av P1, P5 | |
| Gauge Pressure | 45 | kPa |
| Q | 3.06 | L/min |
| H | 8.8 | m |
| Interpreted Result | 35.5 | uL |

Reported Permeability at Stage Av P1, P5

K = 2.9E-06 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

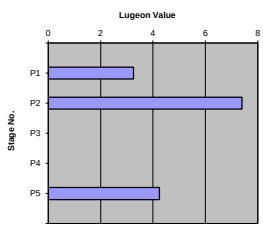
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+445.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.04 | Tested Length (m) : | 1.50 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 11.54 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 12 |
| Tested By : | CL | Computed By : | CL | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 14-Jul-10 | Date : | 14-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 39.5 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 40.3 | | 0.80 | 0.80 | 0.53 | |
| | | 2 | 0:02:00 | 01:00 | 41.0 | | 0.70 | 0.70 | 0.47 | |
| | | 3 | 0:03:00 | 01:00 | 41.5 | | 0.50 | 0.50 | 0.33 | |
| | | 4 | 0:04:00 | 01:00 | 41.5 | | 0.00 | 0.00 | 0.00 | |
| P1 | 40 | 5 | 0:05:00 | 01:00 | 41.5 | | 0.00 | 0.00 | 0.00 | Stage 4 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.00 | 1.33 | |
| | | | | | | | Average: | 0.400 | 0.267 | |
| | | 0 | 0:00:00 | 0 | 49.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 51.7 | | 1.80 | 1.80 | 1.20 | |
| | | 2 | 0:02:00 | 01:00 | 53.3 | | 1.60 | 1.60 | 1.07 | |
| | | 3 | 0:03:00 | 01:00 | 54.2 | | 0.90 | 0.90 | 0.60 | |
| | | 4 | 0:04:00 | 01:00 | 55.1 | | 0.90 | 0.90 | 0.60 | |
| P2 | 70 | 5 | 0:05:00 | 01:00 | 56.1 | | 1.00 | 1.00 | 0.67 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 6.20 | 4.13 | |
| | | | | | | | Average: | 1.240 | 0.827 | |
| | | 0 | 0:00:00 | 0 | | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | #VALUE! | #VALUE! | |
| | | 2 | 0:02:00 | 01:00 | | | | #VALUE! | #VALUE! | |
| | | 3 | 0:03:00 | 01:00 | | | | #VALUE! | #VALUE! | |
| | | 4 | 0:04:00 | 01:00 | | | | #VALUE! | #VALUE! | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | #VALUE! | #VALUE! | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | #VALUE! | #VALUE! | |
| | | | | | | | Average: | #VALUE! | #VALUE! | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 56.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 57.7 | | 0.80 | 0.80 | 0.53 | |
| | | 2 | 0:02:00 | 01:00 | 58.2 | | 0.50 | 0.50 | 0.33 | |
| | | 3 | 0:03:00 | 01:00 | 58.5 | | 0.30 | 0.30 | 0.20 | |
| P5 | 40 | 4 | 0:04:00 | 01:00 | 59.0 | | 0.50 | 0.50 | 0.33 | |
| | | 5 | 0:05:00 | 01:00 | 59.5 | | 0.50 | 0.50 | 0.33 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.60 | 1.73 | |
| | | | | | | | Average: | 0.520 | 0.347 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

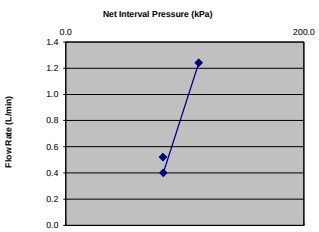
| Stage No. | Lugeon Value |
|---|---|
| P1 | 3.3 |
| P2 | 7.4 |
| P3 | -- |
| P4 | -- |
| P5 | 4.2 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 82.0 |
| 111.8 |
| -- |
| -- |
| 81.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.02 | kPa |
| Stage No. | Av P1, P5 | |
| Gauge Pressure | 40 | kPa |
| Q | 0.46 | L/min |
| H | 8.3 | m |
| Interpreted Result | 3.7 | uL |

Reported Permeability at Stage Av P1, P5

K = 3.4E-07 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

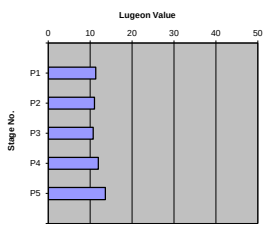
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+458.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 11.09 | Tested Length (m) : | 5.01 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 16.10 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 10-Jul-12 | Date : | 10-Jul-12 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 11.8 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 16.6 | | 4.80 | 4.80 | 0.96 | |
| | | 2 | 0:02:00 | 01:00 | 22.1 | | 5.50 | 5.50 | 1.10 | |
| | | 3 | 0:03:00 | 01:00 | 27.4 | | 5.30 | 5.30 | 1.06 | |
| | | 4 | 0:04:00 | 01:00 | 33.0 | | 5.60 | 5.60 | 1.12 | |
| P1 | 50 | 5 | 0:05:00 | 01:00 | 37.5 | | 4.50 | 4.50 | 0.90 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 25.70 | 5.13 | |
| | | | | | | | Average: | 5.140 | 1.026 | |
| | | 0 | 0:00:00 | 0 | 44.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 51.2 | | 7.20 | 7.20 | 1.44 | |
| | | 2 | 0:02:00 | 01:00 | 59.3 | | 8.10 | 8.10 | 1.62 | |
| | | 3 | 0:03:00 | 01:00 | 66.9 | | 7.60 | 7.60 | 1.52 | |
| | | 4 | 0:04:00 | 01:00 | 74.5 | | 7.60 | 7.60 | 1.52 | |
| P2 | 100 | 5 | 0:05:00 | 01:00 | 82.4 | | 7.90 | 7.90 | 1.58 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 38.40 | 7.66 | |
| | | | | | | | Average: | 7.680 | 1.533 | |
| | | 0 | 0:00:00 | 0 | 90.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 100.0 | | 9.40 | 9.40 | 1.88 | |
| | | 2 | 0:02:00 | 01:00 | 110.0 | | 10.00 | 10.00 | 2.00 | |
| | | 3 | 0:03:00 | 01:00 | 120.9 | | 10.90 | 10.90 | 2.18 | |
| | | 4 | 0:04:00 | 01:00 | 130.9 | | 10.00 | 10.00 | 2.00 | |
| P3 | 150 | 5 | 0:05:00 | 01:00 | 140.7 | | 9.80 | 9.80 | 1.96 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 50.10 | 10.00 | |
| | | | | | | | Average: | 10.020 | 2.000 | |
| | | 0 | 0:00:00 | 0 | 150.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 158.0 | | 7.50 | 7.50 | 1.50 | |
| | | 2 | 0:02:00 | 01:00 | 166.6 | | 8.60 | 8.60 | 1.72 | |
| | | 3 | 0:03:00 | 01:00 | 174.7 | | 8.10 | 8.10 | 1.62 | |
| | | 4 | 0:04:00 | 01:00 | 183.6 | | 8.90 | 8.90 | 1.78 | |
| P4 | 100 | 5 | 0:05:00 | 01:00 | 191.8 | | 8.20 | 8.20 | 1.64 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 41.30 | 8.24 | |
| | | | | | | | Average: | 8.260 | 1.649 | |
| | | 0 | 0:00:00 | 0 | 199.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 206.8 | | 7.10 | 7.10 | 1.42 | |
| | | 2 | 0:02:00 | 01:00 | 212.4 | | 5.60 | 5.60 | 1.12 | |
| | | 3 | 0:03:00 | 01:00 | 218.7 | | 6.30 | 6.30 | 1.26 | |
| P5 | 50 | 4 | 0:04:00 | 01:00 | 224.1 | | 5.40 | 5.40 | 1.08 | |
| | | 5 | 0:05:00 | 01:00 | 230.4 | | 6.30 | 6.30 | 1.26 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 30.70 | 6.13 | |
| | | | | | | | Average: | 6.140 | 1.226 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

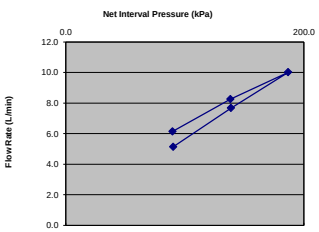
| Stage No. | Lugeon Value |
|---|---|
| P1 | 11.4 |
| P2 | 11.1 |
| P3 | 10.7 |
| P4 | 11.9 |
| P5 | 13.7 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 90.3 |
| 138.7 |
| 186.8 |
| 138.3 |
| 89.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 2.91 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 90 | kPa |
| Q | 7.45 | L/min |
| H | 13.1 | m |
| Interpreted Result | 11.7 | uL |

Reported Permeability at Stage Average

K = 1.4E-06 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

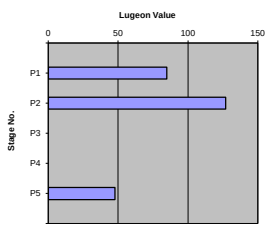
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+458.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.09 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 11.09 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | GRB | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 10-Jul-10 | Date : | 10-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 7.7 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 15.6 | | 7.90 | 7.90 | 7.90 | |
| | | 2 | 0:02:00 | 01:00 | 22.3 | | 6.70 | 6.70 | 6.70 | |
| | | 3 | 0:03:00 | 01:00 | 28.4 | | 6.10 | 6.10 | 6.10 | |
| | | 4 | 0:04:00 | 01:00 | 35.0 | | 6.60 | 6.60 | 6.60 | |
| P1 | 45 | 5 | 0:05:00 | 01:00 | 43.4 | | 8.40 | 8.40 | 8.40 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 35.70 | 35.70 | |
| | | | | | | | Average: | 7.140 | 7.140 | |
| | | 0 | 0:00:00 | 0 | 52.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 65.9 | | 13.20 | 13.20 | 13.20 | |
| | | 2 | 0:02:00 | 01:00 | 83.9 | | 18.00 | 18.00 | 18.00 | |
| | | 3 | 0:03:00 | 01:00 | 96.1 | | 12.20 | 12.20 | 12.20 | |
| | | 4 | 0:04:00 | 01:00 | 111.3 | | 15.20 | 15.20 | 15.20 | |
| P2 | 90 | 5 | 0:05:00 | 01:00 | 129.8 | | 18.50 | 18.50 | 18.50 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 77.10 | 77.10 | |
| | | | | | | | Average: | 15.420 | 15.420 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 136.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 136.6 | | 0.20 | 0.20 | 0.20 | |
| | | 2 | 0:02:00 | 01:00 | 140.1 | | 3.50 | 3.50 | 3.50 | |
| | | 3 | 0:03:00 | 01:00 | 146.4 | | 6.30 | 6.30 | 6.30 | |
| P5 | 45 | 4 | 0:04:00 | 01:00 | 152.5 | | 6.10 | 6.10 | 6.10 | |
| | | 5 | 0:05:00 | 01:00 | 156.9 | | 4.40 | 4.40 | 4.40 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 20.50 | 20.50 | |
| | | | | | | | Average: | 4.100 | 4.100 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

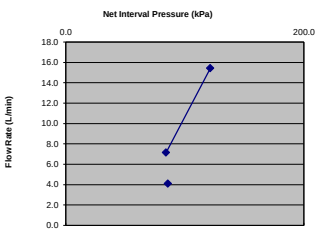
| Stage No. | Lugeon Value |
|---|---|
| P1 | 84.8 |
| P2 | 127.1 |
| P3 | -- |
| P4 | -- |
| P5 | 47.8 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 84.2 |
| 121.3 |
| -- |
| -- |
| 85.8 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 1.66 | kPa |
| Stage No. | Av P1, P5 | |
| Gauge Pressure | 45 | kPa |
| Q | 5.62 | L/min |
| H | 8.7 | m |
| Interpreted Result | 66.3 | uL |

Reported Permeability at Stage Av P1, P5

K = 5.4E-06 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

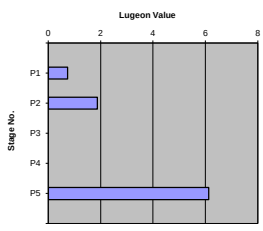
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+458.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.92 | Tested Length (m) : | 2.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 9.92 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 13-Jul-10 | Date : | 13-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 0.9 | | 0.50 | 0.50 | 0.25 | |
| | | 2 | 0:02:00 | 01:00 | 0.9 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 0.9 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 0.9 | | 0.00 | 0.00 | 0.00 | |
| P1 | 40 | 5 | 0:05:00 | 01:00 | 1.0 | | 0.10 | 0.10 | 0.05 | Stage 4 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.60 | 0.30 | |
| | | | | | | | Average: | 0.120 | 0.060 | |
| | | 0 | 0:00:00 | 0 | 2.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 4.0 | | 1.50 | 1.50 | 0.75 | |
| | | 2 | 0:02:00 | 01:00 | 4.1 | | 0.10 | 0.10 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 4.5 | | 0.40 | 0.40 | 0.20 | |
| | | 4 | 0:04:00 | 01:00 | 4.6 | | 0.10 | 0.10 | 0.05 | |
| P2 | 70 | 5 | 0:05:00 | 01:00 | 4.6 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.10 | 1.05 | |
| | | | | | | | Average: | 0.420 | 0.210 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 10.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 11.4 | | 1.00 | 1.00 | 0.50 | |
| | | 2 | 0:02:00 | 01:00 | 12.4 | | 1.00 | 1.00 | 0.50 | |
| | | 3 | 0:03:00 | 01:00 | 13.1 | | 0.70 | 0.70 | 0.35 | |
| P5 | 40 | 4 | 0:04:00 | 01:00 | 13.7 | | 0.60 | 0.60 | 0.30 | |
| | | 5 | 0:05:00 | 01:00 | 15.4 | | 1.70 | 1.70 | 0.85 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.00 | 2.50 | |
| | | | | | | | Average: | 1.000 | 0.500 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

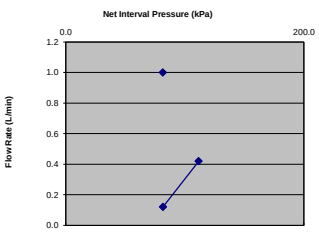
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.7 |
| P2 | 1.9 |
| P3 | -- |
| P4 | -- |
| P5 | 6.1 |

Lugeon Value Curve




| Net Pressures |
|---|
| 81.7 |
| 111.7 |
| -- |
| -- |
| 81.6 |

Flow vs. Pressure




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.06 | kPa |
| Stage No. | P5 | |
| Gauge Pressure | 40 | kPa |
| Q | 1.00 | L/min |
| H | 8.3 | m |
| Interpreted Result | 6.1 | uL |

Reported Permeability at Stage P5

K = 6.1E-07 m/s

**Flow Type**

WASH-OUT

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

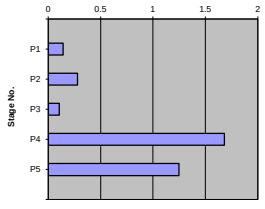
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+589.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.59 | Tested Length (m) : | 4.01 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 13.60 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 14 |
| Tested By : | CL | Computed By : | CL | Rock tested : | | Checked By : | GRB | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 27-Jun-10 | Date : | 27-Jun-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 2.9 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 2.9 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 2.9 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 2.9 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 3.0 | | 0.10 | 0.10 | 0.02 | |
| P1 | 29 | 5 | 0:05:00 | 01:00 | 3.1 | | 0.10 | 0.10 | 0.02 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.20 | 0.05 | |
| | | | | | | | Average: | 0.040 | 0.010 | |
| | | 0 | 0:00:00 | 0 | 5.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.7 | | 0.40 | 0.40 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 5.8 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 5.9 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 5.9 | | 0.00 | 0.00 | 0.00 | |
| P2 | 66 | 5 | 0:05:00 | 01:00 | 5.9 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.60 | 0.15 | |
| | | | | | | | Average: | 0.120 | 0.030 | |
| | | 0 | 0:00:00 | 0 | 6.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 6.4 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 6.5 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 6.6 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 6.6 | | 0.00 | 0.00 | 0.00 | |
| P3 | 100 | 5 | 0:05:00 | 01:00 | 6.7 | | 0.10 | 0.10 | 0.02 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.30 | 0.07 | |
| | | | | | | | Average: | 0.060 | 0.015 | |
| | | 0 | 0:00:00 | 0 | 8.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 9.0 | | 0.50 | 0.50 | 0.12 | |
| | | 2 | 0:02:00 | 01:00 | 9.5 | | 0.50 | 0.50 | 0.12 | |
| | | 3 | 0:03:00 | 01:00 | 10.5 | | 1.00 | 1.00 | 0.25 | |
| | | 4 | 0:04:00 | 01:00 | 11.2 | | 0.70 | 0.70 | 0.17 | |
| P4 | 56 | 5 | 0:05:00 | 01:00 | 11.8 | | 0.60 | 0.60 | 0.15 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.30 | 0.82 | |
| | | | | | | | Average: | 0.660 | 0.165 | |
| | | 0 | 0:00:00 | 0 | 13.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 13.7 | | 0.30 | 0.30 | 0.07 | |
| | | 2 | 0:02:00 | 01:00 | 14.1 | | 0.40 | 0.40 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 14.7 | | 0.60 | 0.60 | 0.15 | |
| P5 | 30 | 4 | 0:04:00 | 01:00 | 14.9 | | 0.20 | 0.20 | 0.05 | |
| | | 5 | 0:05:00 | 01:00 | 15.2 | | 0.30 | 0.30 | 0.07 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.80 | 0.45 | |
| | | | | | | | Average: | 0.360 | 0.090 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

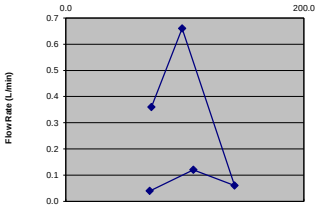
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.1 |
| P2 | 0.3 |
| P3 | 0.1 |
| P4 | 1.7 |
| P5 | 1.2 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 70.5 |
| 107.2 |
| 141.8 |
| 97.8 |
| 72.0 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.03 | kPa |
| Stage No. | P4 | |
| Gauge Pressure | 56 | kPa |
| Q | 0.66 | L/min |
| H | 10.0 | m |
| Interpreted Result | 1.7 | uL |

Reported Permeability at Stage P4

K = 2.0E-07 m/s

**Flow Type**

WASH-OUT

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

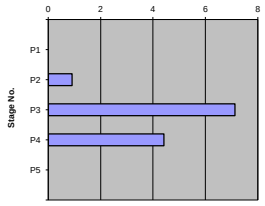
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+589.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.59 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 9.59 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 13 |
| Tested By : | CL | Computed By : | CL | Rock tested : | | Checked By : | GRB | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 27-Jun-10 | Date : | 27-Jun-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P1 | | 5 | 0:05:00 | 01:00 | | | | | | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 0.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 0.7 | | 0.10 | 0.10 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 0.7 | | 0.00 | 0.00 | 0.00 | |
| P2 | 24 | 5 | 0:05:00 | 01:00 | 0.9 | | 0.20 | 0.20 | 0.20 | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.30 | 0.30 | |
| | | | | | | | Average: | 0.060 | 0.060 | |
| | | 0 | 0:00:00 | 0 | 2.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 3.1 | | 0.60 | 0.60 | 0.60 | |
| | | 2 | 0:02:00 | 01:00 | 3.6 | | 0.50 | 0.50 | 0.50 | |
| | | 3 | 0:03:00 | 01:00 | 4.3 | | 0.70 | 0.70 | 0.70 | |
| | | 4 | 0:04:00 | 01:00 | 4.8 | | 0.50 | 0.50 | 0.50 | |
| P3 | 40 | 5 | 0:05:00 | 01:00 | 5.4 | | 0.60 | 0.60 | 0.60 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.90 | 2.90 | |
| | | | | | | | Average: | 0.580 | 0.580 | |
| | | 0 | 0:00:00 | 0 | 8.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 8.8 | | 0.30 | 0.30 | 0.30 | |
| | | 2 | 0:02:00 | 01:00 | 9.1 | | 0.30 | 0.30 | 0.30 | |
| | | 3 | 0:03:00 | 01:00 | 9.4 | | 0.30 | 0.30 | 0.30 | |
| | | 4 | 0:04:00 | 01:00 | 9.7 | | 0.30 | 0.30 | 0.30 | |
| P4 | 22 | 5 | 0:05:00 | 01:00 | 9.9 | | 0.20 | 0.20 | 0.20 | |
| | | 6 | | | | | | | | |
| 1/2 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.40 | 1.40 | |
| | | | | | | | Average: | 0.280 | 0.280 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

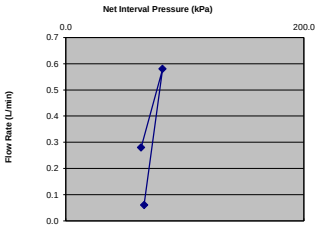
| Stage No. | Lugeon Value |
|---|---|
| P1 | -- |
| P2 | 0.9 |
| P3 | 7.1 |
| P4 | 4.4 |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| -- |
| 65.8 |
| 81.3 |
| 63.3 |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Av P2, P4 | |
| Gauge Pressure | 23 | kPa |
| Q | 0.17 | L/min |
| H | 6.6 | m |
| Interpreted Result | 2.7 | uL |

Reported Permeability at Stage Av P2, P4

K = 2.1E-07 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

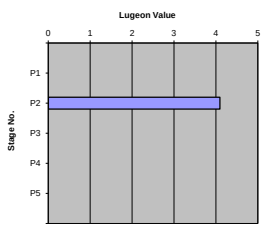
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+589.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 6.66 | Tested Length (m) : | 1.50 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 8.16 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | GRB | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 03-Jul-10 | Date : | 03-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 3.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 3.4 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 3.4 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 3.4 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 3.4 | | 0.00 | 0.00 | 0.00 | |
| P1 | 17 | 5 | 0:05:00 | 01:00 | 3.4 | | 0.00 | 0.00 | 0.00 | Stage 4 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 4.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.0 | | 0.30 | 0.30 | 0.20 | |
| | | 2 | 0:02:00 | 01:00 | 5.3 | | 0.30 | 0.30 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 5.8 | | 0.50 | 0.50 | 0.33 | |
| | | 4 | 0:04:00 | 01:00 | 6.2 | | 0.40 | 0.40 | 0.27 | |
| P2 | 30 | 5 | 0:05:00 | 01:00 | 6.9 | | 0.70 | 0.70 | 0.47 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.20 | 1.47 | |
| | | | | | | | Average: | 0.440 | 0.293 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

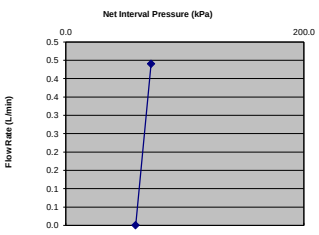
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.00 |
| P2 | 4.1 |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 58.7 |
| 71.7 |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | P2 | |
| Gauge Pressure | 30 | kPa |
| Q | 0.44 | L/min |
| H | 7.3 | m |
| Interpreted Result | 4.1 | uL |

Reported Permeability at Stage P2

K = 3.7E-07 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

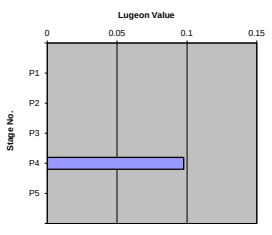
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+616.25 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.81 | Tested Length (m) : | 3.99 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 12.80 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 11 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Checked By : | VTR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-10 | Date : | 26-Jun-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.6 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 0.6 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 0.6 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 0.6 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 0.6 | | 0.00 | 0.00 | 0.00 | |
| P1 | 27 | 5 | 0:05:00 | 01:00 | 0.6 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 2.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 2.0 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 2.0 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 2.0 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 2.0 | | 0.00 | 0.00 | 0.00 | |
| P2 | 60 | 5 | 0:05:00 | 01:00 | 2.0 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 2.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 2.2 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 2.2 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 2.2 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 2.2 | | 0.00 | 0.00 | 0.00 | |
| P3 | 98 | 5 | 0:05:00 | 01:00 | 2.2 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 2.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 2.5 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 2.6 | | 0.10 | 0.10 | 0.03 | |
| | | 3 | 0:03:00 | 01:00 | 2.6 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 2.6 | | 0.00 | 0.00 | 0.00 | |
| P4 | 61 | 5 | 0:05:00 | 01:00 | 2.7 | | 0.10 | 0.10 | 0.03 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.20 | 0.05 | |
| | | | | | | | Average: | 0.040 | 0.010 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

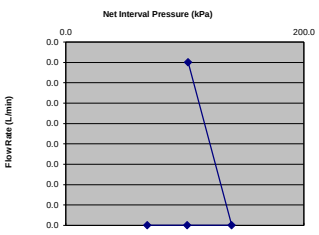
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.00 |
| P2 | 0.00 |
| P3 | 0.00 |
| P4 | 0.10 |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 68.5 |
| 102.0 |
| 139.3 |
| 102.7 |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P4 | |
| Gauge Pressure | 61 | kPa |
| Q | 0.04 | L/min |
| H | 10.5 | m |
| Interpreted Result | 0.1 | uL |

Reported Permeability at Stage P4

K = 1.1E-08 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

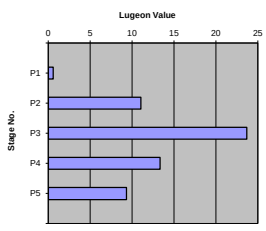
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+616.25 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.81 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 8.81 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 11 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Checked By : | VTR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-10 | Date : | 26-Jun-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 1.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 1.1 | | 0.10 | 0.10 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 1.1 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 1.1 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 1.2 | | 0.10 | 0.10 | 0.10 | |
| P1 | 24 | 5 | 0:05:00 | 01:00 | 1.2 | | 0.00 | 0.00 | 0.00 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.20 | 0.20 | |
| | | | | | | | Average: | 0.040 | 0.040 | |
| | | 0 | 0:00:00 | 0 | 9.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 10.4 | | 1.00 | 1.00 | 1.00 | |
| | | 2 | 0:02:00 | 01:00 | 11.3 | | 0.90 | 0.90 | 0.90 | |
| | | 3 | 0:03:00 | 01:00 | 12.2 | | 0.90 | 0.90 | 0.90 | |
| | | 4 | 0:04:00 | 01:00 | 13.0 | | 0.80 | 0.80 | 0.80 | |
| P2 | 40 | 5 | 0:05:00 | 01:00 | 13.9 | | 0.90 | 0.90 | 0.90 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 4.50 | 4.50 | |
| | | | | | | | Average: | 0.900 | 0.900 | |
| | | 0 | 0:00:00 | 0 | 25.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 28.3 | | 2.50 | 2.50 | 2.50 | |
| | | 2 | 0:02:00 | 01:00 | 31.3 | | 3.00 | 3.00 | 3.00 | |
| | | 3 | 0:03:00 | 01:00 | 33.3 | | 2.00 | 2.00 | 2.00 | |
| | | 4 | 0:04:00 | 01:00 | 35.5 | | 2.20 | 2.20 | 2.20 | |
| P3 | 59 | 5 | 0:05:00 | 01:00 | 37.7 | | 2.20 | 2.20 | 2.20 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 11.90 | 11.90 | |
| | | | | | | | Average: | 2.380 | 2.380 | |
| | | 0 | 0:00:00 | 0 | 43.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 43.9 | | 0.90 | 0.90 | 0.90 | |
| | | 2 | 0:02:00 | 01:00 | 45.1 | | 1.20 | 1.20 | 1.20 | |
| | | 3 | 0:03:00 | 01:00 | 46.3 | | 1.20 | 1.20 | 1.20 | |
| | | 4 | 0:04:00 | 01:00 | 47.4 | | 1.10 | 1.10 | 1.10 | |
| P4 | 41 | 5 | 0:05:00 | 01:00 | 48.5 | | 1.10 | 1.10 | 1.10 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.50 | 5.50 | |
| | | | | | | | Average: | 1.100 | 1.100 | |
| | | 0 | 0:00:00 | 0 | 50.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 51.4 | | 0.60 | 0.60 | 0.60 | |
| | | 2 | 0:02:00 | 01:00 | 51.9 | | 0.50 | 0.50 | 0.50 | |
| | | 3 | 0:03:00 | 01:00 | 52.4 | | 0.50 | 0.50 | 0.50 | |
| P5 | 18 | 4 | 0:04:00 | 01:00 | 52.8 | | 0.40 | 0.40 | 0.40 | |
| | | 5 | 0:05:00 | 01:00 | 53.6 | | 0.80 | 0.80 | 0.80 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.80 | 2.80 | |
| | | | | | | | Average: | 0.560 | 0.560 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

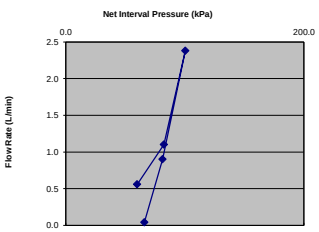
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.6 |
| P2 | 11.1 |
| P3 | 23.7 |
| P4 | 13.3 |
| P5 | 9.3 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 66.0 |
| 81.3 |
| 100.4 |
| 82.4 |
| 60.0 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.06 | kPa |
| Stage No. | Av P2, P4 | |
| Gauge Pressure | 40 | kPa |
| Q | 1.00 | L/min |
| H | 8.3 | m |
| Interpreted Result | 12.2 | uL |

Reported Permeability at Stage Av P2, P4

K = 9.9E-07 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

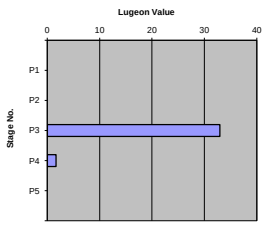
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+616.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 5.82 | Tested Length (m) : | 1.50 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 7.32 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | BB | Computed By : | BB | Rock tested : | | Checked By : | GRB | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 04-Jul-10 | Date : | 04-Jul-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P1 | | 5 | 0:05:00 | 01:00 | | | | | | Stage 4 |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 8.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 8.4 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 8.4 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 8.4 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 8.4 | | 0.00 | 0.00 | 0.00 | |
| P2 | 99 | 5 | 0:05:00 | 01:00 | 8.4 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 15.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 25.6 | | 10.20 | 10.20 | 6.80 | |
| | | 2 | 0:02:00 | 01:00 | 37.6 | | 12.00 | 12.00 | 8.00 | |
| | | 3 | 0:03:00 | 01:00 | 48.9 | | 11.30 | 11.30 | 7.53 | |
| | | 4 | 0:04:00 | 01:00 | 61.9 | | 13.00 | 13.00 | 8.67 | |
| P3 | 198 | 5 | 0:05:00 | 01:00 | 73.4 | | 11.50 | 11.50 | 7.67 | |
| | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 58.00 | 38.67 | |
| | | | | | | | Average: | 11.600 | 7.733 | |
| | | 0 | 0:00:00 | 0 | 77.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 77.1 | | 0.10 | 0.10 | 0.07 | |
| | | 2 | 0:02:00 | 01:00 | 77.4 | | 0.30 | 0.30 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 77.7 | | 0.30 | 0.30 | 0.20 | |
| | | 4 | 0:04:00 | 01:00 | 78.2 | | 0.50 | 0.50 | 0.33 | |
| P4 | 93 | 5 | 0:05:00 | 01:00 | 78.7 | | 0.50 | 0.50 | 0.33 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.70 | 1.13 | |
| | | | | | | | Average: | 0.340 | 0.227 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

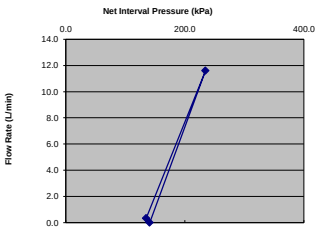
| Stage No. | Lugeon Value |
|---|---|
| P1 | -- |
| P2 | 0.00 |
| P3 | 33.0 |
| P4 | 1.7 |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| -- |
| 140.8 |
| 234.5 |
| 135.0 |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | P4 | |
| Gauge Pressure | 93 | kPa |
| Q | 0.34 | L/min |
| H | 13.8 | m |
| Interpreted Result | 1.7 | uL |

Reported Permeability at Stage P4

K = 1.5E-07 m/s

**Flow Type**

DILATION

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

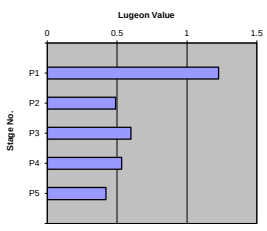
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+625.25 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.76 | Tested Length (m) : | 4.04 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 13.80 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 11 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Checked By : | VTR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-10 | Date : | 26-Jun-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.6 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 0.8 | | 0.20 | 0.20 | 0.05 | |
| | | 2 | 0:02:00 | 01:00 | 1.0 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 1.5 | | 0.50 | 0.50 | 0.12 | |
| | | 4 | 0:04:00 | 01:00 | 2.1 | | 0.60 | 0.60 | 0.15 | |
| P1 | 31 | 5 | 0:05:00 | 01:00 | 2.4 | | 0.30 | 0.30 | 0.07 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.80 | 0.45 | |
| | | | | | | | Average: | 0.360 | 0.089 | |
| | | 0 | 0:00:00 | 0 | 3.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 3.9 | | 0.10 | 0.10 | 0.02 | |
| | | 2 | 0:02:00 | 01:00 | 4.2 | | 0.30 | 0.30 | 0.07 | |
| | | 3 | 0:03:00 | 01:00 | 4.4 | | 0.20 | 0.20 | 0.05 | |
| | | 4 | 0:04:00 | 01:00 | 4.6 | | 0.20 | 0.20 | 0.05 | |
| P2 | 60 | 5 | 0:05:00 | 01:00 | 4.8 | | 0.20 | 0.20 | 0.05 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.00 | 0.25 | |
| | | | | | | | Average: | 0.200 | 0.050 | |
| | | 0 | 0:00:00 | 0 | 7.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 7.8 | | 0.40 | 0.40 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 8.1 | | 0.30 | 0.30 | 0.07 | |
| | | 3 | 0:03:00 | 01:00 | 8.4 | | 0.30 | 0.30 | 0.07 | |
| | | 4 | 0:04:00 | 01:00 | 8.7 | | 0.30 | 0.30 | 0.07 | |
| P3 | 99 | 5 | 0:05:00 | 01:00 | 9.1 | | 0.40 | 0.40 | 0.10 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.70 | 0.42 | |
| | | | | | | | Average: | 0.340 | 0.084 | |
| | | 0 | 0:00:00 | 0 | 11.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 11.8 | | 0.20 | 0.20 | 0.05 | |
| | | 2 | 0:02:00 | 01:00 | 12.0 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 12.3 | | 0.30 | 0.30 | 0.07 | |
| | | 4 | 0:04:00 | 01:00 | 12.4 | | 0.10 | 0.10 | 0.02 | |
| P4 | 61 | 5 | 0:05:00 | 01:00 | 12.7 | | 0.30 | 0.30 | 0.07 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.10 | 0.27 | |
| | | | | | | | Average: | 0.220 | 0.054 | |
| | | 0 | 0:00:00 | 0 | 13.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 13.5 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 13.8 | | 0.30 | 0.30 | 0.07 | |
| | | 3 | 0:03:00 | 01:00 | 13.9 | | 0.10 | 0.10 | 0.02 | |
| P5 | 29 | 4 | 0:04:00 | 01:00 | 14.0 | | 0.10 | 0.10 | 0.02 | |
| | | 5 | 0:05:00 | 01:00 | 14.1 | | 0.10 | 0.10 | 0.02 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.60 | 0.15 | |
| | | | | | | | Average: | 0.120 | 0.030 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

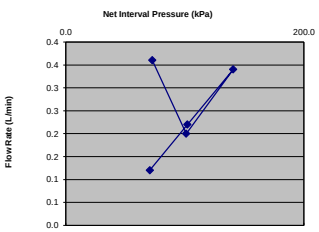
| Stage No. | Lugeon Value |
|---|---|
| P1 | 1.2 |
| P2 | 0.5 |
| P3 | 0.6 |
| P4 | 0.5 |
| P5 | 0.4 |

Lugeon Value Curve




| Net Pressures |
|---|
| 72.7 |
| 101.2 |
| 140.7 |
| 102.2 |
| 70.7 |

Flow vs. Pressure




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 56 | kPa |
| Q | 0.25 | L/min |
| H | 9.9 | m |
| Interpreted Result | 0.7 | uL |

Reported Permeability at Stage Average

K = 7.4E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

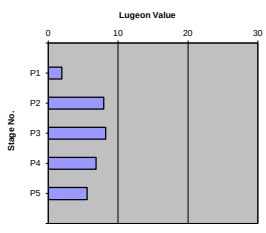
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+625.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.76 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 9.76 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 11 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-10 | Date : | 26-Jun-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.8 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 0.8 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 0.9 | | 0.10 | 0.10 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 1.0 | | 0.10 | 0.10 | 0.10 | |
| | | 4 | 0:04:00 | 01:00 | 1.3 | | 0.30 | 0.30 | 0.30 | |
| P1 | 20 | 5 | 0:05:00 | 01:00 | 1.4 | | 0.10 | 0.10 | 0.10 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.60 | 0.60 | |
| | | | | | | | Average: | 0.120 | 0.120 | |
| | | 0 | 0:00:00 | 0 | 4.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.6 | | 0.70 | 0.70 | 0.70 | |
| | | 2 | 0:02:00 | 01:00 | 6.2 | | 0.60 | 0.60 | 0.60 | |
| | | 3 | 0:03:00 | 01:00 | 6.9 | | 0.70 | 0.70 | 0.70 | |
| | | 4 | 0:04:00 | 01:00 | 7.5 | | 0.60 | 0.60 | 0.60 | |
| P2 | 39 | 5 | 0:05:00 | 01:00 | 8.1 | | 0.60 | 0.60 | 0.60 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.20 | 3.20 | |
| | | | | | | | Average: | 0.640 | 0.640 | |
| | | 0 | 0:00:00 | 0 | 11.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 12.4 | | 0.90 | 0.90 | 0.90 | |
| | | 2 | 0:02:00 | 01:00 | 13.2 | | 0.80 | 0.80 | 0.80 | |
| | | 3 | 0:03:00 | 01:00 | 14.0 | | 0.80 | 0.80 | 0.80 | |
| | | 4 | 0:04:00 | 01:00 | 14.9 | | 0.90 | 0.90 | 0.90 | |
| P3 | 58 | 5 | 0:05:00 | 01:00 | 15.6 | | 0.70 | 0.70 | 0.70 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 4.10 | 4.10 | |
| | | | | | | | Average: | 0.820 | 0.820 | |
| | | 0 | 0:00:00 | 0 | 17.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 17.7 | | 0.60 | 0.60 | 0.60 | |
| | | 2 | 0:02:00 | 01:00 | 18.2 | | 0.50 | 0.50 | 0.50 | |
| | | 3 | 0:03:00 | 01:00 | 18.8 | | 0.60 | 0.60 | 0.60 | |
| | | 4 | 0:04:00 | 01:00 | 19.4 | | 0.60 | 0.60 | 0.60 | |
| P4 | 40 | 5 | 0:05:00 | 01:00 | 19.9 | | 0.50 | 0.50 | 0.50 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.80 | 2.80 | |
| | | | | | | | Average: | 0.560 | 0.560 | |
| | | 0 | 0:00:00 | 0 | 23.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 23.6 | | 0.30 | 0.30 | 0.30 | |
| | | 2 | 0:02:00 | 01:00 | 24.0 | | 0.40 | 0.40 | 0.40 | |
| | | 3 | 0:03:00 | 01:00 | 24.4 | | 0.40 | 0.40 | 0.40 | |
| P5 | 20 | 4 | 0:04:00 | 01:00 | 24.7 | | 0.30 | 0.30 | 0.30 | |
| | | 5 | 0:05:00 | 01:00 | 25.0 | | 0.30 | 0.30 | 0.30 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.70 | 1.70 | |
| | | | | | | | Average: | 0.340 | 0.340 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

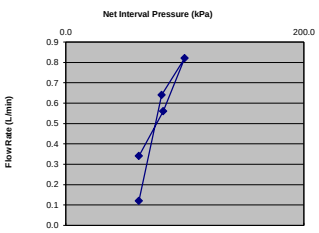
| Stage No. | Lugeon Value |
|---|---|
| P1 | 2.0 |
| P2 | 8.0 |
| P3 | 8.2 |
| P4 | 6.8 |
| P5 | 5.5 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 61.3 |
| 80.5 |
| 99.8 |
| 81.8 |
| 61.3 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.02 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 35 | kPa |
| Q | 0.50 | L/min |
| H | 7.8 | m |
| Interpreted Result | 6.1 | uL |

Reported Permeability at Stage Average

K = 5.2E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

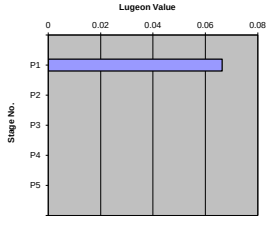
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+625.25 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 6.70 | Tested Length (m) : | 1.50 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 8.20 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | BB | Computed By : | GP | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 03-Jul-10 | Date : | 24-Jan-12 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 13.5 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 13.6 | | 0.02 | 0.02 | 0.01 | |
| | | 2 | 0:02:00 | 01:00 | 13.6 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 13.6 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 13.6 | | 0.01 | 0.01 | 0.01 | |
| P1 | 79 | 5 | 0:05:00 | 01:00 | 13.6 | | 0.00 | 0.00 | 0.00 | Stage 4 |
| | | 6 | 0:06:00 | 01:00 | 13.7 | | 0.08 | 0.08 | 0.05 | |
| 1/3 $P_{MAX}$ | | 7 | 0:07:00 | 01:00 | 13.7 | | 0.00 | 0.00 | 0.00 | |
| | | 8 | 0:08:00 | 01:00 | 13.7 | | 0.00 | 0.00 | 0.00 | |
| | | 9 | 0:09:00 | 01:00 | 13.7 | | 0.01 | 0.01 | 0.01 | |
| | | 10 | 0:10:00 | 01:00 | 13.7 | 0.1000 | 0.00 | 0.00 | 0.00 | |
| | | | | | | | Total : | 0.12 | 0.08 | |
| | | | | | | | Average: | 0.012 | 0.008 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P2 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

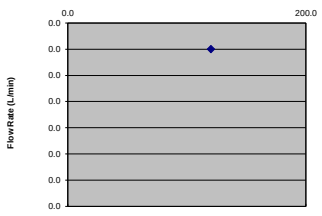
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.1 |
| P2 | -- |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 120.4 |
| -- |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P1 | |
| Gauge Pressure | 79 | kPa |
| Q | 0.01 | L/min |
| H | 12.3 | m |
| Interpreted Result | 0.1 | uL |

Reported Permeability at Stage P1

K = 6.1E-09 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

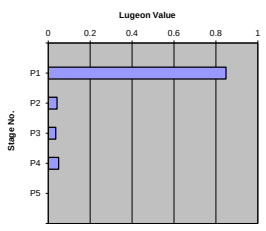
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-30+709.25 | Drilling Method : | Air-Rotary | | | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 11.06 | Tested Length (m) : | 3.95 | | | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 15.01 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Checked By : | VTR | Presumed Water Temperature : | 8 |
| Date : | 25-Jun-10 | Date : | 25-Jun-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | Casing Inner Diameter (mm ) : | 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.9 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 1.0 | | 0.10 | 0.10 | 0.03 | |
| | | 2 | 0:02:00 | 01:00 | 1.1 | | 0.10 | 0.10 | 0.03 | |
| | | 3 | 0:03:00 | 01:00 | 1.4 | | 0.30 | 0.30 | 0.08 | |
| | | 4 | 0:04:00 | 01:00 | 1.7 | | 0.30 | 0.30 | 0.08 | |
| P1 | 30 | 5 | 0:05:00 | 01:00 | 2.1 | | 0.40 | 0.40 | 0.10 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.20 | 0.30 | |
| | | | | | | | Average: | 0.240 | 0.061 | |
| | | 0 | 0:00:00 | 0 | 2.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 2.2 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 2.2 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 2.2 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 2.2 | | 0.00 | 0.00 | 0.00 | |
| P2 | 80 | 5 | 0:05:00 | 01:00 | 2.3 | | 0.10 | 0.10 | 0.03 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | 2.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 2.3 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 2.3 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 2.3 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 2.3 | | 0.00 | 0.00 | 0.00 | |
| P3 | 100 | 5 | 0:05:00 | 01:00 | 2.4 | | 0.10 | 0.10 | 0.03 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | 3.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 4.0 | | 0.10 | 0.10 | 0.03 | |
| | | 2 | 0:02:00 | 01:00 | 4.0 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 4.0 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 4.0 | | 0.00 | 0.00 | 0.00 | |
| P4 | 60 | 5 | 0:05:00 | 01:00 | 4.0 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

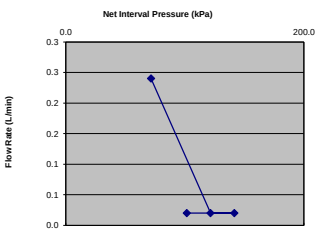
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.85 |
| P2 | 0.04 |
| P3 | 0.04 |
| P4 | 0.05 |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 71.7 |
| 121.7 |
| 141.7 |
| 101.7 |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P4 | |
| Gauge Pressure | 60 | kPa |
| Q | 0.02 | L/min |
| H | 10.4 | m |
| Interpreted Result | 0.05 | uL |

Reported Permeability at Stage P4

K = 5.8E-09 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

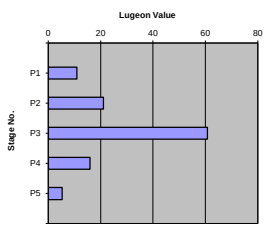
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+709.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.06 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 11.06 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Checked By : | VTR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 25-Jun-10 | Date : | 25-Jun-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 1.2 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 1.7 | | 0.50 | 0.50 | 0.50 | |
| | | 2 | 0:02:00 | 01:00 | 2.6 | | 0.90 | 0.90 | 0.90 | |
| | | 3 | 0:03:00 | 01:00 | 3.4 | | 0.80 | 0.80 | 0.80 | |
| | | 4 | 0:04:00 | 01:00 | 4.2 | | 0.80 | 0.80 | 0.80 | |
| P1 | 30 | 5 | 0:05:00 | 01:00 | 5.1 | | 0.90 | 0.90 | 0.90 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.90 | 3.90 | |
| | | | | | | | Average: | 0.780 | 0.780 | |
| | | 0 | 0:00:00 | 0 | 10.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 12.6 | | 2.50 | 2.50 | 2.50 | |
| | | 2 | 0:02:00 | 01:00 | 14.5 | | 1.90 | 1.90 | 1.90 | |
| | | 3 | 0:03:00 | 01:00 | 16.9 | | 2.40 | 2.40 | 2.40 | |
| | | 4 | 0:04:00 | 01:00 | 18.8 | | 1.90 | 1.90 | 1.90 | |
| P2 | 60 | 5 | 0:05:00 | 01:00 | 20.8 | | 2.00 | 2.00 | 2.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 10.70 | 10.70 | |
| | | | | | | | Average: | 2.140 | 2.140 | |
| | | 0 | 0:00:00 | 0 | 47.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 56.5 | | 9.30 | 9.30 | 9.30 | |
| | | 2 | 0:02:00 | 01:00 | 64.5 | | 8.00 | 8.00 | 8.00 | |
| | | 3 | 0:03:00 | 01:00 | 72.7 | | 8.20 | 8.20 | 8.20 | |
| | | 4 | 0:04:00 | 01:00 | 80.9 | | 8.20 | 8.20 | 8.20 | |
| P3 | 100 | 5 | 0:05:00 | 01:00 | 89.2 | | 8.30 | 8.30 | 8.30 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 42.00 | 42.00 | |
| | | | | | | | Average: | 8.400 | 8.400 | |
| | | 0 | 0:00:00 | 0 | 106.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 107.8 | | 1.20 | 1.20 | 1.20 | |
| | | 2 | 0:02:00 | 01:00 | 109.2 | | 1.40 | 1.40 | 1.40 | |
| | | 3 | 0:03:00 | 01:00 | 110.9 | | 1.70 | 1.70 | 1.70 | |
| | | 4 | 0:04:00 | 01:00 | 112.8 | | 1.90 | 1.90 | 1.90 | |
| P4 | 60 | 5 | 0:05:00 | 01:00 | 114.7 | | 1.90 | 1.90 | 1.90 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 8.10 | 8.10 | |
| | | | | | | | Average: | 1.620 | 1.620 | |
| | | 0 | 0:00:00 | 0 | 115.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 115.4 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 115.5 | | 0.10 | 0.10 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 115.9 | | 0.40 | 0.40 | 0.40 | |
| P5 | 30 | 4 | 0:04:00 | 01:00 | 116.5 | | 0.60 | 0.60 | 0.60 | |
| | | 5 | 0:05:00 | 01:00 | 117.3 | | 0.80 | 0.80 | 0.80 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.90 | 1.90 | |
| | | | | | | | Average: | 0.380 | 0.380 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

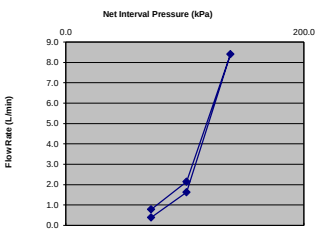
| Stage No. | Lugeon Value |
|---|---|
| P1 | 10.9 |
| P2 | 21.1 |
| P3 | 60.7 |
| P4 | 16.0 |
| P5 | 5.3 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 71.6 |
| 101.4 |
| 138.3 |
| 101.5 |
| 71.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.12 | kPa |
| Stage No. | Av P1,P2,P4,P5 | |
| Gauge Pressure | 45 | kPa |
| Q | 1.23 | L/min |
| H | 8.8 | m |
| Interpreted Result | 13.3 | uL |

Reported Permeability at Stage Av P1,P2,P4,P5

K = 1.2E-06 m/s

**Flow Type**

DILATION

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

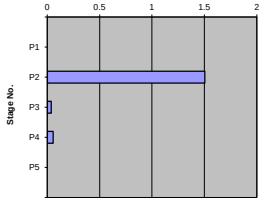
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-30+724.25 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.83 | Tested Length (m) : | 3.57 | Vertical depth to Groundwater: Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 14.40 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Presumed Water Temperature : | 8 |
| Date : | 25-Jun-10 | Date : | 25-Jun-10 | Water Meter Reading in : | Litres | Checked By : VTR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P1 | | 5 | 0:05:00 | 01:00 | | | | | | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 12.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 12.7 | | 0.60 | 0.60 | 0.17 | |
| | | 2 | 0:02:00 | 01:00 | 13.3 | | 0.60 | 0.60 | 0.17 | |
| | | 3 | 0:03:00 | 01:00 | 14.0 | | 0.70 | 0.70 | 0.20 | |
| | | 4 | 0:04:00 | 01:00 | 14.7 | | 0.70 | 0.70 | 0.20 | |
| P2 | 85 | 5 | 0:05:00 | 01:00 | 15.5 | | 0.80 | 0.80 | 0.22 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.40 | 0.95 | |
| | | | | | | | Average: | 0.680 | 0.190 | |
| | | 0 | 0:00:00 | 0 | 17.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 17.1 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 17.1 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 17.1 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 17.2 | | 0.10 | 0.10 | 0.03 | |
| P3 | 104 | 5 | 0:05:00 | 01:00 | 17.2 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.006 | |
| | | 0 | 0:00:00 | 0 | 17.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 17.6 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 17.6 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 17.6 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 17.7 | | 0.10 | 0.10 | 0.03 | |
| P4 | 60 | 5 | 0:05:00 | 01:00 | 17.7 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.006 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

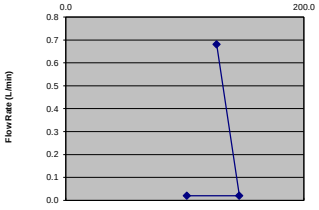
| Stage No. | Lugeon Value |
|---|---|
| P1 | -- |
| P2 | 1.5 |
| P3 | 0.04 |
| P4 | 0.1 |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| -- |
| 126.6 |
| 145.7 |
| 101.7 |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P4 | |
| Gauge Pressure | 60 | kPa |
| Q | 0.02 | L/min |
| H | 10.4 | m |
| Interpreted Result | 0.1 | uL |

Reported Permeability at Stage P4

K = 6.3E-09 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

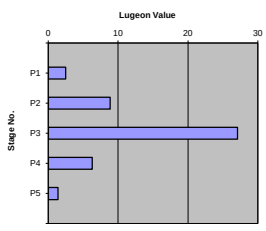
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+724.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.83 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 10.83 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | GRB | Computed By : | GRB | Rock tested : | | Checked By : | VTR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 25-Jun-10 | Date : | 25-Jun-10 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 1.2 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 2.0 | | 0.80 | 0.80 | 0.80 | |
| | | 2 | 0:02:00 | 01:00 | 2.0 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 2.0 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 2.0 | | 0.00 | 0.00 | 0.00 | |
| P1 | 30 | 5 | 0:05:00 | 01:00 | 2.1 | | 0.10 | 0.10 | 0.10 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.90 | 0.90 | |
| | | | | | | | Average: | 0.180 | 0.180 | |
| | | 0 | 0:00:00 | 0 | 4.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.2 | | 1.20 | 1.20 | 1.20 | |
| | | 2 | 0:02:00 | 01:00 | 5.9 | | 0.70 | 0.70 | 0.70 | |
| | | 3 | 0:03:00 | 01:00 | 6.8 | | 0.90 | 0.90 | 0.90 | |
| | | 4 | 0:04:00 | 01:00 | 7.8 | | 1.00 | 1.00 | 1.00 | |
| P2 | 60 | 5 | 0:05:00 | 01:00 | 8.5 | | 0.70 | 0.70 | 0.70 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 4.50 | 4.50 | |
| | | | | | | | Average: | 0.900 | 0.900 | |
| | | 0 | 0:00:00 | 0 | 26.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 29.2 | | 3.10 | 3.10 | 3.10 | |
| | | 2 | 0:02:00 | 01:00 | 33.6 | | 4.40 | 4.40 | 4.40 | |
| | | 3 | 0:03:00 | 01:00 | 37.7 | | 4.10 | 4.10 | 4.10 | |
| | | 4 | 0:04:00 | 01:00 | 41.2 | | 3.50 | 3.50 | 3.50 | |
| P3 | 100 | 5 | 0:05:00 | 01:00 | 45.2 | | 4.00 | 4.00 | 4.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 19.10 | 19.10 | |
| | | | | | | | Average: | 3.820 | 3.820 | |
| | | 0 | 0:00:00 | 0 | 53.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 53.8 | | 0.60 | 0.60 | 0.60 | |
| | | 2 | 0:02:00 | 01:00 | 54.1 | | 0.30 | 0.30 | 0.30 | |
| | | 3 | 0:03:00 | 01:00 | 54.7 | | 0.60 | 0.60 | 0.60 | |
| | | 4 | 0:04:00 | 01:00 | 55.5 | | 0.80 | 0.80 | 0.80 | |
| P4 | 60 | 5 | 0:05:00 | 01:00 | 56.4 | | 0.90 | 0.90 | 0.90 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.20 | 3.20 | |
| | | | | | | | Average: | 0.640 | 0.640 | |
| | | 0 | 0:00:00 | 0 | 56.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 56.6 | | 0.10 | 0.10 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 56.6 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 56.8 | | 0.20 | 0.20 | 0.20 | |
| P5 | 30 | 4 | 0:04:00 | 01:00 | 57.0 | | 0.20 | 0.20 | 0.20 | |
| | | 5 | 0:05:00 | 01:00 | 57.0 | | 0.00 | 0.00 | 0.00 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.50 | 0.50 | |
| | | | | | | | Average: | 0.100 | 0.100 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

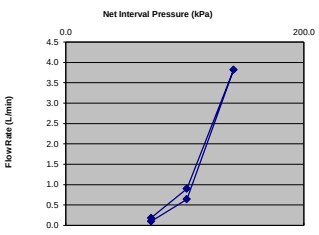
| Stage No. | Lugeon Value |
|---|---|
| P1 | 2.5 |
| P2 | 8.9 |
| P3 | 27.1 |
| P4 | 6.3 |
| P5 | 1.4 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 71.7 |
| 101.6 |
| 140.9 |
| 101.6 |
| 71.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.02 | kPa |
| Stage No. | Av P1,P2,P4,P5 | |
| Gauge Pressure | 45 | kPa |
| Q | 0.46 | L/min |
| H | 8.8 | m |
| Interpreted Result | 4.8 | uL |

Reported Permeability at Stage Av P1,P2,P4,P5

K = 4.3E-07 m/s

**Flow Type**

DILATION

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

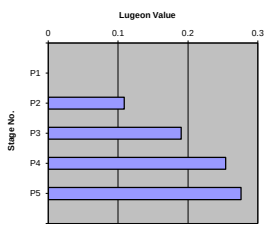
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-30+997.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 5.22 | Tested Length (m) : | 4.28 | | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 9.50 | Packer Type : | Pneumatic - Non-Wireline - Single | | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : VR | Presumed Water Temperature : | 8 |
| Date : | 09-Mar-11 | Date : | 09-Mar-11 | Water Meter Reading in : | Litres | Date : 26-Mar-12 | Casing Inner Diameter (mm ) : | 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P1 | | 5 | 0:05:00 | 01:00 | | | | | | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 31.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 31.8 | | 0.10 | 0.10 | 0.02 | |
| | | 2 | 0:02:00 | 01:00 | 31.8 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 31.8 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 31.8 | | 0.00 | 0.00 | 0.00 | |
| P2 | 87 | 5 | 0:05:00 | 01:00 | 32.0 | | 0.20 | 0.20 | 0.05 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.30 | 0.07 | |
| | | | | | | | Average: | 0.060 | 0.014 | |
| | | 0 | 0:00:00 | 0 | 33.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 33.3 | | 0.20 | 0.20 | 0.05 | |
| | | 2 | 0:02:00 | 01:00 | 33.4 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 33.6 | | 0.20 | 0.20 | 0.05 | |
| | | 4 | 0:04:00 | 01:00 | 33.7 | | 0.10 | 0.10 | 0.02 | |
| P3 | 130 | 5 | 0:05:00 | 01:00 | 33.8 | | 0.10 | 0.10 | 0.02 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.70 | 0.16 | |
| | | | | | | | Average: | 0.140 | 0.033 | |
| | | 0 | 0:00:00 | 0 | 34.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 34.9 | | 0.20 | 0.20 | 0.05 | |
| | | 2 | 0:02:00 | 01:00 | 35.0 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 35.2 | | 0.20 | 0.20 | 0.05 | |
| | | 4 | 0:04:00 | 01:00 | 35.3 | | 0.10 | 0.10 | 0.02 | |
| P4 | 87 | 5 | 0:05:00 | 01:00 | 35.4 | | 0.10 | 0.10 | 0.02 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.70 | 0.16 | |
| | | | | | | | Average: | 0.140 | 0.033 | |
| | | 0 | 0:00:00 | 0 | 35.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 35.6 | | 0.10 | 0.10 | 0.02 | |
| | | 2 | 0:02:00 | 01:00 | 35.8 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 35.8 | | 0.00 | 0.00 | 0.00 | |
| P5 | 43 | 4 | 0:04:00 | 01:00 | 35.8 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 36.0 | | 0.20 | 0.20 | 0.05 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.50 | 0.12 | |
| | | | | | | | Average: | 0.100 | 0.023 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

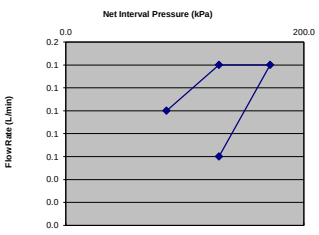
| Stage No. | Lugeon Value |
|---|---|
| P1 | -- |
| P2 | 0.1 |
| P3 | 0.2 |
| P4 | 0.3 |
| P5 | 0.3 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| -- |
| 128.7 |
| 171.7 |
| 128.7 |
| 84.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P5 | |
| Gauge Pressure | 43 | kPa |
| Q | 0.10 | L/min |
| H | 8.6 | m |
| Interpreted Result | 0.3 | uL |

Reported Permeability at Stage P5

K = 3.3E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

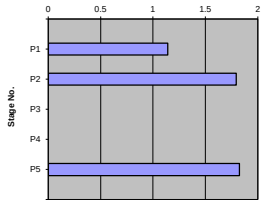
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-30+997.25 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 4.22 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 5.22 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 09-Mar-11 | Date : | 09-Mar-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 1.2 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 1.2 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 1.4 | | 0.20 | 0.20 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 1.5 | | 0.10 | 0.10 | 0.10 | |
| | | 4 | 0:04:00 | 01:00 | 1.5 | | 0.00 | 0.00 | 0.00 | |
| P1 | 46 | 5 | 0:05:00 | 01:00 | 1.7 | | 0.20 | 0.20 | 0.20 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.50 | 0.50 | |
| | | | | | | | Average: | 0.100 | 0.100 | |
| | | 0 | 0:00:00 | 0 | 2.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 2.5 | | 0.20 | 0.20 | 0.20 | |
| | | 2 | 0:02:00 | 01:00 | 2.8 | | 0.30 | 0.30 | 0.30 | |
| | | 3 | 0:03:00 | 01:00 | 3.0 | | 0.20 | 0.20 | 0.20 | |
| | | 4 | 0:04:00 | 01:00 | 3.3 | | 0.30 | 0.30 | 0.30 | |
| P2 | 92 | 5 | 0:05:00 | 01:00 | 3.5 | | 0.20 | 0.20 | 0.20 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.20 | 1.20 | |
| | | | | | | | Average: | 0.240 | 0.240 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 3.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 4.0 | | 0.10 | 0.10 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 4.2 | | 0.20 | 0.20 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 4.4 | | 0.20 | 0.20 | 0.20 | |
| P5 | 46 | 4 | 0:04:00 | 01:00 | 4.5 | | 0.10 | 0.10 | 0.10 | |
| | | 5 | 0:05:00 | 01:00 | 4.7 | | 0.20 | 0.20 | 0.20 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.80 | 0.80 | |
| | | | | | | | Average: | 0.160 | 0.160 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

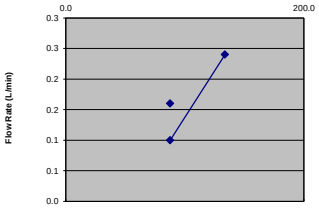
| Stage No. | Lugeon Value |
|---|---|
| P1 | 1.1 |
| P2 | 1.8 |
| P3 | -- |
| P4 | -- |
| P5 | 1.8 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 87.7 |
| 133.7 |
| -- |
| -- |
| 87.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 61 | kPa |
| Q | 0.17 | L/min |
| H | 10.5 | m |
| Interpreted Result | 1.6 | uL |

Reported Permeability at Stage Average

K = 1.3E-07 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

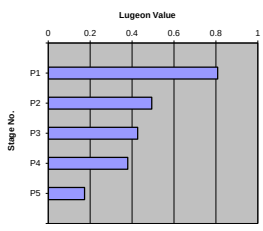
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+012.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 6.61 | Tested Length (m) : | 4.09 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 10.70 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 09-Mar-11 | Date : | 09-Mar-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 2.8 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 3.3 | | 0.50 | 0.50 | 0.12 | |
| | | 2 | 0:02:00 | 01:00 | 3.5 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 3.9 | | 0.40 | 0.40 | 0.10 | |
| | | 4 | 0:04:00 | 01:00 | 4.0 | | 0.10 | 0.10 | 0.02 | |
| P1 | 43 | 5 | 0:05:00 | 01:00 | 4.2 | | 0.20 | 0.20 | 0.05 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.40 | 0.34 | |
| | | | | | | | Average: | 0.280 | 0.068 | |
| | | 0 | 0:00:00 | 0 | 4.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.0 | | 0.30 | 0.30 | 0.07 | |
| | | 2 | 0:02:00 | 01:00 | 5.3 | | 0.30 | 0.30 | 0.07 | |
| | | 3 | 0:03:00 | 01:00 | 5.6 | | 0.30 | 0.30 | 0.07 | |
| | | 4 | 0:04:00 | 01:00 | 5.8 | | 0.20 | 0.20 | 0.05 | |
| P2 | 87 | 5 | 0:05:00 | 01:00 | 6.0 | | 0.20 | 0.20 | 0.05 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.30 | 0.32 | |
| | | | | | | | Average: | 0.260 | 0.064 | |
| | | 0 | 0:00:00 | 0 | 7.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 7.5 | | 0.40 | 0.40 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 7.8 | | 0.30 | 0.30 | 0.07 | |
| | | 3 | 0:03:00 | 01:00 | 8.0 | | 0.20 | 0.20 | 0.05 | |
| | | 4 | 0:04:00 | 01:00 | 8.3 | | 0.30 | 0.30 | 0.07 | |
| P3 | 130 | 5 | 0:05:00 | 01:00 | 8.6 | | 0.30 | 0.30 | 0.07 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.50 | 0.37 | |
| | | | | | | | Average: | 0.300 | 0.073 | |
| | | 0 | 0:00:00 | 0 | 10.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 10.6 | | 0.20 | 0.20 | 0.05 | |
| | | 2 | 0:02:00 | 01:00 | 10.8 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 11.0 | | 0.20 | 0.20 | 0.05 | |
| | | 4 | 0:04:00 | 01:00 | 11.2 | | 0.20 | 0.20 | 0.05 | |
| P4 | 87 | 5 | 0:05:00 | 01:00 | 11.4 | | 0.20 | 0.20 | 0.05 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.00 | 0.24 | |
| | | | | | | | Average: | 0.200 | 0.049 | |
| | | 0 | 0:00:00 | 0 | 11.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 11.6 | | 0.20 | 0.20 | 0.05 | |
| | | 2 | 0:02:00 | 01:00 | 11.6 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 11.7 | | 0.10 | 0.10 | 0.02 | |
| P5 | 43 | 4 | 0:04:00 | 01:00 | 11.7 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 11.7 | | 0.00 | 0.00 | 0.00 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.30 | 0.07 | |
| | | | | | | | Average: | 0.060 | 0.015 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

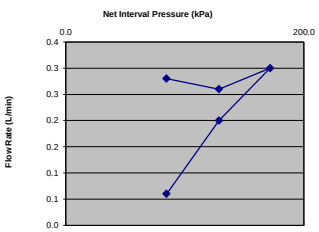
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.8 |
| P2 | 0.5 |
| P3 | 0.4 |
| P4 | 0.4 |
| P5 | 0.2 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 84.7 |
| 128.7 |
| 171.7 |
| 128.7 |
| 84.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P5 | |
| Gauge Pressure | 43 | kPa |
| Q | 0.06 | L/min |
| H | 8.6 | m |
| Interpreted Result | 0.2 | uL |

Reported Permeability at Stage P5

K = 2.0E-08 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

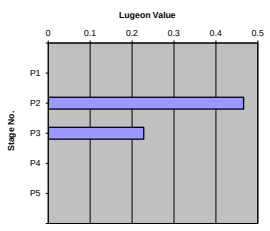
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+012.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 5.61 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 6.61 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | KG | Computed By : | KG | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 09-Mar-11 | Date : | 09-Mar-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P1 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 0.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 0.7 | | 0.10 | 0.10 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 0.8 | | 0.10 | 0.10 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 0.8 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 0.8 | | 0.00 | 0.00 | 0.00 | |
| P2 | 87 | 5 | 0:05:00 | 01:00 | 0.9 | | 0.10 | 0.10 | 0.10 | |
| | | 6 | | | 1.0 | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | 1.0 | | 0.00 | | | |
| | | 8 | | | 1.0 | | 0.00 | | | |
| | | 9 | | | 1.1 | | 0.10 | | | |
| | | 10 | | | 1.1 | | 0.00 | | | |
| | | | | | | | Total : | 0.30 | 0.30 | |
| | | | | | | | Average: | 0.060 | 0.060 | |
| | | 0 | 0:00:00 | 0 | 1.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 1.3 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 1.3 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 1.4 | | 0.10 | 0.10 | 0.10 | |
| | | 4 | 0:04:00 | 01:00 | 1.4 | | 0.00 | 0.00 | 0.00 | |
| P3 | 46 | 5 | 0:05:00 | 01:00 | 1.4 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.10 | |
| | | | | | | | Average: | 0.020 | 0.020 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

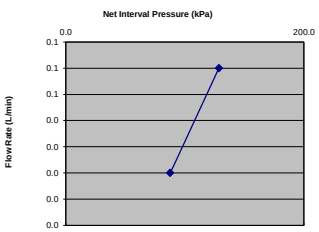
| Stage No. | Lugeon Value |
|---|---|
| P1 | -- |
| P2 | 0.5 |
| P3 | 0.2 |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| -- |
| 128.7 |
| 87.7 |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 67 | kPa |
| Q | 0.04 | L/min |
| H | 11.0 | m |
| Interpreted Result | 0.3 | uL |

Reported Permeability at Stage Average

K = 3.0E-08 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

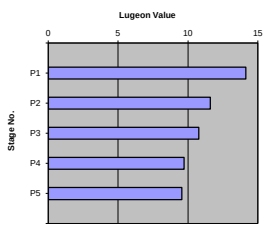
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+036.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.49 | Tested Length (m) : | 2.51 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 12.00 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | CDL | Computed By : | CDL | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 14-Apr-11 | Date : | 14-Apr-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 27.9 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 31.0 | | 3.10 | 3.10 | 1.24 | |
| | | 2 | 0:02:00 | 01:00 | 34.1 | | 3.10 | 3.10 | 1.24 | |
| | | 3 | 0:03:00 | 01:00 | 36.7 | | 2.60 | 2.60 | 1.04 | |
| | | 4 | 0:04:00 | 01:00 | 40.5 | | 3.80 | 3.80 | 1.51 | |
| P1 | 43 | 5 | 0:05:00 | 01:00 | 43.4 | | 2.90 | 2.90 | 1.16 | Stage 2 |
| | | 6 | 0:06:00 | 01:00 | 46.2 | | 2.80 | 2.80 | 1.12 | |
| 1/3 $P_{MAX}$ | | 7 | 0:07:00 | 01:00 | 49.0 | | 2.80 | 2.80 | 1.12 | |
| | | 8 | 0:08:00 | 01:00 | 52.0 | | 3.00 | 3.00 | 1.20 | |
| | | 9 | 0:09:00 | 01:00 | 54.9 | | 2.90 | 2.90 | 1.16 | |
| | | 10 | 0:10:00 | 01:00 | 57.8 | | 2.90 | 2.90 | 1.16 | |
| | | | | | | | Total : | 29.90 | 11.91 | |
| | | | | | | | Average: | 2.990 | 1.191 | |
| | | 0 | 0:00:00 | 0 | 67.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 70.1 | | 3.00 | 3.00 | 1.20 | |
| | | 2 | 0:02:00 | 01:00 | 75.3 | | 5.20 | 5.20 | 2.07 | |
| | | 3 | 0:03:00 | 01:00 | 79.3 | | 4.00 | 4.00 | 1.59 | |
| | | 4 | 0:04:00 | 01:00 | 83.0 | | 3.70 | 3.70 | 1.47 | |
| P2 | 86 | 5 | 0:05:00 | 01:00 | 87.1 | | 4.10 | 4.10 | 1.63 | |
| | | 6 | 0:06:00 | 01:00 | 90.5 | | 3.40 | 3.40 | 1.35 | |
| 2/3 $P_{MAX}$ | | 7 | 0:07:00 | 01:00 | 94.0 | | 3.50 | 3.50 | 1.39 | |
| | | 8 | 0:08:00 | 01:00 | 97.5 | | 3.50 | 3.50 | 1.39 | |
| | | 9 | 0:09:00 | 01:00 | 101.0 | | 3.50 | 3.50 | 1.39 | |
| | | 10 | 0:10:00 | 01:00 | 104.1 | | 3.10 | 3.10 | 1.24 | |
| | | | | | | | Total : | 37.00 | 14.74 | |
| | | | | | | | Average: | 3.700 | 1.474 | |
| | | 0 | 0:00:00 | 0 | 118.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 123.0 | | 5.00 | 5.00 | 1.99 | |
| | | 2 | 0:02:00 | 01:00 | 127.7 | | 4.70 | 4.70 | 1.87 | |
| | | 3 | 0:03:00 | 01:00 | 132.3 | | 4.60 | 4.60 | 1.83 | |
| | | 4 | 0:04:00 | 01:00 | 136.4 | | 4.10 | 4.10 | 1.63 | |
| P3 | 130 | 5 | 0:05:00 | 01:00 | 141.1 | | 4.70 | 4.70 | 1.87 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 23.10 | 9.20 | |
| | | | | | | | Average: | 4.620 | 1.841 | |
| | | 0 | 0:00:00 | 0 | 147.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 150.9 | | 3.50 | 3.50 | 1.39 | |
| | | 2 | 0:02:00 | 01:00 | 154.1 | | 3.20 | 3.20 | 1.27 | |
| | | 3 | 0:03:00 | 01:00 | 157.0 | | 2.90 | 2.90 | 1.16 | |
| | | 4 | 0:04:00 | 01:00 | 159.9 | | 2.90 | 2.90 | 1.16 | |
| P4 | 86 | 5 | 0:05:00 | 01:00 | 162.9 | | 3.00 | 3.00 | 1.20 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 15.50 | 6.18 | |
| | | | | | | | Average: | 3.100 | 1.235 | |
| | | 0 | 0:00:00 | 0 | 168.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 170.3 | | 2.30 | 2.30 | 0.92 | |
| | | 2 | 0:02:00 | 01:00 | 172.5 | | 2.20 | 2.20 | 0.88 | |
| | | 3 | 0:03:00 | 01:00 | 174.6 | | 2.10 | 2.10 | 0.84 | |
| P5 | 47 | 4 | 0:04:00 | 01:00 | 176.8 | | 2.20 | 2.20 | 0.88 | |
| | | 5 | 0:05:00 | 01:00 | 178.6 | | 1.80 | 1.80 | 0.72 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 10.60 | 4.22 | |
| | | | | | | | Average: | 2.120 | 0.845 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

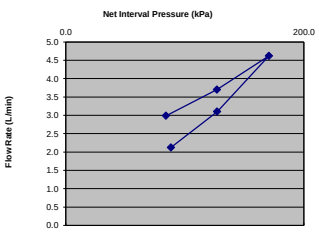
| Stage No. | Lugeon Value |
|---|---|
| P1 | 14.1 |
| P2 | 11.6 |
| P3 | 10.8 |
| P4 | 9.7 |
| P5 | 9.6 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 84.2 |
| 127.0 |
| 170.6 |
| 127.2 |
| 88.4 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.26 | kPa |
| Stage No. | P5 | |
| Gauge Pressure | 47 | kPa |
| Q | 2.12 | L/min |
| H | 9.0 | m |
| Interpreted Result | 9.6 | uL |

Reported Permeability at Stage P5

K = 1.0E-06 m/s

**Flow Type**

VOID FILLING

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

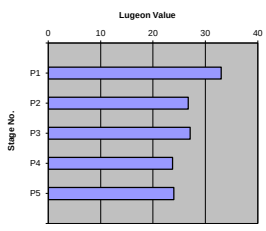
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+036.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.49 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 9.49 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 8 |
| Tested By : | CDL | Computed By : | CDL | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 14-Apr-11 | Date : | 14-Apr-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 43.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 46.3 | | 2.90 | 2.90 | 2.90 | |
| | | 2 | 0:02:00 | 01:00 | 49.0 | | 2.70 | 2.70 | 2.70 | |
| | | 3 | 0:03:00 | 01:00 | 52.0 | | 3.00 | 3.00 | 3.00 | |
| | | 4 | 0:04:00 | 01:00 | 54.9 | | 2.90 | 2.90 | 2.90 | |
| P1 | 46 | 5 | 0:05:00 | 01:00 | 57.8 | | 2.90 | 2.90 | 2.90 | Stage 3 |
| | | | | | | | | | | |
| 1/3 $P_{MAX}$ | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | Total : | 14.40 | 14.40 | |
| | | | | | | | Average: | 2.880 | 2.880 | |
| | | 0 | 0:00:00 | 0 | 87.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 90.5 | | 3.40 | 3.40 | 3.40 | |
| | | 2 | 0:02:00 | 01:00 | 94.0 | | 3.50 | 3.50 | 3.50 | |
| | | 3 | 0:03:00 | 01:00 | 97.5 | | 3.50 | 3.50 | 3.50 | |
| | | 4 | 0:04:00 | 01:00 | 101.0 | | 3.50 | 3.50 | 3.50 | |
| P2 | 86 | 5 | 0:05:00 | 01:00 | 104.1 | | 3.10 | 3.10 | 3.10 | |
| | | | | | | | | | | |
| 2/3 $P_{MAX}$ | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | Total : | 17.00 | 17.00 | |
| | | | | | | | Average: | 3.400 | 3.400 | |
| | | 0 | 0:00:00 | 0 | 118.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 123.0 | | 5.00 | 5.00 | 5.00 | |
| | | 2 | 0:02:00 | 01:00 | 127.7 | | 4.70 | 4.70 | 4.70 | |
| | | 3 | 0:03:00 | 01:00 | 132.3 | | 4.60 | 4.60 | 4.60 | |
| | | 4 | 0:04:00 | 01:00 | 136.4 | | 4.10 | 4.10 | 4.10 | |
| P3 | 130 | 5 | 0:05:00 | 01:00 | 141.1 | | 4.70 | 4.70 | 4.70 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 23.10 | 23.10 | |
| | | | | | | | Average: | 4.620 | 4.620 | |
| | | 0 | 0:00:00 | 0 | 147.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 150.9 | | 3.50 | 3.50 | 3.50 | |
| | | 2 | 0:02:00 | 01:00 | 154.1 | | 3.20 | 3.20 | 3.20 | |
| | | 3 | 0:03:00 | 01:00 | 157.0 | | 2.90 | 2.90 | 2.90 | |
| | | 4 | 0:04:00 | 01:00 | 159.9 | | 2.90 | 2.90 | 2.90 | |
| P4 | 86 | 5 | 0:05:00 | 01:00 | 162.5 | | 2.60 | 2.60 | 2.60 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 15.10 | 15.10 | |
| | | | | | | | Average: | 3.020 | 3.020 | |
| | | 0 | 0:00:00 | 0 | 168.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 170.3 | | 2.30 | 2.30 | 2.30 | |
| | | 2 | 0:02:00 | 01:00 | 172.5 | | 2.20 | 2.20 | 2.20 | |
| | | 3 | 0:03:00 | 01:00 | 174.6 | | 2.10 | 2.10 | 2.10 | |
| P5 | 47 | 4 | 0:04:00 | 01:00 | 176.8 | | 2.20 | 2.20 | 2.20 | |
| | | 5 | 0:05:00 | 01:00 | 178.6 | | 1.80 | 1.80 | 1.80 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 10.60 | 10.60 | |
| | | | | | | | Average: | 2.120 | 2.120 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

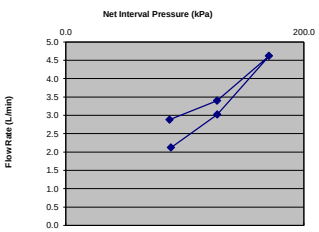
| Stage No. | Lugeon Value |
|---|---|
| P1 | 33.0 |
| P2 | 26.7 |
| P3 | 27.1 |
| P4 | 23.7 |
| P5 | 24.0 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 87.3 |
| 127.1 |
| 170.7 |
| 127.2 |
| 88.4 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.24 | kPa |
| Stage No. | P5 | |
| Gauge Pressure | 47 | kPa |
| Q | 2.12 | L/min |
| H | 9.0 | m |
| Interpreted Result | 24.0 | uL |

Reported Permeability at Stage P5

K = 1.9E-06 m/s

**Flow Type**

VOID FILLING

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

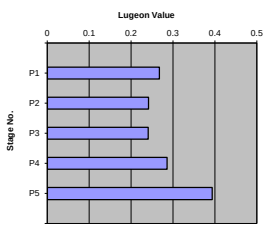
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+057.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.88 | Tested Length (m) : | 4.12 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 13.00 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 6 |
| Tested By : | CDL | Computed By : | CDL | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 15-Apr-11 | Date : | 15-Apr-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 29.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 29.2 | | 0.10 | 0.10 | 0.02 | |
| | | 2 | 0:02:00 | 01:00 | 29.6 | | 0.40 | 0.40 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 29.6 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 29.6 | | 0.00 | 0.00 | 0.00 | |
| P1 | 49 | 5 | 0:05:00 | 01:00 | 29.6 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.50 | 0.12 | |
| | | | | | | | Average: | 0.100 | 0.024 | |
| | | 0 | 0:00:00 | 0 | 30.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 30.2 | | 0.10 | 0.10 | 0.02 | |
| | | 2 | 0:02:00 | 01:00 | 30.4 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 30.5 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 30.7 | | 0.20 | 0.20 | 0.05 | |
| P2 | 99 | 5 | 0:05:00 | 01:00 | 30.8 | | 0.10 | 0.10 | 0.02 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.70 | 0.17 | |
| | | | | | | | Average: | 0.140 | 0.034 | |
| | | 0 | 0:00:00 | 0 | 31.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 31.4 | | 0.20 | 0.20 | 0.05 | |
| | | 2 | 0:02:00 | 01:00 | 31.5 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 31.8 | | 0.30 | 0.30 | 0.07 | |
| | | 4 | 0:04:00 | 01:00 | 32.0 | | 0.20 | 0.20 | 0.05 | |
| P3 | 160 | 5 | 0:05:00 | 01:00 | 32.2 | | 0.20 | 0.20 | 0.05 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.00 | 0.24 | |
| | | | | | | | Average: | 0.200 | 0.049 | |
| | | 0 | 0:00:00 | 0 | 32.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 32.5 | | 0.10 | 0.10 | 0.02 | |
| | | 2 | 0:02:00 | 01:00 | 32.8 | | 0.30 | 0.30 | 0.07 | |
| | | 3 | 0:03:00 | 01:00 | 32.9 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 33.1 | | 0.20 | 0.20 | 0.05 | |
| P4 | 111 | 5 | 0:05:00 | 01:00 | 33.3 | | 0.20 | 0.20 | 0.05 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.90 | 0.22 | |
| | | | | | | | Average: | 0.180 | 0.044 | |
| | | 0 | 0:00:00 | 0 | 33.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 33.8 | | 0.20 | 0.20 | 0.05 | |
| | | 2 | 0:02:00 | 01:00 | 34.0 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 34.0 | | 0.00 | 0.00 | 0.00 | |
| P5 | 57 | 4 | 0:04:00 | 01:00 | 34.1 | | 0.10 | 0.10 | 0.02 | |
| | | 5 | 0:05:00 | 01:00 | 34.4 | | 0.30 | 0.30 | 0.07 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.80 | 0.19 | |
| | | | | | | | Average: | 0.160 | 0.039 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

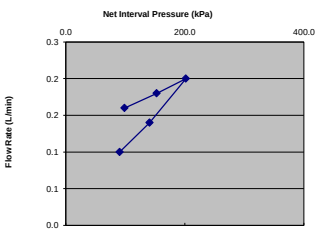
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.3 |
| P2 | 0.2 |
| P3 | 0.2 |
| P4 | 0.3 |
| P5 | 0.4 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 90.7 |
| 140.7 |
| 201.7 |
| 152.7 |
| 98.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 95 | kPa |
| Q | 0.16 | L/min |
| H | 14.0 | m |
| Interpreted Result | 0.3 | uL |

Reported Permeability at Stage Average

K = 3.3E-08 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

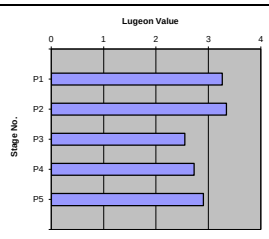
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+057.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.88 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 8.88 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 6 |
| Tested By : | CDL | Computed By : | CDL | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 15-Apr-11 | Date : | 15-Apr-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 15.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 15.8 | | 0.40 | 0.40 | 0.40 | |
| | | 2 | 0:02:00 | 01:00 | 16.0 | | 0.20 | 0.20 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 16.0 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 16.7 | | 0.70 | 0.70 | 0.70 | |
| P1 | 38 | 5 | 0:05:00 | 01:00 | 16.7 | | 0.00 | 0.00 | 0.00 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.30 | 1.30 | |
| | | | | | | | Average: | 0.260 | 0.260 | |
| | | 0 | 0:00:00 | 0 | 17.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 18.0 | | 0.60 | 0.60 | 0.60 | |
| | | 2 | 0:02:00 | 01:00 | 18.4 | | 0.40 | 0.40 | 0.40 | |
| | | 3 | 0:03:00 | 01:00 | 18.7 | | 0.30 | 0.30 | 0.30 | |
| | | 4 | 0:04:00 | 01:00 | 18.9 | | 0.20 | 0.20 | 0.20 | |
| P2 | 66 | 5 | 0:05:00 | 01:00 | 19.2 | | 0.30 | 0.30 | 0.30 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.80 | 1.80 | |
| | | | | | | | Average: | 0.360 | 0.360 | |
| | | 0 | 0:00:00 | 0 | 20.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 20.5 | | 0.40 | 0.40 | 0.40 | |
| | | 2 | 0:02:00 | 01:00 | 20.9 | | 0.40 | 0.40 | 0.40 | |
| | | 3 | 0:03:00 | 01:00 | 21.4 | | 0.50 | 0.50 | 0.50 | |
| | | 4 | 0:04:00 | 01:00 | 21.7 | | 0.30 | 0.30 | 0.30 | |
| P3 | 115 | 5 | 0:05:00 | 01:00 | 22.1 | | 0.40 | 0.40 | 0.40 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.00 | 2.00 | |
| | | | | | | | Average: | 0.400 | 0.400 | |
| | | 0 | 0:00:00 | 0 | 22.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 23.1 | | 0.20 | 0.20 | 0.20 | |
| | | 2 | 0:02:00 | 01:00 | 23.4 | | 0.30 | 0.30 | 0.30 | |
| | | 3 | 0:03:00 | 01:00 | 23.7 | | 0.30 | 0.30 | 0.30 | |
| | | 4 | 0:04:00 | 01:00 | 24.0 | | 0.30 | 0.30 | 0.30 | |
| P4 | 61 | 5 | 0:05:00 | 01:00 | 24.3 | | 0.30 | 0.30 | 0.30 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.40 | 1.40 | |
| | | | | | | | Average: | 0.280 | 0.280 | |
| | | 0 | 0:00:00 | 0 | 24.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 24.9 | | 0.20 | 0.20 | 0.20 | |
| | | 2 | 0:02:00 | 01:00 | 25.1 | | 0.20 | 0.20 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 25.4 | | 0.30 | 0.30 | 0.30 | |
| P5 | 34 | 4 | 0:04:00 | 01:00 | 25.6 | | 0.20 | 0.20 | 0.20 | |
| | | 5 | 0:05:00 | 01:00 | 25.8 | | 0.20 | 0.20 | 0.20 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.10 | 1.10 | |
| | | | | | | | Average: | 0.220 | 0.220 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

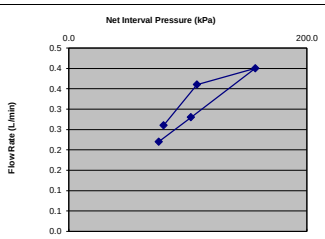
| Stage No. | Lugeon Value |
|---|---|
| P1 | 3.3 |
| P2 | 3.3 |
| P3 | 2.6 |
| P4 | 2.7 |
| P5 | 2.9 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 79.7 |
| 107.7 |
| 156.7 |
| 102.7 |
| 75.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 63 | kPa |
| Q | 0.30 | L/min |
| H | 10.7 | m |
| Interpreted Result | 3.0 | uL |

Reported Permeability at Stage Average

K = 2.4E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

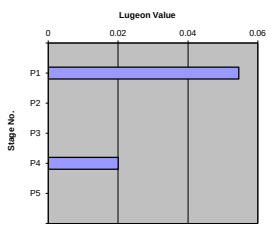
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+108.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 14.40 | Tested Length (m) : | 5.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 19.40 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 6 |
| Tested By : | HM | Computed By : | HM | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 30-Apr-11 | Date : | 30-Apr-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 5.3 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 5.3 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 5.4 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 5.4 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 5.5 | | 0.10 | 0.10 | 0.02 | |
| P1 | 105 | 5 | 0:05:00 | 01:00 | 5.5 | | 0.00 | 0.00 | 0.00 | Stage 1 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.20 | 0.04 | |
| | | | | | | | Average: | 0.040 | 0.008 | |
| | | 0 | 0:00:00 | 0 | 6.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 6.6 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 6.6 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 6.6 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 6.6 | | 0.00 | 0.00 | 0.00 | |
| P2 | 209 | 5 | 0:05:00 | 01:00 | 6.6 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 8.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 8.0 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 8.0 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 8.0 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 8.0 | | 0.00 | 0.00 | 0.00 | |
| P3 | 215 | 5 | 0:05:00 | 01:00 | 8.0 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 8.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 8.0 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 8.0 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 8.1 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 8.1 | | 0.00 | 0.00 | 0.00 | |
| P4 | 158 | 5 | 0:05:00 | 01:00 | 8.1 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.02 | |
| | | | | | | | Average: | 0.020 | 0.004 | |
| | | 0 | 0:00:00 | 0 | 8.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 8.1 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 8.1 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 8.1 | | 0.00 | 0.00 | 0.00 | |
| P5 | 105 | 4 | 0:04:00 | 01:00 | 8.1 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 8.1 | | 0.00 | 0.00 | 0.00 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

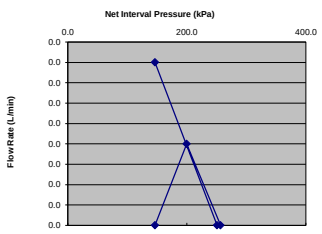
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.05 |
| P2 | 0.00 |
| P3 | 0.00 |
| P4 | 0.02 |
| P5 | 0.00 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 146.7 |
| 250.7 |
| 256.7 |
| 199.7 |
| 146.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 158 | kPa |
| Q | 0.01 | L/min |
| H | 20.4 | m |
| Interpreted Result | 0.01 | uL |

Reported Permeability at Stage Average

K = 1.5E-09 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments: Shut-in test carried out subsequent to constant head test

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

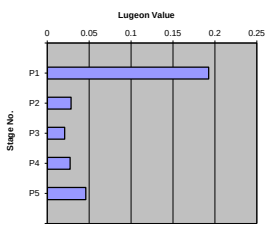
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+108.25 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.43 | Tested Length (m) : | 3.97 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 14.40 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 6 |
| Tested By : | HM | Computed By : | HM | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 30-Apr-11 | Date : | 30-Apr-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 11.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 11.4 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 11.8 | | 0.40 | 0.40 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 11.8 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 11.8 | | 0.00 | 0.00 | 0.00 | |
| P1 | 63 | 5 | 0:05:00 | 01:00 | 11.8 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.40 | 0.10 | |
| | | | | | | | Average: | 0.080 | 0.020 | |
| | | 0 | 0:00:00 | 0 | 12.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 12.5 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 12.5 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 12.5 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 12.6 | | 0.10 | 0.10 | 0.03 | |
| P2 | 135 | 5 | 0:05:00 | 01:00 | 12.6 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | 12.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 12.9 | | 0.10 | 0.10 | 0.03 | |
| | | 2 | 0:02:00 | 01:00 | 12.9 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 12.9 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 12.9 | | 0.00 | 0.00 | 0.00 | |
| P3 | 202 | 5 | 0:05:00 | 01:00 | 12.9 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | 13.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 13.0 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 13.0 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 13.1 | | 0.10 | 0.10 | 0.03 | |
| | | 4 | 0:04:00 | 01:00 | 13.1 | | 0.00 | 0.00 | 0.00 | |
| P4 | 143 | 5 | 0:05:00 | 01:00 | 13.1 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | 13.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 13.1 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 13.1 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 13.1 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 13.1 | | 0.00 | 0.00 | 0.00 | |
| P5 | 68 | 5 | 0:05:00 | 01:00 | 13.2 | | 0.10 | 0.10 | 0.03 | |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.03 | |
| | | | | | | | Average: | 0.020 | 0.005 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

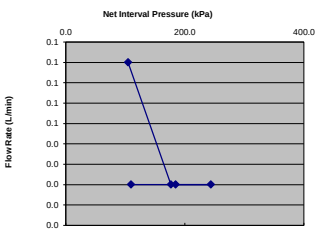
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.19 |
| P2 | 0.03 |
| P3 | 0.02 |
| P4 | 0.03 |
| P5 | 0.05 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 104.7 |
| 176.7 |
| 243.7 |
| 184.7 |
| 109.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 122 | kPa |
| Q | 0.03 | L/min |
| H | 16.7 | m |
| Interpreted Result | 0.06 | uL |

Reported Permeability at Stage Average

K = 5.7E-09 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments: Shut-in test carried out subsequent to constant head test

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

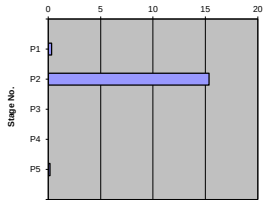
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+108.25 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.43 | Tested Length (m) : | 1.00 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 10.43 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | HM | Computed By : | HM | Rock tested : | | Presumed Water Temperature : | 6 |
| Date : | 30-Apr-11 | Date : | 30-Apr-11 | Water Meter Reading in : | Litres | Checked By : VR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | 5.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.5 | | 0.10 | 0.10 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 5.5 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 5.5 | | 0.00 | 0.00 | 0.00 | Stage 3 |
| | | 4 | | | | | | | | |
| P1 | 66 | 5 | | | | | | | | Attempted to increase pressure to maintain approx. 70 kPa, however spiked. Final 2 minutes not recorded as not representative. |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.10 | |
| | | | | | | | Average: | 0.033 | 0.033 | |
| | | 0 | 0:00:00 | 0 | 12.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 15.5 | | 2.60 | 2.60 | 2.60 | |
| | | 2 | 0:02:00 | 01:00 | 18.4 | | 2.90 | 2.90 | 2.90 | |
| | | 3 | 0:03:00 | 01:00 | 21.1 | | 2.70 | 2.70 | 2.70 | |
| | | 4 | 0:04:00 | 01:00 | 24.3 | | 3.20 | 3.20 | 3.20 | |
| P2 | 140 | 5 | 0:05:00 | 01:00 | 26.8 | | 2.50 | 2.50 | 2.50 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 13.90 | 13.90 | |
| | | | | | | | Average: | 2.780 | 2.780 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 28.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 28.1 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 28.1 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 28.1 | | 0.00 | 0.00 | 0.00 | |
| P5 | 74 | 4 | 0:04:00 | 01:00 | 28.1 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 28.2 | | 0.10 | 0.10 | 0.10 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.10 | |
| | | | | | | | Average: | 0.020 | 0.020 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

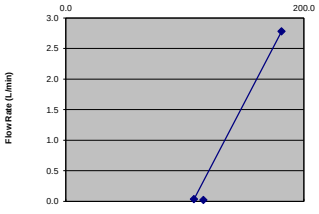
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.3 |
| P2 | 15.3 |
| P3 | -- |
| P4 | -- |
| P5 | 0.2 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 107.7 |
| 181.3 |
| -- |
| -- |
| 115.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Av P1, P5 | |
| Gauge Pressure | 70 | kPa |
| Q | 0.03 | L/min |
| H | 11.4 | m |
| Interpreted Result | 0.2 | uL |

Reported Permeability at Stage Av P1, P5

K = 1.9E-08 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

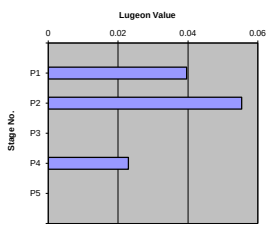
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+126.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.38 | Tested Length (m) : | 4.02 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 14.40 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 6 |
| Tested By : | HM | Computed By : | HM | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 30-Apr-11 | Date : | 30-Apr-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 3.6 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 3.6 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 3.6 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 3.7 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 3.7 | | 0.00 | 0.00 | 0.00 | |
| P1 | 84 | 5 | 0:05:00 | 01:00 | 3.7 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.02 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | 4.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 4.6 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 4.7 | | 0.10 | 0.10 | 0.02 | |
| | | 3 | 0:03:00 | 01:00 | 4.7 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 4.7 | | 0.00 | 0.00 | 0.00 | |
| P2 | 138 | 5 | 0:05:00 | 01:00 | 4.8 | | 0.10 | 0.10 | 0.02 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.20 | 0.05 | |
| | | | | | | | Average: | 0.040 | 0.010 | |
| | | 0 | 0:00:00 | 0 | 5.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.2 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 5.2 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 5.2 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 5.2 | | 0.00 | 0.00 | 0.00 | |
| P3 | 208 | 5 | 0:05:00 | 01:00 | 5.2 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 5.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.4 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 5.4 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 5.4 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 5.4 | | 0.00 | 0.00 | 0.00 | |
| P4 | 175 | 5 | 0:05:00 | 01:00 | 5.5 | | 0.10 | 0.10 | 0.02 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.02 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | 5.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.5 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 5.5 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 5.5 | | 0.00 | 0.00 | 0.00 | |
| P5 | 155 | 4 | 0:04:00 | 01:00 | 5.5 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 5.5 | | 0.00 | 0.00 | 0.00 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

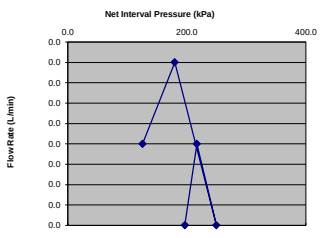
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.04 |
| P2 | 0.06 |
| P3 | 0.00 |
| P4 | 0.02 |
| P5 | 0.00 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 125.7 |
| 179.7 |
| 249.7 |
| 216.7 |
| 196.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 152 | kPa |
| Q | 0.02 | L/min |
| H | 19.7 | m |
| Interpreted Result | 0.02 | uL |

Reported Permeability at Stage Average

K = 2.4E-09 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments: Shut-in test carried out subsequent to constant head test

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

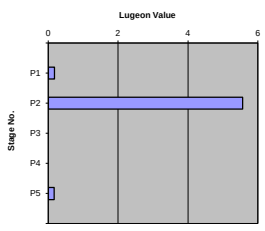
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+126.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.38 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 10.38 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 6 |
| Tested By : | HM | Computed By : | HM | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 30-Apr-11 | Date : | 30-Apr-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 1.7 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 1.7 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 1.8 | | 0.10 | 0.10 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 1.8 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 1.8 | | 0.00 | 0.00 | 0.00 | |
| P1 | 71 | 5 | 0:05:00 | 01:00 | 1.8 | | 0.00 | 0.00 | 0.00 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.10 | |
| | | | | | | | Average: | 0.020 | 0.020 | |
| | | 0 | 0:00:00 | 0 | 4.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.6 | | 0.80 | 0.80 | 0.80 | |
| | | 2 | 0:02:00 | 01:00 | 6.7 | | 1.10 | 1.10 | 1.10 | |
| | | 3 | 0:03:00 | 01:00 | 7.7 | | 1.00 | 1.00 | 1.00 | |
| | | 4 | 0:04:00 | 01:00 | 8.8 | | 1.10 | 1.10 | 1.10 | |
| P2 | 138 | 5 | 0:05:00 | 01:00 | 9.8 | | 1.00 | 1.00 | 1.00 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.00 | 5.00 | |
| | | | | | | | Average: | 1.000 | 1.000 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 10.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 10.4 | | 0.10 | 0.10 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 10.4 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 10.4 | | 0.00 | 0.00 | 0.00 | |
| P5 | 78 | 4 | 0:04:00 | 01:00 | 10.4 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 10.4 | | 0.00 | 0.00 | 0.00 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.10 | |
| | | | | | | | Average: | 0.020 | 0.020 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

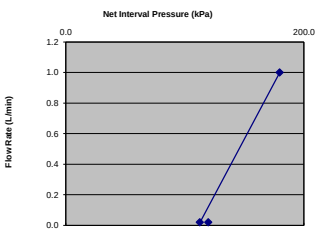
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.2 |
| P2 | 5.6 |
| P3 | -- |
| P4 | -- |
| P5 | 0.2 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 112.7 |
| 179.6 |
| -- |
| -- |
| 119.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Av P1, P5 | |
| Gauge Pressure | 75 | kPa |
| Q | 0.02 | L/min |
| H | 11.8 | m |
| Interpreted Result | 0.2 | uL |

Reported Permeability at Stage Av P1, P5

K = 1.4E-08 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

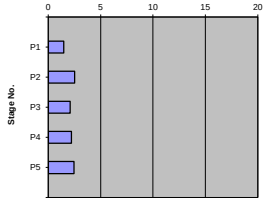
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+270.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 6.16 | Tested Length (m) : | 2.54 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 8.70 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 20 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 23.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 23.7 | | 0.30 | 0.30 | 0.12 | |
| | | 2 | 0:02:00 | 01:00 | 24.2 | | 0.50 | 0.50 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 24.6 | | 0.40 | 0.40 | 0.16 | |
| | | 4 | 0:04:00 | 01:00 | 24.9 | | 0.30 | 0.30 | 0.12 | |
| P1 | 60 | 5 | 0:05:00 | 01:00 | 25.3 | | 0.40 | 0.40 | 0.16 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.90 | 0.75 | |
| | | | | | | | Average: | 0.380 | 0.150 | |
| | | 0 | 0:00:00 | 0 | 25.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 26.7 | | 0.80 | 0.80 | 0.31 | |
| | | 2 | 0:02:00 | 01:00 | 27.7 | | 1.00 | 1.00 | 0.39 | |
| | | 3 | 0:03:00 | 01:00 | 28.7 | | 1.00 | 1.00 | 0.39 | |
| | | 4 | 0:04:00 | 01:00 | 29.7 | | 1.00 | 1.00 | 0.39 | |
| P2 | 108 | 5 | 0:05:00 | 01:00 | 30.7 | | 1.00 | 1.00 | 0.39 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 4.80 | 1.89 | |
| | | | | | | | Average: | 0.960 | 0.378 | |
| | | 0 | 0:00:00 | 0 | 31.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 33.0 | | 1.10 | 1.10 | 0.43 | |
| | | 2 | 0:02:00 | 01:00 | 34.1 | | 1.10 | 1.10 | 0.43 | |
| | | 3 | 0:03:00 | 01:00 | 35.2 | | 1.10 | 1.10 | 0.43 | |
| | | 4 | 0:04:00 | 01:00 | 36.3 | | 1.10 | 1.10 | 0.43 | |
| P3 | 164 | 5 | 0:05:00 | 01:00 | 37.4 | | 1.10 | 1.10 | 0.43 | |
| | | 6 | | | | | | | | Pressure range: ~162-165 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.50 | 2.17 | |
| | | | | | | | Average: | 1.100 | 0.433 | |
| | | 0 | 0:00:00 | 0 | 38.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 39.2 | | 0.90 | 0.90 | 0.35 | |
| | | 2 | 0:02:00 | 01:00 | 40.0 | | 0.80 | 0.80 | 0.31 | |
| | | 3 | 0:03:00 | 01:00 | 40.9 | | 0.90 | 0.90 | 0.35 | |
| | | 4 | 0:04:00 | 01:00 | 41.8 | | 0.90 | 0.90 | 0.35 | |
| P4 | 111 | 5 | 0:05:00 | 01:00 | 42.6 | | 0.80 | 0.80 | 0.31 | |
| | | 6 | | | | | | | | Pressure range: ~109-112 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 4.30 | 1.69 | |
| | | | | | | | Average: | 0.860 | 0.339 | |
| | | 0 | 0:00:00 | 0 | 43.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 43.9 | | 0.60 | 0.60 | 0.24 | |
| | | 2 | 0:02:00 | 01:00 | 44.5 | | 0.60 | 0.60 | 0.24 | |
| | | 3 | 0:03:00 | 01:00 | 45.1 | | 0.60 | 0.60 | 0.24 | |
| P5 | 54 | 4 | 0:04:00 | 01:00 | 45.6 | | 0.50 | 0.50 | 0.20 | |
| | | 5 | 0:05:00 | 01:00 | 46.3 | | 0.70 | 0.70 | 0.28 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.00 | 1.18 | |
| | | | | | | | Average: | 0.600 | 0.236 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

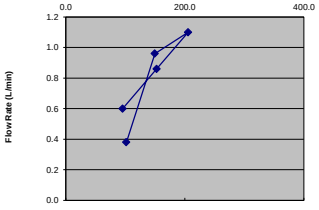
| Stage No. | Lugeon Value |
|---|---|
| P1 | 1.5 |
| P2 | 2.5 |
| P3 | 2.1 |
| P4 | 2.2 |
| P5 | 2.5 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 101.7 |
| 149.6 |
| 205.6 |
| 152.6 |
| 95.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.03 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 99 | kPa |
| Q | 0.78 | L/min |
| H | 14.4 | m |
| Interpreted Result | 2.2 | uL |

Reported Permeability at Stage Average

K = 2.3E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

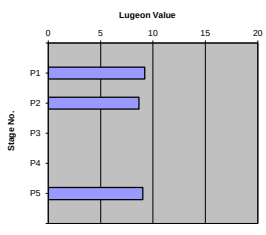
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+270.25 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 5.16 | Tested Length (m) : | 1.00 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 6.16 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Presumed Water Temperature : | 20 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Checked By : VR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | 11.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 12.6 | | 0.80 | 0.80 | 0.80 | |
| | | 2 | 0:02:00 | 01:00 | 13.6 | | 1.00 | 1.00 | 1.00 | |
| | | 3 | 0:03:00 | 01:00 | 14.5 | | 0.90 | 0.90 | 0.90 | |
| | | 4 | 0:04:00 | 01:00 | 15.3 | | 0.80 | 0.80 | 0.80 | |
| P1 | 54 | 5 | 0:05:00 | 01:00 | 16.2 | | 0.90 | 0.90 | 0.90 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: ~54-57; Backfill 20 L |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 4.40 | 4.40 | |
| | | | | | | | Average: | 0.880 | 0.880 | |
| | | 0 | 0:00:00 | 0 | 17.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 18.8 | | 1.40 | 1.40 | 1.40 | |
| | | 2 | 0:02:00 | 01:00 | 20.1 | | 1.30 | 1.30 | 1.30 | |
| | | 3 | 0:03:00 | 01:00 | 21.4 | | 1.30 | 1.30 | 1.30 | |
| | | 4 | 0:04:00 | 01:00 | 22.7 | | 1.30 | 1.30 | 1.30 | |
| P2 | 111 | 5 | 0:05:00 | 01:00 | 24.0 | | 1.30 | 1.30 | 1.30 | |
| | | 6 | | | | | | | | Pressure range: ~109-113 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 6.60 | 6.60 | |
| | | | | | | | Average: | 1.320 | 1.320 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 25.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 25.9 | | 0.90 | 0.90 | 0.90 | |
| | | 2 | 0:02:00 | 01:00 | 26.7 | | 0.80 | 0.80 | 0.80 | |
| | | 3 | 0:03:00 | 01:00 | 27.6 | | 0.90 | 0.90 | 0.90 | |
| P5 | 56 | 4 | 0:04:00 | 01:00 | 28.5 | | 0.90 | 0.90 | 0.90 | |
| | | 5 | 0:05:00 | 01:00 | 29.4 | | 0.90 | 0.90 | 0.90 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~54-58 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 4.40 | 4.40 | |
| | | | | | | | Average: | 0.880 | 0.880 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

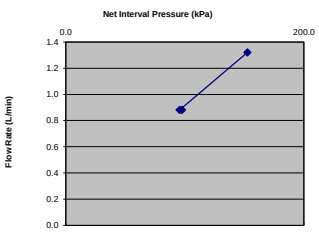
| Stage No. | Lugeon Value |
|---|---|
| P1 | 9.2 |
| P2 | 8.6 |
| P3 | -- |
| P4 | -- |
| P5 | 9.0 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 95.6 |
| 152.6 |
| -- |
| -- |
| 97.6 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.05 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 74 | kPa |
| Q | 1.03 | L/min |
| H | 11.8 | m |
| Interpreted Result | 9.0 | uL |

Reported Permeability at Stage Average

K = 7.2E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

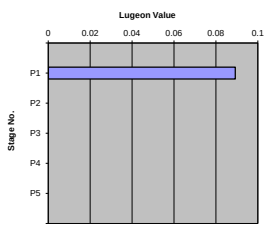
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+357.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.70 | Tested Length (m) : | 2.50 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 11.20 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 20 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 22.7 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 22.8 | | 0.10 | 0.10 | 0.04 | |
| | | 2 | 0:02:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| P1 | 48 | 5 | 0:05:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | Pressure range: ~34-61 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.04 | Start Date & Time : |
| | | | | | | | Average: | 0.020 | 0.008 | |
| | | 0 | 0:00:00 | 0 | 22.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| P2 | 115 | 5 | 0:05:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | Pressure range: ~113-116 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 22.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| P3 | 166 | 5 | 0:05:00 | 01:00 | 22.8 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | Pressure range: ~165-167 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 22.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| P4 | 114 | 5 | 0:05:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | Pressure range: ~113-114 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 22.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| P5 | 64 | 4 | 0:04:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~48-80 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

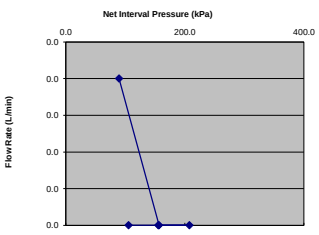
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.09 |
| P2 | 0.00 |
| P3 | 0.00 |
| P4 | 0.00 |
| P5 | 0.00 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 89.7 |
| 156.7 |
| 207.7 |
| 155.7 |
| 105.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 101 | kPa |
| Q | 0.00 | L/min |
| H | 14.6 | m |
| Interpreted Result | 0.02 | uL |

Reported Permeability at Stage Average

K = 1.2E-09 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

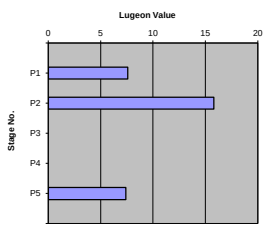
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+357.25 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.70 | Tested Length (m) : | 1.00 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 8.70 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Presumed Water Temperature : | 20 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Checked By : VR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | 13.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 14.4 | | 0.80 | 0.80 | 0.80 | |
| | | 2 | 0:02:00 | 01:00 | 15.2 | | 0.80 | 0.80 | 0.80 | |
| | | 3 | 0:03:00 | 01:00 | 15.9 | | 0.70 | 0.70 | 0.70 | |
| | | 4 | 0:04:00 | 01:00 | 16.6 | | 0.70 | 0.70 | 0.70 | |
| P1 | 56 | 5 | 0:05:00 | 01:00 | 17.3 | | 0.70 | 0.70 | 0.70 | Stage 3 |
| | | 6 | | | | | | | | Pressure range: ~51-60 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.70 | 3.70 | |
| | | | | | | | Average: | 0.740 | 0.740 | |
| | | 0 | 0:00:00 | 0 | 19.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 22.6 | | 2.70 | 2.70 | 2.70 | |
| | | 2 | 0:02:00 | 01:00 | 25.3 | | 2.70 | 2.70 | 2.70 | |
| | | 3 | 0:03:00 | 01:00 | 27.7 | | 2.40 | 2.40 | 2.40 | |
| | | 4 | 0:04:00 | 01:00 | 29.9 | | 2.20 | 2.20 | 2.20 | |
| P2 | 113 | 5 | 0:05:00 | 01:00 | 32.1 | | 2.20 | 2.20 | 2.20 | |
| | | 6 | | | | | | | | Pressure range: ~109-116 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 12.20 | 12.20 | |
| | | | | | | | Average: | 2.440 | 2.440 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 33.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 33.3 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 34.2 | | 0.90 | 0.90 | 0.90 | |
| | | 3 | 0:03:00 | 01:00 | 35.0 | | 0.80 | 0.80 | 0.80 | |
| P5 | 50 | 4 | 0:04:00 | 01:00 | 35.8 | | 0.80 | 0.80 | 0.80 | |
| | | 5 | 0:05:00 | 01:00 | 36.7 | | 0.90 | 0.90 | 0.90 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~40-59 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.40 | 3.40 | |
| | | | | | | | Average: | 0.680 | 0.680 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

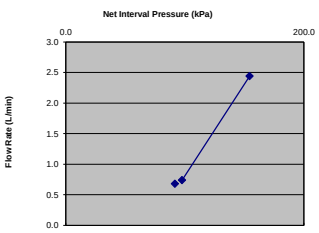
| Stage No. | Lugeon Value |
|---|---|
| P1 | 7.6 |
| P2 | 15.8 |
| P3 | -- |
| P4 | -- |
| P5 | 7.4 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 97.6 |
| 154.4 |
| -- |
| -- |
| 91.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.03 | kPa |
| Stage No. | Av P1, P5 | |
| Gauge Pressure | 53 | kPa |
| Q | 0.71 | L/min |
| H | 9.7 | m |
| Interpreted Result | 7.5 | uL |

Reported Permeability at Stage Av P1, P5

K = 6.1E-07 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

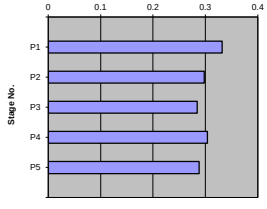
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+432.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.55 | Tested Length (m) : | 3.45 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 11.00 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 20 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 22.5 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 22.8 | | 0.30 | 0.30 | 0.09 | |
| | | 2 | 0:02:00 | 01:00 | 22.9 | | 0.10 | 0.10 | 0.03 | |
| | | 3 | 0:03:00 | 01:00 | 22.9 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 23.0 | | 0.10 | 0.10 | 0.03 | |
| P1 | 63 | 5 | 0:05:00 | 01:00 | 23.1 | | 0.10 | 0.10 | 0.03 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: from 28 to 89 kPa |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.60 | 0.17 | Start Date & Time : |
| | | | | | | | Average: | 0.120 | 0.035 | |
| | | 0 | 0:00:00 | 0 | 23.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 23.5 | | 0.20 | 0.20 | 0.06 | |
| | | 2 | 0:02:00 | 01:00 | 23.6 | | 0.10 | 0.10 | 0.03 | |
| | | 3 | 0:03:00 | 01:00 | 23.8 | | 0.20 | 0.20 | 0.06 | |
| | | 4 | 0:04:00 | 01:00 | 23.9 | | 0.10 | 0.10 | 0.03 | |
| P2 | 114 | 5 | 0:05:00 | 01:00 | 24.1 | | 0.20 | 0.20 | 0.06 | |
| | | 6 | | | | | | | | Pressure range: ~111-116 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.80 | 0.23 | |
| | | | | | | | Average: | 0.160 | 0.046 | |
| | | 0 | 0:00:00 | 0 | 24.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 24.5 | | 0.20 | 0.20 | 0.06 | |
| | | 2 | 0:02:00 | 01:00 | 24.7 | | 0.20 | 0.20 | 0.06 | |
| | | 3 | 0:03:00 | 01:00 | 24.9 | | 0.20 | 0.20 | 0.06 | |
| | | 4 | 0:04:00 | 01:00 | 25.1 | | 0.20 | 0.20 | 0.06 | |
| P3 | 162 | 5 | 0:05:00 | 01:00 | 25.3 | | 0.20 | 0.20 | 0.06 | |
| | | 6 | | | | | | | | Pressure range: ~134-165 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.00 | 0.29 | |
| | | | | | | | Average: | 0.200 | 0.058 | |
| | | 0 | 0:00:00 | 0 | 25.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 25.6 | | 0.20 | 0.20 | 0.06 | |
| | | 2 | 0:02:00 | 01:00 | 25.8 | | 0.20 | 0.20 | 0.06 | |
| | | 3 | 0:03:00 | 01:00 | 25.9 | | 0.10 | 0.10 | 0.03 | |
| | | 4 | 0:04:00 | 01:00 | 26.1 | | 0.20 | 0.20 | 0.06 | |
| P4 | 111 | 5 | 0:05:00 | 01:00 | 26.2 | | 0.10 | 0.10 | 0.03 | |
| | | 6 | | | | | | | | Pressure range: ~110-116 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.80 | 0.23 | |
| | | | | | | | Average: | 0.160 | 0.046 | |
| | | 0 | 0:00:00 | 0 | 26.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 26.4 | | 0.20 | 0.20 | 0.06 | |
| | | 2 | 0:02:00 | 01:00 | 26.4 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 26.5 | | 0.10 | 0.10 | 0.03 | |
| P5 | 59 | 4 | 0:04:00 | 01:00 | 26.6 | | 0.10 | 0.10 | 0.03 | |
| | | 5 | 0:05:00 | 01:00 | 26.7 | | 0.10 | 0.10 | 0.03 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~39-67 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.50 | 0.14 | |
| | | | | | | | Average: | 0.100 | 0.029 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

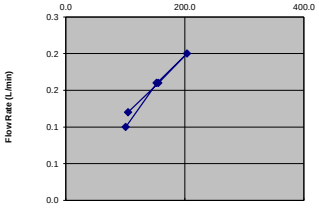
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.3 |
| P2 | 0.3 |
| P3 | 0.3 |
| P4 | 0.3 |
| P5 | 0.3 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 104.7 |
| 155.7 |
| 203.7 |
| 152.7 |
| 100.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 102 | kPa |
| Q | 0.15 | L/min |
| H | 14.6 | m |
| Interpreted Result | 0.3 | uL |

Reported Permeability at Stage Average

K = 3.4E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

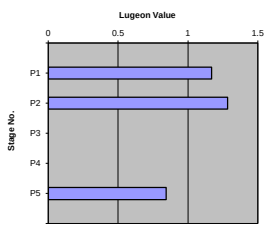
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+432.25 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 6.55 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 7.55 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 20 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 13.9 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 13.9 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 14.1 | | 0.20 | 0.20 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 14.3 | | 0.20 | 0.20 | 0.20 | |
| | | 4 | 0:04:00 | 01:00 | 14.4 | | 0.10 | 0.10 | 0.10 | |
| P1 | 61 | 5 | 0:05:00 | 01:00 | 14.5 | | 0.10 | 0.10 | 0.10 | Pressure range: ~52-69 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.60 | 0.60 | |
| | | | | | | | Average: | 0.120 | 0.120 | |
| | | 0 | 0:00:00 | 0 | 15.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 15.2 | | 0.20 | 0.20 | 0.20 | |
| | | 2 | 0:02:00 | 01:00 | 15.4 | | 0.20 | 0.20 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 15.6 | | 0.20 | 0.20 | 0.20 | |
| | | 4 | 0:04:00 | 01:00 | 15.8 | | 0.20 | 0.20 | 0.20 | |
| P2 | 114 | 5 | 0:05:00 | 01:00 | 16.0 | | 0.20 | 0.20 | 0.20 | |
| | | 6 | | | | | | | | Pressure range: ~111-116 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.00 | 1.00 | |
| | | | | | | | Average: | 0.200 | 0.200 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 16.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 16.1 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 16.3 | | 0.20 | 0.20 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 16.4 | | 0.10 | 0.10 | 0.10 | |
| P5 | 53 | 4 | 0:04:00 | 01:00 | 16.5 | | 0.10 | 0.10 | 0.10 | |
| | | 5 | 0:05:00 | 01:00 | 16.5 | | 0.00 | 0.00 | 0.00 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~40-65 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.40 | 0.40 | |
| | | | | | | | Average: | 0.080 | 0.080 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

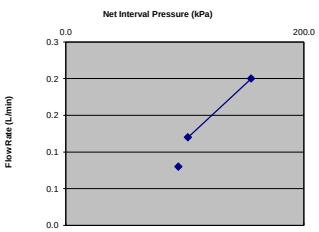
| Stage No. | Lugeon Value |
|---|---|
| P1 | 1.2 |
| P2 | 1.3 |
| P3 | -- |
| P4 | -- |
| P5 | 0.8 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 102.7 |
| 155.7 |
| -- |
| -- |
| 94.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 76 | kPa |
| Q | 0.13 | L/min |
| H | 12.0 | m |
| Interpreted Result | 1.1 | uL |

Reported Permeability at Stage Average

K = 9.2E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

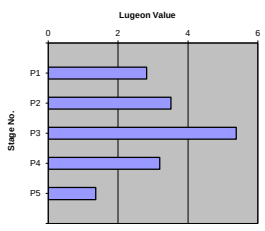
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+483.25 | Drilling Method : | Air-Rotary | | | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.34 | Tested Length (m) : | 2.56 | | | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 10.90 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Presumed Water Temperature : | 14 |
| Date : | 24-Jun-11 | Date : | 24-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | Casing Inner Diameter (mm ) : | 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 21.6 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 22.6 | | 1.00 | 1.00 | 0.39 | |
| | | 2 | 0:02:00 | 01:00 | 23.4 | | 0.80 | 0.80 | 0.31 | |
| | | 3 | 0:03:00 | 01:00 | 24.1 | | 0.70 | 0.70 | 0.27 | |
| | | 4 | 0:04:00 | 01:00 | 24.7 | | 0.60 | 0.60 | 0.23 | Stage 2 |
| P1 | 61 | 5 | 0:05:00 | 01:00 | 25.3 | | 0.60 | 0.60 | 0.23 | |
| | | 6 | | | | | | | | Pressure range: ~56-69 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.70 | 1.45 | Start Date & Time : |
| | | | | | | | Average: | 0.740 | 0.289 | |
| | | 0 | 0:00:00 | 0 | 27.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 28.7 | | 1.60 | 1.60 | 0.62 | |
| | | 2 | 0:02:00 | 01:00 | 30.2 | | 1.50 | 1.50 | 0.59 | |
| | | 3 | 0:03:00 | 01:00 | 31.6 | | 1.40 | 1.40 | 0.55 | |
| | | 4 | 0:04:00 | 01:00 | 32.9 | | 1.30 | 1.30 | 0.51 | |
| P2 | 112 | 5 | 0:05:00 | 01:00 | 34.0 | | 1.10 | 1.10 | 0.43 | |
| | | 6 | | | | | | | | Pressure range: ~109-114 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 6.90 | 2.70 | |
| | | | | | | | Average: | 1.380 | 0.539 | |
| | | 0 | 0:00:00 | 0 | 36.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 40.1 | | 3.20 | 3.20 | 1.25 | |
| | | 2 | 0:02:00 | 01:00 | 43.1 | | 3.00 | 3.00 | 1.17 | |
| | | 3 | 0:03:00 | 01:00 | 45.9 | | 2.80 | 2.80 | 1.09 | |
| | | 4 | 0:04:00 | 01:00 | 48.7 | | 2.80 | 2.80 | 1.09 | |
| P3 | 169 | 5 | 0:05:00 | 01:00 | 51.4 | | 2.70 | 2.70 | 1.05 | |
| | | 6 | | | | | | | | Pressure range: ~166-172 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 14.50 | 5.66 | |
| | | | | | | | Average: | 2.900 | 1.133 | |
| | | 0 | 0:00:00 | 0 | 52.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 53.6 | | 1.30 | 1.30 | 0.51 | |
| | | 2 | 0:02:00 | 01:00 | 54.8 | | 1.20 | 1.20 | 0.47 | |
| | | 3 | 0:03:00 | 01:00 | 56.1 | | 1.30 | 1.30 | 0.51 | |
| | | 4 | 0:04:00 | 01:00 | 57.4 | | 1.30 | 1.30 | 0.51 | |
| P4 | 115 | 5 | 0:05:00 | 01:00 | 58.7 | | 1.30 | 1.30 | 0.51 | |
| | | 6 | | | | | | | | Pressure range: ~108-123 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 6.40 | 2.50 | |
| | | | | | | | Average: | 1.280 | 0.500 | |
| | | 0 | 0:00:00 | 0 | 58.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 59.0 | | 0.20 | 0.20 | 0.08 | |
| | | 2 | 0:02:00 | 01:00 | 59.3 | | 0.30 | 0.30 | 0.12 | |
| | | 3 | 0:03:00 | 01:00 | 59.7 | | 0.40 | 0.40 | 0.16 | |
| P5 | 56 | 4 | 0:04:00 | 01:00 | 59.9 | | 0.20 | 0.20 | 0.08 | |
| | | 5 | 0:05:00 | 01:00 | 60.5 | | 0.60 | 0.60 | 0.23 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~51-61 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.70 | 0.66 | |
| | | | | | | | Average: | 0.340 | 0.133 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

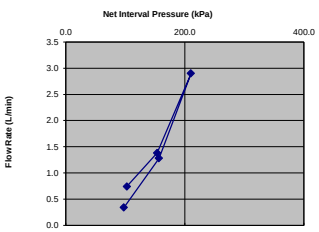
| Stage No. | Lugeon Value |
|---|---|
| P1 | 2.8 |
| P2 | 3.5 |
| P3 | 5.4 |
| P4 | 3.2 |
| P5 | 1.4 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 102.6 |
| 153.6 |
| 210.3 |
| 156.6 |
| 97.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.06 | kPa |
| Stage No. | Av P1,P2,P4,P5 | |
| Gauge Pressure | 86 | kPa |
| Q | 0.94 | L/min |
| H | 13.0 | m |
| Interpreted Result | 2.7 | uL |

Reported Permeability at Stage Av P1,P2,P4,P5

K = 3.0E-07 m/s

**Flow Type**

DILATION

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

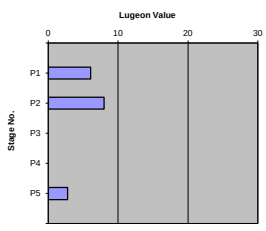
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+483.25 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.34 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 8.34 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 14 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 24-Jun-11 | Date : | 24-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 11.3 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 12.2 | | 0.90 | 0.90 | 0.90 | |
| | | 2 | 0:02:00 | 01:00 | 12.7 | | 0.50 | 0.50 | 0.50 | |
| | | 3 | 0:03:00 | 01:00 | 13.3 | | 0.60 | 0.60 | 0.60 | Stage 3 |
| | | 4 | 0:04:00 | 01:00 | 13.8 | | 0.50 | 0.50 | 0.50 | |
| P1 | 57 | 5 | 0:05:00 | 01:00 | 14.3 | | 0.50 | 0.50 | 0.50 | Pressure range: ~50-65 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.00 | 3.00 | |
| | | | | | | | Average: | 0.600 | 0.600 | |
| | | 0 | 0:00:00 | 0 | 16.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 17.7 | | 1.40 | 1.40 | 1.40 | |
| | | 2 | 0:02:00 | 01:00 | 19.0 | | 1.30 | 1.30 | 1.30 | |
| | | 3 | 0:03:00 | 01:00 | 20.1 | | 1.10 | 1.10 | 1.10 | |
| | | 4 | 0:04:00 | 01:00 | 21.3 | | 1.20 | 1.20 | 1.20 | |
| P2 | 111 | 5 | 0:05:00 | 01:00 | 22.4 | | 1.10 | 1.10 | 1.10 | |
| | | 6 | | | | | | | | Pressure range: ~110-112 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 6.10 | 6.10 | |
| | | | | | | | Average: | 1.220 | 1.220 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 22.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 22.5 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 22.7 | | 0.20 | 0.20 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 23.0 | | 0.30 | 0.30 | 0.30 | |
| P5 | 52 | 4 | 0:04:00 | 01:00 | 23.4 | | 0.40 | 0.40 | 0.40 | |
| | | 5 | 0:05:00 | 01:00 | 23.8 | | 0.40 | 0.40 | 0.40 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~45-59 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.30 | 1.30 | |
| | | | | | | | Average: | 0.260 | 0.260 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

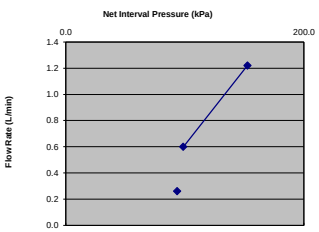
| Stage No. | Lugeon Value |
|---|---|
| P1 | 6.1 |
| P2 | 8.0 |
| P3 | -- |
| P4 | -- |
| P5 | 2.8 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 98.7 |
| 152.6 |
| -- |
| -- |
| 93.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.04 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 73 | kPa |
| Q | 0.69 | L/min |
| H | 11.7 | m |
| Interpreted Result | 5.6 | uL |

Reported Permeability at Stage Average

K = 4.9E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

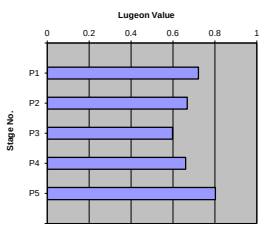
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+511.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.72 | Tested Length (m) : | 2.58 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 11.30 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 20 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 22-Jun-11 | Date : | 22-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 36.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 36.6 | | 0.20 | 0.20 | 0.08 | |
| | | 2 | 0:02:00 | 01:00 | 36.7 | | 0.10 | 0.10 | 0.04 | |
| | | 3 | 0:03:00 | 01:00 | 36.9 | | 0.20 | 0.20 | 0.08 | |
| | | 4 | 0:04:00 | 01:00 | 37.1 | | 0.20 | 0.20 | 0.08 | |
| P1 | 55 | 5 | 0:05:00 | 01:00 | 37.3 | | 0.20 | 0.20 | 0.08 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: ~33-95 |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.90 | 0.35 | |
| | | | | | | | Average: | 0.180 | 0.070 | |
| | | 0 | 0:00:00 | 0 | 37.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 37.8 | | 0.30 | 0.30 | 0.12 | |
| | | 2 | 0:02:00 | 01:00 | 38.1 | | 0.30 | 0.30 | 0.12 | |
| | | 3 | 0:03:00 | 01:00 | 38.3 | | 0.20 | 0.20 | 0.08 | |
| | | 4 | 0:04:00 | 01:00 | 38.5 | | 0.20 | 0.20 | 0.08 | |
| P2 | 109 | 5 | 0:05:00 | 01:00 | 38.8 | | 0.30 | 0.30 | 0.12 | |
| | | 6 | | | | | | | | Pressure range: ~107-112 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.30 | 0.50 | |
| | | | | | | | Average: | 0.260 | 0.101 | |
| | | 0 | 0:00:00 | 0 | 39.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 39.5 | | 0.40 | 0.40 | 0.16 | |
| | | 2 | 0:02:00 | 01:00 | 39.8 | | 0.30 | 0.30 | 0.12 | |
| | | 3 | 0:03:00 | 01:00 | 40.1 | | 0.30 | 0.30 | 0.12 | |
| | | 4 | 0:04:00 | 01:00 | 40.4 | | 0.30 | 0.30 | 0.12 | |
| P3 | 166 | 5 | 0:05:00 | 01:00 | 40.7 | | 0.30 | 0.30 | 0.12 | |
| | | 6 | | | | | | | | Pressure range: ~165-168 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.60 | 0.62 | |
| | | | | | | | Average: | 0.320 | 0.124 | |
| | | 0 | 0:00:00 | 0 | 41.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 41.3 | | 0.30 | 0.30 | 0.12 | |
| | | 2 | 0:02:00 | 01:00 | 41.5 | | 0.20 | 0.20 | 0.08 | |
| | | 3 | 0:03:00 | 01:00 | 41.8 | | 0.30 | 0.30 | 0.12 | |
| | | 4 | 0:04:00 | 01:00 | 42.0 | | 0.20 | 0.20 | 0.08 | |
| P4 | 111 | 5 | 0:05:00 | 01:00 | 42.3 | | 0.30 | 0.30 | 0.12 | |
| | | 6 | | | | | | | | Pressure range: ~109-112 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.30 | 0.50 | |
| | | | | | | | Average: | 0.260 | 0.101 | |
| | | 0 | 0:00:00 | 0 | 42.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 42.7 | | 0.20 | 0.20 | 0.08 | |
| | | 2 | 0:02:00 | 01:00 | 42.9 | | 0.20 | 0.20 | 0.08 | |
| | | 3 | 0:03:00 | 01:00 | 43.1 | | 0.20 | 0.20 | 0.08 | |
| P5 | 55 | 4 | 0:04:00 | 01:00 | 43.3 | | 0.20 | 0.20 | 0.08 | |
| | | 5 | 0:05:00 | 01:00 | 43.5 | | 0.20 | 0.20 | 0.08 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~42-94 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.00 | 0.39 | |
| | | | | | | | Average: | 0.200 | 0.078 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

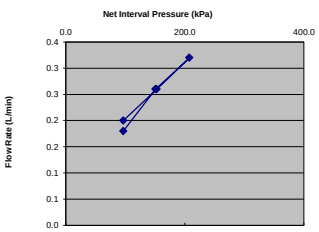
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.7 |
| P2 | 0.7 |
| P3 | 0.6 |
| P4 | 0.7 |
| P5 | 0.8 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 96.7 |
| 150.7 |
| 207.7 |
| 152.7 |
| 96.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 99 | kPa |
| Q | 0.24 | L/min |
| H | 14.4 | m |
| Interpreted Result | 0.7 | uL |

Reported Permeability at Stage Average

K = 7.1E-08 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

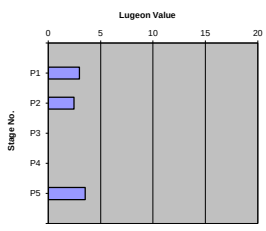
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+511.75 | Drilling Method : | Air-Rotary | | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.72 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 8.72 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 20 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 22-Jun-11 | Date : | 22-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 1.4 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 1.6 | | 0.20 | 0.20 | 0.20 | |
| | | 2 | 0:02:00 | 01:00 | 2.0 | | 0.40 | 0.40 | 0.40 | |
| | | 3 | 0:03:00 | 01:00 | 2.2 | | 0.20 | 0.20 | 0.20 | |
| | | 4 | 0:04:00 | 01:00 | 2.5 | | 0.30 | 0.30 | 0.30 | |
| P1 | 46 | 5 | 0:05:00 | 01:00 | 2.7 | | 0.20 | 0.20 | 0.20 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: ~46-66 |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.30 | 1.30 | |
| | | | | | | | Average: | 0.260 | 0.260 | |
| | | 0 | 0:00:00 | 0 | 3.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 4.2 | | 0.50 | 0.50 | 0.50 | |
| | | 2 | 0:02:00 | 01:00 | 4.5 | | 0.30 | 0.30 | 0.30 | |
| | | 3 | 0:03:00 | 01:00 | 4.9 | | 0.40 | 0.40 | 0.40 | |
| | | 4 | 0:04:00 | 01:00 | 5.2 | | 0.30 | 0.30 | 0.30 | |
| P2 | 113 | 5 | 0:05:00 | 01:00 | 5.6 | | 0.40 | 0.40 | 0.40 | |
| | | 6 | | | | | | | | Pressure range: ~109-115 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.90 | 1.90 | |
| | | | | | | | Average: | 0.380 | 0.380 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 6.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 7.0 | | 0.70 | 0.70 | 0.70 | |
| | | 2 | 0:02:00 | 01:00 | 7.2 | | 0.20 | 0.20 | 0.20 | |
| | | 3 | 0:03:00 | 01:00 | 7.3 | | 0.10 | 0.10 | 0.10 | |
| P5 | 60 | 4 | 0:04:00 | 01:00 | 7.8 | | 0.50 | 0.50 | 0.50 | |
| | | 5 | 0:05:00 | 01:00 | 8.1 | | 0.30 | 0.30 | 0.30 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~39-95 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.80 | 1.80 | |
| | | | | | | | Average: | 0.360 | 0.360 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

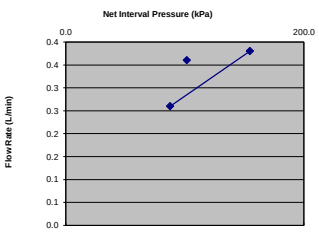
| Stage No. | Lugeon Value |
|---|---|
| P1 | 3.0 |
| P2 | 2.5 |
| P3 | -- |
| P4 | -- |
| P5 | 3.5 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 87.7 |
| 154.7 |
| -- |
| -- |
| 101.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 73 | kPa |
| Q | 0.33 | L/min |
| H | 11.7 | m |
| Interpreted Result | 3.0 | uL |

Reported Permeability at Stage Average

K = 2.4E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

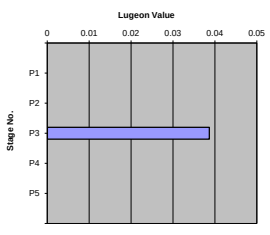
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+534.25 | Drilling Method : | Air-Rotary | | | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.16 | Tested Length (m) : | 2.54 | | | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 11.70 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Presumed Water Temperature : | 14 |
| Date : | 24-Jun-11 | Date : | 24-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | Casing Inner Diameter (mm ) : | 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 3.9 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 3.9 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 3.9 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 3.9 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 3.9 | | 0.00 | 0.00 | 0.00 | |
| P1 | 64 | 5 | 0:05:00 | 01:00 | 3.9 | | 0.00 | 0.00 | 0.00 | Stage 2 |
| | | 6 | | | | | | | | Pressure range: ~55-73 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 4.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| P2 | 120 | 5 | 0:05:00 | 01:00 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | Pressure range: ~110-128 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 4.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 4.4 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 4.4 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 4.5 | | 0.10 | 0.10 | 0.04 | |
| | | 4 | 0:04:00 | 01:00 | 4.5 | | 0.00 | 0.00 | 0.00 | |
| P3 | 162 | 5 | 0:05:00 | 01:00 | 4.5 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | Pressure range: ~151-173 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.04 | |
| | | | | | | | Average: | 0.020 | 0.008 | |
| | | 0 | 0:00:00 | 0 | 4.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 4.5 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 4.5 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 4.5 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 4.5 | | 0.00 | 0.00 | 0.00 | |
| P4 | 128 | 5 | 0:05:00 | 01:00 | 4.5 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | Pressure range: ~124-132 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 5.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.0 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 5.0 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 5.0 | | 0.00 | 0.00 | 0.00 | |
| P5 | 63 | 4 | 0:04:00 | 01:00 | 5.0 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 5.0 | | 0.00 | 0.00 | 0.00 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~50-75 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

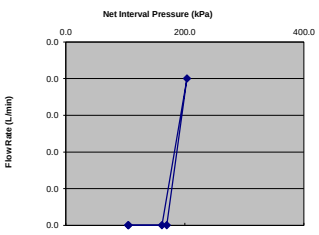
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.00 |
| P2 | 0.00 |
| P3 | 0.04 |
| P4 | 0.00 |
| P5 | 0.00 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 105.7 |
| 161.7 |
| 203.7 |
| 169.7 |
| 104.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P3 | |
| Gauge Pressure | 162 | kPa |
| Q | 0.02 | L/min |
| H | 20.8 | m |
| Interpreted Result | 0.04 | uL |

Reported Permeability at Stage P3

K = 4.1E-09 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

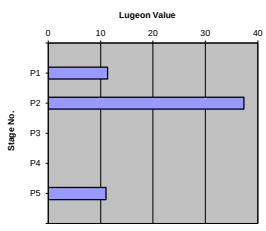
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+534.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | Revision : 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | Immediately prior to test (m bgl) : 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.16 | Tested Length (m) : | 1.00 | | Used in analysis (m bgl) : 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 9.16 | Packer Type : | Pneumatic - Non-Wireline - Single | | Pressure Gauge Height (m agl) : 1.25 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : VR | Presumed Water Temperature : 14 |
| Date : | 24-Jun-11 | Date : | 24-Jun-11 | Water Meter Reading in : | Litres | Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 44.2 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 46.0 | | 1.80 | 1.80 | 1.80 | |
| | | 2 | 0:02:00 | 01:00 | 47.1 | | 1.10 | 1.10 | 1.10 | |
| | | 3 | 0:03:00 | 01:00 | 48.0 | | 0.90 | 0.90 | 0.90 | |
| | | 4 | 0:04:00 | 01:00 | 48.9 | | 0.90 | 0.90 | 0.90 | |
| P1 | 57 | 5 | 0:05:00 | 01:00 | 49.8 | | 0.90 | 0.90 | 0.90 | Stage 3 |
| | | 6 | | | | | | | | Pressure range: ~52-63 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.60 | 5.60 | |
| | | | | | | | Average: | 1.120 | 1.120 | |
| | | 0 | 0:00:00 | 0 | 56.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 62.7 | | 5.80 | 5.80 | 5.80 | |
| | | 2 | 0:02:00 | 01:00 | 68.7 | | 6.00 | 6.00 | 6.00 | |
| | | 3 | 0:03:00 | 01:00 | 74.5 | | 5.80 | 5.80 | 5.80 | |
| | | 4 | 0:04:00 | 01:00 | 80.3 | | 5.80 | 5.80 | 5.80 | |
| P2 | 113 | 5 | 0:05:00 | 01:00 | 85.5 | | 5.20 | 5.20 | 5.20 | |
| | | 6 | | | | | | | | Pressure range: ~110-115 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 28.60 | 28.60 | |
| | | | | | | | Average: | 5.720 | 5.720 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 87.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 87.5 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 89.5 | | 2.00 | 2.00 | 2.00 | |
| | | 3 | 0:03:00 | 01:00 | 90.4 | | 0.90 | 0.90 | 0.90 | |
| P5 | 58 | 4 | 0:04:00 | 01:00 | 91.3 | | 0.90 | 0.90 | 0.90 | |
| | | 5 | 0:05:00 | 01:00 | 93.0 | | 1.70 | 1.70 | 1.70 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~53-65 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.50 | 5.50 | |
| | | | | | | | Average: | 1.100 | 1.100 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

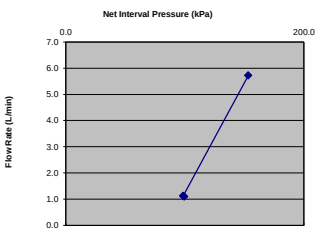
| Stage No. | Lugeon Value |
|---|---|
| P1 | 11.4 |
| P2 | 37.3 |
| P3 | -- |
| P4 | -- |
| P5 | 11.0 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 98.6 |
| 153.3 |
| -- |
| -- |
| 99.6 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.07 | kPa |
| Stage No. | Av P1, P5 | |
| Gauge Pressure | 58 | kPa |
| Q | 1.11 | L/min |
| H | 10.1 | m |
| Interpreted Result | 11.2 | uL |

Reported Permeability at Stage Av P1, P5

K = 9.1E-07 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

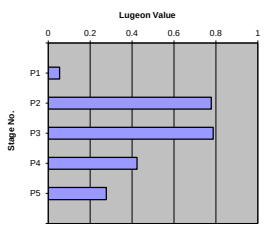
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+700.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 9.08 | Tested Length (m) : | 4.02 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 13.10 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 24-Jun-11 | Date : | 24-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 4.3 | | 0.00 | 0.00 | 0.00 | |
| P1 | 49 | 5 | 0:05:00 | 01:00 | 4.4 | | 0.10 | 0.10 | 0.02 | Stage 2 |
| | | 6 | | | | | | | | Pressure range: ~38-60 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.02 | |
| | | | | | | | Average: | 0.020 | 0.005 | |
| | | 0 | 0:00:00 | 0 | 8.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 9.0 | | 0.50 | 0.50 | 0.12 | |
| | | 2 | 0:02:00 | 01:00 | 9.4 | | 0.40 | 0.40 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 9.8 | | 0.40 | 0.40 | 0.10 | |
| | | 4 | 0:04:00 | 01:00 | 10.2 | | 0.40 | 0.40 | 0.10 | |
| P2 | 99 | 5 | 0:05:00 | 01:00 | 10.7 | | 0.50 | 0.50 | 0.12 | |
| | | 6 | | | | | | | | Pressure range: ~48-99 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.20 | 0.55 | |
| | | | | | | | Average: | 0.440 | 0.109 | |
| | | 0 | 0:00:00 | 0 | 12.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 13.4 | | 0.70 | 0.70 | 0.17 | |
| | | 2 | 0:02:00 | 01:00 | 14.1 | | 0.70 | 0.70 | 0.17 | |
| | | 3 | 0:03:00 | 01:00 | 14.7 | | 0.60 | 0.60 | 0.15 | |
| | | 4 | 0:04:00 | 01:00 | 15.4 | | 0.70 | 0.70 | 0.17 | |
| P3 | 148 | 5 | 0:05:00 | 01:00 | 15.7 | | 0.30 | 0.30 | 0.07 | |
| | | 6 | | | | | | | | Pressure range: ~148 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.00 | 0.75 | |
| | | | | | | | Average: | 0.600 | 0.149 | |
| | | 0 | 0:00:00 | 0 | 16.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 16.5 | | 0.30 | 0.30 | 0.07 | |
| | | 2 | 0:02:00 | 01:00 | 16.7 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 17.0 | | 0.30 | 0.30 | 0.07 | |
| | | 4 | 0:04:00 | 01:00 | 17.2 | | 0.20 | 0.20 | 0.05 | |
| P4 | 99 | 5 | 0:05:00 | 01:00 | 17.4 | | 0.20 | 0.20 | 0.05 | |
| | | 6 | | | | | | | | Pressure range: ~99 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.20 | 0.30 | |
| | | | | | | | Average: | 0.240 | 0.060 | |
| | | 0 | 0:00:00 | 0 | 17.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 17.5 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 17.7 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 17.9 | | 0.20 | 0.20 | 0.05 | |
| P5 | 48 | 4 | 0:04:00 | 01:00 | 18.0 | | 0.10 | 0.10 | 0.02 | |
| | | 5 | 0:05:00 | 01:00 | 18.0 | | 0.00 | 0.00 | 0.00 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~46-50 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.50 | 0.12 | |
| | | | | | | | Average: | 0.100 | 0.025 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

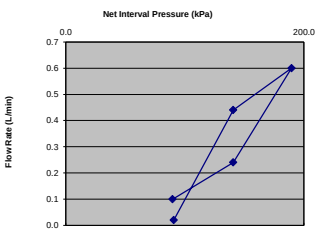
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.1 |
| P2 | 0.8 |
| P3 | 0.8 |
| P4 | 0.4 |
| P5 | 0.3 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 90.7 |
| 140.7 |
| 189.7 |
| 140.7 |
| 89.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 89 | kPa |
| Q | 0.28 | L/min |
| H | 13.3 | m |
| Interpreted Result | 0.5 | uL |

Reported Permeability at Stage Average

K = 6.3E-08 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

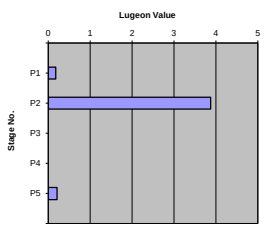
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+700.75 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 8.08 | Tested Length (m) : | 1.00 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 9.08 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Presumed Water Temperature : | 10 |
| Date : | 24-Jun-11 | Date : | 24-Jun-11 | Water Meter Reading in : | Litres | Checked By : VR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | 2.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 2.5 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 2.5 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 2.5 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 2.5 | | 0.00 | 0.00 | 0.00 | |
| P1 | 68 | 5 | 0:05:00 | 01:00 | 2.6 | | 0.10 | 0.10 | 0.10 | Stage 3 |
| | | 6 | | | | | | | | Pressure range: ~57-78 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.10 | |
| | | | | | | | Average: | 0.020 | 0.020 | |
| | | 0 | 0:00:00 | 0 | 4.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.4 | | 0.50 | 0.50 | 0.50 | |
| | | 2 | 0:02:00 | 01:00 | 6.1 | | 0.70 | 0.70 | 0.70 | |
| | | 3 | 0:03:00 | 01:00 | 6.7 | | 0.60 | 0.60 | 0.60 | |
| | | 4 | 0:04:00 | 01:00 | 7.2 | | 0.50 | 0.50 | 0.50 | |
| P2 | 103 | 5 | 0:05:00 | 01:00 | 7.7 | | 0.50 | 0.50 | 0.50 | |
| | | 6 | | | | | | | | Pressure range: ~99-107 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.80 | 2.80 | |
| | | | | | | | Average: | 0.560 | 0.560 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 7.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 7.9 | | 0.10 | 0.10 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 7.9 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 7.9 | | 0.00 | 0.00 | 0.00 | |
| P5 | 55 | 4 | 0:04:00 | 01:00 | 7.9 | | 0.00 | 0.00 | 0.00 | |
| | | 5 | 0:05:00 | 01:00 | 7.9 | | 0.00 | 0.00 | 0.00 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~48-72 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.10 | 0.10 | |
| | | | | | | | Average: | 0.020 | 0.020 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

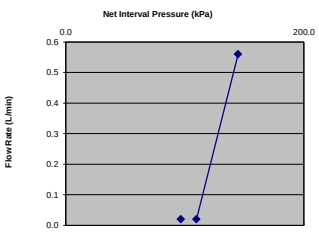
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.2 |
| P2 | 3.9 |
| P3 | -- |
| P4 | -- |
| P5 | 0.2 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 109.7 |
| 144.7 |
| -- |
| -- |
| 96.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | Av P1, P5 | |
| Gauge Pressure | 62 | kPa |
| Q | 0.02 | L/min |
| H | 10.5 | m |
| Interpreted Result | 0.2 | uL |

Reported Permeability at Stage Av P1, P5

K = 1.6E-08 m/s

**Flow Type**

**DILATION**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

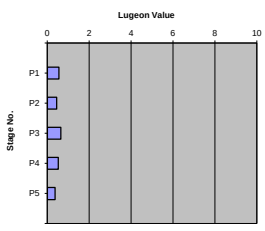
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+730.75 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater — Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 11.16 | Tested Length (m) : | 4.04 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 15.20 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Presumed Water Temperature : | 11 |
| Date : | 25-Jun-11 | Date : | 25-Jun-11 | Water Meter Reading in : | Litres | Checked By : VR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 2.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 2.4 | | 0.30 | 0.30 | 0.07 | |
| | | 2 | 0:02:00 | 01:00 | 2.6 | | 0.20 | 0.20 | 0.05 | |
| | | 3 | 0:03:00 | 01:00 | 3.0 | | 0.40 | 0.40 | 0.10 | |
| | | 4 | 0:04:00 | 01:00 | 3.1 | | 0.10 | 0.10 | 0.02 | Stage 2 |
| P1 | 47 | 5 | 0:05:00 | 01:00 | 3.1 | | 0.00 | 0.00 | 0.00 | |
| | | 6 | | | | | | | | Pressure range: ~45-50 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.00 | 0.25 | |
| | | | | | | | Average: | 0.200 | 0.050 | |
| | | 0 | 0:00:00 | 0 | 4.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 5.1 | | 0.30 | 0.30 | 0.07 | |
| | | 2 | 0:02:00 | 01:00 | 5.4 | | 0.30 | 0.30 | 0.07 | |
| | | 3 | 0:03:00 | 01:00 | 5.6 | | 0.20 | 0.20 | 0.05 | |
| | | 4 | 0:04:00 | 01:00 | 5.9 | | 0.30 | 0.30 | 0.07 | |
| P2 | 103 | 5 | 0:05:00 | 01:00 | 6.1 | | 0.20 | 0.20 | 0.05 | |
| | | 6 | | | | | | | | Pressure range: ~98-107 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.30 | 0.32 | |
| | | | | | | | Average: | 0.260 | 0.064 | |
| | | 0 | 0:00:00 | 0 | 7.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 8.4 | | 0.50 | 0.50 | 0.12 | |
| | | 2 | 0:02:00 | 01:00 | 8.9 | | 0.50 | 0.50 | 0.12 | |
| | | 3 | 0:03:00 | 01:00 | 9.4 | | 0.50 | 0.50 | 0.12 | |
| | | 4 | 0:04:00 | 01:00 | 9.9 | | 0.50 | 0.50 | 0.12 | |
| P3 | 147 | 5 | 0:05:00 | 01:00 | 10.4 | | 0.50 | 0.50 | 0.12 | |
| | | 6 | | | | | | | | Pressure range: ~146-147 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.50 | 0.62 | |
| | | | | | | | Average: | 0.500 | 0.124 | |
| | | 0 | 0:00:00 | 0 | 11.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 11.4 | | 0.30 | 0.30 | 0.07 | |
| | | 2 | 0:02:00 | 01:00 | 11.7 | | 0.30 | 0.30 | 0.07 | |
| | | 3 | 0:03:00 | 01:00 | 12.0 | | 0.30 | 0.30 | 0.07 | |
| | | 4 | 0:04:00 | 01:00 | 12.3 | | 0.30 | 0.30 | 0.07 | |
| P4 | 99 | 5 | 0:05:00 | 01:00 | 12.6 | | 0.30 | 0.30 | 0.07 | |
| | | 6 | | | | | | | | Pressure range: ~99 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.50 | 0.37 | |
| | | | | | | | Average: | 0.300 | 0.074 | |
| | | 0 | 0:00:00 | 0 | 13.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 13.4 | | 0.40 | 0.40 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 13.4 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 13.4 | | 0.00 | 0.00 | 0.00 | |
| P5 | 50 | 4 | 0:04:00 | 01:00 | 13.5 | | 0.10 | 0.10 | 0.02 | |
| | | 5 | 0:05:00 | 01:00 | 13.7 | | 0.20 | 0.20 | 0.05 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~39-61 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.70 | 0.17 | |
| | | | | | | | Average: | 0.140 | 0.035 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

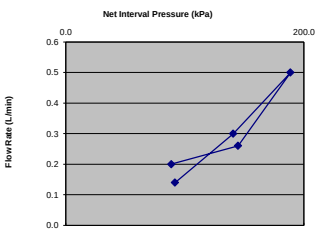
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.6 |
| P2 | 0.4 |
| P3 | 0.7 |
| P4 | 0.5 |
| P5 | 0.4 |

Lugeon Value Curve




| Net Pressures |
|---|
| 88.7 |
| 144.7 |
| 188.7 |
| 140.7 |
| 91.7 |

Flow vs. Pressure




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.01 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 89 | kPa |
| Q | 0.28 | L/min |
| H | 13.3 | m |
| Interpreted Result | 0.5 | uL |

Reported Permeability at Stage Average

K = 6.2E-08 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

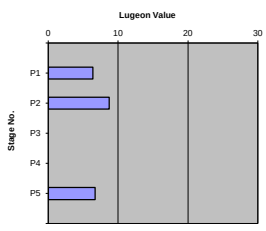
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+730.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 10.16 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 11.16 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 11 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 25-Jun-11 | Date : | 25-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 1.6 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 2.3 | | 0.70 | 0.70 | 0.70 | |
| | | 2 | 0:02:00 | 01:00 | 2.8 | | 0.50 | 0.50 | 0.50 | |
| | | 3 | 0:03:00 | 01:00 | 3.4 | | 0.60 | 0.60 | 0.60 | |
| | | 4 | 0:04:00 | 01:00 | 3.9 | | 0.50 | 0.50 | 0.50 | |
| P1 | 49 | 5 | 0:05:00 | 01:00 | 4.5 | | 0.60 | 0.60 | 0.60 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: ~46-52 |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.90 | 2.90 | Start Date & Time : |
| | | | | | | | Average: | 0.580 | 0.580 | |
| | | 0 | 0:00:00 | 0 | 9.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 10.8 | | 1.30 | 1.30 | 1.30 | |
| | | 2 | 0:02:00 | 01:00 | 12.1 | | 1.30 | 1.30 | 1.30 | |
| | | 3 | 0:03:00 | 01:00 | 13.4 | | 1.30 | 1.30 | 1.30 | |
| | | 4 | 0:04:00 | 01:00 | 14.7 | | 1.30 | 1.30 | 1.30 | |
| P2 | 103 | 5 | 0:05:00 | 01:00 | 15.8 | | 1.10 | 1.10 | 1.10 | |
| | | 6 | | | | | | | | Pressure range: ~102-105 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 6.30 | 6.30 | |
| | | | | | | | Average: | 1.260 | 1.260 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 16.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 17.5 | | 0.70 | 0.70 | 0.70 | |
| | | 2 | 0:02:00 | 01:00 | 18.1 | | 0.60 | 0.60 | 0.60 | |
| | | 3 | 0:03:00 | 01:00 | 18.8 | | 0.70 | 0.70 | 0.70 | |
| P5 | 51 | 4 | 0:04:00 | 01:00 | 19.2 | | 0.40 | 0.40 | 0.40 | |
| | | 5 | 0:05:00 | 01:00 | 19.9 | | 0.70 | 0.70 | 0.70 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~46-56 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.10 | 3.10 | |
| | | | | | | | Average: | 0.620 | 0.620 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

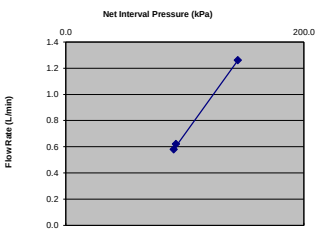
| Stage No. | Lugeon Value |
|---|---|
| P1 | 6.4 |
| P2 | 8.7 |
| P3 | -- |
| P4 | -- |
| P5 | 6.7 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 90.7 |
| 144.6 |
| -- |
| -- |
| 92.6 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.05 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 68 | kPa |
| Q | 0.82 | L/min |
| H | 11.1 | m |
| Interpreted Result | 7.3 | uL |

Reported Permeability at Stage Average

K = 6.1E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

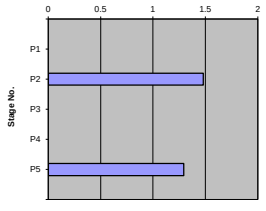
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+775.75 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 7.70 | Tested Length (m) : | 1.00 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 8.70 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Presumed Water Temperature : | 11 |
| Date : | 25-Jun-11 | Date : | 25-Jun-11 | Water Meter Reading in : | Litres | Checked By : VR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 0.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 0.1 | | 0.00 | 0.00 | 0.00 | |
| | | 2 | 0:02:00 | 01:00 | 0.1 | | 0.00 | 0.00 | 0.00 | |
| | | 3 | 0:03:00 | 01:00 | 0.1 | | 0.00 | 0.00 | 0.00 | |
| | | 4 | 0:04:00 | 01:00 | 0.1 | | 0.00 | 0.00 | 0.00 | |
| P1 | 46 | 5 | 0:05:00 | 01:00 | 0.1 | | 0.00 | 0.00 | 0.00 | Stage 3 |
| | | 6 | | | | | | | | Pressure range: ~36-56 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.00 | 0.00 | |
| | | | | | | | Average: | 0.000 | 0.000 | |
| | | 0 | 0:00:00 | 0 | 0.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 0.5 | | 0.30 | 0.30 | 0.30 | |
| | | 2 | 0:02:00 | 01:00 | 0.8 | | 0.30 | 0.30 | 0.30 | |
| | | 3 | 0:03:00 | 01:00 | 0.9 | | 0.10 | 0.10 | 0.10 | |
| | | 4 | 0:04:00 | 01:00 | 1.1 | | 0.20 | 0.20 | 0.20 | |
| P2 | 107 | 5 | 0:05:00 | 01:00 | 1.3 | | 0.20 | 0.20 | 0.20 | |
| | | 6 | | | | | | | | Pressure range: ~84-125 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.10 | 1.10 | |
| | | | | | | | Average: | 0.220 | 0.220 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 1.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 1.5 | | 0.10 | 0.10 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 1.6 | | 0.10 | 0.10 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 1.8 | | 0.20 | 0.20 | 0.20 | |
| P5 | 51 | 4 | 0:04:00 | 01:00 | 1.9 | | 0.10 | 0.10 | 0.10 | |
| | | 5 | 0:05:00 | 01:00 | 2.0 | | 0.10 | 0.10 | 0.10 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~42-61 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.60 | 0.60 | |
| | | | | | | | Average: | 0.120 | 0.120 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

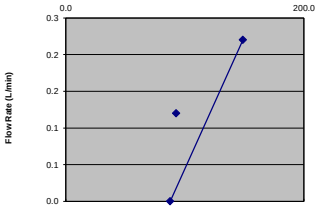
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.0 |
| P2 | 1.5 |
| P3 | -- |
| P4 | -- |
| P5 | 1.3 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 87.7 |
| 148.7 |
| -- |
| -- |
| 92.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P2 | |
| Gauge Pressure | 107 | kPa |
| Q | 0.22 | L/min |
| H | 15.2 | m |
| Interpreted Result | 1.5 | uL |

Reported Permeability at Stage P2

K = 1.2E-07 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

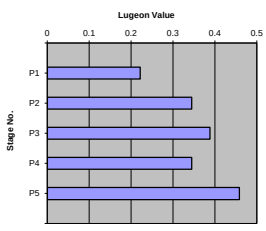
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+922.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 20.10 | Tested Length (m) : | 5.10 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 25.20 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 14 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | 1.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 1.3 | | 0.20 | 0.20 | 0.04 | |
| | | 2 | 0:02:00 | 01:00 | 1.5 | | 0.20 | 0.20 | 0.04 | |
| | | 3 | 0:03:00 | 01:00 | 1.8 | | 0.30 | 0.30 | 0.06 | |
| | | 4 | 0:04:00 | 01:00 | 2.0 | | 0.20 | 0.20 | 0.04 | |
| P1 | 153 | 5 | 0:05:00 | 01:00 | 2.2 | | 0.20 | 0.20 | 0.04 | Stage 1 |
| | | 6 | | | | | | | | Pressure range: ~150-155 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.10 | 0.22 | Start Date & Time : |
| | | | | | | | Average: | 0.220 | 0.043 | |
| | | 0 | 0:00:00 | 0 | 2.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 2.9 | | 0.60 | 0.60 | 0.12 | |
| | | 2 | 0:02:00 | 01:00 | 3.6 | | 0.70 | 0.70 | 0.14 | |
| | | 3 | 0:03:00 | 01:00 | 4.2 | | 0.60 | 0.60 | 0.12 | |
| | | 4 | 0:04:00 | 01:00 | 4.9 | | 0.70 | 0.70 | 0.14 | |
| P2 | 322 | 5 | 0:05:00 | 01:00 | 5.5 | | 0.60 | 0.60 | 0.12 | |
| | | 6 | | | | | | | | Pressure range: ~287-358 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.20 | 0.63 | |
| | | | | | | | Average: | 0.640 | 0.125 | |
| | | 0 | 0:00:00 | 0 | 6.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 7.2 | | 0.80 | 0.80 | 0.16 | |
| | | 2 | 0:02:00 | 01:00 | 8.0 | | 0.80 | 0.80 | 0.16 | |
| | | 3 | 0:03:00 | 01:00 | 8.9 | | 0.90 | 0.90 | 0.18 | |
| | | 4 | 0:04:00 | 01:00 | 9.8 | | 0.90 | 0.90 | 0.18 | |
| P3 | 393 | 5 | 0:05:00 | 01:00 | 10.7 | | 0.90 | 0.90 | 0.18 | |
| | | 6 | | | | | | | | Pressure range: ~356-458 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 4.30 | 0.84 | |
| | | | | | | | Average: | 0.860 | 0.169 | |
| | | 0 | 0:00:00 | 0 | 11.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 12.1 | | 0.70 | 0.70 | 0.14 | |
| | | 2 | 0:02:00 | 01:00 | 12.7 | | 0.60 | 0.60 | 0.12 | |
| | | 3 | 0:03:00 | 01:00 | 13.4 | | 0.70 | 0.70 | 0.14 | |
| | | 4 | 0:04:00 | 01:00 | 14.1 | | 0.70 | 0.70 | 0.14 | |
| P4 | 334 | 5 | 0:05:00 | 01:00 | 14.7 | | 0.60 | 0.60 | 0.12 | |
| | | 6 | | | | | | | | Pressure range: ~292-362 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.30 | 0.65 | |
| | | | | | | | Average: | 0.660 | 0.129 | |
| | | 0 | 0:00:00 | 0 | 15.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 16.1 | | 0.50 | 0.50 | 0.10 | |
| | | 2 | 0:02:00 | 01:00 | 16.5 | | 0.40 | 0.40 | 0.08 | |
| | | 3 | 0:03:00 | 01:00 | 17.0 | | 0.50 | 0.50 | 0.10 | |
| P5 | 155 | 4 | 0:04:00 | 01:00 | 17.4 | | 0.40 | 0.40 | 0.08 | |
| | | 5 | 0:05:00 | 01:00 | 17.9 | | 0.50 | 0.50 | 0.10 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~140-176 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.30 | 0.45 | |
| | | | | | | | Average: | 0.460 | 0.090 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

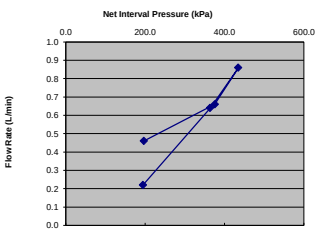
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.2 |
| P2 | 0.3 |
| P3 | 0.4 |
| P4 | 0.3 |
| P5 | 0.5 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 194.7 |
| 363.6 |
| 434.6 |
| 375.6 |
| 196.6 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.05 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 271 | kPa |
| Q | 0.57 | L/min |
| H | 31.9 | m |
| Interpreted Result | 0.4 | uL |

Reported Permeability at Stage Average

K = 4.4E-08 m/s

**Flow Type**

**LOW PERMEABILITY**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

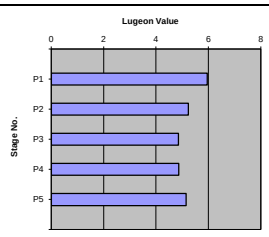
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+922.75 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 16.14 | Tested Length (m) : | 3.96 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 20.10 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Presumed Water Temperature : | 14 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Checked By : VR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | 13.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 17.6 | | 4.10 | 4.10 | 1.04 | |
| | | 2 | 0:02:00 | 01:00 | 21.7 | | 4.10 | 4.10 | 1.04 | |
| | | 3 | 0:03:00 | 01:00 | 25.7 | | 4.00 | 4.00 | 1.01 | |
| | | 4 | 0:04:00 | 01:00 | 29.7 | | 4.00 | 4.00 | 1.01 | |
| P1 | 130 | 5 | 0:05:00 | 01:00 | 33.6 | | 3.90 | 3.90 | 0.98 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: ~116-143 |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 20.10 | 5.08 | Start Date & Time : |
| | | | | | | | Average: | 4.020 | 1.015 | |
| | | 0 | 0:00:00 | 0 | 39.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 45.2 | | 5.60 | 5.60 | 1.41 | |
| | | 2 | 0:02:00 | 01:00 | 50.5 | | 5.30 | 5.30 | 1.34 | |
| | | 3 | 0:03:00 | 01:00 | 55.8 | | 5.30 | 5.30 | 1.34 | |
| | | 4 | 0:04:00 | 01:00 | 61.0 | | 5.20 | 5.20 | 1.31 | |
| P2 | 218 | 5 | 0:05:00 | 01:00 | 66.3 | | 5.30 | 5.30 | 1.34 | |
| | | 6 | | | | | | | | Pressure range: ~188-231 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 26.70 | 6.74 | |
| | | | | | | | Average: | 5.340 | 1.348 | |
| | | 0 | 0:00:00 | 0 | 73.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 80.3 | | 7.20 | 7.20 | 1.82 | |
| | | 2 | 0:02:00 | 01:00 | 87.4 | | 7.10 | 7.10 | 1.79 | |
| | | 3 | 0:03:00 | 01:00 | 94.6 | | 7.20 | 7.20 | 1.82 | |
| | | 4 | 0:04:00 | 01:00 | 101.8 | | 7.20 | 7.20 | 1.82 | |
| P3 | 333 | 5 | 0:05:00 | 01:00 | 108.8 | | 7.00 | 7.00 | 1.77 | |
| | | 6 | | | | | | | | Pressure range: ~290-365 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 35.70 | 9.02 | |
| | | | | | | | Average: | 7.140 | 1.803 | |
| | | 0 | 0:00:00 | 0 | 114.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 119.6 | | 5.20 | 5.20 | 1.31 | |
| | | 2 | 0:02:00 | 01:00 | 124.8 | | 5.20 | 5.20 | 1.31 | |
| | | 3 | 0:03:00 | 01:00 | 130.0 | | 5.20 | 5.20 | 1.31 | |
| | | 4 | 0:04:00 | 01:00 | 134.5 | | 4.50 | 4.50 | 1.14 | |
| P4 | 227 | 5 | 0:05:00 | 01:00 | 140.1 | | 5.60 | 5.60 | 1.41 | |
| | | 6 | | | | | | | | Pressure range: ~200-264 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 25.70 | 6.49 | |
| | | | | | | | Average: | 5.140 | 1.298 | |
| | | 0 | 0:00:00 | 0 | 146.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 149.9 | | 3.70 | 3.70 | 0.93 | |
| | | 2 | 0:02:00 | 01:00 | 153.0 | | 3.10 | 3.10 | 0.78 | |
| | | 3 | 0:03:00 | 01:00 | 156.2 | | 3.20 | 3.20 | 0.81 | |
| P5 | 119 | 4 | 0:04:00 | 01:00 | 159.4 | | 3.20 | 3.20 | 0.81 | |
| | | 5 | 0:05:00 | 01:00 | 162.5 | | 3.10 | 3.10 | 0.78 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~103-128 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 16.30 | 4.12 | |
| | | | | | | | Average: | 3.260 | 0.823 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

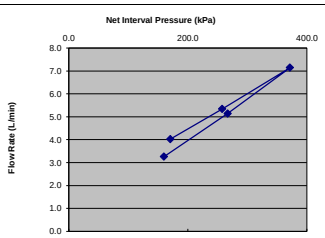
| Stage No. | Lugeon Value |
|---|---|
| P1 | 6.0 |
| P2 | 5.2 |
| P3 | 4.9 |
| P4 | 4.9 |
| P5 | 5.1 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 170.5 |
| 257.8 |
| 371.5 |
| 266.9 |
| 159.9 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 1.76 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 205 | kPa |
| Q | 4.98 | L/min |
| H | 25.0 | m |
| Interpreted Result | 5.2 | uL |

Reported Permeability at Stage Average

K = 6.0E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

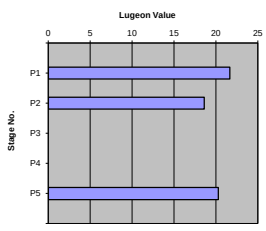
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+922.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 15.14 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 16.14 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 14 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 6.6 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 9.8 | | 3.20 | 3.20 | 3.20 | |
| | | 2 | 0:02:00 | 01:00 | 12.9 | | 3.10 | 3.10 | 3.10 | |
| | | 3 | 0:03:00 | 01:00 | 15.9 | | 3.00 | 3.00 | 3.00 | |
| | | 4 | 0:04:00 | 01:00 | 19.0 | | 3.10 | 3.10 | 3.10 | |
| P1 | 103 | 5 | 0:05:00 | 01:00 | 22.2 | | 3.20 | 3.20 | 3.20 | Stage 3 |
| | | 6 | | | | | | | | Pressure range: ~90-114 |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 15.60 | 15.60 | |
| | | | | | | | Average: | 3.120 | 3.120 | |
| | | 0 | 0:00:00 | 0 | 26.9 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 31.6 | | 4.70 | 4.70 | 4.70 | |
| | | 2 | 0:02:00 | 01:00 | 36.4 | | 4.80 | 4.80 | 4.80 | |
| | | 3 | 0:03:00 | 01:00 | 41.0 | | 4.60 | 4.60 | 4.60 | |
| | | 4 | 0:04:00 | 01:00 | 45.7 | | 4.70 | 4.70 | 4.70 | |
| P2 | 210 | 5 | 0:05:00 | 01:00 | 50.2 | | 4.50 | 4.50 | 4.50 | |
| | | 6 | | | | | | | | Pressure range: ~185-245 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 23.30 | 23.30 | |
| | | | | | | | Average: | 4.660 | 4.660 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 53.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 55.8 | | 2.80 | 2.80 | 2.80 | |
| | | 2 | 0:02:00 | 01:00 | 58.5 | | 2.70 | 2.70 | 2.70 | |
| | | 3 | 0:03:00 | 01:00 | 61.3 | | 2.80 | 2.80 | 2.80 | |
| P5 | 96 | 4 | 0:04:00 | 01:00 | 64.1 | | 2.80 | 2.80 | 2.80 | |
| | | 5 | 0:05:00 | 01:00 | 66.9 | | 2.80 | 2.80 | 2.80 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~84-127 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 13.90 | 13.90 | |
| | | | | | | | Average: | 2.780 | 2.780 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

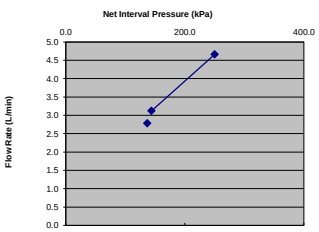
| Stage No. | Lugeon Value |
|---|---|
| P1 | 21.7 |
| P2 | 18.6 |
| P3 | -- |
| P4 | -- |
| P5 | 20.3 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 144.0 |
| 250.3 |
| -- |
| -- |
| 137.1 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.89 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 136 | kPa |
| Q | 3.52 | L/min |
| H | 18.1 | m |
| Interpreted Result | 20.2 | uL |

Reported Permeability at Stage Average

K = 1.6E-06 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

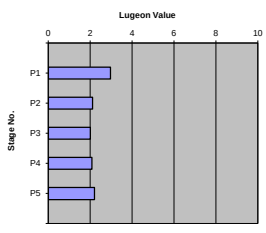
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+934.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 18.00 | Tested Length (m) : | 5.10 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 23.10 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 14 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 6.6 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 10.1 | | 3.50 | 3.50 | 0.69 | |
| | | 2 | 0:02:00 | 01:00 | 13.2 | | 3.10 | 3.10 | 0.61 | |
| | | 3 | 0:03:00 | 01:00 | 16.1 | | 2.90 | 2.90 | 0.57 | |
| | | 4 | 0:04:00 | 01:00 | 18.7 | | 2.60 | 2.60 | 0.51 | |
| P1 | 156 | 5 | 0:05:00 | 01:00 | 21.5 | | 2.80 | 2.80 | 0.55 | Stage 1 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: ~143-168 |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 14.90 | 2.92 | Start Date & Time : |
| | | | | | | | Average: | 2.980 | 0.584 | |
| | | 0 | 0:00:00 | 0 | 25.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 29.6 | | 3.90 | 3.90 | 0.76 | |
| | | 2 | 0:02:00 | 01:00 | 33.7 | | 4.10 | 4.10 | 0.80 | |
| | | 3 | 0:03:00 | 01:00 | 36.5 | | 2.80 | 2.80 | 0.55 | |
| | | 4 | 0:04:00 | 01:00 | 39.8 | | 3.30 | 3.30 | 0.65 | |
| P2 | 281 | 5 | 0:05:00 | 01:00 | 43.0 | | 3.20 | 3.20 | 0.63 | |
| | | 6 | | | | | | | | Pressure range: ~270-291 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 17.30 | 3.39 | |
| | | | | | | | Average: | 3.460 | 0.678 | |
| | | 0 | 0:00:00 | 0 | 48.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 53.1 | | 5.00 | 5.00 | 0.98 | |
| | | 2 | 0:02:00 | 01:00 | 58.1 | | 5.00 | 5.00 | 0.98 | |
| | | 3 | 0:03:00 | 01:00 | 63.0 | | 4.90 | 4.90 | 0.96 | |
| | | 4 | 0:04:00 | 01:00 | 68.1 | | 5.10 | 5.10 | 1.00 | |
| P3 | 449 | 5 | 0:05:00 | 01:00 | 73.1 | | 5.00 | 5.00 | 0.98 | |
| | | 6 | | | | | | | | Pressure range: ~402-495 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 25.00 | 4.90 | |
| | | | | | | | Average: | 5.000 | 0.980 | |
| | | 0 | 0:00:00 | 0 | 76.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 80.0 | | 3.40 | 3.40 | 0.67 | |
| | | 2 | 0:02:00 | 01:00 | 83.4 | | 3.40 | 3.40 | 0.67 | |
| | | 3 | 0:03:00 | 01:00 | 86.8 | | 3.40 | 3.40 | 0.67 | |
| | | 4 | 0:04:00 | 01:00 | 90.1 | | 3.30 | 3.30 | 0.65 | |
| P4 | 275 | 5 | 0:05:00 | 01:00 | 93.4 | | 3.30 | 3.30 | 0.65 | |
| | | 6 | | | | | | | | Pressure range: ~271-278 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 16.80 | 3.29 | |
| | | | | | | | Average: | 3.360 | 0.659 | |
| | | 0 | 0:00:00 | 0 | 95.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 97.8 | | 2.10 | 2.10 | 0.41 | |
| | | 2 | 0:02:00 | 01:00 | 100.0 | | 2.20 | 2.20 | 0.43 | |
| | | 3 | 0:03:00 | 01:00 | 102.3 | | 2.30 | 2.30 | 0.45 | |
| P5 | 152 | 4 | 0:04:00 | 01:00 | 104.4 | | 2.10 | 2.10 | 0.41 | |
| | | 5 | 0:05:00 | 01:00 | 106.6 | | 2.20 | 2.20 | 0.43 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~149-154 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 10.90 | 2.14 | |
| | | | | | | | Average: | 2.180 | 0.427 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

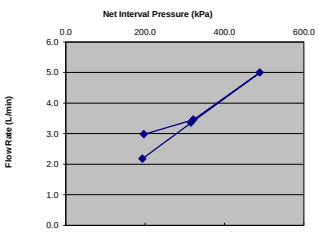
| Stage No. | Lugeon Value |
|---|---|
| P1 | 3.0 |
| P2 | 2.1 |
| P3 | 2.0 |
| P4 | 2.1 |
| P5 | 2.2 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 197.0 |
| 321.7 |
| 488.9 |
| 315.8 |
| 193.3 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.95 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 263 | kPa |
| Q | 3.40 | L/min |
| H | 30.9 | m |
| Interpreted Result | 2.3 | uL |

Reported Permeability at Stage Average

K = 2.7E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

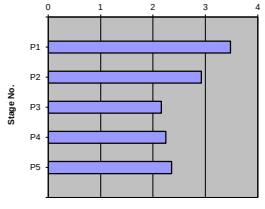
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+934.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 14.03 | Tested Length (m) : | 3.97 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 18.00 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 14 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 26-Jun-11 | Date : | 26-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 2.5 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 4.5 | | 2.00 | 2.00 | 0.50 | |
| | | 2 | 0:02:00 | 01:00 | 6.2 | | 1.70 | 1.70 | 0.43 | |
| | | 3 | 0:03:00 | 01:00 | 8.7 | | 2.50 | 2.50 | 0.63 | |
| | | 4 | 0:04:00 | 01:00 | 11.2 | | 2.50 | 2.50 | 0.63 | |
| P1 | 118 | 5 | 0:05:00 | 01:00 | 13.5 | | 2.30 | 2.30 | 0.58 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: ~104-146 |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 11.00 | 2.77 | Start Date & Time : |
| | | | | | | | Average: | 2.200 | 0.554 | |
| | | 0 | 0:00:00 | 0 | 17.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 20.3 | | 3.30 | 3.30 | 0.83 | |
| | | 2 | 0:02:00 | 01:00 | 23.4 | | 3.10 | 3.10 | 0.78 | |
| | | 3 | 0:03:00 | 01:00 | 26.3 | | 2.90 | 2.90 | 0.73 | |
| | | 4 | 0:04:00 | 01:00 | 29.2 | | 2.90 | 2.90 | 0.73 | |
| P2 | 216 | 5 | 0:05:00 | 01:00 | 31.9 | | 2.70 | 2.70 | 0.68 | |
| | | 6 | | | | | | | | Pressure range: ~209-222 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 14.90 | 3.75 | |
| | | | | | | | Average: | 2.980 | 0.751 | |
| | | 0 | 0:00:00 | 0 | 35.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 39.0 | | 3.40 | 3.40 | 0.86 | |
| | | 2 | 0:02:00 | 01:00 | 42.3 | | 3.30 | 3.30 | 0.83 | |
| | | 3 | 0:03:00 | 01:00 | 45.5 | | 3.20 | 3.20 | 0.81 | |
| | | 4 | 0:04:00 | 01:00 | 48.6 | | 3.10 | 3.10 | 0.78 | |
| P3 | 335 | 5 | 0:05:00 | 01:00 | 51.7 | | 3.10 | 3.10 | 0.78 | |
| | | 6 | | | | | | | | Pressure range: ~317-353 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 16.10 | 4.06 | |
| | | | | | | | Average: | 3.220 | 0.811 | |
| | | 0 | 0:00:00 | 0 | 54.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 56.6 | | 2.40 | 2.40 | 0.60 | |
| | | 2 | 0:02:00 | 01:00 | 59.0 | | 2.40 | 2.40 | 0.60 | |
| | | 3 | 0:03:00 | 01:00 | 61.4 | | 2.40 | 2.40 | 0.60 | |
| | | 4 | 0:04:00 | 01:00 | 63.8 | | 2.40 | 2.40 | 0.60 | |
| P4 | 226 | 5 | 0:05:00 | 01:00 | 66.1 | | 2.30 | 2.30 | 0.58 | |
| | | 6 | | | | | | | | Pressure range: ~213-239 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 11.90 | 3.00 | |
| | | | | | | | Average: | 2.380 | 0.599 | |
| | | 0 | 0:00:00 | 0 | 67.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 69.0 | | 1.50 | 1.50 | 0.38 | |
| | | 2 | 0:02:00 | 01:00 | 70.5 | | 1.50 | 1.50 | 0.38 | |
| | | 3 | 0:03:00 | 01:00 | 72.0 | | 1.50 | 1.50 | 0.38 | |
| P5 | 119 | 4 | 0:04:00 | 01:00 | 73.5 | | 1.50 | 1.50 | 0.38 | |
| | | 5 | 0:05:00 | 01:00 | 75.0 | | 1.50 | 1.50 | 0.38 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~110-128 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 7.50 | 1.89 | |
| | | | | | | | Average: | 1.500 | 0.378 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

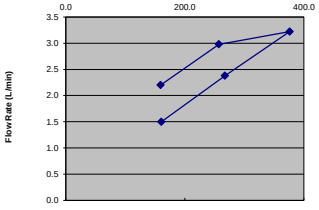
| Stage No. | Lugeon Value |
|---|---|
| P1 | 3.5 |
| P2 | 2.9 |
| P3 | 2.2 |
| P4 | 2.2 |
| P5 | 2.4 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 159.3 |
| 257.1 |
| 376.0 |
| 267.3 |
| 160.5 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.17 | kPa |
| Stage No. | P5 | |
| Gauge Pressure | 119 | kPa |
| Q | 1.50 | L/min |
| H | 16.4 | m |
| Interpreted Result | 2.4 | uL |

Reported Permeability at Stage P5

K = 2.8E-07 m/s

**Flow Type**

VOID FILLING

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

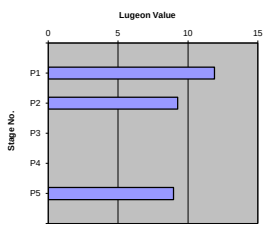
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+934.75 | Drilling Method : | Air-Rotary | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater: Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 13.03 | Tested Length (m) : | 1.00 | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 14.03 | Packer Type : | Pneumatic - Non-Wireline - Single | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | ES | Computed By : | ES | Rock tested : | | Presumed Water Temperature : | 14 |
| Date : | 27-Jun-11 | Date : | 27-Jun-11 | Water Meter Reading in : | Litres | Checked By : VR / Date : 26-Mar-12 | Casing Inner Diameter (mm ) : 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0:00:00 | 0 | 4.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 6.3 | | 1.70 | 1.70 | 1.70 | |
| | | 2 | 0:02:00 | 01:00 | 8.0 | | 1.70 | 1.70 | 1.70 | |
| | | 3 | 0:03:00 | 01:00 | 9.8 | | 1.80 | 1.80 | 1.80 | |
| | | 4 | 0:04:00 | 01:00 | 11.5 | | 1.70 | 1.70 | 1.70 | |
| P1 | 103 | 5 | 0:05:00 | 01:00 | 13.2 | | 1.70 | 1.70 | 1.70 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: ~80-126 |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 8.60 | 8.60 | Start Date & Time : |
| | | | | | | | Average: | 1.720 | 1.720 | |
| | | 0 | 0:00:00 | 0 | 16.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 19.0 | | 2.70 | 2.70 | 2.70 | |
| | | 2 | 0:02:00 | 01:00 | 21.6 | | 2.60 | 2.60 | 2.60 | |
| | | 3 | 0:03:00 | 01:00 | 24.1 | | 2.50 | 2.50 | 2.50 | |
| | | 4 | 0:04:00 | 01:00 | 26.6 | | 2.50 | 2.50 | 2.50 | |
| P2 | 233 | 5 | 0:05:00 | 01:00 | 29.0 | | 2.40 | 2.40 | 2.40 | |
| | | 6 | | | | | | | | Pressure range: ~218-248 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 12.70 | 12.70 | |
| | | | | | | | Average: | 2.540 | 2.540 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 32.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 33.6 | | 1.50 | 1.50 | 1.50 | |
| | | 2 | 0:02:00 | 01:00 | 35.0 | | 1.40 | 1.40 | 1.40 | |
| | | 3 | 0:03:00 | 01:00 | 36.5 | | 1.50 | 1.50 | 1.50 | |
| P5 | 119 | 4 | 0:04:00 | 01:00 | 37.9 | | 1.40 | 1.40 | 1.40 | |
| | | 5 | 0:05:00 | 01:00 | 39.3 | | 1.40 | 1.40 | 1.40 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~89-149 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 7.20 | 7.20 | |
| | | | | | | | Average: | 1.440 | 1.440 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

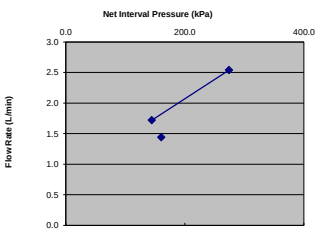
| Stage No. | Lugeon Value |
|---|---|
| P1 | 11.9 |
| P2 | 9.3 |
| P3 | -- |
| P4 | -- |
| P5 | 9.0 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 144.5 |
| 274.3 |
| -- |
| -- |
| 160.5 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.26 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 152 | kPa |
| Q | 1.90 | L/min |
| H | 19.7 | m |
| Interpreted Result | 10.0 | uL |

Reported Permeability at Stage Average

K = 8.0E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

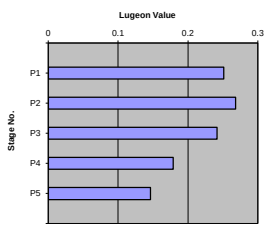
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Job No. : | 09-1428-5007 | Hole No : | Q-31+948.25 | Drilling Method : | Air-Rotary | | | Revision : | 0.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 17.90 | Tested Length (m) : | 5.10 | | | Used in analysis (m bgl) : | 3.00 |
| Location : | Meadowbank | Interval Base (m) : | 23.00 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Pressure Gauge Height (m agl) : | 1.25 |
| Tested By : | LC | Computed By : | LC | Rock tested : | | Checked By : | VR | Presumed Water Temperature : | 11 |
| Date : | 01-Jul-11 | Date : | 01-Jul-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | Casing Inner Diameter (mm ) : | 20.0 |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 4.0 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 4.3 | | 0.30 | 0.30 | 0.06 | |
| | | 2 | 0:02:00 | 01:00 | 4.6 | | 0.30 | 0.30 | 0.06 | |
| | | 3 | 0:03:00 | 01:00 | 4.7 | | 0.10 | 0.10 | 0.02 | |
| | | 4 | 0:04:00 | 01:00 | 4.9 | | 0.20 | 0.20 | 0.04 | |
| P1 | 130 | 5 | 0:05:00 | 01:00 | 5.1 | | 0.20 | 0.20 | 0.04 | Stage 1 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: 0.94 - 1.65 bar |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.10 | 0.22 | |
| | | | | | | | Average: | 0.220 | 0.043 | |
| | | 0 | 0:00:00 | 0 | 7.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 7.5 | | 0.40 | 0.40 | 0.08 | |
| | | 2 | 0:02:00 | 01:00 | 8.0 | | 0.50 | 0.50 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 8.4 | | 0.40 | 0.40 | 0.08 | |
| | | 4 | 0:04:00 | 01:00 | 8.9 | | 0.50 | 0.50 | 0.10 | |
| P2 | 280 | 5 | 0:05:00 | 01:00 | 9.3 | | 0.40 | 0.40 | 0.08 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: 2.40 - 3.20 bar |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 2.20 | 0.43 | |
| | | | | | | | Average: | 0.440 | 0.086 | |
| | | 0 | 0:00:00 | 0 | 13.6 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 15.2 | | 1.60 | 1.60 | 0.31 | |
| | | 2 | 0:02:00 | 01:00 | 15.7 | | 0.50 | 0.50 | 0.10 | |
| | | 3 | 0:03:00 | 01:00 | 16.2 | | 0.50 | 0.50 | 0.10 | |
| | | 4 | 0:04:00 | 01:00 | 16.6 | | 0.40 | 0.40 | 0.08 | |
| P3 | 526 | 5 | 0:05:00 | 01:00 | 17.1 | | 0.50 | 0.50 | 0.10 | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | Pressure range: 4.21 - 6.3 bar |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 3.50 | 0.69 | |
| | | | | | | | Average: | 0.700 | 0.137 | |
| | | 0 | 0:00:00 | 0 | 17.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 17.7 | | 0.30 | 0.30 | 0.06 | |
| | | 2 | 0:02:00 | 01:00 | 18.0 | | 0.30 | 0.30 | 0.06 | |
| | | 3 | 0:03:00 | 01:00 | 18.3 | | 0.30 | 0.30 | 0.06 | |
| | | 4 | 0:04:00 | 01:00 | 18.6 | | 0.30 | 0.30 | 0.06 | |
| P4 | 287 | 5 | 0:05:00 | 01:00 | 18.9 | | 0.30 | 0.30 | 0.06 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: 2.70 - 3.03 bar |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 1.50 | 0.29 | |
| | | | | | | | Average: | 0.300 | 0.059 | |
| | | 0 | 0:00:00 | 0 | 19.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 19.1 | | 0.10 | 0.10 | 0.02 | |
| | | 2 | 0:02:00 | 01:00 | 19.3 | | 0.20 | 0.20 | 0.04 | |
| | | 3 | 0:03:00 | 01:00 | 19.4 | | 0.10 | 0.10 | 0.02 | |
| P5 | 146 | 4 | 0:04:00 | 01:00 | 19.6 | | 0.20 | 0.20 | 0.04 | |
| | | 5 | 0:05:00 | 01:00 | 19.7 | | 0.10 | 0.10 | 0.02 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: 1.27 - 1.65 bar |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 0.70 | 0.14 | Finish Date & Time : |
| | | | | | | | Average: | 0.140 | 0.027 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

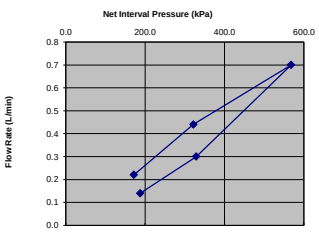
| Stage No. | Lugeon Value |
|---|---|
| P1 | 0.3 |
| P2 | 0.3 |
| P3 | 0.2 |
| P4 | 0.2 |
| P5 | 0.1 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 171.7 |
| 321.7 |
| 567.6 |
| 328.7 |
| 187.7 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.00 | kPa |
| Stage No. | P5 | |
| Gauge Pressure | 146 | kPa |
| Q | 0.14 | L/min |
| H | 19.1 | m |
| Interpreted Result | 0.1 | uL |

Reported Permeability at Stage P5

K = 1.8E-08 m/s

**Flow Type**

LOW PERMEABILITY

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

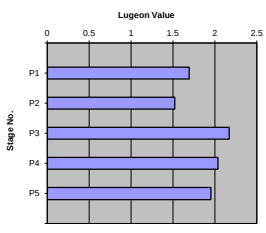
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+948.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 13.88 | Tested Length (m) : | 4.02 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 17.90 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 11 |
| Tested By : | LC | Computed By : | LC | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 01-Jul-11 | Date : | 01-Jul-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 3.8 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 5.1 | | 1.30 | 1.30 | 0.32 | |
| | | 2 | 0:02:00 | 01:00 | 6.2 | | 1.10 | 1.10 | 0.27 | |
| | | 3 | 0:03:00 | 01:00 | 7.2 | | 1.00 | 1.00 | 0.25 | |
| | | 4 | 0:04:00 | 01:00 | 8.1 | | 0.90 | 0.90 | 0.22 | Stage 2 |
| P1 | 114 | 5 | 0:05:00 | 01:00 | 9.1 | | 1.00 | 1.00 | 0.25 | |
| | | 6 | | | | | | | | Pressure range: 0.96 - 1.32 bar |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 5.30 | 1.32 | Start Date & Time : |
| | | | | | | | Average: | 1.060 | 0.264 | June 30, 2011 at 23:32 |
| | | 0 | 0:00:00 | 0 | 12.4 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 13.2 | | 0.80 | 0.80 | 0.20 | |
| | | 2 | 0:02:00 | 01:00 | 14.9 | | 1.70 | 1.70 | 0.42 | |
| | | 3 | 0:03:00 | 01:00 | 16.6 | | 1.70 | 1.70 | 0.42 | |
| | | 4 | 0:04:00 | 01:00 | 18.3 | | 1.70 | 1.70 | 0.42 | |
| P2 | 207 | 5 | 0:05:00 | 01:00 | 20.0 | | 1.70 | 1.70 | 0.42 | |
| | | 6 | | | | | | | | Pressure range: 1.91 - 2.22 bar |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 7.60 | 1.89 | |
| | | | | | | | Average: | 1.520 | 0.378 | |
| | | 0 | 0:00:00 | 0 | 23.1 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 26.1 | | 3.00 | 3.00 | 0.75 | |
| | | 2 | 0:02:00 | 01:00 | 29.3 | | 3.20 | 3.20 | 0.80 | |
| | | 3 | 0:03:00 | 01:00 | 32.6 | | 3.30 | 3.30 | 0.82 | |
| | | 4 | 0:04:00 | 01:00 | 35.9 | | 3.30 | 3.30 | 0.82 | |
| P3 | 328 | 5 | 0:05:00 | 01:00 | 39.2 | | 3.30 | 3.30 | 0.82 | |
| | | 6 | | | | | | | | Pressure range: 3.02 - 3.53 bar |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 16.10 | 4.00 | |
| | | | | | | | Average: | 3.220 | 0.801 | |
| | | 0 | 0:00:00 | 0 | 41.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 43.3 | | 2.10 | 2.10 | 0.52 | |
| | | 2 | 0:02:00 | 01:00 | 45.4 | | 2.10 | 2.10 | 0.52 | |
| | | 3 | 0:03:00 | 01:00 | 47.6 | | 2.20 | 2.20 | 0.55 | |
| | | 4 | 0:04:00 | 01:00 | 49.8 | | 2.20 | 2.20 | 0.55 | |
| P4 | 220 | 5 | 0:05:00 | 01:00 | 51.9 | | 2.10 | 2.10 | 0.52 | |
| | | 6 | | | | | | | | Pressure range: 1.97 - 2.42 bar |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 10.70 | 2.66 | |
| | | | | | | | Average: | 2.140 | 0.532 | |
| | | 0 | 0:00:00 | 0 | 52.8 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 54.0 | | 1.20 | 1.20 | 0.30 | |
| | | 2 | 0:02:00 | 01:00 | 55.3 | | 1.30 | 1.30 | 0.32 | |
| | | 3 | 0:03:00 | 01:00 | 56.6 | | 1.30 | 1.30 | 0.32 | |
| P5 | 124 | 4 | 0:04:00 | 01:00 | 57.9 | | 1.30 | 1.30 | 0.32 | |
| | | 5 | 0:05:00 | 01:00 | 59.3 | | 1.40 | 1.40 | 0.35 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: 1.02 - 1.46 bar |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 6.50 | 1.62 | |
| | | | | | | | Average: | 1.300 | 0.323 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

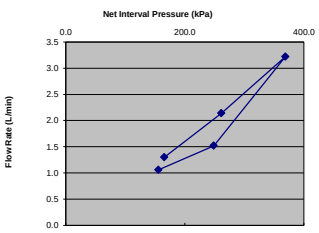
| Stage No. | Lugeon Value |
|---|---|
| P1 | 1.7 |
| P2 | 1.5 |
| P3 | 2.2 |
| P4 | 2.0 |
| P5 | 2.0 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 155.6 |
| 248.5 |
| 369.0 |
| 261.3 |
| 165.5 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.29 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 199 | kPa |
| Q | 1.85 | L/min |
| H | 24.5 | m |
| Interpreted Result | 1.9 | uL |

Reported Permeability at Stage Average

K = 2.2E-07 m/s

**Flow Type**

LAMINAR FLOW

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

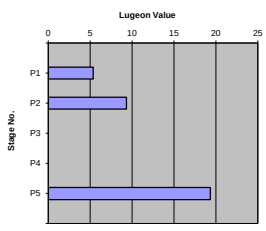
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+948.25 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 12.88 | Tested Length (m) : | 5.02 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 17.90 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 11 |
| Tested By : | LC | Computed By : | LC | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 01-Jul-11 | Date : | 01-Jul-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 8.5 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 12.7 | | 4.20 | 4.20 | 0.84 | |
| | | 2 | 0:02:00 | 01:00 | 16.9 | | 4.20 | 4.20 | 0.84 | |
| | | 3 | 0:03:00 | 01:00 | 21.1 | | 4.20 | 4.20 | 0.84 | |
| | | 4 | 0:04:00 | 01:00 | 25.5 | | 4.40 | 4.40 | 0.88 | |
| P1 | 118 | 5 | 0:05:00 | 01:00 | 29.9 | | 4.40 | 4.40 | 0.88 | Stage 2,3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: 0.94 - 1.41 bar |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 21.40 | 4.26 | |
| | | | | | | | Average: | 4.280 | 0.853 | |
| | | 0 | 0:00:00 | 0 | 41.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 52.9 | | 11.90 | 11.90 | 2.37 | |
| | | 2 | 0:02:00 | 01:00 | 65.9 | | 13.00 | 13.00 | 2.59 | |
| | | 3 | 0:03:00 | 01:00 | 77.1 | | 11.20 | 11.20 | 2.23 | |
| | | 4 | 0:04:00 | 01:00 | 89.1 | | 12.00 | 12.00 | 2.39 | |
| P2 | 225 | 5 | 0:05:00 | 01:00 | 101.8 | | 12.70 | 12.70 | 2.53 | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: 1.97 - 2.52 bar |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 60.80 | 12.11 | |
| | | | | | | | Average: | 12.160 | 2.422 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | 109.2 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 117.1 | | 7.90 | 7.90 | 1.57 | |
| | | 2 | 0:02:00 | 01:00 | 125.6 | | 8.50 | 8.50 | 1.69 | |
| | | 3 | 0:03:00 | 01:00 | 137.2 | | 11.60 | 11.60 | 2.31 | |
| P5 | 114 | 4 | 0:04:00 | 01:00 | 150.2 | | 13.00 | 13.00 | 2.59 | |
| | | 5 | 0:05:00 | 01:00 | 179.9 | | 29.70 | 29.70 | 5.92 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: 0.68 - 1.59 bar |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 70.70 | 14.08 | |
| | | | | | | | Average: | 14.140 | 2.817 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

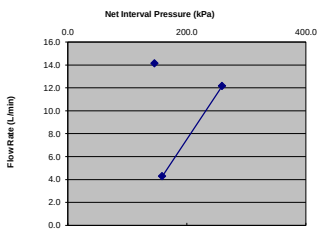
| Stage No. | Lugeon Value |
|---|---|
| P1 | 5.4 |
| P2 | 9.3 |
| P3 | -- |
| P4 | -- |
| P5 | 19.3 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 158.6 |
| 259.1 |
| -- |
| -- |
| 145.6 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 10.07 | kPa |
| Stage No. | P5 | |
| Gauge Pressure | 114 | kPa |
| Q | 14.14 | L/min |
| H | 14.8 | m |
| Interpreted Result | 19.3 | uL |

Reported Permeability at Stage P5

K = 2.4E-06 m/s

**Flow Type**

**WASH-OUT**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

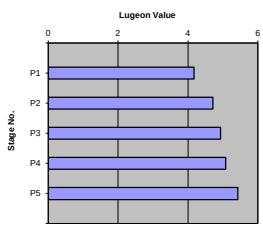
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+970.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 14.72 | Tested Length (m) : | 4.08 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 18.80 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | LC | Computed By : | LC | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 28-Jun-11 | Date : | 28-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 2.5 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 5.0 | | 2.50 | 2.50 | 0.61 | |
| | | 2 | 0:02:00 | 01:00 | 7.5 | | 2.50 | 2.50 | 0.61 | |
| | | 3 | 0:03:00 | 01:00 | 9.9 | | 2.40 | 2.40 | 0.59 | |
| | | 4 | 0:04:00 | 01:00 | 12.4 | | 2.50 | 2.50 | 0.61 | |
| P1 | 102 | 5 | 0:05:00 | 01:00 | 14.7 | | 2.30 | 2.30 | 0.56 | Stage 2 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: ~0.64-1.39 |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 12.20 | 2.99 | Start Date & Time : |
| | | | | | | | Average: | 2.440 | 0.598 | |
| | | 0 | 0:00:00 | 0 | 19.5 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 24.5 | | 5.00 | 5.00 | 1.23 | |
| | | 2 | 0:02:00 | 01:00 | 29.4 | | 4.90 | 4.90 | 1.20 | |
| | | 3 | 0:03:00 | 01:00 | 34.0 | | 4.60 | 4.60 | 1.13 | |
| | | 4 | 0:04:00 | 01:00 | 38.6 | | 4.60 | 4.60 | 1.13 | |
| P2 | 204 | 5 | 0:05:00 | 01:00 | 43.0 | | 4.40 | 4.40 | 1.08 | |
| | | 6 | | | | | | | | Pressure range: ~1.60-2.48 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 23.50 | 5.76 | |
| | | | | | | | Average: | 4.700 | 1.152 | |
| | | 0 | 0:00:00 | 0 | 49.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 56.8 | | 7.10 | 7.10 | 1.74 | |
| | | 2 | 0:02:00 | 01:00 | 64.0 | | 7.20 | 7.20 | 1.76 | |
| | | 3 | 0:03:00 | 01:00 | 71.2 | | 7.20 | 7.20 | 1.76 | |
| | | 4 | 0:04:00 | 01:00 | 78.6 | | 7.40 | 7.40 | 1.81 | |
| P3 | 321 | 5 | 0:05:00 | 01:00 | 85.9 | | 7.30 | 7.30 | 1.79 | |
| | | 6 | | | | | | | | Pressure range: ~2.65-3.76 |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 36.20 | 8.87 | |
| | | | | | | | Average: | 7.240 | 1.775 | |
| | | 0 | 0:00:00 | 0 | 91.0 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 96.0 | | 5.00 | 5.00 | 1.23 | |
| | | 2 | 0:02:00 | 01:00 | 101.0 | | 5.00 | 5.00 | 1.23 | |
| | | 3 | 0:03:00 | 01:00 | 106.0 | | 5.00 | 5.00 | 1.23 | |
| | | 4 | 0:04:00 | 01:00 | 111.1 | | 5.10 | 5.10 | 1.25 | |
| P4 | 202 | 5 | 0:05:00 | 01:00 | 116.1 | | 5.00 | 5.00 | 1.23 | |
| | | 6 | | | | | | | | Pressure range: ~1.55-2.48 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 25.10 | 6.15 | |
| | | | | | | | Average: | 5.020 | 1.230 | |
| | | 0 | 0:00:00 | 0 | 119.7 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 123.0 | | 3.30 | 3.30 | 0.81 | |
| | | 2 | 0:02:00 | 01:00 | 126.3 | | 3.30 | 3.30 | 0.81 | |
| | | 3 | 0:03:00 | 01:00 | 129.7 | | 3.40 | 3.40 | 0.83 | |
| P5 | 110 | 4 | 0:04:00 | 01:00 | 133.0 | | 3.30 | 3.30 | 0.81 | |
| | | 5 | 0:05:00 | 01:00 | 136.4 | | 3.40 | 3.40 | 0.83 | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | Pressure range: ~0.68-1.51 |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 16.70 | 4.09 | |
| | | | | | | | Average: | 3.340 | 0.819 | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

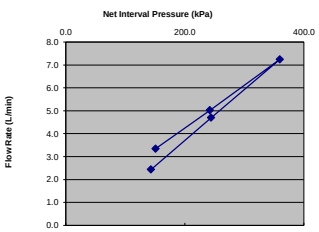
| Stage No. | Lugeon Value |
|---|---|
| P1 | 4.2 |
| P2 | 4.7 |
| P3 | 4.9 |
| P4 | 5.1 |
| P5 | 5.4 |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 143.2 |
| 244.2 |
| 359.5 |
| 242.1 |
| 150.9 |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 0.78 | kPa |
| Stage No. | P5 | |
| Gauge Pressure | 110 | kPa |
| Q | 3.34 | L/min |
| H | 15.4 | m |
| Interpreted Result | 5.4 | uL |

Reported Permeability at Stage P5

K = 6.4E-07 m/s

**Flow Type**

**WASH-OUT**

Comments

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E1-5\Source data\WPT Report Master - Bay Goose Dike.xls

# WATER PRESSURE TEST

Golder Associates

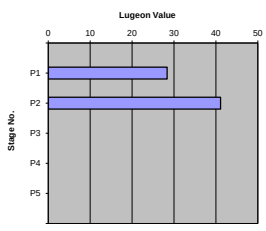
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Revision : | 0.00 |
| Job No. : | 09-1428-5007 | Hole No : | Q-31+970.75 | Drilling Method : | Air-Rotary | Vertical depth to Groundwater | | Immediately prior to test (m bgl) : | 3.00 |
| Client : | Agnico-Eagle | Dip (Deg) : | -90 | Hole Diameter (m) : | 0.0889 | | | Used in analysis (m bgl) : | 3.00 |
| Project : | Bay-Goose Dike | Interval Top (m) : | 13.72 | Tested Length (m) : | 1.00 | | | Pressure Gauge Height (m agl) : | 1.25 |
| Location : | Meadowbank | Interval Base (m) : | 14.72 | Packer Type : | Pneumatic - Non-Wireline - Single | | | Presumed Water Temperature : | 10 |
| Tested By : | LC | Computed By : | LC | Rock tested : | | Checked By : | VR | Casing Inner Diameter (mm ) : | 20.0 |
| Date : | 28-Jun-11 | Date : | 28-Jun-11 | Water Meter Reading in : | Litres | Date : | 26-Mar-12 | | |

| Pressure Stage | Gauge Pressure kPa | No | Actual Time (h:m:s) | Time Intervals (min) | Water Meter Readings Reading (Litres) | | Volume (L) | Discharge (L/min) | Discharge/m (L/min/m) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | c : 1 |
| | | 0 | 0:00:00 | 0 | 8.1 | | 0.00 | 0.00 | 0.00 | |
| | | 1 | 0:01:00 | 01:00 | 12.5 | | 4.40 | 4.40 | 4.40 | |
| | | 2 | 0:02:00 | 01:00 | 17.0 | | 4.50 | 4.50 | 4.50 | |
| | | 3 | 0:03:00 | 01:00 | 21.3 | | 4.30 | 4.30 | 4.30 | |
| | | 4 | 0:04:00 | 01:00 | 25.5 | | 4.20 | 4.20 | 4.20 | |
| P1 | 112 | 5 | 0:05:00 | 01:00 | 29.7 | | 4.20 | 4.20 | 4.20 | Stage 3 |
| | | 6 | | | | | | | | |
| 1/3 $P_{MAX}$ | | 7 | | | | | | | | Pressure range: ~0.67-1.57 |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 21.60 | 21.60 | |
| | | | | | | | Average: | 4.320 | 4.320 | |
| | | 0 | 0:00:00 | 0 | 36.3 | | 0.00 | 0.00 | 0.00 | c : 1 |
| | | 1 | 0:01:00 | 01:00 | 43.2 | | 6.90 | 6.90 | 6.90 | |
| | | 2 | 0:02:00 | 01:00 | 49.2 | | 6.00 | 6.00 | 6.00 | |
| | | 3 | 0:03:00 | 01:00 | 55.5 | | 6.30 | 6.30 | 6.30 | |
| | | 4 | 0:04:00 | 01:00 | 63.5 | | 8.00 | 8.00 | 8.00 | |
| P2 | 250 | 5 | 0:05:00 | 01:00 | 77.3 | | 13.80 | 13.80 | 13.80 | |
| | | 6 | 0:06:00 | 01:00 | 106.4 | | 29.10 | 29.10 | 29.10 | Pressure range variable: ~1.77-3.24 |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | Communicated to Q-31+972.25 |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | 70.10 | 70.10 | |
| | | | | | | | Average: | 11.683 | 11.683 | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P3 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| | | 4 | 0:04:00 | 01:00 | | | | | | |
| P4 | | 5 | 0:05:00 | 01:00 | | | | | | |
| | | 6 | | | | | | | | |
| 2/3 $P_{MAX}$ | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |
| | | 0 | 0:00:00 | 0 | | | | | | c : 1 |
| | | 1 | 0:01:00 | 01:00 | | | | | | |
| | | 2 | 0:02:00 | 01:00 | | | | | | |
| | | 3 | 0:03:00 | 01:00 | | | | | | |
| P5 | | 4 | 0:04:00 | 01:00 | | | | | | |
| | | 5 | 0:05:00 | 01:00 | | | | | | |
| 1/3 $P_{MAX}$ | | 6 | | | | | | | | |
| | | 7 | | | | | | | | |
| | | 8 | | | | | | | | |
| | | 9 | | | | | | | | |
| | | 10 | | | | | | | | |
| | | | | | | | Total : | | | |
| | | | | | | | Average: | | | |

**TEST RESULTS** where $P_{MAX}$ = 20 kPa/m depth below overburden/bedrock interface to a maximum of 800 kPa.

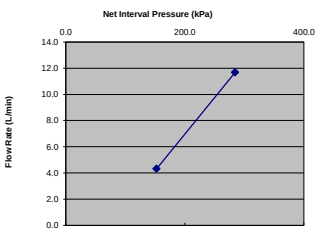
| Stage No. | Lugeon Value |
|---|---|
| P1 | 28.3 |
| P2 | 41.1 |
| P3 | -- |
| P4 | -- |
| P5 | -- |

**Lugeon Value Curve**




| Net Pressures |
|---|
| 152.5 |
| 284.3 |
| -- |
| -- |
| -- |

**Flow vs. Pressure**




**Interpreted Result & Hydraulic Conductivity**

K = Q/2πHL * ln(L/r), from Cedergren, 1989, where:

| | | |
|---|---|---|
| $H_{LOSS}$ | 4.26 | kPa |
| Stage No. | Average | |
| Gauge Pressure | 181 | kPa |
| Q | 8.00 | L/min |
| H | 22.3 | m |
| Interpreted Result | 34.7 | uL |

Reported Permeability at Stage Average

K = 3.0E-06 m/s

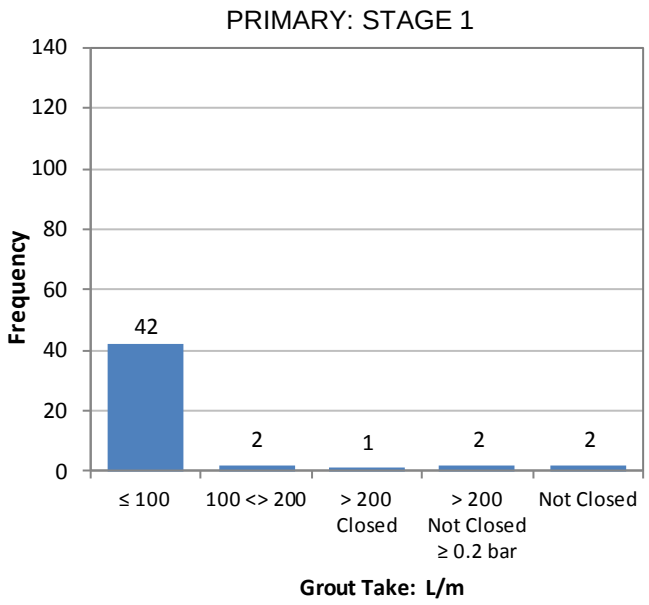
**Flow Type**

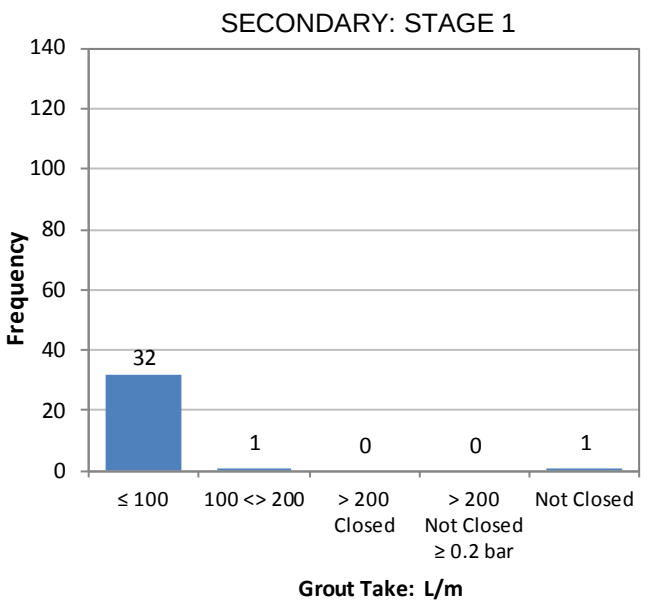
HIGH PERMEABILITY

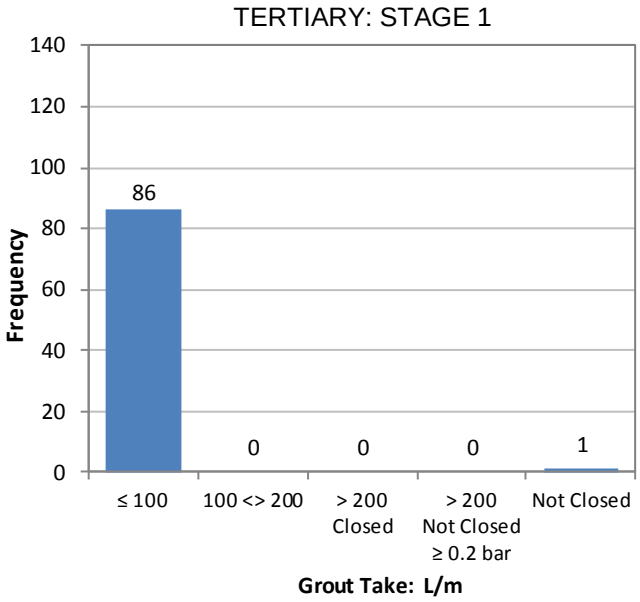
Comments

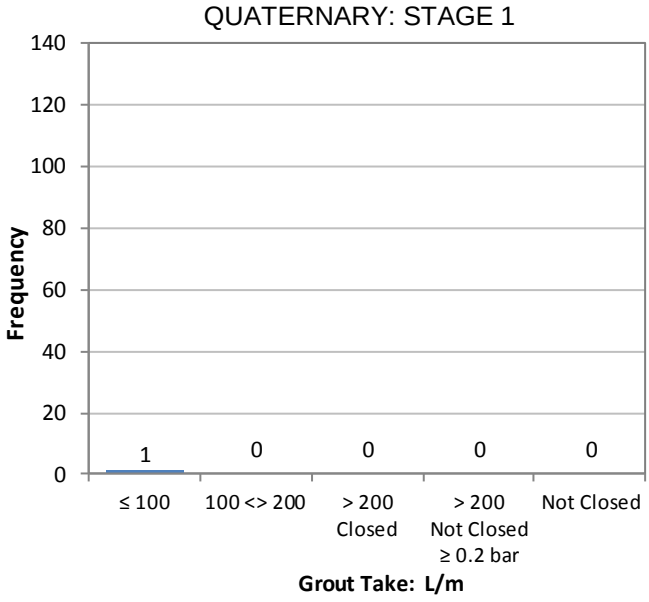
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# E1-6 Ground Improvement Achieved




**NOTES:**

1) Closure criteria : Penetrability ≤ 0.25 L/min/m/bar @ $P_{max}$

2) Injections considered not closed:

- One primary: experienced by-pass during injection
- One primary: stopped injection prematurely
- One secondary: stopped injection prematurely
- One tertiary: stopped injection prematurely

PROJECT

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TITLE

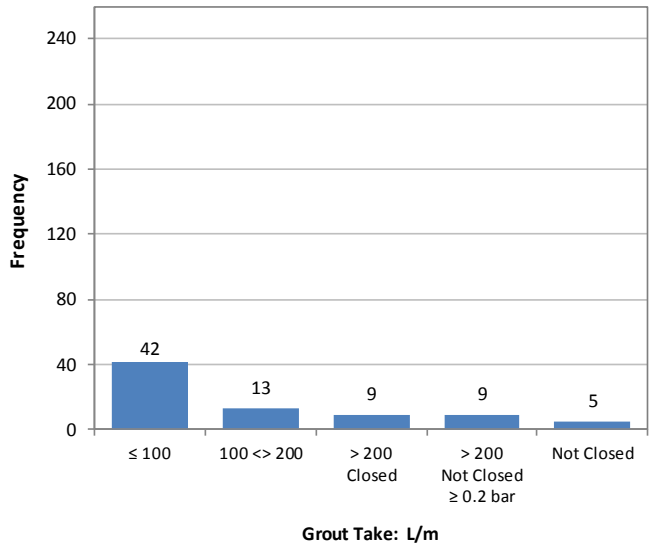
# GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE NORTH STAGE 1

Golder Associates

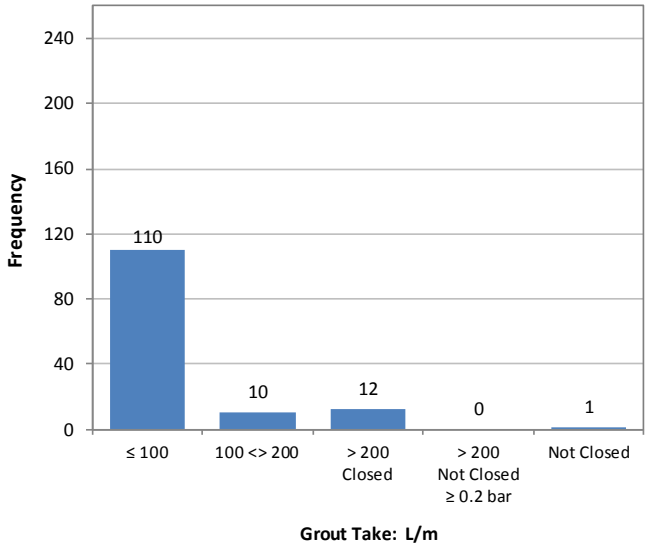
| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 10MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 20MAR12 | | |
| CHECK | GRB | 01DEC12 | FIGURE E1-6.1 | |
| REVIEW | FE | 01DEC12 | | |

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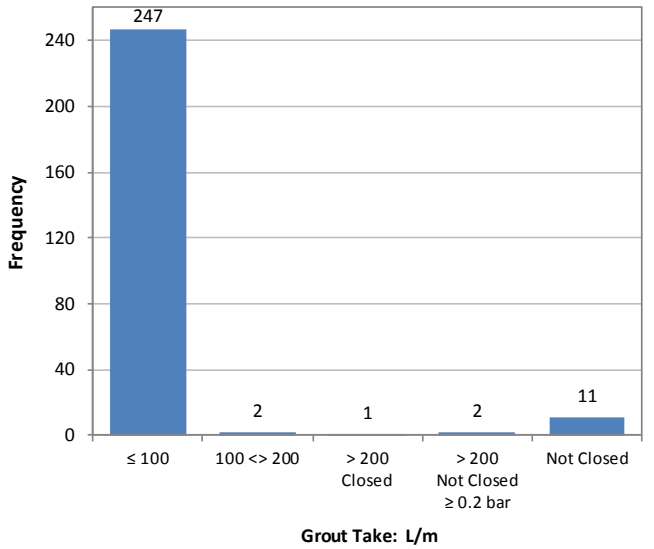
PRIMARY: STAGE 2



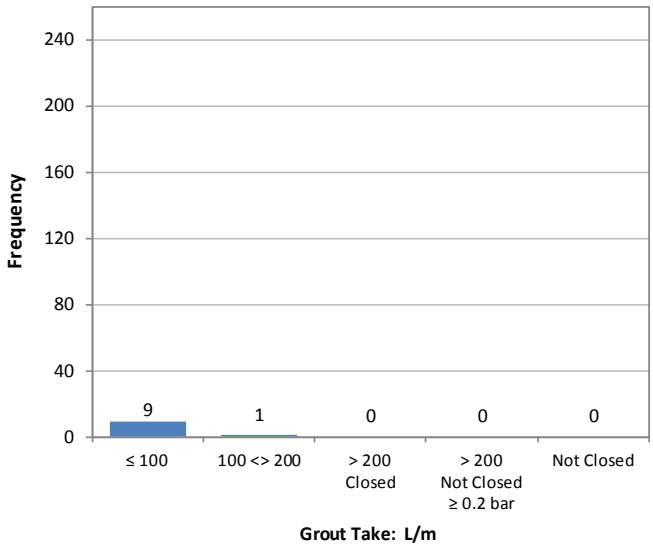

SECONDARY: STAGE 2




TERTIARY: STAGE 2




QUATERNARY: STAGE 2




**NOTES:**

1) Closure criteria: Penetrability ≤ 0.25 L/min/m/bar @ $P_{max}$

2) Injections considered not closed:

- Three primary: experienced by-pass during injection
- One primary: reached volume limit
- One primary: communicated to an adjacent hole
- One secondary: reached volume limit
- Nine tertiary: experienced by-pass during injection
- One tertiary: reached volume limit
- One tertiary: stopped injection prematurely

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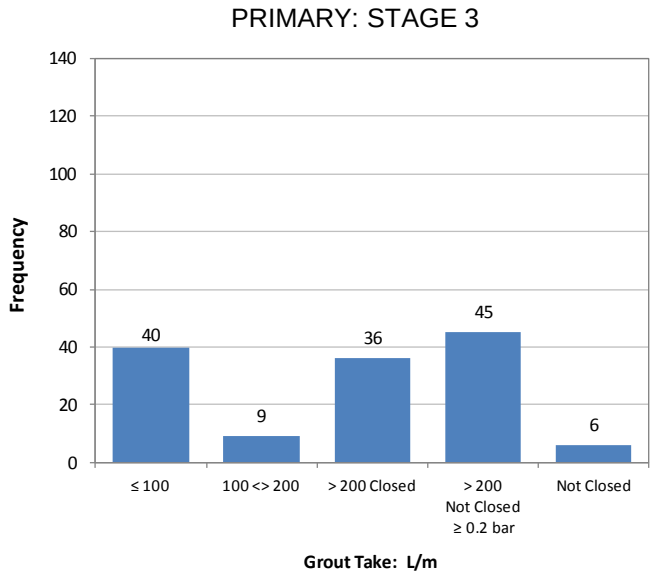
TITLE: **GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE NORTH STAGE 2**

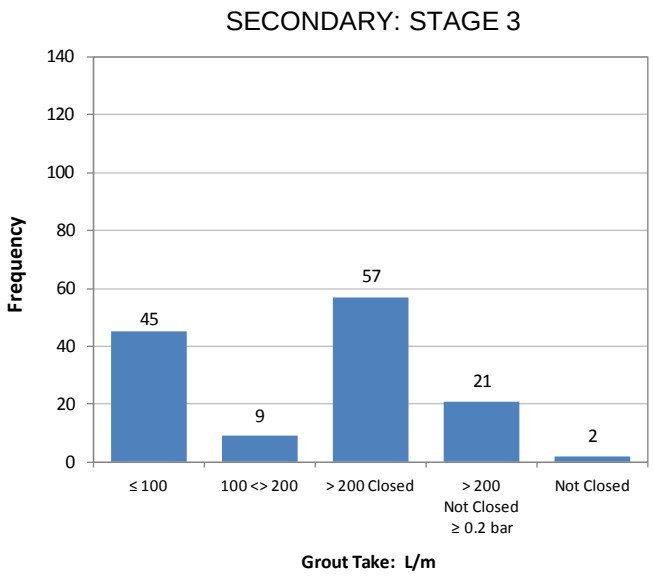
Golder Associates

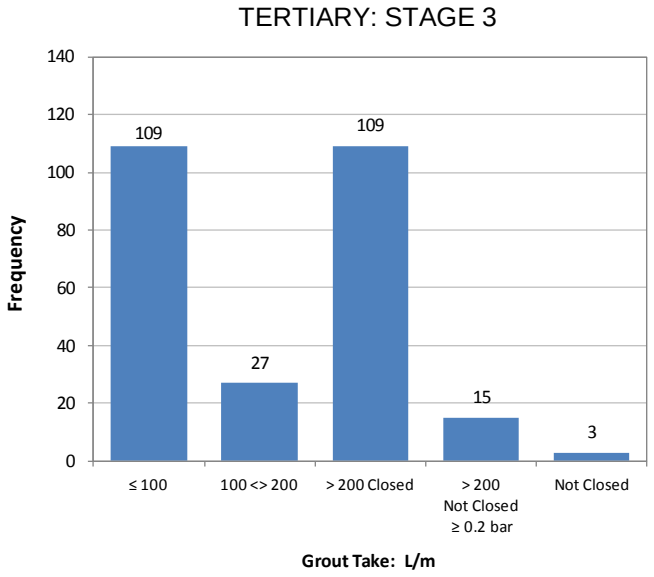
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|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 10MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 20MAR12 | | |
| CHECK | GRB | 01DEC12 | | |
| REVIEW | FE | 01DEC12 | | |

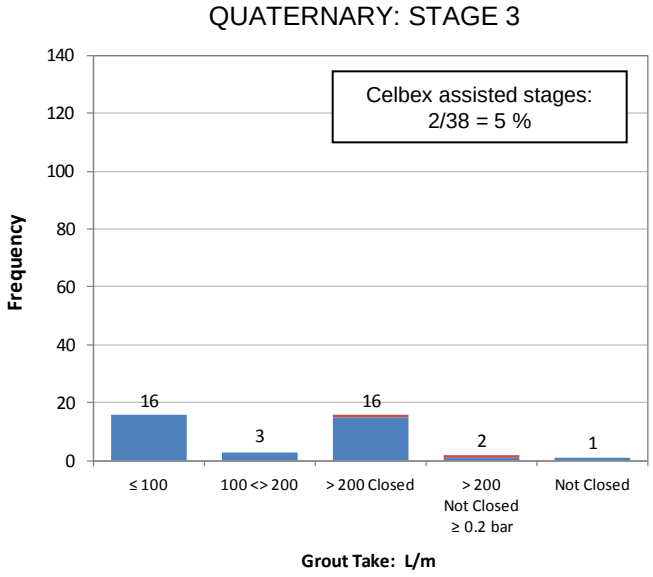
**FIGURE E1-6.2**

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**LEGEND:**

with Celbex

without Celbex

**NOTES:**

1) Closure criteria: Penetrability ≤ 0.25 L/min/m/bar @ $P_{max}$

2) Injections considered not closed:

- One primary: communicated to an adjacent hole
- Two primary: stopped injection prematurely
- Three primary: reached volume limit
- One secondary: stopped injection at the volume limit
- One secondary: experienced by-pass during injection
- Three tertiary: experienced by-pass during injection
- One quaternary: stopped injection prematurely

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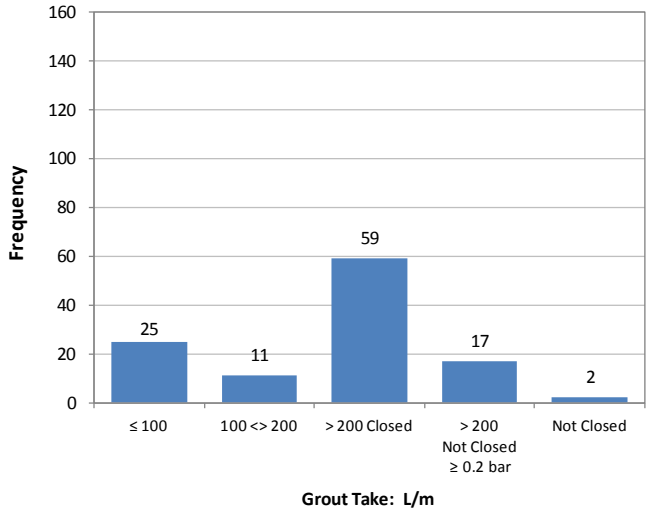
TITLE

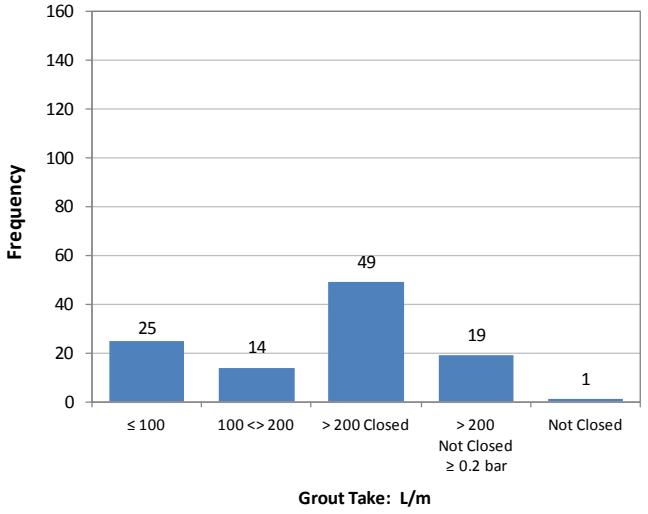
# GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE NORTH STAGE 3

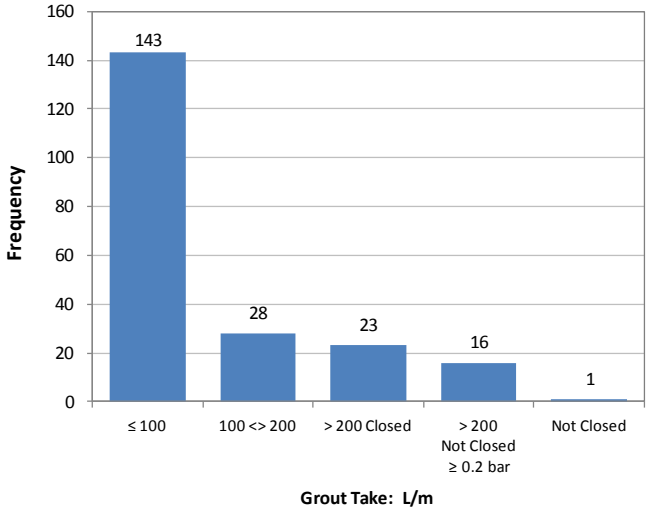
Golder Associates

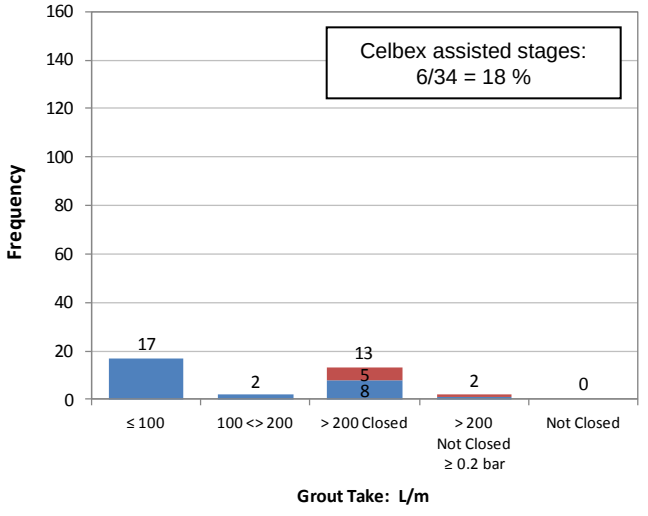
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| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 10MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 20MAR12 | | |
| CHECK | GRB | 01DEC12 | **FIGURE E1-6.3** | |
| REVIEW | FE | 01DEC12 | | |

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**LEGEND:**

with Celbex

without Celbex

**NOTES:**

1) Closure criteria: Penetrability ≤ 0.25 L/min/m/bar @ $P_{max}$

2) Injections considered not closed:

- Two primary: experienced by-pass during injection
- One secondary: experienced by-pass during injection
- One tertiary: communicated to adjacent holes

PROJECT

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TITLE

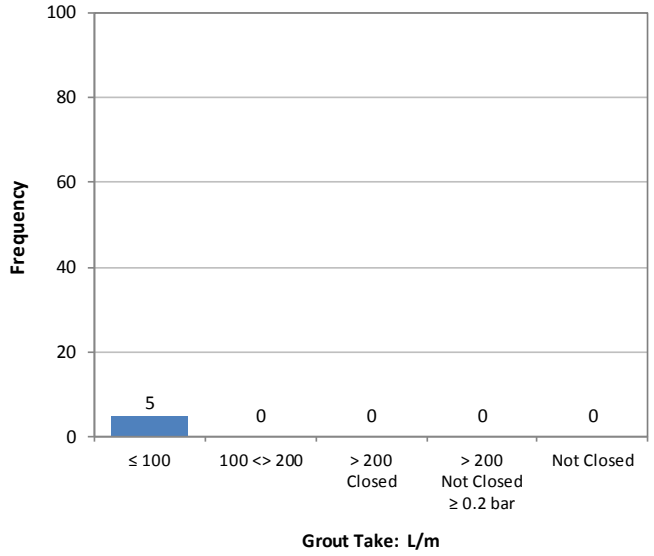
# GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE NORTH STAGE 4

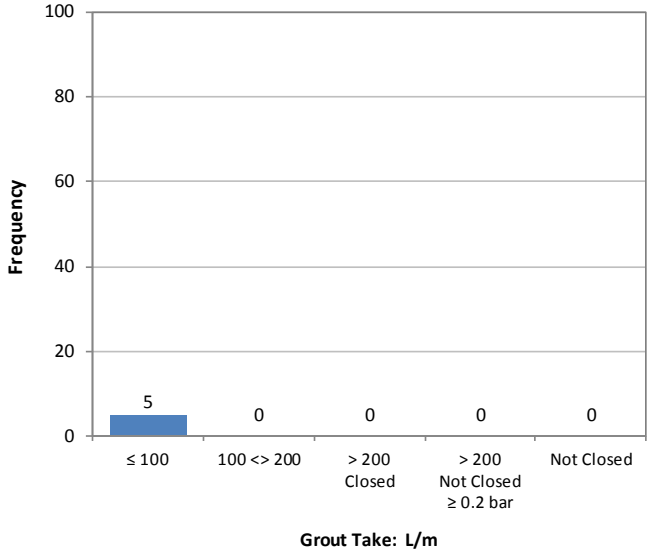
Golder Associates

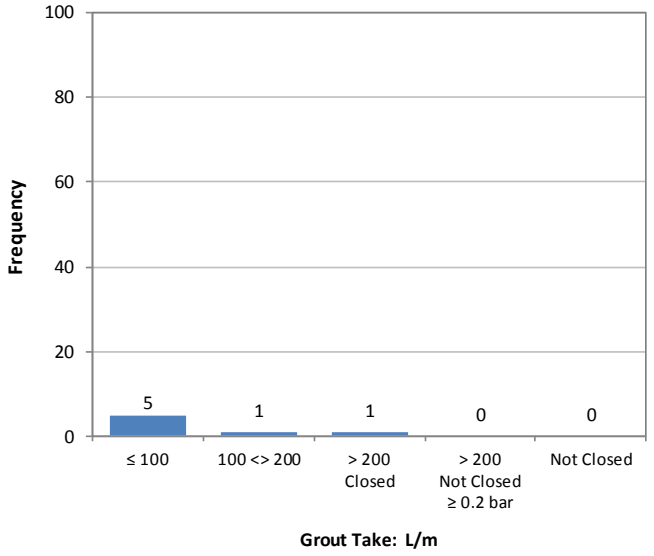
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|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
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| CHECK | GRB | 01DEC12 | | |
| REVIEW | FE | 01DEC12 | | |

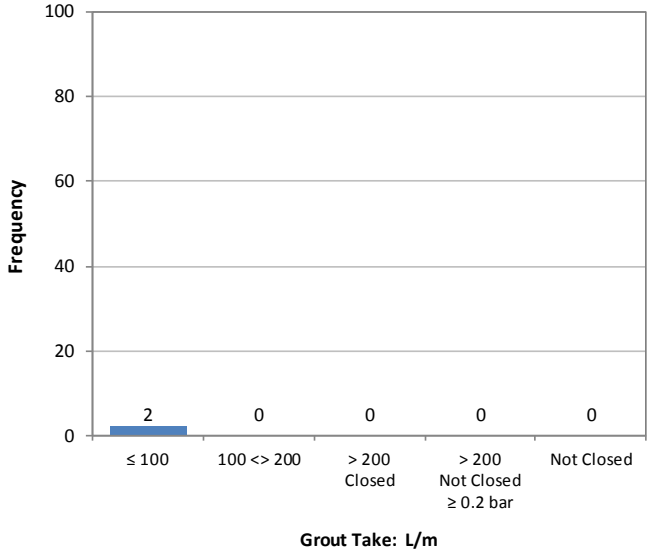
**FIGURE E1-6.4**

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**NOTES:**

1) Closure criteria: Penetrability ≤ 0.25 L/min/m/bar @ $P_{max}$

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TITLE

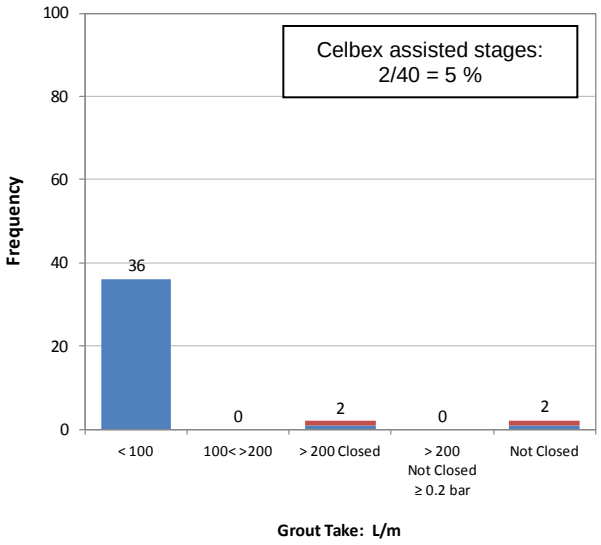
# GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE SOUTH STAGE 1B

Golder Associates

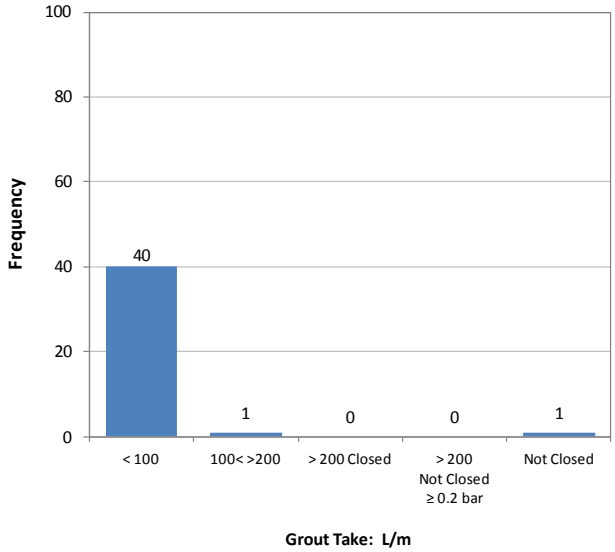
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| DESIGN | VTR | 10MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 20MAR12 | | |
| CHECK | GRB | 01DEC12 | **FIGURE E1-6.5** | |
| REVIEW | FE | 01DEC12 | | |

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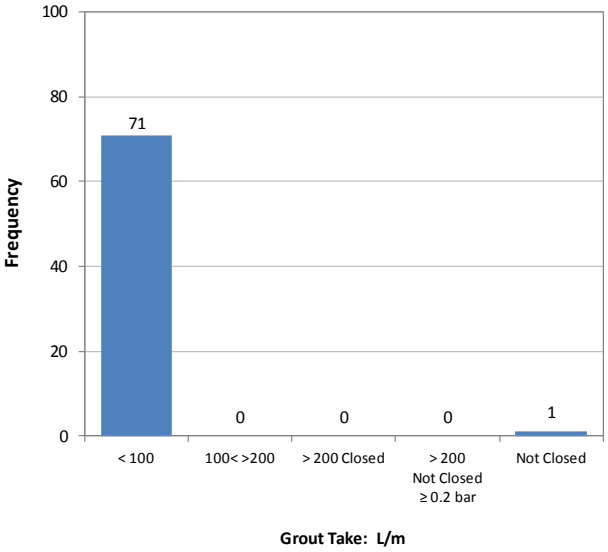
## PRIMARY: STAGE 1C



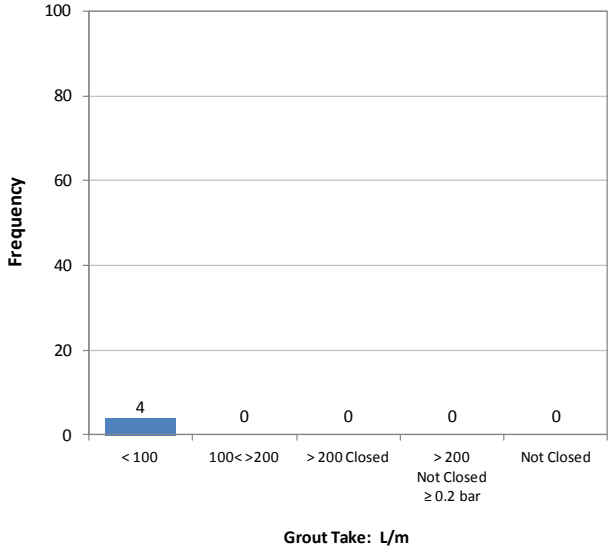

## SECONDARY: STAGE 1C




## TERTIARY: STAGE 1C




## QUATERNARY: STAGE 1C




**LEGEND:**

with Celbex

without Celbex

**NOTES:**

1) Closure criteria: Penetrability ≤ 0.25 L/min/m/bar @ $P_{max}$

2) Injections considered not closed:

- One primary: stopped injection prematurely
- One primary: hole abandoned (packer stuck)
- One secondary: stopped injection prematurely
- One tertiary: stopped injection prematurely

PROJECT

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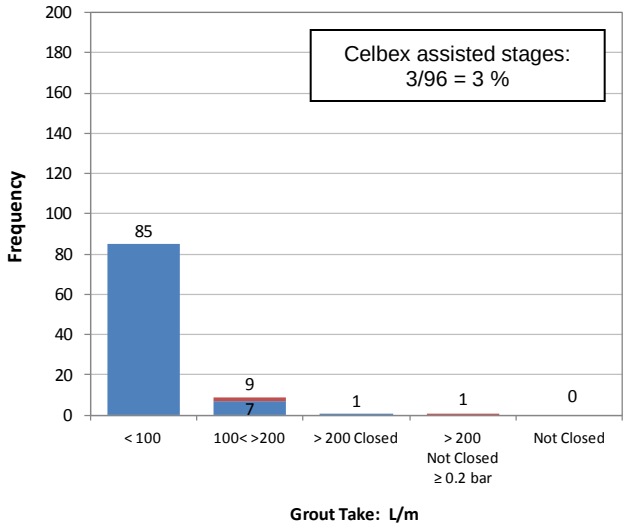
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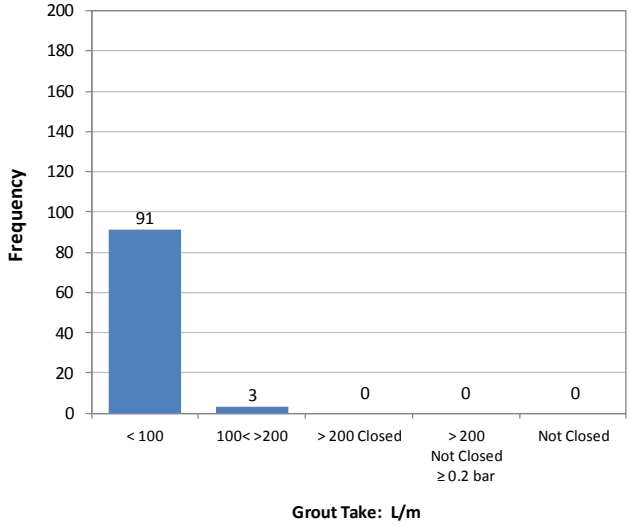
# GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE SOUTH STAGE 1C

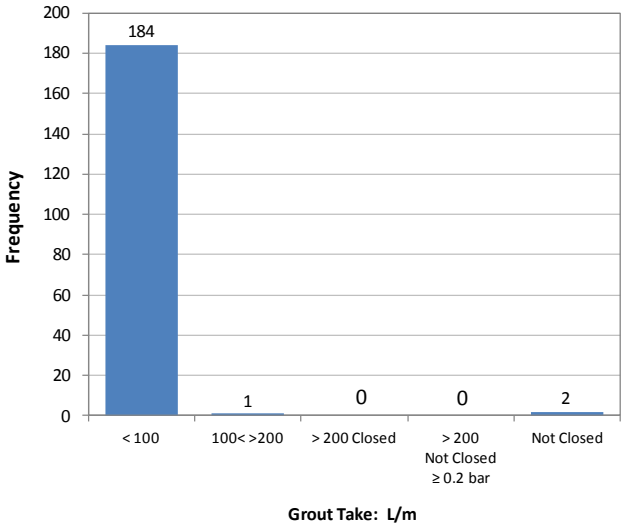
Golder Associates

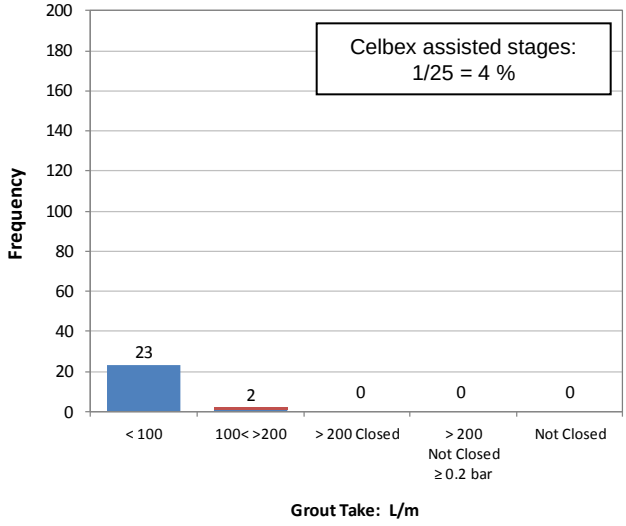
| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 10MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 20MAR12 | | |
| CHECK | GRB | 01DEC12 | FIGURE E1-6.6 | |
| REVIEW | FE | 01DEC12 | | |

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**LEGEND:**

with Celbex

without Celbex

**NOTES:**

1) Closure criteria: Penetrability ≤ 0.25 L/min/m/bar @ $P_{max}$

2) Injections considered not closed:

- Two tertiary: experienced by-pass during injection

PROJECT

AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

# GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE SOUTH STAGE 1

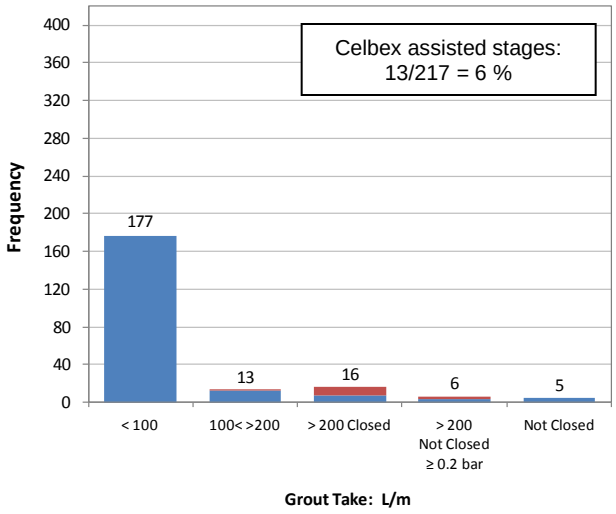
Golder Associates

| | | | | |
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| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
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| CADD | YEW | 20MAR12 | | |
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| REVIEW | FE | 01DEC12 | | |

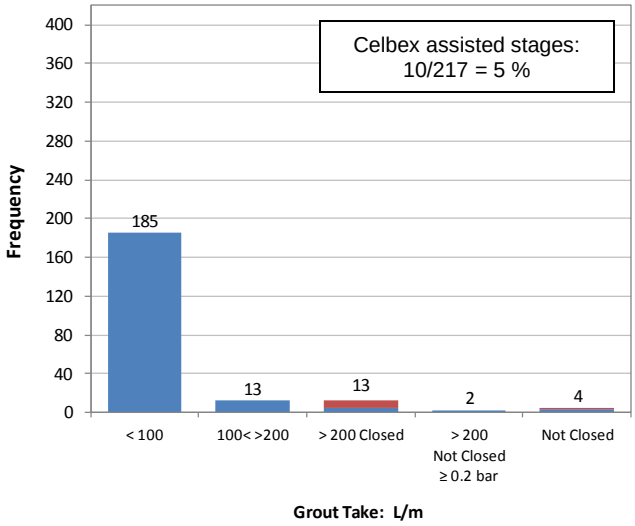
**FIGURE E1-6.7**

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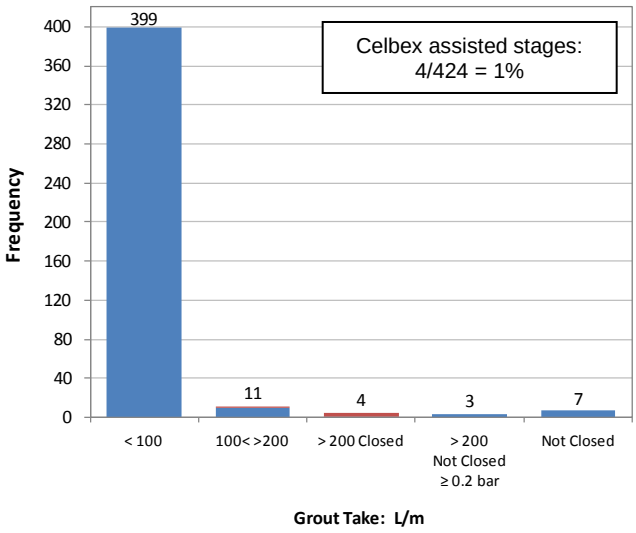
## PRIMARY: STAGE 2



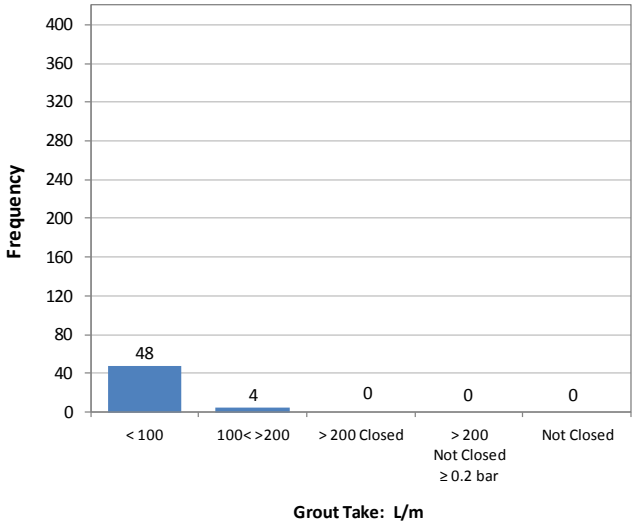

## SECONDARY: STAGE 2




## TERTIARY: STAGE 2




## QUATERNARY: STAGE 2




**LEGEND:**

with Celbex

without Celbex

**NOTES:**

1) Closure criteria: Penetrability ≤ 0.25 L/min/m/bar @ $P_{max}$

2) Injections considered not closed:

- One primary: experienced by-pass during injection
- Three primary: stopped injection prematurely
- Three secondary: experience by-pass during injection
- One secondary: stopped injection prematurely
- Five tertiary: experienced by-pass during injection
- One tertiary: stopped injection prematurely
- One tertiary: experienced by-pass during injection

PROJECT

AEM

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TITLE

# GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE SOUTH STAGE 2

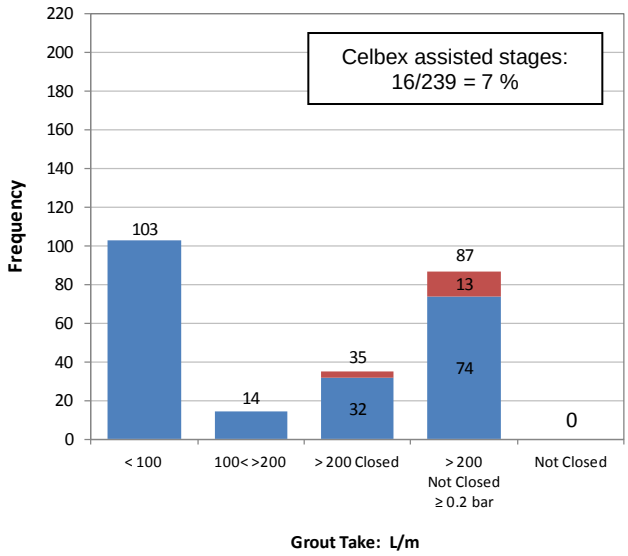
Golder Associates

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| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 10MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 20MAR12 | | |
| CHECK | GRB | 01DEC12 | | |
| REVIEW | FE | 01DEC12 | | |

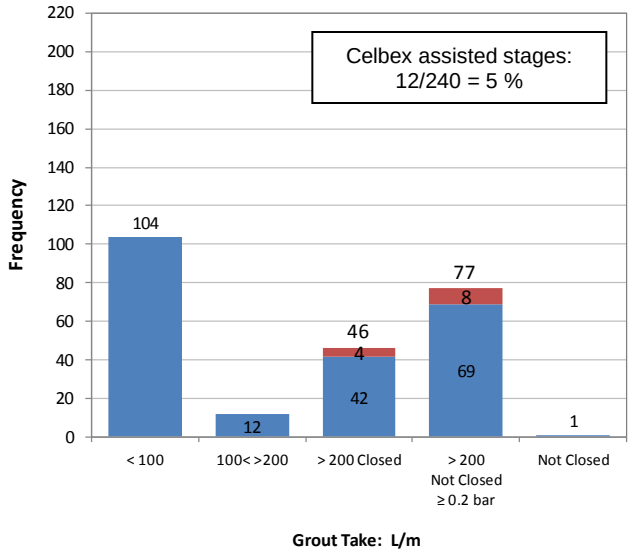
**FIGURE E1-6.8**

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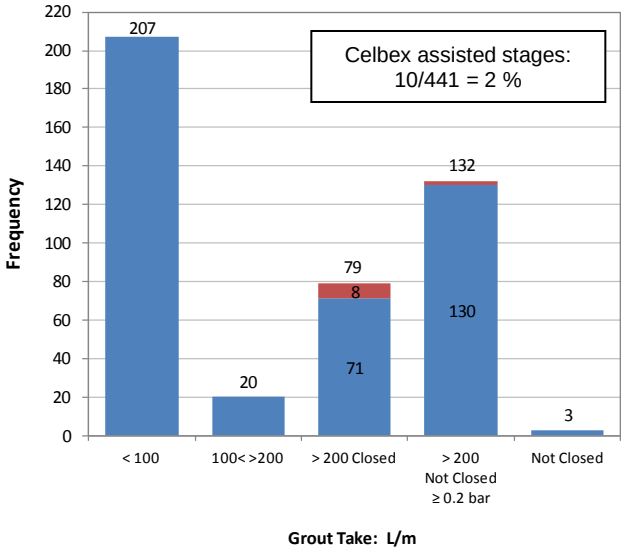
## PRIMARY: STAGE 3



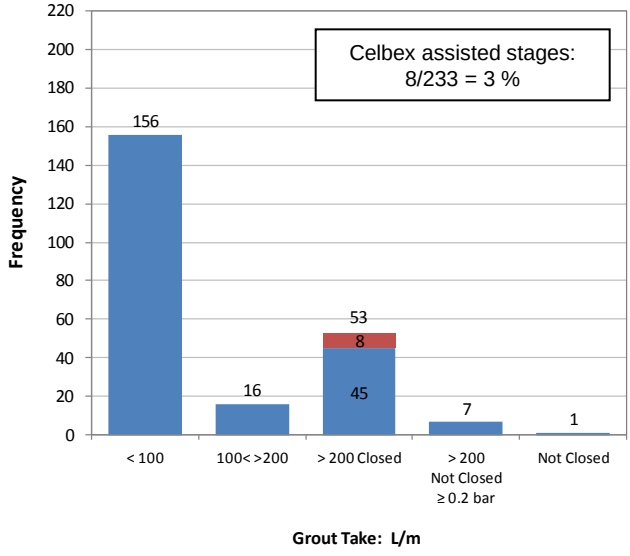

## SECONDARY: STAGE 3




## TERTIARY: STAGE 3




## QUATERNARY: STAGE 3




**LEGEND:**

with Celbex

without Celbex

**NOTES:**

1) Closure criteria: Penetrability ≤ 0.25 L/min/m/bar @ $P_{max}$

2) Injections considered not closed:

- One secondary: experienced by-pass during injection
- One tertiary: stopped injection prematurely
- Two tertiary: stopped injection prematurely
- One quaternary: stopped injection prematurely

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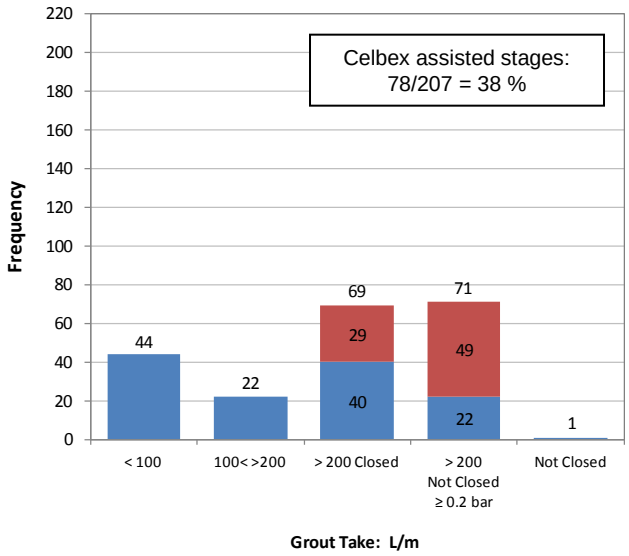
TITLE: **GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE SOUTH STAGE 3**

Golder Associates

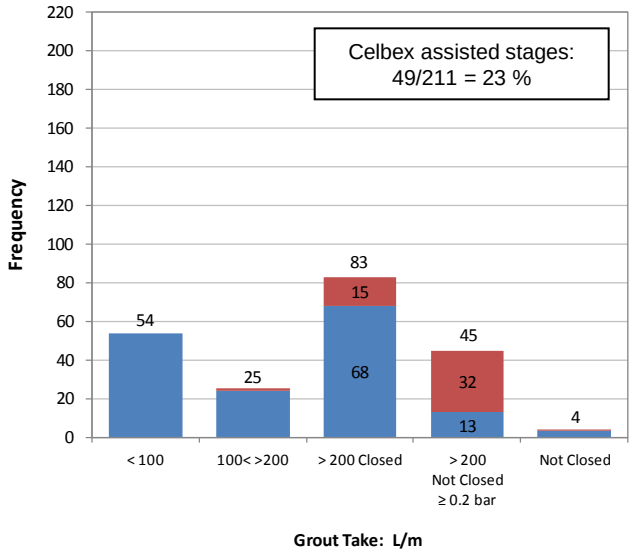
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| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 10MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 20MAR12 | | |
| CHECK | GRB | 01DEC12 | **FIGURE E1-6.9** | |
| REVIEW | FE | 01DEC12 | | |

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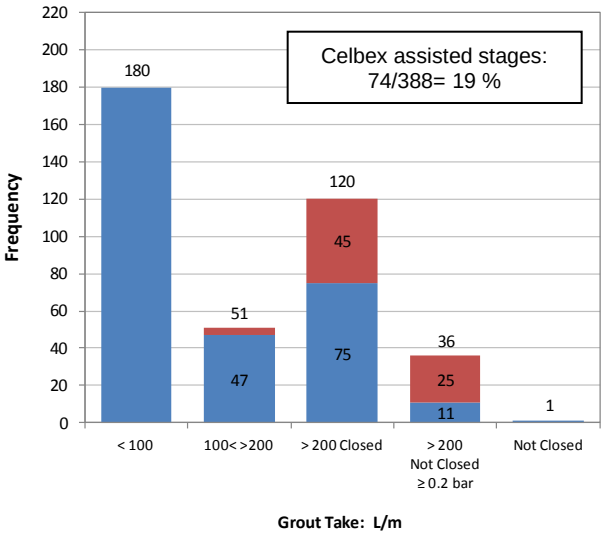
## PRIMARY: STAGE 4



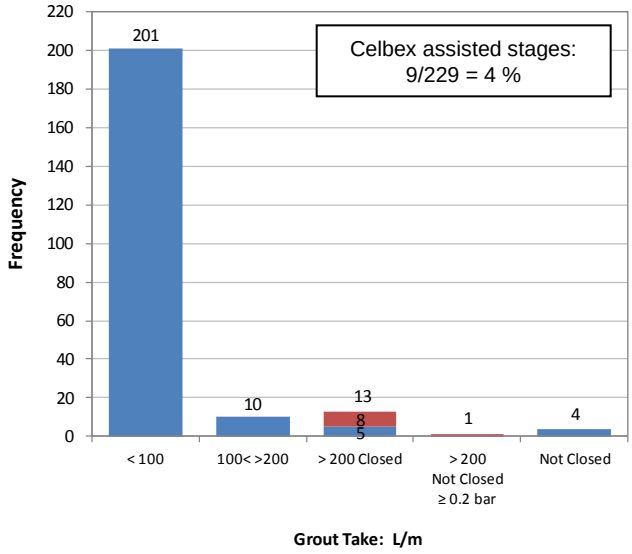

## SECONDARY: STAGE 4




## TERTIARY: STAGE 4




## QUATERNARY: STAGE 4




**LEGEND:**

with Celbex

without Celbex

**NOTES:**

1) Closure criteria: Penetrability ≤ 0.25 L/min/m/bar @ $P_{max}$

2) Injections considered not closed:

- One primary: experienced by-pass during injection
- One secondary: stopped grouting prematurely
- Three secondary: stopped grouting prematurely
- One tertiary: penetrability criteria not met
- Three quaternary: experienced by-pass during injection
- One quaternary: stopped injection prematurely

PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE: **GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE SOUTH STAGE 4**

Golder Associates

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|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 10MAR12 | SCALE N/A | REV. 0 |
| CADD | YEW | 20MAR12 | | |
| CHECK | GRB | 01DEC12 | **FIGURE E1-6.10** | |
| REVIEW | FE | 01DEC12 | | |

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# APPENDIX E2

## Jet Grouting

# E2-1 TAM Trials

- Summary of Trial
- Core Photographs

## Summary of Trial

# TUBE-A-MANCHETTE TRIALS

The following summarizes notes and discussions held during a series of tube-a-manchette (TAM) trials that were conducted in the North Portion of the Bay-Goose Dike in May / June 2010.

**Table 1: Summary of Activities**

| | |
|---|---|
| May 23, 2010 | Discussions / Meetings:<br>With Bruno Perron and Yohan Jalbert, AEM, and Raymond, Orbit-Garant foreman regarding the trial installation of tube-a-manchettes in the North Channel of the Bay-Goose Dike. Plan proceeding forward was agreed upon.<br>■ HQ core through the ¾-inch minus or CSB materials and approximately 0.3 m into bedrock.<br>■ Ream PQ diameter casing overtop of HQ drill rods.<br>■ Pull HQ drill rods and move to next hole.<br>■ When all four casings have been installed:<br>▪ Install TAM and solid PVC through the steel casing,<br>▪ Tremie backfill with casing grout,<br>▪ Pull a couple casings, re-top up the tremie grout, and<br>▪ Repeat until all casings have been extracted.<br><br>General:<br>TAM trial program began; 1 HQ hole was diamond drilled, 1 PQ casing was installed. |
| May 24, 2010 | Discussions / Meetings:<br>Updated Bruno Perron and Yohan Jalbert, AEM, regarding the trial installation of TAMs in the North Channel of the Bay-Goose Dike.<br>■ Drilling through the ¾-inch minus materials while installing MB-GD-D-30+889.275 progressed relatively smoothly. The drillers had some difficulties reaming the casing over the HQ drill rods, particularly near the bedrock / core backfill material contact.<br>■ Drilling through the ¾-inch minus materials while installing MB-GD-U-30+889.275 progressed quickly, the PQ casing being reamed down to bedrock by 10:30 am.<br>■ The two holes through the ¾-inch minus materials, including mobilization plus diamond HQ "pilot" hole drilling and subsequent casing installation, required approximately 8.5 hrs each to complete.<br>■ Drilling through the CSB materials while installing MB-GD-K-30+390.125 progressed a bit slower. Frozen CSB materials were recovered from the top 4 m of the borehole (see attached photograph). Drilling was completed at 1:00 am. Casing was reamed down to bedrock between 1:00 am and 3:00 am.<br>■ On average, 1-hr was required for drill moves between adjacent boreholes.<br><br>General:<br>TAM trial program continued; 1 HQ hole was diamond drilled, 2 PQ casings were installed. |

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| May 25, 2010 | Discussions / Meetings:<br>Updated Bruno Perron and Yohan Jalbert, AEM, regarding the trial installation of TAMs in the North Channel of the Bay-Goose Dike. Ken Lachance of TCG attended the morning meeting as well.<br>■ Reported that three of the four casings had been installed and the fourth, MB-GD-K-30+388.625 had just been started.<br>■ Decided that to optimize the process of installing the TAM and blank PVC casings, because TCG was only operating a day shift crew for the TAM trial program that it would better to install the first TAM's during day shift, and complete the installation of the final casing during night shift.<br>■ Diamond coring of MB-GD-K-30+388.625 was completed at 10:10 am, shortly after this morning's meeting. As discussed, casing was reamed to bedrock during night shift.<br><br>General:<br>TAM trial program continued; 1 HQ hole was diamond drilled, 1 PQ casing was installed, 2 TAM casings were installed and backfill grouted.<br><br>Summary:<br>Commenced TAM installation in MB-GD-D-30+389.275 at 12:30 pm. Completed installation at 2:30 pm.<br>■ A total of 10 batches of the casing grout [100L H20 : 40 kg cement : 22.6 kg bentonite] or approximately 1350 L, was tremied into this hole during installation.<br>■ After backfilling the casing the first time to the collar of the borehole, steel drill casings were extracted two at a time between backfilling operations.<br>■ After the initial backfilling, while the casing was still socketed in bedrock, the backfill grout did not return to the surface, most likely migrating into the ¾-inch minus materials during backfilling.<br><br>2:30 pm to 3:00 pm: Moved between adjacent boreholes.<br><br>Commenced TAM installation in MB-GD-K-30+390.125 at 3:00 pm. Completed installation at 5:00 pm.<br>■ A total of 6 batches of the casing grout, or approximately 810 L, was tremied into this hole during installation.<br>■ After backfilling the casing the first time to the collar of the borehole, steel drill casings were extracted two at a time between backfilling operations.<br>■ After each two-rod pull, the casing grout was topped up via tremie, the casing grout returning to the collar of the casing with each sequence of tremie backfilling.<br>■ After the last rod was pulled, casing grout was topped up at the collar by gravity. |

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| May 26, 2010 | Discussions / Meetings:<br>Updated Bruno Perron and Yohan Jalbert, AEM, regarding the trial installation of TAMs in the North Channel of the Bay-Goose Dike.<br>■ Completed installation of two plastic TAM casing yesterday. Will complete the remaining two in the morning. Thereafter need to wait at least two days for the bentonite-rich casing grout to set.<br>■ Orbit-Garant released to begin demobilizing at 12:30 pm.<br><br>General:<br>TAM trial program continued: final 2 remaining TAM casing were installed and backfill grouted.<br><br>Summary:<br>Commenced TAM installation in MB-GD-U-30+389.275 at 9:50 am. Completed installation at 10:50 am.<br>■ A total of 6 batches of the casing grout [100L H20 : 40 kg cement : 22.6 kg bentonite] or approximately 850 L, was tremied into this hole during installation.<br>■ After backfilling the casing the first time to the collar of the borehole, steel drill casings were extracted two at a time between backfilling operations.<br>■ After the initial backfilling, while the casing was still socketed in bedrock, the backfill grout did not return to the surface, most likely migrating into the ¾-inch minus materials during backfilling.<br><br>10:50 am to 11:30 am: Moved between adjacent boreholes.<br>Commenced TAM installation in MB-GD-K-30+388.625 at 11:30 am. Completed installation at 12:30 pm.<br>■ A total of 6 batches of the casing grout, or approximately 810 L, was tremied into this hole during installation.<br>■ After backfilling the casing the first time to the collar of the borehole, steel drill casings were extracted two at a time between backfilling operations.<br>■ After each two-rod pull, the casing grout was topped up via tremie, the casing grout returning to the collar of the casing with each sequence of tremie backfilling.<br>■ After the last rod was pulled, casing grout was topped up at the collar by gravity. |
| May 27, 2010 | General:<br>Waiting for casing grout to cure. At 48 hrs, hand vane shear strength was 260 kPa. |

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| May 28, 2010 | Summary:<br>Started injection grouting of MB-GD-U-30+389.275:<br>■ Started at 10 am.<br>■ Single packer set-up was not available. Broken inflation fittings. The broken fittings for the single packer will be replaced with new packer on Monday, May 31. Had to switch to using the double packer set-up. As such, the bottom 2 of 7 ports in each TAM are not available.<br>■ Casing grout in bottom 4 available ports could not be broken.<br>■ Casing grout in uppermost (or 5th available port) hydrofractured at 12 bar at 14:30 hrs.<br>■ See grouting summary table for material quantities injected; 45 min for 235 L.<br>■ Flushed TAM for 20 minutes. Completed at 15:35 hrs.<br><br>Started injection grouting of MB-GD-D-30+389.275:<br>■ Started at 15:45 hrs. First available port broke at 2.6 bar at 16:00 hrs.<br>■ See grouting summary table for material quantities injected; 45 min for 340 L. Completed at 16:45 hrs.<br>■ Flushed TAM for 20 minutes.<br>■ Air-lifted both MB-GD-D-30+389.275 and MB-GD-U-30+389.275. For 20 minutes. Completed at 17:20 hrs. |
| May 29, 2010 | Injection grouting of MB-GD-U-30+389.275:<br>■ Began setup at 9:15 am (20 min).<br>■ Casing grout in uppermost port hydrofractured at 6 bar at 9:35 am.<br>■ Injected 140 L of grout over 40 minutes.<br>■ Completed at 10:15; moved packer and rods to MB-GD-U-30+389.275.<br><br>Injection grouting of MB-GD-D-30+389.275:<br>■ Started grout injection at 10:20 hrs; injected 500.2 L over 50 min. Completed at 11:20 hrs.<br>■ Cleaned equipment for 20 minutes.<br>■ Flushed TAM for 10 minutes in both MB-GD-D-30+389.275 and MB-GD-U-30+389.275.<br>■ Air-lifted both MB-GD-D-30+389.275 and MB-GD-U-30+389.275. For 5 minutes. Completed at 12:00 hrs.<br><br>Injection grouting of MB-GD-U-30+389.275:<br>■ Port 4: Injected water for 5 min; injected 483.5 L grout over 40 min; moved to Port 5 in 5 min.<br>■ Port 5: Injected water for 5 min; injected 503.8 L grout over 1 hour; moved to Port 6 in 10 min.<br>■ Port 6: Injected water for 5 min; injected 180.3 L grout over 35 min; moved to Port 7 in 5 min.<br>■ Port 7: Casing grout fractured with mix A at 5.2 bar; injected 531.3 L grout over 45 min.<br>■ Removed packer from hole, rinsed equipment and lines, and washed hole (15 min)<br>■ Air lifted hole (10 min) and put equipment away. Completed at 18:00. |

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| May 30, 2010 | Injection grouting of MB-GD-U-30+390.125:<br>■ Set up grouting equipment, began injecting Port 3 with water at 8:45.<br>■ Port 3: Injected water for 5 min; injected 189.4 L grout over 25 min; moved to Port 4 in 5 min.<br>■ Port 4: Casing grout fractured with mix A at 15 bar; injected 307.8 grout over 35 min; moved to Port 5 in 5 min.<br>■ Port 5: Casing grout fractured with mix A at 12.2 bar; injected 543.5 L grout over 45 min.<br>■ Removed packer from hole, rinsed equipment and lines, and washed hole (45 min).<br>■ Port 5 completed at 11:30; crew took break for lunch; hole not to be airlifted until the end of the day.<br><br>Injection grouting of MB-GD-K-30+390.125 continued:<br>■ Set up grouting equipment, began injecting Port 6 with water at 13:06.<br>■ Port 6: Casing grout fractured with water at 3.5 bar; injected 21 L water over 1 min; injected 227.7 L grout over 20 min; moved to Port 7 in 5 min.<br>■ Port 7: Casing grout fractured with mix A at 3.7 bar; injected 384.6 L grout over 30 min.<br>■ Removed packer from hole, washed hole with water, moved to U-30+389.275 (10 min).<br><br>Injection grouting of MB-GD-U-30+389.275:<br>■ Set up grouting equipment, began injecting Port 7 with mix A at 14:23.<br>■ Port 7: Casing grout fractured at 3.7 bar; injected 300 L grout over 40 min.<br>■ Removed packer from hole; rinsed equipment; moved packer to D-30+389.275 (25 min).<br><br>Injection grouting of MB-GD-D-30+389.275:<br>■ Set up grouting equipment, began injecting Port 3 with mix A at 15:27.<br>■ Port 3: Casing grout fractured with mix A at 4.2 bar; injected 337.8 L grout over 40 min; moved to Port 4 in 5 min.<br>■ Port 4: Casing grout did not fracture with mix A at 25 bar; move to port 5 (5 min).<br>■ Port 5: Casing grout did not fracture with mix A at 21 bar; move to port 6 (5 min).<br>■ Port 6: Casing grout did not fracture with mix A at 20 bar; emptied remaining mix A from agitator (10 min); fractured casing grout with water at 12 bar; injected 45 L water over 10 min; injected 259.9 L grout over 30 min; moved to Port 5 to re-attempt fracturing casing grout with water.<br>■ Port 5: Casing grout did not fracture with water at 18 bar.<br>■ Cleaned equipment, prepared to wash and air lift all 3 holes grouted during the day; washed and air lifted 3 holes (30 min).<br>■ Hole complete at 17:55. |

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| May 31, 2010 | Injection grouting of MB-GD-D-30+389.275:<br>■ Set up grouting equipment, began injecting Port 6 with water at 8:38.<br>■ Port 6: Injected water for 10 min; injected 104.8 L grout over 30 min; moved to Port 7 in 10 min.<br>■ Port 7: Casing grout fractured with water at 15 bar; injected 95.9 L grout over 45 min; moved to K-388.625 in 10 min.<br><br>Injection grouting of MB-GD-K-30+386.625:<br>■ Set up grouting equipment, began injecting Port 3 with mix A at 10:37.<br>■ Port 3: Casing grout fractured at 10 bar; injected 195 L grout over 35 min.<br>■ Cleaned equipment and washed both holes over 30 min; crew then took lunch break.<br><br>Injection grouting of MB-GD-K-30+386.625 continued:<br>■ Set up grouting equipment, began injecting Port 4 with water at 13:31.<br>■ Port 4: Casing grout fractured at 9.1 bar; injected 438.4 L over 50 min; moved to Port 5 in 5 min.<br>■ Port 5: Casing grout fractured with Mix A at 6.9 bar; injected 266.7 L grout over 30 min; moved to Port 6 in 5 min.<br>■ Port 6: Casing grout fractured with Mix A at 6.8 bar; injected 279.7 L grout over 40 min; moved to Port 7 in 5 min.<br>■ Port 7: Casing grout fractured with water at 6.1 bar; injected 286.8 L grout over 60 min; moved to K-390.125 in 5 min.<br><br>Injection grouting of MB-GD-K-30+390.125:<br>■ Set up grouting equipment, began injecting Port 3 with water at 16:37.<br>■ Port 3: Casing grout did not fracture with mix A at 19.77 bar; move to Port 4 in 5 min.<br>■ Port 4: Casing grout did not fracture with mix A at 20.37 bar; move to Port 5 in 5 min.<br>■ Port 5: Casing grout did not fracture with mix A at 20 bar; rinse lines and purge mix A over 5 min.<br>■ Port 5 re-attempt: Casing grout fractured with water at 18 bar; injected 91.7 L grout over 45 min.<br>■ Cleaned equipment, prepared to wash and air lift all 3 holes grouted today; washed and air lifted 3 holes (35 min).<br>■ Complete at 18:20. |

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| June 1, 2010 | Injection grouting of MB-GD-D-30+389.275:<br>■ Set up grouting equipment, began injecting Port 7 at 7:00.<br>■ Port 7: Casing grout fractured at 10.1 bar; injected 25.2 L grout over 10 min; moved to U-389.275 in 10 min.<br><br>Injection grouting of MB-GD-U-30+389.275:<br>■ Set up grouting equipment, began injecting all ports with a single packer at 7:25.<br>■ Casing grout fractured at 8.5 bar; injected 152.9 L of grout over 30 min; moved to K-390.125.<br><br>Injection grouting of MB-GD-K-30+390.125 continued:<br>■ Set up grouting equipment, began injecting Port 6 at 8:04.<br>■ Port 6: Casing grout fractured with Mix A at 9.1 bar; injected 184.4 L of grout over 25 min; moved to Port 7 in 5 min.<br>■ Port 7: Casing grout fractured with Mix A at 7.3 bar; injected 386 L grout over 50 min; moved to K-388.625 in 5 min.<br><br>Injection grouting of MB-GD-K-30+388.625:<br>■ Set up grouting equipment, began injecting Port 3 at 9:30.<br>■ Port 3: Casing grout did not fracture with mix A at 20 bar; move to Port 4 in 5 min.<br>■ Port 4: Casing grout fractured with Mix A at 15 bar; injected 248.5 L grout over 35 min; move to Port 5 in 5 min.<br>■ Port 5: Casing grout fractured with Mix A at 15 bar; injected 265.7 L grout over 30 min; move to Port 6 in 5 min.<br>■ Port 6: Casing grout fractured with Mix A at 15 bar; injected 194.6 L grout over 45 min; move to Port 7 in 5 min.<br>■ Port 7: Casing grout fractured with Mix A at 15 bar; injected 328.1 L grout over 35 min.<br>■ Cleaned equipment and holes over 35 min; broke for lunch. Cleaned further after lunch for 45 min.<br><br>Injection grouting of MB-GD-K-390.125:<br>■ Set up grouting equipment, began injecting Port 5 at 15:00.<br>■ Port 5: Casing grout fractured with Mix A at 16 bar; injected 68.5 L grout over 45 min; move to Port 6 in 5 min.<br>■ Port 6: Casing grout fractured with Mix A at 19.3 bar; injected 387 L grout over 30 min; move to Port 7 in 5 min.<br>■ Port 7: Casing grout fractured with Mix A at 12.5 bar; injected 346.4 L grout over 40 min.<br>■ Cleaned equipment / airlifted and cleaned holes over 60 min; shift change at 18:15. |

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| | Injection grouting of MB-GD-K-388.625:<br>■ Set up grouting equipment, began injecting Port 4 at 20:08.<br>■ Port 4: Casing grout did not fracture with water at 21 bar; move to Port 5 in 5 min.<br>■ Port 5: Casing grout did not fracture with water at 18.5 bar; move to Port 6 in 5 min.<br>■ Port 6: Casing grout did not fracture with water at 18.0 bar; move to Port 7 in 5 min.<br>■ Port 7: Casing grout fractured with water at 4.53 bar; injected 220.1 L over 25 min.<br>■ Cleaned equipment and holes. |

**Table 2: Drilling Summary**

| Date | Hole | Shift | HQ Coring | | | PQ Casing Installation | | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | | From (m) | To (m) | Total (m) | From (m) | To (m) | Total (m) | |
| 23-May-10 | MB-GD-D-30+389.275 | N | 0 | 14.58 | 14.58 | 0 | 14.63 | 14.63 | Bedrock contact at 14.35 m |
| 23-May-10 | MB-GD-U-30+389.275 | D | 0 | 3 | 3 | -- | -- | -- | -- |
| 24-May-10 | MB-GD-U-30+389.275 | D | 3 | 15.04 | 12.04 | 0 | 15.04 | 15.04 | Bedrock contact at 14.76 m bgs |
| 24-May-10 | MB-GD-K-30+390.125 | D | 0 | 12.37 | 12.37 | -- | -- | -- | -- |
| 24-May-10 | MB-GD-K-30+390.125 | N | 12.37 | 14.96 | 2.59 | 0 | 15.01 | 15.01 | Bedrock contact at 14.43 m bgs |
| 25-May-10 | MB-GD-K-30+388.625 | D | 0 | 15.15 | 15.15 | -- | -- | -- | Bedrock contact at 14.0 m bgs |
| 25-May-10 | MB-GD-K-30+388.625 | N | -- | -- | -- | 0 | 14.98 | 14.98 | -- |

**Table 3: Grouting Summary**

| Date | Hole | Shift | Stage | | | Mix | Pdef (bar) | Pfinal (bar) | Pen. (L/min/ m/bar) | Vol. (L) | Tot. Vol. (L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. | From (m) | To (m) | | | | | | | |
| 28-May-10 | U-30+389.275 | Day | 3.1 | 13.79 | 13.29 | A | - | 6.7 | - | - | - | Casing grout did not fracture |
| | | | 3.1 | 13.79 | 13.29 | A | - | 8 | - | - | - | Casing grout did not fracture |
| | | | 3.1 | 13.79 | 13.29 | A | - | 7 | - | - | - | Casing grout did not fracture |
| | | | 4.1 | 13.66 | 13.16 | A | - | 5.7 | - | - | - | Casing grout did not fracture |
| | | | 4.1 | 13.66 | 13.16 | water | - | 14 | - | - | - | Casing grout did not fracture |
| | | | 5.1 | 13.16 | 12.76 | water | - | 15 | - | - | - | Casing grout did not fracture |
| | | | 6.1 | 12.76 | 12.26 | water | - | 15 | - | - | - | Casing grout did not fracture |
| | | | 7.1 | 12.26 | 11.76 | water | - | - | - | 55 | 55 | Fractured casing grout at 11.7 bar |
| | | | 7.1 | 12.26 | 11.76 | A | | 0.9 | 100 | 75 | - | |
| | | | | | | C | | 2.9 | 5.5 | 70 | - | |
| | | | | | | E | | 3 | 0 | 35.2 | 180.2 | Total Volumes; Water: 55 L; Grout 180 L |
| | D-30+389.275 | | 3.1 | 13.65 | 13.15 | water | - | - | - | 40 | 40 | Fractured casing grout at 2.6 bar |
| | | | 3.1 | 13.65 | 13.15 | A | 3 | 0.9 | 18 | 80 | - | |
| | | | | | | C | 3 | 1.5 | 19 | 180 | - | |
| | | | | | | E | 3 | 3.5 | 0.01 | 41.2 | 341.2 | Total Volumes: Water: 40 L; Grout 301.2 L |

| Date | Hole | Shift | Stage | | | Mix | Pdef (bar) | Pfinal (bar) | Pen. (L/min/ m/bar) | Vol. (L) | Tot. Vol. (L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. | From (m) | To (m) | | | | | | | |
| 29-May-10 | U-30+389.275 | Day | 7.2 | 12.14 | 11.64 | water | 3 | 6.2 | - | - | - | Casing grout fractured at 6.2 bar |
| | | | | | | water | 3 | 0.9 | 11.7 | 42 | 42 | Water flow rate before adding Mix A: 6 L/m |
| | | | | | | A | 3 | 1 | 18.5 | 52 | - | |
| | | | | | | C | 3 | 3 | 0 | 85.3 | 137.3 | Total Volume Grout: 137.3 L |
| | D-30+389.275 | | 3.2 | 13.65 | 13.15 | A | 3 | 6 | - | - | - | Casing grout fractured at 6 bar |
| | | | | | | A | 3 | 2.2 | 14.6 | 231 | - | |
| | | | | | | C | 3 | 3.4 | 2 | 259 | - | |
| | | | | | | E | 3 | 3.6 | 0 | 10.2 | 500.2 | Total Volume Grout: 500.2 L |
| | D-30+389.275 | Day | 4.1 | 13.26 | 11.76 | water | 3 | 2.5 | - | 40 | 40 | Casing grout fractured at 2.5 bar |
| | | | | | | A | 3 | 0.9 | 20 | 81 | - | |
| | | | | 13.25 | 12.75 | C | 3 | 3.4 | 9.6 | 383 | - | |
| | | | | | | E | 3 | 3.6 | 2.33 | 19.4 | 483.5 | Total Volume Grout: 483.5 L |
| | | | 5.1 | 12.85 | 12.35 | water | 3 | 6.5 | - | 87 | 87 | Casing grout fractured at 6.5 bar |
| | | | | | | A | 3 | 0.6 | 12.6 | 43.7 | - | |
| | | | | | | C | 3 | 3.5 | 3.4 | 340 | - | |
| | | | | | | E | 3 | 3.7 | 0 | 20.6 | 503.8 | Total Volume Grout: 503.8 L |
| | | | 6.1 | 12.45 | 11.85 | water | 3 | 9 | - | 75 | 75 | Casing grout fractured at 9 bar |
| | | | | | | A | 3 | 2.7 | 7.6 | 70 | - | |
| | | | | | | C | 3 | 3.7 | 1.3 | 98.8 | - | |
| | | | | | | E | 3 | 3.2 | 0.01 | 12.5 | 180.3 | Total Volume Grout: 180.3 L |
| | | | 7.1 | 12.05 | 11.55 | A | 3 | 1.1 | 32.9 | 160 | - | Casing grout fractured at 5.2 bar |
| | | | | | | C | 3 | 2.6 | 9.7 | 321 | - | |
| | | | | | | E | 3 | 2.9 | 1.4 | 50.4 | 531.3 | Total Volume Grout: 531.2 L |
| | K-30+390 | Day | 3.1 | 14.12 | 13.62 | water | -- | 6.7 | -- | 34 | 34 | Casing grout fractured at 6.7 bar |
| | | | | | | A | 3 | 1.8 | 11.6 | 63.3 | - | |
| | | | | | | C | 3 | 3.6 | 0.9 | 121 | - | |

| Date | Hole | Shift | Stage | | | Mix | Pdef (bar) | Pfinal (bar) | Pen. (L/min/ m/bar) | Vol. (L) | Tot. Vol. (L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. | From (m) | To (m) | | | | | | | |
| | | | | | | E | 3 | 3.5 | 0 | 5.4 | 189.4 | |
| | | | 4.1 | 13.72 | 13.22 | A | 3 | 1.8 | 15.09 | 121 | - | Casing grout fractured at 15 bar |
| | | | | | | C | 3 | 3.5 | 1.9 | 161 | - | |
| | | | | | | E | 3 | 3.6 | 0 | 26.4 | 307.8 | |
| | | | 5.1 | 13.32 | 12.82 | A | 3 | 0.7 | 57 | 152 | - | Casing grout fractured at 12.2 bar |
| | | | | | | C | 3 | 1.8 | 12.9 | 340 | - | |
| | | | | | | E | 3 | 3.2 | 0.2 | 50.7 | 543.5 | |
| | | | 6.1 | 12.92 | 12.42 | water | -- | 3.5 | -- | 21 | 21 | Casing grout fractured at 3.5 bar |
| | | | | | | A | 3 | 2.4 | 5.9 | 84 | - | |
| | | | | | | C | 3 | 3.6 | 2.6 | 131 | - | |
| | | | | | | E | 3 | 3.4 | 0 | 12.5 | 227.7 | |
| | | | 7.1 | 12.52 | 12.02 | A | 3 | 1.4 | 26.6 | 221 | - | Casing grout fractured at 3.7 bar |
| | | | | | | C | 3 | 3.5 | 1.2 | 151 | - | |
| | | | | | | E | 3 | 3.6 | 0 | 12.6 | 384.6 | |
| | U-30+389 | | 7.3 | 12.47 | 11.97 | A | 3 | 2.7 | 7.47 | 211 | - | Casing grout fractured at 3.7 bar |
| | | | | | | C | 3 | 3.9 | 0 | 89 | 300 | |
| | D-30+389 | | 3.3 | 14.59 | 13.65 | A | 3 | 3 | 4 | 170 | - | Casing grout fractured at 4.2 bar |
| | | | | | | C | 3 | 3.6 | 1.8 | 150 | - | |
| | | | | | | E | 3 | 3.8 | 0 | 17.8 | 337.8 | |
| | | | 4.2 | 13.25 | 12.85 | A | 3 | 25 | -- | -- | - | Casing grout did not fracture |
| | | | 5.2 | 12.85 | 12.35 | A | 3 | 20 | -- | -- | - | Casing grout did not fracture |
| | | | 6.2 | 12.45 | 11.95 | A | 3 | 20 | -- | -- | - | Casing grout did not fracture on first attempt with mix A |
| | | | | | | water | 3 | 12 | -- | 45 | 45 | Casing grout fractured at 12 bar |
| | | | | | | A | 3 | 2.7 | 6.73 | 27.8 | - | |
| | | | | | | C | 3 | 3.6 | 4.23 | 167 | - | |
| | | | | | | E | 3 | 3.9 | 0.01 | 19.9 | 259.9 | |
| | | | 5.2 | 12.85 | 12.35 | water | 3 | 18 | -- | -- | - | Casing grout did not fracture |

| Date | Hole | Shift | Stage | | | Mix | Pdef (bar) | Pfinal (bar) | Pen. (L/min/ m/bar) | Vol. (L) | Tot. Vol. (L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. | From (m) | To (m) | | | | | | | |
| 30-May-10 | K-30+390 | Day | 3.1 | 14.12 | 13.62 | water | -- | 6.7 | -- | 34 | 34 | Casing grout fractured at 6.7 bar |
| | | | | | | A | 3 | 1.8 | 11.6 | 63.3 | - | |
| | | | | | | C | 3 | 3.6 | 0.9 | 121 | - | |
| | | | | | | E | 3 | 3.5 | 0 | 5.4 | 189.4 | |
| | | | 4.1 | 13.72 | 13.22 | A | 3 | 1.8 | 15.09 | 121 | - | Casing grout fractured at 15 bar |
| | | | | | | C | 3 | 3.5 | 1.9 | 161 | - | |
| | | | | | | E | 3 | 3.6 | 0 | 26.4 | 307.8 | |
| | | | 5.1 | 13.32 | 12.82 | A | 3 | 0.7 | 57 | 152 | - | Casing grout fractured at 12.2 bar |
| | | | | | | C | 3 | 1.8 | 12.9 | 340 | - | |
| | | | | | | E | 3 | 3.2 | 0.2 | 50.7 | 543.5 | |
| | | | 6.1 | 12.92 | 12.42 | water | -- | 3.5 | -- | 21 | 21 | Casing grout fractured at 3.5 bar |
| | | | | | | A | 3 | 2.4 | 5.9 | 84 | - | |
| | | | | | | C | 3 | 3.6 | 2.6 | 131 | - | |
| | | | | | | E | 3 | 3.4 | 0 | 12.5 | 227.7 | |
| | | | 7.1 | 12.52 | 12.02 | A | 3 | 1.4 | 26.6 | 221 | - | Casing grout fractured at 3.7 bar |
| | | | | | | C | 3 | 3.5 | 1.2 | 151 | - | |
| | | | | | | E | 3 | 3.6 | 0 | 12.6 | 384.6 | |
| | U-30+389 | | 7.3 | 12.47 | 11.97 | A | 3 | 2.7 | 7.47 | 211 | - | Casing grout fractured at 3.7 bar |
| | | | | | | C | 3 | 3.9 | 0 | 89 | 300 | |
| | D-30+389 | | 3.3 | 14.59 | 13.65 | A | 3 | 3 | 4 | 170 | - | Casing grout fractured at 4.2 bar |
| | | | | | | C | 3 | 3.6 | 1.8 | 150 | - | |
| | | | | | | E | 3 | 3.8 | 0 | 17.8 | 337.8 | |
| | | | 4.2 | 13.25 | 12.85 | A | 3 | 25 | -- | -- | - | Casing grout did not fracture |
| | | | 5.2 | 12.85 | 12.35 | A | 3 | 20 | -- | -- | - | Casing grout did not fracture |
| | | | 6.2 | 12.45 | 11.95 | A | 3 | 20 | -- | -- | - | Casing grout did not fracture on first attempt with mix A |
| | | | | | | water | 3 | 12 | -- | 45 | 45 | Casing grout fractured at 12 bar |

| Date | Hole | Shift | Stage | | | Mix | Pdef (bar) | Pfinal (bar) | Pen. (L/min/ m/bar) | Vol. (L) | Tot. Vol. (L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. | From (m) | To (m) | | | | | | | |
| | | | | | | A | 3 | 2.7 | 6.73 | 27.8 | - | |
| | | | | | | C | 3 | 3.6 | 4.23 | 167 | - | |
| | | | | | | E | 3 | 3.9 | 0.01 | 19.9 | 259.9 | |
| | | | 5.2 | 12.85 | 12.35 | water | 3 | 18 | -- | -- | - | Casing grout did not fracture |

| Date | Hole | Shift | Stage | | | Mix | Pdef (bar) | Pfinal (bar) | Pen. (L/min/ m/bar) | Vol. (L) | Tot. Vol. (L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. | From (m) | To (m) | | | | | | | |
| 31-May-10 | D-30+389 | Day | 6.3 | 12.45 | 11.95 | water | -- | 4.2 | -- | 55 | 55 | Casing grout fractured at 4.2 bar |
| | | | | | | A | 3 | 3.6 | 1.4 | 60 | - | |
| | | | | | | B | 3 | 3.6 | 1.1 | 29 | - | |
| | | | | | | B+ | 3 | 3.6 | 0 | 15.8 | 104.8 | |
| | | | 7.2 | 12.05 | 11.55 | water | -- | 15 | -- | 23 | 23 | Casing grout fractured at 15 bar |
| | | | | | | A | 3 | 3.4 | 2 | 45.1 | - | |
| | | | | | | B | 3 | 3.9 | 0.71 | 50.8 | 95.9 | |
| | K-30+388 | | 3.1 | 14.21 | 13.71 | A | 3 | 3.5 | 7.8 | 47.1 | - | Casing grout fractured at 10 bar |
| | | | | | | B | 3 | 3.6 | 3.7 | 110 | - | |
| | | | | | | B+ | 3 | 3.4 | 0.09 | 38.3 | 195 | |
| | | | 4.1 | 13.81 | 13.31 | water | -- | 9.1 | -- | 29.3 | 29.3 | Casing grout fractured at 9.1 bar |
| | | | | | | A | 3 | 2.7 | 9.3 | 52.8 | - | |
| | | | | | | B | 3 | 3.5 | 9.3 | 283 | - | |
| | | | | | | C | 3 | 3.3 | 0 | 102 | 438.4 | |
| | | | 5.1 | 13.41 | 12.91 | A | 3 | 2.7 | 10.9 | 156 | - | Casing grout fractured at 6.9 bar |
| | | | | | | B | 3 | 3.5 | 9 | 80.9 | - | |
| | | | | | | C | 3 | 3.5 | 0 | 29.9 | 266.7 | |
| | | | 6.1 | 13.01 | 12.51 | A | 3 | 1.9 | 17.1 | 102 | - | Casing grout fractured at 6.8 bar |
| | | | | | | B | 3 | 2.4 | 13.9 | 106 | - | |
| | | | | | | C | 3 | 3.1 | 1 | 66.1 | - | |
| | | | | | | E | 3 | 3.4 | 0.01 | 5.2 | 279.7 | |
| | | | 7.1 | 12.61 | 12.11 | water | -- | 6.1 | -- | 50 | 50 | Casing grout fractured at 6.1 bar |
| | | | | | | A | 3 | 1.1 | 22.5 | 69.6 | - | |
| | | | | | | B | 3 | 1.7 | 19.4 | 80.4 | - | |
| | | | | | | C | 3 | 3.2 | 0 | 137 | 286.8 | |
| | K-30+390 | | 3.2 | 14.12 | 13.62 | A | 3 | 19.8 | -- | -- | - | Casing grout did not fracture |
| | | | 4.2 | 13.72 | 13.22 | A | 3 | 20.4 | -- | -- | - | Casing grout did not fracture |
| | | | 5.2 | 13.32 | 12.82 | A | 3 | 20 | -- | -- | - | Casing grout did not fracture |

| Date | Hole | Shift | Stage | | | Mix | Pdef (bar) | Pfinal (bar) | Pen. (L/min/ m/bar) | Vol. (L) | Tot. Vol. (L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. | From (m) | To (m) | | | | | | | |
| | | | | | | water | -- | 18 | -- | 27.5 | 27.5 | Casing grout fractured at 18 bar |
| | | | | | | A | 3 | 3.6 | 3.7 | 34.7 | - | |
| | | | | | | B | 3 | 3.1 | 0.73 | 57 | 91.7 | |

| Date | Hole | Shift | Stage | | | Mix | Pdef (bar) | Pfinal (bar) | Pen. (L/min/ m/bar) | Vol. (L) | Tot. Vol. (L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. | From (m) | To (m) | | | | | | | |
| 1-Jun-10 | D-30+389 | Day | 7.3 | 12.05 | 11.55 | water | -- | 10.1 | -- | 35 | -- | Casing grout fractured 10.1 bar |
| | | | | | | A | 3 | 3.1 | 0.2 | 25.2 | 25.2 | |
| | U-30+389 | | 3.3-7.3 | 14.07 | 12.7 | A | 3 | 2.4 | 3.94 | 102 | -- | All ports grouted simultaneously w/ single packer set-up. Casing grout fractured at 8.5 bar. |
| | | | | | | B | 3 | 3.2 | 0.12 | 50.5 | 152.9 | |
| | K-30+390 | | 6.2 | 12.92 | 12.42 | A | 3 | 1.8 | 17.5 | 99.1 | -- | Casing grout fractured at 7.4 bar |
| | | | | | | B | 3 | 3.4 | 10.84 | 62.2 | -- | |
| | | | | | | C | 3 | 3.6 | 0.02 | 23.1 | 184.4 | |
| | | | 7.2 | 12.52 | 12.02 | A | 3 | 2.2 | 18.52 | 122 | -- | Casing grout fractured at 7.3 bar |
| | | | | | | B | 3 | 3.3 | 10.53 | 70.5 | -- | |
| | | | | | | C | 3 | 3.9 | 0.14 | 194 | 386 | |
| | K-30+388 | | 3.2 | 14.21 | 13.71 | A | -- | 20 | -- | -- | -- | Casing grout did not fracture |
| | | | 4.2 | 13.81 | 13.31 | A | 3 | 3.3 | 8.61 | 138 | -- | Fractured casing grout at 15 bar |
| | | | | | | B | 3 | 3.5 | 6.45 | 77 | -- | |
| | | | | | | C | 3 | 3.3 | 0 | 33.5 | 248.5 | |
| | | | 5.2 | 13.41 | 12.91 | A | 3 | 3.5 | 9.36 | 143 | -- | Fractured casing grout at 15 bar |
| | | | | | | B | 3 | 3.7 | 9.15 | 83 | -- | |
| | | | | | | C | 3 | 3.1 | 0 | 39.9 | 265.7 | |
| | | | 6.2 | 13.01 | 12.51 | A | 3 | 3.1 | 4.65 | 107 | -- | Fractured casing grout at 15 bar |
| | | | | | | B | 3 | 3.2 | 3.27 | 70.6 | -- | |
| | | | | | | C | 3 | 3.3 | 0 | 16.9 | 194.6 | |
| | | | 7.2 | 12.61 | 12.11 | A | 3 | 2.7 | 17.24 | 157 | -- | Fractured casing grout at 15 bar |
| | | | | | | B | 3 | 3.3 | 17.6 | 82.9 | -- | |
| | | | | | | C | 3 | 3.5 | 0 | 88.6 | 328.1 | |

| Date | Hole | Shift | Stage | | | Mix | Pdef (bar) | Pfinal (bar) | Pen. (L/min/ m/bar) | Vol. (L) | Tot. Vol. (L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. | From (m) | To (m) | | | | | | | |
| | K-30+390 | | 5.3 | 13.32 | 12.82 | water | -- | -- | -- | 27.9 | -- | Fractured casing grout at 16 bar |
| | | | | | | A | 3 | 3.1 | 2.11 | 48.7 | -- | |
| | | | | | | B | 3 | 3.3 | 0 | 19.8 | 68.5 | |
| | | | 6.3 | 12.92 | 12.42 | A | 3 | 2 | 18.9 | 56.6 | -- | Fractured casing grout at 9.3 bar |
| | | | | | | B | 3 | 2.2 | 17.46 | 81.4 | -- | |
| | | | | | | C | 3 | 3 | 0.01 | 249 | 387 | |
| | | | 7.3 | 12.52 | 12.02 | A | 3 | 3.4 | 9.88 | 144 | -- | Casing grout fractured 12.5 bar |
| | | | | | | B | 3 | 3 | 6.94 | 98.6 | -- | |
| | | | | | | C | 3 | 3.1 | 0.01 | 103 | 346.4 | |
| | K-388 | Night | 4.3 | 13.81 | 13.31 | water | - | 17.7 | - | 7.6 | -- | Casing grout did not fracture |
| | | | 5.3 | 13.41 | 12.91 | water | - | 17.3 | - | 6.8 | -- | Casing grout did not fracture |
| | | | 6.3 | 13.01 | 12.51 | water | - | 17.1 | - | 5.9 | -- | Casing grout did not fracture |
| | | | 7.3 | 12.61 | 12.11 | water | - | 4.5 | - | 58.1 | -- | Casing grout fractured at 4.53 bar |
| | | | | | | A | 3 | 3.6 | 10.31 | 67.3 | -- | |
| | | | | | | C | 3 | 2.9 | 0 | 153 | 220.1 | |

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## Core Photographs

# TAM Trials
# MB-GD-D-30+389.275




**CHECK: GRB**

| | | |
|---|---|---|
| 14.20 – 14.58 DRY | **Golder Associates** | 23-MAY-2010 |

# TAM Trials
# MB-GD-D-30+389.275




**CHECK: GRB**

# TAM Trials
# MB-GD-D-30+389.275




**CHECK: GRB**

| | | |
|---|---|---|
| 14.50 – 15.04 DRY | **Golder Associates** | 24-MAY-2010 |

# TAM Trials
# MB-GD-D-30+389.275




**CHECK: GRB**

# TAM Trials
# MB-GD-K-30+388.625




**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 14.38 DRY | **Golder Associates** | 25-MAY-2010 |

# TAM Trials
# MB-GD-K-30+388.625




**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 14.38 WET | **Golder Associates** | 25-MAY-2010 |

# TAM Trials
# MB-GD-K-30+390.125




**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 14.96 DRY | **Golder Associates** | 24-MAY-2010 |

# TAM Trials
# MB-GD-K-30+390.125




**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 14.96 WET | **Golder Associates** | 24-MAY-2010 |

# E2-2 Soft Zone Probing Program

- Summary of Program
- Locations of Noted Soft Sediments Cross-section

## Summary of Program

# SOFT ZONE PROBING PROGRAM

The following summarizes the soft zone probing program carried in the South Ridge area of the Bay-Goose Dike in October, 2010.

| Date | Station | From (m) | To (m) | % return | Notes |
|---|---|---|---|---|---|
| 13-Oct | 31+934 | 0 | 3.71 | -- | Plastic PE Pipe |
| | | 3.71 | 6.4 | 100 | |
| | | 6.4 | 6.6 | 50 | Loss of return - possibly due to pump according to driller |
| | | 6.6 | 10.2 | 100 | |
| | | 10.2 | 12.92 | 100 | Soft Zone but no dark grey silt visible to surface |

Comments:
Triconing

- 2.72 m of soft material above bedrock
- Triconing with 400 psi
- Hole stayed open during triconing
- No dark grey pure silt seen to surface - only CSB-looking brown material

Subsequent 4.5" casing installation:

- Water in casing to near surface
- Hole blocked at 5.18 m - minimal air trigger to push through
- Hammer bit plugged/blocked at 10.8 m in soft CSB area
- Lowered back hammer with air in soft CSB
- Water return in casing from BR interface

| | | | | | |
|---|---|---|---|---|---|
| 14-Oct | 31+946 | 0 | 3.65 | -- | Plastic PE Pipe |
| | | 3.65 | 10 | 100 | |
| | | 10 | 12.07 | 100 | Soft Zone; no dark grey silt visible to surface |

Comments:
Triconing

- 2.07 m of soft material above bedrock. Softer than previous installation / quicker advance of bit
- Hole stayed open during triconing
- Could not get tape beyond 5.2 m after pulling out rods - complete hole collapse not suspected however

Subsequent 4.5" casing installation:

- Water by-passing between steel and 6" plastic casing; also between plastic casing and ground surface
- Difficult to case from 4.74 to 8.20 m
- Casing broken at second weld in the hole below surface during installation

| Date | Station | From (m) | To (m) | % return | Notes |
|---|---|---|---|---|---|
| 15-Oct | 31+958 | 0 | 3.66 | -- | Plastic PE Pipe |
| | | 3.66 | 6.45 | 100 | |
| | | 6.45 | 7.15 | 100 | Softer CSB |
| | | 7.15 | 10.12 | 100 | |
| | | 10.12 | 12.37 | 100 | Soft Zone; no dark grey silt visible to surface |

Comments:
Triconing

- 2.25 m of soft material above bedrock
- Hole stayed open during triconing
- Cobbles at 5.0 and 9.8 m below ground surface

Subsequent 4.5" casing installation:

- Water by-passing between steel and 6" plastic casing; also between plastic casing and ground surface
- Easier to push down casing than previous installs, little air used

| Date | Station | From (m) | To (m) | % return | Notes |
|---|---|---|---|---|---|
| 15-Oct | 31+970 | 0 | 3.59 | -- | Plastic PE Pipe |
| | | 3.59 | 10.82 | 100 | |
| | | 10.82 | 12.57 | 100 | Soft Zone; no dark grey silt visible to surface |

Comments:
Triconing

- 1.75 m of soft material above bedrock
- Hole stayed open during triconing
- Cobbles at 11.0 and 11.5 m below ground surface in soft zone

Subsequent 4.5" casing installation:

- Water by-passing between steel and 6" plastic casing; also between plastic casing and ground surface

| Date | Station | From (m) | To (m) | % return | Notes |
|---|---|---|---|---|---|
| 15-Oct | 31+982 | 0 | 3.85 | -- | Plastic PE Pipe |
| | | 3.85 | 6 | 100 | |
| | | 6 | 11.67 | 100 | Quicker advance in CSB than previous holes |
| | | 11.67 | 12.92 | 100 | Soft Zone; no dark grey silt visible to surface |

Comments:
Triconing

- 1.25 m of soft material above bedrock
- Hole stayed open during triconing

Subsequent 4.5" casing installation:

- Water by-passing between steel and 6" plastic casing; also between plastic casing and ground surface

| Date | Station | From (m) | To (m) | % return | Notes |
|---|---|---|---|---|---|
| 16-Oct | 31+994 | 0 | 3.87 | -- | Plastic PE Pipe |
| | | 3.87 | 10.42 | 100 | Cobble at 6 m |
| | | 10.42 | 14.18 | 100 | Soft Zone; no dark grey silt visible to surface |
| Comments:<br>Triconing<br>■ 3.0 m of soft material above 0.64 m of weak rock/till<br>■ Hole stayed open during triconing<br>■ Helper dropped steel bolt in hole<br><br>Subsequent 4.5" casing installation:<br>■ Open hole to 15.24 m<br>■ Lots of cuttings in last 5 m, brown return, medium rock | | | | | |
| 17-Oct | 31+817 | 0 | 3.66 | -- | Plastic PE Pipe |
| | | 3.66 | 12.2 | 100 | Cobbles at 5.0 m |
| | | 12.2 | 13.12 | 100 | Soft Zone |
| | | 13.12 | 13.3 | 100 | Possible till or weathered bedrock |
| Comments:<br>Triconing<br>■ 0.92 m of soft material above 0.18 m of weak rock/till.<br>■ Hole stayed open during triconing | | | | | |
| 17-Oct | 31+808 | 0 | 3.83 | -- | Plastic PE Pipe |
| | | 3.83 | 4.6 | 0 | Cobbles |
| | | 4.6 | 8.2 | 0 | Softer CSB |
| | | 8.2 | 8.5 | 0 | CSB becoming firm |
| | | 8.5 | 9.05 | 0 | Soft layer |
| Comments:<br>Triconing<br>■ 0.55 m of soft material above bedrock surface<br>■ Hole stayed open during triconing<br>■ No water return from 4.0 - 9.05 m, water stayed at 1.5 m below top of PE casing<br><br>Subsequent 4.5" casing installation:<br>■ Open hole | | | | | |

| Date | Station | From (m) | To (m) | % return | Notes |
|---|---|---|---|---|---|
| 17-Oct | 31+796 | 0 | 3.83 | -- | Plastic PE Pipe |
| | | 3.83 | 7.55 | 100 | Cobbles at 5.0 |
| | | 7.55 | 8.1 | 100 | Soft Zone |
| | | 8.1 | 8.7 | 100 | Possible till or weathered bedrock |

Comments:
Triconing

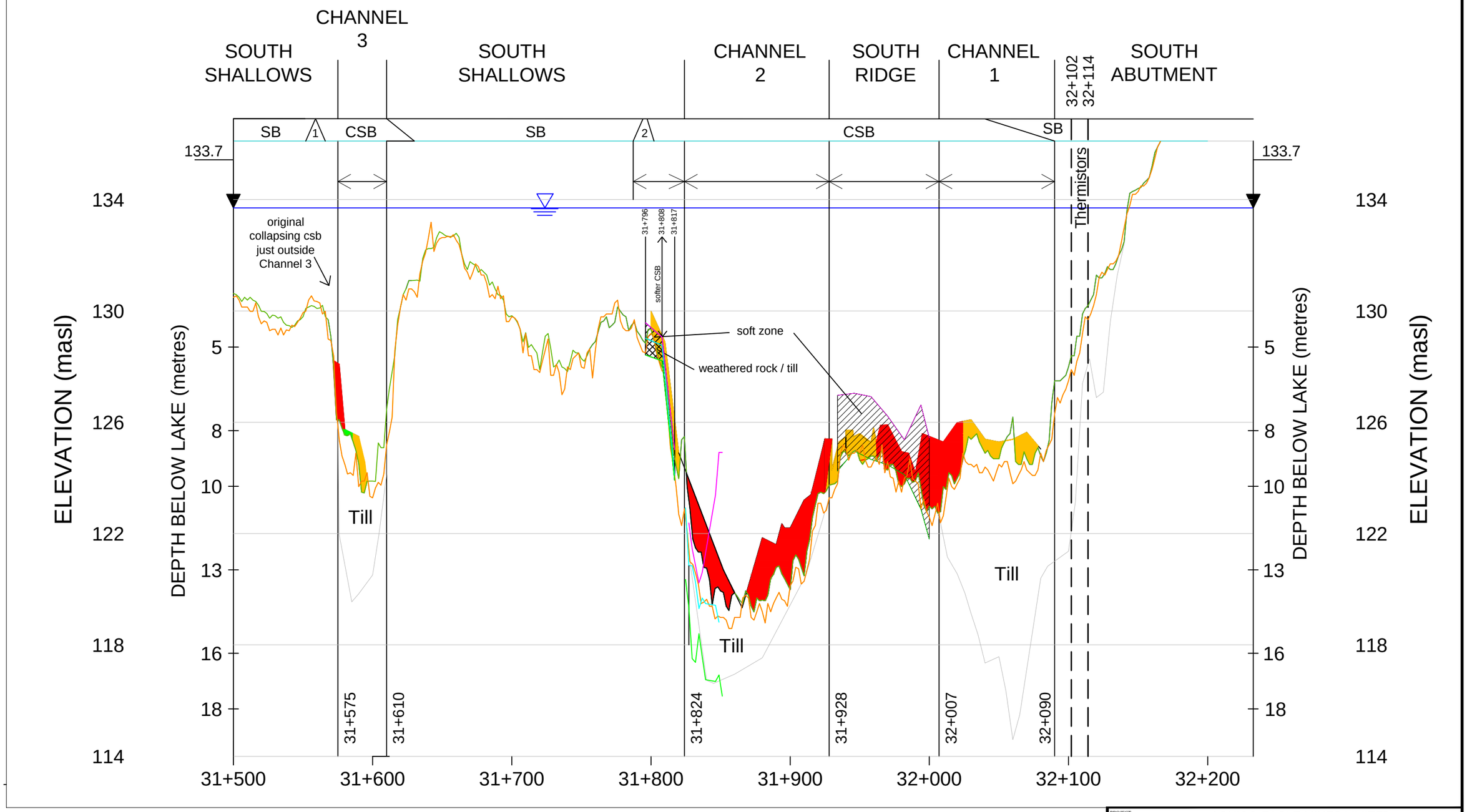
- 0.55 m of soft material above 0.6 m of weak rock/till
- Hole stayed open during triconing

Subsequent 4.5" casing installation:

- Open hole

o:\active_2009\1428\09-1428-5007 meadowbank 2009 dike construction\bay goose dike\as-built report and appendixes\rev 0\app e\e2-2\01_appendix e2_soft zone probing program.docx

## Locations of Noted Soft Sediments Cross-section




## LEGEND:

- LAKE LEVEL: ~133.7m
- ORIGINAL TRENCH (SOUNDING)
- BASE OF CUT-OFF WALL (SOUNDING)
- POSSIBLE EXTENT OF TILL (WINTER 2010 INVESTIGATION)
- INTERPRETED BEDROCK (CSB / JET DRILLING)
- TOP OF SOFT ZONE (CSB / JET DRILLING)
- TOP OF TILL (CSB / JET DRILLING)
- SOFT SEDIMENT THICKNESS < 0.5 m (CONSTRUCTION)
- SOFT SEDIMENT THICKNESS >= 0.5 but < 1.0 m (CONSTRUCTION)
- SOFT SEDIMENT THICKNESS >= 1.0 m (CONSTRUCTION)
- SOFT ZONE (CSB / JET DRILLING)
- WEATHERED ROCK / TILL (CSB /JET DRILLING)

0 4 8 12 16 20
VERTICAL SCALE IN METRES

0 20 40 60 80 100
HORIZONTAL SCALE IN METRES

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# LOCATIONS OF NOTED SOFT SEDIMENTS

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | VTR | OCT10 | SCALE | AS SHOWN | REV. 0 |
| CADD | VTR | OCT10 | FIGURE E2-2.1 | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

Drawing File: Q:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E2-2\Figure E2-2.1 Soft Zones Drawing.dwg November 29, 2012 2:12:02 PM By: VRombough

## E2-3 Tables of Quantities

- North Channel
- Channel 3
- Channel 2
- South Ridge
- Channel 1

Golder Associates

**TABLE E2-3.1**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - NORTH CHANNEL**

AEM

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | DEPTH | | Draw | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| | | | | | | | | | | | From | To | | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-30+359.75 | 12-May-11 | 137.87 | -- | -- | 12.80 | 1.40 | 14.20 | Y | Caving noted at bottom of hole; water loss during hammer pull. | 12-May-11 | 12.80 | 11.63 | 1.17 | 1:1 | 10:45 | 10:49 | 16 | 413.7 | 304.8 | 424.0 | 0.76 | -- | 2048 | -- | Grout Temperature: 22.2°C |
| | | | | | | | | | | | 11.63 | 9.59 | 2.04 | 1:1 | 10:53 | 11:01 | 16 | 413.7 | 304.8 | 424.0 | 0.76 | -- | 3062 | -- | |
| | | | | | | | | | | | | | **3.21** | | | | | | | | **0.76** | **5860** | **5110** | **2555** | |
| P-30+362.75 | 12-May-11 | 137.86 | -- | -- | 13.05 | 1.29 | 14.33 | N | | 12-May-11 | 13.08 | 11.58 | 1.49 | 1:1 | 14:27 | 14:33 | 16 | 413.7 | 304.8 | 424.0 | 0.76 | -- | 2540 | -- | Communicated to P-30+359.75 for duration of grouting. |
| | | | | | | | | | | | 11.58 | 9.58 | 2.00 | 1:1 | 14:38 | 14:45 | 16 | 399.9 | 304.8 | 427.8 | 0.76 | -- | 3320 | -- | Grout Temperature: 18.4°C |
| | | | | | | | | | | | | | **3.50** | | | | | | | | **0.76** | **6377** | **5860** | **2930** | |
| P-30+365.75 | 12-May-11 | 137.87 | -- | -- | 13.59 | 1.14 | 14.73 | N | Communicated to P-30+362.75 | 12-May-11 | 13.70 | 11.50 | 2.20 | 1:1 | 17:45 | 17:53 | 16 | 406.8 | 304.8 | 424.0 | 0.76 | -- | 3592 | -- | Communicated to P-30+362.75 for duration of grouting. |
| | | | | | | | | | | | 11.50 | 10.40 | 1.10 | 1:1 | 17:57 | 18:02 | 16 | 406.8 | 304.8 | 424.0 | 0.76 | -- | 1987 | -- | Grout Temperature: 28.3°C |
| | | | | | | | | | | | | | **3.31** | | | | | | | | **0.76** | **6033** | **5580** | **2790** | |
| P-30+368.75 | 12-May-11 | 137.80 | -- | -- | 13.68 | 1.26 | 14.94 | N | | 12-May-11 | 13.94 | 11.80 | 2.14 | 1:1 | 22:15 | 22:23 | 16 | 413.7 | 304.8 | 431.5 | 0.76 | -- | 3778 | -- | Grout Temperature: 13.9°C |
| | | | | | | | | | | | 11.80 | 10.73 | 1.07 | 1:1 | 22:29 | 22:33 | 16 | 417.1 | 304.8 | 431.5 | 0.76 | -- | 2408 | -- | Communicated to P-30+365.75 starting at 13.1 m for duration of grouting |
| | | | | | | | | | | | 10.73 | 10.28 | 0.45 | 1:1 | 22:40 | 22:42 | 16 | 406.8 | 304.8 | 431.5 | 0.76 | -- | 1132 | -- | |
| | | | | | | | | | | | | | **3.66** | | | | | | | | **0.76** | **6672** | **7317** | **3659** | |
| P-30+371.75 | 12-May-11 | 137.93 | -- | -- | 12.80 | 0.93 | 13.73 | Y | Communicated to P-30+368.75 | 12-May-11 | 13.16 | 11.42 | 1.74 | 1:1 | 2:27 | 2:33 | 16 | 413.7 | 304.8 | 427.8 | 0.76 | -- | 2922 | -- | Grout Temperature: 15°C |
| | | | | | | | | | | | 11.42 | 10.14 | 1.28 | 1:1 | 2:40 | 2:45 | 16 | 399.9 | 304.8 | 416.4 | 0.76 | -- | 2975 | -- | Communicated to P-30+368.75 from 7.9 to 9.1 m |
| | | | | | | | | | | | | | **3.02** | | | | | | | | **0.76** | **5510** | **5898** | **2949** | |
| P-30+374.75 | 12-May-11 | 137.85 | -- | -- | 13.71 | 1.23 | 14.94 | N | | 12-May-11 | 13.58 | 11.66 | 1.92 | 1:1 | 7:01 | 7:10 | 16 | 406.8 | 304.8 | 416.4 | 0.76 | -- | 4039 | -- | Communicated to P-30+371.75 for duration of grouting. |
| | | | | | | | | | | | 11.66 | 10.65 | 1.01 | 1:1 | 8:12 | 9:17 | 16 | 393.0 | 304.8 | 435.3 | 0.76 | -- | 2196 | -- | Grout Temperature: 25.4°C |
| | | | | | | | | | | | | | **2.94** | | | | | | | | **0.76** | **5354** | **6235** | **3117** | |
| P-30+377.75 | 13-May-11 | 137.81 | -- | -- | 13.78 | 1.18 | 14.95 | Y | Communicated to P-30+374.75 | 13-May-11 | 14.19 | 12.17 | 2.02 | 1:1 | 20:52 | 21:01 | 16 | 403.3 | 304.8 | 427.8 | 0.76 | -- | 4312 | -- | Computer error for Depth RT sensor, pulled rods |
| | | | | | | | | | | | 12.17 | 11.43 | 0.75 | 1:1 | 22:33 | 22:37 | 16 | 399.9 | 304.8 | 435.3 | 0.76 | -- | 2120 | -- | Pull rate manually adjusted |
| | | | | | | | | | | | 11.43 | 10.01 | 1.41 | 1:1 | 22:42 | 22:48 | 16 | 393.0 | 304.8 | 435.3 | 0.76 | -- | 2631 | -- | |
| | | | | | | | | | | | | | **4** | | | | | | | | **0.76** | **7623** | **9062** | **4531** | |
| P-30+380.75 | 13-May-11 | 137.90 | 29.00 | -- | 14.89 | 1.29 | 16.18 | Y | Layered very soft zones starting at 8.8 m. | 13-May-11 | 15.28 | 14.49 | 0.79 | 1:1 | 1:59 | 2:02 | 16 | 417.1 | 304.8 | 431.5 | 0.76 | -- | 1632 | -- | |
| | | | | | | | | | | | 14.49 | 11.48 | 3.01 | 1:1 | 2:07 | 2:18 | 16 | 417.1 | 304.8 | 427.8 | 0.76 | -- | 5228 | -- | Grout Temperature: 15°C |
| | | | | | | | | | | | 11.48 | 7.84 | 3.64 | 1:1 | 2:24 | 2:38 | 16 | 406.8 | 304.8 | 431.5 | 0.76 | -- | 6344 | -- | |
| | | | | | | | | | | | | | **7.44** | | | | | | | | **0.76** | **13572** | **13204** | **6602** | |
| P-30+383.75 | 13-May-11 | 137.91 | 30.00 | -- | 14.62 | 1.19 | 15.82 | N | Very soft zone noted from 11.4 to 12.3 m; layers of very soft zones beyond to 13.7 m. | 13-May-11 | 14.59 | 11.50 | 3.09 | 1:1 | 5:50 | 6:02 | 16 | 403.3 | 304.8 | 435.3 | 0.76 | -- | 5792 | -- | Communicated to P-30+380.75 for duration of grouting. |
| | | | | | | | | | | | 11.50 | 8.60 | 2.90 | 1:1 | 6:07 | 6:18 | 16 | 399.9 | 304.8 | 427.8 | 0.76 | -- | 5288 | -- | Grout Temperature: 16.7°C |
| | | | | | | | | | | | | | **5.99** | | | | | | | | **0.76** | **10920** | **11080** | **5540** | |
| P-30+386.75 | 14-May-11 | 137.87 | -- | -- | 15.18 | 1.28 | 16.46 | N | Communicated to P-30+383.75 | 14-May-11 | 15.49 | 14.61 | 0.88 | 1:1 | 8:25 | 8:29 | 16 | 399.9 | 304.8 | 420.2 | 0.76 | -- | 1806 | -- | Communicated to P-30+383.75 for duration of grouting. |
| | | | | | | | | | | | 14.61 | 11.59 | 3.02 | 1:1 | 8:34 | 8:47 | 16 | 406.8 | 304.8 | 424.0 | 0.76 | -- | 5228 | -- | Grout Temperature: 21.7°C |
| | | | | | | | | | | | 11.59 | 10.88 | 0.71 | 1:1 | 8:48 | 8:52 | 16 | 393.0 | 304.8 | 427.8 | 0.76 | -- | 1245 | -- | |
| | | | | | | | | | | | | | **4.61** | | | | | | | | **0.76** | **8407** | **8279** | **4139** | |
| P-30+389.75 | 14-May-11 | 137.97 | -- | -- | 15.36 | 1.26 | 16.62 | Y | Communicated to P-30+386.75 | 14-May-11 | 15.55 | 14.51 | 1.04 | 1:1 | 11:44 | 11:48 | 16 | 406.8 | 304.8 | 424.0 | 0.76 | -- | 1927 | -- | Grout Temperature: 22.2°C |
| | | | | | | | | | | | 14.51 | 10.96 | 3.55 | 1:1 | 11:51 | 12:16 | 16 | 413.7 | 152.4 | 223.3 | 0.76 | -- | 5508 | -- | Single jet plugged; used half pull rate. |
| | | | | | | | | | | | | | **4.59** | | | | | | | | **0.76** | **8373** | **7435** | **3717** | Communicated to P-30+386.75 during trip in with tricone but not during grouting; water drop out of site in between rods during trip in. |

**TABLE E2-3.1**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - NORTH CHANNEL**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-30+392.75 | 14-May-11 | 137.90 | -- | -- | 13.87 | 1.23 | 15.09 | N | Communicated to P-30+389.75 | 14-May-11 | 14.02 | 11.24 | 2.78 | 1:1 | 15:41 | 15:51 | 16 | 406.8 | 304.8 | 427.8 | 0.76 | -- | 4584 | -- | |
| | | | | | | | | | | | | | **2.78** | | | | | | | | **0.76** | **5065** | **4584** | **2292** | Communicated to P-30+388.75 for duration of grouting; Communicated to P-30+386.75 at 11.9 m. |
| P-30+395.75 | 14-May-11 | 137.97 | -- | -- | 14.05 | 1.24 | 15.29 | N | Communicated to P-30+392.75 | 14-May-11 | 14.17 | 11.16 | 3.02 | 1:1 | 18:04 | 18:18 | 16 | 406.8 | 304.8 | 427.8 | 0.76 | -- | 4660 | -- | Grout Temperature: 18.3°C. Grout drop out of site in between rods. |
| | | | | | | | | | | | | | **3.02** | | | | | | | | **0.76** | **5504** | **4660** | **2330** | |
| P-30+398.75 | 14-May-11 | 137.96 | -- | -- | 14.11 | 1.19 | 15.30 | N | Communicated to P-30+395.75 | 14-May-11 | 14.46 | 11.93 | 2.53 | 1:1 | 21:42 | 21:51 | 16 | 399.9 | 304.8 | 427.8 | 0.76 | -- | 4289 | -- | Communicated P-30+395.75 and P-30+392.75 (air bubbling). |
| | | | | | | | | | | | 11.93 | 11.33 | 0.60 | 1:1 | 21:58 | 22:00 | 16 | 399.9 | 304.8 | 427.8 | 0.76 | -- | 1189 | -- | |
| | | | | | | | | | | | | | **3.13** | | | | | | | | **0.76** | **5710** | **5477** | **2739** | |
| P-30+401.75 | 14-May-11 | 137.90 | -- | -- | 14.81 | 1.29 | 16.10 | Y | | 14-May-11 | 15.21 | 14.55 | 0.66 | 1:1 | 0:40 | 0:42 | 16 | 406.8 | 304.8 | 420.2 | 0.76 | -- | 1170 | -- | Communicated to P-30+398.75 at 7.6 m while tripping in with tricone. Pull rate adjusted manually at 14 m. |
| | | | | | | | | | | | 14.55 | 11.79 | 2.76 | 1:1 | 0:49 | 0:58 | 16 | 410.2 | 304.8 | 427.8 | 0.76 | -- | 4558 | -- | |
| | | | | | | | | | | | | | **3.42** | | | | | | | | **0.76** | **6238** | **5727** | **2864** | |
| P-30+404.75 | 14-May-11 | 137.89 | -- | -- | 14.60 | 0.97 | 15.57 | N | Communicated to P-30+401.75 | 14-May-11 | 14.62 | 11.38 | 3.24 | 1:1 | 3:53 | 4:05 | 16 | 406.8 | 304.8 | 427.8 | 0.76 | -- | 5235 | -- | Communicated to P-30+401.75; very little return from 13.7 to 11.6 m. |
| | | | | | | | | | | | | | **3.24** | | | | | | | | **0.76** | **5910** | **5235** | **2618** | |
| P-30+407.75 | 14-May-11 | 137.89 | -- | -- | 13.99 | 0.88 | 14.87 | N | | 14-May-11 | 14.36 | 10.94 | 3.42 | 1:1 | 6:54 | 7:07 | 16 | 406.8 | 304.8 | 435.3 | 0.76 | -- | 6246 | -- | Grout Temperature: 17.2°C |
| | | | | | | | | | | | | | **3.42** | | | | | | | | **0.76** | **6238** | **6246** | **3123** | |
| P-30+410.75 | 15-May-11 | 137.88 | -- | -- | 12.62 | 1.03 | 13.65 | N | | 15-May-11 | 12.80 | 11.16 | 1.64 | 1:1 | 8:57 | 9:04 | 16 | 406.8 | 304.8 | 427.8 | 0.76 | -- | 3093 | -- | Communicated to P-30+407.75 for duration of grouting. |
| | | | | | | | | | | | 11.16 | 10.97 | 0.20 | 1:1 | 9:06 | 9:07 | 16 | 399.9 | 304.8 | 442.9 | 0.76 | -- | 606 | -- | Grout Temperature: 6.7°C |
| | | | | | | | | | | | | | **1.83** | | | | | | | | **0.76** | **3347** | **3698** | **1849** | |
| P-30+413.75 | 15-May-11 | 137.90 | 19.00 | -- | 14.23 | 1.23 | 15.47 | N | Very soft zone noted at 5.8 m; loss of water in very soft material at 13.7 m. | 15-May-11 | 13.93 | 11.48 | 2.44 | 1:1 | 12:11 | 12:24 | 16 | 406.8 | 304.8 | 431.5 | 0.76 | -- | 4959 | -- | |
| | | | | | | | | | | | 11.48 | 8.45 | 3.04 | 1:1 | 12:28 | 12:38 | 16 | 406.8 | 304.8 | 431.5 | 0.76 | -- | 4717 | -- | Single jet plugged; used half pull rate for final draw. |
| | | | | | | | | | | | 8.45 | 5.77 | 2.68 | 1:1 | 12:42 | 13:00 | 16 | 413.7 | 152.4 | 223.3 | 0.76 | -- | 3842 | -- | Grout Temperature: 20.1°C |
| | | | | | | | | | | | | | **8.16** | | | | | | | | **0.76** | **14879** | **13518** | **6759** | |
| P-30+416.75 | 15-May-11 | 137.99 | -- | -- | 14.75 | 1.25 | 16.00 | N | | 15-May-11 | 14.47 | 12.10 | 2.37 | 1:1 | 16:02 | 16:11 | 16 | 413.7 | 304.8 | 439.1 | 0.76 | -- | 4119 | -- | Communicated to P-30+413.75 for duration of grouting. |
| | | | | | | | | | | | | | **2.37** | | | | | | | | **0.76** | **4320** | **4119** | **2059** | Grout Temperature: 17.8°C |
| P-30+419.75 | 15-May-11 | 138.02 | -- | -- | 14.60 | 1.25 | 15.85 | N | | 15-May-11 | 14.58 | 11.89 | 2.69 | 1:1 | 20:34 | 20:42 | 16 | 406.8 | 304.8 | 431.5 | 0.76 | -- | 3899 | -- | Communicated to P-30+416.75 at 7.3 m while tripping in with tricone; no return while grouting. |
| | | | | | | | | | | | | | **2.69** | | | | | | | | **0.76** | **4898** | **3899** | **1949** | Grout Temperature: 28.9°C |
| P-30+422.75 | 15-May-11 | 138.04 | -- | -- | 14.55 | 1.01 | 15.55 | Y | 20-40% water return from 4.9 to 10.2 m; light hammer triggering from 7.0 to 41.8 m. | 15-May-11 | 14.94 | 14.53 | 0.41 | 1:1 | 23:19 | 23:20 | 16 | 417.1 | 304.8 | 431.5 | 0.76 | -- | 984 | -- | Communicated to P-30+419.75 for duration of grouting. |
| | | | | | | | | | | | 14.53 | 14.04 | 0.49 | 1:1 | 23:26 | 23:28 | 16 | 417.1 | 304.8 | 427.8 | 0.76 | -- | 1211 | -- | |
| | | | | | | | | | | | 14.04 | 11.85 | 2.19 | 1:1 | 23:29 | 23:36 | 16 | 413.7 | 304.8 | 427.8 | 0.76 | -- | 3206 | -- | Pull rate adjusted manually. |
| | | | | | | | | | | | | | **3.09** | | | | | | | | **0.76** | **5632** | **5402** | **2701** | |
| P-30+425.75 | 15-May-11 | 138.04 | -- | -- | 13.99 | 0.97 | 14.96 | N | Communicated to P-30+422.75; no hammer trigger from 1.8 to 3.2 m. | 15-May-11 | 14.33 | 14.14 | 0.19 | 1:1 | 1:43 | 1:44 | 16 | 399.9 | 304.8 | 431.5 | 0.76 | -- | 810 | -- | Computer error, no volume recorded. Volumes estimated. |
| | | | | | | | | | | | 14.14 | 12.16 | 1.98 | 1:1 | 1:53 | 2:00 | 16 | 393.0 | 304.8 | 424.0 | 0.76 | -- | 3346 | -- | |
| | | | | | | | | | | | | | **2.17** | | | | | | | | **0.76** | **3959** | **4156** | **2078** | |
| P-30+428.75 | 15-May-11 | 138.00 | -- | -- | 13.86 | 0.87 | 14.72 | N | Very light to no hammer trigger from 6.7 to 10.2 m. | 15-May-11 | 14.33 | 13.87 | 0.47 | 1:1 | 4:07 | 4:09 | 16 | 399.9 | 304.8 | 424.0 | 0.76 | -- | 1226 | -- | Grout Temperature: 21.1°C |
| | | | | | | | | | | | 13.87 | 12.01 | 1.86 | 1:1 | 4:18 | 4:25 | 16 | 399.9 | 304.8 | 431.5 | 0.76 | -- | 3206 | -- | Computer error, volumes estimated. |
| | | | | | | | | | | | | | **2.33** | | | | | | | | **0.76** | **4242** | **4433** | **2216** | |

**TABLE E2-3.1**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - NORTH CHANNEL**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | DEPTH | | Draw | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| | | | | | | | | | | | From | To | | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-30+431.75 | 15-May-11 | 138.02 | -- | -- | 13.44 | 0.90 | 14.33 | N | | 15-May-11 | 13.76 | 11.52 | 2.24 | 1:1 | 6:36 | 6:45 | 16 | 406.8 | 304.8 | 431.5 | 0.76 | -- | 3490 | -- | Grout Temperature: 17.2°C |
| | | | | | | | | | | | | | **2.24** | | | | | | | | **0.76** | **4087** | **3490** | **1745** | Loss of grout return at 12.2 m. |
| P-30+434.75 | 16-May-11 | 137.93 | -- | -- | 13.35 | 1.22 | 14.57 | N | | 16-May-11 | 13.57 | 11.35 | 2.22 | 1:1 | 9:15 | 9:25 | 16 | 403.3 | 304.8 | 427.8 | 0.76 | -- | 4656 | -- | Grout Temperature: 30.6°C |
| | | | | | | | | | | | | | **2.22** | | | | | | | | **0.76** | **4048** | **4656** | **2328** | Communicated to P-30+431.75 for duration of grouting. |
| S-30+361.25 | 16-May-11 | 137.93 | -- | -- | 13.11 | 1.25 | 14.35 | N | 50% loss of return at 13.7 m. | 16-May-11 | 13.41 | 11.51 | 1.90 | 1:1 | 11:46 | 11:54 | 16 | 399.9 | 304.8 | 427.8 | 0.76 | -- | 3377 | -- | Grout Temperature: 28.3°C |
| | | | | | | | | | | | 11.51 | 9.62 | 1.90 | 1:1 | 12:02 | 12:09 | 16 | 399.9 | 304.8 | 424.0 | 0.76 | -- | 3327 | -- | |
| | | | | | | | | | | | | | **3.80** | | | | | | | | **0.76** | **6928** | **6704** | **3352** | |
| S-30+364.25 | 16-May-11 | 137.93 | -- | -- | 13.29 | 1.25 | 14.54 | N | | 16-May-11 | 13.41 | 11.58 | 1.83 | 1:1 | 14:52 | 15:00 | 16 | 407.5 | 304.8 | 424.0 | 0.76 | -- | 3430 | -- | Communicated with P-30+361.25 for duration of grouting. |
| | | | | | | | | | | | 11.58 | 9.90 | 1.68 | 1:1 | 15:09 | 15:15 | 16 | 413.7 | 304.8 | 435.3 | 0.76 | -- | 2756 | -- | Grout Temperature: 28.3°C |
| | | | | | | | | | | | | | **3.51** | | | | | | | | **0.76** | **6405** | **6185** | **3093** | |
| S-30+367.25 | 16-May-11 | 138.01 | -- | -- | 13.96 | 1.29 | 15.25 | Y | | 16-May-11 | 14.02 | 10.75 | 3.26 | 1:1 | 19:10 | 19:21 | 16 | 406.8 | 304.8 | 431.5 | 0.76 | -- | 5057 | -- | Communicated with P-30+364.25 and P-30+361.25 for duration of grouting. |
| | | | | | | | | | | | | | **3.26** | | | | | | | | **0.76** | **5955** | **5057** | **2529** | |
| S-30+370.25 | 16-May-11 | 138.01 | -- | -- | 13.18 | 0.93 | 14.11 | N | | 16-May-11 | 13.46 | 11.50 | 1.96 | 1:1 | 21:37 | 21:44 | 16 | 406.8 | 304.8 | 431.5 | 0.76 | -- | 3596 | -- | |
| | | | | | | | | | | | 11.50 | 10.15 | 1.35 | 1:1 | 21:49 | 21:54 | 16 | 399.9 | 304.8 | 427.8 | 0.76 | -- | 2578 | -- | |
| | | | | | | | | | | | | | **3.31** | | | | | | | | **0.76** | **6044** | **6174** | **3087** | |
| S-30+373.25 | 16-May-11 | 138.02 | -- | -- | 13.27 | 0.98 | 14.26 | N | | 16-May-11 | 13.58 | 10.74 | 2.84 | 1:1 | 0:45 | 0:55 | 16 | 393.0 | 304.8 | 431.5 | 0.76 | -- | 5148 | -- | |
| | | | | | | | | | | | | | **2.84** | | | | | | | | **0.76** | **5182** | **5148** | **2574** | |
| S-30+376.25 | 16-May-11 | 138.03 | -- | -- | 14.07 | 1.18 | 15.25 | N | | 16-May-11 | 14.38 | 11.61 | 2.77 | 1:1 | 3:16 | 3:26 | 16 | 420.6 | 304.8 | 439.1 | 0.76 | -- | 5201 | -- | Grout Temperature: 16.1°C |
| | | | | | | | | | | | 11.61 | 10.09 | 1.52 | 1:1 | 3:32 | 3:38 | 16 | 406.8 | 304.8 | 427.8 | 0.76 | -- | 2960 | -- | |
| | | | | | | | | | | | | | **4.29** | | | | | | | | **0.76** | **7828** | **8161** | **4081** | |
| S-30+379.25 | 16-May-11 | 137.94 | -- | -- | 14.45 | 1.27 | 15.72 | Y | | 16-May-11 | 14.47 | 11.41 | 3.06 | 1:1 | 6:33 | 6:44 | 16 | 403.3 | 304.8 | 427.8 | 0.76 | -- | 4860 | -- | Communication to P-30+376.25, P-30+373.25 and P-30+30+370.25 for duration of grouting. |
| | | | | | | | | | | | 11.41 | 10.31 | 1.10 | 1:1 | 6:49 | 6:53 | 16 | 406.8 | 304.8 | 427.8 | 0.76 | -- | 2074 | -- | |
| | | | | | | | | | | | | | **4.16** | | | | | | | | **0.76** | **7589** | **6935** | **3467** | |
| S-30+382.25 | 17-May-11 | 137.97 | -- | -- | 15.03 | 1.82 | 16.85 | Y | Small very soft zone noted from 13.4 m to 13.7 m. | 17-May-11 | 15.24 | 14.56 | 0.68 | 1:1 | 9:03 | 9:06 | 16 | 413.7 | 304.8 | 427.8 | 0.76 | -- | 1874 | -- | Difficulty triconing to depth; re-entered with hammer.<br>Grout Temperature: 27.8°C |
| | | | | | | | | | | | 14.56 | 10.76 | 3.80 | 1:1 | 13:16 | 13:30 | 16 | 413.7 | 304.8 | 420.2 | 0.76 | -- | 6095 | -- | Communicated to P-30+376.25 at 12.8 m, to P-30+373.25 at 11.9 m and to P-30+379.25 for duration of grouting. |
| | | | | | | | | | | | | | **4.48** | | | | | | | | **0.76** | **8179** | **7968** | **3984** | |
| S-30+385.25 | 17-May-11 | 138.02 | -- | -- | 15.64 | 1.16 | 16.80 | N | | 17-May-11 | 15.71 | 14.61 | 1.11 | 1:1 | 16:47 | 16:51 | 16 | 413.7 | 304.8 | 427.8 | 0.76 | -- | 2241 | -- | Communicated to 30+382.25 during trip in with tricone and as bubbling water for duration of grouting.<br>Grout Temperature: 22.4°C |
| | | | | | | | | | | | 14.61 | 11.13 | 3.48 | 1:1 | 16:56 | 17:22 | 16 | 413.7 | 152.4 | 223.3 | 0.76 | -- | 5652 | -- | |
| | | | | | | | | | | | | | **4.59** | | | | | | | | **0.76** | **8368** | **7893** | **3946** | |
| S-30+388.25 | 17-May-11 | 137.98 | -- | -- | 14.94 | 1.25 | 16.19 | Y | | 17-May-11 | 15.29 | 14.52 | 0.77 | 1:1 | 21:12 | 21:14 | 16 | 406.8 | 304.8 | 420.2 | 0.76 | -- | 1673 | -- | Grout Temperature: 13.9°C |
| | | | | | | | | | | | 14.52 | 11.01 | 3.51 | 1:1 | 21:20 | 21:34 | 16 | 406.8 | 304.8 | 416.4 | 0.76 | -- | 6375 | -- | |
| | | | | | | | | | | | | | **4.29** | | | | | | | | **0.76** | **7817** | **8048** | **4024** | |
| S-30+391.25 | 17-May-11 | 137.96 | -- | -- | 14.42 | 1.06 | 15.48 | Y | | 17-May-11 | 14.57 | 13.55 | 1.02 | 1:1 | 0:08 | 0:12 | 16 | 413.7 | 304.8 | 412.6 | 0.76 | -- | 2082 | -- | Grout Temperature: 26.1°C<br>Communicated to 30+388.25 for duration of grouting. |
| | | | | | | | | | | | 13.55 | 11.50 | 2.05 | 1:1 | 0:18 | 0:25 | 16 | 406.8 | 304.8 | 416.4 | 0.76 | -- | 4035 | -- | |
| | | | | | | | | | | | 11.50 | 10.43 | 1.07 | 1:1 | 0:33 | 0:36 | 16 | 399.9 | 304.8 | 416.4 | 0.76 | -- | 2059 | -- | |
| | | | | | | | | | | | | | **4.14** | | | | | | | | **0.76** | **7550** | **8176** | **4088** | |

**TABLE E2-3.1**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - NORTH CHANNEL**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-30+394.25 | 17-May-11 | 137.95 | -- | -- | 13.87 | 1.19 | 15.06 | N | | 17-May-11 | 14.18 | 11.25 | 2.93 | 1:1 | 4:51 | 5:03 | 16 | 399.9 | 304.8 | 416.4 | 0.76 | -- | 5493 | -- | Grout Temperature: 19.4°C<br>Communicated to 30+391.25 and 30+392.75 for duration of grouting. |
| | | | | | | | | | | | | | **2.93** | | | | | | | | **0.76** | **5338** | **5493** | **2746** | |
| S-30+397.25 | 17-May-11 | 137.95 | -- | -- | 13.91 | 0.85 | 14.76 | N | Communicated to S-30+394.25 | 18-May-11 | 13.88 | 11.06 | 2.82 | 1:1 | 7:40 | 7:50 | 16 | 410.2 | 304.8 | 424.0 | 0.76 | -- | 4864 | -- | Grout Temperature: 20.4o C<br>Communicated to 30+394.25 for duration of grouting |
| | | | | | | | | | | | | | **2.82** | | | | | | | | **0.76** | **5143** | **4864** | **2432** | |
| S-30+400.25 | 18-May-11 | 137.93 | -- | -- | 14.30 | 1.22 | 15.51 | N | | 18-May-11 | 14.48 | 11.59 | 2.89 | 1:1 | 10:45 | 10:57 | 16 | 399.9 | 304.8 | 424.0 | 0.76 | -- | 5224 | -- | Grout Temperature: 32.8°C<br>Communicated to 30+394.25 from 14.5 to 13.1 m and to 30+397.25 for duration of grouting. |
| | | | | | | | | | | | | | **2.89** | | | | | | | | **0.76** | **5271** | **5224** | **2612** | |
| S-30+403.25 | 18-May-11 | 137.91 | -- | -- | 14.39 | 1.21 | 15.60 | N | | 18-May-11 | 14.57 | 11.19 | 3.38 | 1:1 | 13:18 | 13:31 | 16 | 406.8 | 304.8 | 427.8 | 0.76 | -- | 6079 | -- | Grout Temperature: 5.2°C<br>Communicated to 30+400.25 for duration of grouting. |
| | | | | | | | | | | | | | **3.38** | | | | | | | | **0.76** | **6172** | **6079** | **3040** | |
| S-30+406.25 | 18-May-11 | 137.91 | -- | -- | 14.23 | 1.22 | 15.45 | Y | | 18-May-11 | 14.64 | 11.27 | 3.36 | 1:1 | 17:04 | 17:18 | 16 | 413.7 | 304.8 | 431.5 | 0.76 | -- | 6174 | -- | Grout Temperature: 28.1°C |
| | | | | | | | | | | | | | **3.36** | | | | | | | | **0.76** | **6138** | **6174** | **3087** | |
| S-30+409.25 | 18-May-11 | 137.95 | -- | -- | 14.17 | 0.83 | 15.00 | N | | 18-May-11 | 14.34 | 11.42 | 2.92 | 1:1 | 20:40 | 20:51 | 16 | 399.9 | 304.8 | 408.8 | 0.76 | -- | 5205 | -- | Grout Temperature: 28.3°C |
| | | | | | | | | | | | | | **2.92** | | | | | | | | **0.76** | **5321** | **5205** | **2602** | |
| S-30+412.25 | 18-May-11 | 137.98 | -- | -- | 13.49 | 1.34 | 14.83 | Y | | 18-May-11 | 13.81 | 11.94 | 1.87 | 1:1 | 23:28 | 23:34 | 16 | 399.9 | 304.8 | 416.4 | 0.76 | -- | 3085 | -- | |
| | | | | | | | | | | | | | **1.87** | | | | | | | | **0.76** | **3403** | **3085** | **1543** | |
| S-30+415.25 | 18-May-11 | 137.98 | -- | -- | 14.28 | 1.21 | 15.49 | N | | 18-May-11 | 14.57 | 12.00 | 2.57 | 1:1 | 0.075 | 1:58 | 16 | 406.8 | 304.8 | 424.0 | 0.76 | -- | 4618 | -- | Grout Temperature: 22.2°C |
| | | | | | | | | | | | | | **2.57** | | | | | | | | **0.76** | **4693** | **4618** | **2309** | |
| S-30+418.25 | 18-May-11 | 138.07 | -- | -- | 14.63 | 1.22 | 15.85 | N | | 18-May-11 | 14.68 | 12.09 | 2.59 | 1:1 | 9:18 | 9:28 | 16 | 417.1 | 304.8 | 416.4 | 0.76 | -- | 4334 | 416 | Grout Temperature: 21.7°C<br>Communicated to 30+415.25 for duration of grouting. |
| | | | | | | | | | | | | | **2.59** | | | | | | | | **0.76** | **4732** | **4334** | **2167** | |
| S-30+421.25 | 18-May-11 | 138.11 | -- | -- | 14.65 | 0.94 | 15.59 | N | | 19-May-11 | 14.69 | 12.02 | 2.67 | 1:1 | 7:58 | 8:11 | 16 | 406.8 | 304.8 | 424.0 | 0.76 | -- | 4936 | -- | Communicated to 30+418.25 and 30+415.25 while tripping in with tricone.<br>Grout Temperature: 19°C |
| | | | | | | | | | | | | | **2.67** | | | | | | | | **0.76** | **4865** | **4936** | **2468** | |
| S-30+424.25 | 19-May-11 | 138.09 | 25.00 | -- | 14.20 | 1.22 | 15.42 | N | Very soft zone noted from 7.6 to 9.4 m and from 10.7 to 11.3 m. | 19-May-11 | 14.60 | 11.52 | 3.08 | 1:1 | 10:14 | 10:26 | 16 | 406.8 | 304.8 | 424.0 | 0.76 | -- | 5303 | -- | Grout Temperature: 19.4°C<br>Communicated to 30+391.25 and 30+392.75 for duration of grouting. |
| | | | | | | | | | | | 11.52 | 7.92 | 3.61 | 1:1 | 10:34 | 10:50 | 16 | 393.0 | 304.8 | 408.8 | 0.76 | -- | 6151 | -- | |
| | | | | | | | | | | | | | **6.69** | | | | | | | | **0.76** | **12199** | **11455** | **5727** | |
| S-30+427.25 | 19-May-11 | 138.08 | -- | -- | 13.96 | 1.52 | 15.48 | N | | 19-May-11 | 14.33 | 12.14 | 2.19 | 1:1 | 12:52 | 13:01 | 16 | 413.7 | 304.8 | 424.0 | 0.76 | -- | 3948 | -- | Commu nicated to 30+424.25 at 14.2 m<br>Grout Temperature: 16.6°C |
| | | | | | | | | | | | | | **2.19** | | | | | | | | **0.76** | **3987** | **3948** | **1974** | |
| S-30+430.25 | 19-May-11 | 138.06 | -- | -- | 13.66 | 1.19 | 14.84 | N | Small very soft zone noted from 7.6 to 8.2 m. | 19-May-11 | 13.34 | 12.98 | 0.37 | 1:1 | 15:13 | 15:17 | 16 | 403.3 | 304.8 | 427.8 | 0.76 | -- | 1942 | -- | Grout Temperature: 19.4°C<br>Communicated to 30+391.25 and 30+392.75 for duration of grouting. |
| | | | | | | | | | | | 12.98 | 11.17 | 1.80 | 1:1 | 16:37 | 16:44 | 16 | 399.9 | 304.8 | 431.5 | 0.76 | -- | 3324 | -- | |
| | | | | | | | | | | | | | **2.17** | | | | | | | | **0.76** | **3953** | **5266** | **2633** | |
| S-30+433.25 | 19-May-11 | 137.94 | -- | -- | 13.35 | 1.10 | 14.45 | N | | 19-May-11 | 13.64 | 11.24 | 2.40 | 1:1 | 19:34 | 19:43 | 16 | 420.6 | 304.8 | 431.5 | 0.76 | -- | 3611 | -- | Communicated with 30+430.25 while tripping in with tricone; no return during grouting.<br>Grout Temperature: 15°C |
| | | | | | | | | | | | | | **2.40** | | | | | | | | **0.76** | **4370** | **3611** | **1806** | |

**TABLE E2-3.2**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 3**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-31+575 | 18-Apr-11 | 137.11 | -- | 10 | 15.09 | 1.52 | 16.61 | N | Till very hard, very dense. Hard to differentiate between till and bedrock. | 18-Apr-11 | 15.39 | 14.64 | 0.75 | 1:1 | 17:02 | 17:05 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1760 | -- | |
| | | | | | | | | | | | 14.64 | 11.63 | 3.01 | 1:1 | 17:10 | 17:17 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4281 | -- | Grout Temperature: 23.9°C at 11.6 m |
| | | | | | | | | | | | 11.63 | 8.62 | 3.02 | 1:1 | 17:25 | 17:32 | 16 | 401.6 | 304.8 | 424.0 | -- | -- | 3922 | -- | Marsh: 28.7 s; Density: 1.51 g/cc |
| | | | | | | | | | | | | | **6.78** | | | | | | | | **0.76** | **12360** | **9963** | **4982** | |
| P-31+577.4 | 18-Apr-11 | 137.08 | -- | 12 | 15.15 | 1.53 | 16.68 | N | | 19-Apr-11 | 15.58 | 14.52 | 1.06 | 1:1 | 11:15 | 11:18 | 16 | 399.9 | 304.8 | 431.5 | -- | -- | 1866 | -- | |
| | | | | | | | | | | | 14.52 | 11.69 | 2.83 | 1:1 | 11:23 | 11:32 | 16 | 403.3 | 304.8 | 435.3 | -- | -- | 3971 | -- | Grout Temperature: 26.4°C at 12.2 m. |
| | | | | | | | | | | | 11.69 | 11.49 | 0.20 | 1:1 | 11:33 | 11:34 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 598 | -- | Pump briefly stopped working. |
| | | | | | | | | | | | 11.49 | 10.33 | 1.16 | 1:1 | 11:39 | 11:42 | 16 | 398.2 | 304.8 | 424.0 | -- | -- | 1896 | -- | Marsh: 31 s, Density: 1.54 g/cc, Temp: 26.4°C |
| | | | | | | | | | | | | | **5.25** | | | | | | | | **0.76** | **9569** | **8332** | **4166** | |
| P-31+579.8 | 19-Apr-11 | 136.98 | -- | 15 | 16.03 | 1.58 | 17.61 | N | | 19-Apr-11 | 16.68 | 14.50 | 2.18 | 1:1 | 14:52 | 14:59 | 16 | 401.6 | 304.8 | 431.5 | -- | -- | 3293 | -- | Grout Temperature: 25.4°C at 14.9 m. |
| | | | | | | | | | | | 14.50 | 13.01 | 1.48 | 1:1 | 15:04 | 15:09 | 16 | 396.4 | 304.8 | 427.8 | -- | -- | 2108 | -- | Pump briefly stopped working. |
| | | | | | | | | | | | | | **3.67** | | | | | | | | **0.76** | **6689** | **5402** | **2701** | |
| P-31+582.2 | 19-Apr-11 | 136.93 | -- | 14 | 16.52 | 1.67 | 18.19 | N | | 19-Apr-11 | 17.53 | 14.59 | 2.94 | 1:1 | 17:38 | 17:47 | 16 | 405.1 | 304.8 | 431.5 | -- | -- | 4168 | -- | Grout Temperature: 18.6 °C at 15.2 m. |
| | | | | | | | | | | | 14.59 | 12.94 | 1.65 | 1:1 | 17:51 | 17:56 | 16 | 394.7 | 304.8 | 420.2 | -- | -- | 2230 | -- | Communicated to 31+579.8 from 16.5 to 14.3 m. |
| | | | | | | | | | | | | | **4.58** | | | | | | | | **0.76** | **8357** | **6397** | **3199** | |
| P-31+584.6 | 19-Apr-11 | 136.97 | -- | 15 | 17.47 | 1.52 | 18.99 | N | Bedrock appears harder than previous holes in Channels 2, 1-2 and 1. | 19-Apr-11 | 18.06 | 17.48 | 0.58 | 1:1 | 21:53 | 21:56 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 1560 | -- | |
| | | | | | | | | | | | 17.46 | 14.94 | 2.52 | 1:1 | 22:01 | 22:09 | 16 | 420.6 | 304.8 | 435.3 | -- | -- | 3676 | -- | |
| | | | | | | | | | | | 14.94 | 14.51 | 0.43 | 1:1 | 22:25 | 22:27 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 977 | -- | |
| | | | | | | | | | | | 14.51 | 11.57 | 2.95 | 1:1 | 23:13 | 23:23 | 16 | 413.7 | 304.8 | 412.6 | -- | -- | 4433 | -- | Grout Temperature: 10.2 °C |
| | | | | | | | | | | | 11.57 | 9.85 | 1.72 | 1:1 | 23:35 | 23:40 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 2763 | -- | Both jets clogged at 11.6 m. |
| | | | | | | | | | | | | | **8.19** | | | | | | | | **0.76** | **14940** | **13408** | **6704** | |
| P-31+587 | 19-Apr-11 | 137.02 | -- | 14 | 17.28 | 1.97 | 19.25 | N | Blue / grey chips returning to surface during drilling in bedrock. | 19-Apr-11 | 18.16 | 17.36 | 0.80 | 1:1 | 4:39 | 4:41 | 16 | 399.9 | 304.8 | 431.5 | -- | -- | 1840 | -- | Water loss and communication to 31+584.6 at 9.5 m during rod entry; water return at 11.3 m. Equal communication during grouting of first draw. |
| | | | | | | | | | | | 17.36 | 14.31 | 3.05 | 1:1 | 4:47 | 4:56 | 16 | 406.8 | 304.8 | 435.3 | -- | -- | 4293 | -- | Grout Temperature: 22.8°C |
| | | | | | | | | | | | 14.31 | 11.27 | 3.04 | 1:1 | 5:02 | 5:19 | 16 | 413.7 | 152.4 | 230.9 | -- | -- | 4130 | -- | Single jet clogged; half pull rate used. |
| | | | | | | | | | | | 11.27 | 10.20 | 1.07 | 1:1 | 5:24 | 5:29 | 16 | 413.7 | 152.4 | 230.9 | -- | -- | 1473 | -- | Communication changed to air at 13.4 m, then back to grout at 11.2 m. |
| | | | | | | | | | | | | | **7.96** | | | | | | | | **0.76** | **14517** | **11735** | **5867** | |
| P-31+589.4 | 20-Apr-11 | 137.06 | -- | 15 | 17.95 | 1.08 | 19.03 | N | Water loss at 10.5 m; lines thawed - 80% return; dropped to 60% return at 18.0 m. | 20-Apr-11 | 18.44 | 17.58 | 0.86 | 1:1 | 9:38 | 9:41 | 16 | 399.9 | 304.8 | 431.5 | -- | -- | 1401 | -- | Grout Temperature: 17.3°C at 15.5 m |
| | | | | | | | | | | | 17.58 | 14.53 | 3.05 | 1:1 | 9:45 | 9:54 | 16 | 405.1 | 304.8 | 435.3 | -- | -- | 4315 | -- | Communicated to 31+584.6 and 31+587 16.5 to 13.7 m. |
| | | | | | | | | | | | 14.53 | 12.23 | 2.30 | 1:1 | 9:58 | 10:05 | 16 | 401.6 | 304.8 | 427.8 | -- | -- | 3210 | -- | |
| | | | | | | | | | | | 12.23 | 10.67 | 1.56 | 1:1 | 10:10 | 10:18 | 16 | 403.3 | 152.4 | 228.6 | -- | -- | 2196 | -- | Single jet clogged; used half pull rate. |
| | | | | | | | | | | | | | **7.77** | | | | | | | | **0.76** | **14172** | **11122** | **5561** | |

**TABLE E2-3.2**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 3**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-31+591.8 | 20-Apr-11 | 137.08 | -- | 14 | 18.30 | 1.27 | 19.57 | N | | 20-Apr-11 | 19.19 | 17.62 | 1.57 | 1:1 | 13:06 | 13:11 | 16 | 403.3 | 304.8 | 431.5 | -- | -- | 2192 | -- | Grout Temperature: 22.1°C at 15.2 m. |
| | | | | | | | | | | | 17.62 | 14.57 | 3.05 | 1:1 | 13:16 | 13:25 | 16 | 399.9 | 304.8 | 427.8 | -- | -- | 3766 | -- | Communicated to 31+589.4 at 15.2 m. |
| | | | | | | | | | | | 14.57 | 12.53 | 2.04 | 1:1 | 14:07 | 14:14 | 16 | 399.9 | 304.8 | 431.5 | -- | -- | 3237 | -- | Both jets clogged; tripped out to clean. |
| | | | | | | | | | | | 12.53 | 11.91 | 0.62 | 1:1 | 14:16 | 14:18 | 16 | 399.9 | 304.8 | 427.8 | -- | -- | 1117 | -- | Marsh: 29.9 s, Density: 1.48 g/cc, Temp: 30.5°C |
| | | | | | | | | | | | | | **7.28** | | | | | | | | **0.76** | **13277** | **10311** | **5156** | |
| P-31+594.2 | 20-Apr-11 | 137.06 | -- | 15 | 18.67 | 0.77 | 19.43 | N | | 20-Apr-11 | 19.20 | 17.68 | 1.52 | 1:1 | 17:05 | 17:10 | 16 | 406.8 | 304.8 | 435.3 | -- | -- | 2411 | -- | Communicated to 31+591.8 from 18.3 to 19.2 m while triconing down. |
| | | | | | | | | | | | 17.68 | 14.64 | 3.04 | 1:1 | 17:14 | 17:24 | 16 | 406.8 | 304.8 | 435.3 | -- | -- | 4713 | -- | Grout Temperature: 25°C at 15.9 m. |
| | | | | | | | | | | | 14.63 | 12.93 | 1.70 | 1:1 | 18:13 | 18:19 | 16 | 405.1 | 304.8 | 435.3 | -- | -- | 2786 | -- | Both jets clogged; tripped out to clean. |
| | | | | | | | | | | | 12.93 | 11.95 | 0.98 | 1:1 | 18:23 | 18:26 | 16 | 403.3 | 304.8 | 431.5 | -- | -- | 1628 | -- | |
| | | | | | | | | | | | 11.95 | 11.85 | 0.11 | 1:1 | 18:28 | 18:29 | 16 | 386.1 | 304.8 | 427.8 | -- | -- | 420 | -- | |
| | | | | | | | | | | | | | **5.83** | | | | | | | | **0.76** | **13405** | **11958** | **5979** | |
| P-31+596.6 | 20-Apr-11 | 137.20 | 12 | 14 | 17.10 | 1.02 | 18.12 | N | Fast advance from 11.6 to 13.2 m with nearly no shaking of the drill string. | 20-Apr-11 | 17.41 | 14.38 | 3.04 | 1:1 | 22:19 | 22:29 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 4190 | -- | Communicated to 31+594.2 from 6.1 to 9.1 m while triconing down and during jet grouting. |
| | | | | | | | | | | | 14.38 | 11.75 | 2.63 | 1:1 | 22:35 | 22:43 | 16 | 410.2 | 304.8 | 435.3 | -- | -- | 3944 | -- | Grout Temperature: 29.4°C at 14.4 m. |
| | | | | | | | | | | | | | **11.49** | | | | | | | | **0.76** | **10336** | **8135** | **4067** | |
| P-31+599 | 20-Apr-11 | 137.21 | -- | 14 | 16.61 | 1.84 | 18.45 | N | Fast advance from 9.0 to 11.0 m with shaking of the drill string; low return at anticipated soft zone depth. | 20-Apr-11 | 16.90 | 14.36 | 2.54 | 1:1 | 2:13 | 2:21 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 3736 | -- | Grout Temperature: 12.8°C, Density: 1.54 g/cc |
| | | | | | | | | | | | 14.36 | 12.28 | 2.08 | 1:1 | 2:28 | 2:34 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 3623 | -- | Communicated to 31+596.4 while triconing to 14.6 m and during first jet grouting draw. |
| | | | | | | | | | | | | | **16.11** | | | | | | | | **0.76** | **8418** | **7359** | **3679** | |
| P-31+601.4 | 20-Apr-11 | 137.07 | 12 | 13 | 16.34 | 1.68 | 18.02 | N | Fast advance from 12.3 to 13.2 m with nearly no shaking of the drill string. Communicated to 31+599. | 21-Apr-11 | 17.01 | 14.34 | 2.67 | 1:1 | 8:39 | 8:46 | 16 | 403.3 | 304.8 | 435.3 | -- | -- | 3498 | -- | Grout Temperature: 20.9°C at 13.4 m. |
| | | | | | | | | | | | 14.34 | 10.81 | 3.52 | 1:1 | 9:40 | 9:51 | 16 | 403.3 | 304.8 | 416.4 | -- | -- | 4925 | -- | Both jets clogged; Tripped out to clean; Communicated to 31+584.6 and 31+591.8 along bedrock interface; Communicated to 31+599 from 17.0 to 10.8 m. |
| | | | | | | | | | | | | | **6.19** | | | | | | | | **0.76** | **11298** | **8423** | **4211** | |
| P-31+603.8 | 21-Apr-11 | 137.17 | 12 | 13 | 16.38 | 1.52 | 17.91 | N | Distinct fractured bedrock zone above competent bedrock. | 21-Apr-11 | 17.07 | 14.50 | 2.58 | 1:1 | 12:53 | 13:01 | 16 | 398.2 | 304.8 | 416.4 | -- | -- | 3910 | -- | Grout Temperature: 6.7°C at 15.2 m. |
| | | | | | | | | | | | 14.50 | 10.65 | 3.84 | 1:1 | 13:06 | 13:19 | 16 | 413.7 | 304.8 | 412.6 | -- | -- | 5512 | -- | Grout Temperature: 7.7°C at 11.0 m. |
| | | | | | | | | | | | | | **6.42** | | | | | | | | **0.76** | **11709** | **9422** | **4711** | |
| P-31+606.2 | 21-Apr-11 | 137.19 | 13 | 14 | 15.27 | 1.34 | 16.61 | N | Distinct fractured bedrock zone above competent bedrock. | 21-Apr-11 | 15.86 | 14.60 | 1.26 | 1:1 | 18:53 | 18:57 | 16 | 398.2 | 304.8 | 420.2 | -- | -- | 2237 | -- | |
| | | | | | | | | | | | 14.60 | 11.49 | 3.11 | 1:1 | 19:01 | 19:12 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 4096 | -- | Grout Temperature: 13.9°C at 11.5 m. |
| | | | | | | | | | | | 11.49 | 11.01 | 0.48 | 1:1 | 19:18 | 19:19 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 1045 | -- | |
| | | | | | | | | | | | | | **3.59** | | | | | | | | **0.76** | **8852** | **7378** | **3689** | |
| P-31+608.6 | 21-Apr-11 | 137.21 | 12 | 13 | 14.36 | 1.65 | 16.01 | N | Fast advance from 11.9 to 13.0 m with nearly no shaking of the drill string. | 21-Apr-11 | 14.79 | 14.44 | 0.35 | 1:1 | 23:08 | 23:10 | 16 | 403.3 | 304.8 | 424.0 | -- | -- | -- | -- | Lost record of volume. |
| | | | | | | | | | | | 14.44 | 10.62 | 3.81 | 1:1 | 23:16 | 23:29 | 16 | 417.1 | 304.8 | 431.5 | -- | -- | 6734 | -- | Step pull rate not activated during first minute of grout flow at 14.4 m. |
| | | | | | | | | | | | 10.62 | 10.38 | 0.24 | 1:1 | 23:40 | 23:41 | 16 | 379.2 | 304.8 | 424.0 | -- | -- | 821 | -- | Communicated to 31+606.2 for length of jet grout column. |
| | | | | | | | | | | | | | **4.05** | | | | | | | | **0.76** | **8034** | **7556** | **3778** | Grout Temperature: 18.3°C at 10.4 m. |
| P-31+611 | 21-Apr-11 | 137.18 | 11 | 12 | 12.56 | 1.09 | 13.64 | N | Fast advance from 11.1 to 11.8 m with nearly no shaking of the drill string. Communicated to 31+608.6. | 21-Apr-11 | 12.98 | 11.38 | 1.60 | 1:1 | 3:16 | 3:21 | 16 | 420.6 | 304.8 | 431.5 | -- | -- | 2544 | -- | Slight communication with 31+608.6 from 11.6 to 10.7 m. |
| | | | | | | | | | | | 11.38 | 9.58 | 1.80 | 1:1 | 3:26 | 3:32 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 2896 | -- | Marsh:40.6 s; Density:1.58 g/cc; Bleed:14% |
| | | | | | | | | | | | | | **3.40** | | | | | | | | **0.76** | **6199** | **5440** | **2720** | |

**TABLE E2-3.2**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 3**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-31+576.2 | 22-Apr-11 | 137.24 | -- | 11 | 14.69 | 1.71 | 16.40 | N | | 22-Apr-11 | 15.86 | 14.69 | 1.16 | 1:1 | 9:44 | 9:47 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1847 | -- | Grout Temperature: 24.4°C at 13.7 m. |
| | | | | | | | | | | | 14.69 | 11.67 | 3.02 | 1:1 | 9:52 | 10:01 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4149 | -- | |
| | | | | | | | | | | | 11.67 | 9.42 | 2.26 | 1:1 | 10:06 | 10:13 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 3358 | -- | |
| | | | | | | | | | | | | | **6.44** | | | | | | | | **0.76** | **11743** | **9354** | **4677** | |
| S-31+578.6 | 22-Apr-11 | 137.16 | -- | 13 | 15.59 | 1.23 | 16.82 | N | | 22-Apr-11 | 16.15 | 14.69 | 1.46 | 1:1 | 12:50 | 12:55 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 2464 | -- | Grout Temperature: 20.2°C at 14.3 m. |
| | | | | | | | | | | | 14.69 | 12.85 | 1.84 | 1:1 | 12:59 | 13:06 | 16 | 401.6 | 304.8 | 424.0 | -- | -- | 2869 | -- | Communicated to 31+576.2 from 12.2 to 11.3 m |
| | | | | | | | | | | | 12.85 | 11.38 | 1.47 | 1:1 | 13:10 | 13:15 | 16 | 401.6 | 304.8 | 424.0 | -- | -- | 2464 | -- | |
| | | | | | | | | | | | | | **4.77** | | | | | | | | **0.76** | **8707** | **7798** | **3899** | |
| S-31+581 | 22-Apr-11 | 137.17 | -- | 14 | 16.34 | 1.05 | 17.39 | N | | 22-Apr-11 | 16.78 | 14.62 | 2.15 | 1:1 | 16:02 | 16:08 | 16 | 417.1 | 304.8 | 431.5 | -- | -- | 3153 | -- | Communicated to 31+578.6 from 16.0 to 11.0 m |
| | | | | | | | | | | | 14.62 | 11.02 | 3.60 | 1:1 | 16:14 | 16:26 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 5175 | -- | Grout Temperature: 14.6°C at 14.3 m |
| | | | | | | | | | | | | | **5.76** | | | | | | | | **0.76** | **10503** | **8328** | **4164** | |
| S-31+583.4 | 22-Apr-11 | 137.25 | -- | 15 | 17.73 | 1.48 | 19.20 | N | | 22-Apr-11 | 18.90 | 17.71 | 1.19 | 1:1 | 18:41 | 18:45 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 1946 | -- | Communicated to 31+581.0 at 18.6 m. |
| | | | | | | | | | | | 17.71 | 14.66 | 3.05 | 1:1 | 18:49 | 18:59 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 4463 | -- | Jets clogged at 14.7 m, rods tripped out. |
| | | | | | | | | | | | 14.81 | 11.40 | 3.42 | 1:1 | 19:57 | 20:09 | 16 | 399.9 | 304.8 | 442.9 | -- | -- | 5803 | -- | Grout Temperature: 17.8°C at 12.2 m. |
| | | | | | | | | | | | | | **7.66** | | | | | | | | **0.76** | **13972** | **12212** | **5133** | |
| S-31+585.8 | 22-Apr-11 | 137.18 | -- | 15 | 17.77 | 1.46 | 19.23 | N | Communicated to 31+583.4 | 22-Apr-11 | 18.39 | 18.39 | 0.01 | 1:1 | 0:04 | 0:05 | 16 | 172.4 | 304.8 | 227.1 | -- | -- | 273 | -- | Tricone caught before full pressure reached at 18.39 m. |
| | | | | | | | | | | | 18.39 | 17.27 | 1.12 | 1:1 | 0:07 | 0:10 | 16 | 413.7 | 304.8 | 412.6 | -- | -- | 1821 | -- | |
| | | | | | | | | | | | 17.27 | 14.29 | 2.98 | 1:1 | 0:17 | 0:27 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 4618 | -- | Communicated to 31+583.4. |
| | | | | | | | | | | | 14.29 | 10.96 | 3.33 | 1:1 | 0:36 | 0:47 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 5303 | -- | Grout Temperature: 12.2°C at 15.2 m. |
| | | | | | | | | | | | | | **7.43** | | | | | | | | **0.76** | **13561** | **12015** | **4961** | |
| S-31+588.2 | 22-Apr-11 | 137.20 | -- | 15 | 17.62 | 1.76 | 19.38 | N | | 22-Apr-11 | 18.01 | 17.48 | 0.53 | 1:1 | 4:40 | 4:42 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 1249 | -- | Communicated to 31+585.8 at 18 m. |
| | | | | | | | | | | | 17.48 | 14.42 | 3.06 | 1:1 | 4:48 | 4:57 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 4452 | -- | Grout Temperature: 11.7°C at 15.2 m. |
| | | | | | | | | | | | 14.42 | 10.98 | 3.44 | 1:1 | 5:04 | 5:24 | 16 | 413.7 | 152.4 | 221.4 | -- | -- | 4720 | -- | One jet clogged at 14.4 m, half rate pull used. |
| | | | | | | | | | | | | | **7.03** | | | | | | | | **0.76** | **12827** | **10421** | **4586** | Marsh: 31 s, Density: 1.51 g/cc |
| S-31+590.6 | 23-Apr-11 | 137.16 | -- | 16 | 18.21 | 1.51 | 19.72 | N | | 23-Apr-11 | 18.59 | 17.61 | 0.98 | 1:1 | 9:18 | 9:22 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 1722 | -- | Grout Temperature: 20°C at 15.8 m. |
| | | | | | | | | | | | 17.61 | 14.57 | 3.04 | 1:1 | 9:26 | 9:36 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 4471 | -- | |
| | | | | | | | | | | | 14.57 | 11.25 | 3.32 | 1:1 | 10:29 | 10:41 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 5103 | -- | Grout Temperature: 14.4°C at 11.6 m. |
| | | | | | | | | | | | | | **7.34** | | | | | | | | **0.76** | **13388** | **11296** | **5648** | |
| S-31+593 | 23-Apr-11 | 137.19 | -- | 15 | 17.95 | 1.55 | 19.51 | N | | 23-Apr-11 | 18.90 | 17.65 | 1.24 | 1:1 | 13:10 | 13:14 | 16 | 410.2 | 304.8 | 420.2 | -- | -- | 2006 | -- | Grout Temperature: 20°C at 14.6 m. |
| | | | | | | | | | | | 17.65 | 14.64 | 3.01 | 1:1 | 13:19 | 13:29 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 4599 | -- | |
| | | | | | | | | | | | 14.64 | 11.64 | 3.00 | 1:1 | 13:34 | 13:53 | 16 | 413.7 | 152.4 | 217.3 | -- | -- | 4365 | -- | One jet clogged, half step pull rate used. |
| | | | | | | | | | | | | | **7.25** | | | | | | | | **0.76** | **13233** | **10970** | **5485** | |

**TABLE E2-3.2**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 3**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | DEPTH | | Draw | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| | | | | | | | | | | | From | To | | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-31+595.4 | 23-Apr-11 | 137.16 | -- | 15 | 17.89 | 1.89 | 19.78 | N | | 23-Apr-11 | 19.79 | 17.58 | 2.22 | 1:1 | 20:00 | 20:08 | 16 | 406.8 | 304.8 | 412.6 | -- | -- | 3846 | -- | Grout Temperature: 16.7°C at 17.6 m. |
| | | | | | | | | | | | 17.58 | 14.55 | 3.03 | 1:1 | 20:17 | 20:26 | 16 | 406.8 | 304.8 | 408.8 | -- | -- | 4690 | -- | Communicated with 31+593.0 from 16.8 to 12.5 m. |
| | | | | | | | | | | | 14.55 | 11.65 | 2.90 | 1:1 | 20:34 | 20:44 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 4418 | -- | |
| | | | | | | | | | | | | | **8.14** | | | | | | | | **0.76** | **14856** | **12954** | **6477** | |
| S-31+597.8 | 23-Apr-11 | 137.24 | -- | 14 | 16.86 | 2.07 | 18.93 | N | | 23-Apr-11 | 17.53 | 17.51 | 0.02 | 1:1 | 0:30 | 0:31 | 0 | 399.9 | 0 | 416.4 | -- | -- | -- | -- | Communicated to 31+593.0 and 31+595.4 15.2 to 13.7 m. |
| | | | | | | | | | | | 17.51 | 17.31 | 0.20 | 1:1 | 0:32 | 0:33 | 16 | 344.7 | 304.8 | 405.0 | -- | -- | -- | -- | Tricone caught, released manually. |
| | | | | | | | | | | | 17.31 | 17.09 | 0.23 | 1:1 | 0:35 | 0:36 | 15 | 413.7 | 304.8 | 412.6 | -- | -- | -- | -- | Tricone caught, released manually. |
| | | | | | | | | | | | 17.08 | 14.75 | 2.33 | 1:1 | 0:38 | 0:48 | 15 | 399.9 | 304.8 | 408.8 | -- | -- | 6288 | -- | Tricone caught, released manually. |
| | | | | | | | | | | | 14.75 | 14.47 | 0.27 | 1:1 | 0:52 | 0:53 | 15 | 413.7 | 304.8 | 420.2 | -- | -- | 3255 | -- | Volume approximate, connection to sensors lost, pull rate paused, grout pressure kept, connection restored in approximately 2 min; Ran out of grout at 14.8 m. |
| | | | | | | | | | | | 14.47 | 11.63 | 2.85 | 1:1 | 1:02 | 1:23 | 15 | 406.8 | 304.8 | 420.2 | -- | -- | 4891 | -- | Communicated to 31+601.4, 31+593.0 and 31+595.4 at bottom of hole; Grout Temperature: 20°C at 12.5 m. |
| | | | | | | | | | | | | | **5.89** | | | | | | | | **0.76** | **10747** | **14434** | **7217** | |
| S-31+600.2 | 23-Apr-11 | 137.31 | -- | 14 | 16.79 | 1.83 | 18.62 | N | | 23-Apr-11 | 17.07 | 14.55 | 2.53 | 1:1 | 4:53 | 5:02 | 16 | 403.3 | 304.8 | 412.6 | -- | -- | 4701 | -- | Grout Temperature: 22.2°C at 14.8 m. |
| | | | | | | | | | | | 14.55 | 11.67 | 2.88 | 1:1 | 5:08 | 5:19 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 5360 | -- | Communicated to 31+597.8 during grouting. |
| | | | | | | | | | | | | | **5.40** | | | | | | | | **0.76** | **9858** | **10062** | **5031** | |
| S-31+602.6 | 23-Apr-11 | 137.20 | 12 | 14 | 16.49 | 1.52 | 18.01 | N | | 24-Apr-11 | 16.79 | 14.58 | 2.21 | 1:1 | 8:19 | 8:28 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 4353 | -- | Grout Temperature: 17.1°C at 13.7 m. |
| | | | | | | | | | | | 14.58 | 11.32 | 3.26 | 1:1 | 8:33 | 8:45 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 5731 | -- | Communicated to 31+600.2 from 16.8 to 10.7 m. |
| | | | | | | | | | | | 11.32 | 10.73 | 0.59 | 1:1 | 8:49 | 8:52 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 1302 | -- | |
| | | | | | | | | | | | | | **6.07** | | | | | | | | **0.76** | **11070** | **11387** | **5693** | |
| S-31+605 | 24-Apr-11 | 137.20 | 12 | 13 | 15.06 | 1.66 | 16.72 | N | | 24-Apr-11 | 15.28 | 14.68 | 0.60 | 1:1 | 12:06 | 12:08 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 1370 | -- | Grout Temperature: 19.6°C at 13.4 m. |
| | | | | | | | | | | | 14.68 | 11.61 | 3.07 | 1:1 | 12:14 | 12:25 | 16 | 410.2 | 304.8 | 427.8 | -- | -- | 5250 | -- | |
| | | | | | | | | | | | 11.61 | 10.49 | 1.12 | 1:1 | 12:30 | 12:34 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 1946 | -- | |
| | | | | | | | | | | | | | **4.79** | | | | | | | | **0.76** | **8740** | **8566** | **4283** | |
| S-31+607.4 | 24-Apr-11 | 137.20 | 12 | 13 | 13.84 | 0.79 | 14.63 | N | | 24-Apr-11 | 14.02 | 11.70 | 2.32 | 1:1 | 14:59 | 15:07 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 3793 | -- | Grout Temperature: 17.6°C at 12.2 m. |
| | | | | | | | | | | | 11.70 | 11.55 | 0.16 | 1:1 | 15:08 | 15:09 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 564 | -- | |
| | | | | | | | | | | | 11.55 | 10.38 | 1.16 | 1:1 | 15:05 | 15:19 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 2154 | -- | |
| | | | | | | | | | | | | | **3.64** | | | | | | | | **0.76** | **6639** | **6511** | **3255** | |
| S-31+609.8 | 24-Apr-11 | 137.20 | 12 | 12 | 12.76 | 1.56 | 14.33 | N | | 24-Apr-11 | 13.08 | 11.56 | 1.52 | 1:1 | 18:35 | 18:40 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 2483 | -- | Grout Temperature: 20.3°C at 12.2 m. |
| | | | | | | | | | | | 11.56 | 9.92 | 1.64 | 1:1 | 18:48 | 18:53 | 16 | 401.6 | 304.8 | 420.2 | -- | -- | 2752 | -- | Communicated to 31+607.4 from 13.1 to 9.9 m. |
| | | | | | | | | | | | | | **3.16** | | | | | | | | **0.76** | **5760** | **5235** | **2618** | |

**TABLE E2-3.3**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 2**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-31+824.8 | 23-Oct-10 | 136.35 | -- | 13.41 | 16.00 | 1.83 | 17.83 | N | First hole drilled. Difficult to determine top of soft zone. | 02-Nov-10 | 17.47 | 14.39 | 3.09 | 1:1 | 16:40 | 16:48 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 3562 | -- | |
| | | | | | | | | | | | 14.39 | 13.04 | 1.35 | 1:1 | 16:59 | 17:07 | 16 | 427.5 | 152.4 | 242.3 | -- | -- | 1696 | | |
| | | | | | | | | | | | | | **4.43** | | | | | | | | **0.76** | **8090** | **5258** | **2629** | |
| P-31+827.2 | 27-Oct-10 | 136.20 | 13.72 | 15.24 | 16.76 | 1.83 | 18.59 | N | Assumed grout platform elevation. | 02-Nov-10 | 17.32 | 17.26 | 0.05 | 1:1 | 14:40 | 14:41 | 16 | 403.3 | 304.8 | 412.6 | -- | -- | 1272 | -- | |
| | | | | | | | | | | | 17.26 | 14.28 | 2.98 | 1:1 | 14:47 | 14:55 | 16 | 424.7 | 304.8 | 420.2 | -- | -- | 3373 | -- | |
| | | | | | | | | | | | 14.28 | 11.23 | 3.05 | 1:1 | 15:02 | 15:09 | 16 | 399.9 | 304.8 | 408.8 | -- | -- | 3358 | | |
| | | | | | | | | | | | | | **6.09** | | | | | | | | **0.76** | **11109** | **8002** | **4001** | |
| P-31+829.6 | 27-Oct-10 | 136.20 | 14.63 | 15.24 | 18.59 | 1.83 | 20.42 | N | Assumed grout platform elevation. Communicated to P-31+834.4 and P-31+832. | 02-Nov-10 | 17.56 | 17.23 | 0.32 | 1:1 | 11:17 | 11:18 | 16 | 365.4 | 304.8 | 401.3 | -- | -- | 1049 | -- | |
| | | | | | | | | | | | 17.23 | 16.28 | 0.96 | 1:1 | 11:27 | 11:29 | 7 | 413.7 | 304.8 | 420.2 | -- | -- | 1185 | -- | |
| | | | | | | | | | | | 16.28 | 14.21 | 2.06 | 1:1 | 11:29 | 11:36 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 3112 | -- | Spoil communicated to 31+827.2 at 14.7 m. |
| | | | | | | | | | | | 14.21 | 11.12 | 3.09 | 1:1 | 11:44 | 11:52 | 16 | 399.9 | 304.8 | 408.8 | -- | -- | 3517 | | |
| | | | | | | | | | | | | | **6.44** | | | | | | | | **0.76** | **11743** | **8862** | **4431** | |
| P-31+832 | 26-Oct-10 | 136.12 | -- | 15.85 | 18.75 | 1.98 | 20.73 | N | | 31-Oct-10 | 20.26 | 19.00 | 1.26 | 1:1 | 14:57 | 15:00 | 16 | 396.4 | 304.8 | 439.1 | -- | -- | 1363 | -- | |
| | | | | | | | | | | | 19.00 | 17.36 | 1.64 | 1:1 | 15:00 | 15:04 | 16 | 427.5 | 304.8 | 465.6 | -- | -- | 2972 | -- | Swivel on drill leaking |
| | | | | | | | | | | | 17.36 | 14.36 | 3.00 | 1:1 | 15:15 | 15:24 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 3994 | -- | |
| | | | | | | | | | | | 14.36 | 12.15 | 2.21 | 1:1 | 15:30 | 15:38 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 3036 | -- | |
| | | | | | | | | | | | | | **8.11** | | | | | | | | **0.76** | **14795** | **11364** | **7510** | |
| P-31+834.4 | 26-Oct-10 | 136.08 | 15.85 | 16.76 | 17.68 | 1.83 | 19.51 | N | Communicated to P-31+836.8 after flushing for 5 min. | 31-Oct-10 | 19.27 | 18.36 | 0.91 | 1:1 | 10:17 | 10:21 | 16 | 396.4 | 304.8 | 420.2 | -- | -- | 1442 | -- | |
| | | | | | | | | | | | 18.36 | 17.49 | 0.88 | 1:1 | 10:23 | 10:25 | 16 | 427.5 | 304.8 | 416.4 | -- | -- | 1173 | -- | |
| | | | | | | | | | | | 17.49 | 14.44 | 3.05 | 1:1 | 10:34 | 10:44 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 4327 | -- | Spoil sample taken at 14.94 m |
| | | | | | | | | | | | 14.44 | 11.90 | 2.54 | 1:1 | 10:53 | 11:00 | 16 | 413.7 | 304.8 | 412.6 | -- | -- | 3286 | -- | |
| | | | | | | | | | | | | | **7.37** | | | | | | | | **0.76** | **13450** | **10228** | **6007** | |
| P-31+836.8 | 25-Oct-10 | 136.16 | 15.85 | 16.76 | 18.90 | 2.13 | 21.03 | N | Communicated to P-31+839.2 and P-31+848.8. | 30-Oct-10 | 20.48 | 17.43 | 3.04 | 1:1 | 14:07 | 14:16 | 16 | 413.7 | 304.8 | 421.3 | -- | -- | 3653 | -- | |
| | | | | | | | | | | | 17.43 | 14.43 | 3.00 | 1:1 | 14:22 | 14:30 | 16 | 417.1 | 304.8 | 416.4 | -- | -- | 3880 | -- | |
| | | | | | | | | | | | 14.43 | 13.58 | 0.86 | 1:1 | 14:37 | 14:40 | 16 | 420.6 | 304.8 | 424.0 | -- | -- | 1276 | -- | |
| | | | | | | | | | | | | | **6.90** | | | | | | | | **0.76** | **12588** | **8809** | **5285** | |
| P-31+839.2 | 24-Oct-10 | 136.26 | -- | 16.76 | 19.51 | 2.13 | 21.64 | N | Second hole drilled. Difficult to determine top of soft zone. | 30-Oct-10 | 19.59 | 17.38 | 2.21 | 1:1 | 16:43 | 16:49 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 3115 | -- | |
| | | | | | | | | | | | 17.38 | 15.53 | 1.84 | 1:1 | 16:59 | 17:04 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 2366 | -- | |
| | | | | | | | | | | | | | **4.06** | | | | | | | | **0.76** | **7400** | **5481** | **3289** | |
| P-31+841.6 | 28-Oct-10 | 136.20 | 15.85 | 16.76 | 20.12 | 2.44 | 22.56 | N | Assumed grout platform elevation. Communicated to P-31+844. | 30-Oct-10 | 22.10 | 21.80 | 0.29 | 1:1 | 10:12 | 10:14 | 16 | 372.3 | 304.8 | 405.0 | -- | -- | 780 | -- | |
| | | | | | | | | | | | 21.80 | 19.49 | 2.31 | 1:1 | 10:14 | 10:19 | 16 | 403.3 | 304.8 | 412.6 | -- | -- | 2423 | -- | |
| | | | | | | | | | | | 19.49 | 16.50 | 2.99 | 1:1 | 10:28 | 10:35 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 3524 | -- | |
| | | | | | | | | | | | 16.50 | 16.44 | 0.05 | 1:1 | 10:42 | 10:43 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 360 | -- | |
| | | | | | | | | | | | 16.44 | 16.40 | 0.04 | 1:1 | 11:02 | 11:05 | 16 | 351.6 | 304.8 | 212.0 | -- | -- | 382 | -- | |
| | | | | | | | | | | | 16.40 | 16.15 | 0.25 | 1:1 | 11:52 | 11:54 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 1703 | -- | Spoil sample taken at 14.94 m |
| | | | | | | | | | | | 16.15 | 13.38 | 2.77 | 1:1 | 12:03 | 12:10 | 16 | 417.1 | 304.8 | 416.4 | -- | -- | 3384 | -- | Estimated 60% spoils. |
| | | | | | | | | | | | | | **8.71** | | | | | | | | **0.76** | **15896** | **12556** | **7534** | |
| P-31+844 | 28-Oct-10 | 136.20 | 15.54 | 17.07 | 20.12 | 2.44 | 22.56 | N | Assumed grout platform elevation. | 29-Oct-10 | 20.91 | 17.64 | 3.27 | 1:1 | 17:28 | 17:36 | 16 | 410.2 | 304.8 | 416.4 | -- | -- | 5451 | -- | |
| | | | | | | | | | | | 17.64 | 15.08 | 2.56 | 1:1 | 18:19 | 18:33 | 16 | 337.8 | 152.4 | 193.8 | -- | -- | 2896 | -- | Monitor became plugged. Reset DPR. |
| | | | | | | | | | | | 15.08 | 13.50 | 1.58 | 1:1 | 18:41 | 18:51 | 16 | 365.4 | 152.4 | 218.8 | -- | -- | 1647 | -- | Spoil communicated 31+846.4 at 20.9 m |
| | | | | | | | | | | | | | **7.41** | | | | | | | | **0.76** | **13522** | **9993** | **4997** | |

**TABLE E2-3.3**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 2**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-31+846.4 | 26-Oct-10 | 136.19 | 12.80 | 16.76 | 19.51 | 2.51 | 22.02 | N | Communicated to P-31+839.2. | 29-Oct-10 | 20.96 | 20.82 | 0.14 | 1:1 | 13:57 | 13:57 | -- | -- | -- | -- | -- | -- | 337 | -- | While starting up, a pressure fuse blew, additionally a pressure gauge mount became loose. |
| | | | | | | | | | | | 20.82 | 20.78 | 0.04 | 1:1 | 14:23 | 14:24 | -- | -- | -- | -- | -- | -- | 587 | -- | |
| | | | | | | | | | | | 20.78 | 18.12 | 2.66 | 1:1 | 14:36 | 14:43 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 3611 | -- | DPR was reset at 9.14 m due to an engine stall on the drill rig. |
| | | | | | | | | | | | 18.12 | 15.20 | 2.91 | 1:1 | 14:56 | 15:04 | 16 | 417.1 | 304.8 | 431.5 | -- | -- | 4183 | -- | |
| | | | | | | | | | | | 15.20 | 13.08 | 2.12 | 1:1 | 15:13 | 15:18 | 16 | 420.6 | 304.8 | 435.3 | -- | -- | 2816 | -- | Spoil communicated 31+844 at 18.6 m |
| | | | | | | | | | | | | | **7.88** | | | | | | | | **0.76** | **14367** | **11534** | **5767** | |
| P-31+848.8 | 26-Oct-10 | 136.20 | 11.28 | 17.37 | 19.28 | 1.70 | 20.98 | N | Assumed grout platform elevation.Communicated to P-31+846.4 and P-31+839.2. | 28-Oct-10 | 20.16 | 14.33 | 5.83 | 1:1 | 15:59 | 17:10 | 16 | 399.9 | 304.8 | -- | -- | -- | 9286 | | Spoil communicated to 31+846.4, 31+839.2 and 31+836.8 at 15.5 m |
| | | | | | | | | | | | | | **5.83** | | | | | | | | **0.76** | **10636** | **9286** | **4643** | |
| P-31+851.2 | 26-Oct-10 | 136.20 | 11.28 | 18.29 | 20.04 | 1.30 | 21.34 | N | Assumed grout platform elevation. | 28-Oct-10 | 9.11 | 19.05 | 9.94 | 1:1 | 13:10 | 14:10 | 16 | 399.9 | 304.8 | -- | -- | -- | 13188 | -- | Water communicated to 31+848.8 at 18.6 m. Spoil communicated to 31+848.8 at 16.9 m. |
| | | | | | | | | | | | | | **9.94** | | | | | | | | **0.76** | **18126** | **13188** | **6594** | |
| P-31+853.6 | 29-Oct-10 | 136.20 | 16.15 | 17.37 | 19.20 | 2.13 | 21.34 | N | Assumed grout platform elevation. | 05-Nov-10 | 19.48 | 19.15 | 0.33 | 1:1 | 14:07 | 14:11 | 16 | 410.2 | 304.8 | 393.7 | -- | -- | 1192 | -- | |
| | | | | | | | | | | | 19.15 | 17.99 | 1.16 | 1:1 | 14:19 | 14:24 | 16 | 400.6 | 304.8 | 405.0 | -- | -- | 2018 | -- | Water communicated to 31+856 and 31+858.4 from 17.4 to 20.5 m |
| | | | | | | | | | | | 17.99 | 15.04 | 2.94 | 1:1 | 14:29 | 14:39 | 16 | 399.9 | 304.8 | 405.0 | -- | -- | 4240 | -- | |
| | | | | | | | | | | | 15.04 | 14.81 | 0.23 | 1:1 | 14:44 | 14:45 | 16 | 393.0 | 304.8 | 393.7 | -- | -- | 621 | -- | Spoil communicated to 31+856 and 31+858.4 from 17.4 to 16.5 m |
| | | | | | | | | | | | | | **4.67** | | | | | | | | **0.76** | **8523** | **8070** | **3028** | |
| P-31+856 | 30-Oct-10 | 136.20 | 13.72 | 16.76 | 19.51 | 1.83 | 21.34 | N | Assumed grout platform elevation. Soft layer encountered at 13.7 m was not very soft as other holes. | 06-Nov-10 | 19.20 | 18.56 | 0.65 | 1:1 | 13:30 | 13:35 | 16 | 413.7 | 304.8 | 401.3 | -- | -- | 1790 | -- | Spoil communicated to 31+868; spoil comm. to 31+860.8 |
| | | | | | | | | | | | 18.56 | 17.28 | 1.28 | 1:1 | 18:38 | 18:43 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 1124 | -- | Loss of circulation at 17.4 m |
| | | | | | | | | | | | 17.28 | 15.31 | 1.97 | 1:1 | 18:49 | 18:57 | 16 | 420.6 | 304.8 | 424.0 | -- | -- | 3255 | -- | |
| | | | | | | | | | | | 15.31 | 14.61 | 0.70 | 1:1 | 19:29 | 19:31 | 16 | 420.6 | 304.8 | 454.2 | -- | -- | 2915 | -- | |
| | | | | | | | | | | | | | **4.60** | | | | | | | | **0.76** | **8384** | **9085** | **6163** | |
| P-31+858.4 | 30-Oct-10 | 136.20 | 14.02 | 17.37 | 19.35 | 1.98 | 21.34 | N | Assumed grout platform elevation. Very soft layer encountered at 16.8 m. | 07-Nov-10 | 20.32 | 17.51 | 2.82 | 1:1 | 10:13 | 10:22 | 16 | 410.2 | 304.8 | 408.8 | -- | -- | 3888 | -- | |
| | | | | | | | | | | | 17.51 | 15.24 | 2.27 | 1:1 | 10:27 | 10:36 | 16 | 403.3 | 304.8 | 408.8 | -- | -- | 3384 | -- | Water communicated to 31+860.8 from 13.1 to 20.4 m while lowering tricone; samples taken at 16.8 m |
| | | | | | | | | | | | | | **5.09** | | | | | | | | **0.76** | **9280** | **7272** | **2498** | |
| P-31+860.8 | 31-Oct-10 | 136.20 | 13.72 | 18.29 | 21.95 | 2.44 | 24.38 | N | Communicated to P-31+858.4 and P-31+856. Soft layer encountered at 16.8 m. Soft layer in Till at 20.1 m bgs. | 07-Nov-10 | 20.31 | 17.51 | 2.81 | 1:1 | 11:55 | 12:05 | 16 | 399.9 | 304.8 | 393.7 | -- | -- | 3971 | -- | |
| | | | | | | | | | | | 17.51 | 14.61 | 2.90 | 1:1 | 12:11 | 12:21 | 16 | 399.9 | 304.8 | 397.5 | -- | -- | 3925 | -- | Water and spoils communicated 2 m downstream to surface from 20.6 to 15.5 m |
| | | | | | | | | | | | | | **5.70** | | | | | | | | **0.76** | **10403** | **7896** | **3520** | |
| P-31+863.2 | 31-Oct-10 | 136.20 | 13.72 | 17.07 | 19.51 | 2.44 | 21.95 | N | Assumed grout platform elevation. Communicated to P-31+860.8. | 07-Nov-10 | 20.64 | 17.46 | 3.17 | 1:1 | 13:55 | 14:05 | 16 | 406.8 | 304.8 | 397.5 | -- | -- | 4455 | -- | Spoils communicated to 31+860.8 and surface from 19.8 to 18.0 m and from 16.5 to 15.2 m |
| | | | | | | | | | | | 17.46 | 14.90 | 2.56 | 1:1 | 14:09 | 14:18 | 16 | 396.4 | 304.8 | 386.1 | -- | -- | 3308 | -- | |
| | | | | | | | | | | | | | **5.73** | | | | | | | | **0.76** | **10458** | **7764** | **2839** | |
| P-31+865.6 | 02-Nov-10 | 136.20 | 14.33 | 16.76 | 19.20 | 2.13 | 21.34 | N | Assumed grout platform elevation. | 07-Nov-10 | 20.54 | 17.48 | 3.06 | 1:1 | 15:38 | 15:49 | 16 | 399.9 | 304.8 | 393.7 | -- | -- | 4149 | -- | |
| | | | | | | | | | | | 17.48 | 17.48 | 0.00 | 1:1 | 15:53 | 15:55 | 16 | 189.6 | 304.8 | 193.1 | -- | -- | 333 | -- | Plugged jet; shut off to fix and lowered beyond 17.48 m when re-started |
| | | | | | | | | | | | 17.60 | 14.59 | 3.01 | 1:1 | 16:38 | 16:48 | 16 | 406.8 | 304.8 | 386.1 | -- | -- | 4217 | -- | |
| | | | | | | | | | | | 14.59 | 14.39 | 0.20 | 1:1 | 16:53 | 16:54 | 16 | 396.4 | 304.8 | 386.1 | -- | -- | 984 | -- | |
| | | | | | | | | | | | | | **3.21** | | | | | | | | **0.76** | **11448** | **9683** | **2574** | |
| P-31+868 | 02-Nov-10 | 136.20 | 15.24 | 16.76 | 19.66 | 2.29 | 21.95 | N | Assumed grout platform elevation. | 09-Nov-10 | 19.62 | 19.60 | 0.02 | 1:1 | 12:13 | 12:16 | 16 | 206.8 | 304.8 | 340.7 | -- | -- | 114 | -- | Lots of gravel to surface while lowering tri-cone; Flow rate listed is average 227 - 454 L/min during jet grouting |
| | | | | | | | | | | | 19.57 | 17.28 | 2.29 | 1:1 | 13:28 | 13:36 | 16 | 399.9 | 304.8 | 401.3 | -- | -- | 3032 | -- | Nozzles clogged during previous draw (sand); re-entered hole: actual depth where draw began is 17.45 m |
| | | | | | | | | | | | 17.28 | 16.89 | 0.39 | 1:1 | 16:12 | 16:16 | 16 | 399.9 | 304.8 | 424.0 | | | 1215 | -- | Grout plant breadown; re-entered hole: actual depth where draw began is 16.92 m |
| | | | | | | | | | | | 16.89 | 16.54 | 0.35 | 1:1 | 17:45 | 17:49 | 16 | 393.0 | 304.8 | 431.5 | -- | -- | 2127 | -- | |
| | | | | | | | | | | | 16.54 | 14.02 | 2.52 | 1:1 | 17:49 | 17:58 | 16 | 413.7 | 304.8 | 442.9 | -- | -- | 2127 | -- | |
| | | | | | | | | | | | | | **5.57** | | | | | | | | **0.76** | **10164** | **8616** | **2593** | |

**TABLE E2-3.3**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 2**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-31+870.4 | 06-Nov-10 | 136.20 | -- | 16.76 | 20.12 | 2.13 | 22.25 | N | Assumed grout platform elevation. | 10-Nov-10 | 20.47 | 17.45 | 3.02 | 1:1 | 11:19 | 11:29 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 4542 | -- | Water communicated to 31+872.8, 875.2, 877.6 and 888 on entering with tricone at 19.81 m; air communicated to surface along pit side of CSB walls, approx. 1m from holes. |
| | | | | | | | | | | | 17.45 | 16.40 | 1.05 | 1:1 | 11:34 | 11:37 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 1794 | -- | Ran out of grout; waited for new batch to continue draw |
| | | | | | | | | | | | 16.40 | 14.47 | 1.93 | 1:1 | 11:54 | 12:01 | 16 | 420.6 | 304.8 | 442.9 | -- | -- | 3698 | -- | Communicated to 875.2 and 877.6: thick grout to 14.33 m. Communicated to 872.8 and 880: thin grout to 14.33 m. Communicated past 880 stopped at 15.54m. |
| | | | | | | | | | | | | | **6.00** | | | | | | | | **0.76** | **10942** | **10035** | **3785** | |
| P-31+872.8 | 06-Nov-10 | 136.25 | 15.85 | 17.07 | 19.20 | 2.13 | 21.34 | N | | 11-Nov-10 | 19.17 | 17.48 | 1.69 | 1:1 | 15:32 | 15:42 | 16 | 351.6 | 304.8 | 473.2 | -- | -- | 4232 | -- | Open to 19.72 m - trapping drill rods below |
| | | | | | | | | | | | 17.48 | 15.00 | 2.48 | 1:1 | 15:46 | 15:57 | 16 | 324.1 | 292.1 | 495.9 | -- | -- | 6356 | -- | Problem with screen at grout plant; jets worn |
| | | | | | | | | | | | 15.00 | 14.62 | 0.38 | 1:1 | 16:02 | 16:04 | 16 | 265.4 | 292.1 | 511.0 | -- | -- | 958 | -- | Blown drill rods- redo last draws / reset |
| | | | | | | | | | | | 17.36 | 14.63 | 2.73 | 1:1 | 18:29 | 18:41 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 5648 | -- | |
| | | | | | | | | | | | | | **4.55** | | | | | | | | **0.76** | **8307** | **17193** | **7571** | |
| P-31+875.2 | 06-Nov-10 | 136.26 | 15.24 | 17.37 | 19.20 | 2.13 | 21.34 | N | Communicated to P-31+872.8 | 10-Nov-10 | 20.45 | 19.34 | 1.12 | 1:1 | 15:54 | 15:57 | 16 | 372.3 | 304.8 | 412.6 | -- | -- | 3278 | -- | Water communicated to 31+872.8 on entering with tricone at 17.37 m. |
| | | | | | | | | | | | 19.34 | 17.41 | 1.92 | 1:1 | 16:01 | 16:08 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 3081 | -- | |
| | | | | | | | | | | | 17.41 | 14.92 | 2.49 | 1:1 | 16:13 | 16:23 | 16 | 393.0 | 304.8 | 401.3 | -- | -- | 4429 | -- | No grout or water communicated above 19.20 m. Re-entered: actual depth where draw began is 17.46 m. |
| | | | | | | | | | | | | | **5.53** | | | | | | | | **0.76** | **10091** | **10788** | **4921** | |
| P-31+877.6 | 06-Nov-10 | 136.31 | 15.24 | 16.76 | 19.20 | 2.13 | 21.34 | N | Communicated to P-31+875.2, P-31+872.8. | 10-Nov-10 | 20.21 | 17.50 | 2.72 | 1:1 | 17:51 | 18:03 | 16 | 420.6 | 304.8 | 405.0 | -- | -- | 4694 | -- | Clogged one jet - changed withdrawal rate |
| | | | | | | | | | | | 17.50 | 17.35 | 0.15 | 1:1 | 18:09 | 18:11 | 16 | 330.9 | 152.4 | 200.6 | -- | -- | 670 | -- | Clogged one jet - changed withdrawal rate and rotational rate |
| | | | | | | | | | | | 17.35 | 14.62 | 2.73 | 1:1 | 18:13 | 18:34 | 10 | 413.7 | 127 | 223.3 | -- | -- | 3505 | -- | |
| | | | | | | | | | | | | | **5.60** | | | | | | | | **0.76** | **10208** | **8869** | **3407** | |
| P-31+880 | 07-Nov-10 | 136.33 | 15.24 | 16.76 | 18.29 | 2.44 | 20.73 | N | Communicated to P-31+877.6, P-31+875., P-31+872.8. | 11-Nov-10 | 19.83 | 17.37 | 2.46 | 1:1 | 9:12 | 9:22 | 16 | 413.7 | 304.8 | 408.8 | -- | -- | 4050 | -- | |
| | | | | | | | | | | | 17.37 | 14.62 | 2.76 | 1:1 | 9:29 | 9:39 | 16 | 372.3 | 304.8 | 378.5 | -- | -- | 4380 | -- | |
| | | | | | | | | | | | | | **5.21** | | | | | | | | **0.76** | **9508** | **8430** | **3028** | |
| P-31+882.4 | 07-Nov-10 | 136.33 | 14.33 | 16.76 | 18.90 | 2.13 | 21.03 | N | | 11-Nov-10 | 19.97 | 17.38 | 2.58 | 1:1 | 10:56 | 11:08 | 16 | 420.6 | 304.8 | 412.6 | -- | -- | 4849 | -- | |
| | | | | | | | | | | | 17.38 | 14.32 | 3.07 | 1:1 | 11:14 | 11:25 | 16 | 396.4 | 304.8 | 412.6 | -- | -- | 5330 | -- | |
| | | | | | | | | | | | | | **5.65** | | | | | | | | **0.76** | **10308** | **10179** | **4164** | |
| P-31+884.8 | 07-Nov-10 | 136.30 | 14.63 | 16.76 | 19.81 | 2.13 | 21.95 | N | Communicated to P-31+882.4. | 11-Nov-10 | 19.54 | 17.46 | 2.08 | 1:1 | 13:28 | 13:35 | 16 | 406.8 | 304.8 | 386.1 | -- | -- | 1590 | -- | Water communicated to 31+882.4 on entering with tricone at 16.76 m |
| | | | | | | | | | | | 17.46 | 14.33 | 3.13 | 1:1 | 13:38 | 13:44 | 16 | 399.9 | 457.2 | 393.7 | -- | -- | 2214 | -- | Continuous pull / pulled too fast / to be redone |
| | | | | | | | | | | | 16.84 | 14.62 | 2.21 | 1:1 | 13:45 | 13:55 | 16 | 406.8 | 304.8 | 401.3 | -- | -- | 4395 | -- | Re-entered hole for another draw. communicated to 31+882.4 stopped at 15.54 m during jetting |
| | | | | | | | | | | | | | **5.21** | | | | | | | | **0.76** | **9508** | **8199** | **3218** | |
| P-31+887.2 | 19-Nov-10 | 136.42 | 14.94 | 16.76 | 19.20 | 2.13 | 21.34 | Y | Return brown-grey in final 4.5 m advance. | 10-Dec-10 | 19.61 | 17.62 | 1.99 | 1:1 | 15:26 | 15:34 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 3948 | -- | |
| | | | | | | | | | | | 17.62 | 14.68 | 2.94 | 1:1 | 15:37 | 15:50 | 16 | 399.9 | 304.8 | 454.2 | -- | -- | 2597 | -- | Communicated to P-31+889.6 from 17.22 to 16.83 m, and from 16.37 to 16.01 m. |
| | | | | | | | | | | | 14.68 | 13.57 | 1.11 | 1:1 | 15:53 | 15:58 | 16 | 420.6 | 304.8 | 439.1 | -- | -- | 2339 | -- | |
| | | | | | | | | | | | | | **6.04** | | | | | | | | **0.76** | **11025** | **8884** | **4442** | |
| P-31+889.6 | 19-Nov-10 | 136.41 | -- | 16.76 | 19.20 | 2.13 | 21.34 | N | Communicated to P-31+887.2; return brown-grey from within CSB at 12.2 m to end of hole | 11-Dec-10 | 20.05 | 17.50 | 2.54 | 1:1 | 11:06 | 11:17 | 16 | 379.2 | 304.8 | 393.7 | -- | -- | 4440 | -- | Communicated with water to P-31+892 from 19.0 to 18.4 m. |
| | | | | | | | | | | | 17.50 | 14.35 | 3.16 | 1:1 | 11:24 | 11:37 | 16 | 406.8 | 304.8 | 401.3 | -- | -- | 5795 | -- | |
| | | | | | | | | | | | 14.35 | 14.05 | 0.30 | 1:1 | 11:43 | 11:53 | 16 | 413.7 | 304.8 | 397.5 | -- | -- | 784 | -- | Ran out of grout at 11:43 am. |
| | | | | | | | | | | | 14.05 | 13.41 | 0.64 | 1:1 | 11:58 | 12:00 | 16 | 406.8 | 304.8 | 412.6 | -- | -- | 1302 | -- | |
| | | | | | | | | | | | | | **6.64** | | | | | | | | **0.76** | **12110** | **12322** | **6161** | |
| P-31+892 | 19-Nov-10 | 136.39 | 14.33 | 16.46 | 18.59 | 2.44 | 21.03 | Y | Communicated to P-31+889.6; return brown-grey from within till at 16.8 m to end of hole | 11-Dec-10 | 20.17 | 17.55 | 2.62 | 1:1 | 14:01 | 14:12 | 16 | 413.7 | 304.8 | 446.7 | -- | -- | 4982 | -- | Rotation stopped temporarily at 19.8 m. Pressure and flow rate remained the same. |
| | | | | | | | | | | | 17.55 | 15.29 | 2.26 | 1:1 | 14:16 | 14:25 | 16 | 420.6 | 304.8 | 439.1 | -- | -- | 3827 | -- | |
| | | | | | | | | | | | 15.29 | 14.52 | 0.77 | 1:1 | 14:47 | 14:49 | 16 | 420.6 | 304.8 | 435.3 | -- | -- | 1514 | -- | |
| | | | | | | | | | | | 14.52 | 13.40 | 1.12 | 1:1 | 14:53 | 14:59 | 16 | 420.6 | 304.8 | 442.9 | -- | -- | 2373 | -- | |
| | | | | | | | | | | | | | **6.78** | | | | | | | | **0.76** | **12360** | **12696** | **6348** | |

**TABLE E2-3.3**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 2**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | DEPTH | | Draw | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| | | | | | | | | | | | From | To | | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-31+894.4 | 19-Nov-10 | 136.39 | 14.63 | 16.76 | 17.68 | 2.13 | 19.81 | Y | Communicated to P-31+892, P-31+889.6 Minor communication to P-31+887.2 | 11-Dec-10 | 18.63 | 17.73 | 0.91 | 1:1 | 16:57 | 17:03 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 2650 | -- | Rapid pull at bottom of hole. Reset to 18.63 m and restarted. |
| | | | | | | | | | | | 17.73 | 14.76 | 2.97 | 1:1 | 17:06 | 17:18 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 4849 | -- | |
| | | | | | | | | | | | 14.76 | 13.70 | 1.05 | 1:1 | 17:21 | 17:25 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1904 | -- | |
| | | | | | | | | | | | | | **4.93** | | | | | | | | **0.76** | **8991** | **9403** | **4701** | |
| P-31+896.8 | 02-Dec-10 | 136.43 | 14.63 | -- | 17.07 | 2.44 | 19.51 | Y | Communicated to P-31+894.4, P-31+892. Till was not encountered. | 12-Dec-10 | 18.46 | 17.49 | 0.98 | 1:1 | 8:28 | 8:33 | 16 | 420.6 | 304.8 | 424.0 | -- | -- | 2457 | -- | |
| | | | | | | | | | | | 17.49 | 13.92 | 3.57 | 1:1 | 8:37 | 8:51 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 5894 | -- | Re-chucked to do last 0.6 m at 8:44 am. |
| | | | | | | | | | | | | | **4.54** | | | | | | | | **0.76** | **8284** | **8351** | **4175** | |
| P-31+899.2 | 02-Dec-10 | 136.47 | 12.50 | 16.15 | 18.29 | 2.44 | 20.73 | Y | Communicated to P-31+896.8, P-31+894.4, P-31+892. | 12-Dec-10 | 19.59 | 17.78 | 1.81 | 1:1 | 10:22 | 10:29 | 16 | 420.6 | 304.8 | 446.7 | -- | -- | 3358 | -- | Rotation slowed briefly due to tight hole at 10:27 am. |
| | | | | | | | | | | | 17.78 | 14.81 | 2.97 | 1:1 | 10:32 | 10:44 | 16 | 420.6 | 304.8 | 442.9 | -- | -- | 4864 | -- | Communicated to P-31+896.8 from 16.8 to 14.8 m. |
| | | | | | | | | | | | 14.81 | 12.34 | 2.47 | 1:1 | 10:48 | 10:57 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 4062 | -- | Communicated to P-31+896.8 from 13.7 to 12.2 m. |
| | | | | | | | | | | | | | **7.24** | | | | | | | | **0.76** | **13211** | **12284** | **6142** | |
| P-31+901.6 | 02-Dec-10 | 136.43 | 13.72 | 16.15 | 18.59 | 2.44 | 21.03 | Y | | 12-Dec-10 | 19.52 | 17.43 | 2.09 | 1:1 | 12:53 | 13:02 | 16 | 399.9 | 304.8 | 442.9 | -- | -- | 3403 | -- | Communicated to P-31+904 at 15.2 m. |
| | | | | | | | | | | | 17.43 | 13.71 | 3.72 | 1:1 | 13:05 | 13:20 | 16 | 406.8 | 304.8 | 442.9 | -- | -- | 6378 | -- | Re-chucked at 14.3 m to do last 0.6 m. |
| | | | | | | | | | | | | | **5.81** | | | | | | | | **0.76** | **10603** | **9782** | **4891** | |
| P-31+904 | 05-Dec-10 | 136.42 | 14.33 | 16.15 | 17.53 | 2.29 | 19.81 | Y | Communicated to P-31+901.6. | 12-Dec-10 | 18.56 | 17.34 | 1.22 | 1:1 | 15:28 | 15:33 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 2086 | -- | Water communicated to P-31+901.6 at 17.5 m while reaming to bottom of hole with tricone. |
| | | | | | | | | | | | 17.34 | 14.36 | 2.97 | 1:1 | 15:39 | 15:51 | 16 | 420.6 | 304.8 | 424.0 | -- | -- | 4940 | -- | Communicated to P-31+901.6 from 17.2 to 13.7 m. |
| | | | | | | | | | | | 14.36 | 12.80 | 1.56 | 1:1 | 15:56 | 16:03 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 2737 | -- | |
| | | | | | | | | | | | | | **5.76** | | | | | | | | **0.76** | **10508** | **9763** | **4881** | |
| P-31+906.4 | 05-Dec-10 | 136.45 | 13.72 | 16.76 | 17.83 | 2.74 | 20.57 | Y | Communicated to P-31+904, P-31+901.6. | 12-Dec-10 | 18.96 | 17.49 | 1.47 | 1:1 | 17:27 | 17:32 | 16 | 420.6 | 304.8 | 450.5 | -- | -- | 2540 | -- | |
| | | | | | | | | | | | 17.49 | 14.43 | 3.07 | 1:1 | 17:37 | 17:49 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 5001 | -- | Communicated to P-31+907.6 from 15.6 to 15.3 m. |
| | | | | | | | | | | | 14.43 | 13.55 | 0.88 | 1:1 | 17:53 | 17:59 | 16 | 399.9 | 152.4 | 223.3 | -- | -- | 1461 | -- | Nozzle plugged - step speed reduced by half. |
| | | | | | | | | | | | 13.55 | 12.77 | 0.77 | 1:1 | 17:59 | 18:04 | 16 | 386.1 | 152.4 | 219.6 | -- | -- | 1177 | -- | |
| | | | | | | | | | | | | | **6.19** | | | | | | | | **0.76** | **11292** | **10179** | **5089** | |
| P-31+908.8 | 05-Dec-10 | 136.35 | 14.94 | 16.00 | 18.90 | 2.44 | 21.34 | Y | Communicated to P-31+906.4, P-31+904, P-31+901.6. | 14-Dec-10 | 19.84 | 17.47 | 2.36 | 1:1 | 14:26 | 14:37 | 16 | 420.6 | 304.8 | -- | -- | -- | 4872 | -- | Flow rate sensor not working - total volume obtained from grout plant. Water communicated to P-31+913.6 while reaming to bottom of hole with tricone. |
| | | | | | | | | | | | 17.47 | 17.27 | 0.20 | 1:1 | 14:40 | 14:42 | 16 | 413.7 | 304.8 | -- | -- | -- | -- | -- | Pinhole developed in grout hose - replaced and re-installed. |
| | | | | | | | | | | | 17.27 | 17.20 | 0.07 | 1:1 | 14:42 | 14:44 | 16 | 255.1 | 304.8 | -- | -- | -- | 1155 | -- | Nozzle plugged at 17.2 m. |
| | | | | | | | | | | | 17.20 | 15.15 | 2.05 | 1:1 | 16:59 | 17:10 | 16 | 420.6 | 304.8 | -- | -- | -- | -- | -- | Re-entered: actual depth where draw began is 17.71 m. |
| | | | | | | | | | | | 15.15 | 13.70 | 1.45 | 1:1 | 17:15 | 17:25 | 16 | 386.1 | 152.4 | -- | -- | -- | 7177 | -- | Pulled jet at half the rate. |
| | | | | | | | | | | | | | **6.13** | | | | | | | | **0.76** | **11187** | **13204** | **6602** | |
| P-31+911.2 | 05-Dec-10 | 136.45 | 14.63 | 16.00 | 17.37 | 3.96 | 21.34 | Y | Communicated to P-31+908.8, P-31+906.4, P-31+904, P-31+901.6. Softer zone within bedrock from 19.2 to 19.8 m; green return. | 15-Dec-10 | 18.95 | 17.78 | 1.16 | 1:1 | 10:05 | 10:10 | 16 | 420.6 | 304.8 | -- | -- | -- | 2744 | -- | Flow rate sensor not working - total volume obtained from grout plant. |
| | | | | | | | | | | | 17.78 | 14.94 | 2.84 | 1:1 | 10:14 | 10:28 | 16 | 413.7 | 304.8 | -- | -- | -- | 4482 | -- | |
| | | | | | | | | | | | 14.94 | 14.30 | 0.64 | 1:1 | 11:41 | 11:46 | 16 | 413.7 | 152.4 | -- | -- | -- | 2139 | -- | Nozzle or hose clogged; used half pull speed |
| | | | | | | | | | | | | | **4.65** | | | | | | | | **0.76** | **8485** | **9365** | **4683** | |
| P-31+913.6 | 11-Dec-10 | 136.50 | 14.17 | 15.54 | 16.31 | 2.29 | 18.59 | Y | Communicated to P-31+908.8 and P-31+911.2. | 15-Dec-10 | 17.43 | 14.58 | 2.84 | 1:1 | 13:57 | 14:08 | 16 | 420.6 | 304.8 | -- | -- | -- | 4955 | -- | Flow rate sensor not working - total volume obtained from grout plant. Water communicated to P-31+911.2 at 17.4 m while reaming to bottom of hole with tricone. |
| | | | | | | | | | | | 14.58 | 12.79 | 1.79 | 1:1 | 14:14 | 14:27 | 16 | 420.6 | 152.4 | -- | -- | -- | 2786 | -- | Nozzle clogged; used half pull speed |
| | | | | | | | | | | | | | **4.64** | | | | | | | | **0.76** | **8457** | **7741** | **3871** | |
| P-31+916 | 10-Dec-10 | 136.43 | 13.11 | 14.17 | 14.94 | 2.44 | 17.37 | Y | | 08-Jan-11 | 16.16 | 14.45 | 1.71 | 1:1 | 21:45 | 21:52 | 16 | 403.3 | 304.8 | 412.6 | -- | -- | 3013 | -- | |
| | | | | | | | | | | | 14.45 | 12.08 | 2.37 | 1:1 | 21:56 | 22:13 | 16 | 406.8 | 152.4 | 221.4 | -- | -- | 3789 | -- | Nozzle clogged; used half pull rate. |
| | | | | | | | | | | | | | **4.08** | | | | | | | | **0.76** | **7450** | **6802** | **3401** | |

**TABLE E2-3.3**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 2**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-31+918.4 | 10-Dec-10 | 136.40 | 12.95 | 13.72 | 14.17 | 2.29 | 16.46 | N | Communicated to P-31+916. | 08-Jan-11 | 15.29 | 14.24 | 1.05 | 1:1 | 23:55 | 23:59 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 2158 | -- | Communicated to P-31+916.0 from 15.1 to 14.6 m. |
| | | | | | | | | | | | 14.24 | 11.88 | 2.36 | 1:1 | 0:05 | 0:15 | 16 | 406.8 | 304.8 | 412.6 | -- | -- | 4107 | -- | |
| | | | | | | | | | | | | | **3.42** | | | | | | | | **0.76** | **6227** | **6265** | **3132** | |
| P-31+920.8 | 12-Dec-10 | 136.38 | 12.19 | 13.26 | 13.41 | 2.44 | 15.85 | N | Communicated to P-31+908.8, P-31+911.2 and P-31+913.6. | 08-Jan-11 | 14.41 | 11.55 | 2.86 | 1:1 | 2:10 | 2:23 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 5235 | -- | |
| | | | | | | | | | | | | | **2.86** | | | | | | | | **0.76** | **5210** | **5235** | **2618** | |
| P-31+923.2 | 12-Dec-10 | 136.33 | 12.80 | 13.41 | 13.56 | 2.44 | 16.00 | N | Communicated to P-31+920.8. | 08-Jan-11 | 14.42 | 11.55 | 2.87 | 1:1 | 4:10 | 4:23 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 5247 | -- | Communicated slightly with P-31+920.8 at 13.1 m. |
| | | | | | | | | | | | | | **2.87** | | | | | | | | **0.76** | **5226** | **5247** | **2623** | |
| P-31+925.3 | 08-Jan-11 | 136.43 | 11.28 | -- | 14.08 | 1.22 | 15.30 | N | Replacement hole. | 09-Jan-11 | 13.52 | 11.26 | 2.26 | 1:1 | 9:39 | 9:47 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 3835 | -- | Grout Temperature: 15.7°C<br>Communicated to P-31+925.2 and P-31+920.8 from 13.52 to 10.27 m. |
| | | | | | | | | | | | 11.26 | 10.27 | 0.99 | 1:1 | 9:52 | 9:56 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 2048 | -- | |
| | | | | | | | | | | | | | **3.25** | | | | | | | | **0.76** | **5935** | **5883** | **2941** | |
| P-31+925.6 | 12-Dec-10 | 136.42 | 10.67 | -- | 13.87 | 2.29 | 16.15 | N | Communicated to P-31+920.8, P-31+923.2. | | | | | | | | | | | | | | | | |
| S-31+826 | 09-Nov-10 | 136.41 | -- | 14.94 | 16.31 | 2.59 | 18.90 | N | | 12-Nov-10 | 17.04 | 16.86 | 0.18 | 1:1 | 9:18 | 9:19 | 16 | 420.6 | 304.8 | 416.4 | -- | -- | 965 | -- | Problem at grout plant - checked filters |
| | | | | | | | | | | | 16.86 | 14.36 | 2.50 | 1:1 | 9:22 | 9:33 | 16 | 413.7 | 304.8 | 408.8 | -- | -- | 4501 | -- | |
| | | | | | | | | | | | 14.36 | 11.88 | 2.47 | 1:1 | 9:36 | 9:48 | 16 | 413.7 | 304.8 | 401.3 | -- | -- | 4860 | -- | |
| | | | | | | | | | | | | | **5.15** | | | | | | | | **0.76** | **9402** | **10327** | **2801** | |
| S-31+828.4 | 09-Nov-10 | 136.43 | 14.33 | 15.24 | 17.37 | 2.44 | 19.81 | N | | 12-Nov-10 | 18.78 | 17.43 | 1.36 | 1:1 | 12:31 | 12:37 | 16 | 413.7 | 304.8 | 412.6 | -- | -- | 2733 | -- | |
| | | | | | | | | | | | 17.43 | 13.09 | 4.34 | 1:1 | 12:41 | 12:58 | 16 | 420.6 | 304.8 | 408.8 | -- | -- | 7575 | -- | |
| | | | | | | | | | | | | | **5.69** | | | | | | | | **0.76** | **10386** | **10308** | **2612** | |
| S-31+830.8 | 09-Nov-10 | 136.51 | 15.24 | 15.85 | 18.59 | 2.13 | 20.73 | N | Communicated to S-31+828.4 | 12-Nov-10 | 19.52 | 17.42 | 2.10 | 1:1 | 13:56 | 14:06 | 16 | 420.6 | 304.8 | 401.3 | -- | -- | 3994 | -- | |
| | | | | | | | | | | | 17.42 | 14.26 | 3.15 | 1:1 | 14:09 | 14:23 | 16 | 420.6 | 304.8 | 397.5 | -- | -- | 5792 | -- | |
| | | | | | | | | | | | 14.26 | 13.41 | 0.86 | 1:1 | 14:25 | 14:28 | 16 | 420.6 | 304.8 | 401.3 | -- | -- | 1484 | -- | |
| | | | | | | | | | | | | | **6.12** | | | | | | | | **0.76** | **11159** | **11269** | **3066** | |
| S-31+833.2 | 09-Nov-10 | 136.43 | 15.54 | 16.46 | 18.90 | 2.44 | 21.34 | N | | 12-Nov-10 | 19.59 | 19.56 | 0.03 | 1:1 | 15:36 | 15:37 | 16 | 420.6 | 304.8 | 408.8 | -- | -- | 420 | -- | Blew grout line fuse<br>Communicated to S-31+830.8 from 18 to 17.7 m. Re-entered: actual depth where draw began is 19.58 m. |
| | | | | | | | | | | | 19.56 | 17.34 | 2.22 | 1:1 | 16:06 | 16:15 | 16 | 413.7 | 304.8 | 405.0 | -- | -- | 5175 | -- | |
| | | | | | | | | | | | 17.34 | 14.31 | 3.03 | 1:1 | 16:22 | 16:35 | 16 | 399.9 | 304.8 | 401.3 | -- | -- | 5992 | -- | Re-entered: actual depth where draw began is 17.37 m. |
| | | | | | | | | | | | | | **5.29** | | | | | | | | **0.76** | **9641** | **11587** | **4959** | |
| S-31+835.6 | 10-Nov-10 | 136.40 | -- | 16.76 | 17.98 | 3.05 | 21.03 | N | | 12-Nov-10 | 19.99 | 17.71 | 2.29 | 1:1 | 17:45 | 17:54 | 16 | 399.9 | 304.8 | 405.0 | -- | -- | 4948 | -- | Flow increasedto 454 Lpm and pressure drop to 365 bar, however no blown rods or other problems found. Rod joint at wrong place relative to depth reading. Potentially 1.2 m higher in this interval than indicated.<br>Re-entered: actual depth where draw began is 17.74 m. Rod joint at wrong place relative to depth reading. Potentially 1.2 m higher in this interval than indicated. |
| | | | | | | | | | | | 17.71 | 15.15 | 2.55 | 1:1 | 19:35 | 19:47 | 16 | 420.6 | 304.8 | 412.6 | -- | -- | 6863 | -- | |
| | | | | | | | | | | | 15.15 | 14.62 | 0.54 | 1:1 | 19:54 | 19:56 | 16 | 406.8 | 304.8 | 408.8 | -- | -- | 1537 | -- | |
| | | | | | | | | | | | | | **5.38** | | | | | | | | **0.76** | **9813** | **13347** | **5337** | |
| S-31+838 | 10-Nov-10 | 136.31 | 15.24 | 15.85 | 19.20 | 2.13 | 21.34 | Y | | 13-Nov-10 | 20.24 | 19.99 | 0.25 | 1:1 | 9:02 | 9:04 | 16 | 420.6 | 304.8 | 405.0 | -- | -- | 530 | -- | Stuck drill rod in bedrock; not able to get back down to previous depth upon re-entry. Plugged jets and frozen air line; not able to get back down to previous depth upon re-entry<br>Re-entered: actual depth where draw began is 17.41 m. |
| | | | | | | | | | | | 19.82 | 19.76 | 0.05 | 1:1 | 9:19 | 9:20 | 16 | 344.7 | 304.8 | 378.5 | -- | -- | 644 | -- | |
| | | | | | | | | | | | 19.63 | 17.32 | 2.31 | 1:1 | 9:21 | 9:31 | 16 | 399.9 | 304.8 | 405.0 | -- | -- | 4035 | -- | |
| | | | | | | | | | | | 17.32 | 14.31 | 3.01 | 1:1 | 11:05 | 11:19 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 5852 | -- | |
| | | | | | | | | | | | | | **5.62** | | | | | | | | **0.76** | **10258** | **11061** | **3558** | |
| S-31+840.4 | 10-Nov-10 | 136.35 | 15.85 | 16.76 | 18.90 | 2.44 | 21.34 | Y | Communicated to S-31+838 | 13-Nov-10 | 20.00 | 17.33 | 2.67 | 1:1 | 13:00 | 13:12 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 5462 | -- | |
| | | | | | | | | | | | 17.33 | 14.31 | 3.01 | 1:1 | 13:17 | 13:28 | 16 | 393.0 | 304.8 | 405.0 | -- | -- | 5273 | -- | |
| | | | | | | | | | | | | | **5.69** | | | | | | | | **0.76** | **10375** | **10735** | **3785** | |

**TABLE E2-3.3**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 2**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-31+842.8 | 11-Nov-10 | 136.44 | 15.24 | 16.46 | 20.12 | 2.74 | 22.86 | N | | 13-Nov-10 | 21.98 | 20.35 | 1.63 | 1:1 | 13:56 | 14:06 | 16 | 399.9 | 199.9996 | 405.0 | -- | -- | 3960 | -- | |
| | | | | | | | | | | | 20.35 | 17.32 | 3.02 | 1:1 | 14:09 | 14:23 | 16 | 399.9 | 199.9996 | 401.3 | -- | -- | 7609 | -- | |
| | | | | | | | | | | | 17.32 | 14.31 | 3.01 | 1:1 | 14:25 | 14:28 | 16 | 406.8 | 199.9996 | 427.8 | -- | -- | 7514 | -- | |
| | | | | | | | | | | | | | **7.67** | | | | | | | | **0.84** | **16927** | **19082** | **6814** | |
| S-31+845.2 | 11-Nov-10 | 136.47 | -- | 17.07 | 19.81 | 3.05 | 22.86 | N | | 13-Nov-10 | 20.42 | 17.46 | 2.97 | 1:1 | 17:51 | 18:03 | 16 | 410.2 | 304.8 | 408.8 | -- | -- | 5300 | -- | |
| | | | | | | | | | | | 17.46 | 14.91 | 2.54 | 1:1 | 18:07 | 18:17 | 16 | 410.2 | 304.8 | 408.8 | -- | -- | 4505 | -- | |
| | | | | | | | | | | | | | **5.51** | | | | | | | | **0.76** | **10052** | **9804** | **3331** | |
| S-31+847.6 | 11-Nov-10 | 136.44 | 12.19 | 16.76 | 19.51 | 2.13 | 21.64 | N | Communicated to P-31+842.8. | 14-Nov-10 | 19.81 | 18.61 | 1.20 | 1:1 | 9:58 | 10:02 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 1666 | -- | Communicated to S-31+850 from 19.20 m to 17.98 m. |
| | | | | | | | | | | | 18.61 | 17.32 | 1.30 | 1:1 | 10:02 | 10:11 | 16 | 417.1 | 152.4 | 424.0 | -- | -- | 4206 | -- | |
| | | | | | | | | | | | 17.32 | 15.54 | 1.77 | 1:1 | 10:16 | 10:29 | 16 | 420.6 | 152.4 | 427.8 | -- | -- | 5799 | -- | Pressure drop, ran out of grout. |
| | | | | | | | | | | | 15.54 | 14.60 | 0.94 | 1:1 | 10:50 | 10:58 | 16 | 413.7 | 152.4 | 416.4 | -- | -- | 3221 | -- | Re-entered: actual depth where draw began is 15.55 m. |
| | | | | | | | | | | | | | **5.21** | | | | | | | | **1.07** | **18635** | **14892** | **5981** | |
| S-31+850 | 12-Nov-10 | 136.37 | 12.80 | 17.07 | 18.90 | 2.44 | 21.34 | N | Communicated to S-31+847.6. | 14-Nov-10 | 20.35 | 17.43 | 2.93 | 1:1 | 12:05 | 12:16 | 16 | 420.6 | 304.8 | 412.6 | -- | -- | 5837 | -- | |
| | | | | | | | | | | | 17.43 | 14.88 | 2.55 | 1:1 | 12:20 | 12:30 | 16 | 417.1 | 304.8 | 401.3 | -- | -- | 4584 | -- | |
| | | | | | | | | | | | | | **5.48** | | | | | | | | **0.76** | **9991** | **10421** | **3407** | |
| S-31+852.4 | 12-Nov-10 | 136.44 | 15.85 | 16.46 | 19.20 | 2.13 | 21.34 | Y | Communicated to S-31+850. | 14-Nov-10 | 20.42 | 17.45 | 2.97 | 1:1 | 13:27 | 13:41 | 16 | 413.7 | 304.8 | 401.3 | -- | -- | 6064 | -- | |
| | | | | | | | | | | | 17.45 | 17.39 | 0.06 | 1:1 | 13:53 | 13:53 | 16 | 399.9 | 152.4 | 219.6 | -- | -- | 613 | -- | Jet clogged temporarily and recovered. |
| | | | | | | | | | | | 17.39 | 14.32 | 3.07 | 1:1 | 13:55 | 14:08 | 16 | 403.3 | 304.8 | 397.5 | -- | -- | 5269 | -- | |
| | | | | | | | | | | | | | **6.10** | | | | | | | | **0.76** | **11131** | **11947** | **5054** | |
| S-31+854.8 | 12-Nov-10 | 136.44 | 14.94 | 16.76 | 19.51 | 2.44 | 21.95 | Y | | 14-Nov-10 | 20.38 | 17.44 | 2.94 | 1:1 | 15:09 | 15:23 | 16 | 413.7 | 304.8 | 405.0 | -- | -- | 5197 | -- | |
| | | | | | | | | | | | 17.44 | 14.31 | 3.14 | 1:1 | 15:26 | 15:39 | 16 | 413.7 | 304.8 | 397.5 | -- | -- | 5341 | -- | |
| | | | | | | | | | | | | | **6.07** | | | | | | | | **0.76** | **11081** | **10539** | **4088** | |
| S-31+857.2 | 12-Nov-10 | 136.42 | 14.02 | 17.37 | 19.81 | 2.44 | 22.25 | Y | Dark grey bedrock - cuttings close to black. | 14-Nov-10 | 20.88 | 20.47 | 0.41 | 1:1 | 16:50 | 16:52 | 16 | 417.1 | 304.8 | 401.3 | -- | -- | 1215 | -- | Communicated to S-31+859.6 from 20.57 to 17.67 m. |
| | | | | | | | | | | | 20.46 | 17.49 | 2.97 | 1:1 | 16:57 | 17:08 | 16 | 417.1 | 304.8 | 405.0 | -- | -- | 5205 | -- | |
| | | | | | | | | | | | 17.49 | 15.23 | 2.26 | 1:1 | 17:14 | 17:23 | 16 | 410.2 | 304.8 | 397.5 | -- | -- | 4066 | -- | |
| | | | | | | | | | | | | | **5.64** | | | | | | | | **0.76** | **10297** | **10486** | **3615** | |
| S-31+859.6 | 13-Nov-10 | 136.40 | 14.63 | 16.76 | 19.51 | 2.44 | 21.95 | Y | Dark grey return. | 16-Nov-10 | 21.19 | 20.22 | 0.97 | 1:1 | 9:28 | 9:32 | 16 | 424.0 | 304.8 | 416.4 | -- | -- | 2320 | -- | |
| | | | | | | | | | | | 20.22 | 17.25 | 2.97 | 1:1 | 9:37 | 9:50 | 16 | 420.6 | 304.8 | 405.0 | -- | -- | 5390 | -- | Loss of return to surface at 15.4 m; flow rate jumped to 1155 Lpm temporarily; communicated to 857.2 (all spoils) while lack of return to surface continued for remainder of hole |
| | | | | | | | | | | | 17.25 | 15.31 | 1.94 | 1:1 | 9:56 | 10:03 | 16 | 406.8 | 304.8 | 393.7 | -- | -- | 3645 | -- | |
| | | | | | | | | | | | 15.31 | 14.62 | 0.70 | 1:1 | 10:03 | 10:06 | 16 | 406.8 | 304.8 | 393.7 | -- | -- | 927 | -- | No thick grout to surface; only cloudy water (thin). |
| | | | | | | | | | | | | | **6.57** | | | | | | | | **0.76** | **11993** | **12284** | **5129** | |
| S-31+862 | 13-Nov-10 | 136.40 | 15.24 | 17.37 | 19.51 | 2.13 | 21.64 | Y | | 19-Nov-10 | 20.35 | 17.48 | 2.87 | 1:1 | 12:06 | 12:17 | 16 | 406.8 | 304.8 | 401.3 | -- | -- | 5716 | -- | Communicated to 31+864.4 from 20 to 19.4 m |
| | | | | | | | | | | | 17.48 | 14.62 | 2.86 | 1:1 | 12:22 | 12:34 | 16 | 393.0 | 304.8 | 401.3 | -- | -- | 5163 | -- | 4 spoils samples taken at 15.2 m |
| | | | | | | | | | | | | | **5.72** | | | | | | | | **0.76** | **10436** | **10879** | **4429** | |
| S-31+864.4 | 13-Nov-10 | 136.33 | 13.72 | 16.76 | 18.59 | 2.74 | 21.34 | Y | Communicated to S-31+862. | 19-Nov-10 | 20.16 | 17.39 | 2.77 | 1:1 | 14:21 | 14:32 | 16 | 420.6 | 304.8 | 427.8 | -- | -- | 4762 | -- | Communicated to 31+862 from 19.8 - 18.6 m |
| | | | | | | | | | | | 17.39 | 14.63 | 2.76 | 1:1 | 14:39 | 14:50 | 16 | 393.0 | 304.8 | 454.2 | -- | -- | 5409 | -- | Communicated to 31+862 from 17.4 - 16.2 m |
| | | | | | | | | | | | | | **5.53** | | | | | | | | **0.76** | **10091** | **10171** | **3785** | |

**TABLE E2-3.3**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 2**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-31+866.8 | 13-Nov-10 | 136.32 | 15.24 | 16.76 | 19.51 | 2.44 | 21.95 | N | | 19-Nov-10 | 20.45 | 17.47 | 2.98 | 1:1 | 16:49 | 17:02 | 16 | 413.7 | 304.8 | 405.0 | -- | -- | 5247 | -- | Communicated to 31+864.4 from 19.8-19.5 m Communicated to surface at backfilled P-31+868 location from 19.2-14 m (bubbled). |
| | | | | | | | | | | | 17.47 | 14.20 | 3.27 | 1:1 | 17:07 | 17:21 | 16 | 417.1 | 304.8 | 408.8 | -- | -- | 5996 | -- | Ran out of grout; waited for new batch |
| | | | | | | | | | | | 14.20 | 14.02 | 0.18 | 1:1 | 17:33 | 17:35 | 16 | 413.7 | 304.8 | 405.0 | -- | -- | 1166 | -- | |
| | | | | | | | | | | | | | **6.43** | | | | | | | | **0.76** | **11732** | **12409** | **4088** | |
| S-31+869.2 | 13-Nov-10 | 136.38 | -- | 18.29 | 19.81 | 2.13 | 21.95 | N | Return sandy and grey over entire hole. | 20-Nov-10 | 20.42 | 17.38 | 3.04 | 1:1 | 10:53 | 11:07 | 16 | 399.9 | 304.8 | 401.3 | -- | -- | 5901 | -- | Communicated to 31+866.8 from 19.5 to 15.2 m |
| | | | | | | | | | | | 17.38 | 14.01 | 3.37 | 1:1 | 11:12 | 11:27 | 16 | 403.3 | 304.8 | 401.3 | -- | -- | 6216 | -- | |
| | | | | | | | | | | | | | **6.41** | | | | | | | | **0.76** | **11698** | **12117** | **5148** | |
| S-31+871.6 | 14-Nov-10 | 136.36 | 12.50 | 16.76 | 19.51 | 2.44 | 21.95 | N | | 20-Nov-10 | 20.63 | 17.68 | 2.96 | 1:1 | 13:12 | 13:23 | 16 | 413.7 | 304.8 | 412.6 | -- | -- | 4701 | -- | Communicated (air) at bedrock interface to 31+869.2 + 31+874 |
| | | | | | | | | | | | 17.68 | 15.68 | 2.00 | 1:1 | 13:29 | 13:36 | 16 | 399.9 | 304.8 | 401.3 | -- | -- | 3600 | -- | |
| | | | | | | | | | | | 15.68 | 14.66 | 1.01 | 1:1 | 13:38 | 13:42 | 16 | 420.6 | 304.8 | 412.6 | -- | -- | 2101 | -- | |
| | | | | | | | | | | | 14.66 | 11.87 | 2.80 | 1:1 | 13:46 | 13:57 | 16 | 420.6 | 304.8 | 412.6 | -- | -- | 4679 | -- | Communicated (thick grout) to 31+869.2 from 14 to 11.9 m. Lost all three cones of tri-cone bit in hole. |
| | | | | | | | | | | | | | **8.77** | | | | | | | | **0.76** | **9035** | **15081** | **4997** | |
| S-31+874 | 14-Nov-10 | 136.40 | 13.72 | 16.76 | 19.20 | 3.51 | 22.71 | N | | 03-Dec-10 | 19.78 | 19.35 | 0.42 | 1:1 | 13:35 | 13:52 | 16 | 406.8 | 304.8 | 446.7 | -- | -- | 6038 | -- | Lost power at grout plant. Reset to bottom (4 times). |
| | | | | | | | | | | | 19.35 | 17.38 | 1.98 | 1:1 | 13:54 | 14:04 | 16 | 393.0 | 304.8 | 442.9 | -- | -- | 4550 | -- | |
| | | | | | | | | | | | 17.38 | 15.85 | 1.53 | 1:1 | 14:09 | 14:14 | 16 | 372.3 | 304.8 | 435.3 | -- | -- | 2540 | -- | Lost power at grout plant. Reset to previous depth. |
| | | | | | | | | | | | 15.85 | 14.35 | 1.50 | 1:1 | 14:32 | 14:36 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 2574 | -- | |
| | | | | | | | | | | | 14.35 | 13.12 | 1.23 | 1:1 | 14:45 | 14:49 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1711 | -- | |
| | | | | | | | | | | | | | **6.65** | | | | | | | | **0.76** | **12132** | **17413** | **8706** | |
| S-31+876.4 | 14-Nov-10 | 136.42 | -- | 16.76 | 19.20 | 2.13 | 21.34 | N | | 07-Dec-10 | 18.93 | 18.45 | 0.48 | 1:1 | 15:11 | 15:21 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 4770 | -- | Rods jammed at 18.6 m depth. |
| | | | | | | | | | | | 18.45 | 18.14 | 0.31 | 1:1 | 15:21 | 15:27 | 16 | 420.6 | 304.8 | 416.4 | -- | -- | 1855 | -- | Pulling slower. Attempting to clean nozzles. |
| | | | | | | | | | | | 18.14 | 17.46 | 0.68 | 1:1 | 15:27 | 15:34 | 16 | 206.8 | 304.8 | 283.9 | -- | -- | 2290 | -- | |
| | | | | | | | | | | | 17.46 | 17.38 | 0.08 | 1:1 | 15:40 | 15:42 | 16 | 13.8 | 304.8 | 75.7 | -- | -- | 114 | -- | Rocks on top of hammer. Rods jammed. |
| | | | | | | | | | | | 17.38 | 16.47 | 0.91 | 1:1 | 15:42 | 15:46 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1707 | -- | |
| | | | | | | | | | | | 16.47 | 16.36 | 0.10 | 1:1 | 15:46 | 15:48 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 734 | -- | Paused during jet grouting. Rods jammed. |
| | | | | | | | | | | | 16.36 | 15.82 | 0.54 | 1:1 | 15:48 | 15:50 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 621 | -- | |
| | | | | | | | | | | | 15.82 | 15.71 | 0.11 | 1:1 | 15:50 | 16:11 | 16 | 1.4 | 304.8 | 0.0 | -- | -- | 553 | -- | Ran out of grout at end of lift. |
| | | | | | | | | | | | 15.71 | 14.03 | 1.68 | 1:1 | 16:11 | 16:19 | 16 | 420.6 | 304.8 | 416.4 | -- | -- | 4013 | -- | |
| | | | | | | | | | | | | | **4.90** | | | | | | | | **0.76** | **8929** | **16656** | **8328** | |
| S-31+878.8 | 14-Nov-10 | 136.37 | -- | 16.76 | 18.59 | 2.74 | 21.34 | N | Communicated to S-31+876.4 | 07-Dec-10 | 19.48 | 17.24 | 2.24 | 1:1 | 19:05 | 19:15 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 4800 | -- | |
| | | | | | | | | | | | 17.24 | 14.02 | 3.22 | 1:1 | 19:22 | 19:35 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 5610 | -- | |
| | | | | | | | | | | | | | **5.46** | | | | | | | | **0.76** | **9958** | **10410** | **5205** | |
| S-31+881.2 | 18-Nov-10 | 136.44 | -- | 15.24 | 18.90 | 2.44 | 21.34 | N | Communicated to S-31+878.8; return during drilling mostly brown / grey. | 09-Dec-10 | 18.64 | 17.55 | 1.09 | 1:1 | 17:24 | 17:28 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 3293 | -- | |
| | | | | | | | | | | | 17.55 | 14.59 | 2.96 | 1:1 | 17:37 | 17:48 | 16 | 413.7 | 304.8 | 435.3 | -- | -- | 4501 | -- | Communicated to S-31+883.6 from 17.6 to 15.8 m |
| | | | | | | | | | | | 14.59 | 13.71 | 0.88 | 1:1 | 17:52 | 17:56 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 1722 | -- | Communicated to S-31+883.6 from 14.25 to 13.84 m |
| | | | | | | | | | | | | | **4.93** | | | | | | | | **0.76** | **9002** | **9517** | **4758** | |
| S-31+883.6 | 18-Nov-10 | 136.38 | -- | 16.76 | 19.51 | 2.13 | 21.64 | Y | Communicated to S-31+881.2, P-31+882.4; return brown / grey starting from within till. | 10-Dec-10 | 20.33 | 17.98 | 2.35 | 1:1 | 9:02 | 9:12 | 16 | 386.1 | 304.8 | 405.0 | -- | -- | 5894 | -- | Water pump was shut off / froze mid-column. Ran out of grout mid-lift. |
| | | | | | | | | | | | 18.71 | 17.98 | -- | 1:1 | 13:02 | 13:05 | 16 | 420.6 | 304.8 | 420.2 | -- | -- | 2108 | -- | Re-jet grouted interval. |
| | | | | | | | | | | | 17.98 | 14.94 | 3.04 | 1:1 | 13:09 | 13:20 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 5209 | -- | Spoil sample taken at 17.3 m. |
| | | | | | | | | | | | 14.94 | 13.63 | 1.31 | 1:1 | 13:23 | 13:28 | 16 | 410.2 | 304.8 | 446.7 | -- | -- | 2256 | -- | Re-entered: actual depth where draw began is 18.00 m. |
| | | | | | | | | | | | | | **6.70** | | | | | | | | **0.76** | **12221** | **15467** | **7734** | |

**TABLE E2-3.3**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 2**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | DEPTH | | Draw | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| | | | | | | | | | | | From | To | | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-31+886 | 15-Dec-10 | 136.47 | 16.15 | 17.07 | 19.75 | 2.13 | 21.88 | N | | 16-Dec-10 | 20.54 | 17.46 | 3.08 | 1:1 | 8:41 | 8:51 | 16 | 420.6 | 304.8 | 427.8 | -- | -- | 4493 | -- | Large washed out / cavity at surface due to drilling hours before jet grouting |
| | | | | | | | | | | | 17.46 | 15.03 | 2.43 | 1:1 | 8:55 | 9:05 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 3706 | -- | Ran out of grout at 15.21 m |
| | | | | | | | | | | | 15.03 | 14.46 | 0.57 | 1:1 | 9:21 | 9:23 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 1507 | -- | |
| | | | | | | | | | | | 14.46 | 13.45 | 1.01 | 1:1 | 9:28 | 9:32 | 16 | 403.3 | 304.8 | 420.2 | -- | -- | 1722 | -- | |
| | | | | | | | | | | | | | **7.09** | | | | | | | | **0.76** | **12927** | **11428** | **5714** | |
| S-31+888.4 | 16-Dec-10 | 136.62 | -- | 16.76 | 19.21 | 2.13 | 21.34 | N | | 16-Dec-10 | 20.22 | 17.48 | 2.74 | 1:1 | 13:16 | 13:26 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 4346 | -- | |
| | | | | | | | | | | | 17.48 | 14.50 | 2.97 | 1:1 | 13:31 | 13:42 | 16 | 420.6 | 304.8 | 427.8 | -- | -- | 4766 | -- | |
| | | | | | | | | | | | 14.50 | 13.39 | 1.11 | 1:1 | 13:44 | 13:49 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 1817 | -- | |
| | | | | | | | | | | | | | **6.82** | | | | | | | | **0.76** | **12449** | **10928** | **5464** | |
| S-31+890.8 | 16-Dec-10 | 136.43 | -- | 16.15 | 18.65 | 0.98 | 19.63 | N | | 16-Dec-10 | 19.10 | 17.53 | 1.57 | 1:1 | 18:08 | 18:14 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 2786 | -- | Communication to S-31+888.4 and S-31+886 at 17.53 m |
| | | | | | | | | | | | 17.53 | 14.56 | 2.97 | 1:1 | 18:18 | 18:29 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 4766 | -- | Frozen air line at 17:20; Communicated to S-31+892 at 17.37 m |
| | | | | | | | | | | | 14.56 | 13.38 | 1.18 | 1:1 | 18:32 | 18:38 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 2067 | -- | Frozen valve at grout plant at 17:50 |
| | | | | | | | | | | | | | **5.72** | | | | | | | | **0.76** | **10431** | **9619** | **4809** | |
| S-31+893.2 | 16-Dec-10 | 136.50 | -- | 16.76 | 17.59 | 2.01 | 19.60 | N | Hole collapse / caving during re-entry with tricone; 5 attempts required to get tricone to depth | 16-Dec-10 | 17.48 | 14.44 | 3.04 | 1:1 | 3:08 | 3:20 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | -- | -- | Water communicated to S-31+888.4 and S-31+890.8 while reaming to bottom of hole with tricone. |
| | | | | | | | | | | | 14.44 | 13.09 | 1.34 | 1:1 | 3:20 | 3:25 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | -- | -- | |
| | | | | | | | | | | | | | **4.39** | | | | | | | | **0.76** | **8001** | **7927** | **3963** | |
| S-31+895.6 | 16-Dec-10 | 136.58 | 16.15 | 16.92 | 17.22 | 2.23 | 19.45 | N | | 16-Dec-10 | 18.53 | 18.33 | 0.20 | 1:1 | 6:53 | 6:54 | 16 | 41.4 | 304.8 | 465.6 | -- | -- | 916 | -- | Water communicated to S-31+893.2 at 17.37 m while reaming to bottom of hole with tricone. |
| | | | | | | | | | | | 18.33 | 18.24 | 0.09 | 1:1 | 7:00 | 7:01 | 16 | 1.4 | 304.8 | 0.0 | -- | -- | 1276 | -- | Pressure sensor not working |
| | | | | | | | | | | | 18.27 | 18.27 | -- | 1:1 | 7:01 | 7:09 | 16 | 2.8 | 304.8 | 34.1 | -- | -- | 772 | -- | Pressure sensor not working |
| | | | | | | | | | | | 18.27 | 18.27 | -- | 1:1 | 7:09 | 7:10 | 16 | 0.3 | 304.8 | 106.0 | -- | -- | 204 | -- | Pressure sensor not working |
| | | | | | | | | | | | 18.24 | 17.37 | 0.87 | 1:1 | 8:38 | 8:42 | 16 | 420.6 | 304.8 | 446.7 | -- | -- | 1942 | -- | Re-entered: actual depth where draw began is 18.3 m |
| | | | | | | | | | | | 17.37 | 14.37 | 3.00 | 1:1 | 8:46 | 8:58 | 16 | 420.6 | 304.8 | 446.7 | -- | -- | 5428 | -- | Nozzle stuck in bedrock at 17.37 m |
| | | | | | | | | | | | 14.37 | 13.71 | 0.66 | 1:1 | 9:02 | 9:05 | 16 | 420.6 | 304.8 | 442.9 | -- | -- | 1378 | -- | |
| | | | | | | | | | | | | | **4.82** | | | | | | | | **0.76** | **8785** | **11916** | **5958** | |
| S-31+898 | 17-Dec-10 | 136.52 | 13.56 | 16.79 | 17.07 | 1.25 | 18.32 | N | | 17-Dec-10 | 18.00 | 17.34 | 0.66 | 1:1 | 12:38 | 12:41 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 1719 | -- | Communication to S-31+895.6 from 17.4 to 16.2 m |
| | | | | | | | | | | | 17.34 | 14.37 | 2.97 | 1:1 | 12:44 | 12:57 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 5292 | -- | Communication with P-31+899.2 from 16.2 to 13.4 m |
| | | | | | | | | | | | 14.37 | 12.78 | 1.58 | 1:1 | 13:00 | 13:07 | 16 | 393.0 | 304.8 | 405.0 | -- | -- | 2922 | -- | Grout Temperature: 8.3°C |
| | | | | | | | | | | | | | **5.22** | | | | | | | | **0.76** | **9519** | **9933** | **4966** | |
| S-31+900.4 | 17-Dec-10 | 136.53 | 13.41 | 16.15 | 17.71 | 0.61 | 18.32 | N | | 17-Dec-10 | 17.92 | 17.34 | 0.58 | 1:1 | 18:33 | 18:36 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 2461 | -- | |
| | | | | | | | | | | | 17.34 | 14.39 | 2.95 | 1:1 | 18:40 | 18:52 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 5088 | -- | Re-entered: actual depth where draw began is 17.4 m. |
| | | | | | | | | | | | 14.39 | 13.05 | 1.34 | 1:1 | 18:56 | 19:03 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 2495 | -- | |
| | | | | | | | | | | | | | **4.87** | | | | | | | | **0.76** | **8890** | **10043** | **5021** | |
| S-31+902.8 | 17-Dec-10 | 136.45 | -- | 16.76 | 17.68 | 1.98 | 19.66 | N | Water loss; could not see to which hole communication occurred as no water surfaced. | 17-Dec-10 | 18.59 | 17.43 | 1.16 | 1:1 | 1:16 | 1:21 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 3051 | -- | |
| | | | | | | | | | | | 17.41 | 14.37 | 3.04 | 1:1 | 1:27 | 1:38 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4985 | -- | |
| | | | | | | | | | | | 14.37 | 12.77 | 1.60 | 1:1 | 1:44 | 1:50 | 16 | 393.0 | 304.8 | 408.8 | -- | -- | 2775 | -- | Re-entered: actual depth where draw began is 14.4 m. |
| | | | | | | | | | | | | | **5.81** | | | | | | | | **0.76** | **10597** | **10811** | **5406** | |
| S-31+905.2 | 17-Dec-10 | 136.40 | -- | 16.31 | 17.98 | 1.62 | 19.60 | N | | 17-Dec-10 | 18.57 | 17.43 | 1.13 | 1:1 | 9:03 | 9:08 | 16 | 420.6 | 304.8 | 431.5 | -- | -- | 2222 | -- | |
| | | | | | | | | | | | 17.43 | 14.43 | 3.00 | 1:1 | 9:13 | 9:35 | 16 | 420.6 | 152.4 | 238.5 | -- | -- | 5436 | -- | Nozzle clogged; used half pull speed |
| | | | | | | | | | | | 14.43 | 12.78 | 1.65 | 1:1 | 9:39 | 9:50 | 16 | 420.6 | 152.4 | 238.5 | -- | -- | 2673 | -- | |
| | | | | | | | | | | | | | **5.79** | | | | | | | | **0.76** | **10553** | **10330** | **5165** | |

**TABLE E2-3.3**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 2**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-31+907.6 | 18-Dec-10 | 136.54 | 13.87 | 16.15 | 18.90 | 1.92 | 20.82 | N | | 18-Dec-10 | 19.74 | 17.39 | 2.36 | 1:1 | 14:06 | 14:16 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 4111 | -- | |
| | | | | | | | | | | | 17.39 | 14.34 | 3.04 | 1:1 | 14:19 | 14:31 | 16 | 420.6 | 304.8 | 427.8 | -- | -- | 5379 | -- | Communication to S-31+905.2 at 15.5m |
| | | | | | | | | | | | 14.34 | 13.37 | 0.97 | 1:1 | 14:35 | 14:39 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 1828 | -- | Grout Temperature: 10.8°C |
| | | | | | | | | | | | | | **6.37** | | | | | | | | **0.76** | **11615** | **11318** | **5659** | |
| S-31+910 | 18-Dec-10 | 136.50 | 14.63 | 16.46 | 19.45 | 1.68 | 21.12 | N | | 18-Dec-10 | 20.13 | 17.47 | 2.66 | 1:1 | 18:54 | 19:04 | 16 | 410.2 | 304.8 | 427.8 | -- | -- | 4558 | -- | Communication to P-31+911.2 at 19.7m |
| | | | | | | | | | | | 17.47 | 14.48 | 2.98 | 1:1 | 19:08 | 19:19 | 16 | 413.7 | 304.8 | 412.6 | -- | -- | 4944 | -- | |
| | | | | | | | | | | | 14.48 | 13.38 | 1.10 | 1:1 | 19:24 | 19:29 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 2078 | -- | |
| | | | | | | | | | | | | | **6.75** | | | | | | | | **0.76** | **12315** | **11580** | **5790** | |
| S-31+912.4 | 18-Dec-10 | 136.50 | 13.78 | 15.39 | 16.46 | 2.09 | 18.55 | N | | 18-Dec-10 | 17.32 | 14.47 | 2.85 | 1:1 | 22:34 | 22:45 | 16 | 420.6 | 304.8 | 427.8 | -- | -- | 5394 | -- | |
| | | | | | | | | | | | 14.47 | 12.71 | 1.75 | 1:1 | 22:48 | 22:57 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 3418 | -- | |
| | | | | | | | | | | | | | **4.60** | | | | | | | | **0.76** | **8396** | **8812** | **4406** | |
| S-31+914.8 | 11-Jan-11 | 136.68 | 14.63 | -- | 15.58 | 1.25 | 16.82 | N | | 11-Jan-11 | 15.96 | 14.53 | 1.43 | 1:1 | 21:39 | 21:46 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 2805 | -- | Tricone caught at approx. 15.2 m. Released without manual manipulation of the rod string. |
| | | | | | | | | | | | 14.53 | 12.83 | 1.70 | 1:1 | 21:50 | 21:57 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 3157 | -- | |
| | | | | | | | | | | | | | **3.13** | | | | | | | | **0.76** | **5705** | **5962** | **2981** | |
| S-31+917.2 | 11-Jan-11 | 136.66 | -- | 14.33 | 15.09 | 1.24 | 16.33 | N | | 11-Jan-11 | 15.41 | 14.45 | 0.96 | 1:1 | 1:24 | 1:29 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 2078 | -- | Tricone caught between 14.9 and 14.6 m. Released without manual maniputalion of the rod string. |
| | | | | | | | | | | | 14.50 | 12.16 | 2.34 | 1:1 | 1:35 | 1:45 | 16 | 358.5 | 304.8 | 424.0 | -- | -- | 4175 | -- | |
| | | | | | | | | | | | | | **3.30** | | | | | | | | **0.76** | **6027** | **6254** | **3127** | |
| S-31+919.6 | 11-Jan-11 | 136.69 | 12.19 | 13.78 | 14.14 | 1.19 | 15.33 | N | | 11-Jan-11 | 14.54 | 11.83 | 2.71 | 1:1 | 5:18 | 5:31 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 5194 | -- | |
| | | | | | | | | | | | | | **2.71** | | | | | | | | **0.76** | **4943** | **5194** | **2597** | |
| S-31+922 | 12-Jan-11 | 136.69 | -- | 13.96 | 14.11 | 1.38 | 15.50 | N | | 12-Jan-11 | 14.43 | 13.44 | 0.98 | 1:1 | 21:09 | 21:15 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 2218 | -- | Pressure drop noted. Batch plant screen became plugged at 13.44 m. |
| | | | | | | | | | | | 13.44 | 10.87 | 2.57 | 1:1 | 21:18 | 21:25 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 5178 | -- | |
| | | | | | | | | | | | | | **3.56** | | | | | | | | **0.76** | **6489** | **7397** | **3698** | |
| S-31+924.4 | 12-Jan-11 | 136.69 | -- | 13.62 | 14.08 | 1.33 | 15.41 | N | | 13-Jan-11 | 14.51 | 11.66 | 2.84 | 1:1 | 10:12 | 10:24 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 4421 | -- | Grout temperature: 26.3°C |
| | | | | | | | | | | | 11.66 | 11.27 | 0.39 | 1:1 | 10:24 | 10:26 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 761 | -- | Communicated to S-31+919.6, S-31+922.0, P-31+923.2, and P-31+925.3. |
| | | | | | | | | | | | | | **3.23** | | | | | | | | **0.76** | **5899** | **5182** | **2591** | |
| S-31+926.8 | 13-Jan-11 | 136.68 | 11.22 | 13.29 | 13.81 | 1.37 | 15.18 | N | | 13-Jan-11 | 14.23 | 11.47 | 2.76 | 1:1 | 16:09 | 16:22 | 16 | 399.9 | 228.6 | 420.2 | -- | -- | 5784 | -- | Grout temperature: 20.1°C |
| | | | | | | | | | | | 11.47 | 11.46 | 0.02 | 1:1 | 16:25 | 16:26 | 16 | 206.8 | 228.6 | 75.7 | -- | -- | 26 | -- | Pressure drop noted. Both nozzles plugged. Pulled jet grout rod string and re-entered. |
| | | | | | | | | | | | 11.46 | 10.66 | 0.79 | 1:1 | 17:15 | 17:21 | 16 | 399.9 | 228.6 | 424.0 | -- | -- | 2930 | -- | Ran out of grout. |
| | | | | | | | | | | | 10.66 | 10.19 | 0.47 | 1:1 | 17:36 | 17:38 | 16 | 358.5 | 228.6 | 424.0 | -- | -- | 469 | -- | |
| | | | | | | | | | | | | | **4.04** | | | | | | | | **0.76** | **7373** | **9210** | **4605** | |

**TABLE E2-3.4**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - SOUTH RIDGE**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-31+928 | 09-Jan-11 | 136.49 | 11.16 | -- | 13.17 | 1.24 | 14.40 | N | Communicated to P-31+925.3. | 09-Jan-11 | 12.87 | 11.36 | 1.51 | 1:1 | 13:22 | 13:28 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 2676 | -- | Grout Temperature: 18.2°C |
| | | | | | | | | | | | 11.37 | 10.14 | 1.23 | 1:1 | 13:34 | 13:39 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 2180 | -- | Communicated to P-31+959.2 and P-31+961.6 while re-drilling, but no visible communication during jet grouting. |
| | | | | | | | | | | | | | **2.74** | | | | | | | | **0.76** | **5004** | **4857** | **2428** | |
| P-31+930.4 | 09-Jan-11 | 136.46 | 10.39 | -- | 12.98 | 0.73 | 13.72 | N | | 09-Jan-11 | 13.43 | 11.38 | 2.06 | 1:1 | 16:46 | 16:54 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 3778 | -- | Grout Temperature: 12.0°C |
| | | | | | | | | | | | 11.38 | 9.17 | 2.21 | 1:1 | 16:59 | 17:07 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 3899 | -- | Communicated to P-31+928.0 and P-31+925.3 from 12.2 to 10.7 m. |
| | | | | | | | | | | | | | **4.26** | | | | | | | | **0.76** | **7778** | **7677** | **3838** | |
| P-31+932.5 | 09-Jan-11 | 136.44 | 8.87 | 11.64 | 12.77 | 1.31 | 14.08 | N | Replacement hole. Communicated to P-31+930.4. | 09-Jan-11 | 13.42 | 11.38 | 2.05 | 1:1 | 22:44 | 22:52 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 3426 | -- | Re-drilled using DTH hammer when depth to bedrock could not be obtained with tricone. |
| | | | | | | | | | | | 11.38 | 8.33 | 3.04 | 1:1 | 22:56 | 23:08 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 4929 | -- | Communicated slightly to P-31+936.4. |
| | | | | | | | | | | | | | **5.09** | | | | | | | | **0.76** | **9285** | **8354** | **4177** | Spoil sample taken. |
| P-31+932.8 | 19-Dec-10 | 136.07 | 8.84 | -- | 12.77 | 0.00 | 12.77 | N | Small hammer lost down hole due to mechanical break | | | | | | | | | | | | | | | | |
| P-31+935.2 | 19-Dec-10 | 136.19 | 7.62 | -- | 11.73 | 0.96 | 12.69 | N | Hole was not setup exactly over surveyed location as pin was missing / knocked out. Actual location of drilling ~15 cm closer to 31+937.6 | 19-Dec-10 | 12.28 | 11.51 | 0.77 | 1:1 | 16:31 | 16:35 | 16 | 420.6 | 304.8 | 431.5 | -- | -- | 1821 | -- | |
| | | | | | | | | | | | 11.51 | 8.50 | 3.01 | 1:1 | 16:39 | 16:52 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 5708 | -- | Ran out of grout at 17:02 |
| | | | | | | | | | | | 8.50 | 7.57 | 0.93 | 1:1 | 16:59 | 17:03 | 16 | 413.7 | 304.8 | 439.1 | -- | -- | 1798 | -- | Communication to surface approximately where P-31+937.6 will be drilled. |
| | | | | | | | | | | | | | **4.71** | | | | | | | | **0.76** | **8590** | **9327** | **4664** | |
| P-31+937.6 | 05-Jan-11 | 136.14 | 8.99 | -- | 11.64 | 1.34 | 12.98 | N | | 06-Jan-11 | 12.54 | 11.83 | 0.71 | 1:1 | 9:11 | 9:13 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 1628 | -- | Grout Temperature: 0.2°C |
| | | | | | | | | | | | 11.83 | 11.82 | 0.01 | 1:1 | 9:13 | 9:21 | 16 | 68.9 | 304.8 | 189.3 | -- | -- | 644 | -- | |
| | | | | | | | | | | | 11.82 | 11.46 | 0.36 | 1:1 | 9:21 | 9:26 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 2703 | -- | |
| | | | | | | | | | | | 11.46 | 10.05 | 1.41 | 1:1 | 9:47 | 9:56 | 16 | 399.9 | 152.4 | 219.6 | -- | -- | 2271 | -- | Nozzle clogged; used half pull rate. |
| | | | | | | | | | | | 10.05 | 8.73 | 1.31 | 1:1 | 11:23 | 11:32 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 4149 | -- | Both nozzles clogged. Pulled rods. Re-entered: actual depth where draw began is 10.36 m. Communicated to |
| | | | | | | | | | | | 8.73 | 8.38 | 0.35 | 1:1 | 11:32 | 11:47 | 16 | 413.7 | 304.8 | 18.9 | -- | -- | 19 | -- | P-31+935.2 and probe hole on c/l at 31+946. |
| | | | | | | | | | | | | | **4.16** | | | | | | | | **0.76** | **7595** | **11413** | **5707** | Hose blown outside of shelter at 11:47. Stopped jet grouting. |
| P-31+940 | 06-Jan-11 | 136.20 | 8.84 | -- | 11.28 | 0.94 | 12.22 | N | | 06-Jan-11 | 11.05 | 8.62 | 2.43 | 1:1 | 18:00 | 18:10 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 4720 | -- | Grout Temperature: 13.6°C |
| | | | | | | | | | | | 8.62 | 7.89 | 0.72 | 1:1 | 18:16 | 18:21 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 1719 | -- | Communicated to P-31+937.6 and probe hole on c/l at 31+946. |
| | | | | | | | | | | | | | **3.15** | | | | | | | | **0.76** | **5755** | **6439** | **3219** | |
| P-31+942.4 | 06-Jan-11 | 136.19 | 9.45 | -- | 11.67 | 0.64 | 12.31 | N | | 06-Jan-11 | 11.92 | 11.43 | 0.50 | 1:1 | 21:37 | 21:41 | 16 | 403.3 | 152.4 | 233.6 | -- | -- | 1325 | -- | Nozzle clogged; used half pull rate. |
| | | | | | | | | | | | 11.43 | 8.30 | 3.12 | 1:1 | 21:47 | 22:09 | 16 | 403.3 | 152.4 | 229.0 | -- | -- | 5368 | -- | |
| | | | | | | | | | | | | | **3.62** | | | | | | | | **0.76** | **6605** | **6693** | **3346** | |
| P-31+944.8 | 06-Jan-11 | 136.21 | 7.77 | -- | 11.49 | 0.94 | 12.43 | N | | 06-Jan-11 | 11.92 | 11.42 | 0.50 | 1:1 | 3:03 | 3:05 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 1768 | -- | |
| | | | | | | | | | | | 11.42 | 8.39 | 3.03 | 1:1 | 3:09 | 3:21 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 4959 | -- | Communicated to P-31+942.4 between 10.67 and 9.14 m depth. |
| | | | | | | | | | | | 8.39 | 8.15 | 0.23 | 1:1 | 3:31 | 3:33 | 16 | 275.8 | 152.4 | 189.3 | -- | -- | 545 | -- | |
| | | | | | | | | | | | 8.15 | 6.98 | 1.17 | 1:1 | 3:33 | 3:41 | 16 | 379.2 | 152.4 | 213.9 | -- | -- | 1828 | -- | |
| | | | | | | | | | | | | | **4.94** | | | | | | | | **0.76** | **9007** | **2373** | **1187** | |
| P-31+947.2 | 06-Jan-11 | 136.23 | 7.92 | -- | 11.03 | 1.17 | 12.21 | N | | 07-Jan-11 | 11.66 | 11.22 | 0.45 | 1:1 | 9:28 | 9:31 | 16 | 399.9 | 304.8 | 454.2 | -- | -- | 1666 | -- | Grout Temperature: 11.3°C |
| | | | | | | | | | | | 11.83 | 8.11 | 3.72 | 1:1 | 9:34 | 9:49 | 16 | 68.9 | 304.8 | 442.9 | -- | -- | 6518 | -- | Tricone jammed by caved material at 8 m. Released manually. |
| | | | | | | | | | | | 8.11 | 7.44 | 0.68 | 1:1 | 9:49 | 9:52 | 16 | 413.7 | 304.8 | 435.3 | -- | -- | 2941 | -- | |
| | | | | | | | | | | | | | **4.84** | | | | | | | | **0.76** | **8824** | **11125** | **5563** | |
| P-31+949.6 | 07-Jan-11 | 136.12 | 9.60 | -- | 11.00 | 1.16 | 12.16 | N | | 07-Jan-11 | 11.46 | 8.44 | 3.02 | 1:1 | 13:15 | 13:29 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 5345 | -- | Grout Temperature: 14.8°C |
| | | | | | | | | | | | | | **3.02** | | | | | | | | **0.76** | **5516** | **5345** | **2673** | |

**TABLE E2-3.4**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - SOUTH RIDGE**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-31+952 | 07-Jan-11 | 136.18 | 9.91 | -- | 11.64 | 1.22 | 12.86 | N | | 07-Jan-11 | 12.10 | 11.42 | 0.68 | 1:1 | 16:10 | 16:13 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 1692 | -- | Grout Temperature: 11.4°C |
| | | | | | | | | | | | 11.42 | 8.90 | 2.52 | 1:1 | 16:16 | 16:27 | 16 | 420.6 | 304.8 | 431.5 | -- | -- | 4630 | -- | Communicated to P-31+949.6 over full length of column. |
| | | | | | | | | | | | | | **3.20** | | | | | | | | **0.76** | **5838** | **6322** | **3161** | |
| P-31+954.4 | 07-Jan-11 | 136.19 | 9.91 | -- | 11.46 | 1.99 | 13.45 | N | Communicated to P-31+952. | 07-Jan-11 | 13.02 | 11.30 | 1.72 | 1:1 | 21:23 | 21:29 | 16 | 420.6 | 304.8 | 435.3 | -- | -- | 3153 | -- | |
| | | | | | | | | | | | 11.30 | 8.85 | 2.44 | 1:1 | 21:34 | 21:44 | 16 | 420.6 | 304.8 | 420.2 | -- | -- | 4376 | -- | |
| | | | | | | | | | | | | | **4.16** | | | | | | | | **0.76** | **7595** | **7529** | **3765** | |
| P-31+956.8 | 07-Jan-11 | 136.23 | 8.93 | -- | 11.76 | 1.83 | 13.59 | N | | 07-Jan-11 | 13.11 | 11.31 | 1.81 | 1:1 | 1:01 | 1:10 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 3691 | -- | Tricone caught at 12.7 m. Released manually. Lowered rod string 15 cm and recommenced jet grouting at regular rate. |
| | | | | | | | | | | | 11.31 | 7.91 | 3.40 | 1:1 | 1:15 | 1:31 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 6647 | -- | |
| | | | | | | | | | | | | | **5.21** | | | | | | | | **0.76** | **9496** | **10338** | **5169** | |
| P-31+959.2 | 07-Jan-11 | 136.21 | 9.17 | -- | 11.43 | 2.09 | 13.52 | N | | 07-Jan-11 | 12.81 | 11.35 | 1.46 | 1:1 | 4:30 | 4:40 | 16 | 406.8 | 304.8 | 412.6 | -- | -- | 4384 | -- | Tricone caught repeatedly between 12.08 and 12.05 m. Released manually and continued jet grouting at regular rate. |
| | | | | | | | | | | | 11.35 | 8.19 | 3.16 | 1:1 | 4:43 | 4:58 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 6026 | -- | |
| | | | | | | | | | | | | | **4.62** | | | | | | | | **0.76** | **8429** | **10410** | **5205** | |
| P-31+961.6 | 08-Jan-11 | 136.16 | 9.91 | -- | 11.58 | 1.28 | 12.86 | N | | 08-Jan-11 | 12.02 | 11.25 | 0.77 | 1:1 | 9:35 | 9:40 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 2453 | -- | Tricone caught repeatedly between 12.0 and 11.3 m. Released manually and continued jet grouting at regular rate. |
| | | | | | | | | | | | 11.25 | 8.90 | 2.34 | 1:1 | 9:44 | 9:54 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4005 | -- | Communicated to P-31+959.2 over full length of column. |
| | | | | | | | | | | | | | **3.11** | | | | | | | | **0.76** | **5677** | **6458** | **3229** | |
| P-31+964 | 08-Jan-11 | 136.03 | 7.41 | -- | 11.16 | 1.22 | 12.38 | N | Communicated to P-31+961.6. | 08-Jan-11 | 11.44 | 8.36 | 3.08 | 1:1 | 16:10 | 16:13 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 5432 | | Tricone caught slightly at approximately 10.7 m. |
| | | | | | | | | | | | 8.36 | 6.75 | 1.61 | 1:1 | 16:15 | 16:29 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 2646 | -- | Communicated to P-31+959.2 and P-31+961.6. |
| | | | | | | | | | | | | | **4.69** | | | | | | | | **0.76** | **8551** | **8078** | **4039** | Grout Temperature: 22.8°C |
| P-31+966.4 | 08-Jan-11 | 136.05 | 7.99 | -- | 11.19 | 1.22 | 12.41 | N | Communicated to P-31+964. | 08-Jan-11 | 11.35 | 8.37 | 2.98 | 1:1 | 18:43 | 18:55 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 5364 | -- | Grout Temperature: 13.2°C |
| | | | | | | | | | | | 8.37 | 7.47 | 0.90 | 1:1 | 18:59 | 19:03 | 16 | 413.7 | 304.8 | 435.3 | -- | -- | 1919 | -- | |
| | | | | | | | | | | | | | **3.88** | | | | | | | | **0.76** | **7078** | **7283** | **3642** | |
| P-31+969.4 | 15-Jan-11 | 136.11 | 9.20 | -- | 11.86 | 1.22 | 13.08 | N | Communicated to S-31+965.2. | 15-Jan-11 | 11.64 | 11.38 | 0.26 | 1:1 | 1:22 | 1:24 | 13 | 406.8 | 304.8 | 427.8 | -- | -- | 1166 | -- | Communicated to S-31+965.2 and the spoil trench adjacent to S-31+962.8. |
| | | | | | | | | | | | 11.38 | 8.21 | 3.17 | 1:1 | 1:28 | 1:41 | 13 | 399.9 | 304.8 | 420.2 | -- | -- | 5368 | -- | Hole offset 32 cm upstream. |
| | | | | | | | | | | | | | **3.43** | | | | | | | | **0.76** | **6255** | **6534** | **3267** | |
| P-31+972.4 | 15-Jan-11 | 136.07 | 10.36 | -- | 11.92 | 1.21 | 13.12 | N | | 15-Jan-11 | 12.12 | 11.43 | 0.69 | 1:1 | 4:41 | 4:44 | 13 | 406.8 | 304.8 | 446.7 | -- | -- | 1794 | -- | Communicated to P-31+969.4. |
| | | | | | | | | | | | 11.43 | 9.06 | 2.37 | 1:1 | 4:47 | 4:57 | 13 | 413.7 | 304.8 | 420.2 | -- | -- | 4168 | -- | |
| | | | | | | | | | | | | | **3.06** | | | | | | | | **0.76** | **5577** | **5962** | **2981** | |
| P-31+975.4 | 15-Jan-11 | 136.14 | 9.78 | -- | 12.37 | 0.45 | 12.82 | N | Weathered bedrock or till encountered at 10.57 m. | 16-Jan-11 | 12.07 | 11.50 | 0.57 | 1:1 | 8:49 | 8:51 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 1102 | -- | Grout temperature: 10.1°C |
| | | | | | | | | | | | 11.50 | 8.74 | 2.76 | 1:1 | 8:54 | 9:04 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 4664 | -- | Communicated to S-31+972.4 from 12.1 to 10.1 m. |
| | | | | | | | | | | | | | **3.33** | | | | | | | | **0.76** | **6066** | **5765** | **2883** | |
| P-31+978.4 | 16-Jan-11 | 136.16 | -- | -- | 12.65 | 1.25 | 13.90 | N | Communicated to P-31+975.4 | 16-Jan-11 | 12.99 | 11.38 | 1.61 | 1:1 | 12:02 | 12:09 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 3214 | -- | Grout temperature: 17.4°C |
| | | | | | | | | | | | 11.38 | 9.43 | 1.95 | 1:1 | 12:12 | 12:20 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 3324 | -- | Tricone caught at 13.0 m, released manually. |
| | | | | | | | | | | | | | **3.56** | | | | | | | | **0.76** | **6494** | **6537** | **3269** | Communicated to P-31+975.4 for length of column. |
| P-31+981.4 | 16-Jan-11 | 136.19 | 11.06 | -- | 12.25 | 1.22 | 13.47 | N | Slight communication with P-31+978.4 | 16-Jan-11 | 12.71 | 11.43 | 1.28 | 1:1 | 15:36 | 15:41 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 2453 | -- | Grout temperature: 6.8°C |
| | | | | | | | | | | | 11.43 | 10.03 | 1.39 | 1:1 | 15:45 | 15:50 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 2616 | -- | Spoil sample taken at 11.0 m. |
| | | | | | | | | | | | | | **2.67** | | | | | | | | **0.76** | **4876** | **5069** | **2534** | |

**TABLE E2-3.4**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - SOUTH RIDGE**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-31+984.4 | 16-Jan-11 | 136.30 | 10.00 | -- | 13.35 | 1.25 | 14.60 | N | | 16-Jan-11 | 13.16 | 11.43 | 1.73 | 1:1 | 18:40 | 18:46 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 3085 | -- | Grout temperature: 18.4°C |
| | | | | | | | | | | | 11.43 | 9.50 | 1.93 | 1:1 | 18:50 | 18:57 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 3414 | -- | Communicated to P-31+981.4 and P-31+978.4 from 13.1-10.1 m. |
| | | | | | | | | | | | | | **3.65** | | | | | | | | **0.76** | **6661** | **6500** | **3250** | |
| P-31+987.4 | 16-Jan-11 | 136.29 | 11.06 | 12.59 | 12.74 | 1.22 | 13.96 | N | | 16-Jan-11 | 12.86 | 11.43 | 1.43 | 1:1 | 21:01 | 21:07 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 2835 | -- | |
| | | | | | | | | | | | 11.43 | 10.05 | 1.38 | 1:1 | 21:13 | 21:20 | 16 | 406.8 | 304.8 | 412.6 | -- | -- | 2635 | -- | |
| | | | | | | | | | | | | | **2.81** | | | | | | | | **0.76** | **5126** | **5470** | **2735** | |
| P-31+990.4 | 16-Jan-11 | 136.31 | 11.55 | -- | 12.50 | 1.01 | 13.51 | N | | 16-Jan-11 | 12.53 | 11.45 | 1.07 | 1:1 | 23:17 | 23:24 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 3339 | -- | Tricone caught at 12.4 m, released automatically. |
| | | | | | | | | | | | 11.45 | 10.56 | 0.89 | 1:1 | 23:27 | 0:32 | 16 | 406.8 | 304.8 | 397.5 | -- | -- | 1851 | -- | |
| | | | | | | | | | | | | | **1.96** | | | | | | | | **0.76** | **3581** | **5190** | **2595** | |
| P-31+993.4 | 16-Jan-11 | 136.25 | 11.31 | -- | 13.38 | 1.24 | 14.62 | N | Communicated to P-31+990.4 | 16-Jan-11 | 13.44 | 11.43 | 2.00 | 1:1 | 2:04 | 2:13 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 3555 | -- | Communicated to P-31+990.4 from 13.4 to 10.8 m with greater spoils returning from P-31+990.4. |
| | | | | | | | | | | | 11.43 | 10.29 | 1.14 | 1:1 | 2:16 | 2:22 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 2233 | -- | |
| | | | | | | | | | | | | | **3.14** | | | | | | | | **0.76** | **5732** | **5788** | **2894** | |
| P-31+996.4 | 16-Jan-11 | 136.24 | 11.92 | -- | 13.05 | 1.16 | 14.20 | N | Communicated to P-31+993.4 | 16-Jan-11 | 13.12 | 10.81 | 2.31 | 1:1 | 5:55 | 6:05 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 4667 | -- | Communicated to P-31+993.4. |
| | | | | | | | | | | | | | **2.31** | | | | | | | | **0.76** | **4214** | **4667** | **2334** | |
| P-31+999.4 | 17-Jan-11 | 136.10 | -- | -- | 14.23 | 1.22 | 15.45 | N | Communicated to P-31+996.4 | 17-Jan-11 | 14.66 | 14.31 | 0.35 | 1:1 | 10:15 | 10:17 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 984 | -- | Grout temperature: 11.8°C |
| | | | | | | | | | | | 14.31 | 11.38 | 2.94 | 1:1 | 10:20 | 10:32 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 5178 | -- | Communicated to P-31+996.4 from 14.63 to 11.58 m. |
| | | | | | | | | | | | 11.38 | 10.02 | 1.36 | 1:1 | 10:36 | 10:41 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 2514 | -- | |
| | | | | | | | | | | | | | **4.65** | | | | | | | | **0.76** | **8479** | **8676** | **4338** | |
| P-32+002.4 | 17-Jan-11 | 136.00 | -- | -- | -- | -- | -- | N | QA of this activity not carried out | 17-Jan-11 | 13.73 | 11.38 | 2.34 | 1:1 | 2:48 | 3:15 | 16 | 406.8 | 304.8 | -- | -- | -- | 4387 | -- | QA of beginning of jet grouting not carried out. |
| | | | | | | | | | | | 11.38 | 9.43 | 1.95 | 1:1 | 12:12 | 12:20 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 2563 | -- | |
| | | | | | | | | | | | | | **3.68** | | | | | | | | **0.76** | **6716** | **6950** | **3475** | |
| P-32+004.8 | 17-Jan-11 | 136.11 | 8.84 | 10.67 | 14.97 | 0.46 | 15.42 | N | QA of this activity not carried out | 17-Jan-11 | 15.12 | 14.84 | 0.27 | 1:1 | 18:56 | 18:59 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 1378 | -- | |
| | | | | | | | | | | | 14.84 | 14.34 | 0.50 | 1:1 | 18:59 | 19:01 | 17 | 413.7 | 304.8 | 416.4 | -- | -- | 1041 | -- | |
| | | | | | | | | | | | 14.34 | 11.35 | 2.99 | 1:1 | 19:04 | 19:16 | 18 | 406.8 | 304.8 | 420.2 | -- | -- | 5281 | -- | |
| | | | | | | | | | | | 11.35 | 8.85 | 2.51 | 1:1 | 19:21 | 19:31 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 4546 | -- | Communicated to P-32+004.8 from 11.37 to 8.85 m. |
| | | | | | | | | | | | | | **6.27** | | | | | | | | **0.76** | **11442** | **12246** | **6123** | |
| S-31+929.2 | 13-Jan-11 | 136.63 | 12.19 | -- | 13.11 | 1.22 | 14.33 | N | | 13-Jan-11 | 12.95 | 11.59 | 1.36 | 1:1 | 0:32 | 0:40 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 3301 | -- | Grout Temperature: 11.9°C |
| | | | | | | | | | | | 11.59 | 10.83 | 0.77 | 1:1 | 0:45 | 0:49 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 1613 | -- | Pressure drop noted. Paused to clean batch plant screen. On re-start, pop-valve on nozzle broke. Pulled jet grouting string twice before problem was determined. Changed jet nozzle. |
| | | | | | | | | | | | 10.83 | 9.74 | 1.09 | 1:1 | 2:25 | 2:31 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 4686 | -- | |
| | | | | | | | | | | | | | **1.09** | | | | | | | | **0.76** | **1979** | **9600** | **4800** | |
| S-31+931.6 | 13-Jan-11 | 136.60 | 11.89 | -- | 13.20 | 1.07 | 14.26 | N | | 14-Jan-11 | 13.44 | 13.23 | 0.22 | 1:1 | 8:25 | 8:27 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 678 | -- | Grout temperature: 14.9°C |
| | | | | | | | | | | | 13.23 | 11.55 | 1.68 | 1:1 | 8:29 | 8:35 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 2669 | -- | Pressure drop noted at 13.2 m. |
| | | | | | | | | | | | 11.55 | 8.78 | 2.77 | 1:1 | 8:38 | 8:48 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 4304 | -- | |
| | | | | | | | | | | | | | **4.66** | | | | | | | | **0.76** | **8507** | **7650** | **3825** | |
| S-31+934 | 14-Jan-11 | 136.55 | 9.24 | -- | 12.65 | 1.20 | 13.85 | N | | 14-Jan-11 | 13.11 | 11.42 | 1.69 | 1:1 | 16:09 | 16:22 | 13 | 406.8 | 228.6 | 427.8 | -- | -- | 4153 | -- | Grout temperature: 18.4°C |
| | | | | | | | | | | | 11.42 | 8.40 | 3.02 | 1:1 | 16:25 | 16:26 | 13 | 413.7 | 228.6 | 424.0 | -- | -- | 8014 | -- | Communicated to S-31+931.6. |
| | | | | | | | | | | | 8.40 | 7.95 | 0.45 | 1:1 | 17:36 | 17:38 | 13 | 406.8 | 228.6 | 427.8 | -- | -- | 1772 | -- | Pressure drop noted at 8.4 m. Associated with mixing of a new batch of grout. |
| | | | | | | | | | | | | | **5.16** | | | | | | | | **1.07** | **18461** | **13938** | **6969** | |

**TABLE E2-3.4**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - SOUTH RIDGE**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-31+936.4 | 09-Jan-11 | 136.56 | 9.57 | 11.13 | 11.80 | 1.25 | 13.05 | N | | 09-Jan-11 | 12.31 | 11.38 | 0.93 | 1:1 | 3:02 | 3:06 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 1783 | -- | |
| | | | | | | | | | | | 11.38 | 7.56 | 3.83 | 1:1 | 3:09 | 3:25 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 6685 | -- | |
| | | | | | | | | | | | | | **4.76** | | | | | | | | **0.76** | **8679** | **8468** | **4234** | |
| S-31+938.8 | 09-Jan-11 | 136.60 | 9.60 | -- | 11.64 | 1.24 | 12.88 | N | | 10-Jan-11 | 11.96 | 11.42 | 0.53 | 1:1 | 7:46 | 7:51 | 16 | 413.7 | 304.8 | 439.1 | -- | -- | 2203 | -- | Grout Temperature: 14.8°C |
| | | | | | | | | | | | 11.42 | 8.33 | 3.09 | 1:1 | 7:55 | 8:06 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 5050 | -- | Communicated to S-31+936.4 and P-31+937.6. |
| | | | | | | | | | | | | | **3.62** | | | | | | | | **0.76** | **6611** | **7253** | **3626** | |
| S-31+941.2 | 10-Jan-11 | 136.61 | 8.29 | -- | 11.92 | 1.22 | 13.14 | N | | 10-Jan-11 | 12.24 | 11.42 | 0.82 | 1:1 | 21:50 | 21:53 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 1688 | -- | |
| | | | | | | | | | | | 11.42 | 8.73 | 2.69 | 1:1 | 21:58 | 22:08 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 4633 | -- | |
| | | | | | | | | | | | 8.73 | 8.39 | 0.34 | 1:1 | 22:09 | 22:11 | 16 | 358.5 | 304.8 | 427.0 | -- | -- | 2555 | -- | Pressure drop noted. CamLock on charge pump was sucking air. |
| | | | | | | | | | | | | | **3.85** | | | | | | | | **0.76** | **7022** | **8877** | **4438** | |
| S-31+943.6 | 10-Jan-11 | 136.52 | 10.06 | -- | 11.73 | 0.94 | 12.68 | N | | 10-Jan-11 | 11.66 | 11.32 | 0.33 | 1:1 | 1:59 | 2:02 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 1314 | -- | Used an extra 380 L at beginning of jet grouting to flush hole and thus prevent rod string from becoming stuck. |
| | | | | | | | | | | | 11.32 | 7.97 | 3.35 | 1:1 | 2:07 | 2:22 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 6057 | -- | Communicated to S-31+941.2. |
| | | | | | | | | | | | | | **3.69** | | | | | | | | **0.76** | **6722** | **7370** | **3685** | |
| S-31+946 | 10-Jan-11 | 136.42 | 7.62 | -- | 11.43 | 1.23 | 12.66 | N | | 10-Jan-11 | 11.49 | 8.40 | 3.09 | 1:1 | 5:45 | 5:57 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 5194 | -- | |
| | | | | | | | | | | | 8.40 | 7.00 | 1.40 | 1:1 | 6:00 | 6:06 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 2479 | -- | Communicated to S-31+943.6. |
| | | | | | | | | | | | | | **4.49** | | | | | | | | **0.76** | **8190** | **7673** | **3837** | |
| S-31+948.4 | 14-Jan-11 | 136.31 | 8.29 | -- | 11.52 | 1.29 | 12.81 | N | | 14-Jan-11 | 11.24 | 8.41 | 2.83 | 1:1 | 18:58 | 19:12 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 6060 | -- | Communicated to S-31+946 and P-31+954.4. |
| | | | | | | | | | | | 8.41 | 7.56 | 0.85 | 1:1 | 19:17 | 19:22 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 8305 | -- | |
| | | | | | | | | | | | | | **3.69** | | | | | | | | **0.76** | **6728** | **14366** | **7183** | |
| S-31+950.8 | 14-Jan-11 | 136.32 | 10.49 | -- | 11.37 | 1.13 | 12.50 | N | | 14-Jan-11 | 11.41 | 8.87 | 2.54 | 1:1 | 23:45 | 23:56 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 4588 | -- | Communicated to S-31+948.4. |
| | | | | | | | | | | | | | **2.54** | | | | | | | | **0.76** | **4637** | **4588** | **2294** | |
| S-31+953.2 | 14-Jan-11 | 136.34 | 9.75 | 11.58 | 11.98 | 1.28 | 13.26 | N | | 14-Jan-11 | 11.89 | 11.35 | 0.54 | 1:1 | 4:23 | 4:27 | 16 | 413.7 | 304.8 | 420.2 | -- | -- | 1647 | -- | Tricone got caught at 11.7 m. Released without manual manipulation of the drill string. |
| | | | | | | | | | | | 11.35 | 9.03 | 2.32 | 1:1 | 4:36 | 4:51 | 16 | 413.7 | 152.4 | 227.1 | -- | -- | 5231 | -- | Communicated to P-31+954.4. |
| | | | | | | | | | | | | | **2.86** | | | | | | | | **0.76** | **5215** | **6878** | **3439** | |
| S-31+955.6 | 15-Jan-11 | 136.35 | 10.49 | -- | 12.04 | 1.22 | 13.26 | N | | 15-Jan-11 | 12.34 | 11.42 | 0.92 | 1:1 | 9:13 | 9:16 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 1548 | -- | Grout temperature: 16.5°C |
| | | | | | | | | | | | 11.42 | 8.41 | 3.01 | 1:1 | 9:19 | 9:29 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 4372 | -- | Communicated to S-31+953.2 from 12.34 m to top of column. |
| | | | | | | | | | | | | | **3.93** | | | | | | | | **0.76** | **7161** | **5920** | **2960** | |
| S-31+958 | 15-Jan-11 | 136.32 | 8.72 | -- | 11.92 | 1.22 | 13.14 | N | Communicated slightly to S-31+955.6 and S-31+953.2 | 15-Jan-11 | 12.35 | 11.51 | 0.84 | 1:1 | 12:39 | 12:42 | 13 | 413.7 | 304.8 | 424.0 | -- | -- | 1552 | -- | Grout temperature: 16.9°C |
| | | | | | | | | | | | 11.51 | 8.22 | 3.29 | 1:1 | 12:45 | 13:07 | 13 | 393.0 | 152.4 | 212.0 | -- | -- | 4929 | -- | Nozzle clogged at 11.51 m; used half pull rate. |
| | | | | | | | | | | | | | **4.13** | | | | | | | | **0.76** | **7534** | **6481** | **3240** | |
| S-31+960.4 | 15-Jan-11 | 136.29 | -- | -- | 11.64 | 1.37 | 13.01 | N | Top of soft zone 8.1 m; Communicated slightly to S-31+955.6. | 15-Jan-11 | 12.20 | 11.46 | 0.73 | 1:1 | 15:21 | 15:23 | 13 | 413.7 | 304.8 | 420.2 | -- | -- | 1325 | -- | Grout temperature: 12.7°C |
| | | | | | | | | | | | 11.46 | 8.53 | 2.94 | 1:1 | 15:26 | 15:36 | 13 | 413.7 | 304.8 | 420.2 | -- | -- | 4084 | -- | Communicated to S-31+958.0 from 11.5 to approximately 8.5 m. |
| | | | | | | | | | | | | | **3.67** | | | | | | | | **0.76** | **6700** | **5409** | **2705** | |
| S-31+962.8 | 15-Jan-11 | 136.30 | 8.93 | -- | 11.70 | 1.26 | 12.97 | N | Communicated to S-31+960.4. | 15-Jan-11 | 12.25 | 11.50 | 0.74 | 1:1 | 18:07 | 18:10 | 13 | 413.7 | 304.8 | 420.2 | -- | -- | 1279 | -- | Tricone caught between 11.8 and 11.5 m, and 11.44 m. Released manually. Grout temperature: 11.6°C |
| | | | | | | | | | | | 11.50 | 7.94 | 3.57 | 1:1 | 18:16 | 18:28 | 13 | 413.7 | 304.8 | 420.2 | -- | -- | 5356 | -- | Communicated to S-31+960.4 and P-31+966.4 from 12.25 m to top of column. |
| | | | | | | | | | | | | | **4.31** | | | | | | | | **0.76** | **7862** | **6636** | **3318** | |

**TABLE E2-3.4**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - SOUTH RIDGE**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-31+965.2 | 15-Jan-11 | 136.18 | -- | -- | 11.05 | 1.18 | 12.23 | N | | 15-Jan-11 | 11.35 | 8.34 | 3.01 | 1:1 | 21:41 | 21:51 | 13 | 399.9 | 304.8 | 405.0 | -- | -- | 4334 | -- | Communicated to P-31+966.4 and S-31+962.8. |
| | | | | | | | | | | | 8.34 | 6.80 | 1.54 | 1:1 | 21:56 | 22:01 | 13 | 399.9 | 304.8 | 408.8 | -- | -- | 2673 | -- | |
| | | | | | | | | | | | | | **4.55** | | | | | | | | **0.76** | **8301** | **7007** | **3503** | |
| S-31+967.9 | 24-Jan-11 | 136.43 | 8.53 | 11.28 | 11.51 | 1.31 | 12.82 | N | | 24-Jan-11 | 11.49 | 8.46 | 3.03 | 1:1 | 20:17 | 20:27 | 16 | 399.9 | 304.8 | 408.8 | -- | -- | 5402 | -- | Grout temperature: 19.4°C |
| | | | | | | | | | | | 8.47 | 7.65 | 0.81 | 1:1 | 20:31 | 20:36 | 16 | 372.3 | 304.8 | 424.0 | -- | -- | 2006 | -- | Nozzle plugged briefly |
| | | | | | | | | | | | | | **3.84** | | | | | | | | **0.76** | **7011** | **7408** | **3704** | |
| S-31+970.9 | 24-Jan-11 | 136.43 | 10.67 | -- | 12.04 | 0.51 | 12.55 | N | | 24-Jan-11 | 12.03 | 11.42 | 0.62 | 1:1 | 1:26 | 1:27 | 16 | 399.9 | 304.8 | 442.9 | -- | -- | 1632 | -- | Grout temperature: 14.4°C |
| | | | | | | | | | | | 11.41 | 8.40 | 3.01 | 1:1 | 1:31 | 1:42 | 16 | 399.9 | 304.8 | 435.3 | -- | -- | 4929 | -- | |
| | | | | | | | | | | | | | **3.63** | | | | | | | | **0.76** | **6622** | **6560** | **3280** | |
| S-31+973.9 | 24-Jan-11 | 136.38 | -- | -- | 12.28 | 0.50 | 12.79 | N | | 25-Jan-11 | 12.37 | 11.57 | 0.81 | 1:1 | 11:48 | 11:53 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 2396 | -- | Grout temperature: 20.5°C |
| | | | | | | | | | | | 11.57 | 8.95 | 2.62 | 1:1 | 11:58 | 12:12 | 16 | 406.8 | 152.4 | 234.7 | -- | -- | 3698 | -- | Nozzle plugged; used half pull rate. |
| | | | | | | | | | | | | | **3.42** | | | | | | | | **0.76** | **6244** | **3698** | **1849** | |
| S-31+976.9 | 25-Jan-11 | 136.37 | 9.63 | 11.80 | 13.05 | 1.25 | 14.30 | N | | 25-Jan-11 | 13.26 | 0.00 | 1.93 | 1:1 | 16:23 | 16:29 | 16 | 399.9 | 304.8 | 431.5 | -- | -- | 3286 | -- | Grout temperature: 22.3°C |
| | | | | | | | | | | | 11.34 | 11.27 | 0.07 | 1:1 | 16:34 | 16:35 | 16 | 393.0 | 152.4 | 223.3 | -- | -- | 348 | -- | Nozzle plugged; used half pull rate |
| | | | | | | | | | | | 11.27 | 8.51 | 2.76 | 1:1 | 16:36 | 16:46 | 16 | 399.9 | 304.8 | 427.8 | -- | -- | 4577 | -- | Nozzle unplugged |
| | | | | | | | | | | | | | **4.76** | | | | | | | | **0.76** | **8679** | **8211** | **4105** | |
| S-31+979.9 | 25-Jan-11 | 136.42 | -- | -- | 12.53 | 1.09 | 13.62 | N | New hammer bit being used - faster advance. | 25-Jan-11 | 12.85 | 11.23 | 1.61 | 1:1 | 20:18 | 20:24 | 16 | 379.2 | 304.8 | 435.3 | -- | -- | 3358 | -- | |
| | | | | | | | | | | | 11.23 | 10.82 | 0.41 | 1:1 | 20:28 | 20:31 | 16 | 399.9 | 304.8 | 431.5 | -- | -- | 1090 | -- | Screen plugged; volume reset. |
| | | | | | | | | | | | 11.28 | 9.78 | 1.50 | 1:1 | 22:39 | 22:45 | 16 | 413.7 | 304.8 | 416.4 | -- | -- | 2582 | -- | Air line blown; tripped out to repair |
| | | | | | | | | | | | | | **3.51** | | | | | | | | **0.76** | **6411** | **7030** | **3515** | |
| S-31+982.9 | 25-Jan-11 | 136.45 | 10.06 | -- | 12.50 | 0.97 | 13.47 | N | | 14-Feb-11 | 12.81 | 11.61 | 1.20 | 1:1 | 1:28 | 1:32 | 16 | 393.0 | 304.8 | 405.0 | -- | -- | 2366 | -- | Grout Temperature: 15.5°C<br>No visible return or communication for length of column. |
| | | | | | | | | | | | 11.61 | 11.56 | 0.05 | 1:1 | 1:33 | 1:34 | 16 | 393.0 | 304.8 | 405.0 | -- | -- | 545 | -- | Pull was paused at 11.6 m for 1 minute to encourage spoil return. |
| | | | | | | | | | | | 11.56 | 9.78 | 1.78 | 1:1 | 1:48 | 1:54 | 16 | 393.0 | 304.8 | 408.8 | -- | -- | 3437 | -- | Spoil came up to a point just below the ground surface, but did not spill over into the trench. |
| | | | | | | | | | | | | | **3.03** | | | | | | | | **0.76** | **5527** | **6348** | **0** | |
| S-31+985.9 | 14-Feb-11 | 136.50 | 11.58 | -- | 12.50 | 1.01 | 13.50 | N | | 14-Feb-11 | 12.37 | 11.40 | 0.98 | 1:1 | 6:30 | 6:33 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 2714 | -- | |
| | | | | | | | | | | | 11.40 | 9.78 | 1.61 | 1:1 | 6:37 | 6:43 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 3013 | -- | No visible communication for length of column. |
| | | | | | | | | | | | | | **2.59** | | | | | | | | **0.76** | **4720** | **5727** | **2864** | |
| S-31+988.9 | 15-Feb-11 | 136.53 | -- | -- | 13.20 | 1.29 | 14.49 | N | Intersected top of prev. grouted interval | 15-Feb-11 | 14.16 | 14.05 | 0.11 | 1:1 | 12:17 | 12:19 | 16 | 399.9 | 304.8 | 408.8 | -- | -- | 750 | -- | Communicated to S-31+985.9. |
| | | | | | | | | | | | 14.05 | 12.07 | 1.98 | 1:1 | 12:42 | 12:49 | 16 | 386.1 | 304.8 | 420.2 | -- | -- | 2612 | -- | Drill head stuck at 14.1 m. Freed manually using the drill jacks. |
| | | | | | | | | | | | 12.07 | 11.29 | 0.79 | 1:1 | 12:51 | 12:55 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 1162 | -- | |
| | | | | | | | | | | | 11.29 | 9.07 | 2.22 | 1:1 | 13:00 | 13:07 | 16 | 396.4 | 304.8 | 4205.6 | -- | -- | 3642 | -- | |
| | | | | | | | | | | | | | **5.09** | | | | | | | | **0.76** | **9285** | **8165** | **4083** | Grout Temperature: 11.3°C |
| S-31+991.9 | 15-Feb-11 | 136.61 | -- | -- | 13.63 | 1.48 | 15.11 | N | Intersected top of prev. grouted interval | 15-Feb-11 | 14.45 | 11.36 | 3.08 | 1:1 | 15:55 | 16:06 | 16 | 389.6 | 304.8 | 427.8 | -- | -- | 5091 | -- | Communicated to S-31+988.9 and S-31+985.9 |
| | | | | | | | | | | | 11.37 | 10.37 | 1.00 | 1:1 | 16:10 | 16:13 | 16 | 389.6 | 304.8 | 420.2 | -- | -- | 1870 | -- | |
| | | | | | | | | | | | | | **4.08** | | | | | | | | **0.76** | **7445** | **6961** | **3481** | Grout Temperature: 14.0°C |
| S-31+994.9 | 15-Feb-11 | 136.52 | 12.04 | -- | 13.72 | 1.22 | 14.94 | N | | 15-Feb-11 | 14.07 | 10.90 | 3.17 | 1:1 | 20:18 | 20:30 | 16 | 399.9 | 304.8 | 431.5 | -- | -- | 5879 | -- | Grout Temperature: 25°C<br>Re-chucked rods at 11.5 m to complete hole without stopping and re-starting. |
| | | | | | | | | | | | | | **3.17** | | | | | | | | **0.76** | **5788** | **5879** | **2939** | |

**TABLE E2-3.4**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - SOUTH RIDGE**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-31+997.9 | 15-Feb-11 | 136.60 | 11.89 | -- | 13.99 | 1.22 | 15.21 | N | | 15-Feb-11 | 14.38 | 11.44 | 2.94 | 1:1 | 1:48 | 1:58 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 4811 | -- | Grout Temperature: 21.1°C |
| | | | | | | | | | | | | | **2.94** | | | | | | | | **0.76** | **5371** | **4811** | **2406** | Communicated to S-31+994.9 |
| S-32+001.1 | 15-Feb-11 | 136.53 | 12.10 | -- | 14.57 | 1.28 | 15.85 | N | | 15-Feb-11 | 14.95 | 14.44 | 0.51 | 1:1 | 5:20 | 5:22 | 16 | 399.9 | 304.8 | 427.8 | -- | -- | 1408 | -- | Grout Temperature: 13.9°C |
| | | | | | | | | | | | 14.44 | 11.24 | 3.20 | 1:1 | 5:26 | 5:38 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 5375 | -- | Re-chucked rods at 11.5 m to complete hole without stopping and re-starting. Pump seized at 11.2 m, column ended approx. 0.27 m below target top elevation. |
| | | | | | | | | | | | | | **3.71** | | | | | | | | **0.76** | **6767** | **6783** | **3392** | |
| S-32+002.8 | 16-Feb-11 | 136.56 | -- | -- | 14.57 | 1.43 | 16.00 | N | | 16-Feb-11 | 15.67 | 14.54 | 1.13 | 1:1 | 9:58 | 10:03 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 1980 | -- | |
| | | | | | | | | | | | 14.54 | 10.88 | 3.66 | 1:1 | 10:06 | 10:21 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 6023 | -- | Ran out of grout at 10.88 m; grouting terminated. |
| | | | | | | | | | | | | | **4.79** | | | | | | | | **0.76** | **8740** | **8002** | **4001** | Grout Temperature: 10.0°C |
| S-32+004.5 | 16-Feb-11 | 136.55 | -- | -- | 13.78 | 1.49 | 15.27 | N | Depth sensor re-zeroed at 4.4 m, lost accuracy slightly. | 17-Feb-11 | 14.60 | 14.38 | 0.21 | 1:1 | 9:59 | 10:00 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 1105 | -- | Pressure drop at 14.4 m, no reason noted. |
| | | | | | | | | | | | 14.38 | 11.48 | 2.90 | 1:1 | 10:02 | 10:13 | 16 | 403.3 | 304.8 | 420.2 | -- | -- | 4429 | -- | Grout Temperature: 13.0°C |
| | | | | | | | | | | | 11.48 | 10.59 | 0.89 | 1:1 | 10:17 | 10:20 | 16 | 403.3 | 304.8 | 412.6 | -- | -- | 1620 | -- | Neat grout samples taken. |
| | | | | | | | | | | | | | **4.01** | | | | | | | | **0.76** | **7317** | **7154** | **3577** | Marsh: 29.1 s, Density: 1.44 g/cc, Grout Temp: 11.5°C |
| S-32+006.2 | 17-Feb-11 | 136.53 | -- | -- | 14.60 | 1.87 | 16.47 | N | | 17-Feb-11 | 15.86 | 14.42 | 1.44 | 1:1 | 13:55 | 13:59 | 16 | 389.6 | 304.8 | 416.4 | -- | -- | 2245 | -- | Communicated to S-32+004.5 from 15.1 to 14.0 m. |
| | | | | | | | | | | | 14.42 | 11.41 | 3.02 | 1:1 | 14:03 | 14:13 | 16 | 389.6 | 304.8 | 420.2 | -- | -- | 4929 | -- | Grout Temperature: 11.4°C |
| | | | | | | | | | | | 11.41 | 10.07 | 1.34 | 1:1 | 14:19 | 14:24 | 16 | 396.4 | 304.8 | 420.2 | -- | -- | 2438 | -- | |
| | | | | | | | | | | | | | **5.79** | | | | | | | | **0.76** | **10570** | **9611** | **4806** | |

**TABLE E2-3.5**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 1**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-32+009.6 | 17-Jan-11 | 136.13 | 9.30 | 13.01 | 15.12 | 0.52 | 15.64 | N | | 17-Jan-11 | 15.27 | 14.23 | 1.04 | 1:1 | 23:53 | 23:59 | 16 | 406.8 | 304.8 | 439.1 | -- | -- | 2086 | -- | Both nozzles clogged; cleaned and re-entered for second draw. |
| | | | | | | | | | | | 14.23 | 11.31 | 2.91 | 1:1 | 0:54 | 1:07 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 5576 | -- | Communicated slightly to 32+007.2 from 14.35 m to end of hole. |
| | | | | | | | | | | | 11.31 | 9.28 | 2.03 | 1:1 | 1:09 | 1:20 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 4020 | -- | Single nozzle briefly plugged at which time half pull-rate was used. |
| | | | | | | | | | | | | | **5.99** | | | | | | | | **0.76** | **10920** | **11682** | **5841** | |
| P-32+012 | 17-Jan-11 | 136.21 | 9.45 | 13.72 | 16.22 | 0.93 | 17.15 | N | | 17-Jan-11 | 16.28 | 14.35 | 1.93 | 1:1 | 4:35 | 4:43 | 16 | 393.0 | 304.8 | 435.3 | -- | -- | 4202 | -- | |
| | | | | | | | | | | | 14.35 | 11.36 | 2.99 | 1:1 | 4:47 | 4:59 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 5618 | -- | |
| | | | | | | | | | | | 11.36 | 9.45 | 1.91 | 1:1 | 5:06 | 5:12 | 16 | 406.8 | 152.4 | 230.9 | -- | -- | 2877 | -- | Nozzle plugged; used half pull rate. |
| | | | | | | | | | | | | | **6.83** | | | | | | | | **0.76** | **12454** | **12696** | **6348** | |
| P-32+014.4 | 17-Jan-11 | 136.16 | -- | 10.67 | 16.40 | 0.69 | 17.09 | N | | 18-Jan-11 | 16.06 | 15.98 | 0.09 | 1:1 | 9:48 | 9:48 | 16 | 351.6 | 152.4 | 363.4 | -- | -- | 553 | -- | Nozzle clogged; used half pull rate |
| | | | | | | | | | | | 15.98 | 14.39 | 1.59 | 1:1 | 9:53 | 10:03 | 16 | 406.8 | 152.4 | 227.1 | -- | -- | 2430 | -- | Grout temperature: 18.4°C |
| | | | | | | | | | | | 14.39 | 11.28 | 3.11 | 1:1 | 10:07 | 10:24 | 16 | 406.8 | 152.4 | 227.1 | -- | -- | 4213 | -- | |
| | | | | | | | | | | | | | **4.78** | | | | | | | | **0.76** | **8724** | **7196** | **3598** | |
| P-32+016.8 | 18-Jan-11 | 136.36 | -- | 13.11 | 16.68 | 0.85 | 17.54 | N | | 18-Jan-11 | 17.09 | 16.02 | 1.07 | 1:1 | 4:20 | 4:23 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 1817 | -- | Grout temperature: 17.3°C |
| | | | | | | | | | | | 16.02 | 14.54 | 1.48 | 1:1 | 4:28 | 4:33 | 16 | 399.9 | 304.8 | 435.3 | -- | -- | 2366 | -- | |
| | | | | | | | | | | | 14.51 | 12.16 | 2.35 | 1:1 | 5:42 | 5:50 | 16 | 399.9 | 304.8 | 435.3 | -- | -- | 3816 | -- | Double nozzle clogged; cleaned (1 hr) |
| | | | | | | | | | | | | | **4.90** | | | | | | | | **0.76** | **8929** | **7999** | **3999** | |
| P-32+019.2 | 18-Jan-11 | 136.33 | 10.49 | 12.68 | 16.22 | 0.98 | 17.19 | N | | 18-Jan-11 | 16.75 | 14.36 | 2.39 | 1:1 | 20:43 | 20:52 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 4119 | -- | Grout temperature: 21.1°C |
| | | | | | | | | | | | 14.36 | 11.40 | 2.96 | 1:1 | 20:55 | 21:08 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 5300 | -- | Communicated to P-32+016.8 |
| | | | | | | | | | | | 11.40 | 9.59 | 1.81 | 1:1 | 21:12 | 21:25 | 16 | 372.3 | 152.4 | 227.1 | -- | -- | 2998 | -- | Nozzle clogged; used half pull rate |
| | | | | | | | | | | | | | **7.17** | | | | | | | | **0.76** | **13072** | **12416** | **6208** | |
| P-32+021.6 | 20-Jan-11 | 136.35 | -- | 12.44 | 16.40 | 1.16 | 17.56 | N | | 20-Jan-11 | 16.58 | 16.31 | 0.27 | 1:1 | 10:14 | 10:15 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 1079 | -- | |
| | | | | | | | | | | | 16.31 | 16.18 | 0.13 | 1:1 | 10:16 | 10:17 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 413 | -- | Issues with pump experienced during draws 2 - 5 |
| | | | | | | | | | | | 16.26 | 16.13 | 0.13 | 1:1 | 10:21 | 10:21 | 16 | 379.2 | 304.8 | 412.6 | -- | -- | 515 | -- | |
| | | | | | | | | | | | 16.13 | 15.86 | 0.27 | 1:1 | 10:27 | 10:28 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 890 | -- | |
| | | | | | | | | | | | 16.03 | 16.03 | 0.00 | 1:1 | 10:38 | 10:38 | -- | -- | -- | -- | -- | -- | 678 | -- | |
| | | | | | | | | | | | 16.03 | 15.16 | 0.87 | 1:1 | 10:53 | 10:56 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 1949 | -- | Line required cleaning at 3744 L injected |
| | | | | | | | | | | | 15.16 | 14.39 | 0.77 | 1:1 | 10:58 | 11:01 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 1442 | -- | Issues with pump; plugged |
| | | | | | | | | | | | 14.39 | 11.45 | 2.94 | 1:1 | 11:06 | 11:24 | 16 | 413.7 | 152.4 | 227.1 | -- | -- | 4535 | -- | Single nozzle plugged; used half pull rate |
| | | | | | | | | | | | | | **5.38** | | | | | | | | **0.76** | **9819** | **11500** | **5750** | |
| P-32+024 | 20-Jan-11 | 136.36 | -- | 11.31 | 16.79 | 1.24 | 18.03 | N | Communicated to P-32+021.6 | 20-Jan-11 | 17.07 | 14.45 | 2.62 | 1:1 | 15:28 | 15:36 | 16 | 406.8 | 304.8 | 435.3 | -- | -- | 1817 | -- | |
| | | | | | | | | | | | 14.45 | 11.36 | 3.10 | 1:1 | 15:40 | 15:50 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 6749 | -- | |
| | | | | | | | | | | | 11.36 | 10.37 | 0.99 | 1:1 | 15:59 | 16:01 | 16 | 413.7 | 152.4 | 234.7 | -- | -- | 1666 | -- | Communicated to P-32+021.6 throughout length of column |
| | | | | | | | | | | | | | **6.70** | | | | | | | | **0.76** | **12221** | **10232** | **5116** | |
| P-32+026.4 | 20-Jan-11 | 136.38 | 8.38 | 10.55 | 16.76 | 1.25 | 18.01 | N | | 20-Jan-11 | 17.07 | 14.42 | 2.65 | 1:1 | 19:14 | 19:23 | 16 | 420.6 | 304.8 | 442.9 | -- | -- | 4542 | -- | Grout temperature: 8.3°C |
| | | | | | | | | | | | 14.42 | 11.42 | 3.00 | 1:1 | 19:29 | 19:39 | 16 | 365.4 | 304.8 | 408.8 | -- | -- | 4550 | -- | Nozzle plugged briefly at 5890 L |
| | | | | | | | | | | | 11.42 | 9.52 | 1.91 | 1:1 | 19:43 | 19:50 | 16 | 386.1 | 304.8 | 424.0 | -- | -- | 2937 | -- | |
| | | | | | | | | | | | 9.52 | 8.38 | 1.14 | 1:1 | 20:07 | 20:14 | 16 | 399.9 | 304.8 | 439.1 | -- | -- | 2850 | -- | Grout temperature: 2.2°C |
| | | | | | | | | | | | | | **8.69** | | | | | | | | **0.76** | **15857** | **14880** | **7440** | |
| P-32+028.8 | 20-Jan-11 | 136.35 | 10.97 | 11.89 | 16.76 | 1.52 | 18.29 | N | Communicated to P-32+026.4 | 20-Jan-11 | 17.47 | 14.44 | 3.04 | 1:1 | 2:44 | 2:55 | 16 | 393.0 | 304.8 | 431.5 | -- | -- | 4936 | -- | Grout temperature: 16.7°C |
| | | | | | | | | | | | 14.44 | 11.44 | 2.99 | 1:1 | 2:58 | 3:18 | 16 | 399.9 | 152.4 | 234.7 | -- | -- | 4512 | -- | Single nozzle plugged; used half pull rate |
| | | | | | | | | | | | 11.43 | 10.06 | 1.37 | 1:1 | 3:21 | 3:31 | 16 | 399.9 | 152.4 | 227.1 | -- | -- | 2101 | -- | |
| | | | | | | | | | | | | | **7.40** | | | | | | | | **0.76** | **13500** | **11549** | **5775** | |

**TABLE E2-3.5**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 1**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-32+031.2 | 20-Jan-11 | 136.30 | 8.17 | 11.64 | 18.96 | 1.25 | 20.21 | N | | 21-Jan-11 | 19.31 | 17.47 | 1.83 | 1:1 | 12:46 | 12:51 | 16 | 393.0 | 304.8 | 446.7 | -- | -- | 3356 | -- | Grout temperature: 19°C |
| | | | | | | | | | | | 17.47 | 14.40 | 3.07 | 1:1 | 13:47 | 13:57 | 16 | 399.9 | 304.8 | 435.3 | -- | -- | 5061 | -- | Nozzles clogged prior to second draw; cleaned out and re-entered hole |
| | | | | | | | | | | | 14.40 | 11.42 | 2.98 | 1:1 | 14:02 | 14:13 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 1311 | -- | |
| | | | | | | | | | | | 11.42 | 8.27 | 3.15 | 1:1 | 14:19 | 14:29 | 16 | 413.7 | 304.8 | 435.3 | -- | -- | 8277 | -- | Communicated to P-32+028.8 from 14.40 to 8.27 m |
| | | | | | | | | | | | | | **11.04** | | | | | | | | **0.76** | **20133** | **18006** | **9003** | |
| P-32+033.6 | 21-Jan-11 | 136.30 | 8.99 | 12.56 | 19.81 | 1.34 | 21.15 | N | Communicated to P-32+031.2 | 21-Jan-11 | 19.97 | 17.41 | 2.57 | 1:1 | 18:10 | 18:18 | 16 | 413.7 | 304.8 | 442.9 | -- | -- | 4024 | -- | Communicated to P-32+031.2 from 19.97 to 9.0 m |
| | | | | | | | | | | | 17.41 | 14.48 | 2.93 | 1:1 | 18:26 | 18:42 | 16 | 420.6 | 152.4 | 234.7 | -- | -- | 4614 | -- | Nozzle plugged; used half pull rate for remainder of hole |
| | | | | | | | | | | | 14.48 | 11.53 | 2.95 | 1:1 | 18:47 | 19:06 | 16 | 413.7 | 152.4 | 230.9 | -- | -- | 4399 | -- | |
| | | | | | | | | | | | 11.53 | 9.00 | 2.53 | 1:1 | 19:11 | 19:27 | 16 | 406.8 | 152.4 | 230.9 | -- | -- | 4213 | -- | |
| | | | | | | | | | | | | | **10.98** | | | | | | | | **0.76** | **20022** | **17250** | **8625** | |
| P-32+036 | 22-Jan-11 | 136.68 | 12.19 | 16.76 | 19.98 | 1.23 | 21.21 | N | | 23-Jan-11 | 19.78 | 19.57 | -- | 1:1 | 9:14 | 9:15 | 16 | 413.7 | 152.4 | 242.3 | -- | -- | 901 | -- | Nozzle plugged; use half pull rate. |
| | | | | | | | | | | | 20.55 | 20.39 | -- | 1:1 | 10:29 | 10:30 | 16 | -- | 152.4 | 253.6 | -- | -- | 946 | -- | Hose blown, lowered and re-started. |
| | | | | | | | | | | | 20.55 | 17.49 | 3.06 | 1:1 | 11:13 | 11:31 | 16 | 399.9 | 152.4 | 230.9 | -- | -- | 4539 | -- | Pump and water valve broken; restart again. Nozzle plugged; used half pull rate for remainder of hole. |
| | | | | | | | | | | | 17.49 | 14.42 | 3.07 | 1:1 | 11:36 | 11:54 | 16 | 406.8 | 152.4 | 230.9 | -- | -- | 4690 | -- | |
| | | | | | | | | | | | 14.42 | 11.88 | 2.54 | 1:1 | 11:59 | 12:16 | 16 | 406.8 | 152.4 | 230.9 | -- | -- | 4043 | -- | Grout temperature: 6.1°C |
| | | | | | | | | | | | | | **8.67** | | | | | | | | **0.76** | **15818** | **15119** | **7559** | |
| P-32+038.4 | 23-Jan-11 | 136.47 | 12.04 | 12.65 | 20.88 | 1.25 | 22.13 | N | Communicated to P-32+036 | 23-Jan-11 | 21.06 | 20.36 | 0.70 | 1:1 | 16:47 | 16:49 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 1590 | -- | Nozzle briefly plugged. |
| | | | | | | | | | | | 20.36 | 17.35 | 3.01 | 1:1 | 16:54 | 17:04 | 16 | 399.9 | 304.8 | 427.8 | -- | -- | 4800 | -- | |
| | | | | | | | | | | | 17.35 | 14.37 | 2.97 | 1:1 | 17:11 | 17:20 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 5012 | -- | |
| | | | | | | | | | | | 14.37 | 11.88 | 2.50 | 1:1 | 17:25 | 17:33 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 4096 | -- | Grout temperature: 19°C |
| | | | | | | | | | | | | | **9.18** | | | | | | | | **0.76** | **16752** | **15497** | **7749** | |
| P-32+040.8 | 23-Jan-11 | 136.47 | 10.06 | 13.59 | 22.33 | 0.30 | 22.63 | N | Communicated to P-32+038.4 | 24-Jan-11 | 22.34 | 20.58 | 1.76 | 1:1 | 13:01 | 13:06 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 3006 | -- | Grout temperature: 15.3°C |
| | | | | | | | | | | | 20.58 | 17.57 | 3.01 | 1:1 | 13:10 | 13:20 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 4607 | -- | |
| | | | | | | | | | | | 17.57 | 14.53 | 3.04 | 1:1 | 13:24 | 13:43 | 16 | 399.9 | 152.4 | 227.1 | -- | -- | 4558 | -- | Nozzle plugged; used half pull rate for remainder of hole |
| | | | | | | | | | | | 14.53 | 11.56 | 2.97 | 1:1 | 13:48 | 14:06 | 16 | 406.8 | 152.4 | 227.1 | -- | -- | 4459 | -- | |
| | | | | | | | | | | | 11.56 | 10.54 | 1.01 | 1:1 | 14:10 | 14:17 | 16 | 413.7 | 152.4 | 230.9 | -- | -- | 1753 | -- | |
| | | | | | | | | | | | | | **11.80** | | | | | | | | **0.76** | **21523** | **18382** | **9191** | |
| P-32+043.2 | 22-Feb-11 | 136.41 | 10.73 | 11.23 | 18.51 | 1.30 | 19.81 | N | | 22-Feb-11 | 19.20 | 17.59 | 1.61 | 1:1 | 15:22 | 15:27 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 2767 | -- | |
| | | | | | | | | | | | 17.60 | 14.61 | 2.99 | 1:1 | 16:58 | 17:09 | 16 | 396.4 | 304.8 | 427.8 | -- | -- | 5061 | -- | Grout Temperature: 19.8°C |
| | | | | | | | | | | | 14.62 | 12.54 | 2.08 | 1:1 | 17:14 | 17:21 | 16 | 413.7 | 304.8 | 439.1 | -- | -- | 3581 | -- | |
| | | | | | | | | | | | 12.57 | 11.23 | 1.34 | 1:1 | 18:22 | 18:27 | 16 | 413.7 | 304.8 | 439.1 | -- | -- | 2495 | -- | Ran out of grout. Nozzle clogged. |
| | | | | | | | | | | | | | **8.06** | | | **28** | | | | | **0.76** | **14695** | **13904** | **6952** | |
| P-32+045.6 | 22-Feb-11 | 136.38 | -- | 12.95 | 18.62 | 1.09 | 19.71 | N | | 22-Feb-11 | 18.90 | 18.73 | 0.16 | 1:1 | 22:35 | 22:36 | 16 | 406.8 | 304.8 | 446.7 | -- | -- | 757 | -- | Tricone caught at bedrock at bottom, released manually up to 18.73 m. |
| | | | | | | | | | | | 18.73 | 17.60 | 1.13 | 1:1 | 22:36 | 22:40 | 16 | 406.8 | 304.8 | 446.7 | -- | -- | 1772 | -- | Lost pressure on initial start-up. |
| | | | | | | | | | | | 17.60 | 15.13 | 2.47 | 1:1 | 22:45 | 22:55 | 16 | 399.9 | 304.8 | 442.9 | -- | -- | 4849 | -- | Pressure drop at 15.13 m, batching grout. |
| | | | | | | | | | | | 15.13 | 14.47 | 0.66 | 1:1 | 1:50 | 1:54 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 2960 | -- | Communicated to P-32+043.2 from 18.9 to 14.5 m. |
| | | | | | | | | | | | 14.47 | 11.44 | 3.04 | 1:1 | 2:01 | 2:15 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 6473 | -- | Grout Temperature: 12.8°C |
| | | | | | | | | | | | | | **7.46** | | | **33** | | | | | **0.76** | **13605** | **16054** | **8027** | Marsh: 29.5 s, Density: 1.50 g/cc, Grout Temp: 10.0°C |
| P-32+048 | 22-Feb-11 | 136.36 | 12.59 | 12.89 | 19.75 | 1.28 | 21.03 | N | | 25-Feb-11 | 19.87 | 19.40 | 0.47 | 1:1 | 15:56 | 15:58 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1083 | -- | Cement hopper screen plugged. Restart. |
| | | | | | | | | | | | 19.40 | 18.39 | 1.01 | 1:1 | 16:01 | 16:05 | 16 | 403.3 | 304.8 | 427.8 | -- | -- | 2120 | -- | Cement hopper screen plugged. Restart. |
| | | | | | | | | | | | 18.39 | 17.44 | 0.94 | 1:1 | 16:07 | 16:11 | 16 | 393.0 | 304.8 | 425.9 | -- | -- | 1984 | -- | |
| | | | | | | | | | | | 17.44 | 16.26 | 1.19 | 1:1 | 16:16 | 16:21 | 16 | 393.0 | 304.8 | 412.6 | -- | -- | 2498 | -- | Grout Temperature: 18.5°C |
| | | | | | | | | | | | 16.26 | 14.42 | 1.84 | 1:1 | 16:23 | 16:32 | 16 | 396.4 | 304.8 | 420.2 | -- | -- | 3713 | -- | Cement hopper screen plugged. Restart. |
| | | | | | | | | | | | 14.42 | 11.32 | 3.10 | 1:1 | 16:37 | 16:50 | 16 | 386.1 | 304.8 | 416.4 | -- | -- | 5936 | -- | |
| | | | | | | | | | | | | | **8.55** | | | **52** | | | | | **0.76** | **15601** | **17333** | **8667** | |

**TABLE E2-3.5**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 1**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-32+050.4 | 25-Feb-11 | 136.30 | -- | 11.43 | 20.12 | 1.25 | 21.37 | N | | 25-Feb-11 | 20.42 | 17.41 | 3.01 | 1:1 | 22:07 | 22:20 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 6132 | -- | Nozzles plugged. Restart required |
| | | | | | | | | | | | 17.41 | 14.44 | 2.97 | 1:1 | 22:38 | 23:01 | 16 | 372.3 | 152.4 | 227.1 | -- | -- | 5924 | -- | Communication to S-32+0492 |
| | | | | | | | | | | | 14.44 | 11.34 | 3.10 | 1:1 | 0:45 | 1:00 | 16 | 386.1 | 304.8 | 420.2 | -- | -- | 6083 | -- | Grout Temperature: 14.4°C |
| | | | | | | | | | | | 11.34 | 10.08 | 1.26 | 1:1 | 1:07 | 1:19 | 16 | 399.9 | 152.4 | 230.9 | -- | -- | 2616 | -- | Nozzles plugged. Restart required |
| | | | | | | | | | | | | | **10.34** | | | **63** | | | | | **0.76** | **18865** | **20755** | **10378** | |
| P-32+052.8 | 25-Feb-11 | 136.28 | -- | 11.58 | 21.34 | 1.22 | 22.56 | N | | 26-Feb-11 | 21.41 | 20.59 | 0.82 | 1:1 | 6:16 | 6:24 | 16 | 372.3 | 152.4 | 227.1 | -- | -- | 1949 | -- | Nozzle plugged; used half pull rate. |
| | | | | | | | | | | | 20.59 | 17.57 | 3.02 | 1:1 | 6:30 | 6:53 | 16 | 406.8 | 152.4 | 238.5 | -- | -- | 5860 | -- | |
| | | | | | | | | | | | 17.57 | 17.37 | 0.19 | 1:1 | 9:02 | 9:03 | 16 | 393.0 | 304.8 | 227.1 | -- | -- | 757 | -- | |
| | | | | | | | | | | | 17.37 | 14.58 | 2.79 | 1:1 | 9:06 | 9:18 | 16 | 393.0 | 304.8 | 422.1 | -- | -- | 5515 | -- | |
| | | | | | | | | | | | 14.58 | 13.10 | 1.48 | 1:1 | 9:21 | 9:28 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 2983 | -- | Cement hopper screen plugged. Restart. |
| | | | | | | | | | | | 13.10 | 11.84 | 1.27 | 1:1 | 9:43 | 9:49 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 2725 | -- | Grout Temperature: 17.9°C; screen plugged. |
| | | | | | | | | | | | 11.84 | 11.55 | 0.28 | 1:1 | 10:09 | 10:11 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 1344 | -- | Screen plugged, two times. |
| | | | | | | | | | | | 11.55 | 10.03 | 1.52 | 1:1 | 10:14 | 10:21 | 16 | 399.9 | 304.8 | 425.9 | -- | -- | 3100 | -- | Rods tripped out to unplug. Restart. |
| | | | | | | | | | | | | | 7.531608 | | | 52 | | | | | 0.762 | 13738.756 | 24234.208 | 8212.4513 | |
| P-32+055.2 | 26-Feb-11 | 136.26 | -- | 12.34 | 21.40 | 1.32 | 22.71 | N | | 26-Feb-11 | 21.62 | 20.48 | 1.15 | 1:1 | 14:29 | 14:34 | 16 | 399.9 | 304.8 | 427.8 | -- | -- | 2514 | -- | Communicated to P-32+052.8. |
| | | | | | | | | | | | 20.48 | 17.53 | 2.95 | 1:1 | 14:38 | 14:51 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 5636 | -- | |
| | | | | | | | | | | | 17.53 | 14.47 | 3.05 | 1:1 | 15:48 | 16:02 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 6117 | -- | Nozzles clogged. Restart required. |
| | | | | | | | | | | | 14.47 | 12.77 | 1.70 | 1:1 | 16:06 | 16:13 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 3407 | -- | Grout Temperature: 14.9°C |
| | | | | | | | | | | | 12.77 | 10.97 | 1.80 | 1:1 | 16:28 | 16:36 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 3698 | -- | Ran out of grout. |
| | | | | | | | | | | | | | **10.65** | | | **47** | | | | | **0.76** | **19427** | **21372** | **10686** | |
| P-32+057.6 | 26-Feb-11 | 136.22 | -- | 11.70 | 21.37 | 0.96 | 22.33 | N | | 26-Feb-11 | 21.15 | 20.39 | 0.76 | 1:1 | 0:03 | 0:06 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 2313 | -- | |
| | | | | | | | | | | | 20.39 | 17.36 | 3.03 | 1:1 | 0:10 | 0:21 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 4656 | -- | |
| | | | | | | | | | | | 17.36 | 14.37 | 2.99 | 1:1 | 0:28 | 0:46 | 16 | 399.9 | 152.4 | 219.6 | -- | -- | 4406 | -- | Nozzle clogged. |
| | | | | | | | | | | | 14.37 | 10.37 | 4.00 | 1:1 | 0:49 | 1:15 | 16 | 406.8 | 152.4 | 196.8 | -- | -- | 5830 | -- | Nozzle clogged. |
| | | | | | | | | | | | | | **10.78** | | | **58** | | | | | **0.76** | **19660** | **17205** | **8602** | |
| P-32+060 | 26-Feb-11 | 136.21 | -- | 12.28 | 22.01 | 1.18 | 23.19 | | | 26-Feb-11 | 22.25 | 20.43 | 1.82 | 1:1 | 5:27 | 5:44 | 16 | 358.5 | 152.4 | 234.7 | -- | -- | 3804 | -- | Nozzle clogged. |
| | | | | | | | | | | | 20.43 | 17.45 | 2.98 | 1:1 | 5:48 | 6:11 | 16 | 406.8 | 152.4 | 219.6 | -- | -- | 5213 | -- | |
| | | | | | | | | | | | 17.45 | 14.55 | 2.90 | 1:1 | 6:15 | 6:32 | 16 | 399.9 | 152.4 | 215.8 | -- | -- | 4872 | -- | |
| | | | | | | | | | | | 14.40 | 14.39 | 0.01 | 1:1 | 6:49 | 6:52 | 16 | 372.3 | 152.4 | 181.7 | -- | -- | 273 | -- | |
| | | | | | | | | | | | 14.39 | 10.83 | 3.56 | 1:1 | 6:54 | 7:25 | 16 | 406.8 | 152.4 | 219.6 | -- | -- | 6322 | -- | Cement hopper screen plugged. Restart required. |
| | | | | | | | | | | | | | **11.27** | | | **91** | | | | | **0.76** | **20566** | **20483** | **10241** | |
| P-32+062.4 | 27-Feb-11 | 136.21 | -- | 12.50 | 21.46 | 1.19 | 22.65 | N | | 27-Feb-11 | 21.64 | 20.57 | 1.07 | 1:1 | 11:08 | 11:13 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 2748 | -- | |
| | | | | | | | | | | | 20.57 | 17.55 | 3.01 | 1:1 | 11:16 | 11:29 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 5822 | -- | Jet nozzle clogged at 17.54 m; used half pull rate. |
| | | | | | | | | | | | 17.55 | 14.54 | 3.01 | 1:1 | 11:31 | 11:56 | 16 | 399.9 | 152.4 | 227.1 | -- | -- | 5413 | -- | |
| | | | | | | | | | | | 14.54 | 10.97 | 3.57 | 1:1 | 12:00 | 12:27 | 16 | 399.9 | 152.4 | 223.3 | -- | -- | 6394 | -- | Grout Temperature: 15.5°C |
| | | | | | | | | | | | | | **6.59** | | | **70** | | | | | **0.76** | **12015** | **20377** | **10188** | |
| P-32+064.8 | 27-Feb-11 | 136.33 | -- | 12.50 | 21.43 | 1.18 | 22.60 | N | | 27-Feb-11 | 21.64 | 20.57 | 1.07 | 1:1 | 16:48 | 16:52 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 2252 | -- | |
| | | | | | | | | | | | 20.57 | 17.55 | 3.02 | 1:1 | 16:46 | 17:09 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 5705 | -- | |
| | | | | | | | | | | | 17.55 | 14.47 | 3.07 | 1:1 | 17:12 | 17:16 | 16 | 389.6 | 304.8 | 420.2 | -- | -- | 5830 | -- | |
| | | | | | | | | | | | 14.47 | 10.95 | 3.53 | 1:1 | 17:30 | 17:45 | 16 | 386.1 | 304.8 | 420.2 | -- | -- | 6768 | -- | Grout Temperature: 14.8°C |
| | | | | | | | | | | | | | **10.70** | | | **46** | | | | | **0.76** | **19516** | **20555** | **10277** | |
| P-32+067.2 | 01-Apr-11 | 136.60 | -- | 12.65 | 20.97 | 1.22 | 22.19 | N | | 01-Apr-11 | 21.35 | 20.64 | 0.70 | 1:1 | 18:01 | 18:04 | 16 | 386.1 | 304.8 | 424.0 | -- | -- | 1579 | -- | Tricone caught at 21.3 m; released manually. |
| | | | | | | | | | | | 20.64 | 17.62 | 3.02 | 1:1 | 18:09 | 18:19 | 16 | 393.0 | 304.8 | 427.8 | -- | -- | 4622 | -- | Grout Temperature: 16.8°C |
| | | | | | | | | | | | 17.62 | 14.62 | 3.00 | 1:1 | 18:23 | 18:43 | 16 | 413.7 | 152.4 | 223.3 | -- | -- | 4577 | -- | Nozzle plugged; used half pull rate |
| | | | | | | | | | | | 14.62 | 11.20 | 3.43 | 1:1 | 18:47 | 19:09 | 16 | 386.1 | 152.4 | 219.6 | -- | -- | 5046 | -- | |
| | | | | | | | | | | | | | **10.15** | | | | | | | | **0.76** | **18520** | **15823** | **7912** | |

**TABLE E2-3.5**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 1**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-32+069.6 | 01-Apr-11 | 136.52 | -- | 12.25 | 20.60 | 1.23 | 21.83 | N | Difficult trip out of rods; re-drilled with hammer prior to commencing jet grouting. | 01-Apr-11 | 20.43 | 17.37 | 3.06 | 1:1 | 2:49 | 3:01 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 5504 | -- | Grout Temperature: 20.6°C |
| | | | | | | | | | | | 17.37 | 14.32 | 3.05 | 1:1 | 3:14 | 3:37 | 16 | 413.7 | 152.4 | 225.2 | -- | -- | 4826 | -- | Nozzle plugged; used half pull rate |
| | | | | | | | | | | | 14.32 | 10.70 | 3.62 | 1:1 | 3:42 | 4:08 | 16 | 413.7 | 152.4 | 224.1 | -- | -- | 5833 | -- | |
| | | | | | | | | | | | | | **9.73** | | | | | | | | **0.76** | **17742** | **16164** | **8082** | |
| P-32+072 | 01-Apr-11 | 136.47 | -- | 12.81 | 21.61 | 1.10 | 22.71 | N | Potential boulders on top of bedrock / highly fractured bedrock from 20.9 - 21.6 m. | 02-Apr-11 | 21.94 | 21.34 | 0.60 | 1:1 | 9:35 | 9:37 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1344 | -- | |
| | | | | | | | | | | | 21.34 | 20.55 | 0.79 | 1:1 | 9:39 | 9:42 | 15 | 399.9 | 304.8 | 420.2 | -- | -- | 1310 | -- | Tricone caught at 21.34 m; released manually |
| | | | | | | | | | | | 20.55 | 20.45 | 0.10 | 1:1 | 9:47 | 9:47 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 447 | -- | Rotation slowed to 15 RPM from 21.34 to 20.55 m. |
| | | | | | | | | | | | 20.45 | 17.53 | 2.91 | 1:1 | 9:48 | 9:59 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4645 | -- | Tricone caught at 20.45 m; released manually |
| | | | | | | | | | | | 17.53 | 14.55 | 2.98 | 1:1 | 10:03 | 10:15 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 5288 | -- | Grout Temperature: 27.2°C |
| | | | | | | | | | | | 14.55 | 11.26 | 3.29 | 1:1 | 11:00 | 11:14 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 6204 | -- | Both nozzles clogged at 14.55 m; tripped out rods. |
| | | | | | | | | | | | | | **10.68** | | | | | | | | **0.76** | **19482** | **19237** | **9619** | |
| P-32+074.4 | 02-Apr-11 | 136.50 | -- | 12.62 | 18.75 | 1.28 | 20.03 | N | | 02-Apr-11 | 19.06 | 18.98 | 0.08 | 1:1 | 14:36 | 14:37 | 16 | 365.4 | 304.8 | 408.8 | -- | -- | 530 | -- | Tricone caught at 19.06 m, released manually to 18.81 m. |
| | | | | | | | | | | | 18.98 | 18.81 | 0.17 | 1:1 | 14:38 | 14:39 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 587 | -- | Communicated to P-32+072.0 and P-32+069.8 from bottom to top of column |
| | | | | | | | | | | | 18.81 | 17.47 | 1.34 | 1:1 | 14:39 | 14:45 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 2230 | -- | |
| | | | | | | | | | | | 17.47 | 14.44 | 3.03 | 1:1 | 14:49 | 15:01 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 5421 | -- | Grout Temperature: 16.9°C |
| | | | | | | | | | | | 14.44 | 10.97 | 3.47 | 1:1 | 15:52 | 16:07 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 6515 | -- | Both nozzles clogged at 14.44 m; tripped out rods. |
| | | | | | | | | | | | | | **8.10** | | | | | | | | **0.76** | **14767** | **15282** | **7641** | |
| P-32+076.8 | 02-Apr-11 | 136.62 | -- | 12.92 | 20.06 | 1.25 | 21.31 | N | Lost return at 16.8 m. Some return back between 18.9 m to ~20.7 m. All return back at ~20.7 m. | 02-Apr-11 | 20.21 | 17.61 | 2.60 | 1:1 | 18:52 | 19:04 | 16 | 413.7 | 304.8 | 424.0 | -- | -- | 4770 | -- | Communicated to P-32+074.4 |
| | | | | | | | | | | | 17.62 | 17.61 | 0.01 | 1:1 | 19:08 | 19:11 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 912 | -- | Return lost at 19.17 m |
| | | | | | | | | | | | 17.44 | 17.33 | 0.11 | 1:1 | 19:12 | 19:14 | 16 | 399.9 | #VALUE! | 420.2 | -- | -- | 780 | -- | Tricone caught at 17.44 m; released manually. |
| | | | | | | | | | | | 17.38 | 14.64 | 2.74 | 1:1 | 19:21 | 19:33 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4895 | -- | Water return back at 16.76 m |
| | | | | | | | | | | | 14.63 | 11.37 | 3.26 | 1:1 | 19:38 | 19:54 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 6730 | -- | Grout Temperature: 20°C |
| | | | | | | | | | | | | | **8.72** | | | | | | | | **0.76** | **15913** | **18087** | **9043** | |
| P-32+079.2 | 03-Apr-11 | 136.92 | -- | 12.60 | 19.51 | 1.28 | 20.79 | N | 100% return observed outside of casing at 19.36 m. Communicated to 32+076.8. | 03-Apr-11 | 19.67 | 18.18 | 1.48 | 1:1 | 13:48 | 14:03 | 16 | 399.9 | 152.4 | 227.1 | -- | -- | 2813 | -- | Pull all rods - grout in airline. Trip-out of hole - reset. |
| | | | | | | | | | | | 18.18 | 17.71 | 0.47 | 1:1 | 16:00 | 16:02 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 1397 | -- | Tricone caught at 18.09 m and 16.97 m; released manually. |
| | | | | | | | | | | | 17.71 | 14.68 | 3.03 | 1:1 | 16:06 | 16:19 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 5436 | -- | Irregular return from hole and not communicating. |
| | | | | | | | | | | | 14.68 | 11.05 | 3.63 | 1:1 | 16:22 | 16:38 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 6477 | -- | Grout Temperature: 22.4°C |
| | | | | | | | | | | | | | **8.62** | | | | | | | | **0.76** | **15718** | **16122** | **8061** | |
| P-32+081.6 | 03-Apr-11 | 136.92 | -- | 13.17 | 16.37 | 3.40 | 19.77 | N | Drilling very hard at approximately 17.4 m but water return did not change to regular grey. Drilled to 19.8 m as driller thought a boulder was present. | 04-Apr-11 | 17.56 | 14.49 | 3.06 | 1:1 | 5:37 | 5:52 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 6113 | -- | Bedrock at 17.4 m. Bit caught between 15.8 and 16.2 m. |
| | | | | | | | | | | | 14.49 | 11.64 | 2.85 | 1:1 | 5:56 | 6:10 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 5640 | -- | Grout Temperature: 16.7°C at 16.5 m. |
| | | | | | | | | | | | | | **5.91** | | | | | | | | **0.76** | **10786** | **11754** | **5877** | |
| P-32+084 | 05-Apr-11 | 136.83 | -- | 12.59 | 18.87 | 0.87 | 19.74 | N | Communicated to P-31+081.6 | 05-Apr-11 | 17.62 | 16.95 | 0.67 | 1:1 | 13:21 | 13:25 | 16 | 386.1 | 304.8 | 412.6 | -- | -- | 2158 | -- | Continual hole collapse; could not get tricone down to full depth. |
| | | | | | | | | | | | 16.95 | 16.61 | 0.34 | 1:1 | 13:25 | 13:26 | 16 | 386.1 | Manual | 412.6 | -- | -- | 189 | -- | Withdrawl would not stop; driller pushed rods back down. |
| | | | | | | | | | | | 16.61 | 14.55 | 2.07 | 1:1 | 13:26 | 13:35 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 3770 | -- | |
| | | | | | | | | | | | 14.55 | 11.03 | 3.51 | 1:1 | 13:39 | 13:54 | 16 | 386.1 | 304.8 | 420.2 | -- | -- | 6015 | -- | Grout Temperature: 19.9°C at 12.2 m. |
| | | | | | | | | | | | | | **6.58** | | | | | | | | **0.76** | **12010** | **12132** | **6066** | |
| P-32+086.4 | 05-Apr-11 | 136.87 | -- | 10.67 | 15.76 | 0.97 | 16.73 | N | | 05-Apr-11 | 16.07 | 14.61 | 1.46 | 1:1 | 16:29 | 16:35 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 2525 | -- | |
| | | | | | | | | | | | 14.61 | 11.60 | 3.01 | 1:1 | 16:39 | 16:51 | 16 | 396.4 | 304.8 | 416.4 | -- | -- | 5160 | -- | Grout Temperature: 24.8°C at 12.2 m. |
| | | | | | | | | | | | 11.60 | 9.26 | 2.34 | 1:1 | 16:54 | 17:04 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 4100 | -- | |
| | | | | | | | | | | | | | **6.81** | | | | | | | | **0.76** | **12421** | **11784** | **5892** | |
| P-32+088.8 | 05-Apr-11 | 136.91 | -- | 11.09 | 15.61 | 1.19 | 16.79 | N | Ice in casing; boulder at 14.5 m | 05-Apr-11 | 16.09 | 14.61 | 1.48 | 1:1 | 18:25 | 18:31 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 3100 | -- | |
| | | | | | | | | | | | 14.61 | 11.56 | 3.05 | 1:1 | 18:35 | 18:49 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 5557 | -- | Nozzle clogged; used half pull rate. |
| | | | | | | | | | | | 11.56 | 10.14 | 1.42 | 1:1 | 18:53 | 19:04 | 16 | 420.6 | 152.4 | 227.1 | -- | -- | 2684 | -- | Grout Temperature: 21.1°C at 10.4 m. |
| | | | | | | | | | | | | | **5.94** | | | | | | | | **0.76** | **10842** | **11341** | **5671** | |

**TABLE E2-3.5**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 1**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| P-32+091.2 | 05-Apr-11 | 136.93 | -- | 10.03 | 15.97 | 1.43 | 17.40 | N | Ice in casing; boulder at 11.6 and 15.1 m | 05-Apr-11 | 16.31 | 14.55 | 1.76 | 1:1 | 0:27 | 0:34 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 3517 | -- | Grout Temp: 23.3°C at 14.6 m; Marsh: 31 s; Density: 1.53 g/cc. |
| | | | | | | | | | | | 14.55 | 11.54 | 3.01 | 1:1 | 0:40 | 1:03 | 16 | 413.7 | 152.4 | 223.3 | -- | -- | 4781 | -- | Nozzle clogged; used half pull rate |
| | | | | | | | | | | | 11.54 | 9.69 | 1.85 | 1:1 | 1:07 | 1:22 | 16 | 413.7 | 152.4 | 223.3 | -- | -- | 3373 | -- | Lost return at 12.2 m until 10.7 m; communication to P-32+092.4 at 11.6 m; communication to P-32+084 at bedrock interface. |
| | | | | | | | | | | | | | **6.62** | | | | | | | | **0.76** | **12071** | **11670** | **5835** | |
| P-32+093.6 | 05-Apr-11 | 136.94 | -- | 10.30 | 15.39 | 1.23 | 16.63 | N | | 06-Apr-11 | 15.70 | 14.51 | 1.18 | 1:1 | 8:32 | 8:37 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 2131 | -- | |
| | | | | | | | | | | | 14.51 | 11.47 | 3.04 | 1:1 | 8:41 | 8:53 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 5190 | -- | Communicated to P-32+092.4. |
| | | | | | | | | | | | 11.47 | 10.00 | 1.48 | 1:1 | 8:59 | 9:05 | 16 | 403.3 | 304.8 | 416.4 | -- | -- | 2612 | -- | Grout Temperature: 22.4°C |
| | | | | | | | | | | | 10.00 | 8.85 | 1.15 | 1:1 | 9:12 | 9:17 | 16 | 396.4 | 304.8 | 416.4 | -- | -- | 2233 | -- | Density: 1.54 g/cc |
| | | | | | | | | | | | | | **9.88** | | | | | | | | **0.76** | **18014** | **4845** | **10251** | |
| P-32+096 | 06-Apr-11 | 136.96 | -- | 9.88 | 14.66 | 1.22 | 15.88 | N | Ice in casing at 3.4 m. Some cobbles / boulders from 9.8 to 14.7 m within till. | 06-Apr-11 | 14.99 | 14.33 | 0.66 | 1:1 | 11:36 | 11:41 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 1450 | -- | Communicated to P-32+093.6 at 10.7 m. |
| | | | | | | | | | | | 14.33 | 11.31 | 3.02 | 1:1 | 11:44 | 11:56 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 5057 | -- | Grout Temperature: 19.9°C at 12.2 m. Both jets plugged at 11.31 m; pulled all rods out. |
| | | | | | | | | | | | 11.31 | 9.02 | 2.29 | 1:1 | 12:49 | 13:00 | 16 | 393.0 | 304.8 | 412.6 | -- | -- | 4156 | -- | |
| | | | | | | | | | | | | | **5.97** | | | | | | | | **0.76** | **10892** | **10728** | **5332** | Grout Temperature: 21.7°C at 9.8 m. |
| P-32+098.4 | 06-Apr-11 | 137.06 | -- | 10.23 | 14.98 | 1.26 | 16.25 | N | Mid-sized boulders within till. | 06-Apr-11 | 15.70 | 14.51 | 1.18 | 1:1 | 15:23 | 15:28 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 2161 | -- | During flushing and while waiting for grout to be batched, 378.5 L of coarse gravel was washed to surface. |
| | | | | | | | | | | | 14.51 | 11.53 | 2.99 | 1:1 | 15:32 | 15:54 | 16 | 413.7 | 152.4 | 223.3 | -- | -- | 4842 | -- | One jet plugged, reduced withdrawal and flow rates. Both jets plugged at 11.53 m; pulled all rods out. |
| | | | | | | | | | | | 11.53 | 8.84 | 2.69 | 1:1 | 16:32 | 16:44 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4879 | -- | |
| | | | | | | | | | | | | | **6.86** | | | | | | | | **0.76** | **12510** | **11882** | **5941** | Grout Temperature: 20.7°C at 11.9 m. |
| P-32+100.8 | 06-Apr-11 | 137.00 | -- | 9.72 | 13.55 | 1.24 | 14.80 | N | Mid-sized cobbles / boulders within till. Weathered bedrock at interface with till. More competent at 14 m. | 06-Apr-11 | 14.18 | 11.48 | 2.69 | 1:1 | 18:51 | 19:02 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 4645 | -- | Both jets plugged; pressured down / up to test. Pulled all rods. |
| | | | | | | | | | | | 11.48 | 11.18 | 0.30 | 1:1 | 18:49 | 18:53 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 1329 | -- | Grout Temperature: 23.3°C. |
| | | | | | | | | | | | 11.18 | 8.41 | 2.77 | 1:1 | 18:58 | 19:09 | 16 | 393.0 | 304.8 | 412.6 | -- | -- | 5125 | -- | Comminicated to P-32+093.6 at 11 m. |
| | | | | | | | | | | | | | **5.77** | | | | | | | | **0.76** | **10531** | **11099** | **5549** | Bleed (spoils) at 2 hrs: 1%. |
| P-32+103.2 | 06-Apr-11 | 137.05 | -- | 9.17 | 14.54 | 0.29 | 14.83 | N | | 06-Apr-11 | 13.80 | 11.15 | 2.65 | 1:1 | 22:51 | 23:04 | 16 | 393.0 | 304.8 | 427.8 | -- | -- | 5262 | -- | Grout Temperature: 15.6°C at 9.1 m. |
| | | | | | | | | | | | 11.15 | 8.34 | 2.81 | 1:1 | 23:07 | 23:20 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 5428 | -- | |
| | | | | | | | | | | | | | **5.46** | | | | | | | | **0.76** | **4832** | **10690** | **5345** | |
| P-32+105.6 | 06-Apr-11 | 137.00 | -- | 8.84 | 13.34 | 0.02 | 13.36 | N | Bedrock though competent, appeared to be softer than previous holes. | 06-Apr-11 | 12.89 | 11.25 | 1.64 | 1:1 | 1:56 | 2:04 | 16 | 399.9 | 304.8 | 427.8 | -- | -- | 3483 | -- | Communicated to 32+092.4 |
| | | | | | | | | | | | 11.25 | 8.98 | 2.28 | 1:1 | 2:08 | 2:18 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 4331 | -- | Grout Temperature: 22.4°C |
| | | | | | | | | | | | 8.98 | 7.96 | 1.02 | 1:1 | 2:28 | 2:34 | 16 | 399.9 | 304.8 | 431.5 | -- | -- | 2438 | -- | Density: 1.54 g/cc |
| | | | | | | | | | | | | | **4.94** | | | | | | | | **0.76** | **9007** | **10251** | **5125** | |
| S-32+007.9 | 17-Feb-11 | 136.55 | 9.91 | -- | 15.26 | 1.31 | 16.57 | N | | 17-Feb-11 | 16.08 | 14.40 | 1.68 | 1:1 | 17:51 | 17:57 | 16 | 389.6 | 304.8 | 408.8 | -- | -- | 2665 | -- | Grout Temperature: 20.7°C |
| | | | | | | | | | | | 14.40 | 11.36 | 3.05 | 1:1 | 18:00 | 18:11 | 16 | 399.9 | 304.8 | 408.8 | -- | -- | 4868 | -- | |
| | | | | | | | | | | | 11.36 | 9.89 | 1.47 | 1:1 | 18:16 | 18:21 | 16 | 403.3 | 304.8 | 416.4 | -- | -- | 2574 | -- | |
| | | | | | | | | | | | | | **6.19** | | | | | | | | **0.76** | **11298** | **10107** | **5054** | |
| S-32+010.8 | 17-Feb-11 | 136.60 | 10.06 | 13.50 | 16.03 | 1.22 | 17.25 | N | | 17-Feb-11 | 16.33 | 14.49 | 1.83 | 1:1 | 23:09 | 23:15 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 3161 | -- | Grout Temperature: 17.8°C |
| | | | | | | | | | | | 14.49 | 11.46 | 3.04 | 1:1 | 23:19 | 23:30 | 16 | 399.9 | 304.8 | 408.8 | -- | -- | 4902 | -- | No visible communication. |
| | | | | | | | | | | | 11.46 | 10.49 | 0.96 | 1:1 | 23:34 | 23:38 | 16 | 406.8 | 304.8 | 408.8 | -- | -- | 1628 | -- | Pump overheating at 10.5 m, kept low flow to avoid jets clogging while pump cooled (1060 L used). |
| | | | | | | | | | | | 10.49 | 9.17 | 1.33 | 1:1 | 23:54 | 23:59 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 3293 | -- | |
| | | | | | | | | | | | | | **5.32** | | | | | | | | **0.76** | **9713** | **12984** | **6492** | |
| S-32+013.2 | 17-Feb-11 | 136.60 | 10.67 | 13.17 | 16.58 | 1.22 | 17.80 | N | | 17-Feb-11 | 16.93 | 14.46 | 2.47 | 1:1 | 4:24 | 4:32 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 3956 | -- | Grout Temperature: 4.4 to 6.7°C throughout hole, limited hot water available, warm concrete and cold water were used for the majority of the hole. |
| | | | | | | | | | | | 14.46 | 11.45 | 3.02 | 1:1 | 4:37 | 4:48 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4974 | -- | No visible communication. |
| | | | | | | | | | | | 11.45 | 9.77 | 1.68 | 1:1 | 4:52 | 4:58 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 2843 | -- | Marsh: 31 s, Density: 1.54 g/cc, Grout Temp: 7.5°C |
| | | | | | | | | | | | | | **7.17** | | | | | | | | **0.76** | **13072** | **11773** | **5886** | |

Golder Associates

**TABLE E2-3.5**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 1**

AEM

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-32+015.6 | 17-Feb-11 | 136.61 | 10.06 | 12.62 | 15.03 | 1.52 | 16.55 | N | | 18-Feb-11 | 15.93 | 14.32 | 1.61 | 1:1 | 8:29 | 8:35 | 16 | 403.3 | 304.8 | 424.0 | -- | -- | 2725 | -- | |
| | | | | | | | | | | | 14.32 | 11.29 | 3.03 | 1:1 | 8:38 | 8:49 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 4963 | -- | Grout Temperature: 9.2°C |
| | | | | | | | | | | | 11.29 | 9.14 | 2.15 | 1:1 | 8:53 | 9:01 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 3592 | -- | No visible communication. |
| | | | | | | | | | | | | | **6.79** | | | | | | | | **0.76** | **12382** | **11281** | **5640** | |
| S-32+018.0 | 18-Feb-11 | 136.62 | 10.21 | 13.32 | 16.58 | 1.44 | 18.02 | N | | 18-Feb-11 | 16.91 | 14.48 | 2.43 | 1:1 | 22:54 | 23:03 | 16 | 399.9 | 304.8 | 405.0 | -- | -- | 4058 | -- | Tricone caught at 16.6 m, released manually. |
| | | | | | | | | | | | 14.48 | 11.46 | 3.03 | 1:1 | 23:07 | 23:18 | 16 | 399.9 | 304.8 | 408.8 | -- | -- | 4989 | -- | Grout Temperature: 18.6°C |
| | | | | | | | | | | | 11.46 | 9.21 | 2.24 | 1:1 | 23:30 | 23:38 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 3804 | -- | No visible communication. |
| | | | | | | | | | | | | | **7.70** | | | | | | | | **0.76** | **14039** | **12851** | **6426** | |
| S-32+020.4 | 18-Feb-11 | 136.57 | -- | -- | 16.40 | 1.25 | 17.65 | N | | 18-Feb-11 | 16.43 | 16.31 | 0.11 | 1:1 | 3:41 | 3:42 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1151 | -- | Tricone caught at bottom, released manually (265 L). |
| | | | | | | | | | | | 16.31 | 14.37 | 1.95 | 1:1 | 3:44 | 3:51 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 3460 | -- | Pressure drop at 16.3 m due to problems with pump. |
| | | | | | | | | | | | 14.37 | 11.38 | 2.99 | 1:1 | 3:55 | 4:06 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 4864 | -- | Communicated to S-32+018.0 for length of column. |
| | | | | | | | | | | | 11.38 | 10.42 | 0.96 | 1:1 | 4:10 | 4:13 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1821 | -- | Grout Temperature: 10°C |
| | | | | | | | | | | | | | **6.01** | | | | | | | | **0.76** | **10964** | **11296** | **5648** | |
| S-32+022.8 | 18-Feb-11 | 136.71 | -- | 12.68 | 16.73 | 1.28 | 18.01 | N | | 19-Feb-11 | 17.10 | 14.53 | 2.57 | 1:1 | 9:10 | 9:18 | 16 | 403.3 | 304.8 | 427.8 | -- | -- | 4172 | -- | Grout Temperature: 10.7°C |
| | | | | | | | | | | | 14.53 | 11.18 | 3.35 | 1:1 | 9:22 | 9:44 | 16 | 403.3 | 152.4 | 228.3 | -- | -- | 5231 | -- | Nozzle clogged at 14.54 m; used half pull rate. |
| | | | | | | | | | | | | | **5.92** | | | | | | | | **0.76** | **10798** | **9403** | **4701** | Communicated to S-32+018.0 from 16.3 to 11.2 m. |
| S-32+025.2 | 19-Feb-11 | 136.72 | 9.88 | 11.70 | 16.73 | 1.28 | 18.01 | N | | 19-Feb-11 | 17.16 | 17.07 | 0.09 | 1:1 | 13:19 | 13:19 | 16 | 393.0 | 304.8 | 401.3 | -- | -- | 591 | -- | Tricone caught in bedrock, released manually. |
| | | | | | | | | | | | 17.06 | 14.45 | 2.61 | 1:1 | 13:26 | 13:35 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 3452 | -- | Grout Temperature: 21.2°C |
| | | | | | | | | | | | 14.45 | 11.45 | 3.00 | 1:1 | 13:39 | 13:49 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 4493 | -- | Communicated to S-32+022.8 from 16.6 to 9.1 m. |
| | | | | | | | | | | | 11.45 | 9.14 | 2.31 | 1:1 | 13:52 | 14:01 | 16 | 403.3 | 304.8 | 424.0 | -- | -- | 3698 | -- | |
| | | | | | | | | | | | | | **8.00** | | | | | | | | **0.76** | **14601** | **12234** | **6117** | |
| S-32+027.6 | 19-Feb-11 | 136.78 | 9.97 | 12.56 | 17.74 | 1.16 | 18.90 | N | | 19-Feb-11 | 18.31 | 17.40 | 0.91 | 1:1 | 17:19 | 17:22 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1529 | -- | |
| | | | | | | | | | | | 17.40 | 14.47 | 2.94 | 1:1 | 17:27 | 17:37 | 16 | 393.0 | 304.8 | 408.8 | -- | -- | 4751 | -- | Grout Temperature: 20.8°C |
| | | | | | | | | | | | 14.47 | 11.50 | 2.97 | 1:1 | 17:41 | 17:51 | 16 | 396.4 | 304.8 | 416.4 | -- | -- | 4679 | -- | Communicated to S-32+025.2 from 17.7 to 9.1 m. |
| | | | | | | | | | | | 11.50 | 9.09 | 2.41 | 1:1 | 17:55 | 18:04 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 3876 | -- | |
| | | | | | | | | | | | | | **9.22** | | | | | | | | **0.76** | **16819** | **14835** | **7418** | |
| S-32+030 | 19-Feb-11 | 136.77 | 9.69 | 11.67 | 18.41 | 1.25 | 19.66 | N | | 20-Feb-11 | 18.78 | 17.75 | 1.03 | 1:1 | 4:19 | 4:23 | 16 | 406.8 | 304.8 | 435.3 | -- | -- | 2048 | -- | Grout Temperature: 21.2°C |
| | | | | | | | | | | | 17.75 | 16.28 | 1.48 | 1:1 | 4:29 | 4:35 | 16 | 410.2 | 304.8 | 435.3 | -- | -- | 4304 | -- | Pump leaking, causing cavitation in the high pressure line, rods tripped out while pump fixed. |
| | | | | | | | | | | | 16.28 | 14.49 | 1.79 | 1:1 | 9:10 | 9:18 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 3505 | -- | |
| | | | | | | | | | | | 14.49 | 11.43 | 3.06 | 1:1 | 9:21 | 9:32 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4959 | -- | |
| | | | | | | | | | | | 11.43 | 8.67 | 2.76 | 1:1 | 9:36 | 9:46 | 16 | 403.3 | 304.8 | 420.2 | -- | -- | 4455 | -- | |
| | | | | | | | | | | | | | **9.09** | | | | | | | | **0.76** | **16574** | **19272** | **9636** | |
| S-32+032.4 | 20-Feb-11 | 136.88 | 9.05 | 11.80 | 19.54 | 1.55 | 21.09 | N | Communicated to S-32+030.0 | 20-Feb-11 | 20.43 | 17.56 | 2.87 | 1:1 | 13:56 | 14:05 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4974 | -- | |
| | | | | | | | | | | | 17.56 | 14.57 | 2.99 | 1:1 | 14:09 | 14:19 | 16 | 403.3 | 304.8 | 420.2 | -- | -- | 4648 | -- | Communicated to S-32+030.0, and casings for stations 32+043.2 through to 32+066.8. |
| | | | | | | | | | | | 14.57 | 11.98 | 2.59 | 1:1 | 14:24 | 14:33 | 16 | 403.3 | 304.8 | 424.0 | -- | -- | 4081 | -- | Grout Temperature: 27.0°C at 12.5 m. |
| | | | | | | | | | | | 11.98 | 11.56 | 0.41 | 1:1 | 16:06 | 16:09 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 1575 | -- | Jet grouting operations paused to wait for water truck at 12.0 m. |
| | | | | | | | | | | | 11.56 | 8.13 | 3.44 | 1:1 | 16:12 | 16:25 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 5667 | -- | Grout Temperature: 18.6°C at 9.75 m. |
| | | | | | | | | | | | | | **9.44** | | | | | | | | **0.76** | **17214** | **20945** | **10472** | |
| S-32+034.8 | 20-Feb-11 | 136.86 | 11.02 | 13.90 | 19.87 | 1.17 | 21.04 | N | | 20-Feb-11 | 20.30 | 17.68 | 2.62 | 1:1 | 20:13 | 20:22 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 4437 | -- | |
| | | | | | | | | | | | 17.68 | 14.65 | 3.03 | 1:1 | 20:26 | 20:37 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 4963 | -- | Grout Temperature: 18.3°C |
| | | | | | | | | | | | 14.65 | 11.65 | 3.01 | 1:1 | 20:52 | 21:04 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 5031 | -- | |
| | | | | | | | | | | | 11.65 | 10.06 | 1.59 | 1:1 | 21:07 | 21:13 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 2911 | -- | |
| | | | | | | | | | | | | | **10.24** | | | | | | | | **0.76** | **18687** | **17341** | **8670** | |

**TABLE E2-3.5**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 1**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-32+037.2 | 20-Feb-11 | 136.87 | 10.42 | 13.53 | 18.29 | 1.34 | 19.63 | N | | 20-Feb-11 | 18.60 | 17.72 | 0.88 | 1:1 | 1:05 | 1:07 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 1722 | -- | |
| | | | | | | | | | | | 17.72 | 14.70 | 3.02 | 1:1 | 1:10 | 1:21 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4713 | -- | Grout Temperature: 22°C |
| | | | | | | | | | | | 14.70 | 11.70 | 3.00 | 1:1 | 1:32 | 1:43 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4800 | -- | Communicated to S-32+034.8 |
| | | | | | | | | | | | 11.70 | 9.43 | 2.27 | 1:1 | 2:05 | 2:13 | 16 | 399.9 | 304.8 | 427.8 | -- | -- | 3990 | -- | Marsh: 31.4 s, Desnity: 1.56 g/cc, Grout Temp: 18.0°C |
| | | | | | | | | | | | | | **9.17** | | | | | | | | **0.76** | **16730** | **15225** | **7612** | |
| S-32+039.6 | 20-Feb-11 | 136.75 | 10.24 | 14.17 | 19.11 | 1.28 | 20.39 | N | | 22-Feb-11 | 19.46 | 18.20 | 1.27 | 1:1 | 6:22 | 6:29 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 2877 | -- | |
| | | | | | | | | | | | 18.21 | 17.56 | 0.64 | 1:1 | 6:33 | 6:37 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 2987 | -- | Tricone Caught. Pulled monitor manually. |
| | | | | | | | | | | | 17.56 | 16.26 | 1.30 | 1:1 | 6:41 | 6:49 | 16 | 399.9 | 304.8 | 427.8 | -- | -- | 3857 | -- | Tricone Caught. Pulled monitor manually. |
| | | | | | | | | | | | 16.26 | 15.61 | 0.66 | 1:1 | 6:50 | 6:57 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 2998 | -- | Tricone Caught. Pulled monitor manually. |
| | | | | | | | | | | | 15.61 | 14.50 | 1.11 | 1:1 | 8:33 | 8:37 | 16 | 393.0 | 304.8 | 439.1 | -- | -- | 1995 | -- | Blown Monitor. |
| | | | | | | | | | | | 14.50 | 14.37 | 0.12 | 1:1 | 9:50 | 9:53 | 16 | 172.4 | 0 | 473.2 | -- | -- | 3502 | -- | Blown Monitor. |
| | | | | | | | | | | | 14.37 | 11.48 | 2.90 | 1:1 | 9:58 | 10:08 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 4580 | -- | Communicated to S-32+037.2 |
| | | | | | | | | | | | 11.48 | 10.01 | 1.48 | 1:1 | 10:12 | 10:17 | 16 | 399.9 | 304.8 | 408.8 | -- | -- | 2453 | -- | Grout Temperature: 20.0°C |
| | | | | | | | | | | | 10.01 | 9.21 | 0.80 | 1:1 | 10:34 | 10:38 | 16 | 406.8 | 152.4 | 223.7 | -- | -- | 1647 | -- | Screen on grout pump intake plugged. Nozzle clogged. |
| | | | | | | | | | | | | | **10.27** | | | | | | | | **0.76** | **18003** | **26895** | **6091** | |
| S-32+042 | 27-Feb-11 | 136.40 | -- | 9.94 | 18.61 | 0.91 | 19.51 | N | | 27-Feb-11 | 18.90 | 17.34 | 1.56 | 1:1 | 3:16 | 3:22 | 16 | 393.0 | 304.8 | 431.5 | -- | -- | 3819 | -- | |
| | | | | | | | | | | | 18.90 | 14.33 | 3.01 | 1:1 | 3:25 | 3:40 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 5773 | -- | |
| | | | | | | | | | | | 14.33 | 11.31 | 3.03 | 1:1 | 3:48 | 4:01 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 6049 | -- | |
| | | | | | | | | | | | 11.31 | 9.75 | 1.55 | 1:1 | 4:04 | 4:16 | 16 | 386.1 | 304.8 | 408.8 | -- | -- | 3899 | -- | Grout Temperature: 16.1°C |
| | | | | | | | | | | | | | **9.14** | | | | | | | | **0.76** | **16680** | **19540** | **9770** | |
| S-32+044.4 | 27-Feb-11 | 136.39 | -- | 12.25 | 19.05 | 1.32 | 20.37 | N | | 28-Feb-11 | 19.18 | 17.54 | 1.64 | 1:1 | 8:59 | 9:06 | 16 | 413.7 | 304.8 | 431.5 | -- | -- | 3441 | -- | |
| | | | | | | | | | | | 17.54 | 14.55 | 3.00 | 1:1 | 9:10 | 9:34 | 16 | 413.7 | 152.4 | 219.6 | -- | -- | 5307 | -- | Nozzle plugged; used half pull rate. |
| | | | | | | | | | | | 14.55 | 10.82 | 3.72 | 1:1 | 9:38 | 10:06 | 16 | 406.8 | 152.4 | 215.8 | -- | -- | 6272 | -- | Grout Temperature: 16.3°C. |
| | | | | | | | | | | | | | **8.36** | | | | | | | | **0.76** | **15251** | **15021** | **7510** | |
| S-32+046.8 | 28-Feb-11 | 136.36 | -- | -- | 20.12 | 1.09 | 21.20 | N | Encountered hardened grout. | 28-Feb-11 | 20.42 | 17.54 | 2.88 | 1:1 | 15:21 | 15:33 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 5485 | -- | Communicated to S-32+044.4 for length of column. |
| | | | | | | | | | | | 17.54 | 14.48 | 3.06 | 1:1 | 15:37 | 15:51 | 16 | 393.0 | 304.8 | 412.6 | -- | -- | 5693 | -- | |
| | | | | | | | | | | | 14.48 | 11.16 | 3.32 | 1:1 | 15:54 | 16:08 | 16 | 393.0 | 304.8 | 412.6 | -- | -- | 5943 | -- | Grout Temperature: 16.7°C. |
| | | | | | | | | | | | | | **9.26** | | | | | | | | **0.76** | **16891** | **17121** | **8561** | |
| S-32+049.2 | 28-Feb-11 | 136.33 | -- | 12.62 | 20.03 | 1.18 | 21.20 | N | Intersected top of prev. grouted interval. | 28-Feb-11 | 20.16 | 17.38 | 2.78 | 1:1 | 19:56 | 20:09 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 5534 | -- | Drill head catching on guide rail every 1.5 m. |
| | | | | | | | | | | | 17.38 | 14.38 | 2.99 | 1:1 | 20:11 | 20:27 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 6034 | -- | |
| | | | | | | | | | | | 14.38 | 10.67 | 3.71 | 1:1 | 20:29 | 20:55 | 16 | 393.0 | 304.8 | 412.6 | -- | -- | 8055 | -- | Grout Temperature: 14.4°C. |
| | | | | | | | | | | | | | **9.49** | | | | | | | | **0.76** | **17308** | **19624** | **9812** | |
| S-32+051.6 | 28-Feb-11 | 136.29 | -- | 11.95 | 20.47 | 1.17 | 21.64 | N | | 28-Feb-11 | 20.50 | 17.32 | 3.18 | 1:1 | 2:02 | 2:18 | 16 | 399.9 | 304.8 | 431.5 | -- | -- | 8691 | -- | Drill head catching on guide rail every 1.5 m. |
| | | | | | | | | | | | 17.32 | 14.29 | 3.03 | 1:1 | 2:28 | 2:40 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 4970 | -- | |
| | | | | | | | | | | | 14.29 | 11.26 | 3.03 | 1:1 | 2:43 | 2:54 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 5114 | -- | |
| | | | | | | | | | | | 11.27 | 10.06 | 1.21 | 1:1 | 3:04 | 3:09 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 2320 | -- | Grout Temperature: 15.0°C. |
| | | | | | | | | | | | | | **10.44** | | | | | | | | **0.76** | **19049** | **21096** | **10548** | |
| S-32+054 | 28-Feb-11 | 136.26 | -- | 12.28 | 21.35 | 0.10 | 21.46 | N | | 01-Mar-11 | 21.48 | 21.18 | 0.30 | 1:1 | 8:00 | 8:02 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 1420 | -- | Drill head catching on guide rail every 1.5 m; replaced worn roller after hole was completed. |
| | | | | | | | | | | | 21.18 | 20.59 | 0.60 | 1:1 | 8:05 | 8:07 | 16 | 399.9 | 304.8 | 427.8 | -- | -- | 1374 | -- | |
| | | | | | | | | | | | 20.59 | 17.56 | 3.03 | 1:1 | 8:13 | 8:24 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 4944 | -- | Tricone stuck at 29.18 m; released manually. |
| | | | | | | | | | | | 17.56 | 14.47 | 3.08 | 1:1 | 8:27 | 8:39 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 5258 | -- | |
| | | | | | | | | | | | 14.47 | 12.80 | 1.67 | 1:1 | 8:43 | 8:51 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 3134 | -- | Ran out of grout. |
| | | | | | | | | | | | 12.80 | 10.65 | 2.15 | 1:1 | 9:03 | 9:11 | 16 | 393.0 | 304.8 | 427.8 | -- | -- | 4126 | -- | Grout Temperature: 16.6°C. |
| | | | | | | | | | | | | | **10.83** | | | | | | | | **0.76** | **19755** | **20256** | **10128** | |

**TABLE E2-3.5**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 1**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-32+056.4 | 01-Mar-11 | 136.26 | -- | 12.19 | 21.34 | 1.22 | 22.56 | N | | 01-Mar-11 | 21.49 | 21.37 | 0.12 | 1:1 | 15:47 | 15:49 | 16 | 379.2 | 304.8 | 416.4 | -- | -- | | | Manual pull. Tricone stuck at 21.49 m; released manually. |
| | | | | | | | | | | | 21.37 | 20.51 | 0.86 | 1:1 | 15:49 | 15:52 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 530 | -- | Manual pull. Tricone stuck at 21.17 m; released manually. |
| | | | | | | | | | | | 20.51 | 17.48 | 3.03 | 1:1 | 16:01 | 16:12 | 16 | 393.0 | 304.8 | 431.5 | -- | -- | 1420 | -- | Tricone stuck at 21.12 m; released manually. Electronic control re-started. |
| | | | | | | | | | | | 17.48 | 15.90 | 1.58 | 1:1 | 16:16 | 16:21 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 4641 | -- | |
| | | | | | | | | | | | 15.90 | 14.47 | 1.42 | 1:1 | 16:35 | 16:40 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 1155 | -- | Ran out of grout. |
| | | | | | | | | | | | 14.47 | 10.98 | 3.49 | 1:1 | 16:43 | 16:57 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 3963 | -- | Communicated to S-32+054. |
| | | | | | | | | | | | | | **10.51** | | | | | | | | **0.76** | **19176** | **17591** | **8795** | Grout Temperature: 16.9°C. |
| | | | | | | | | | | | | | | | | | | | | | | | | | Bleed (spoils) at 2 hrs: 2 % |
| S-32+058.8 | 01-Mar-11 | 136.24 | -- | 12.31 | 21.34 | 1.37 | 22.71 | N | | 01-Mar-11 | 21.57 | 20.41 | 1.17 | 1:1 | 8:15 | 8:24 | 16 | 399.9 | 304.8 | 431.5 | -- | -- | 3301 | -- | Plugged screen at batch plant. |
| | | | | | | | | | | | 20.41 | 17.41 | 2.99 | 1:1 | 8:27 | 8:48 | 16 | 399.9 | 152.4 | 223.3 | -- | -- | 4633 | -- | Nozzle plugged; used half pull rate. |
| | | | | | | | | | | | 17.41 | 16.89 | 0.52 | 1:1 | 8:50 | 8:54 | 16 | 406.8 | 152.4 | 219.6 | -- | -- | 901 | -- | Generator stopped working; activity paused. |
| | | | | | | | | | | | 16.89 | 12.86 | 4.03 | 1:1 | 9:00 | 9:17 | 16 | 406.8 | 152.4 | 219.6 | -- | -- | 3778 | -- | |
| | | | | | | | | | | | 12.86 | 10.54 | 2.32 | 1:1 | 9:18 | 9:45 | 16 | 399.9 | 152.4 | 219.6 | -- | -- | 5860 | -- | |
| | | | | | | | | | | | | | **11.03** | | | | | | | | **0.76** | **20127** | **18473** | **9236** | |
| S-32+061.2 | 01-Mar-11 | 136.19 | -- | 11.89 | 22.28 | 1.43 | 23.71 | N | | 02-Mar-11 | 22.39 | 22.29 | 0.10 | 1:1 | 11:01 | 11:02 | 16 | 386.1 | 304.8 | 416.4 | -- | -- | 613 | -- | Tricone caught at 22.29 m, 21.42 m, and 16.62 m; released manually each time. |
| | | | | | | | | | | | 22.29 | 21.40 | 0.89 | 1:1 | 11:03 | 11:06 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 522 | -- | |
| | | | | | | | | | | | 21.40 | 20.55 | 0.85 | 1:1 | 11:06 | 11:09 | 16 | 386.1 | 304.8 | 427.8 | -- | -- | 1995 | -- | |
| | | | | | | | | | | | 20.55 | 19.98 | 0.57 | 1:1 | 11:13 | 11:15 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 1601 | -- | |
| | | | | | | | | | | | 19.98 | 17.61 | 2.37 | 1:1 | 11:16 | 11:23 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 3025 | -- | |
| | | | | | | | | | | | 17.61 | 14.60 | 3.00 | 1:1 | 11:28 | 11:38 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 4614 | -- | Grout Temperature: 12.8°C |
| | | | | | | | | | | | 14.60 | 10.81 | 3.79 | 1:1 | 11:43 | 11:56 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 6057 | -- | Marsh: 29.72 s Density: 1.34 g/cc, Grout Temp: 10.1°C |
| | | | | | | | | | | | | | **11.58** | | | | | | | | **0.76** | **21122** | **18427** | **9214** | |
| S-32+063.6 | 01-Apr-11 | 136.27 | -- | 13.11 | 21.55 | 1.10 | 22.65 | N | | 01-Apr-11 | 21.86 | 21.85 | 0.01 | 1:1 | 11:01 | 11:02 | 16 | 344.7 | 304.8 | 378.5 | -- | -- | 454 | -- | Tricone caught at 21.9 and 21.8 m; released manually. |
| | | | | | | | | | | | 21.85 | 21.46 | 0.40 | 1:1 | 11:04 | 11:07 | 16 | 399.9 | Manual | 424.0 | -- | -- | 1707 | -- | |
| | | | | | | | | | | | 21.46 | 20.58 | 0.87 | 1:1 | 11:09 | 11:12 | 16 | 406.8 | Manual | 439.1 | -- | -- | 1370 | -- | Grout Temperature: 6.2°C |
| | | | | | | | | | | | 20.58 | 17.54 | 3.04 | 1:1 | 11:17 | 11:28 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 4906 | -- | Grout Temperature: 21.8°C |
| | | | | | | | | | | | 17.54 | 14.54 | 3.01 | 1:1 | 11:33 | 11:44 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 5095 | -- | |
| | | | | | | | | | | | 14.54 | 13.14 | 1.40 | 1:1 | 11:48 | 11:53 | 16 | 393.0 | 304.8 | 427.8 | -- | -- | 2396 | -- | |
| | | | | | | | | | | | 13.14 | 11.55 | 1.60 | 1:1 | 12:06 | 12:12 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 2843 | -- | |
| | | | | | | | | | | | | | **10.32** | | | | | | | | **0.76** | **18821** | **18772** | **9386** | |
| S-32+066 | 07-Apr-11 | 136.35 | -- | 12.51 | 21.31 | 0.99 | 22.30 | N | Bedrock was fractured over first 0.2 m. | 07-Apr-11 | 21.66 | 21.40 | 0.26 | 1:1 | 10:17 | 10:19 | 16 | 393.0 | 304.8 | 412.6 | -- | -- | 965 | -- | Rods stuck at 21.4 m; pulled manually. |
| | | | | | | | | | | | 21.40 | 21.34 | 0.06 | 1:1 | 10:19 | 10:21 | 16 | 34.5 | Manual | 37.9 | -- | -- | 30 | -- | Grout Temperature: 18.4°C at 16.8 m. |
| | | | | | | | | | | | 21.34 | 20.24 | 1.10 | 1:1 | 10:22 | 10:26 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 1851 | -- | |
| | | | | | | | | | | | 20.24 | 17.20 | 3.04 | 1:1 | 10:29 | 10:43 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 5337 | -- | |
| | | | | | | | | | | | 17.20 | 14.16 | 3.04 | 1:1 | 10:46 | 10:59 | 16 | 403.3 | 304.8 | 427.8 | -- | -- | 5689 | -- | |
| | | | | | | | | | | | 14.16 | 11.83 | 2.33 | 1:1 | 11:02 | 11:12 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 4084 | -- | |
| | | | | | | | | | | | 11.83 | 10.98 | 0.84 | 1:1 | 11:18 | 11:23 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 1851 | -- | |
| | | | | | | | | | | | | | **10.67** | | | | | | | | **0.76** | **19466** | **19809** | **9905** | |
| S-32+068.4 | 07-Apr-11 | 136.57 | -- | 11.86 | 20.73 | 1.23 | 21.96 | N | Ice and CSB / grout from primary holes inside casing. Bedrock very fractured at surface. | 07-Apr-11 | 20.99 | 20.94 | 0.05 | 1:1 | 14:27 | 14:28 | 32 | 379.2 | Manual | 302.8 | -- | -- | 1109 | -- | As rods were inserted (17.4 m), air returning outside of casing. |
| | | | | | | | | | | | 20.94 | 20.92 | 0.02 | 1:1 | 14:28 | 14:31 | 23 | 379.2 | Manual | 416.4 | -- | -- | 784 | -- | Comminicated with S-32+066 |
| | | | | | | | | | | | 20.92 | 20.38 | 0.55 | 1:1 | 14:32 | 14:35 | 15 | 399.9 | 12 | 424.0 | -- | -- | 1181 | -- | Grout Temperature: 28°C at 16.2 m. |
| | | | | | | | | | | | 20.38 | 17.39 | 2.98 | 1:1 | 14:37 | 14:49 | 16 | 386.1 | 12 | 416.4 | -- | -- | 5023 | -- | 4 spoil samples collected at 16.2 m. |
| | | | | | | | | | | | 17.39 | 14.34 | 3.05 | 1:1 | 14:52 | 15:06 | 16 | 386.1 | 12 | 412.6 | -- | -- | 5262 | -- | 4 neat samples collected at end of grouting. |
| | | | | | | | | | | | 14.34 | 10.92 | 3.42 | 1:1 | 15:09 | 15:23 | 16 | 393.0 | 12 | 416.4 | -- | -- | 11053 | -- | Marsh: 29 s |
| | | | | | | | | | | | | | **10.07** | | | | | | | | **0.76** | **18365** | **19241** | **12206** | Density: 1.53 g/cc |

**TABLE E2-3.5**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 1**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-32+070.8 | 07-Apr-11 | 136.51 | -- | 12.85 | 20.35 | 1.30 | 21.65 | N | No grout until approx. 0.6 m above till contact. Boulders at 13.6 and 14.2 m. Communicated to S-32+066. | 07-Apr-11 | 21.34 | 20.94 | 0.40 | 1:1 | 18:17 | 18:23 | 23 | 393.0 | Manual | 416.4 | -- | -- | 1885 | -- | Air return lost / plugged after first 0.9 m. |
| | | | | | | | | | | | 20.94 | 20.62 | 0.33 | 1:1 | 18:23 | 18:25 | 16 | 413.7 | 304.8 | 223.3 | -- | -- | 731 | -- | Grout Temperature: 21.8°C at 17.3 m. |
| | | | | | | | | | | | 20.62 | 19.78 | 0.84 | 1:1 | 18:30 | 18:34 | 16 | 413.7 | 304.8 | 4209.4 | -- | -- | 0 | -- | |
| | | | | | | | | | | | 19.78 | 19.83 | -0.06 | 1:1 | 18:34 | 18:35 | 33 | 68.9 | Manual | 227.1 | -- | -- | 1643 | -- | |
| | | | | | | | | | | | 19.83 | 17.55 | 2.28 | 1:1 | 18:35 | 18:43 | 16 | 386.1 | 304.8 | 416.4 | -- | -- | 3570 | -- | |
| | | | | | | | | | | | 17.55 | 14.52 | 3.03 | 1:1 | 18:45 | 19:00 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 5247 | -- | |
| | | | | | | | | | | | 14.52 | 11.63 | 2.90 | 1:1 | 19:04 | 19:15 | 16 | 393.0 | 304.8 | 420.2 | -- | -- | 5023 | -- | |
| | | | | | | | | | | | | | **9.72** | | | | | | | | **0.76** | **17725** | **18098** | **9049** | |
| S-32+073.2 | 07-Apr-11 | 136.45 | -- | 12.56 | 19.87 | 1.89 | 21.76 | N | Boulders from 14.6 to 15.5 m. Soft layers between 17.6 and 18.9 m. | 07-Apr-11 | 20.33 | 17.32 | 3.01 | 1:1 | 22:43 | 22:57 | 16 | 393.0 | 304.8 | 435.3 | -- | -- | 5720 | -- | Grout Temperature: 27.8°C at 15.8 m. |
| | | | | | | | | | | | 17.32 | 14.30 | 3.01 | 1:1 | 23:01 | 23:14 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 11099 | -- | |
| | | | | | | | | | | | 14.30 | 11.00 | 3.30 | 1:1 | 23:23 | 23:37 | 16 | 406.8 | 304.8 | 427.8 | -- | -- | 507 | -- | |
| | | | | | | | | | | | | | **9.33** | | | | | | | | **0.76** | **5499** | **17326** | **8663** | |
| S-32+075.6 | 07-Apr-11 | 136.47 | -- | 12.65 | 19.23 | 1.42 | 20.65 | N | Boulders at 17.4, 17.7 and 18.3 m. | 07-Apr-11 | 19.63 | 18.89 | 0.73 | 1:1 | 4:08 | 4:13 | 16 | 406.8 | 304.8 | 439.1 | -- | -- | 2165 | -- | Rods stuck at 18.9 m. |
| | | | | | | | | | | | 18.89 | 17.38 | 1.51 | 1:1 | 4:15 | 4:21 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 2654 | -- | Communicated with S-32+073.2 at 18.9 m. |
| | | | | | | | | | | | 17.38 | 14.34 | 3.04 | 1:1 | 4:25 | 4:39 | 16 | 399.9 | 304.8 | 427.4 | -- | -- | 5595 | -- | Rods sticking at 17.5 m. Both jets plugged at 14.3 m; pulled rods and re-started. |
| | | | | | | | | | | | 14.34 | 11.10 | 3.24 | 1:1 | 5:40 | 5:54 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 6102 | -- | Marsh: 30 s; Density: 1.52 g/cc |
| | | | | | | | | | | | | | **8.53** | | | | | | | | **0.76** | **15551** | **16516** | **8258** | Grout Temperature: 23.3°C |
| S-32+078 | 08-Apr-11 | 136.73 | -- | 12.76 | 19.20 | 1.23 | 20.43 | N | Reduced water return. | 08-Apr-11 | 19.48 | 17.60 | 1.87 | 1:1 | 18:39 | 18:46 | 16 | 406.8 | 304.8 | 420.2 | -- | -- | 3664 | -- | Spoils return - low volume. |
| | | | | | | | | | | | 17.60 | 17.09 | 0.51 | 1:1 | 18:50 | 18:52 | 16 | 386.1 | 304.8 | 416.4 | -- | -- | 689 | -- | Both nozzles plugged at 14.6 m; pulled rods. |
| | | | | | | | | | | | 17.09 | 16.33 | 0.77 | 1:1 | 18:53 | 18:55 | 32 | 393.0 | Manual | 416.4 | -- | -- | 1211 | -- | |
| | | | | | | | | | | | 16.33 | 14.57 | 1.75 | 1:1 | 18:55 | 19:01 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 2707 | -- | |
| | | | | | | | | | | | 14.57 | 11.21 | 3.36 | 1:1 | 20:02 | 20:17 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 6341 | -- | |
| | | | | | | | | | | | | | **8.26** | | | | | | | | **0.76** | **15074** | **14612** | **7306** | |
| S-32+080.4 | 08-Apr-11 | 136.82 | -- | 12.80 | 19.51 | 1.30 | 20.80 | N | Soft zone between 14.6 and 15.2 m; reduced water return. Boulder at 18 m. Hammer getting stuck between 18 and 18.9 m. | 08-Apr-11 | 19.82 | 19.81 | 0.01 | 1:1 | 0:34 | 0:37 | 16 | 406.8 | 304.8 | | -- | -- | 984 | -- | |
| | | | | | | | | | | | 19.81 | 17.50 | 2.31 | 1:1 | 0:39 | 0:48 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 3755 | -- | Grout Temperature: 16.1°C at 17.7 m. |
| | | | | | | | | | | | 17.50 | 17.16 | 0.34 | 1:1 | 0:55 | 0:58 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 1128 | -- | Rods stuck at 17.2 m. |
| | | | | | | | | | | | 17.16 | 17.13 | 0.03 | 1:1 | 0:59 | 1:01 | 16 | 399.9 | 304.8 | 412.6 | -- | -- | 719 | -- | Density: 1.51 g/cc |
| | | | | | | | | | | | 17.13 | 14.48 | 2.65 | 1:1 | 1:02 | 1:11 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 4399 | -- | Marsh: 30 s |
| | | | | | | | | | | | 14.48 | 11.28 | 3.20 | 1:1 | 1:16 | 1:30 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 5954 | -- | |
| | | | | | | | | | | | | | **8.54** | | | | | | | | **0.76** | **15573** | **16940** | **8470** | |
| S-32+082.8 | 08-Apr-11 | 136.81 | -- | 12.74 | 16.46 | 1.34 | 17.80 | N | Boulders at 14.8 and 15.7 m | 08-Apr-11 | 16.82 | 14.50 | 2.32 | 1:1 | 4:28 | 4:39 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 4588 | -- | Grout Temperature: 14.4°C. |
| | | | | | | | | | | | 14.50 | 11.27 | 3.23 | 1:1 | 4:43 | 5:58 | 16 | 406.8 | 304.8 | 431.5 | -- | -- | 6166 | -- | |
| | | | | | | | | | | | | | **5.55** | | | | | | | | **0.76** | **10130** | **10754** | **5377** | |
| S-32+085.2 | 09-Apr-11 | 136.74 | -- | 12.11 | 16.37 | 1.18 | 17.54 | N | Some cobbles and small boulders within till. | 09-Apr-11 | 16.75 | 15.47 | 1.27 | 1:1 | 9:13 | 9:18 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 2411 | -- | |
| | | | | | | | | | | | 15.47 | 15.40 | 0.08 | 1:1 | 9:18 | 9:18 | 32 | 413.7 | Manual | 435.3 | -- | -- | 201 | -- | |
| | | | | | | | | | | | 15.40 | 14.38 | 1.02 | 1:1 | 9:18 | 9:23 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 1609 | -- | |
| | | | | | | | | | | | 14.38 | 11.41 | 2.97 | 1:1 | 9:26 | 9:38 | 16 | 399.9 | 304.8 | 420.2 | -- | -- | 5281 | -- | Grout Temperature: 23.7°C at 13.4 m. |
| | | | | | | | | | | | 11.41 | 10.57 | 0.84 | 1:1 | 9:41 | 9:45 | 16 | 386.1 | 304.8 | 416.4 | -- | -- | 1685 | -- | Bleed (spoils) at 2 hrs: 5%. |
| | | | | | | | | | | | | | **6.18** | | | | | | | | **0.76** | **11276** | **11186** | **5593** | |
| S-32+087.6 | 09-Apr-11 | 136.91 | -- | 10.82 | 15.54 | 0.58 | 16.13 | N | Ice in casing. Difficult to determine till/bedrock interface. Weathered bedrock between 15 and 15.3 m. | 09-Apr-11 | 15.61 | 14.49 | 1.12 | 1:1 | 11:52 | 11:58 | 16 | 406.8 | 304.8 | 424.0 | -- | -- | 2249 | -- | Grout Temperature: 25.5°C. |
| | | | | | | | | | | | 14.49 | 10.64 | 3.86 | 1:1 | 12:01 | 12:17 | 16 | 406.8 | 304.8 | 416.4 | -- | -- | 6730 | -- | Density: 1.53 g/cc. Marsh: 31 s |
| | | | | | | | | | | | | | **4.97** | | | | | | | | **0.76** | **9068** | **8979** | **4489** | |

**TABLE E2-3.5**
**SUMMARY OF BAY GOOSE DIKE JET GROUTING QA AND QUANTITIES - CHANNEL 1**

| HOLE ID | PRE DRILLING | | | | | | | | | JET GROUTING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | DEPTH | | | MIX | INJECTION PERIOD | | PARAMETERS | | | | VOLUME | | | | |
| Chainage | Date | Ground Surface Elevation | Depth to Soft Zone | Depth to Till | Depth to Bedrock | Subdrill into Bedrock | Total Hole Length | Downhole Orientation Survey | Comments | Date | From | To | Draw | w:c | Start | End | Pre-set Rotation | Pressure | Withdrawal Rate | Flow Rate | Column Radius | Theoretical | Final | Spoils | COMMENTS |
| | (dd-mmm-yy) | (m) | (m) | (m) | (m) | (m) | (m) | (Y/N) | | (dd-mmm-yy) | (m) | (m) | (m) | | (hh:mm) | (hh:mm) | (RPM) | (bar) | (mm/min) | (L/min) | (m) | (L) | (L) | (L) | |
| S-32+090 | 09-Apr-11 | 136.95 | -- | 10.39 | 15.33 | 0.98 | 16.32 | N | Ice in casing; some cobbles within till. Boulders at 13.2 and 14.2 m. Fractured bedrock between 15.3 and 15.5 m. | 09-Apr-11 | 15.64 | 14.43 | 1.22 | 1:1 | 14:35 | 14:41 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 2373 | -- | Grout Temperature: 27.4°C. |
| | | | | | | | | | | | 14.43 | 11.37 | 3.05 | 1:1 | 14:45 | 14:57 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 5356 | -- | |
| | | | | | | | | | | | 11.37 | 9.56 | 1.81 | 1:1 | 15:00 | 15:08 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 3187 | -- | |
| | | | | | | | | | | | | | **6.08** | | | | | | | | **0.76** | **11092** | **10917** | **5459** | |
| S-32+092.4 | 09-Apr-11 | 136.92 | -- | 10.70 | 15.64 | 0.93 | 16.57 | N | Ice in casing; some cobbles within till. Very fractured bedrock near surface between 15.2 and 15.6 m. | 09-Apr-11 | 15.96 | 15.93 | 0.03 | 1:1 | 17:26 | 17:26 | 16 | 365.4 | Manual | 408.8 | -- | -- | 379 | -- | Grout Temperature: 23.9°C at 12.9 m. |
| | | | | | | | | | | | 15.93 | 14.51 | 1.42 | 1:1 | 17:27 | 17:32 | 16 | 399.9 | 304.8 | 416.4 | -- | -- | 2241 | -- | |
| | | | | | | | | | | | 14.51 | 11.53 | 2.97 | 1:1 | 17:36 | 17:49 | 16 | 393.0 | 304.8 | 412.6 | -- | -- | 5281 | -- | |
| | | | | | | | | | | | 11.53 | 9.93 | 1.60 | 1:1 | 17:53 | 18:00 | 16 | 386.1 | 304.8 | 412.6 | -- | -- | 2990 | -- | |
| | | | | | | | | | | | | | **6.02** | | | | | | | | **0.76** | **10931** | **10891** | **5445** | |
| S-32+094.8 | 10-Apr-11 | 136.93 | -- | 10.12 | 15.09 | 1.24 | 16.33 | N | Ice in casing; some mid-sized cobbles within till. Fractured bedrock near surface between 14.6 and 15.1 m. | 10-Apr-11 | 15.85 | 14.55 | 1.30 | 1:1 | 17:12 | 17:16 | 16 | 386.1 | 304.8 | 412.6 | -- | -- | 2385 | -- | Both jets plugged; pulled rods. |
| | | | | | | | | | | | 14.55 | 11.54 | 3.01 | 1:1 | 18:09 | 18:23 | 16 | 386.1 | 304.8 | 416.4 | -- | -- | 5402 | -- | Ran out of grout with 0.2 m to bottom of casing. Mixed new batch and completed. |
| | | | | | | | | | | | 11.54 | 9.07 | 2.46 | 1:1 | 18:27 | 18:38 | 16 | 393.0 | 304.8 | 416.4 | -- | -- | 4289 | -- | Grout Temperature: 27.4°C at 13.1 m. |
| | | | | | | | | | | | | | **5.48** | | | | | | | | **0.76** | **9990** | **12075** | **6038** | |
| S-32+097.2 | 10-Apr-11 | 137.00 | -- | 9.88 | 15.70 | 1.07 | 16.76 | N | Ice in casing. Boulders, cobbles immediately above bedrock. | 10-Apr-11 | 15.95 | 14.40 | 1.55 | 1:1 | 20:45 | 20:53 | 16 | 413.7 | 304.8 | 427.8 | -- | -- | 3096 | -- | Lower than anticipated air pressure (2.9 bar) at the start of jet grouting. |
| | | | | | | | | | | | 14.40 | 11.46 | 2.94 | 1:1 | 20:56 | 21:09 | 16 | 399.9 | 304.8 | 434.9 | -- | -- | 5375 | -- | Collected sample from 12.5 to 11.6 m. |
| | | | | | | | | | | | 11.46 | 11.46 | 0.00 | 1:1 | 21:12 | 21:14 | 16 | -- | 304.8 | 444.8 | -- | -- | 375 | -- | Difficult to achieve pressure at 10.2 m. |
| | | | | | | | | | | | 11.46 | 9.02 | 2.44 | 1:1 | 21:16 | 21:30 | 16 | 393.0 | 304.8 | 439.1 | -- | -- | 6053 | -- | Grout Temperature: 16.7°C. |
| | | | | | | | | | | | | | **6.93** | | | | | | | | **0.76** | **12643** | **14899** | **7450** | Density: 1.49 g/cc. Marsh: 28 s |
| S-32+099.6 | 10-Apr-11 | 137.00 | -- | 10.09 | 14.48 | 1.22 | 15.70 | N | Ice in casing. | 10-Apr-11 | 14.84 | 14.34 | 0.50 | 1:1 | 1:07 | 1:12 | 16 | 399.9 | 304.8 | 435.3 | -- | -- | 1893 | -- | |
| | | | | | | | | | | | 14.34 | 11.29 | 3.05 | 1:1 | 1:16 | 1:40 | 16 | 406.8 | 152.4 | 234.7 | -- | -- | 5440 | -- | |
| | | | | | | | | | | | 11.29 | 8.88 | 2.41 | 1:1 | 1:43 | 2:02 | 16 | 413.7 | 152.4 | 227.1 | -- | -- | 4213 | -- | |
| | | | | | | | | | | | | | **5.96** | | | | | | | | **0.76** | **10881** | **11546** | **5773** | |
| S-32+102 | 10-Apr-11 | 137.08 | -- | 9.45 | 14.63 | 1.37 | 16.00 | N | Boulder or fractured bedrock close to till / bedrock interface. | 10-Apr-11 | 14.89 | 14.28 | 0.61 | 1:1 | 4:51 | 4:56 | 16 | 393.0 | 304.8 | 4258.6 | -- | -- | 1813 | -- | Grout Temperature: 13.3°C at 14.3 m. |
| | | | | | | | | | | | 14.37 | 11.33 | 3.04 | 1:1 | 5:00 | 5:12 | 16 | 393.0 | 304.8 | 424.0 | -- | -- | 5235 | -- | |
| | | | | | | | | | | | 11.33 | 8.27 | 3.06 | 1:1 | 5:16 | 5:30 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 5830 | -- | |
| | | | | | | | | | | | | | **6.71** | | | | | | | | **0.76** | **12238** | **12878** | **6439** | |
| S-32+104.4 | 11-Apr-11 | 136.98 | -- | 9.02 | 13.93 | 1.33 | 15.26 | N | Ice and SB inside casing. Small cobbles / boulders between 10.4 and 10.8 m. Fractured bedrock between 10.8 and 13.9 m. | 11-Apr-11 | 14.24 | 11.44 | 2.80 | 1:1 | 9:33 | 9:44 | 16 | 399.9 | 304.8 | 424.0 | -- | -- | 4705 | -- | Communicated to S-32+102 at 13.4 m. |
| | | | | | | | | | | | 11.44 | 8.98 | 2.46 | 1:1 | 9:48 | 9:59 | 16 | 393.0 | 304.8 | 427.8 | -- | -- | 4315 | -- | Communicated to S-32+099.6 at 11.5 m. |
| | | | | | | | | | | | 8.98 | 8.22 | 0.76 | 1:1 | 10:03 | 10:08 | 16 | 393.0 | 304.8 | 442.9 | -- | -- | 1893 | -- | Ran out of grout with 0.7 m to the bottom of casing. Mixed another batch and completed. |
| | | | | | | | | | | | | | **6.01** | | | | | | | | **0.76** | **10970** | **10913** | **5457** | Grout Temperature: 28°C at 10.9 m. |

# E2-4 Jet Grouting Progress Cross Section

Drawing File: O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Boy Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E2-4\JetGrout_Xsect_Progress.dwg November 29, 2012 2:33:17 PM By: VRombough

ELEVATION (m)

136
132
128
124
120
116
112

31+830
31+845
31+860
31+875
31+890
31+905

COLUMN DIAMETER INCREASED TO 5.5' DUE TO OVERLAP ISSUES

COLUMN DIAMETER INCREASED TO 7.0' DUE TO OVERLAP ISSUES

FIRST HOLE ATTEMPTED

SINGLE NOZZLE INJECTION

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED

3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104 — FINAL VOLUME INJECTED (l)

BOULDER REPORTED

3.3@2.0

THEORETICAL VOLUME (L)

COBBLES AND BOULDERS REPORTED

| | WITHDRAWL RATE (MM/MIN) | COL. DIA. (M) | NO. OF NOZZLES | MATERIAL |
|---|---|---|---|---|
| T.VOL / F.VOL | DESIGN (300) | 1.5 | 2 | TILL / SOFT |
| T.VOL / F.VOL | DESIGN (300) | 2.1 | 2 | SOFT |
| T.VOL / F.VOL | HALF (150) | 1.5 | 1 | TILL / SOFT |
| T.VOL / F.VOL | REDUCED (150-230) | 2.1 | 2 | TILL / SOFT |

GROUND SURFACE (OBSERVED)
SOFT ZONE (INTERPRETED)
TILL (INTERPRETED)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
DRILLING COMMUNICATION

TOP OF SOFT ZONE (OBSERVED)
BASE OF CUT-OFF WALL (OBSERVED)
BEDROCK (OBSERVED)
ORIGINAL TRENCH

UNABLE TO GROUT WITHIN BEDROCK DUE TO HIGH RISK OF EQUIPMENT LOSS OR BREAKDOWN

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# JET GROUTING PROGRESS
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | 09-1428-5007 | | PHASE No. | 2000 | |
| DESIGN | RC | NOV10 | SCALE | AS SHOWN | REV. 0 |
| CADD | RC | NOV10 | | | |
| CHECK | GRB | 01DEC12 | FIGURE E2-4.1 | | |
| REVIEW | FE | 01DEC12 | | | |

Drawing File: c:\active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E2-4\JetGrout_Xsect_Progress.dwg November 29, 2012 2:33:17 PM By: VRombough

ELEVATION (m)

136
132
128
124
120
116
112

31+920
31+935
31+950
31+965
31+980
31+995

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED

3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104

FINAL VOLUME INJECTED (l)

3.3/2.0

THEORETICAL VOLUME (L)

BOULDER REPORTED

COBBLES AND BOULDERS REPORTED

| | WITHDRAWL RATE (MM/MIN) | COL. DIA. (M) | NO. OF NOZZLES | MATERIAL |
|---|---|---|---|---|
| T.VOL / F.VOL | DESIGN (300) | 1.5 | 2 | TILL / SOFT |
| T.VOL / F.VOL | DESIGN (300) | 2.1 | 2 | SOFT |
| T.VOL / F.VOL | HALF (150) | 1.5 | 1 | TILL / SOFT |
| T.VOL / F.VOL | REDUCED (150-230) | 2.1 | 2 | TILL / SOFT |

GROUND SURFACE (OBSERVED)
SOFT ZONE (INTERPRETED)
TILL (INTERPRETED)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
DRILLING COMMUNICATION

TOP OF SOFT ZONE (OBSERVED)
BASE OF CUT-OFF WALL (OBSERVED)
BEDROCK (OBSERVED)
ORIGINAL TRENCH
UNABLE TO GROUT WITHIN BEDROCK DUE TO HIGH RISK OF EQUIPMENT LOSS OR BREAKDOWN

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

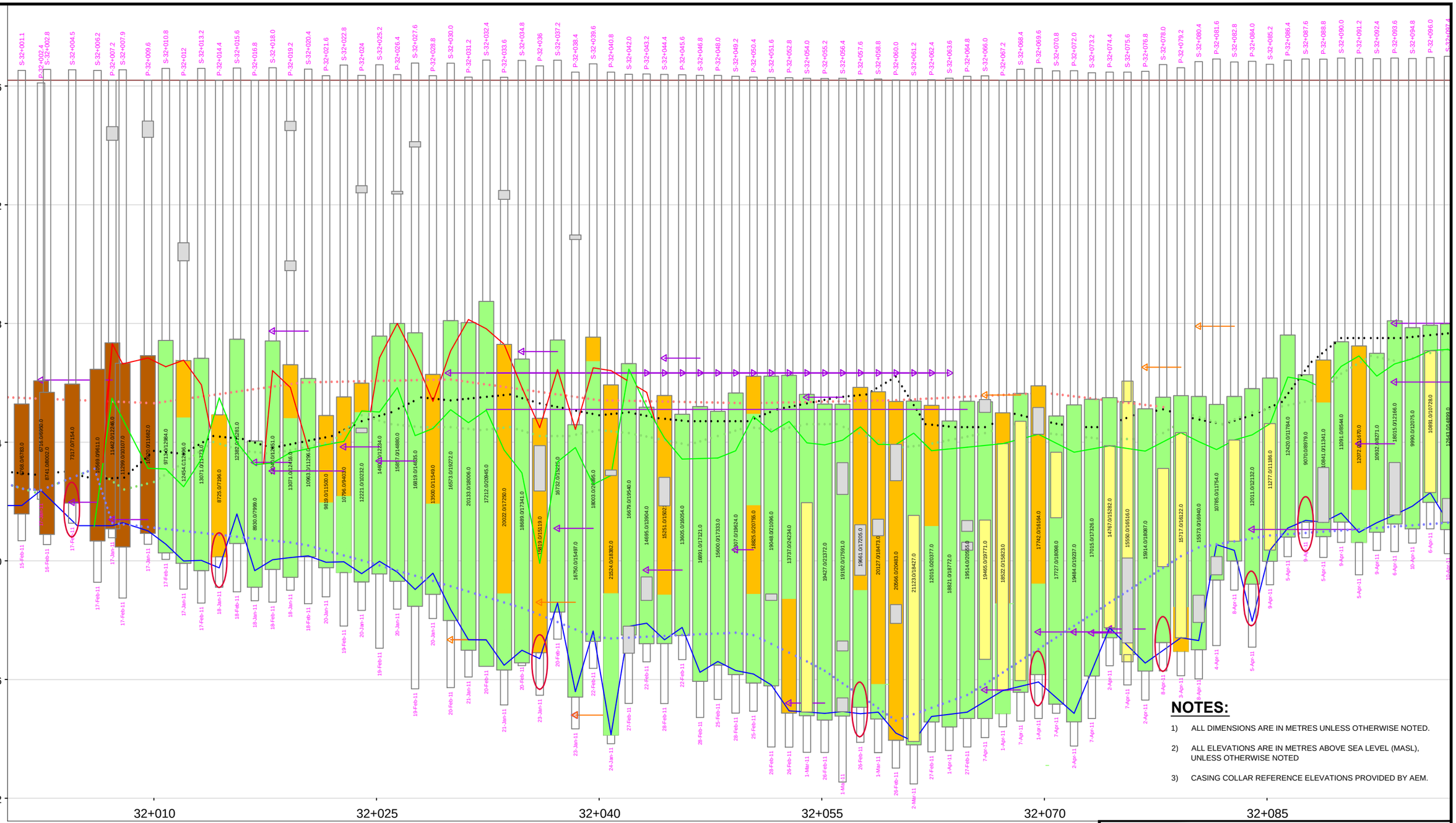
PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# JET GROUTING PROGRESS
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | RC | NOV10 | SCALE | AS SHOWN | REV. 0 |
| CADD | RC | NOV10 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E2-4.2




## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104 — FINAL VOLUME INJECTED (l)

BOULDER REPORTED

3,320.0 — THEORETICAL VOLUME (L)

COBBLES AND BOULDERS REPORTED

| | WITHDRAWL RATE (MM/MIN) | COL. DIA. (M) | NO. OF NOZZLES | MATERIAL |
|---|---|---|---|---|
| T.VOL / F.VOL | DESIGN (300) | 1.5 | 2 | TILL / SOFT |
| T.VOL / F.VOL | DESIGN (300) | 2.1 | 2 | SOFT |
| T.VOL / F.VOL | HALF (150) | 1.5 | 1 | TILL / SOFT |
| T.VOL / F.VOL | REDUCED (150-230) | 2.1 | 2 | TILL / SOFT |

- GROUND SURFACE (OBSERVED)
- SOFT ZONE (INTERPRETED)
- TILL (INTERPRETED)
- BEDROCK (2010 INVESTIGATION)
- GROUTING COMMUNICATION
- DRILLING COMMUNICATION
- TOP OF SOFT ZONE (OBSERVED)
- BASE OF CUT-OFF WALL (OBSERVED)
- BEDROCK (OBSERVED)
- ORIGINAL TRENCH
- UNABLE TO GROUT WITHIN BEDROCK DUE TO HIGH RISK OF EQUIPMENT LOSS OR BREAKDOWN

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

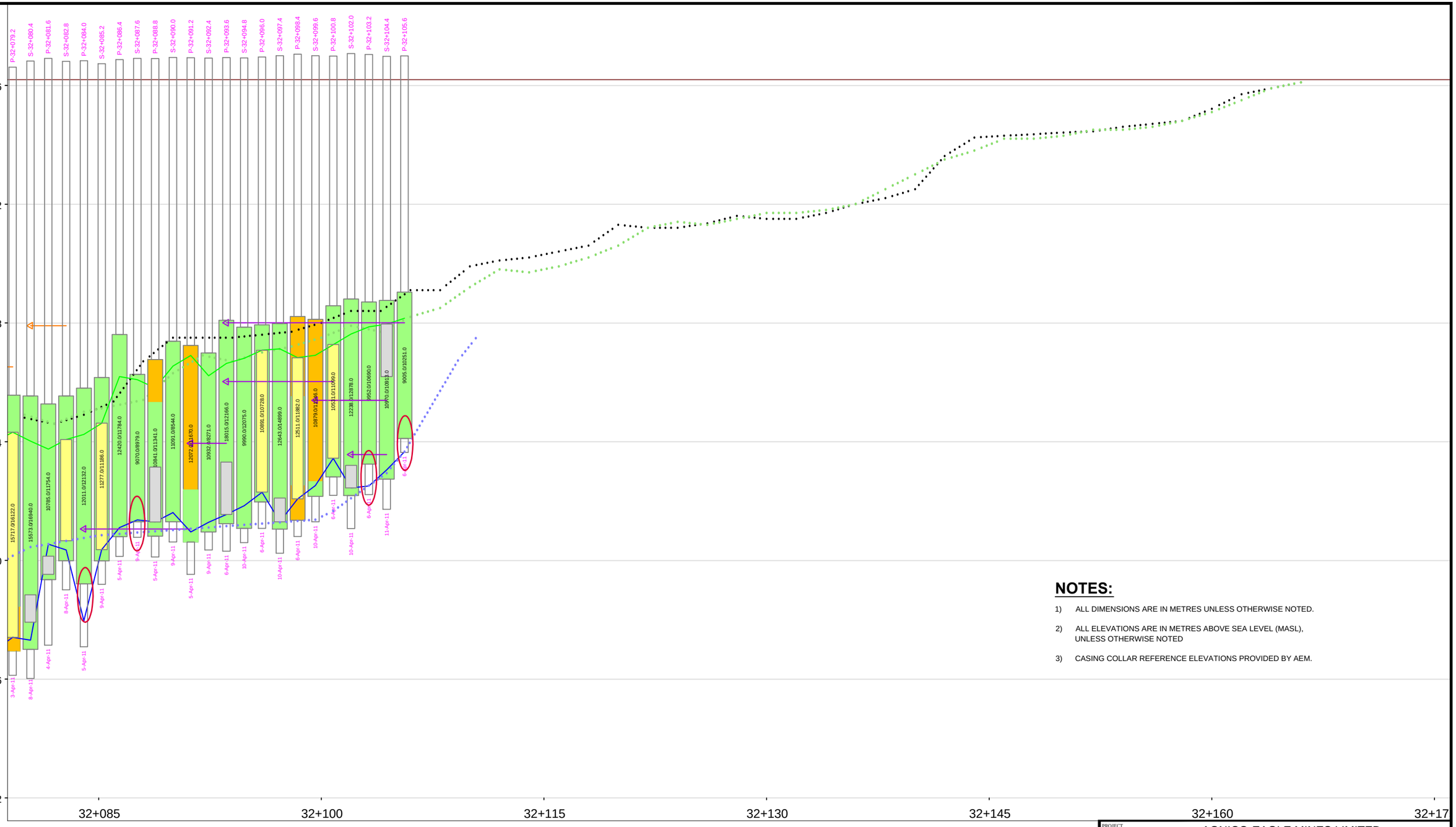
TITLE
# BAY-GOOSE DIKE
# JET GROUTING PROGRESS
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | RC | NOV10 | SCALE | AS SHOWN | REV. 0 |
| CADD | RC | NOV10 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E2-4.3

Drawing File: G:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E2-4\JetGrout_Xsect_Progress.dwg November 29, 2012 2:33:17 PM By: VRombough




## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104 — FINAL VOLUME INJECTED (l)

3,372.0 — THEORETICAL VOLUME (L)

BOULDER REPORTED

COBBLES AND BOULDERS REPORTED

| | WITHDRAWL RATE (MM/MIN) | COL. DIA. (M) | NO. OF NOZZLES | MATERIAL |
|---|---|---|---|---|
| T.VOL / F.VOL | DESIGN (300) | 1.5 | 2 | TILL / SOFT |
| T.VOL / F.VOL | DESIGN (300) | 2.1 | 2 | SOFT |
| T.VOL / F.VOL | HALF (150) | 1.5 | 1 | TILL / SOFT |
| T.VOL / F.VOL | REDUCED (150-230) | 2.1 | 2 | TILL / SOFT |

- GROUND SURFACE (OBSERVED)
- SOFT ZONE (INTERPRETED)
- TILL (INTERPRETED)
- BEDROCK (2010 INVESTIGATION)
- GROUTING COMMUNICATION
- DRILLING COMMUNICATION
- TOP OF SOFT ZONE (OBSERVED)
- BASE OF CUT-OFF WALL (OBSERVED)
- BEDROCK (OBSERVED)
- ORIGINAL TRENCH
- UNABLE TO GROUT WITHIN BEDROCK DUE TO HIGH RISK OF EQUIPMENT LOSS OR BREAKDOWN

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

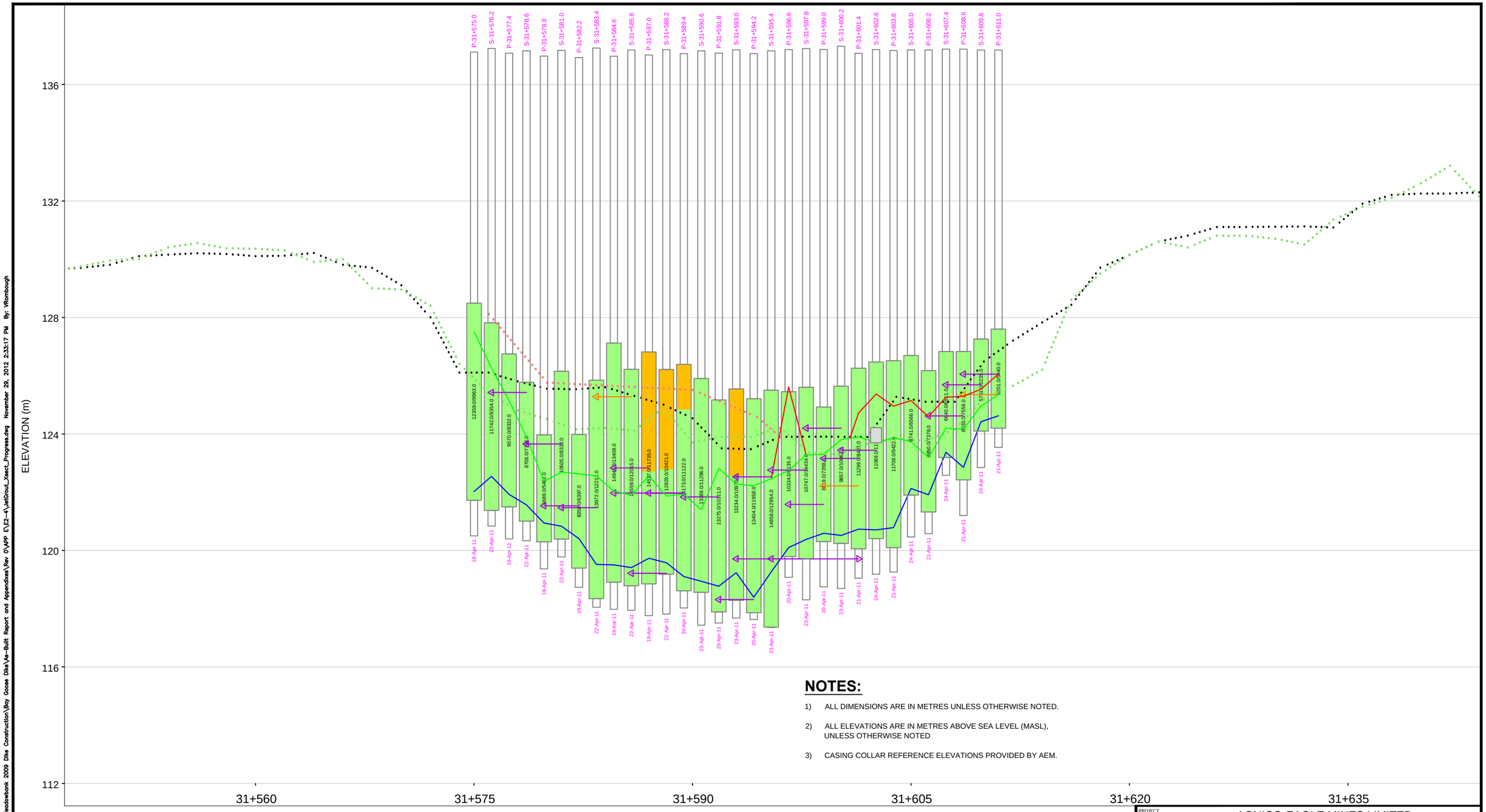
TITLE
# BAY-GOOSE DIKE
# JET GROUTING PROGRESS
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | RC | NOV10 | SCALE | AS SHOWN | REV. 0 |
| CADD | RC | NOV10 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E2-4.4

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E2-4\JetGrout_Xsect_Progress.dwg November 29, 2012 2:33:17 PM By: VRombough




## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104 — FINAL VOLUME INJECTED (l)

BOULDER REPORTED

3.37/0 — THEORETICAL VOLUME (L)

COBBLES AND BOULDERS REPORTED

| | WITHDRAWL RATE (MM/MIN) | COL. DIA. (M) | NO. OF NOZZLES | MATERIAL |
|---|---|---|---|---|
| T.VOL / F.VOL | DESIGN (300) | 1.5 | 2 | TILL / SOFT |
| T.VOL / F.VOL | DESIGN (300) | 2.1 | 2 | SOFT |
| T.VOL / F.VOL | HALF (150) | 1.5 | 1 | TILL / SOFT |
| T.VOL / F.VOL | REDUCED (150-230) | 2.1 | 2 | TILL / SOFT |

- GROUND SURFACE (OBSERVED)
- SOFT ZONE (INTERPRETED)
- TILL (INTERPRETED)
- BEDROCK (2010 INVESTIGATION)
- GROUTING COMMUNICATION
- DRILLING COMMUNICATION
- TOP OF SOFT ZONE (OBSERVED)
- BASE OF CUT-OFF WALL (OBSERVED)
- BEDROCK (OBSERVED)
- ORIGINAL TRENCH

UNABLE TO GROUT WITHIN BEDROCK DUE TO HIGH RISK OF EQUIPMENT LOSS OR BREAKDOWN

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AEM
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# JET GROUTING PROGRESS
# CROSS SECTION

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | PHASE No. | | 2000 |
| DESIGN | RC | NOV10 | SCALE | AS SHOWN | REV. 0 |
| CADD | RC | NOV10 | | | |
| CHECK | GRB | 01DEC12 | FIGURE E2-4.5 | | |
| REVIEW | FE | 01DEC12 | | | |

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E2-4\JetGrout_Xsect_Progress.dwg November 29, 2012 2:33:17 PM By: VRombough

Drawing File: Q:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Boy Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E2-4\JetGrout_Xsect_Progress.dwg November 29, 2012 2:33:17 PM By: VRombough

ELEVATION (m)

136
132
128
124
120
116
112

30+350
30+365
30+380
30+395
30+410
30+425
30+440

## NOTES:

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL), UNLESS OTHERWISE NOTED
3) CASING COLLAR REFERENCE ELEVATIONS PROVIDED BY AEM.

## LEGEND:

BOREHOLE NAME
P-PRIMARY
S-SECONDARY
T-TERTIARY
Q-QUATERNARY

P - 60+104 — FINAL VOLUME INJECTED (l)

3.3/2.0 — THEORETICAL VOLUME (L)

BOULDER REPORTED

COBBLES AND BOULDERS REPORTED

| | WITHDRAWL RATE (MM/MIN) | COL. DIA. (M) | NO. OF NOZZLES | MATERIAL |
|---|---|---|---|---|
| T.VOL / F.VOL | DESIGN (300) | 1.5 | 2 | TILL / SOFT |
| T.VOL / F.VOL | DESIGN (300) | 2.1 | 2 | SOFT |
| T.VOL / F.VOL | HALF (150) | 1.5 | 1 | TILL / SOFT |
| T.VOL / F.VOL | REDUCED (150-230) | 2.1 | 2 | TILL / SOFT |

GROUND SURFACE (OBSERVED)
SOFT ZONE (INTERPRETED)
TILL (INTERPRETED)
BEDROCK (2010 INVESTIGATION)
GROUTING COMMUNICATION
DRILLING COMMUNICATION

TOP OF SOFT ZONE (OBSERVED)
BASE OF CUT-OFF WALL (OBSERVED)
BEDROCK (OBSERVED)
ORIGINAL TRENCH

UNABLE TO GROUT WITHIN BEDROCK DUE TO HIGH RISK OF EQUIPMENT LOSS OR BREAKDOWN

0 1 2 3 4 5
VERTICAL SCALE IN METRES

0 2 4 6 8 10
HORIZONTAL SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
# BAY-GOOSE DIKE
# JET GROUTING PROGRESS
# CROSS SECTION

Golder Associates

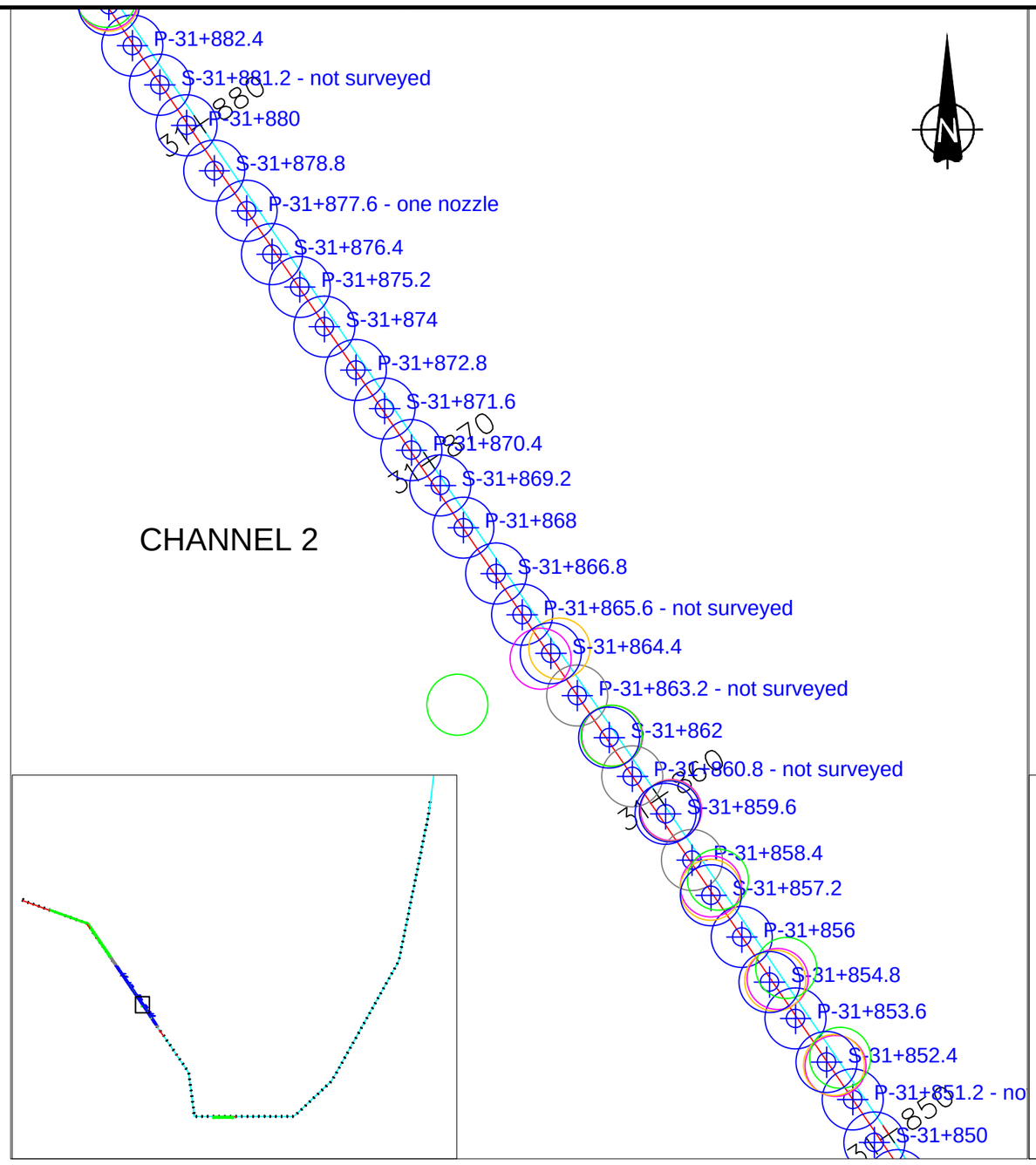
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| REVIEW | FE | 01DEC12 | | | |

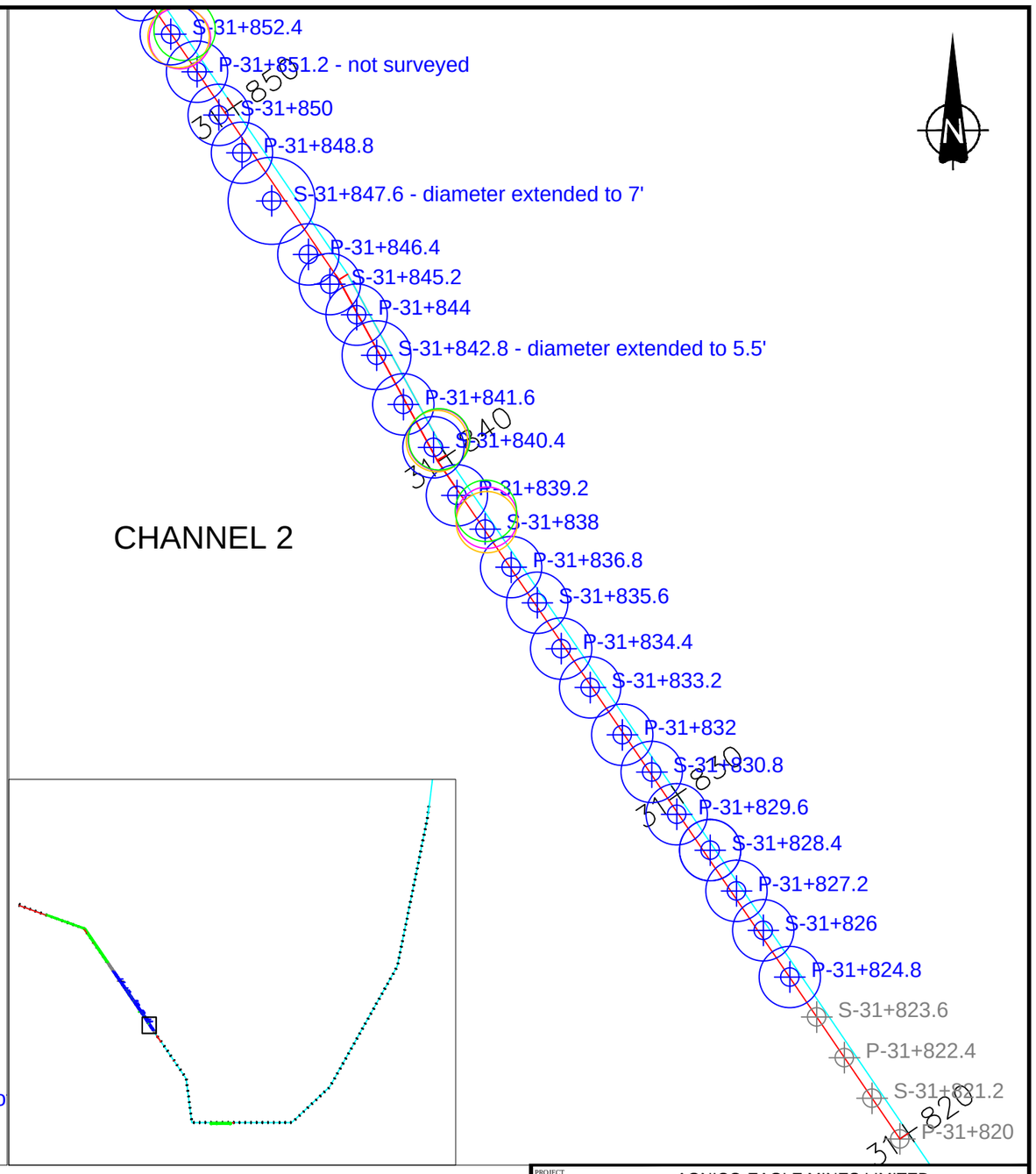
FIGURE E2-4.6

# E2-5 Deviation Survey Results

- Deviation Surveys
- Hayward Baker Deviation Survey Reports
- Agnico-Eagle Deviation Survey Reports

# Deviation Surveys




**LEGEND:**

- AS-BUILT CENTRELINE
- 0.25 m CENTRELINE OFFSET (LAKESIDE)
- P-31+824.8 COMPLETED JET GROUT HOLE
- JET GROUT COLUMN COLLAR
- JET GROUT COLUMN MID-DEPTH (TOP OF PROJECTION)
- JET GROUT COLUMN AT DEPTH (ABSOLUTE POSITION)
- JET GROUT COLUMN PROJECTED TO FULL DEPTH

0 1 2 3 4 5
SCALE IN METRES

PROJECT
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

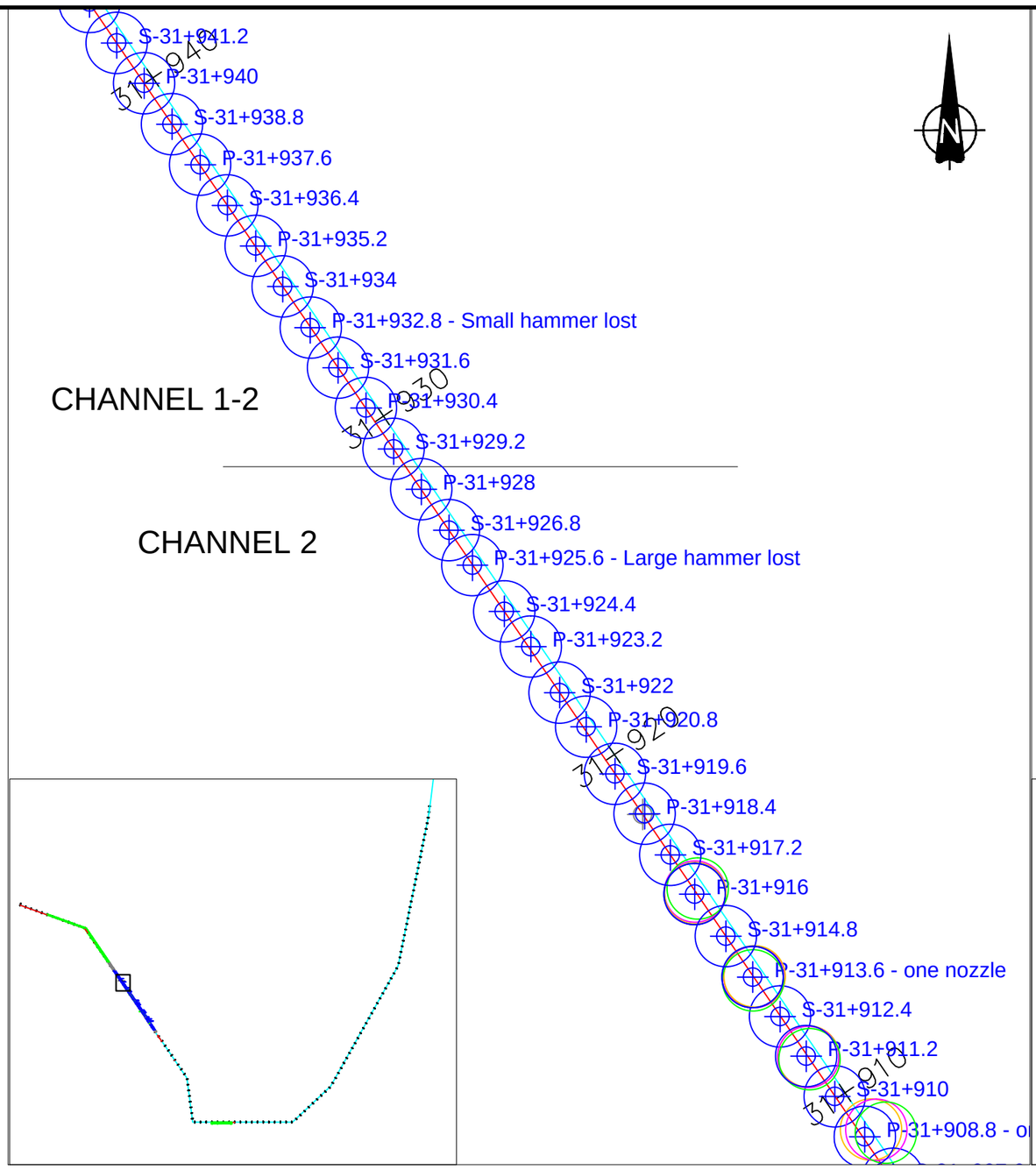
TITLE
**BAY-GOOSE DIKE**
**DEVIATION SURVEYS**
**CHANNEL 2 - AEM**

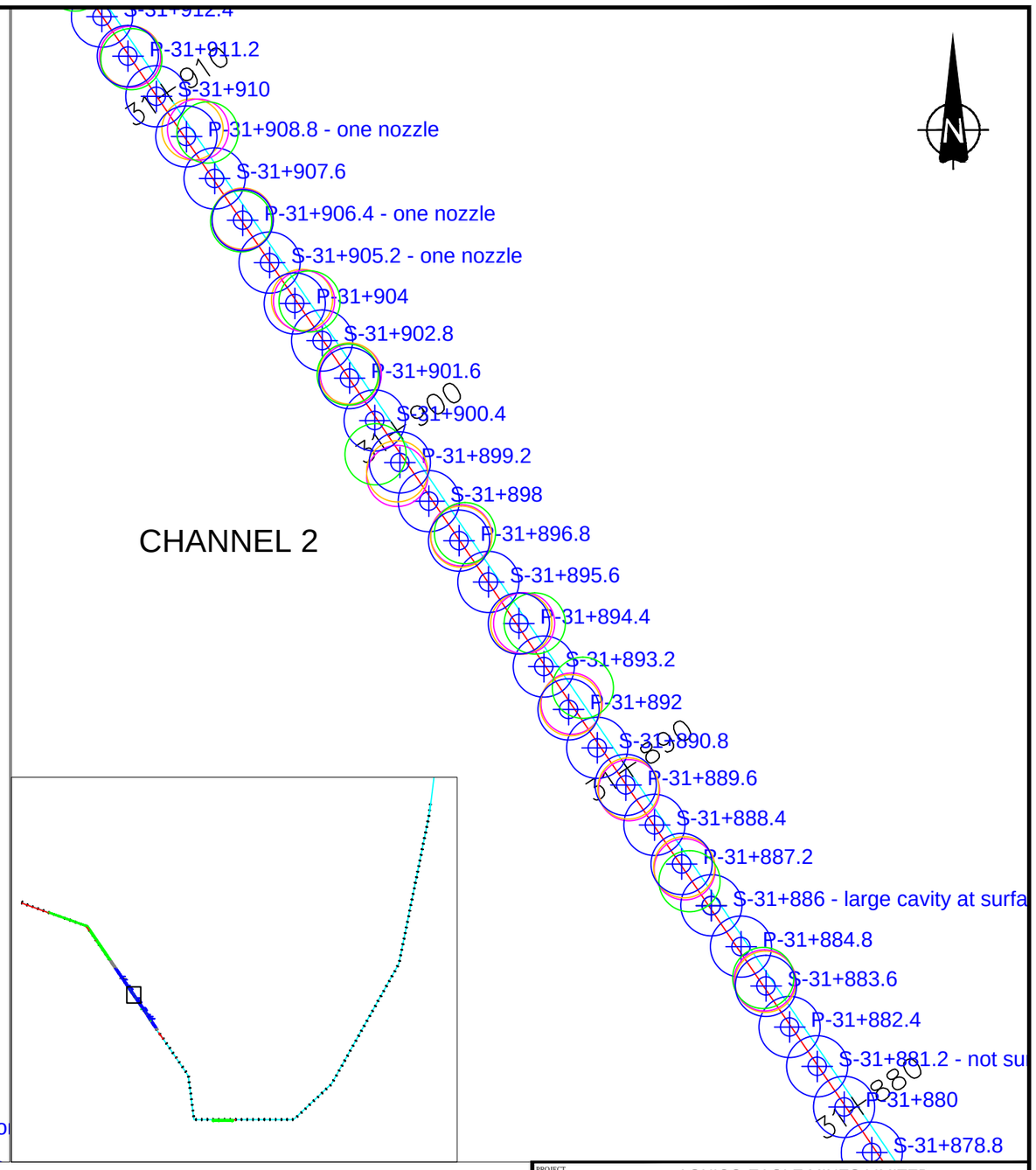
Golder Associates

| | | | | | |
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| DESIGN | VTR | SEP2011 | SCALE | AS SHOWN | REV. 0 |
| CADD | VTR | SEP2011 | | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

FIGURE E2-5.1

Drawing File: O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E2-5\Jet_Grouting_Deviation.dwg November 29, 2012 2:40:37 PM By: VRombough




**LEGEND:**

- AS-BUILT CENTRELINE
- 0.25 m CENTRELINE OFFSET (LAKESIDE)
- P-31+824.8 COMPLETED JET GROUT HOLE
- JET GROUT COLUMN COLLAR
- JET GROUT COLUMN MID-DEPTH (TOP OF PROJECTION)
- JET GROUT COLUMN AT DEPTH (ABSOLUTE POSITION)
- JET GROUT COLUMN PROJECTED TO FULL DEPTH

0 1 2 3 4 5
SCALE IN METRES

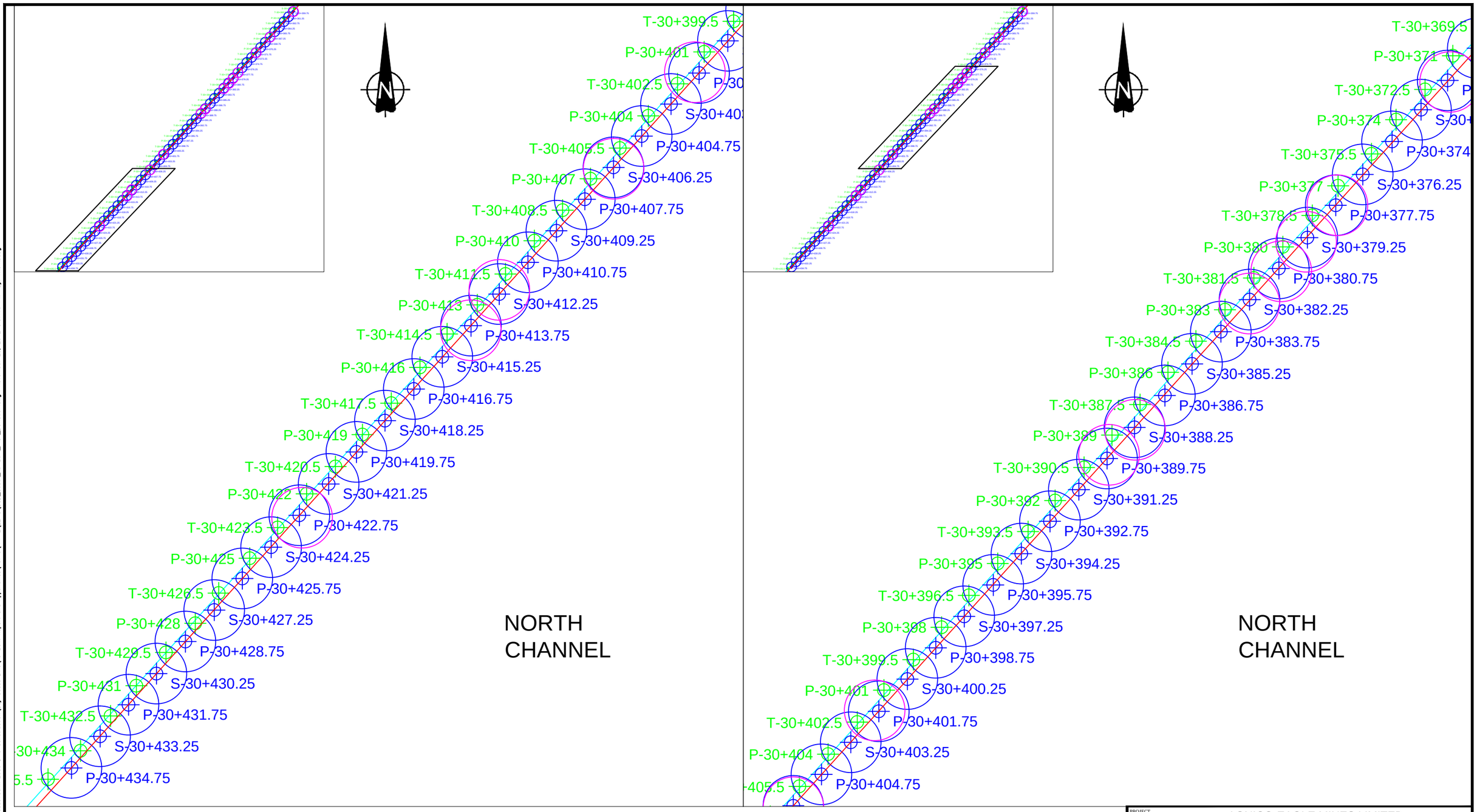
PROJECT
AEM
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
**BAY-GOOSE DIKE**
**DEVIATION SURVEYS**
**CHANNEL 2 - AEM**

Golder Associates

| | | | | |
|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | |
| DESIGN | VTR | SEP2011 | SCALE AS SHOWN | REV. 0 |
| CADD | VTR | SEP2011 | | |
| CHECK | GRB | 01DEC12 | FIGURE E2-5.2 | |
| REVIEW | FE | 01DEC12 | | |

Drawing File: C:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendices\Rev 0\APP E\E2-5\Jet_Grouting_Deviation.dwg November 29, 2012 2:40:37 PM By: VRombough




**LEGEND:**

- AS-BUILT CUT-OFF CENTRELINE
- 0.25 m CENTRELINE OFFSET (LAKESIDE)
- S-31+826 — COMPLETED JET GROUT HOLE
- P-31+790 — INSTALLED CASING FOR BEDROCK GROUTING
- JET GROUT COLUMN COLLAR
- JET GROUT COLUMN AT DEPTH (CUMULATIVE DEVIATION)

0 1 2 3 4 5
SCALE IN METRES

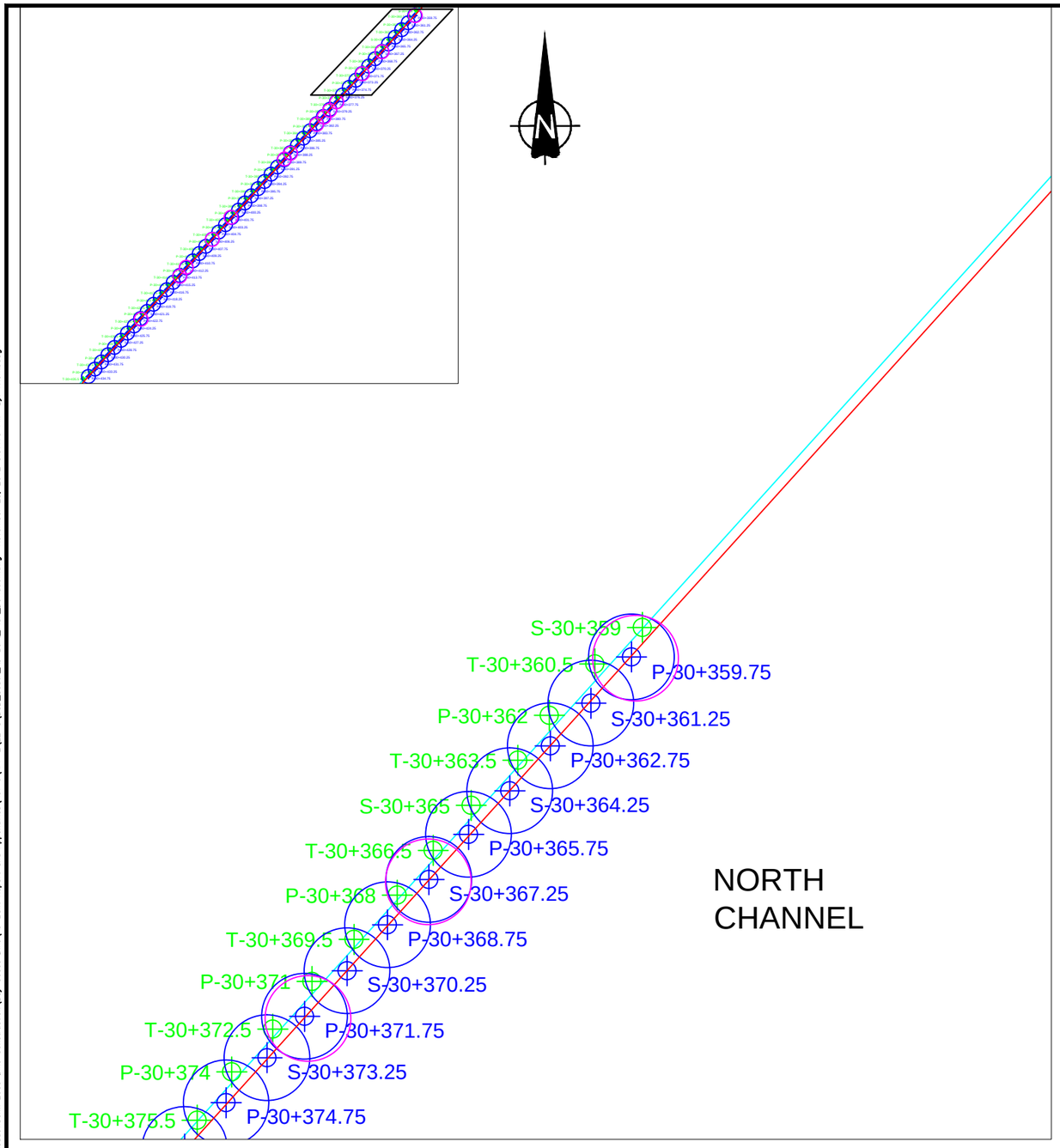
PROJECT
AEM
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
**BAY-GOOSE DIKE NORTH DEVIATION SURVEYS NORTH CHANNEL - HBI**

Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | |
| DESIGN | VTR | SEP2011 | SCALE | AS SHOWN | REV. 0 |
| CADD | VTR | SEP2011 | FIGURE E2-5.3 | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

Drawing File: G:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E2-5\BGD_South_As-Built_Plan_Deviation.dwg November 29, 2012 3:57:10 PM By: VRombough




**LEGEND:**

- AS-BUILT CUT-OFF CENTRELINE
- 0.25 m CENTRELINE OFFSET (LAKESIDE)
- S-31+826 — COMPLETED JET GROUT HOLE
- P-31+790 — INSTALLED CASING FOR BEDROCK GROUTING
- JET GROUT COLUMN COLLAR
- JET GROUT COLUMN AT DEPTH (CUMULATIVE DEVIATION)

0 1 2 3 4 5
SCALE IN METRES

PROJECT
AEM
AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
**BAY-GOOSE DIKE NORTH DEVIATION SURVEYS NORTH CHANNEL - HBI**

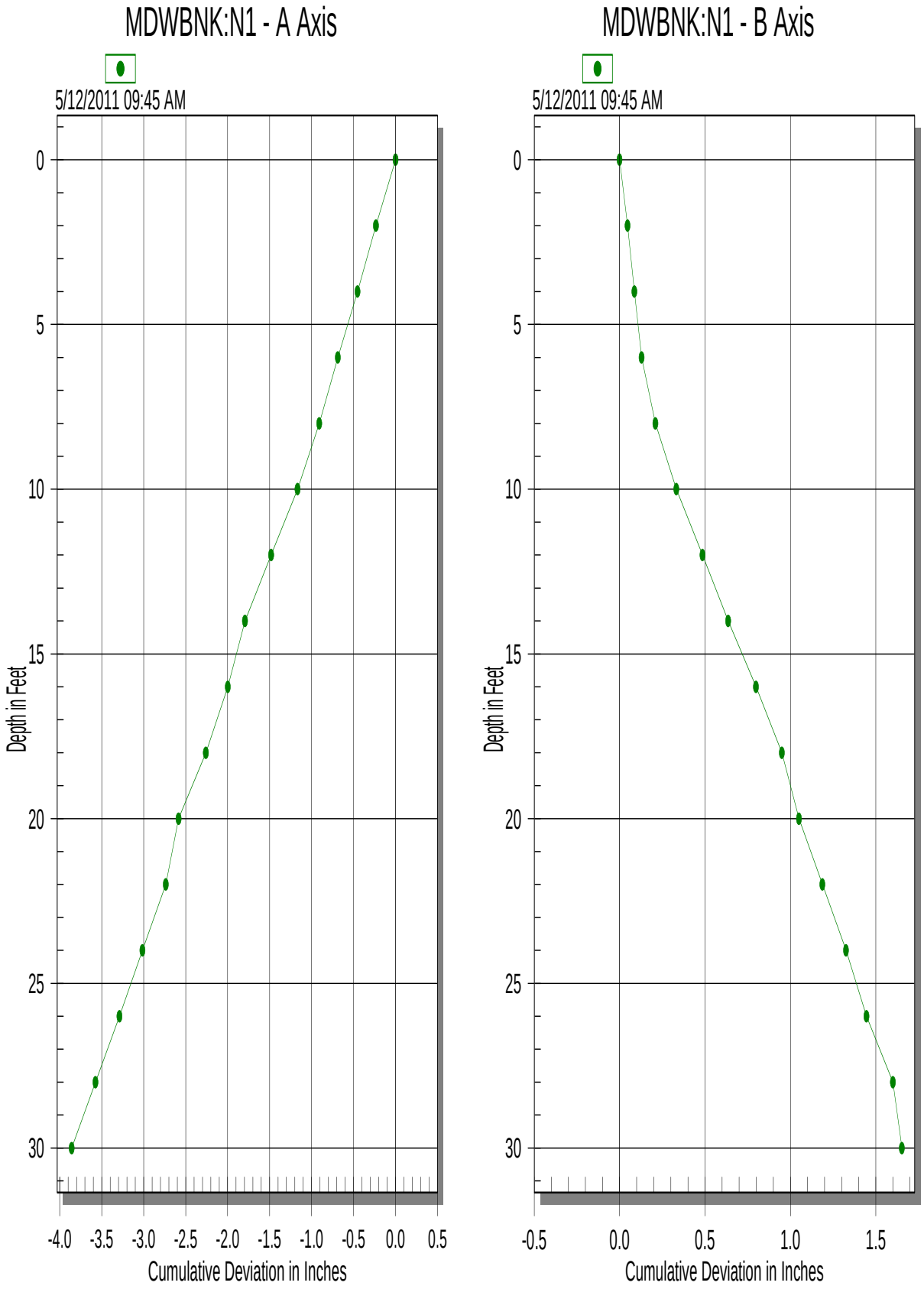
Golder Associates

| | | | | | |
|---|---|---|---|---|---|
| PROJECT No. | | 09-1428-5007 | FILE No. | | |
| DESIGN | VTR | SEP2011 | SCALE | AS SHOWN | REV. 0 |
| CADD | VTR | SEP2011 | FIGURE E2-5.4 | | |
| CHECK | GRB | 01DEC12 | | | |
| REVIEW | FE | 01DEC12 | | | |

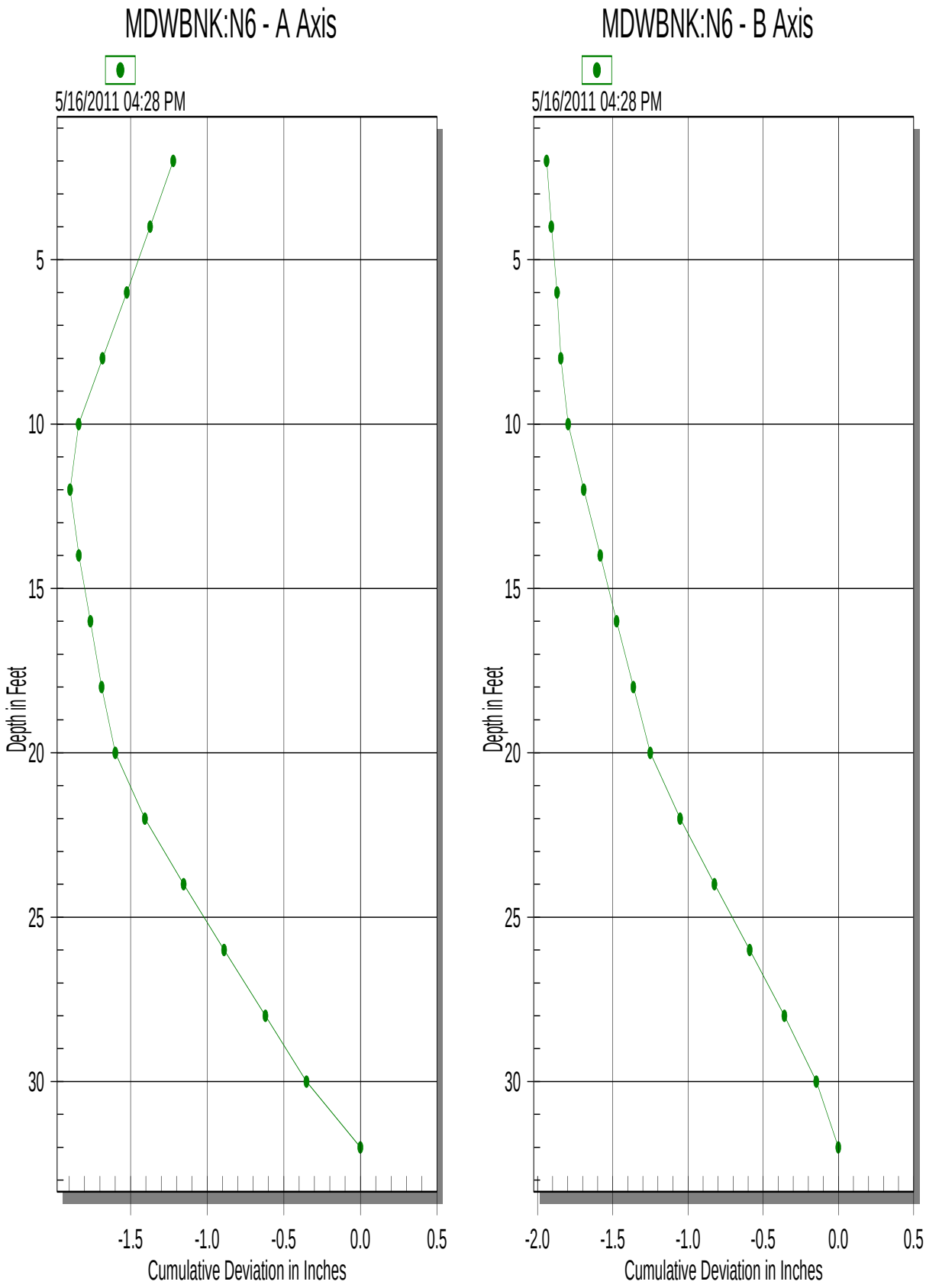
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# Hayward Baker Deviation Survey Reports

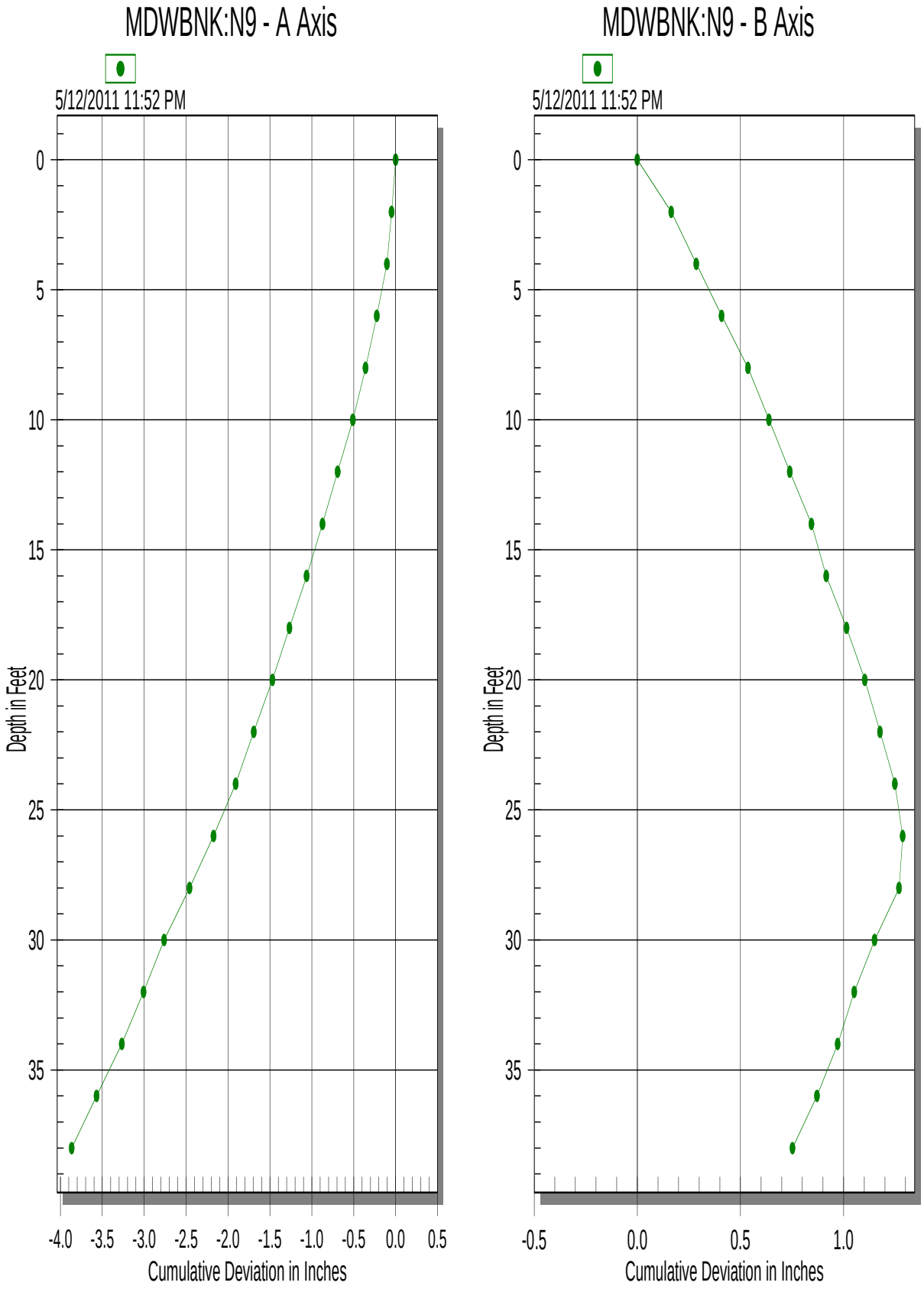
North Channel Hole # N-1
Station 30+359.75



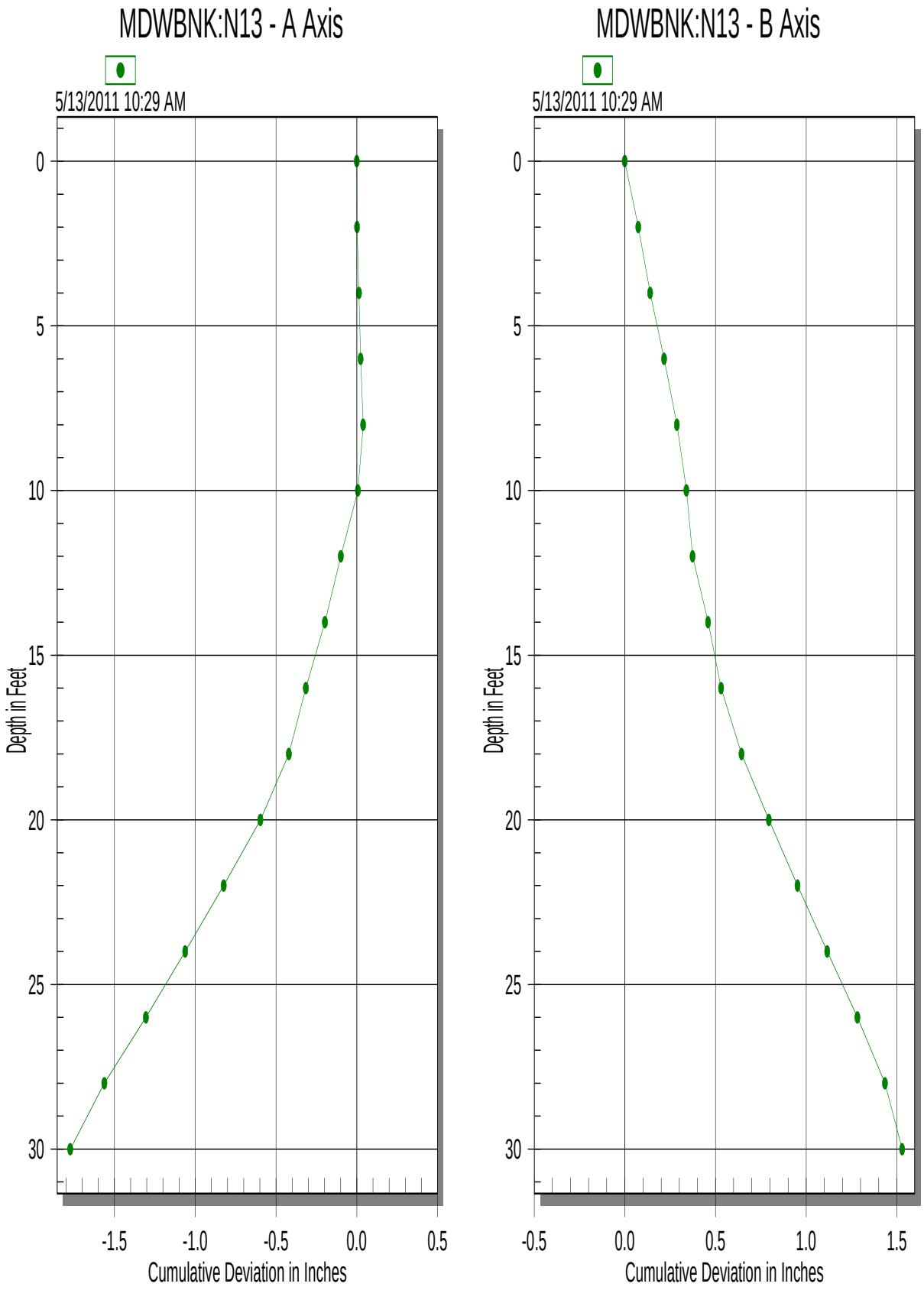
North Channel Hole # N6
Station: 30+367.25



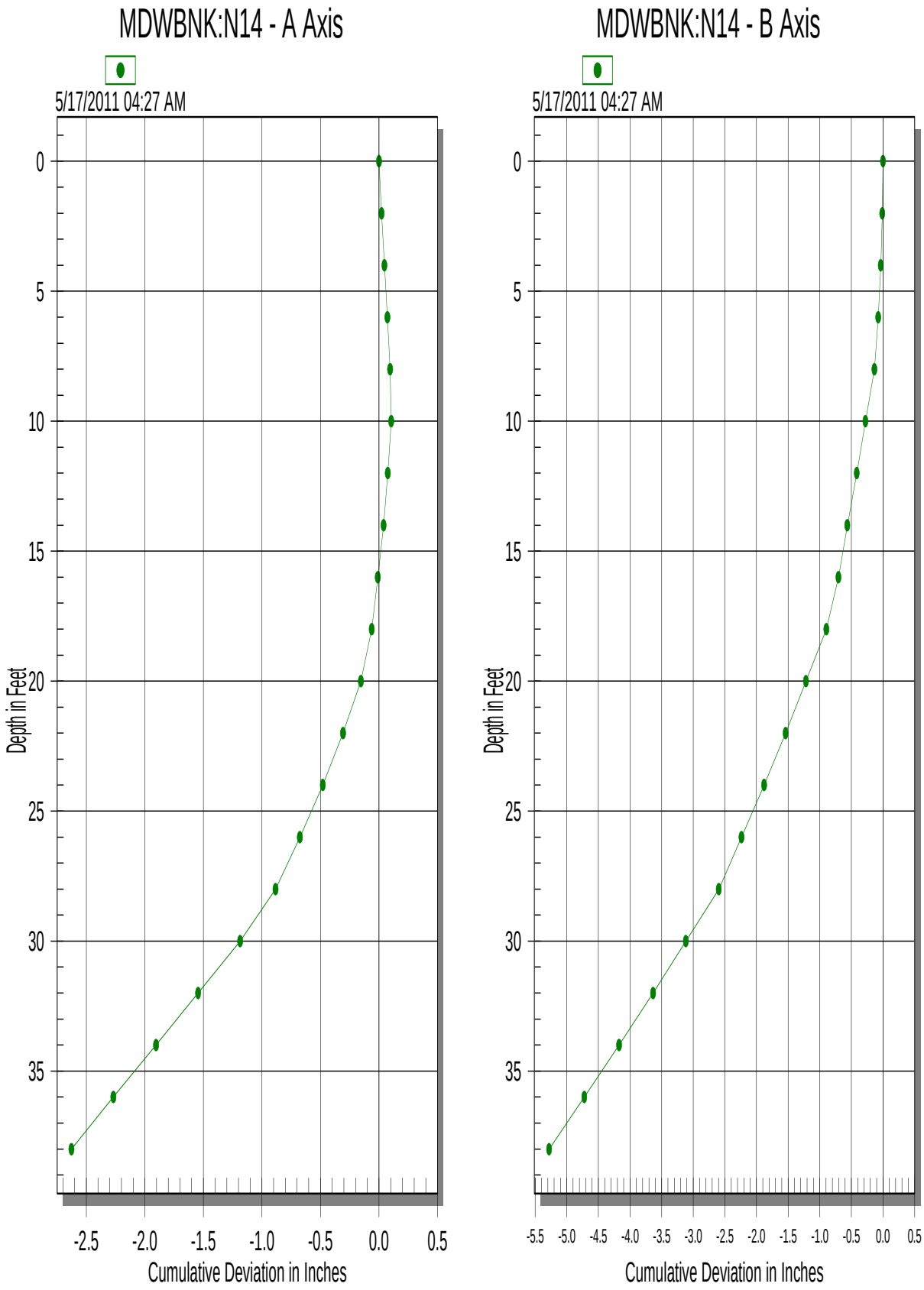
North Channel Hole # N9
Station: 30+371.75



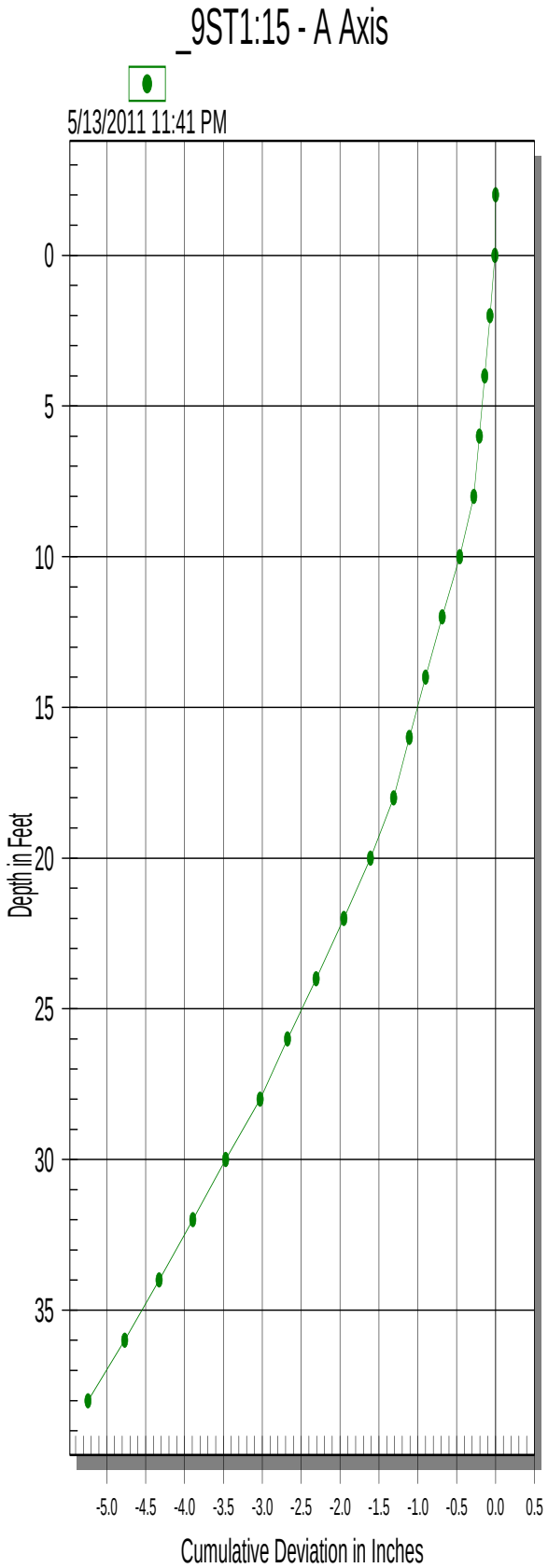
North Channel Hole # N13
Station: 30+359.75

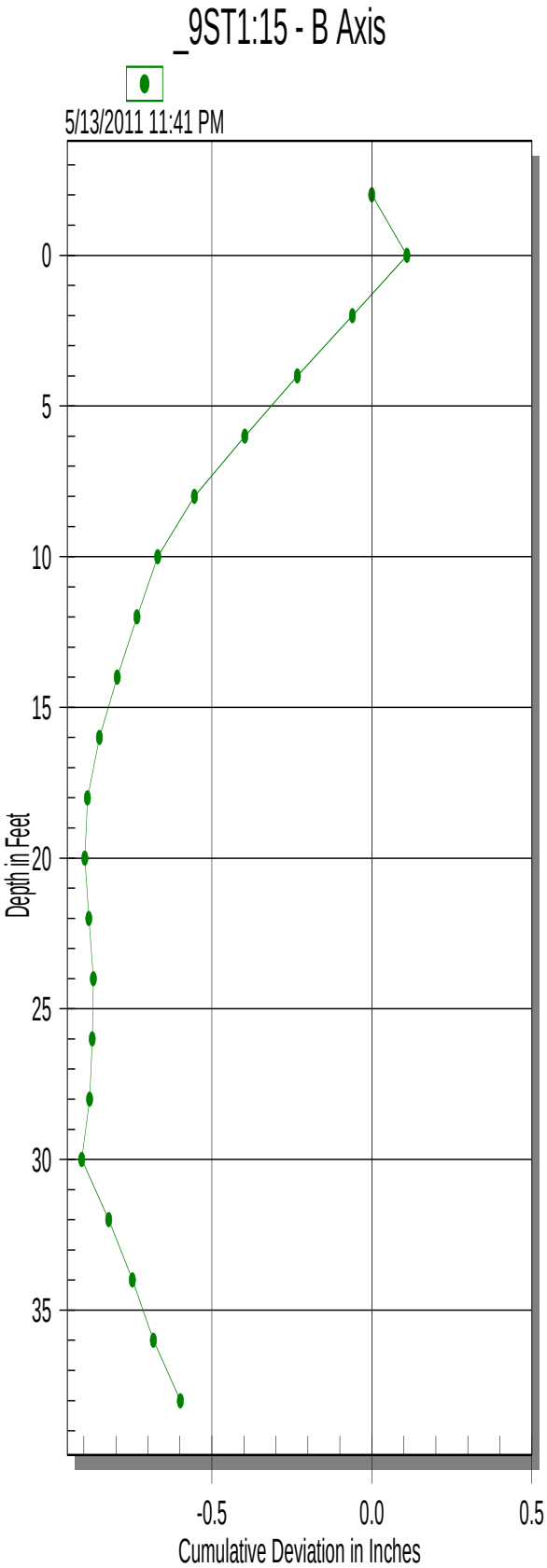


North Channel Hole # N14
Station: 30+379.25

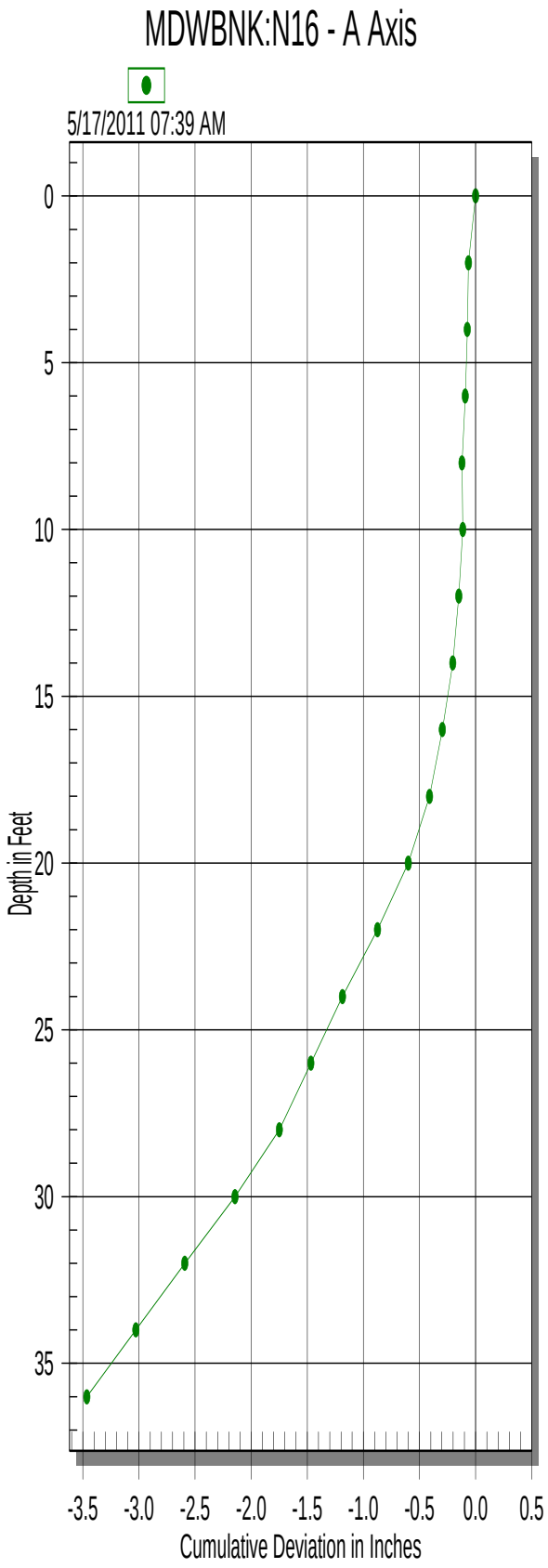


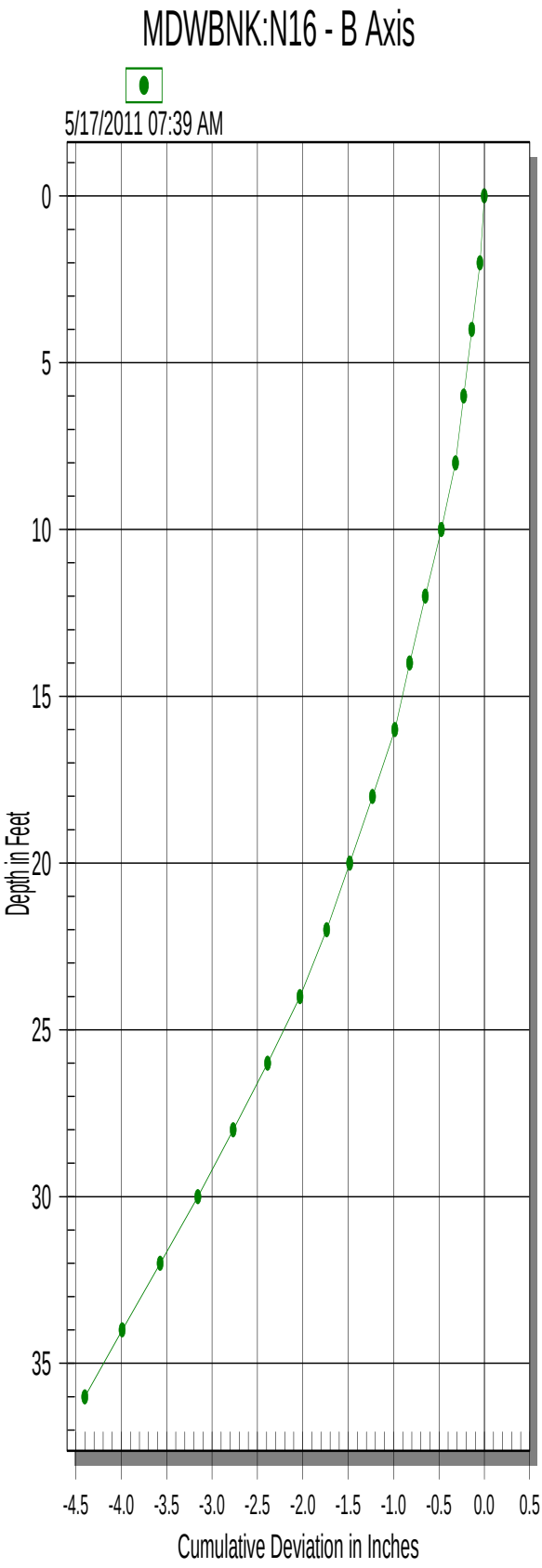
North Channel Hole# N15
Station 30+380.75



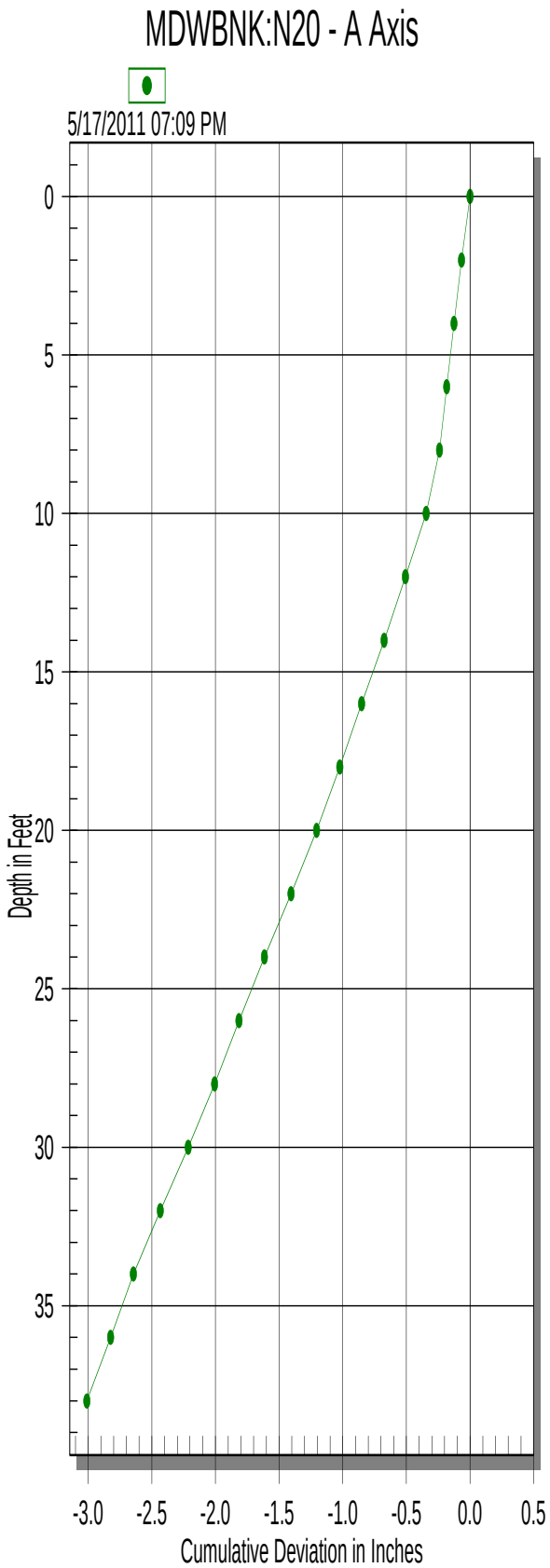



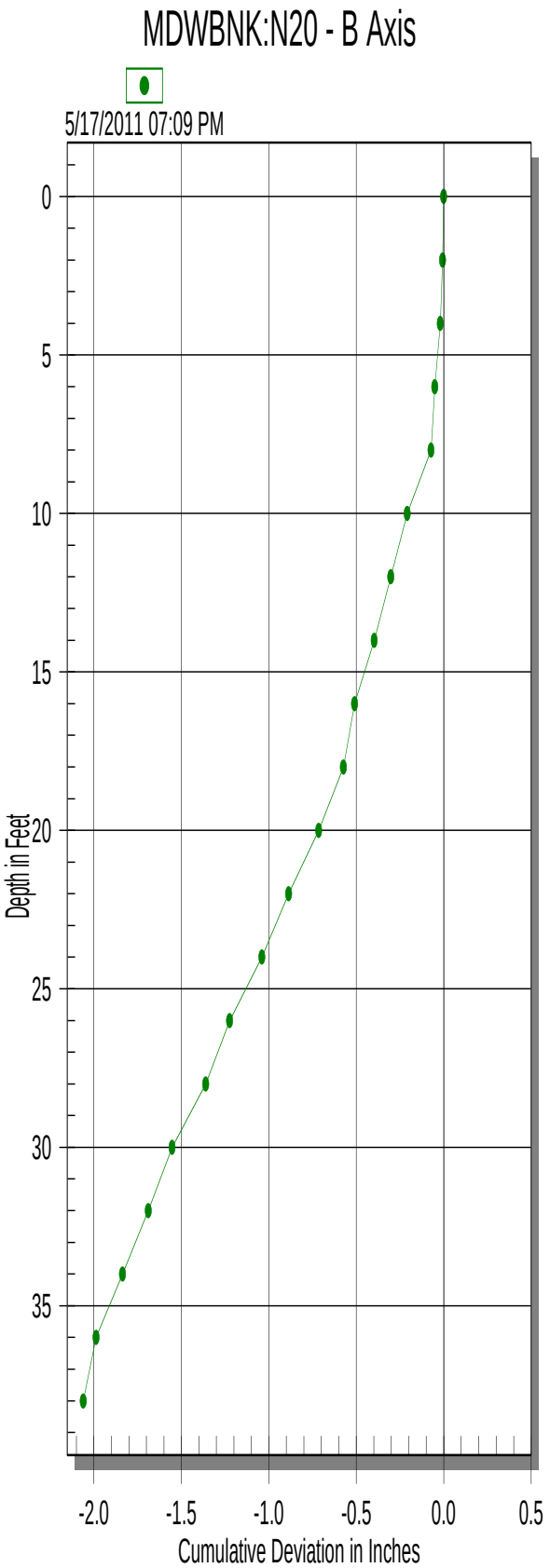
North Channel Hole # N16
Station: 30+382.25



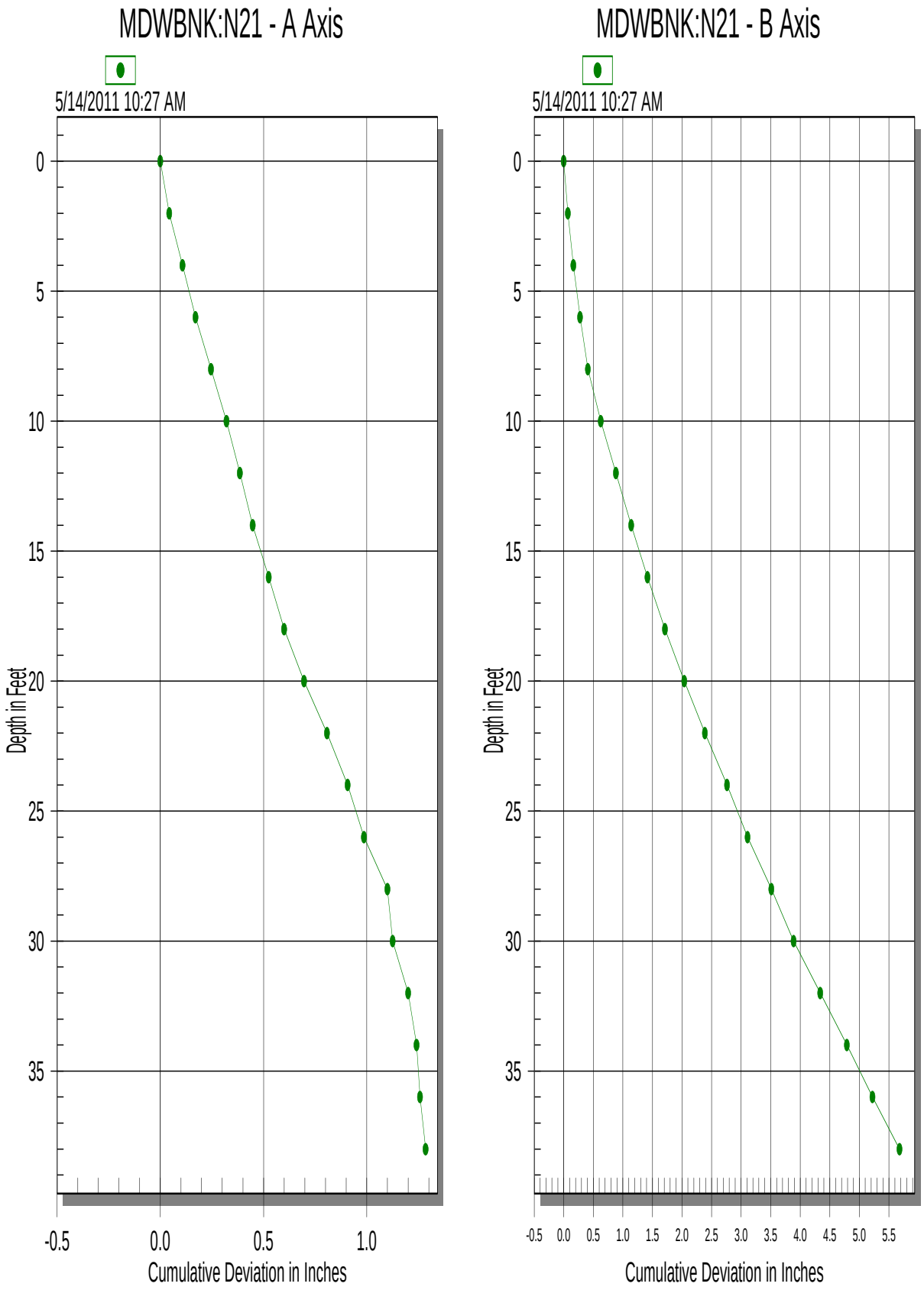



North Channel Hole # N20
Station: 30+388.25

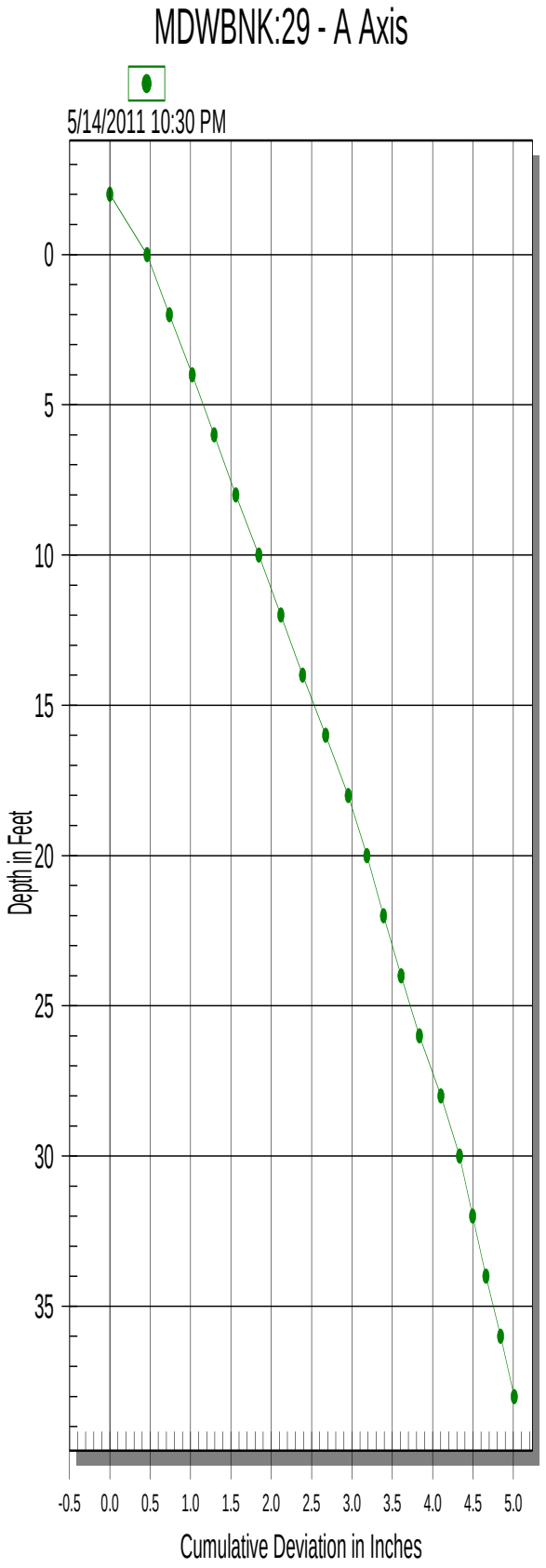


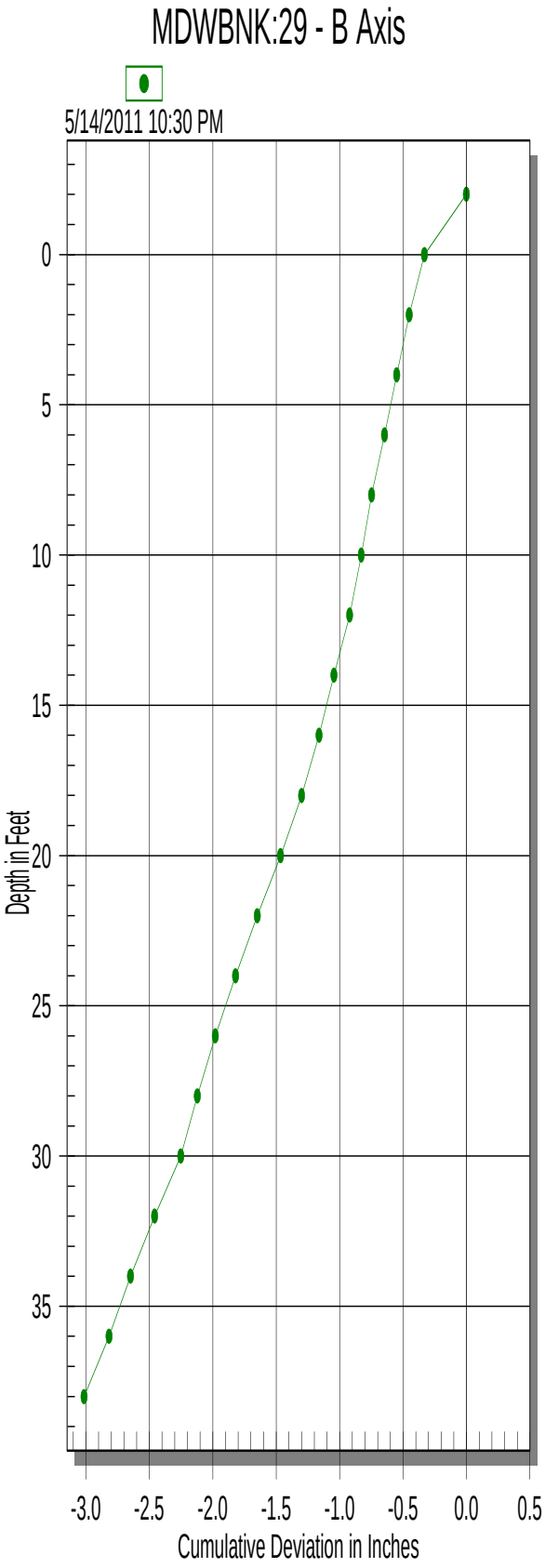



North Channel Hole # N21
Station: 30+389.75

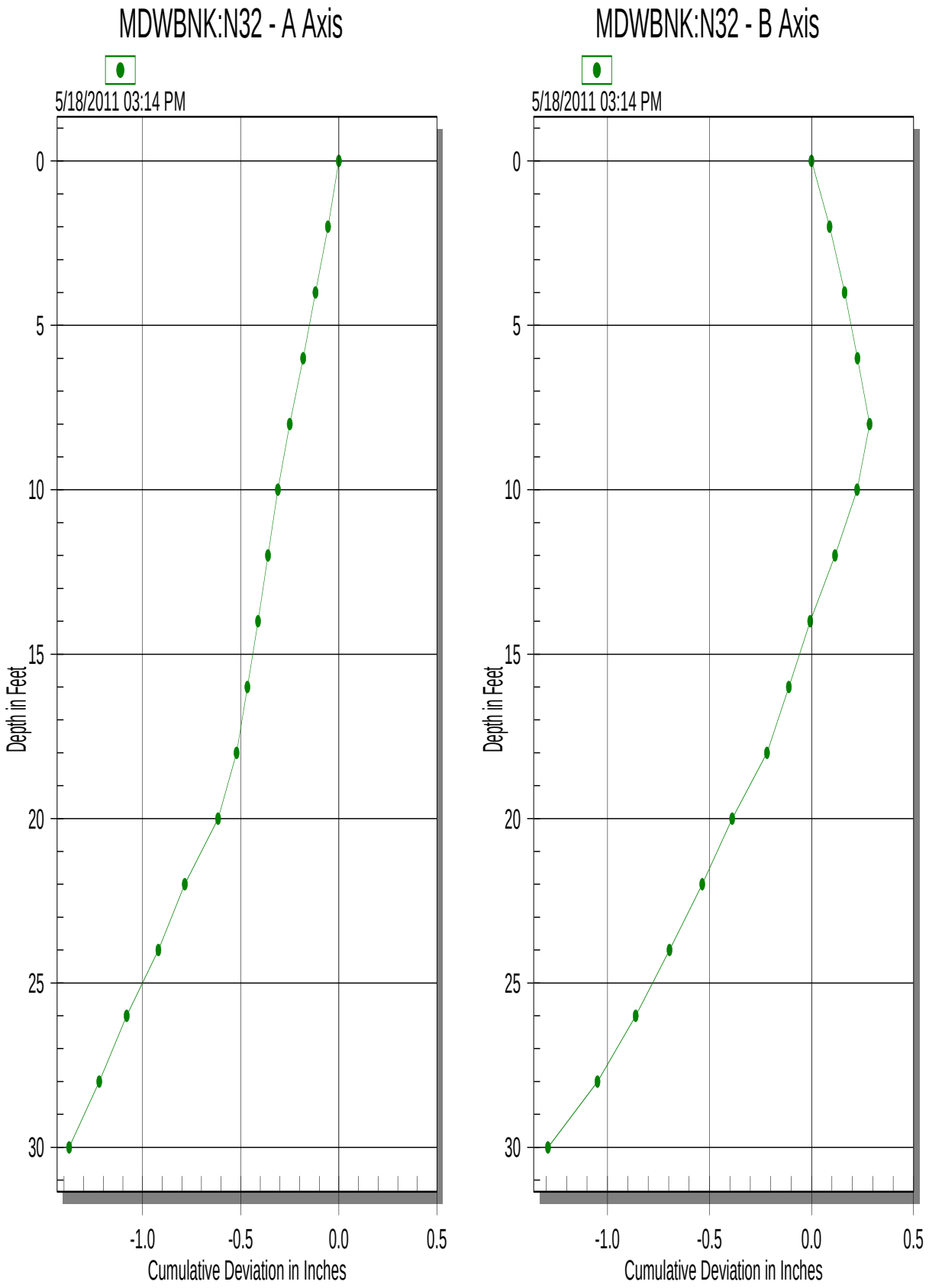


North Channel Hole # N29
Station: 30+401.75

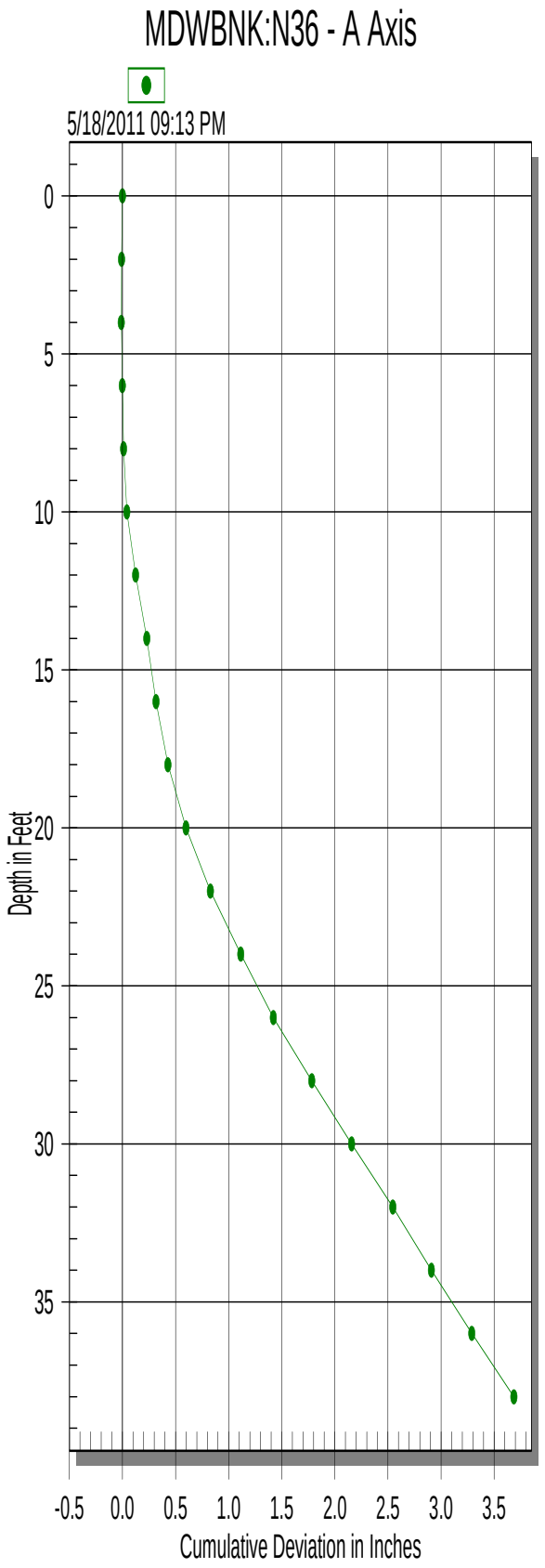


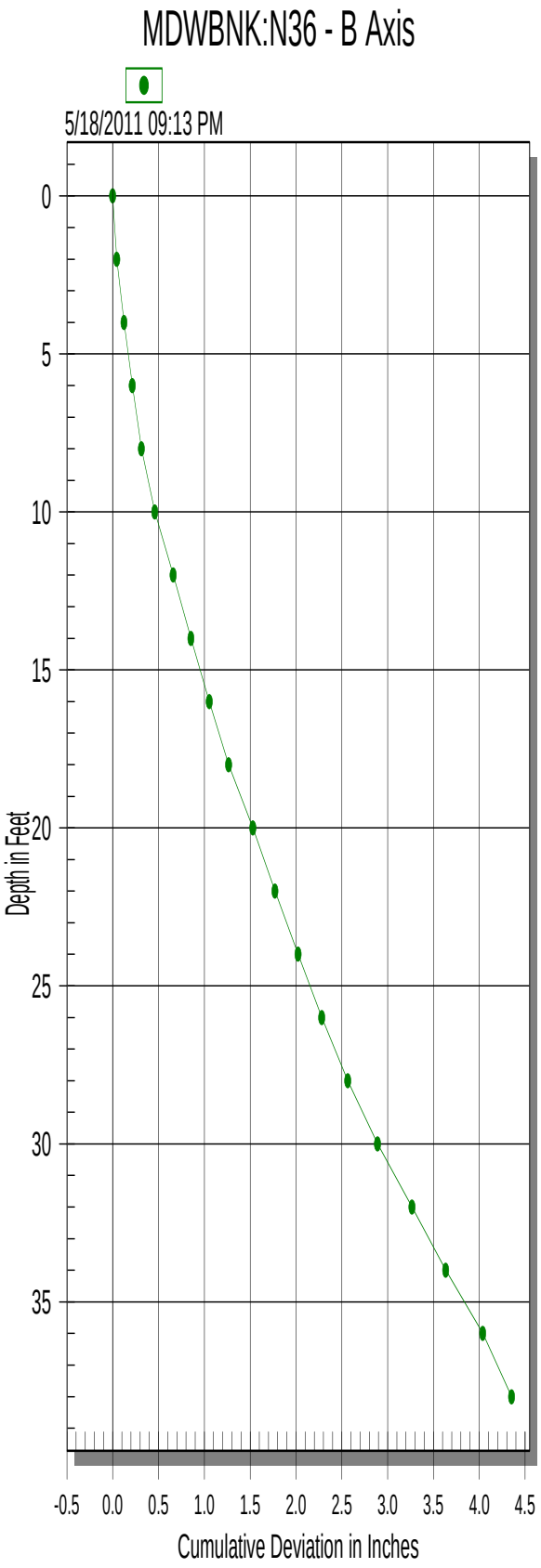



North Channel Hole # N32
Station: 30+406.25

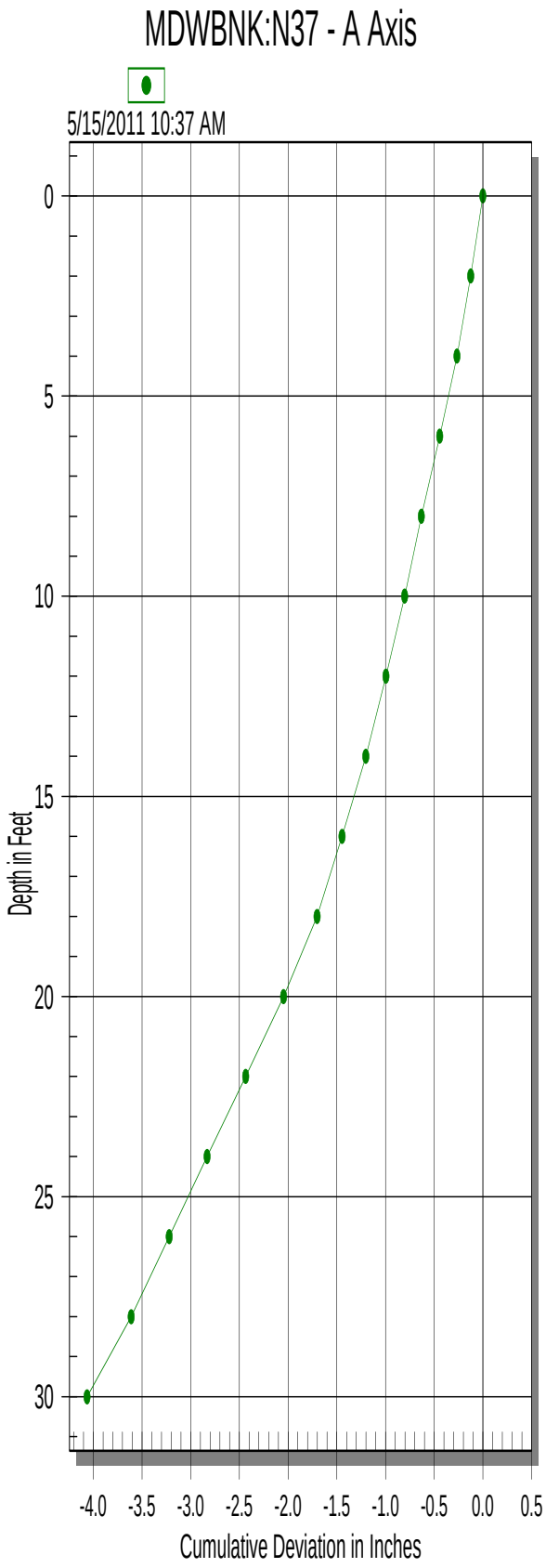


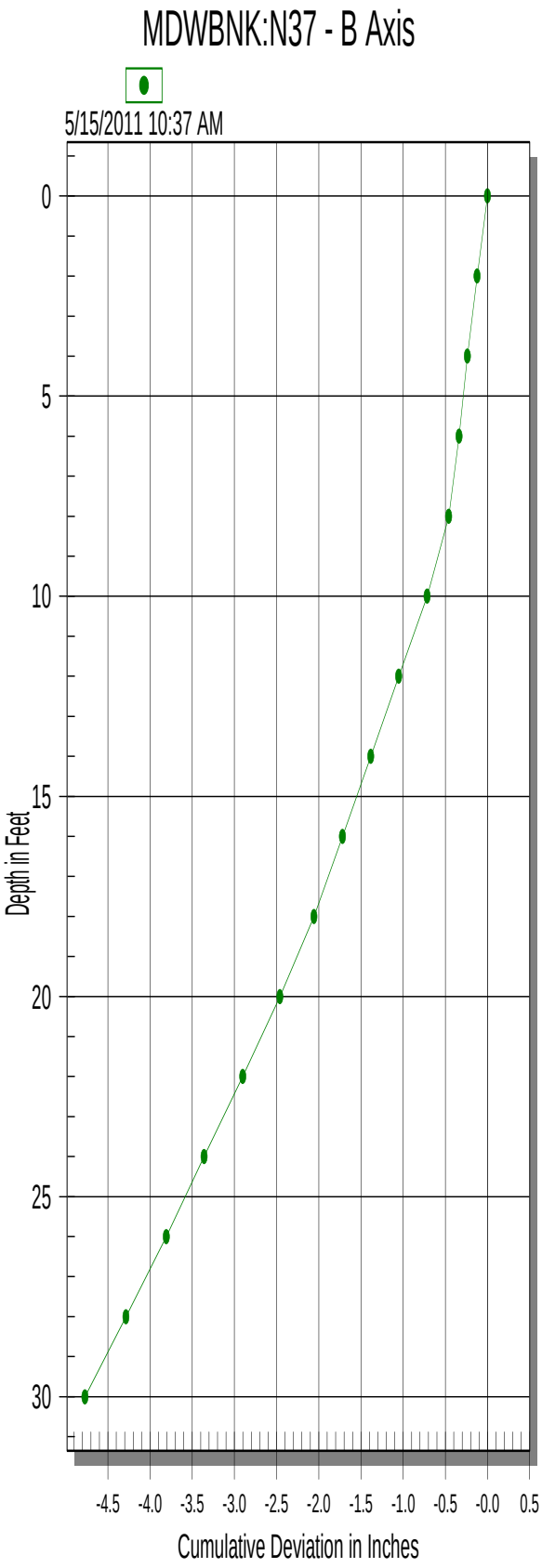
North Channel Hole # N36
Station: 30+412.25



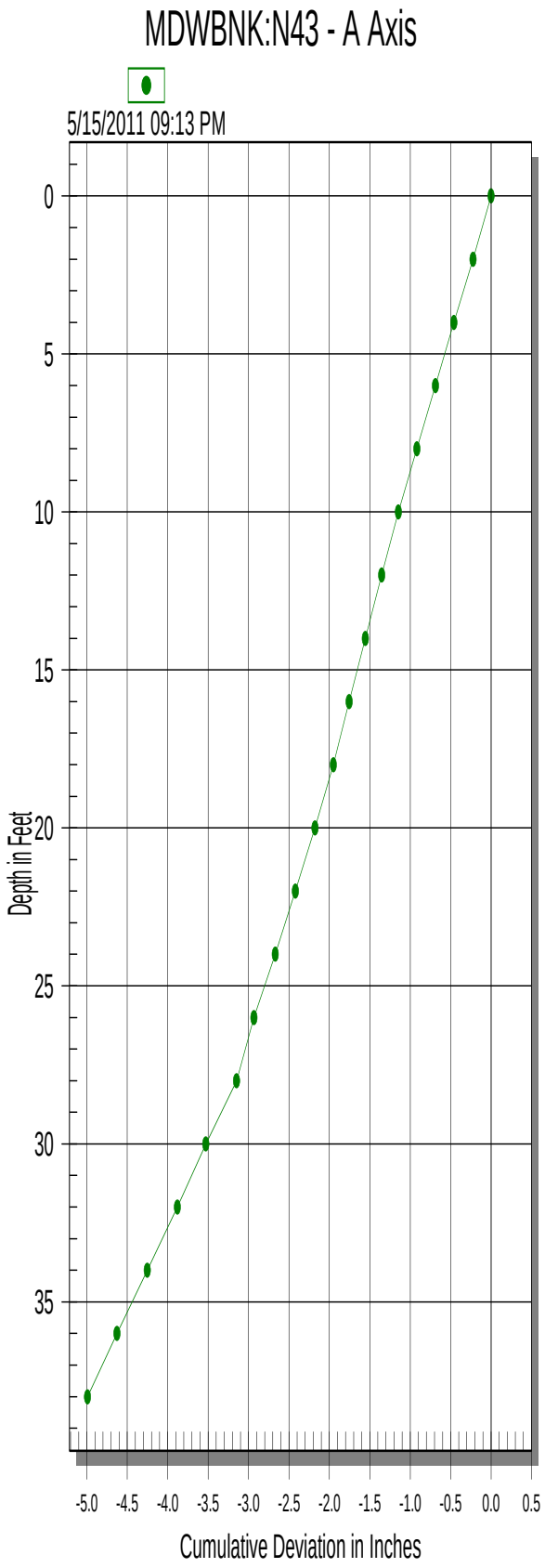



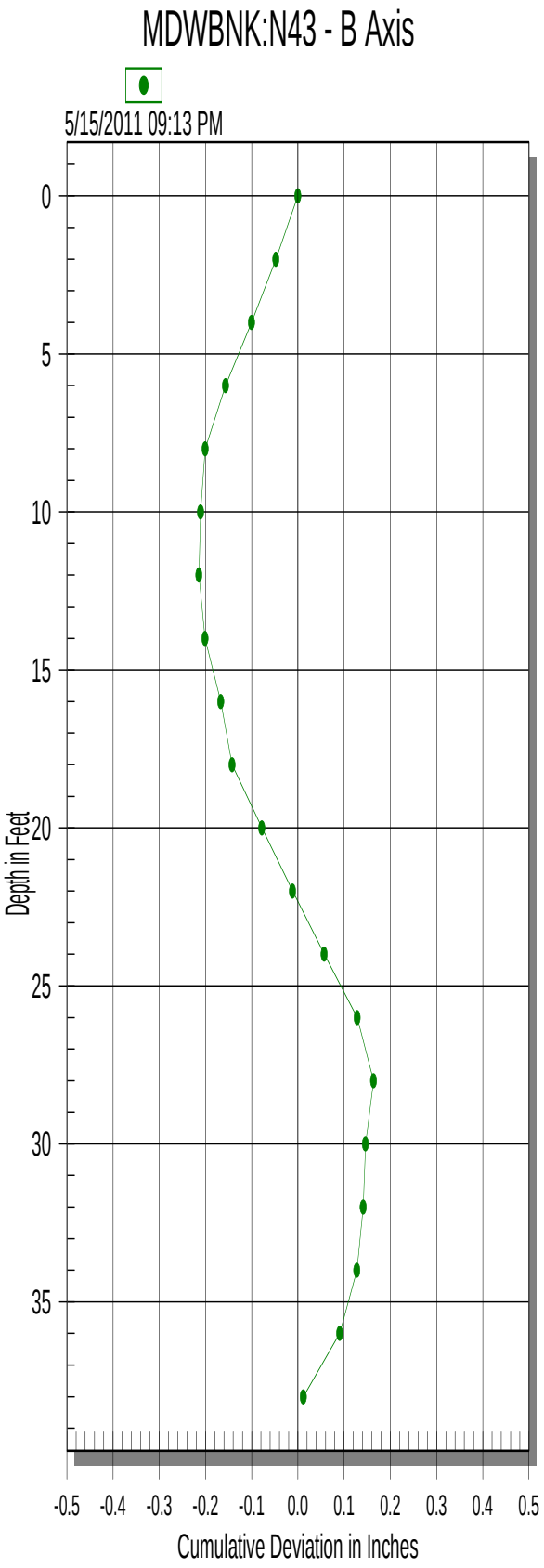
North Channel Hole# N37
Station: 30+413.75



North Channel Hole # N43
Station: 30+422.75



# Agnico-Eagle Deviation Survey Reports

RST Instruments Ltd.

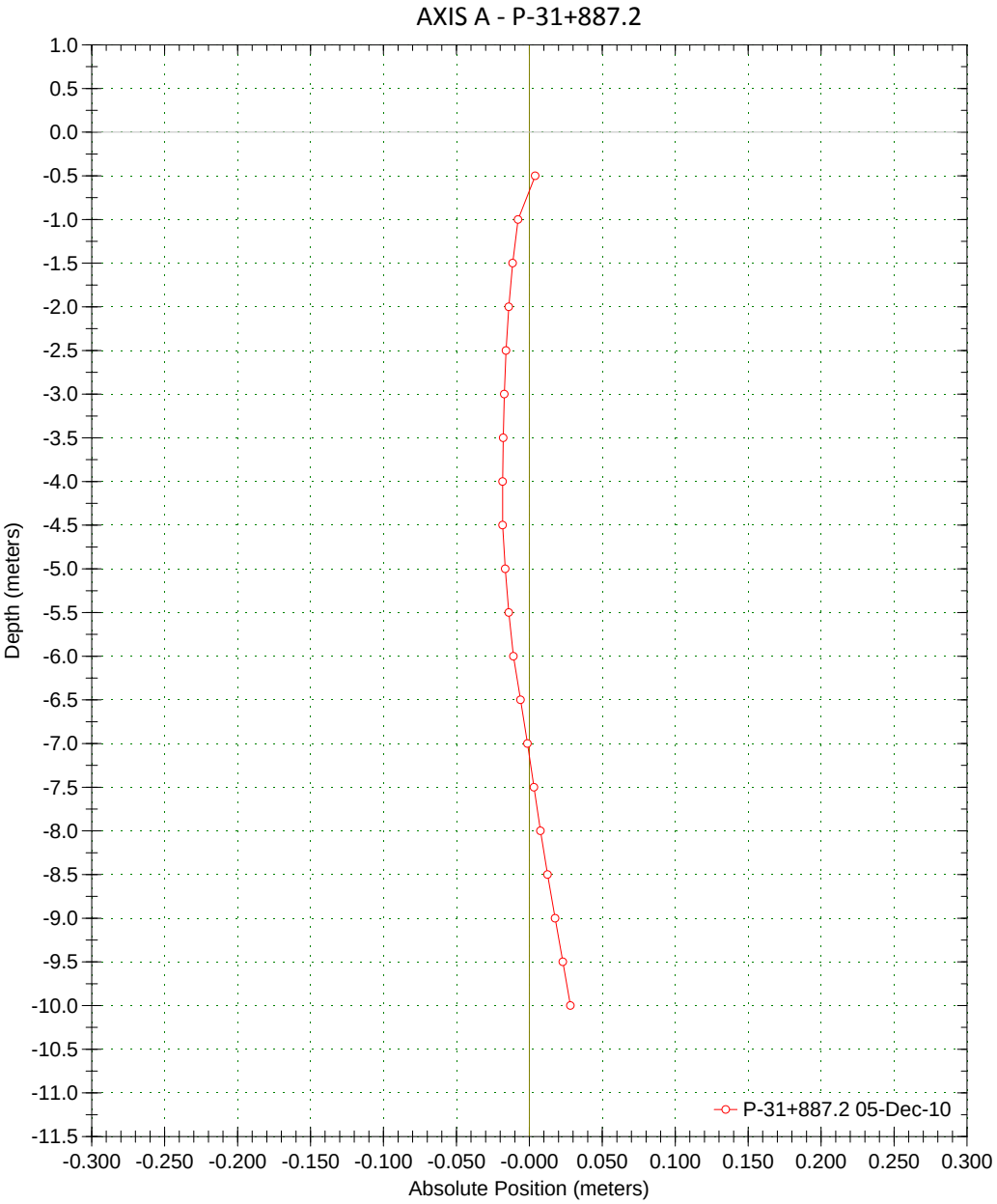
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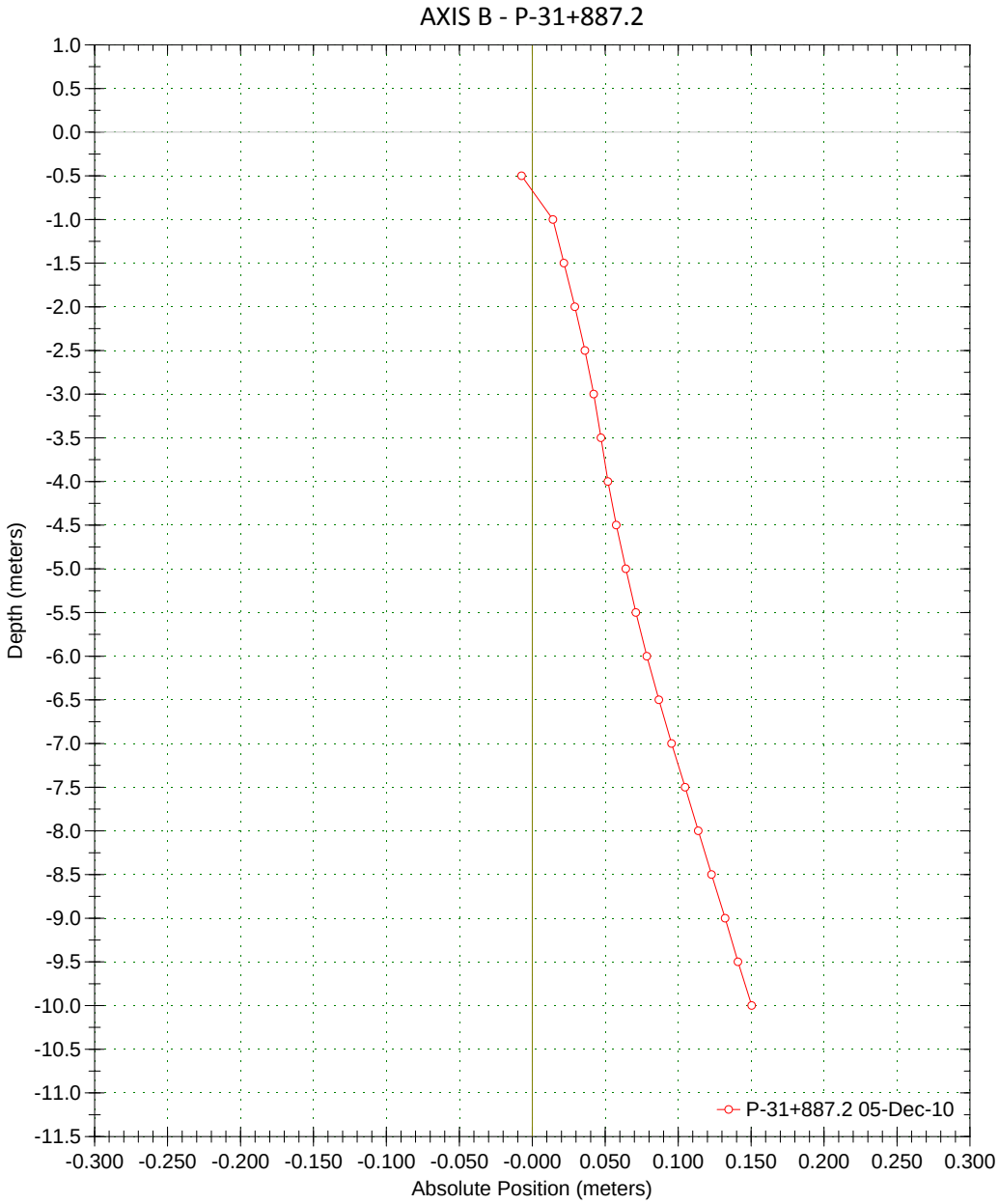
Inclinalysis v.2.30

Borehole : 31+887.2
Project : Baygoose_Jet Grouting
Location : Baygoose Dike South
Northing : 7212088.828
Easting : 638436.735
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 10.0 meters
North Groove Azimuth :
Base Reading :
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
# P - 31+887.2



RST Instruments Ltd.

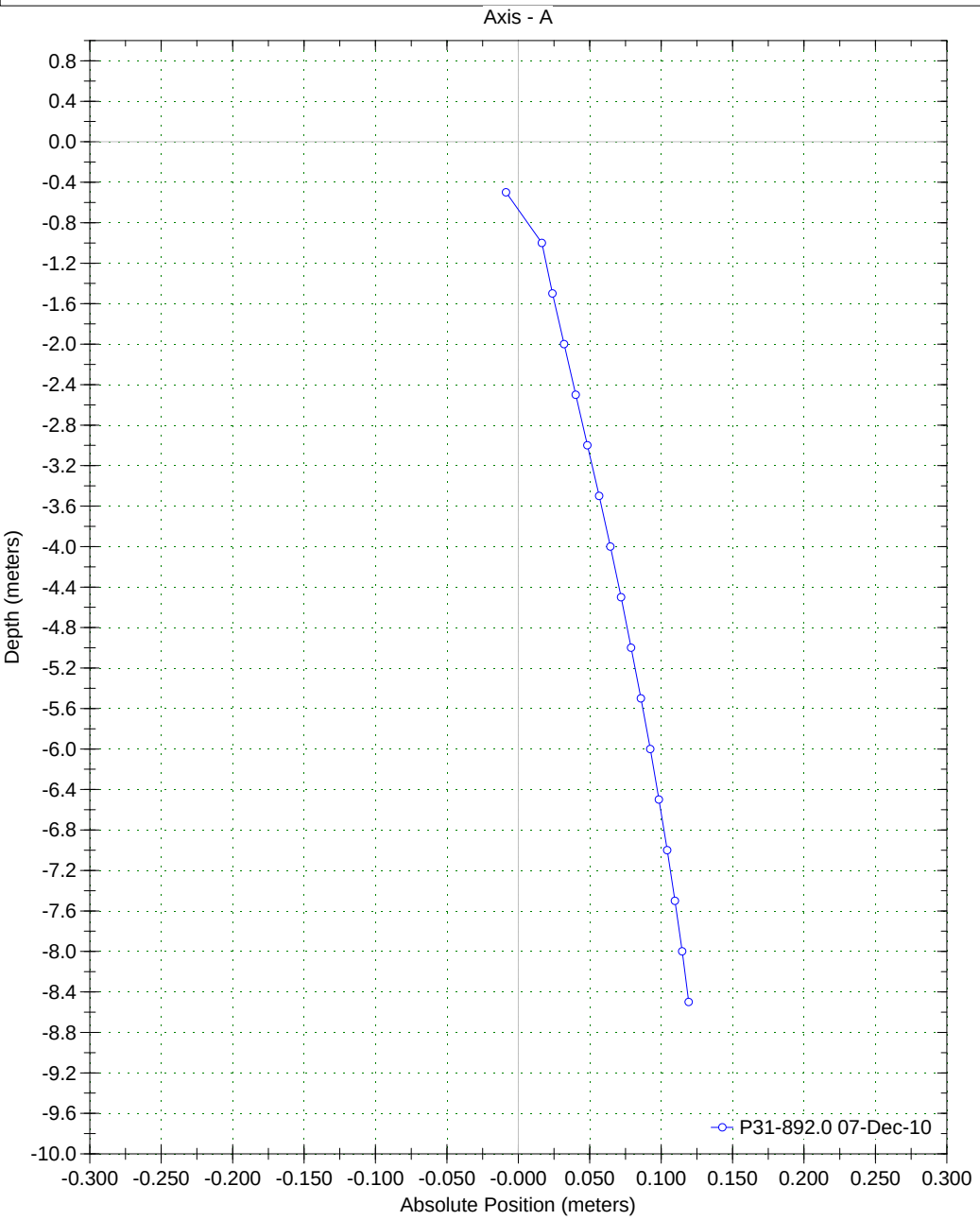
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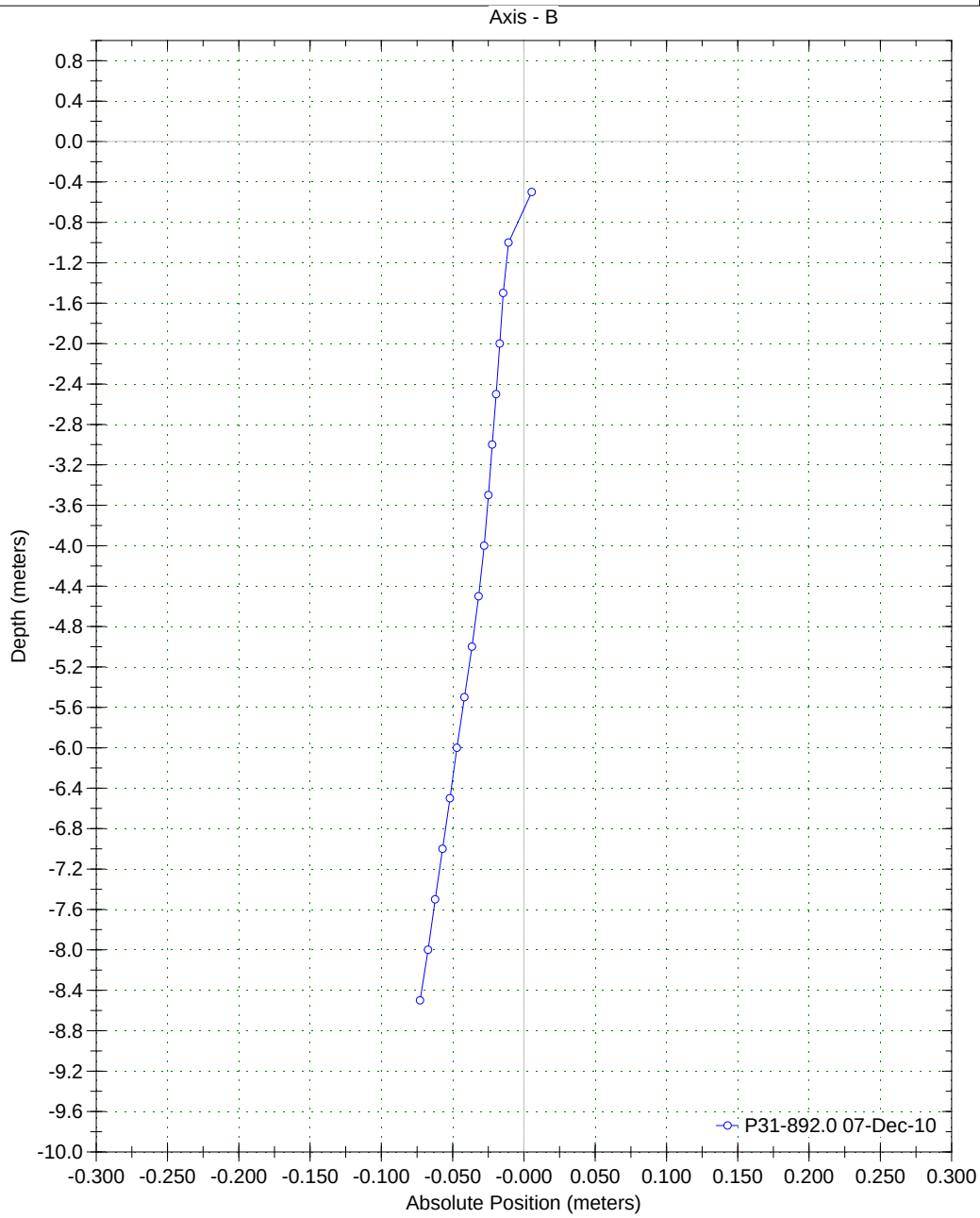
Inclinalysis v.2.30

Borehole : 31+892.0 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212092.793
Easting : 638434.031
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 8.5 meters
North Groove Azimuth :
Base Reading : 2010 Dec 07 11:31
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## P - 31+892.0



RST Instruments Ltd.

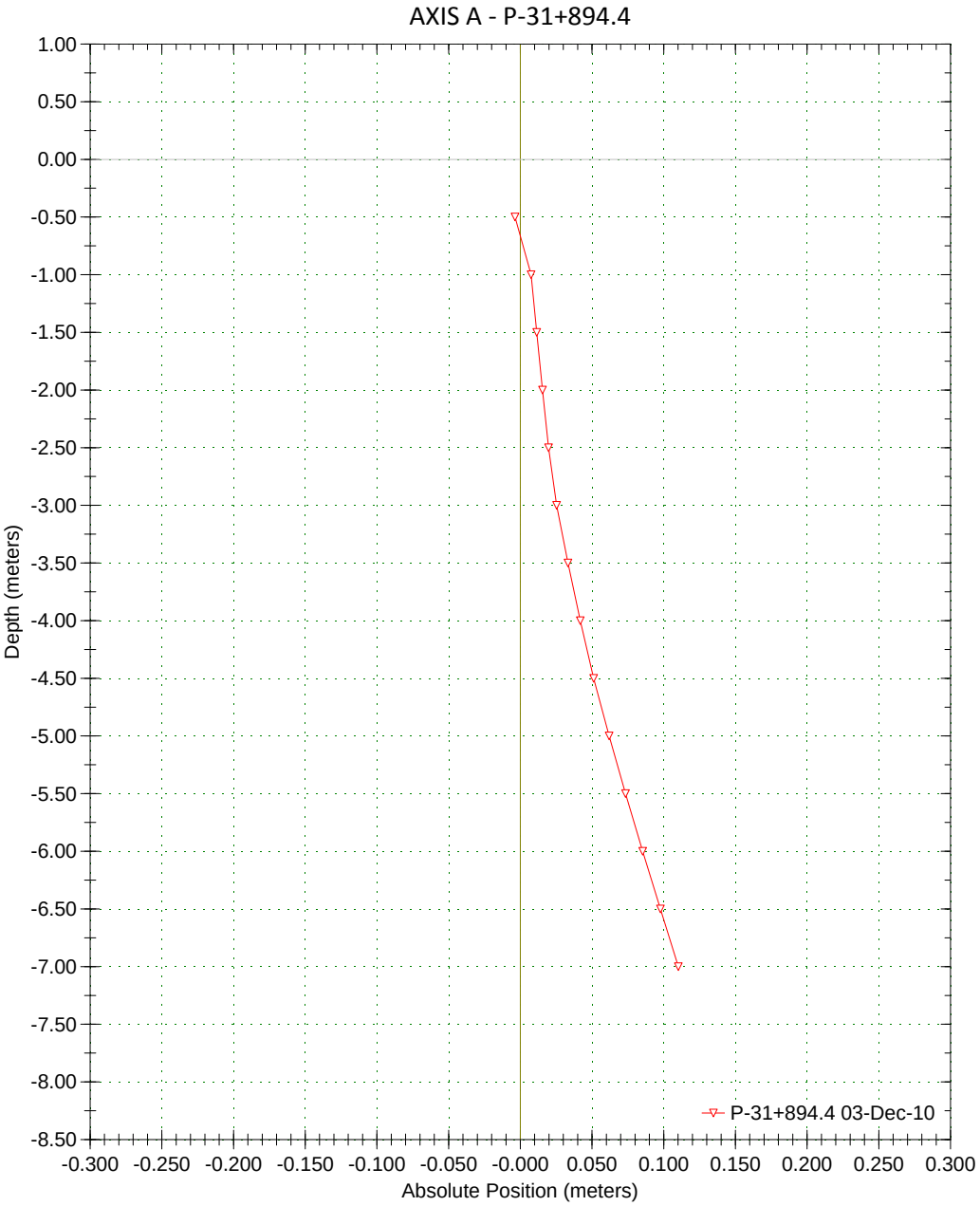
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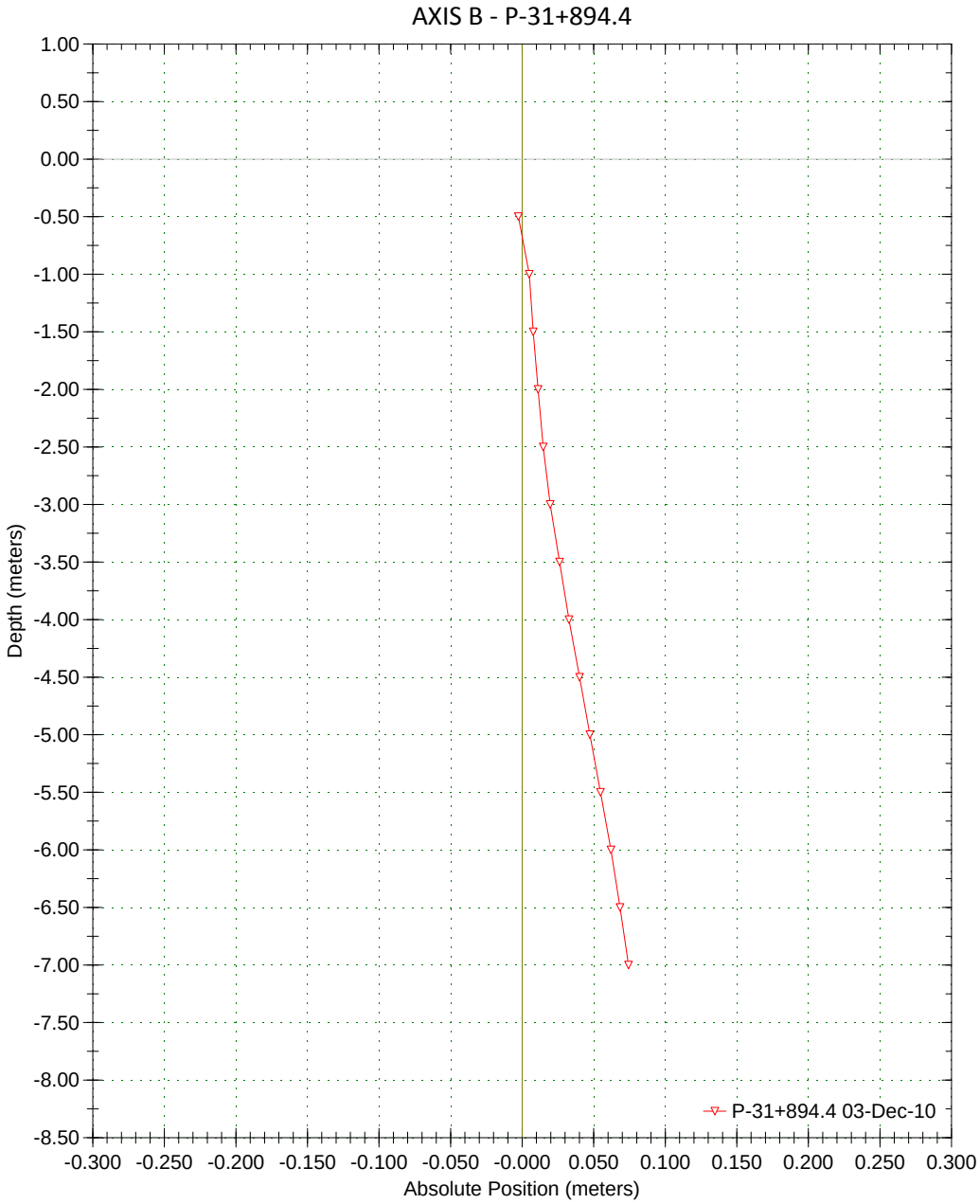
Inclinalysis v.2.30

Borehole : 31+894.4 **top-referenced
Project : Baygoose_Jet Grouting
Location : Baygoose Dike - South
Northing : 7212094.776
Easting : 638432.679
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 7.0 meters
North Groove Azimuth :
Base Reading : 2010 Dec 03 15:00
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
# P - 31+894.4



RST Instruments Ltd.

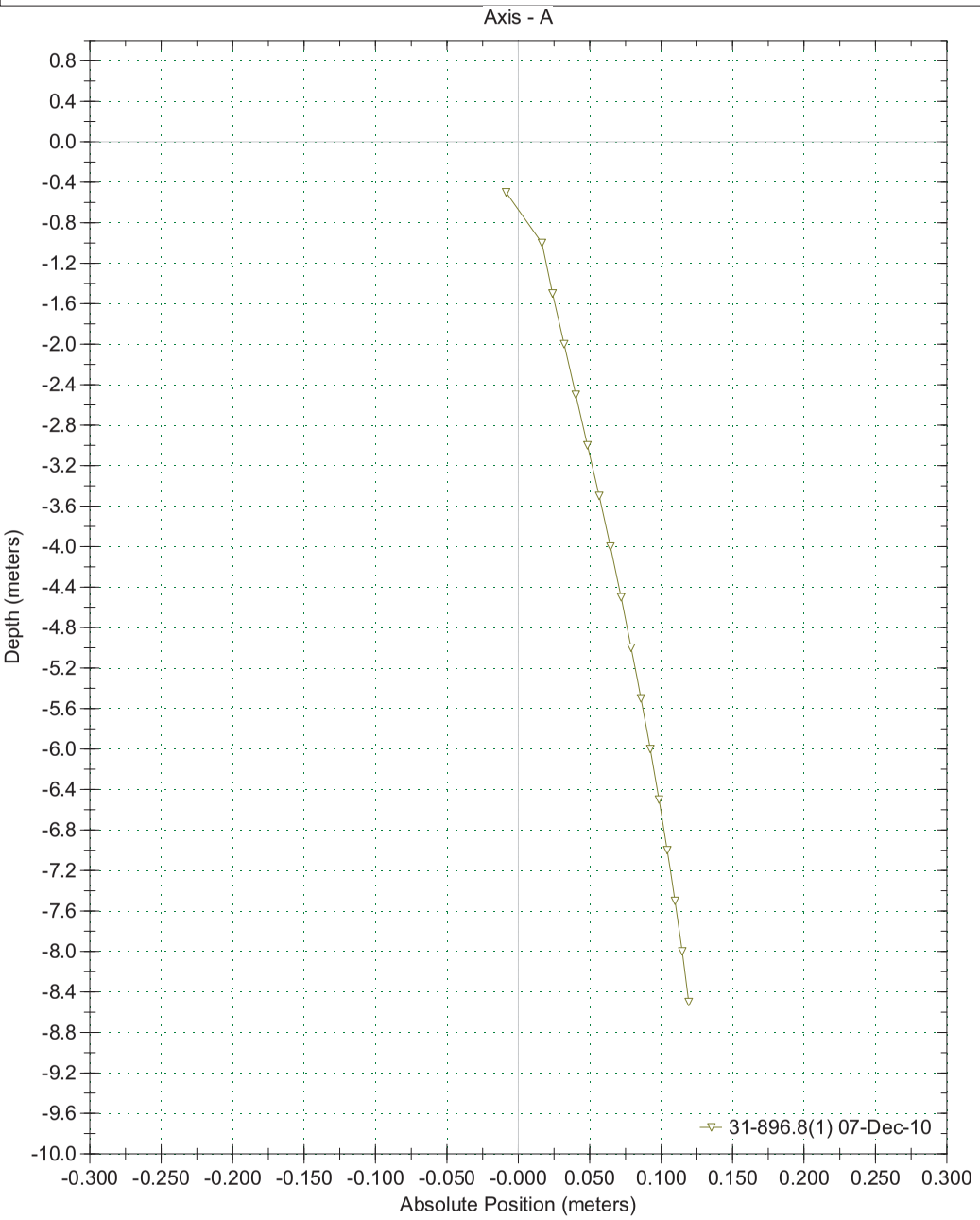
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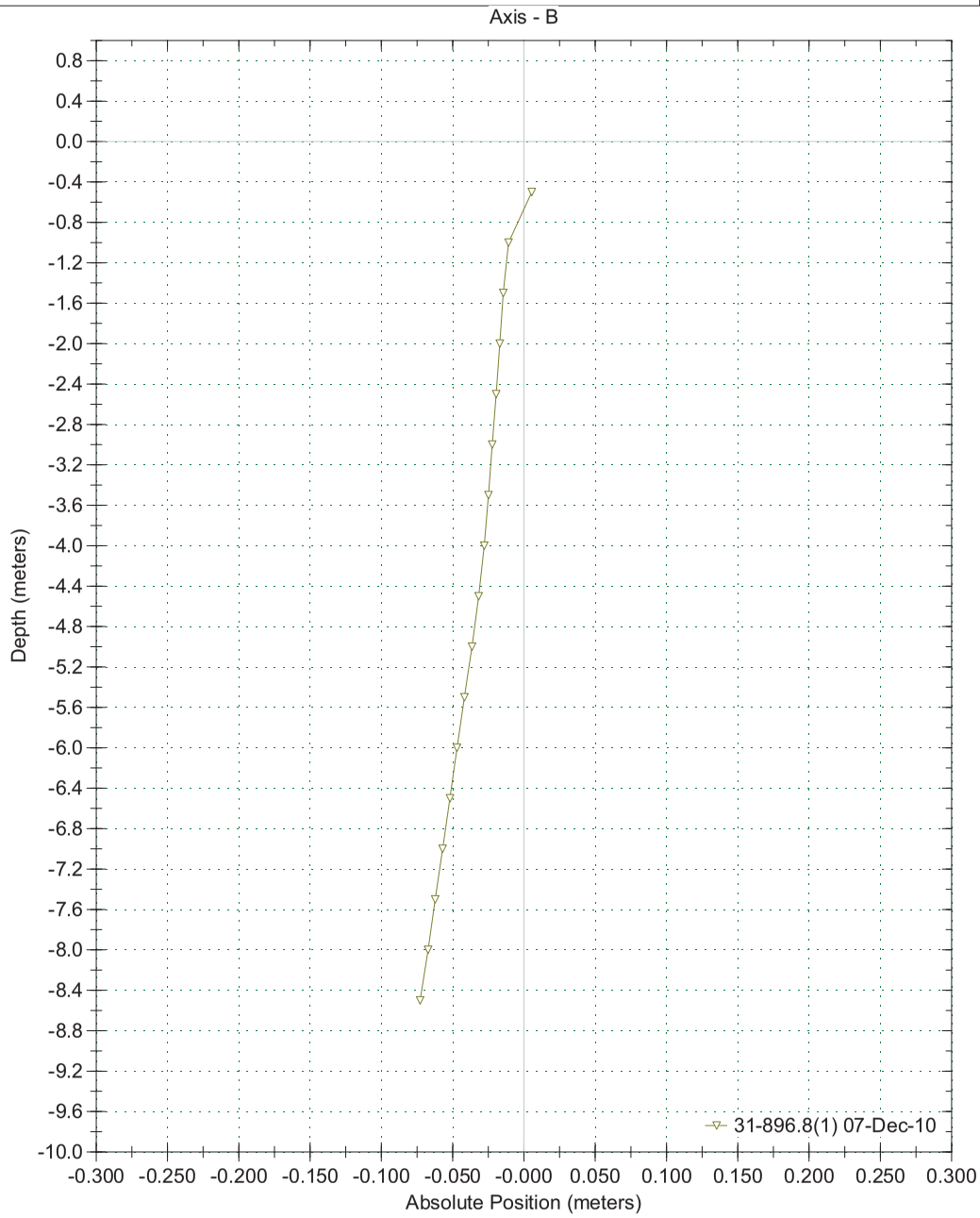
Inclinalysis v.2.30

Borehole : 31+896.8 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212096.759
Easting : 638431.326
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 8.5 meters
North Groove Azimuth :
Base Reading : 2010 Dec 07 11:31
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## P - 31+896.8



RST Instruments Ltd.

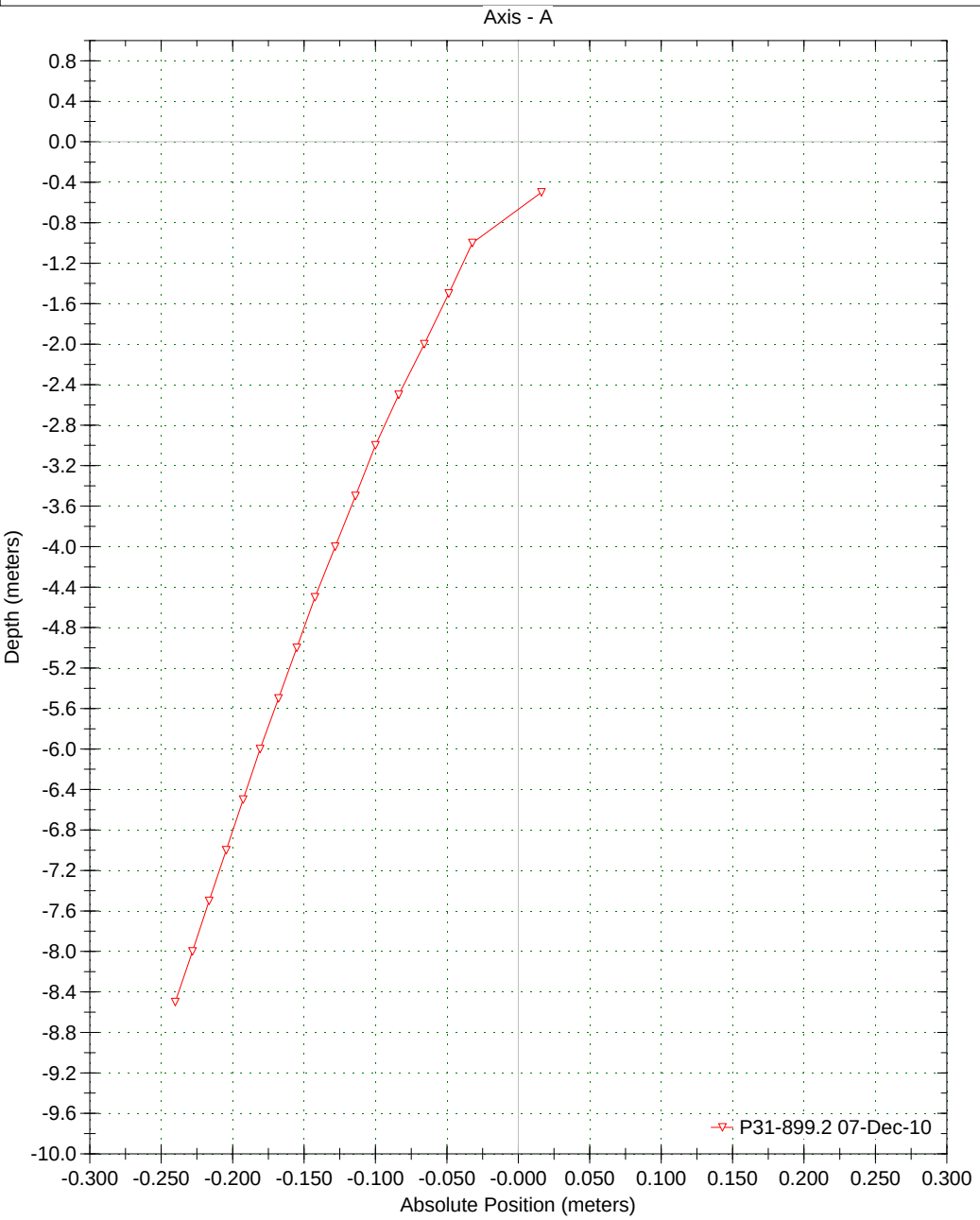
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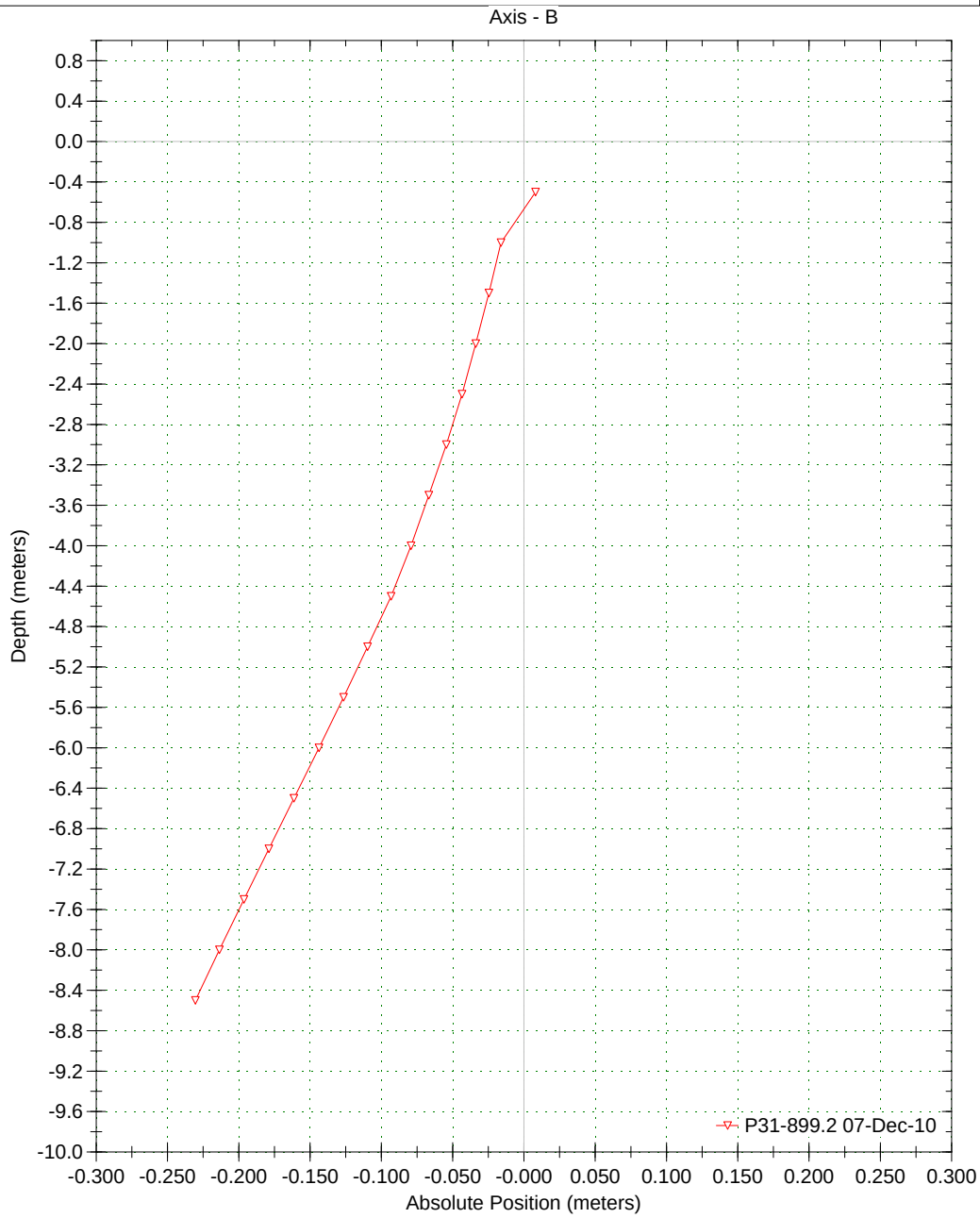
Inclinalysis v.2.30

Borehole : 31+899.2 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212098.742
Easting : 638429.974
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 8.5 meters
North Groove Azimuth :
Base Reading : 2010 Dec 07 14:40
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## P - 31+899.2



RST Instruments Ltd.

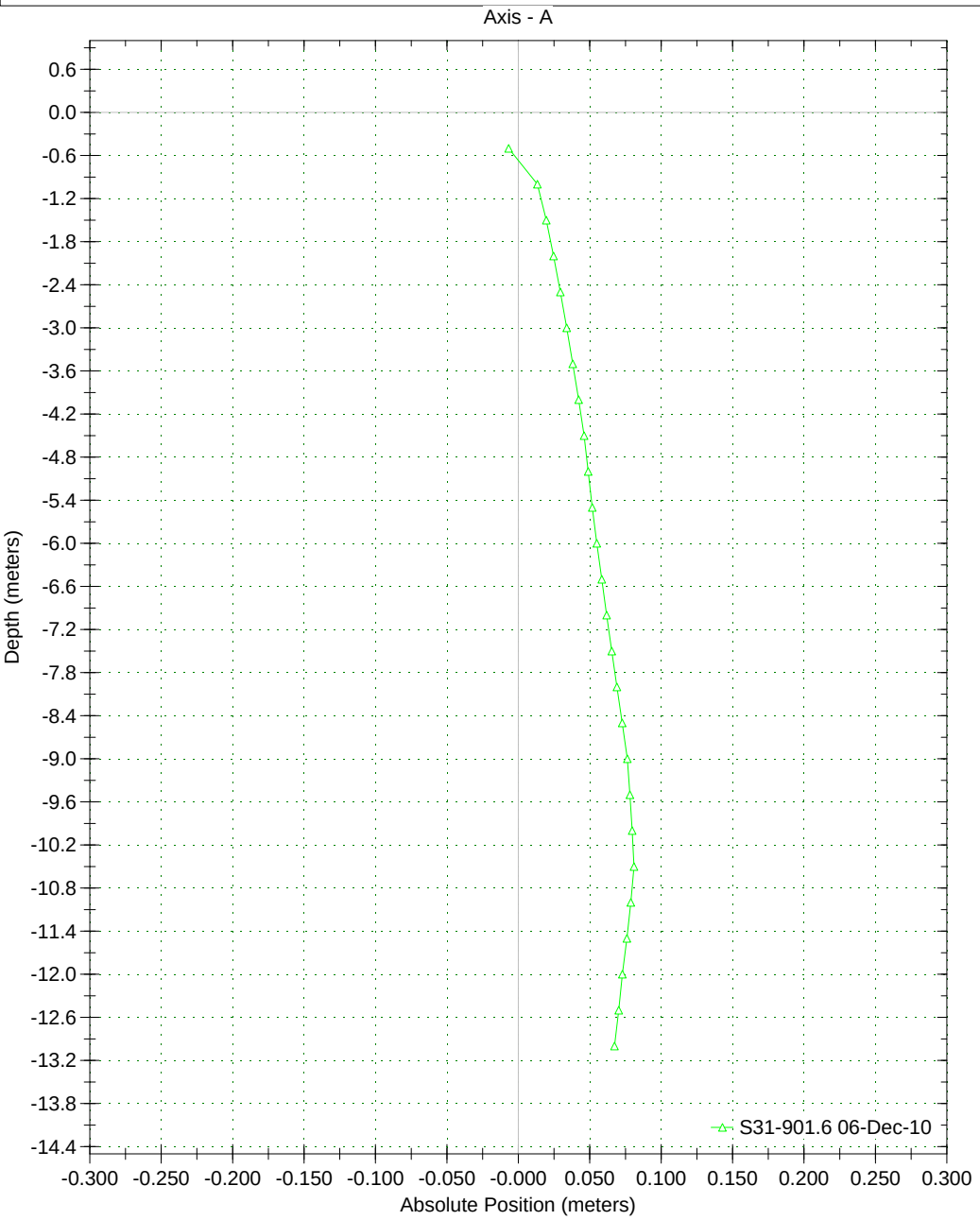
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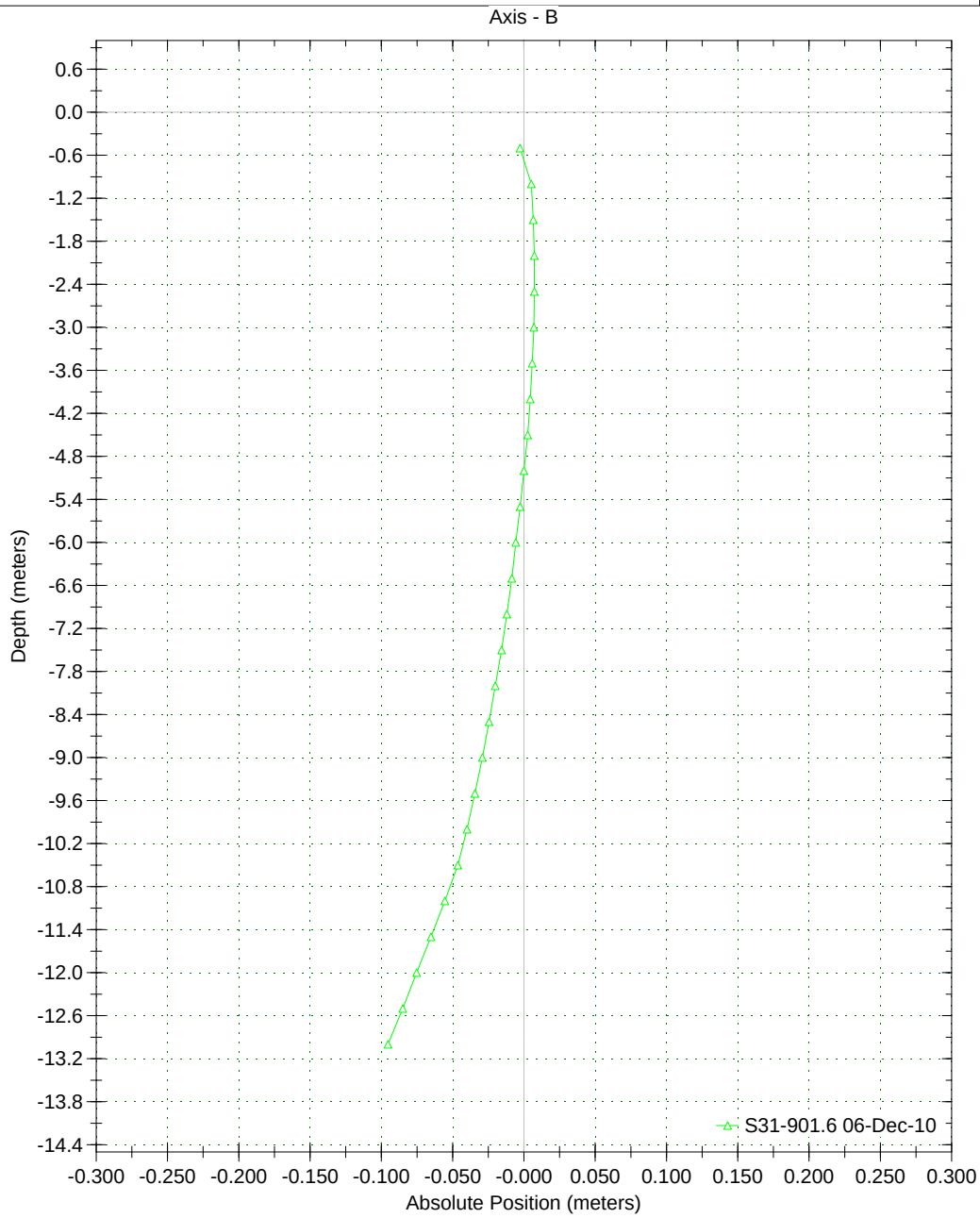
Inclinalysis v.2.30

Borehole : 31+901.6 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212175.082
Easting : 638377.918
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 13.0 meters
North Groove Azimuth :
Base Reading : 2010 Dec 06 18:23
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## P - 31+901.6



RST Instruments Ltd.

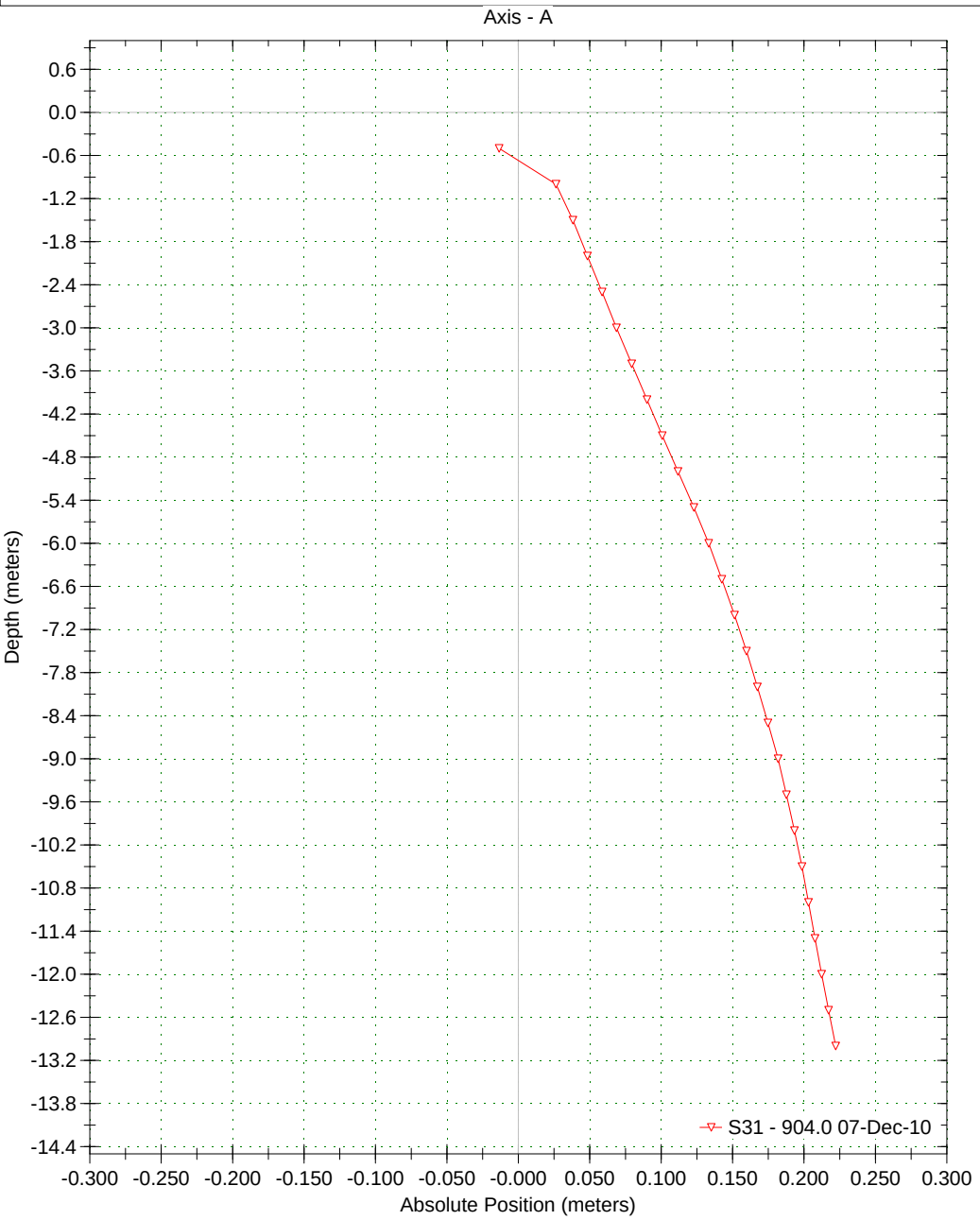
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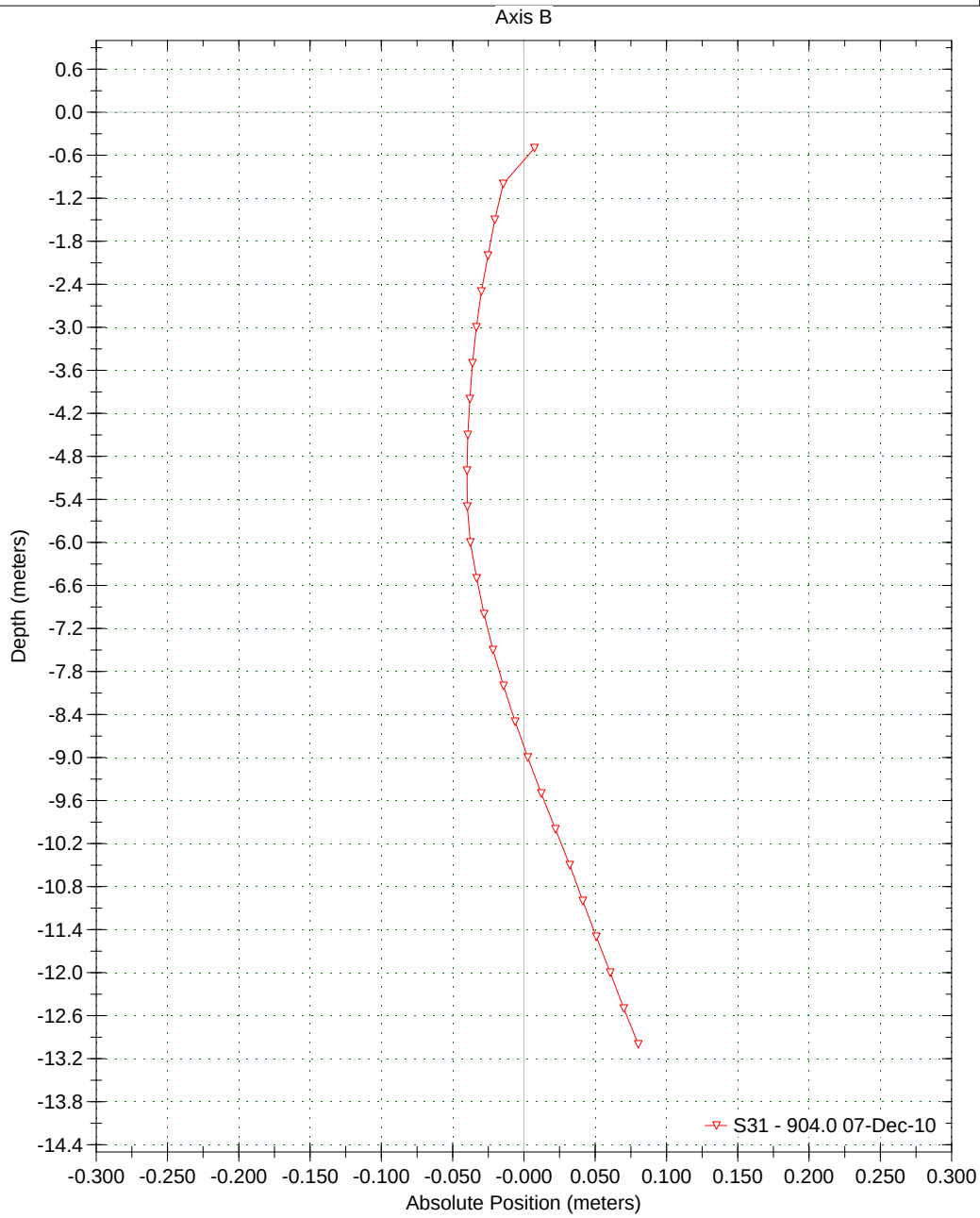
Inclinalysis v.2.30

Borehole : 31+904.0 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212177.065
Easting : 638376.565
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 13.0 meters
North Groove Azimuth :
Base Reading : 2010 Dec 07 15:35
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## P - 31+904.0



RST Instruments Ltd.

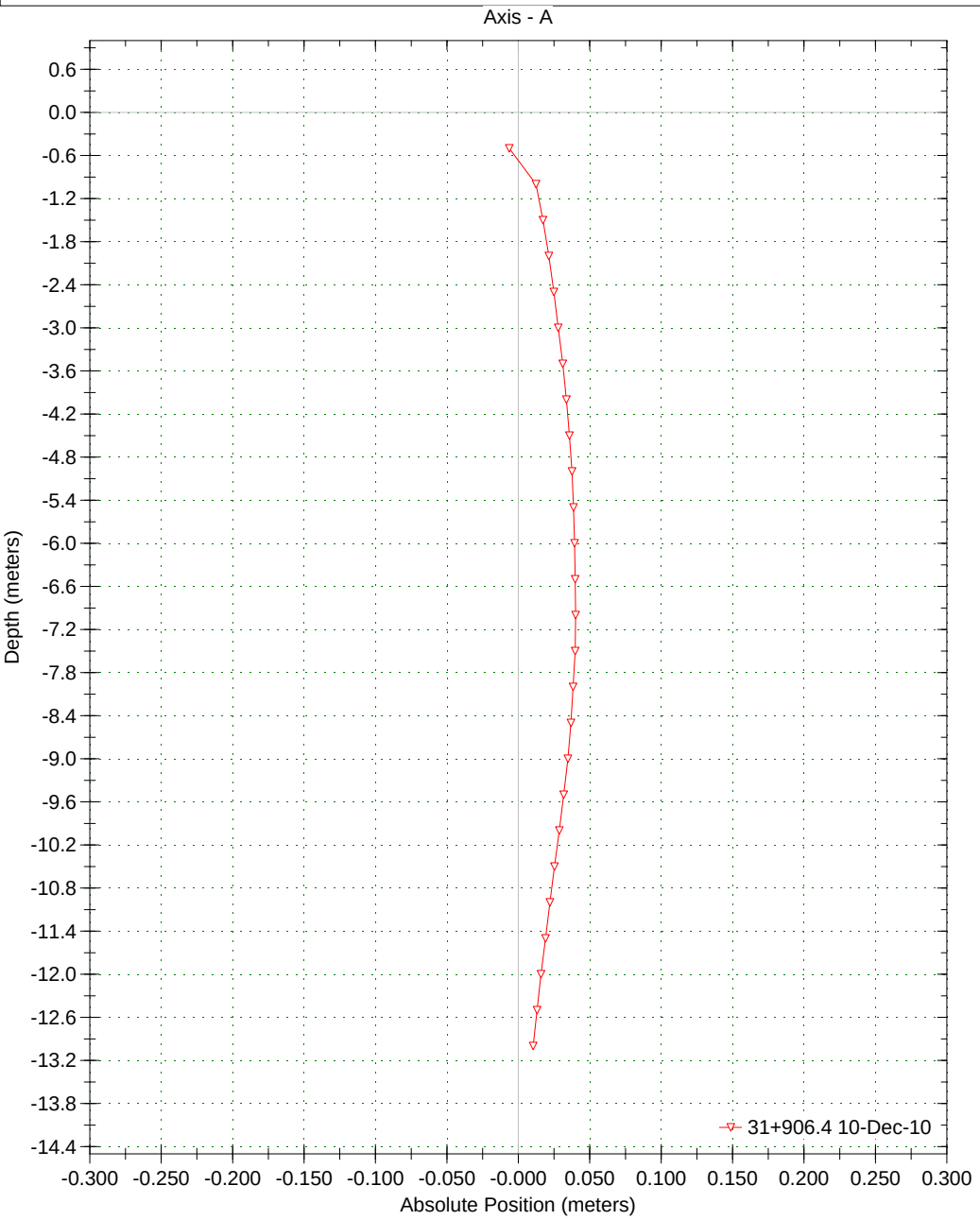
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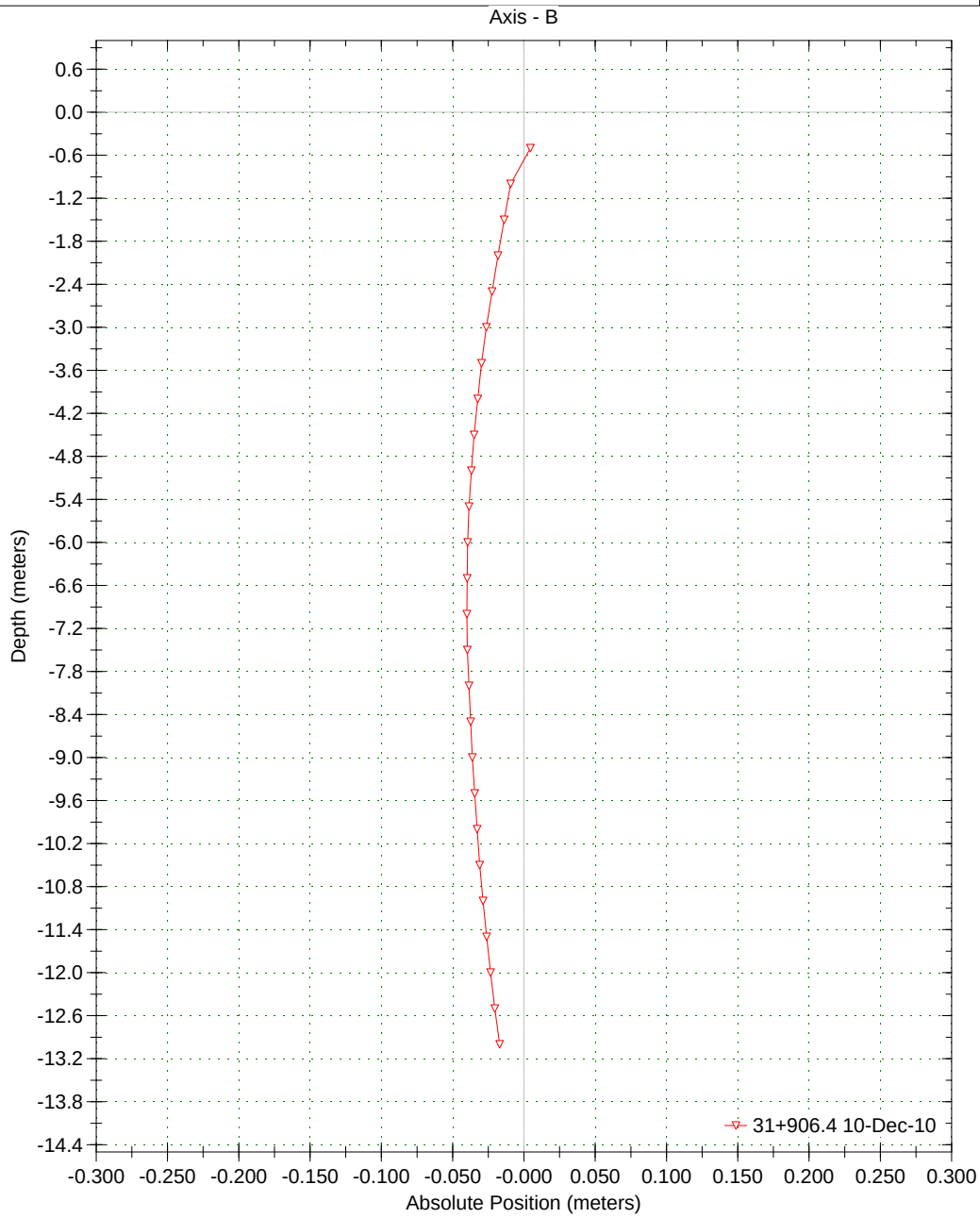
Inclinalysis v.2.30

Borehole : 31+906.4 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212104.690
Easting : 638425.918
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 13.0 meters
North Groove Azimuth :
Base Reading : 2010 Dec 10 15:41
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## P - 31+906.4



RST Instruments Ltd.

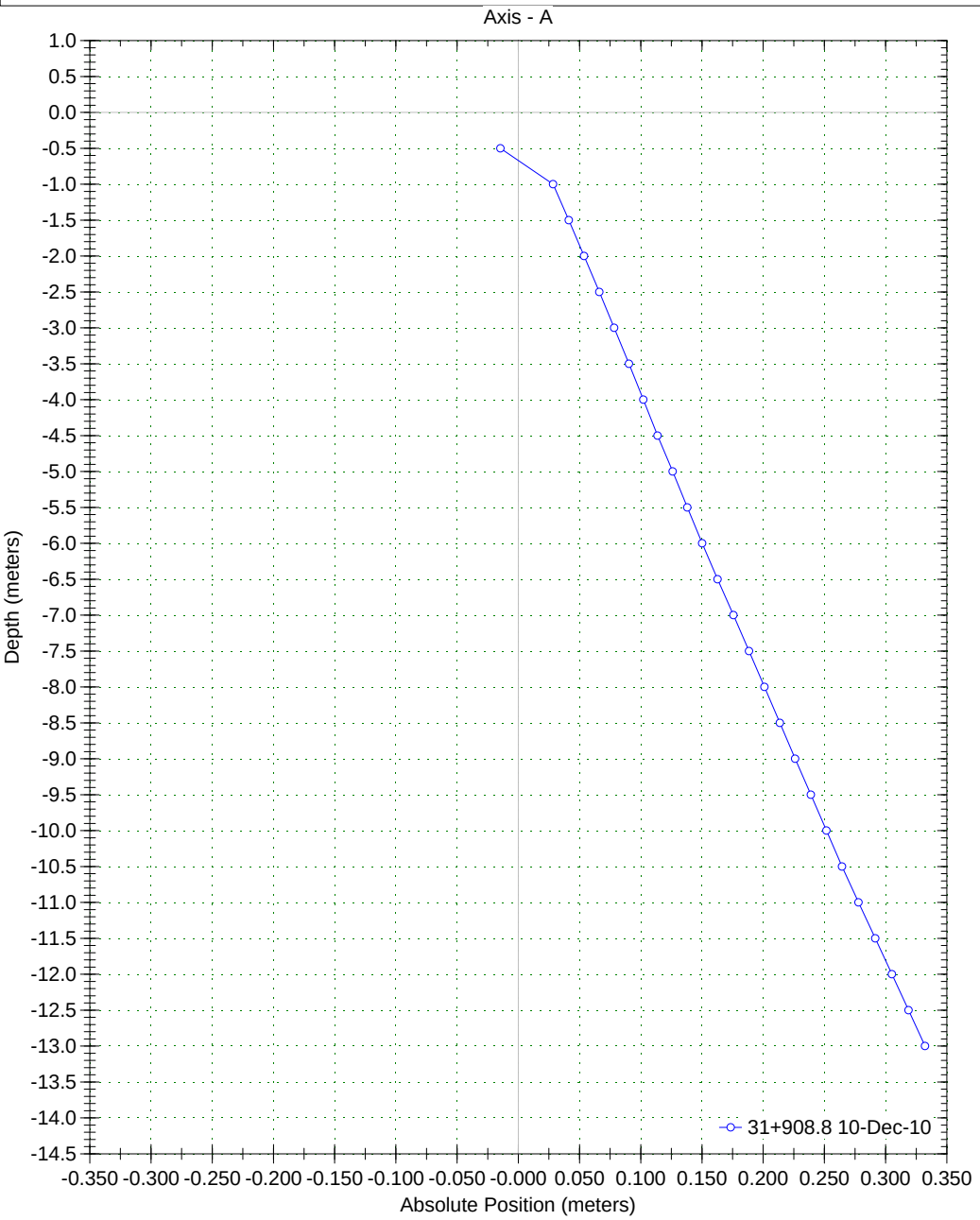
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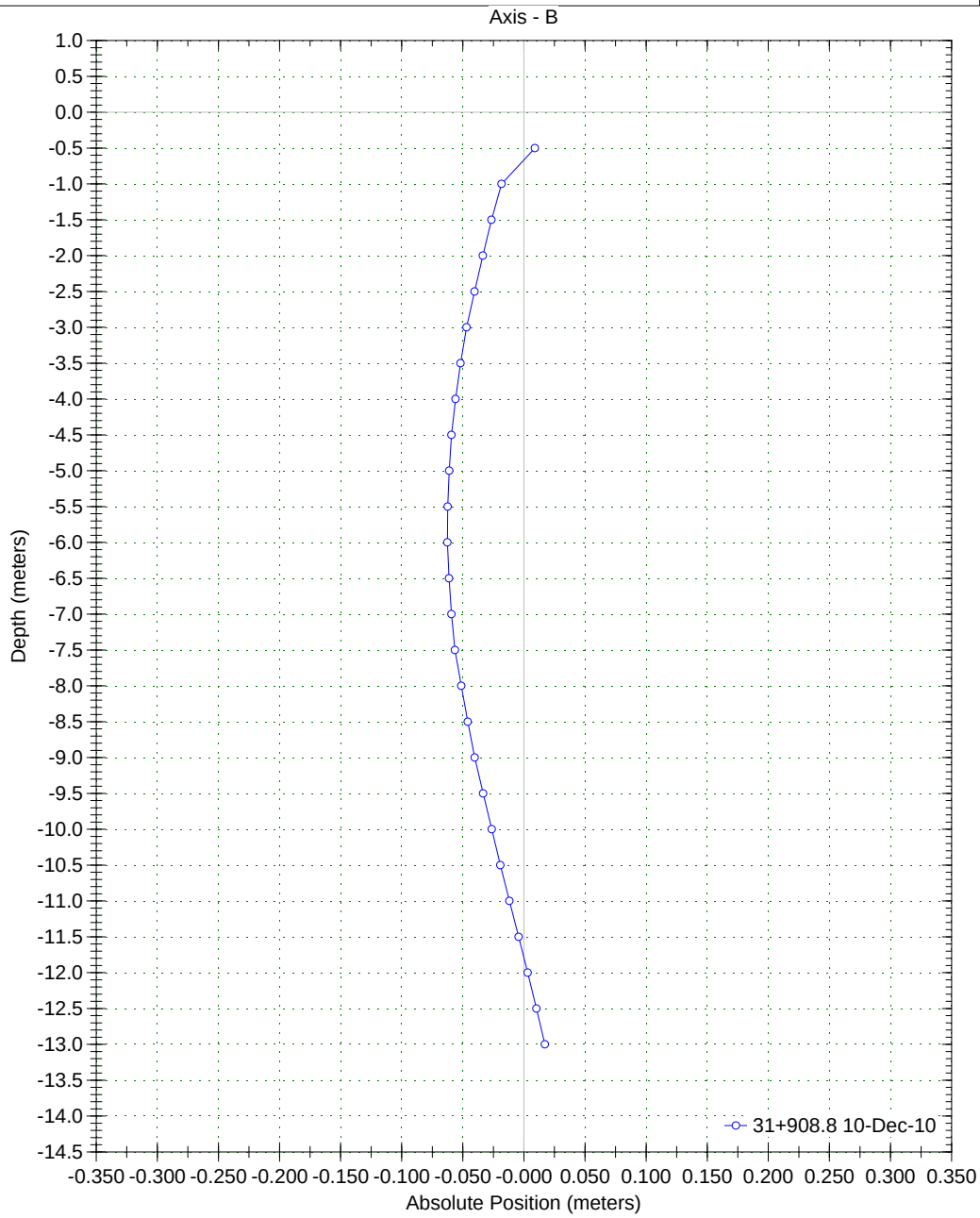
Inclinalysis v.2.30

Borehole : 31+908.8 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212106.673
Easting : 638424.566
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 13.0 meters
North Groove Azimuth :
Base Reading : 2010 Dec 10 12:19
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## P - 31+908.8



RST Instruments Ltd.

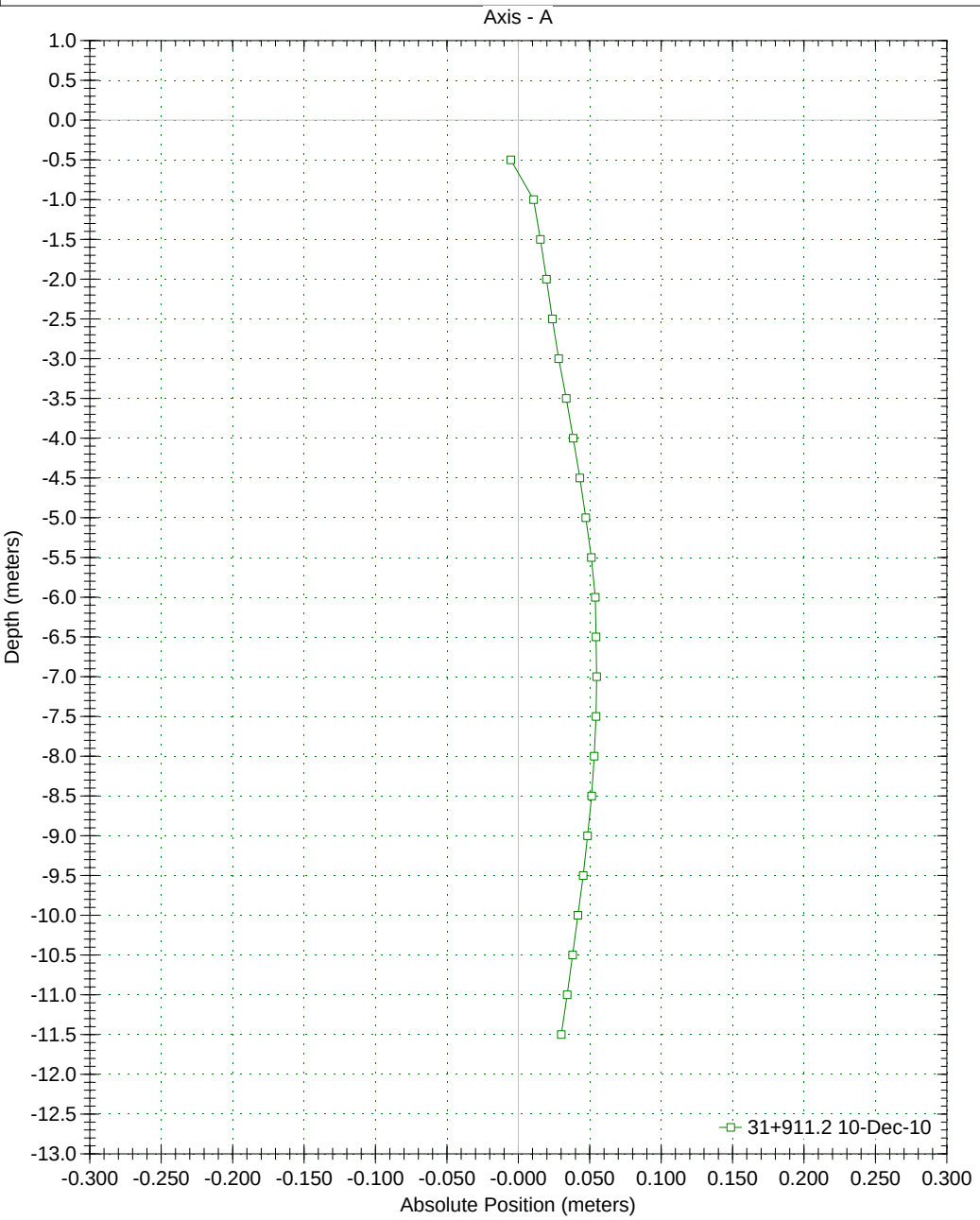
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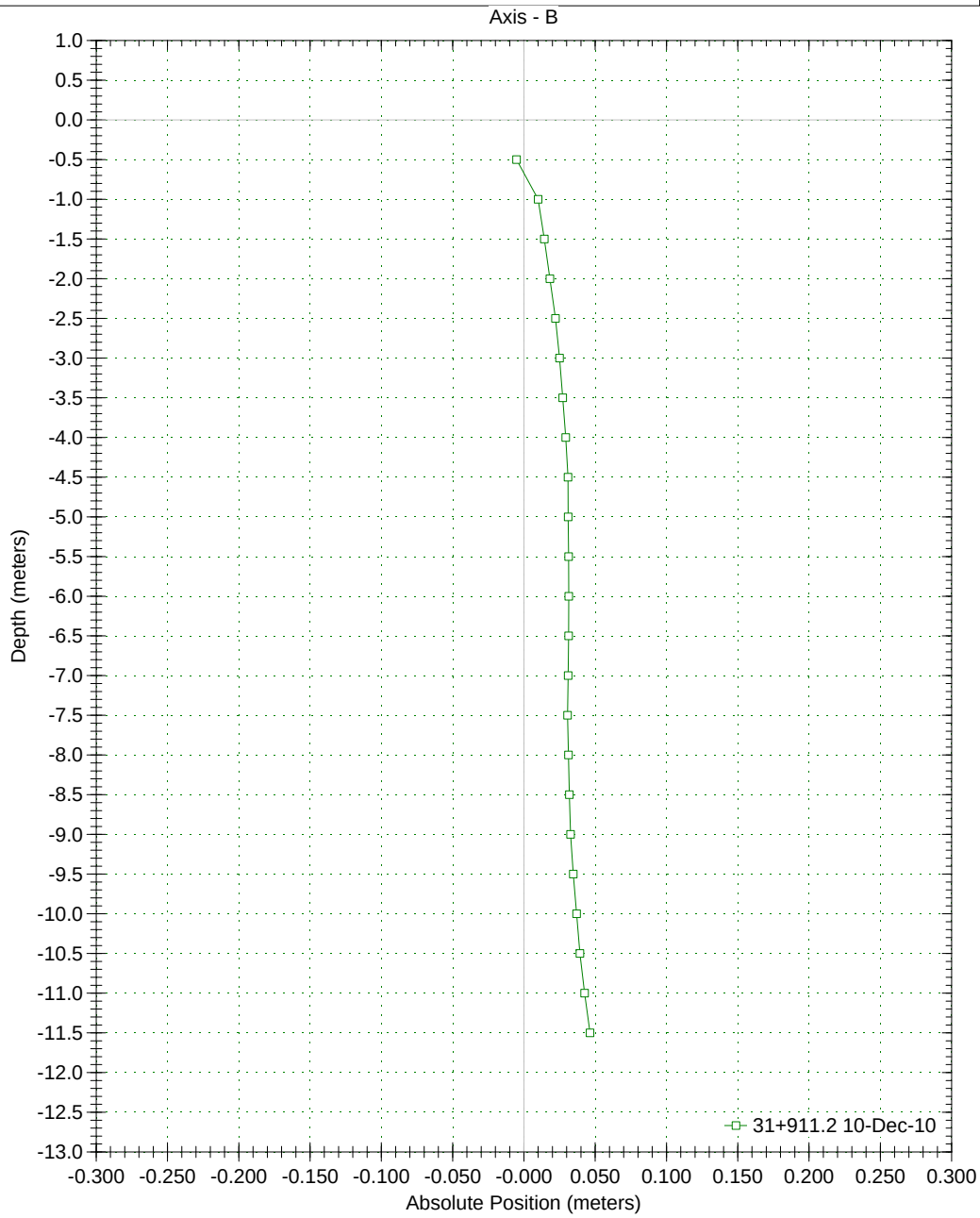
Inclinalysis v.2.30

Borehole : 31+911.2 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212108.656
Easting : 638423.214
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 11.5 meters
North Groove Azimuth :
Base Reading : 2010 Dec 10 11:14
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## P - 31+911.2



RST Instruments Ltd.

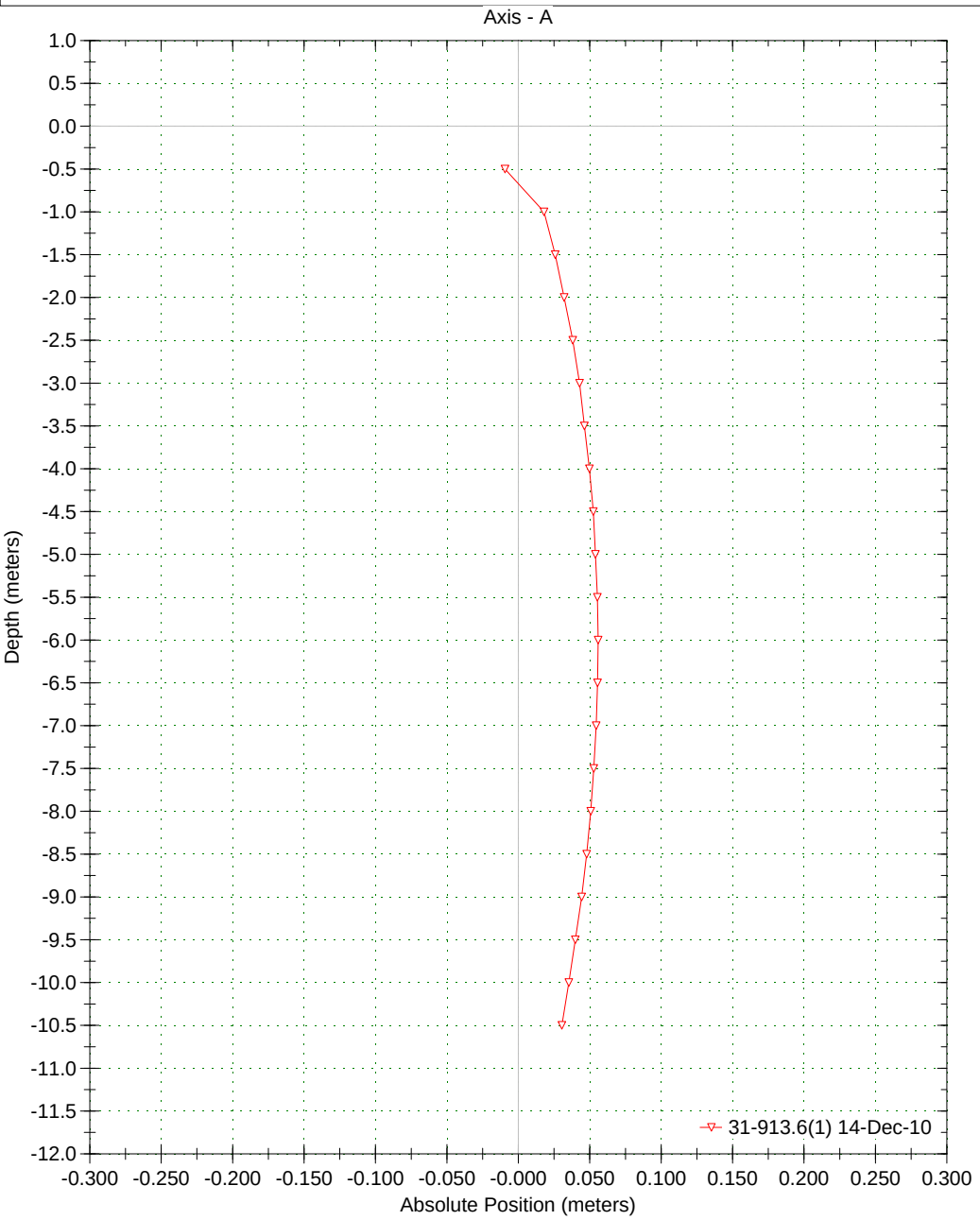
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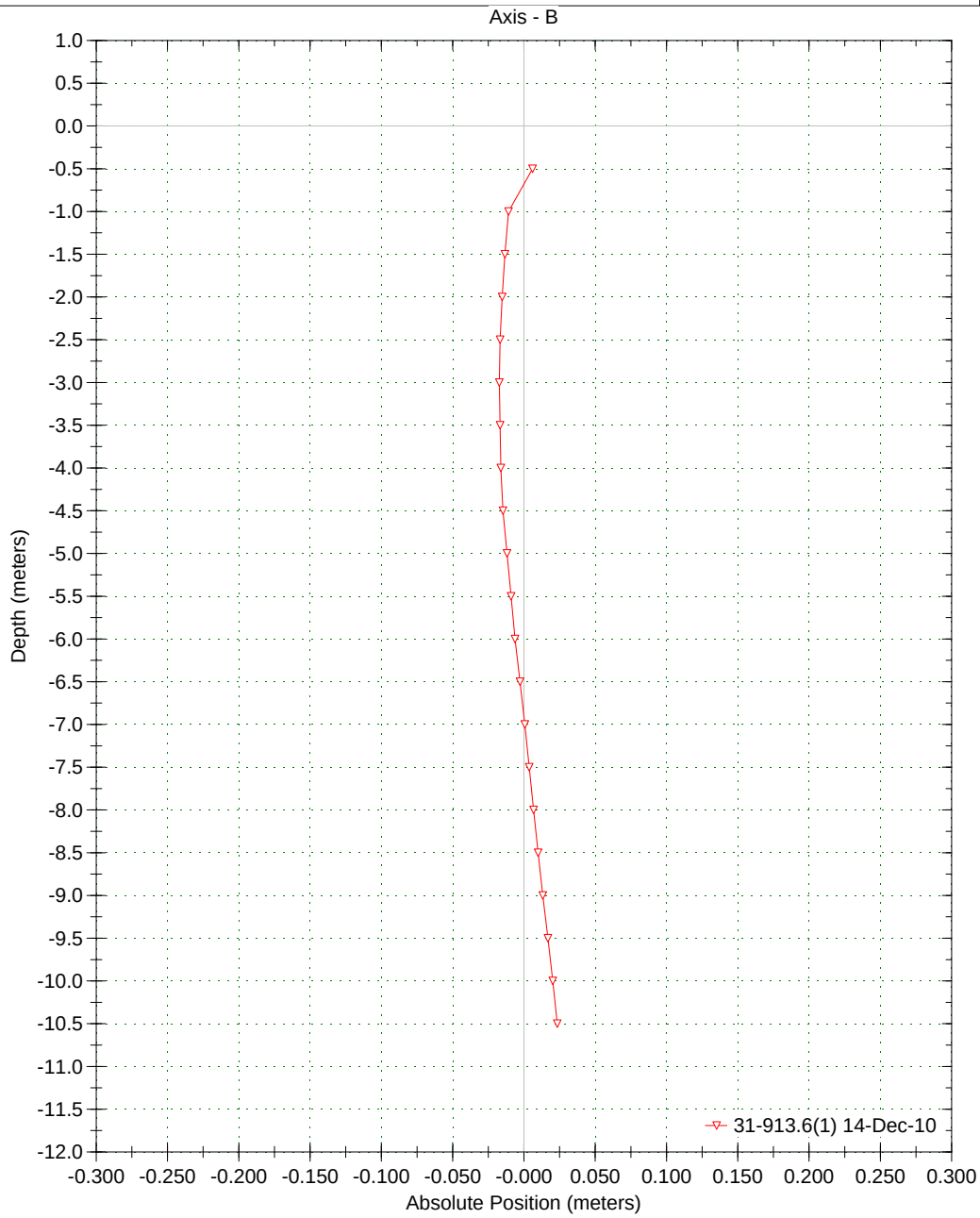
Inclinalysis v.2.30

Borehole : 31-913.6 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212110.639
Easting : 638421.862
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 10.5 meters
North Groove Azimuth :
Base Reading : 2010 Dec 14 09:26
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## P - 31+913.6



RST Instruments Ltd.

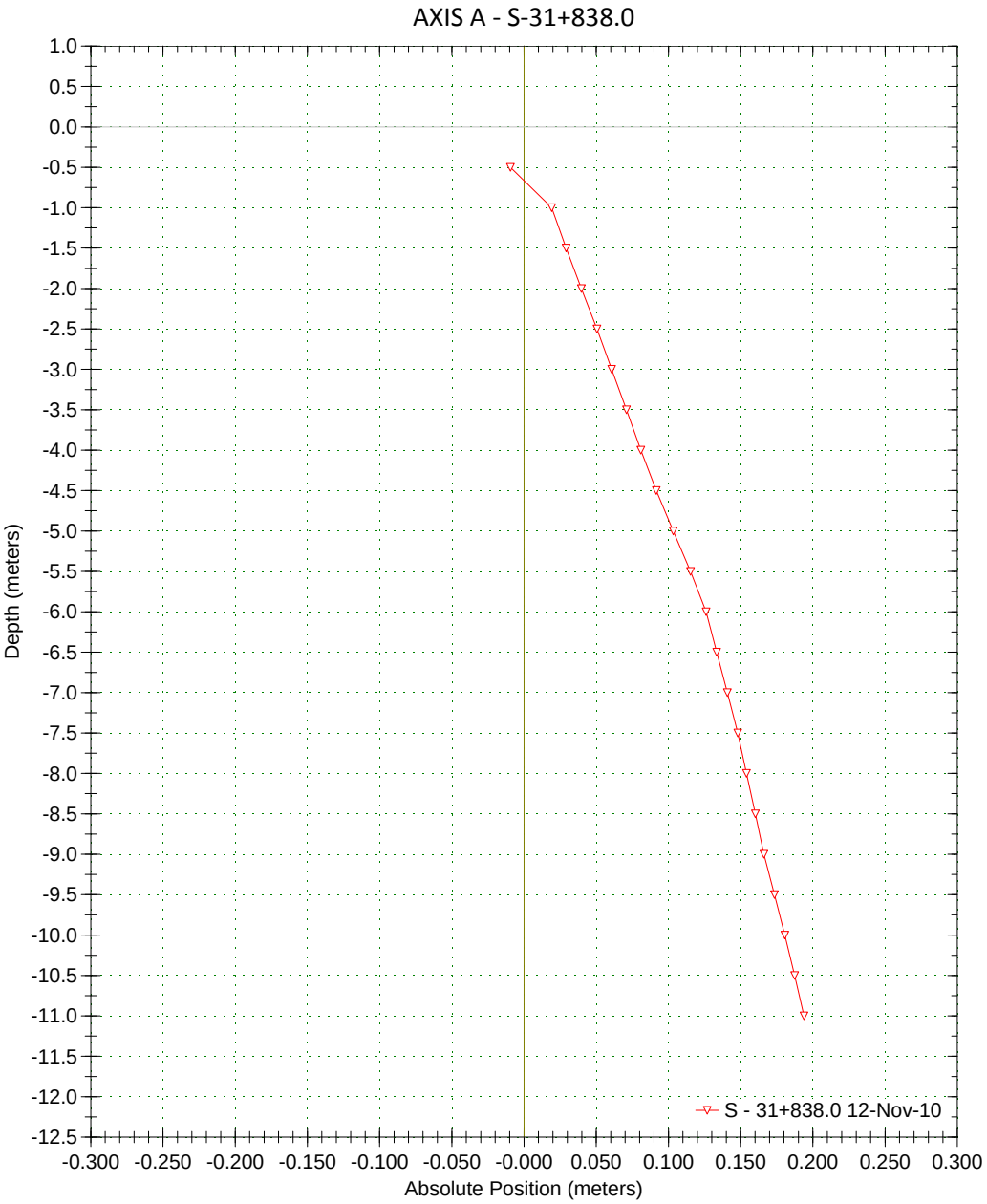
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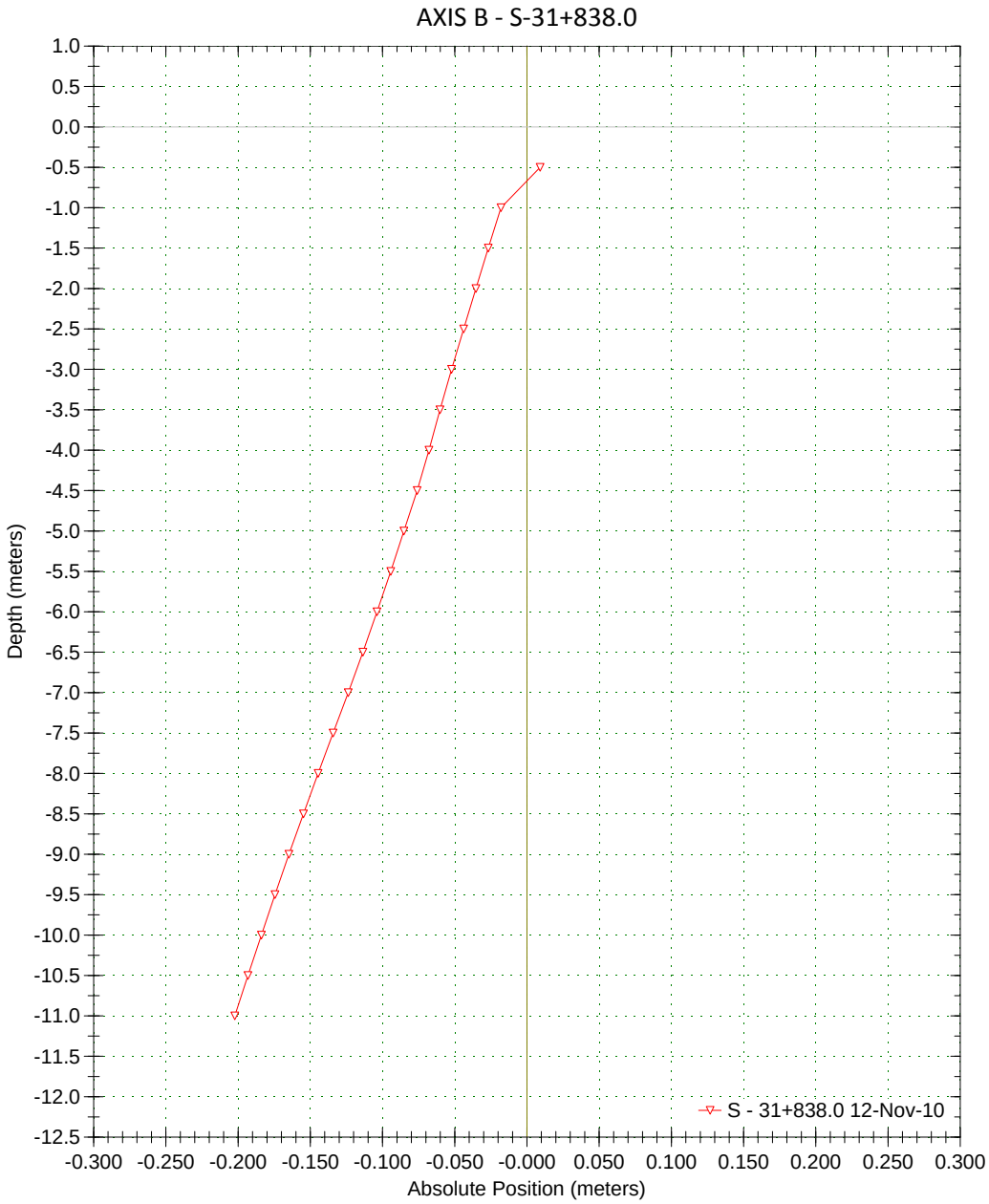
Inclinalysis v.2.30

Borehole : 31+838.0 **top-referenced
Project : Baygoose_Jet Grouting
Location : Baygoose Dike South
Northing : 7212047.917
Easting : 638464.027
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 11.0 meters
North Groove Azimuth :
Base Reading : 2010 Nov 12 15:21
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
# S-31+838.0



RST Instruments Ltd.

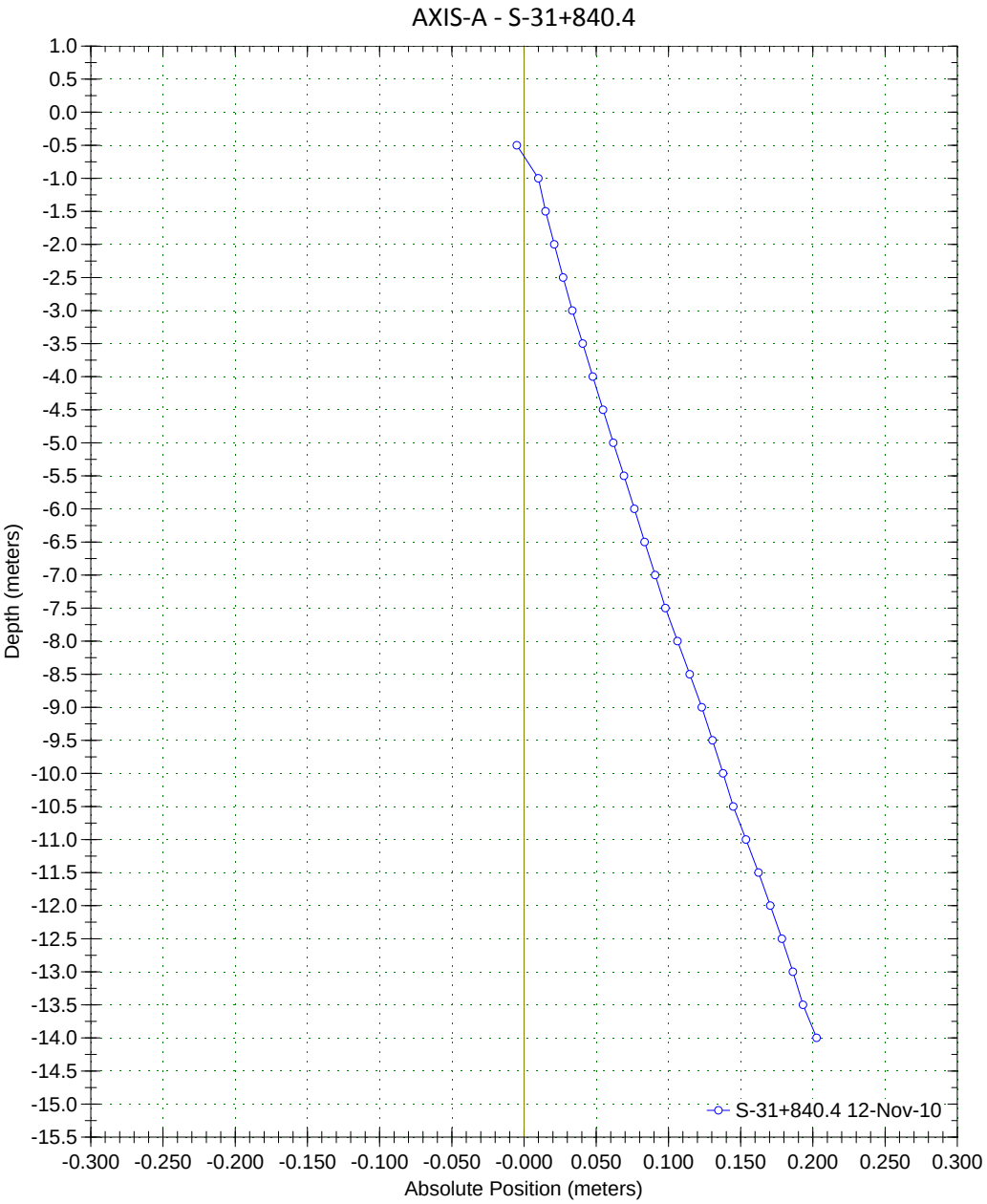
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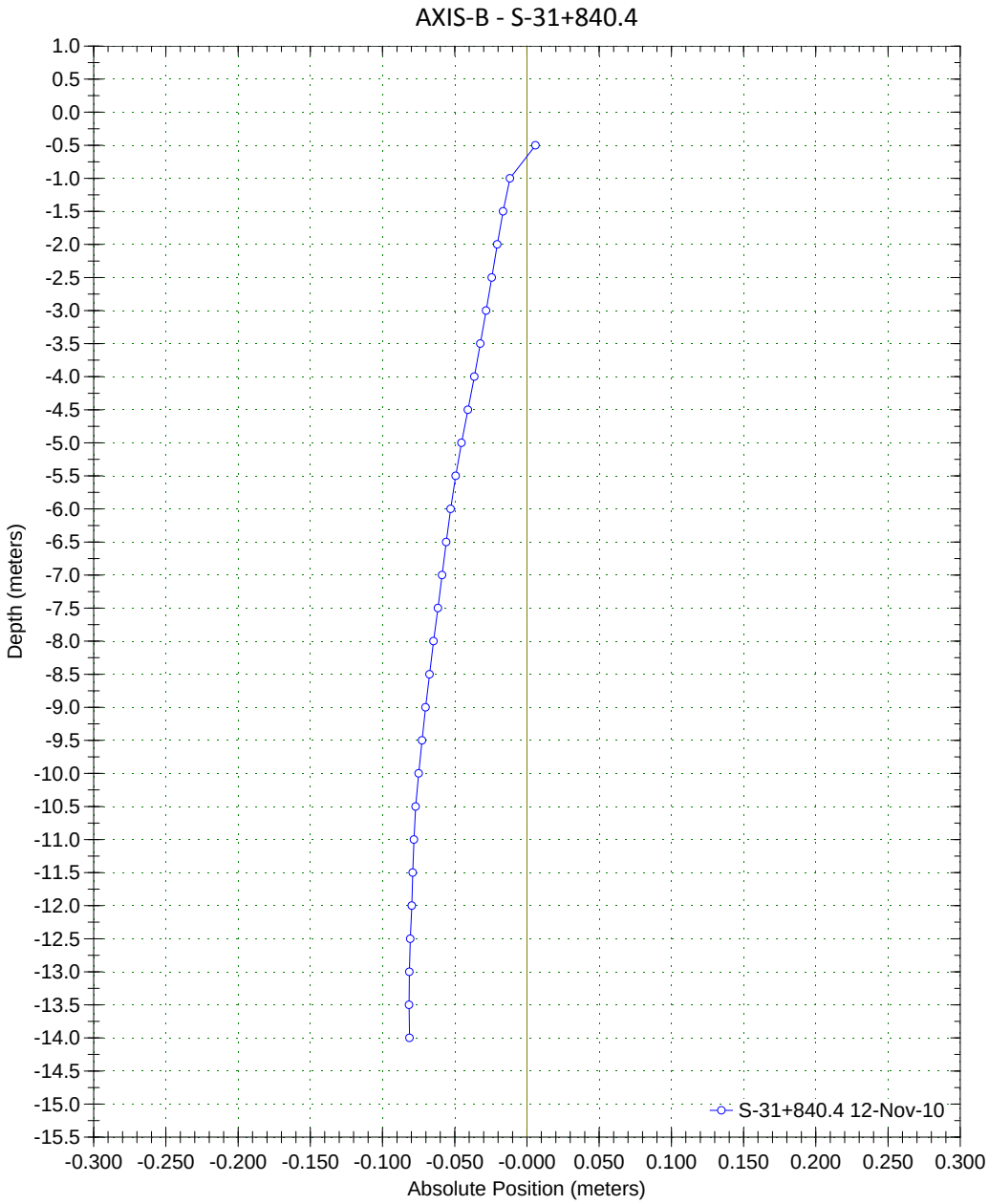
Inclinalysis v.2.30

Borehole : 31+840.4 **top-referenced
Project : Baygoose_Jet Grouting
Location : Baygoose Dike South
Northing : 7212049.919
Easting : 638462.705
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 14.0 meters
North Groove Azimuth :
Base Reading : 2010 Nov 12 11:09
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
# S-31+840.4



RST Instruments Ltd.

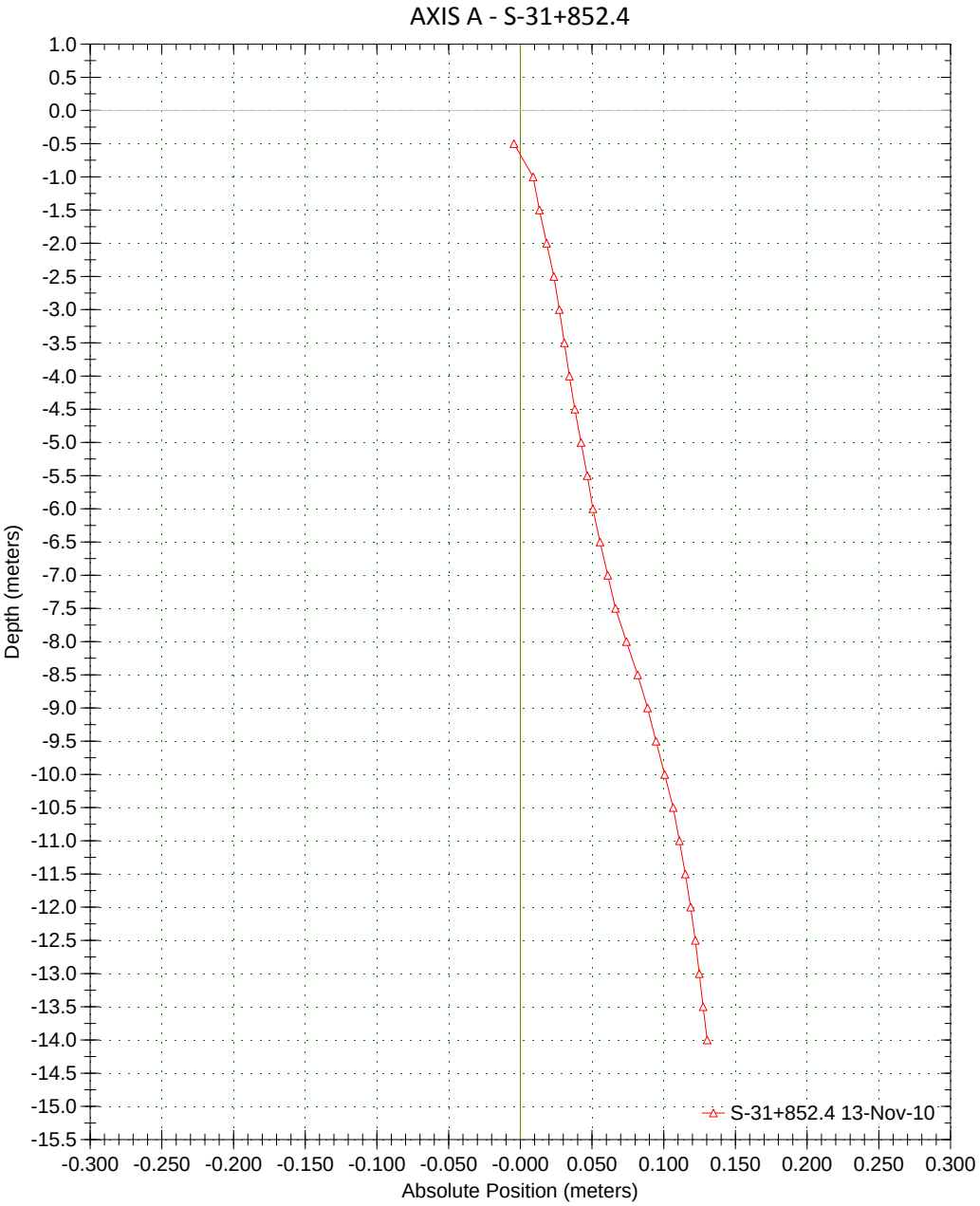
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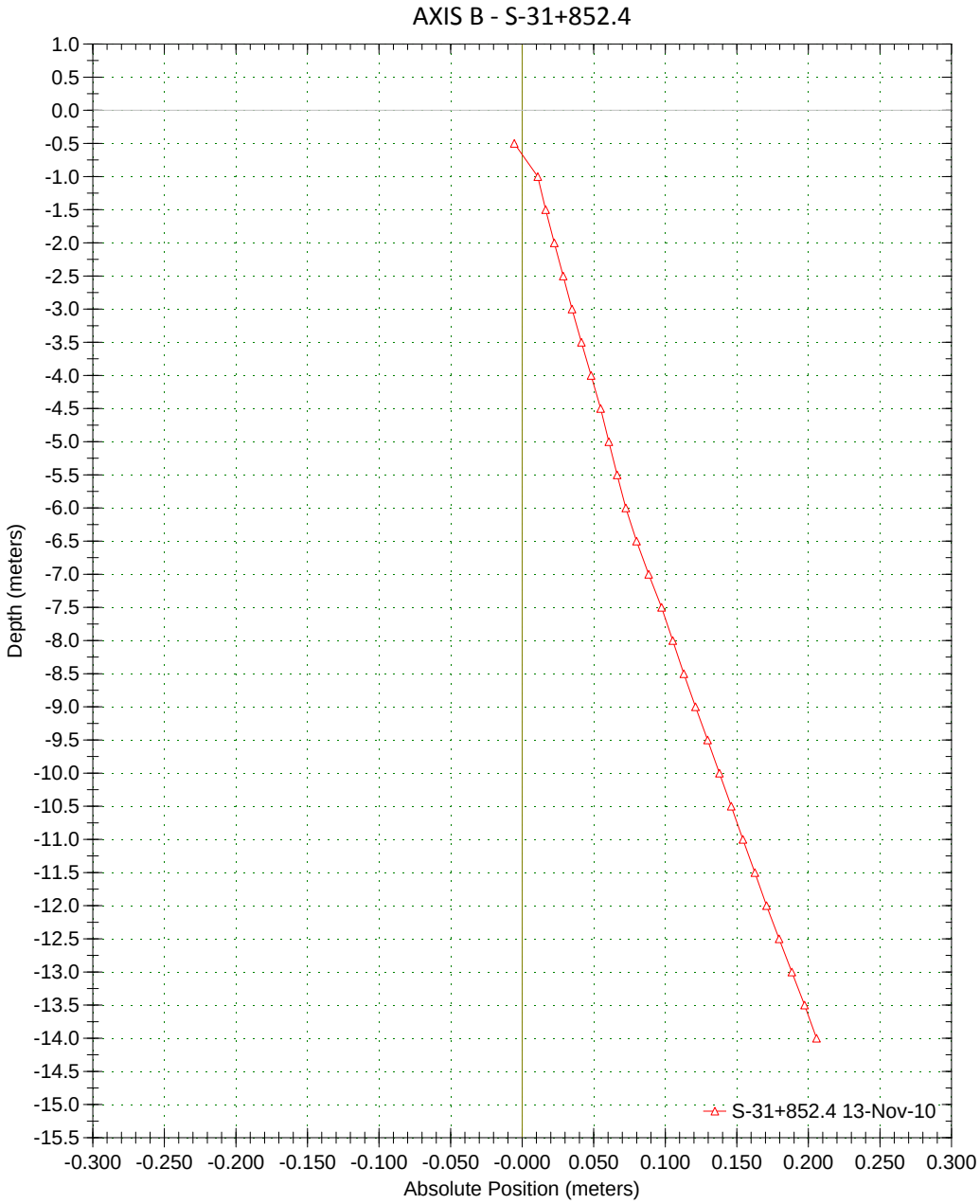
Inclinalysis v.2.30

Borehole : 31+852.4
Project : Baygoose_Jet Grouting
Location : Baygoose Dike South
Northing : 7212060.076
Easting : 638456.341
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 14.0 meters
North Groove Azimuth :
Base Reading : 2010 Nov 13 14:48
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
# S-31+852.4



RST Instruments Ltd.

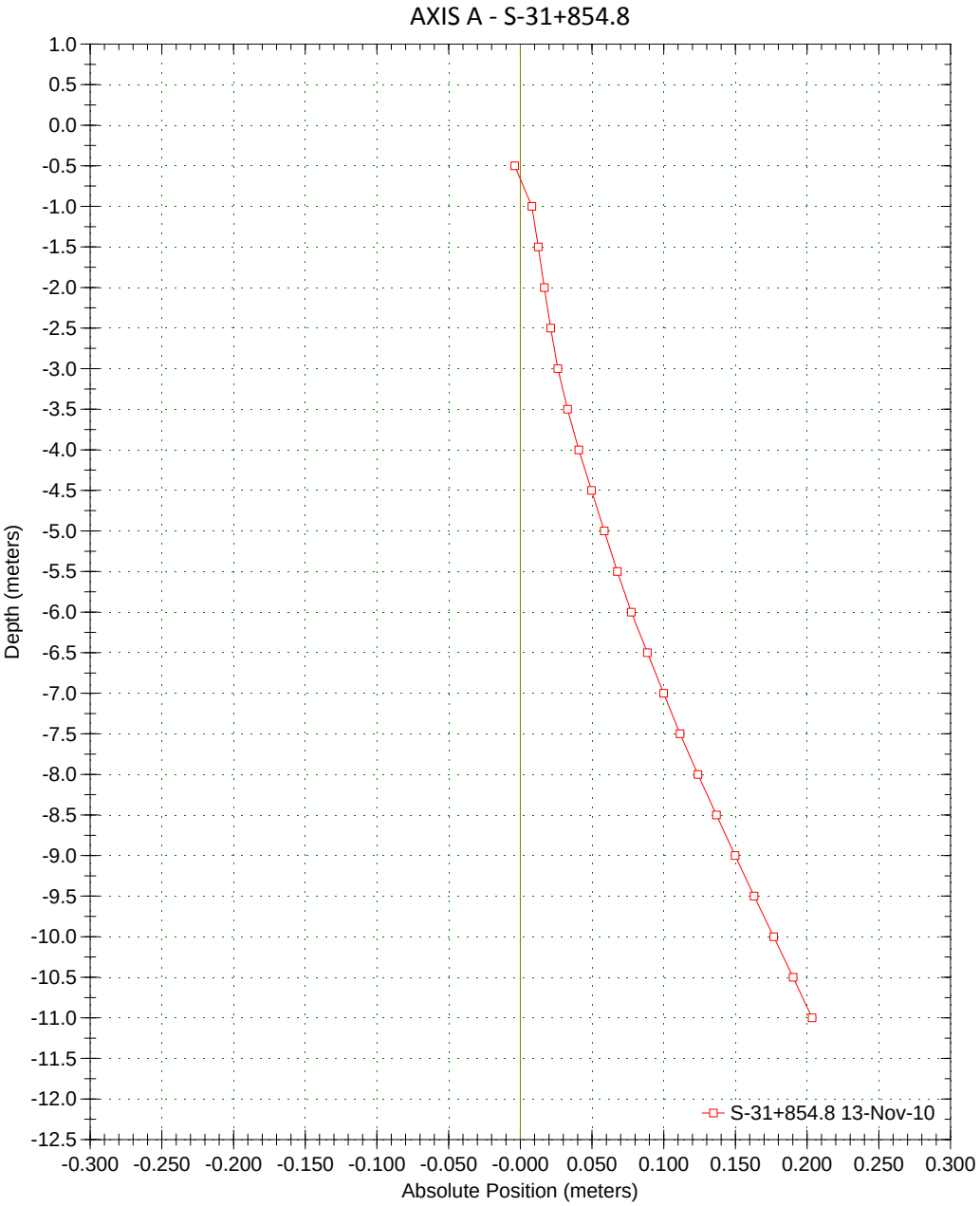
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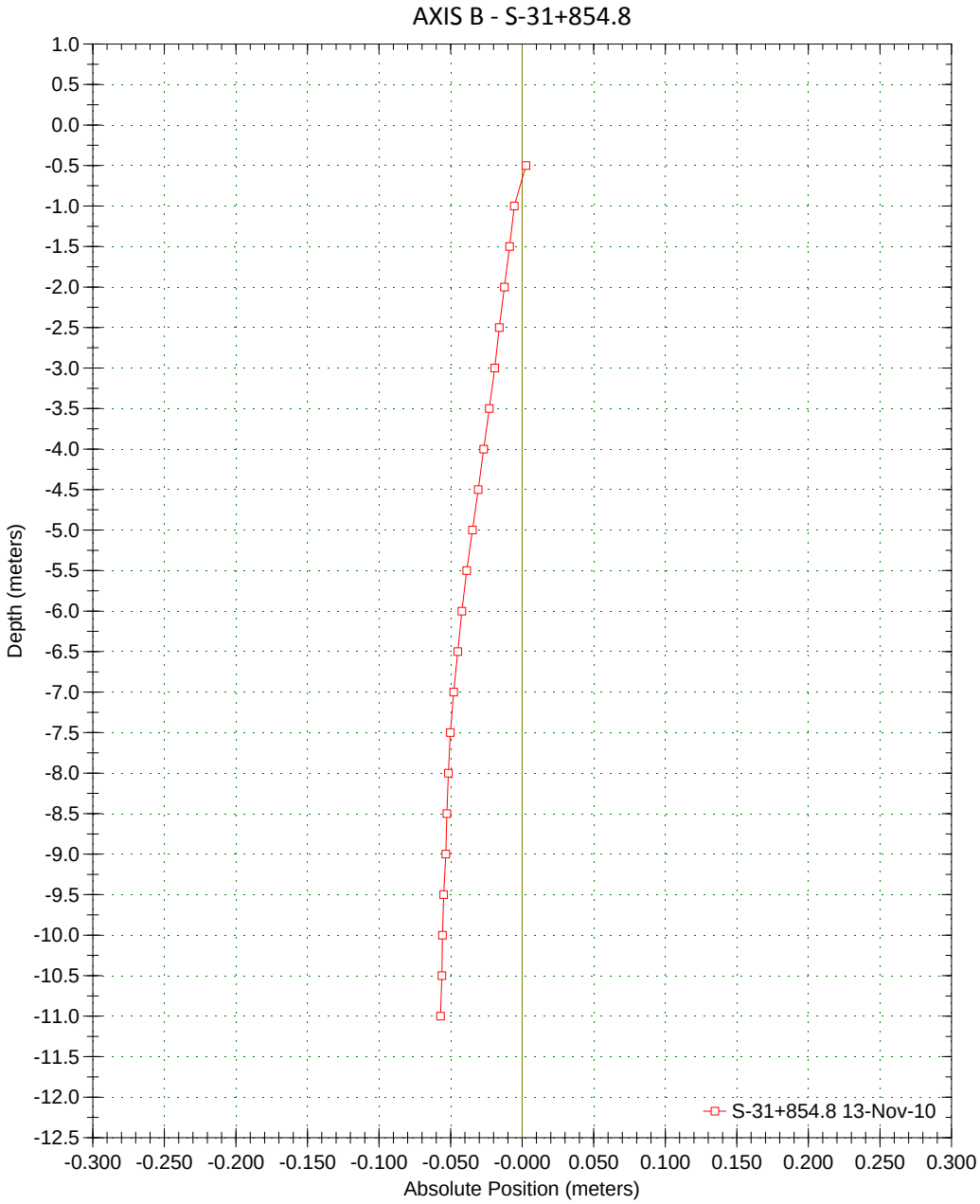
Inclinalysis v.2.30

Borehole : 31+854.8 **top-referenced
Project : Baygoose_Jet Grouting
Location : Baygoose Dlke South
Northing : 7212062.059
Easting : 638454.989
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 11.0 meters
North Groove Azimuth :
Base Reading : 2010 Nov 13 15:14
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
# S-31+854.8



RST Instruments Ltd.

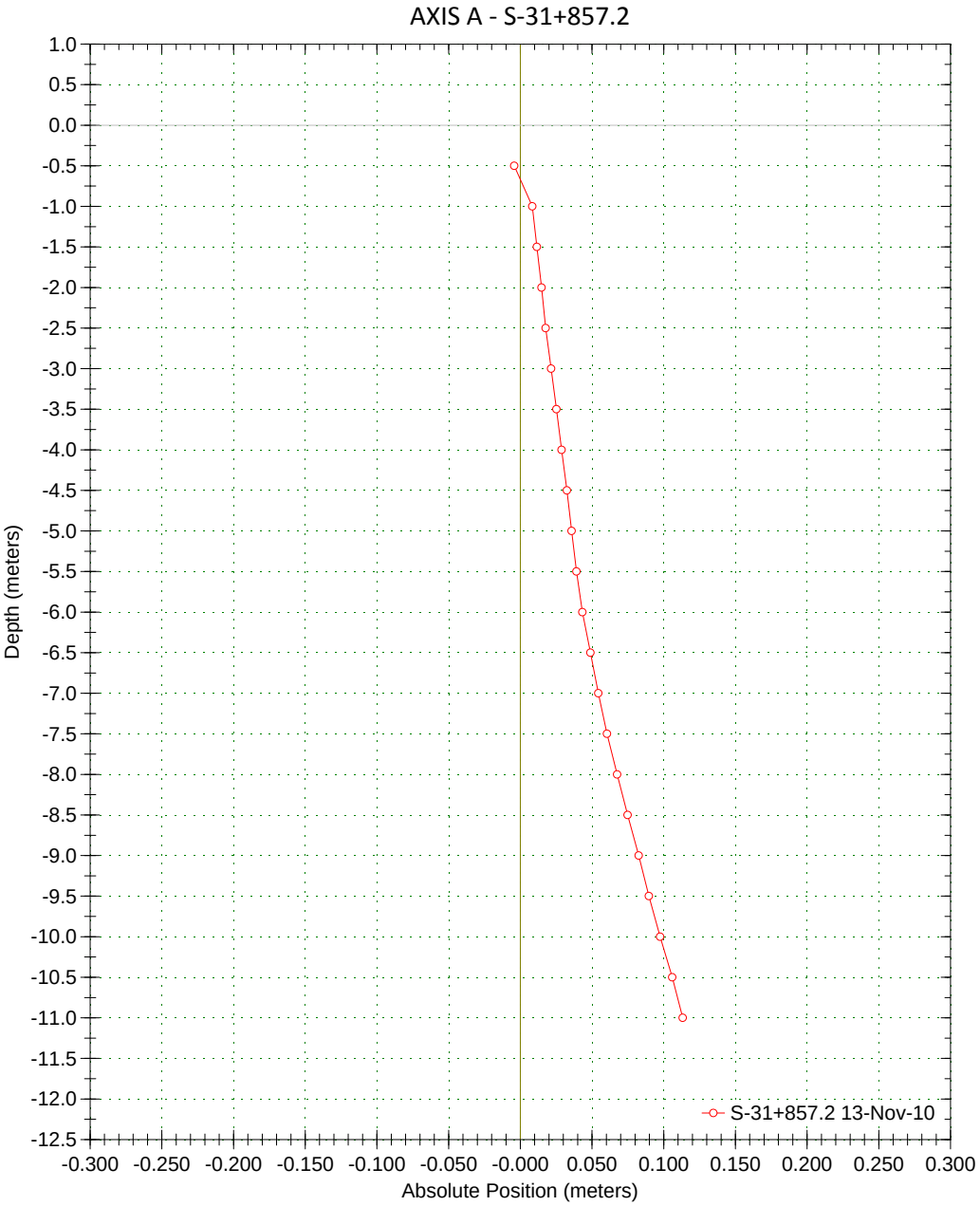
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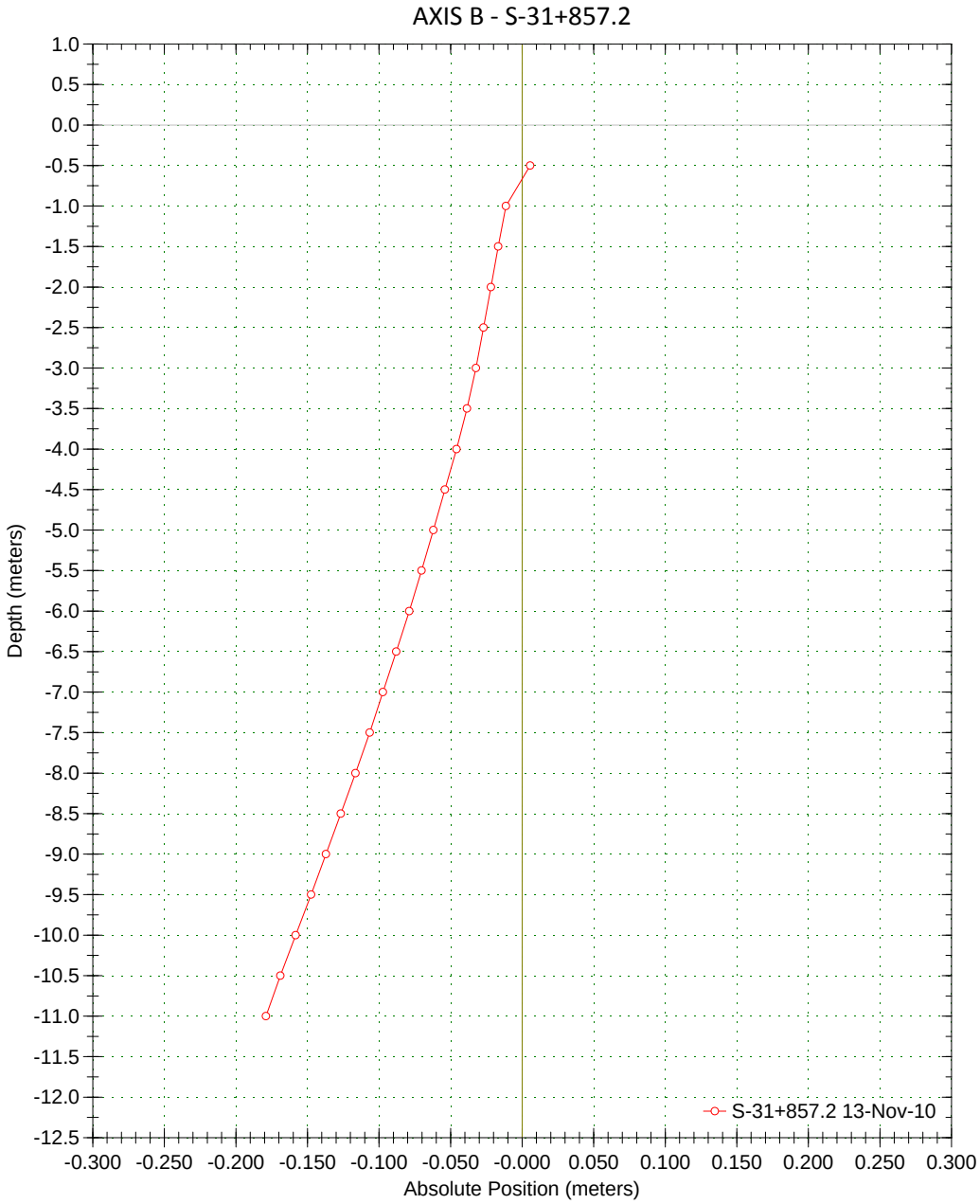
Inclinalysis v.2.30

Borehole : 31+857.2 **top-referenced
Project : Baygoose_Jet Grouting
Location : Baygoose Dike South
Northing : 7212064.042
Easting : 638453.637
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 11.0 meters
North Groove Azimuth :
Base Reading : 2010 Nov 13 15:40
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
# S-31+857.2



RST Instruments Ltd.

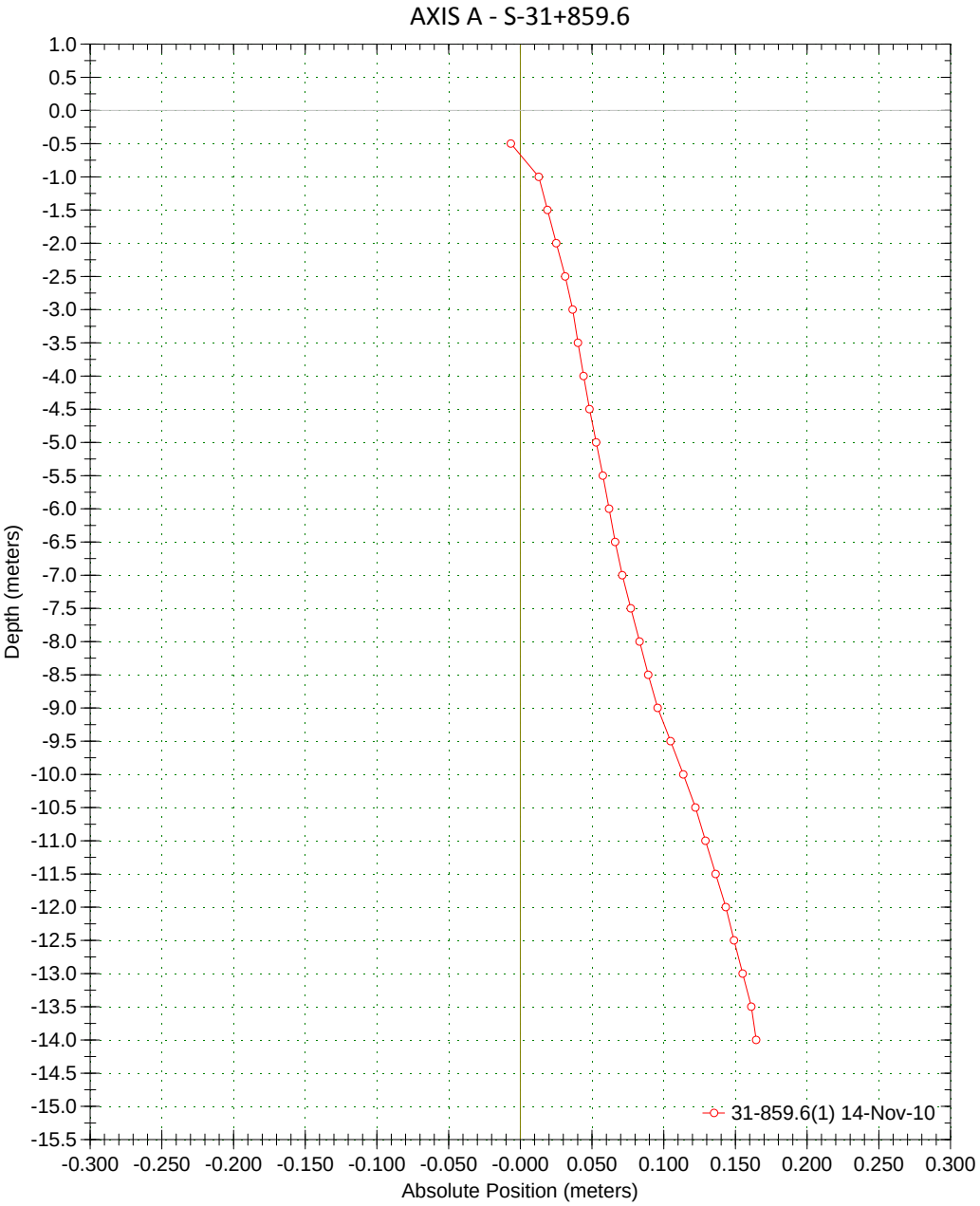
ABSOLUTE POSITION

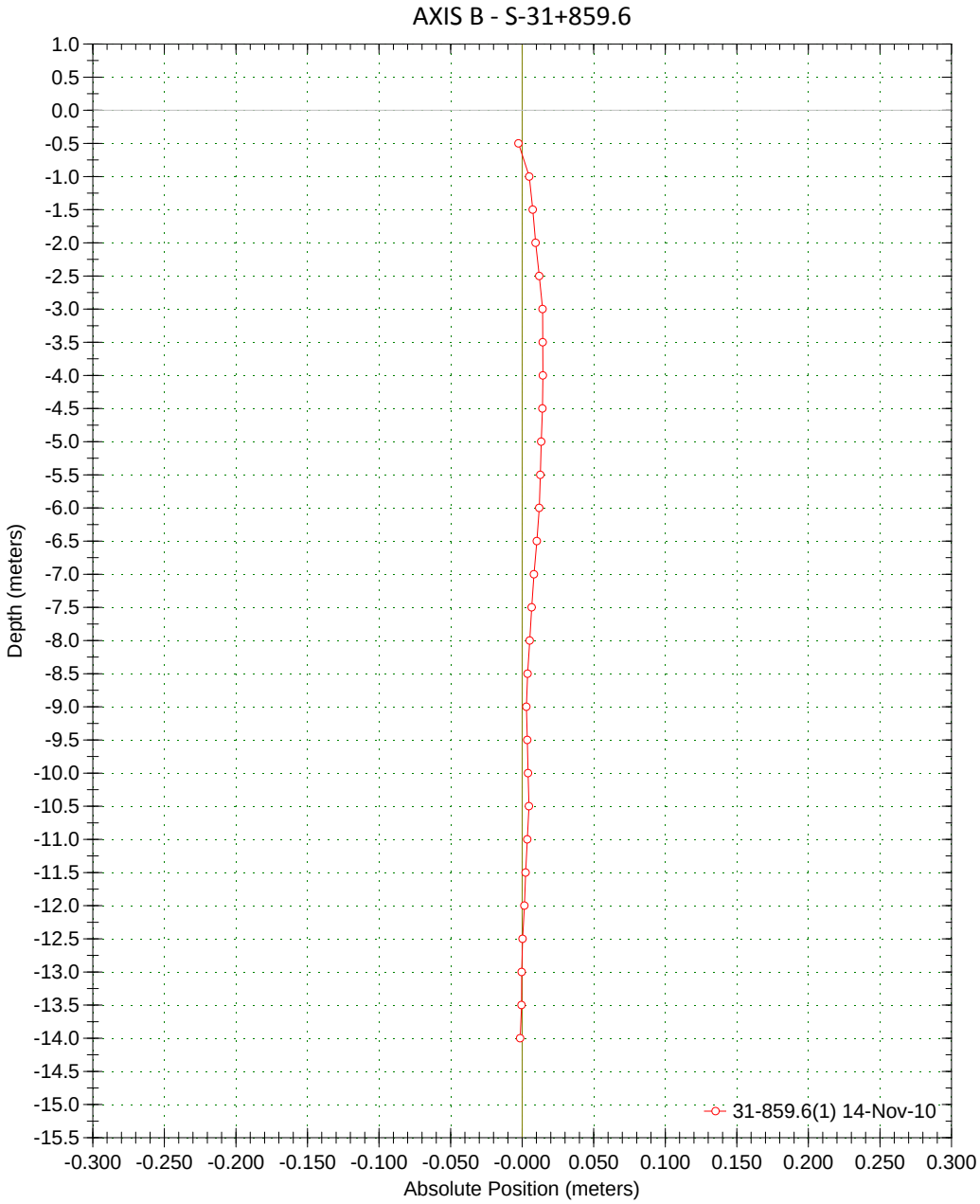
Inclinalysis v.2.30

Borehole : 31+859.6 **top-referenced
Project : Baygoose_Jet Grouting
Location : Baygoose Dike South
Northing : 7212066.025
Easting : 638452.284
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 14.0 meters
North Groove Azimuth :
Base Reading : 2010 Nov 14 10:51
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
# S - 31+859.6



RST Instruments Ltd.

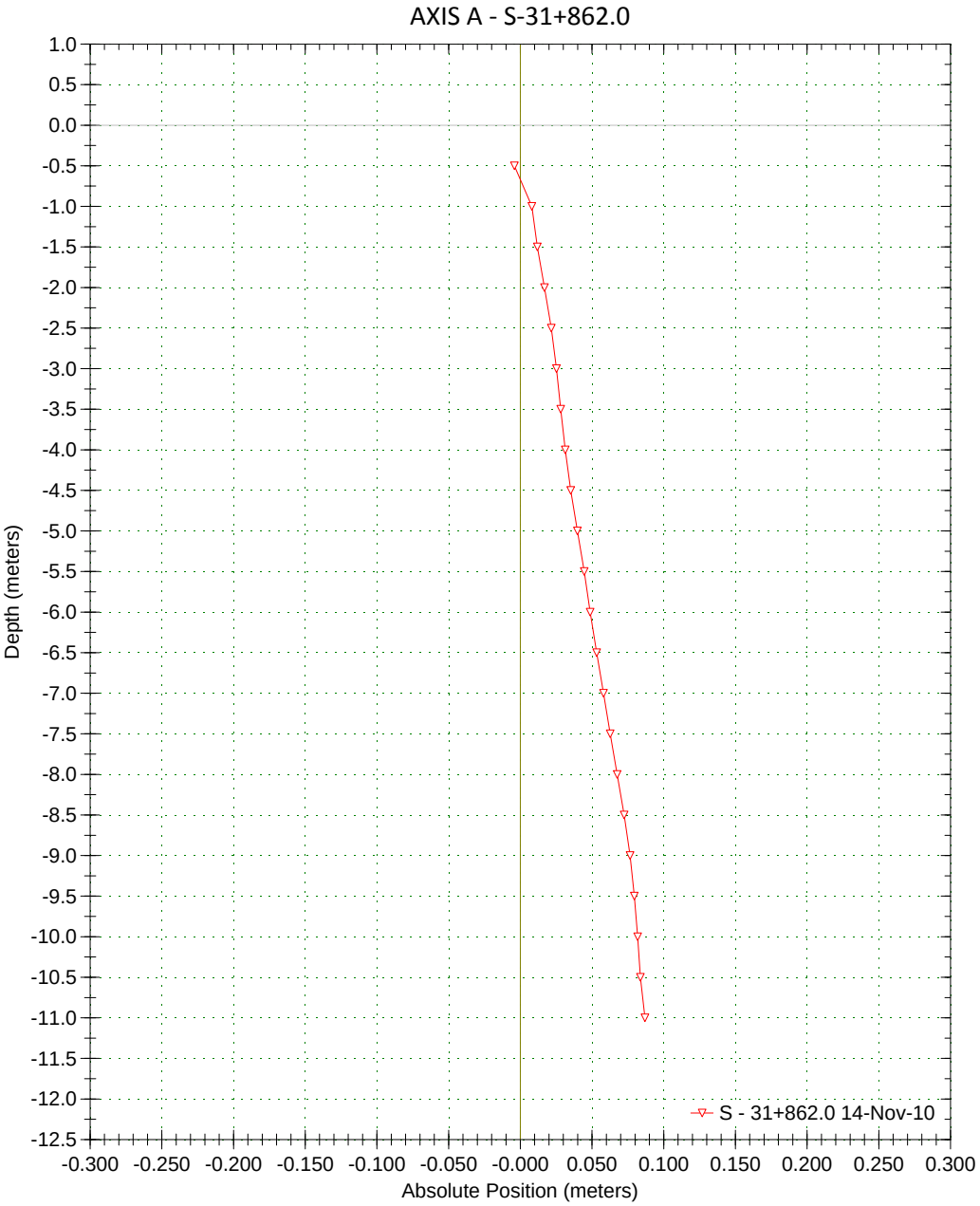
ABSOLUTE POSITION

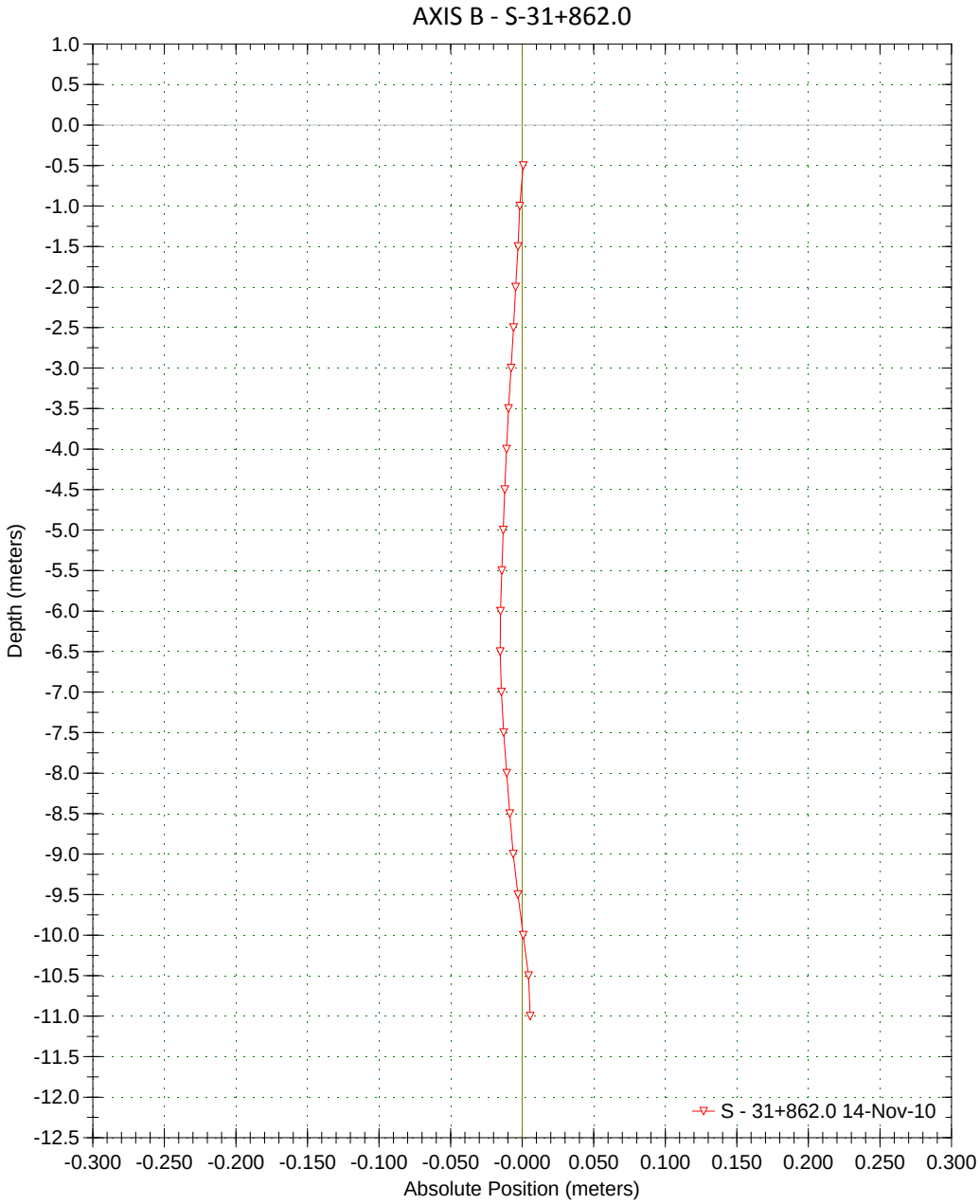
Inclinalysis v.2.30

Borehole : 31+862.0 **top-referenced
Project : Baygoose_Jet Grouting
Location : Baygoose Dlke South
Northing : 7212068.007
Easting : 638450.932
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 11.0 meters
North Groove Azimuth :
Base Reading : 2010 Nov 14 11:26
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
# S - 31+862.0



RST Instruments Ltd.

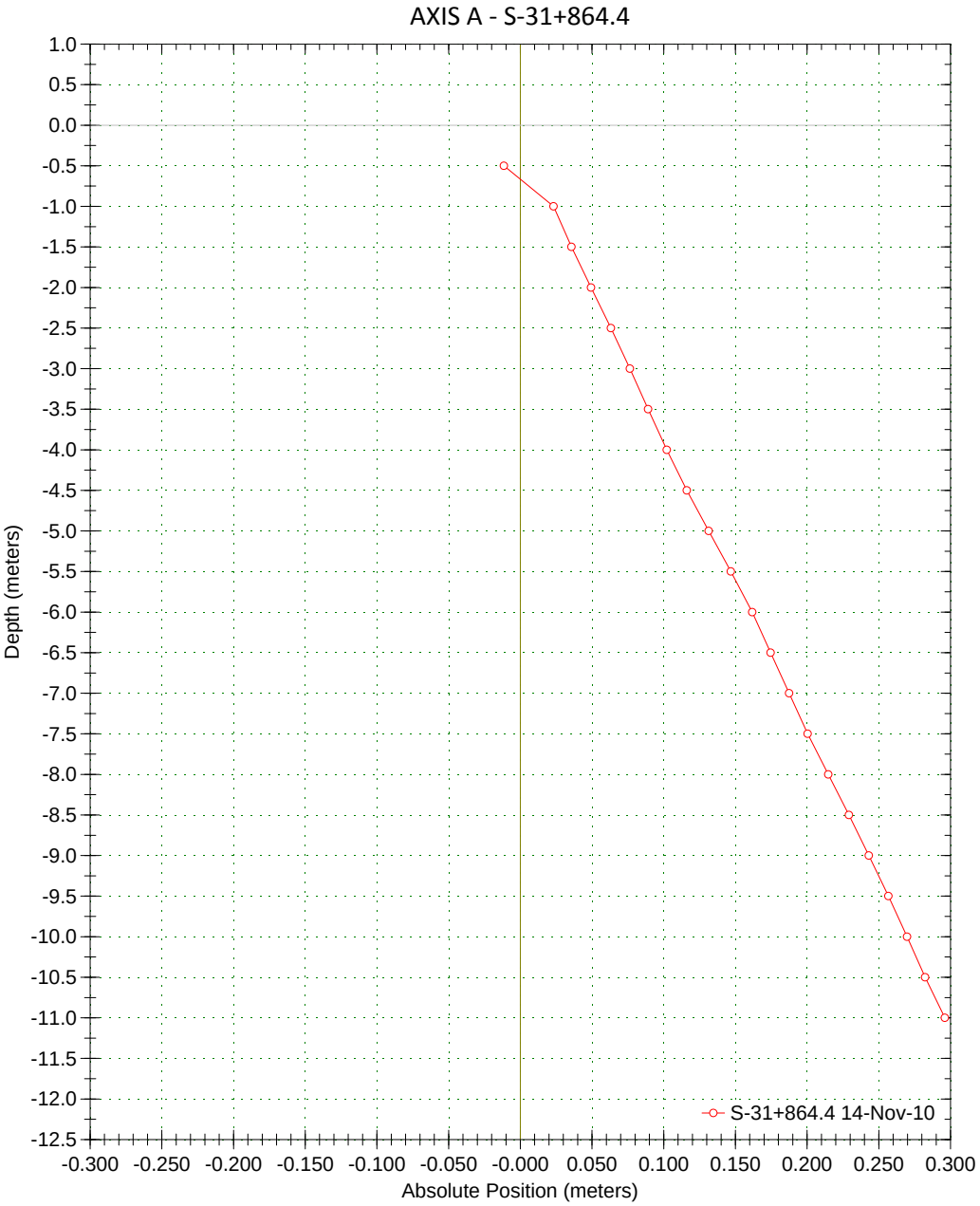
ABSOLUTE POSITION

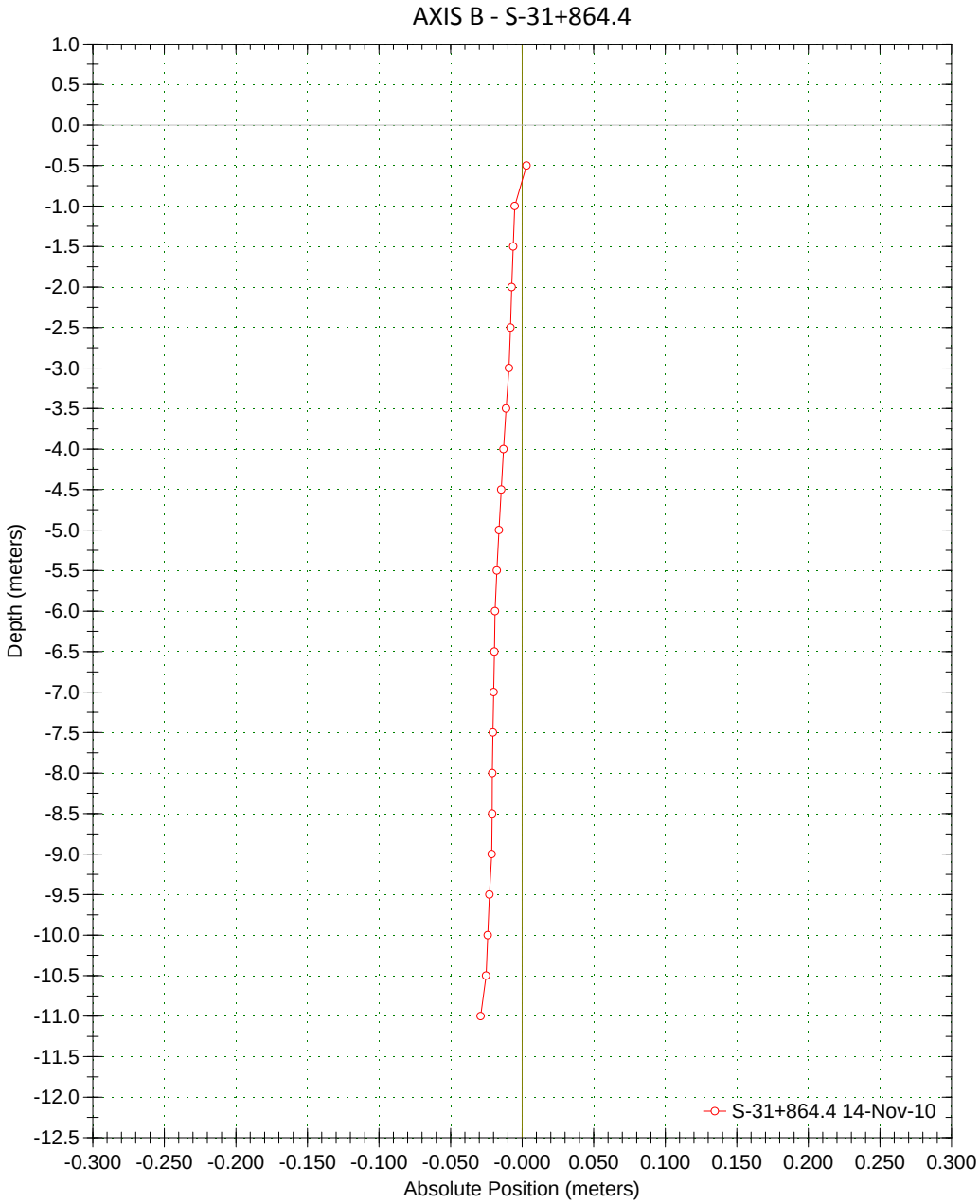
Inclinalysis v.2.30

Borehole : 31+864.4
Project : Baygoose_Jet Grouting
Location : Baygoose Dlke South
Northing : 7212069.990
Easting : 638449.580
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 11.0 meters
North Groove Azimuth :
Base Reading : 2010 Nov 14 11:53
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
# S-31+864.4



RST Instruments Ltd.

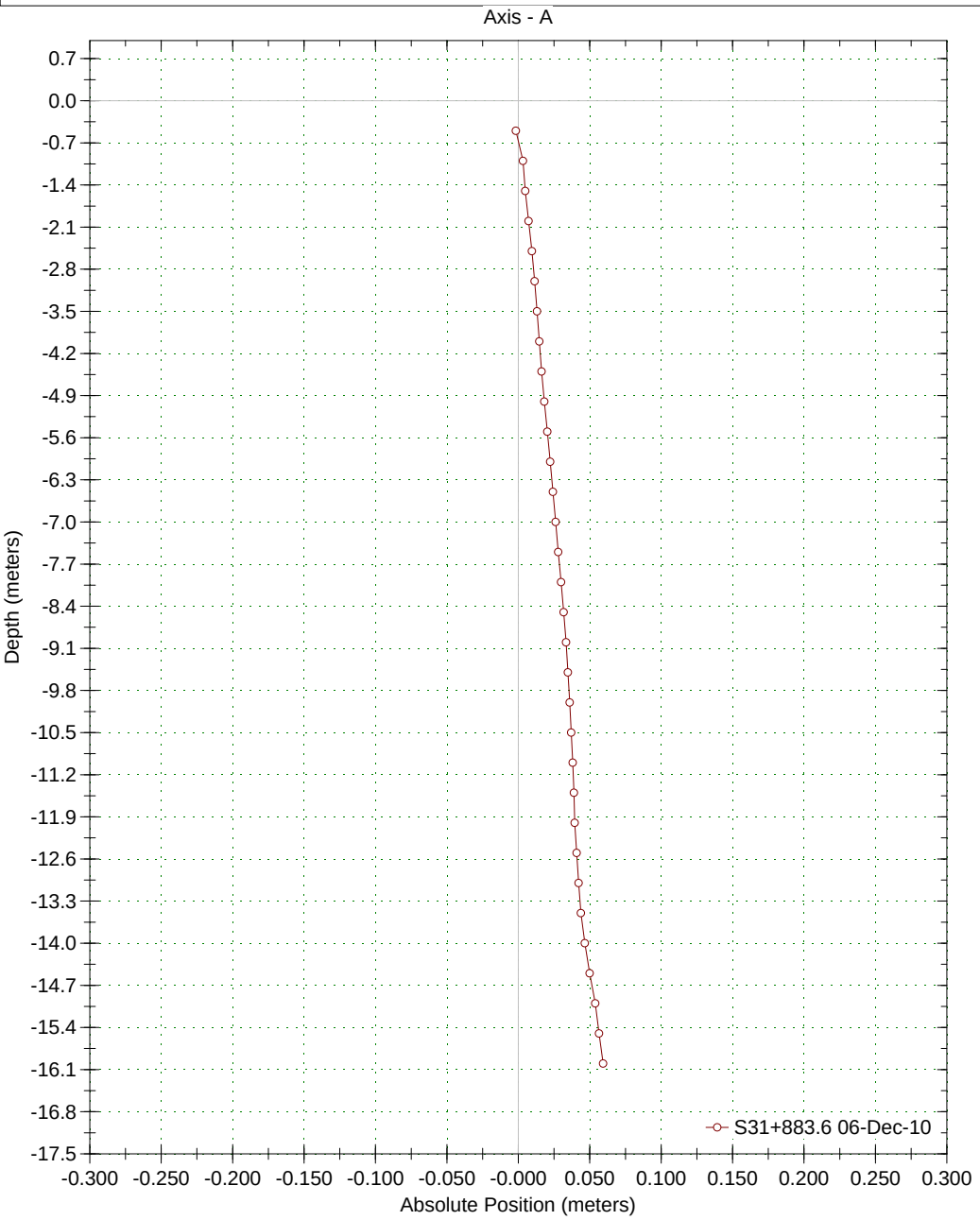
ABSOLUTE POSITION

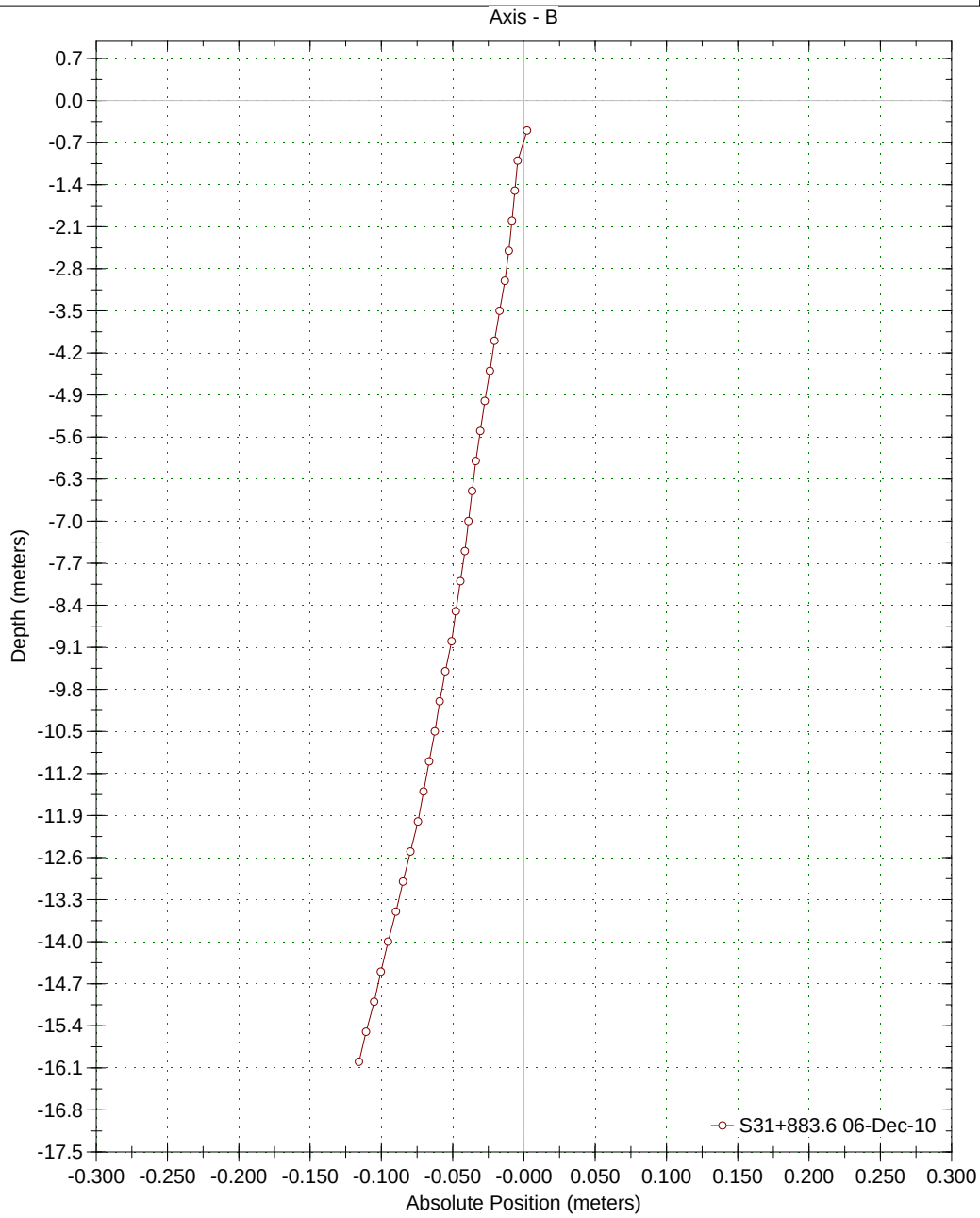
Inclinalysis v.2.30

Borehole : 31+883.6 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212085.853
Easting : 638438.763
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 16.0 meters
North Groove Azimuth :
Base Reading : 2010 Dec 06 16:49
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## S - 31+883.6



RST Instruments Ltd.

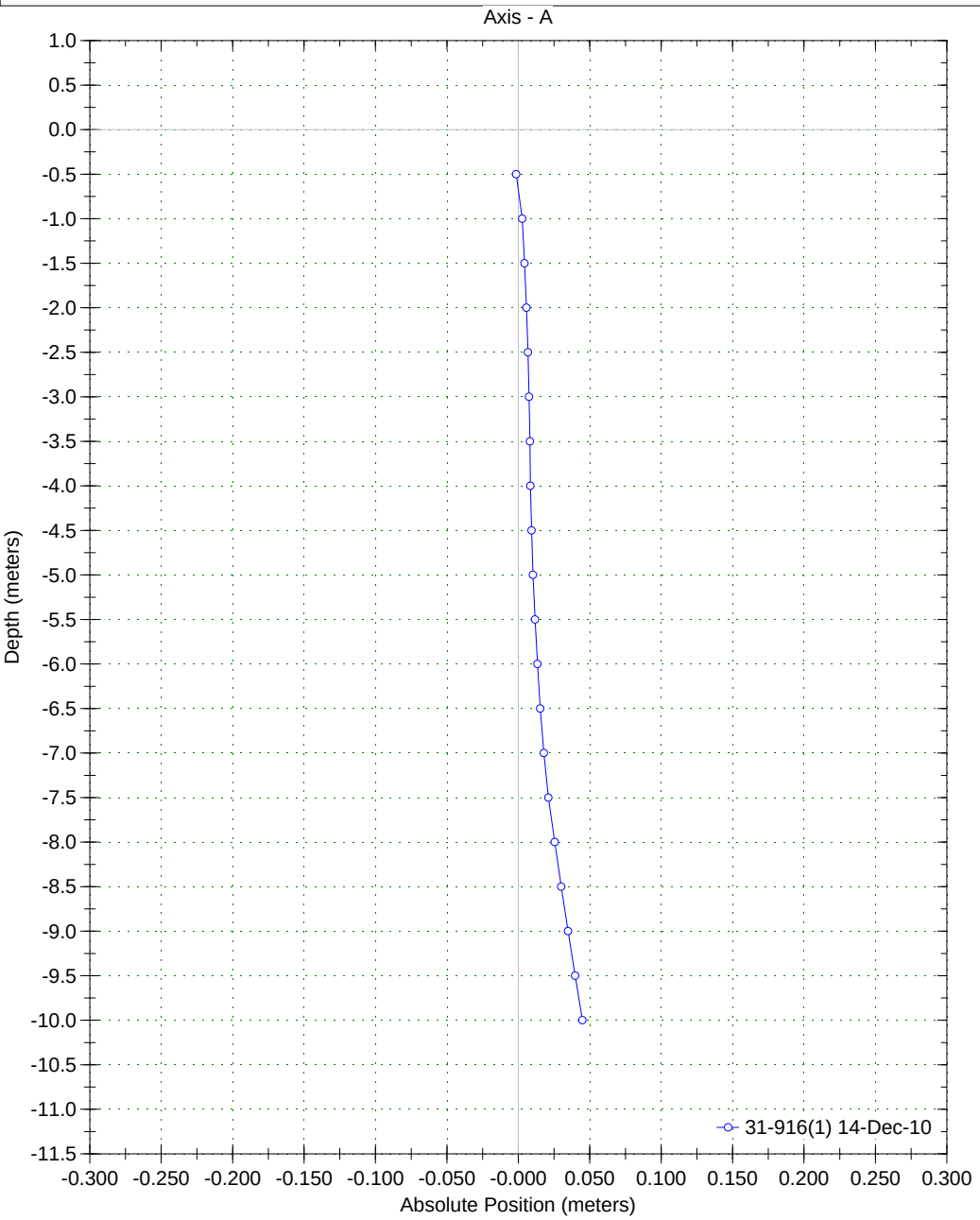
ABSOLUTE POSITION

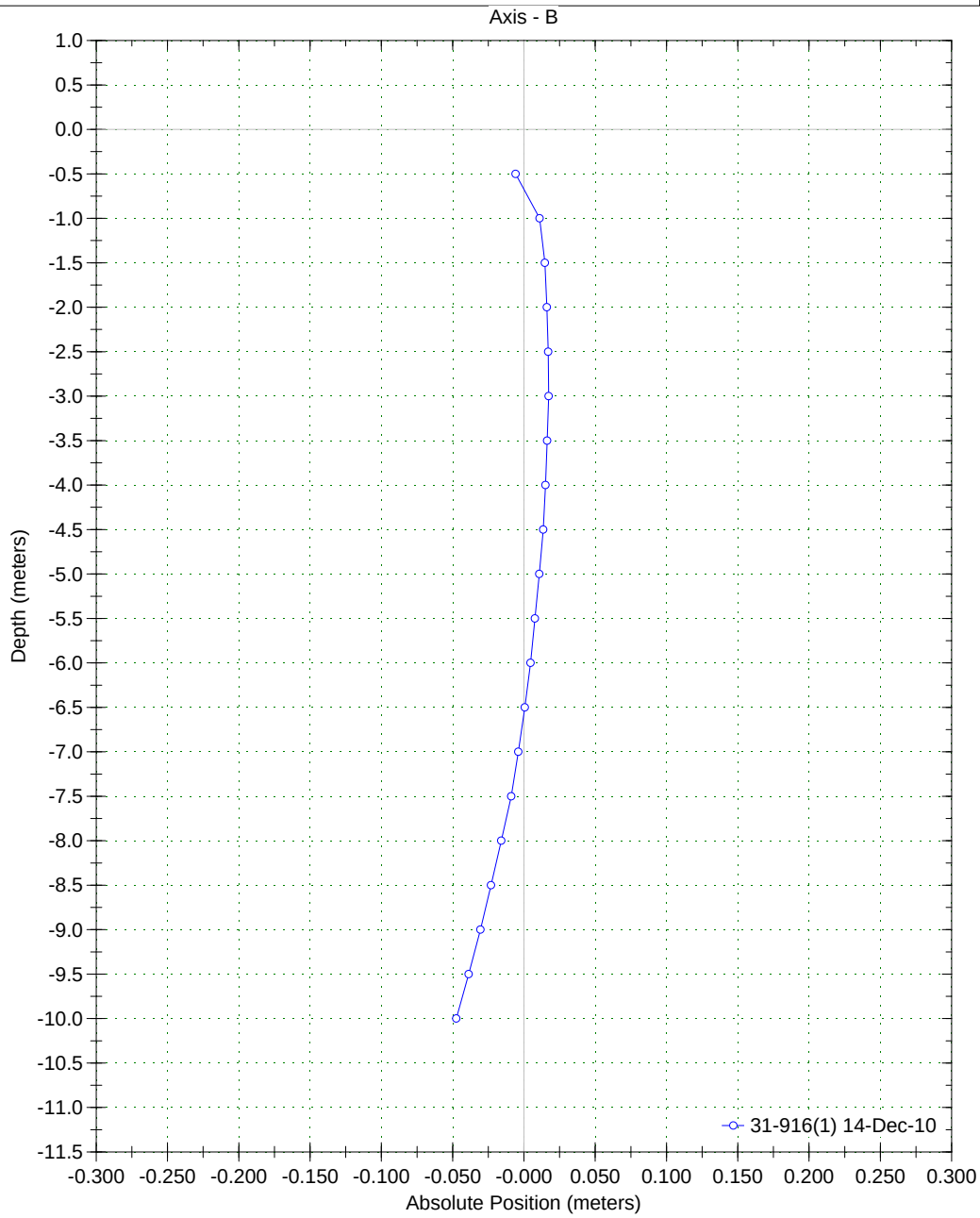
Inclinalysis v.2.30

Borehole : 31-916.0 **top-referenced
Project : Baygoose_Jet Grouting
Location : BGD South
Northing : 7212112.622
Easting : 638420.509
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 10.0 meters
North Groove Azimuth :
Base Reading : 2010 Dec 14 08:48
Axis A Azimuth : 0.0 degrees

# HOLE DEVIATION
## P - 31+916.0

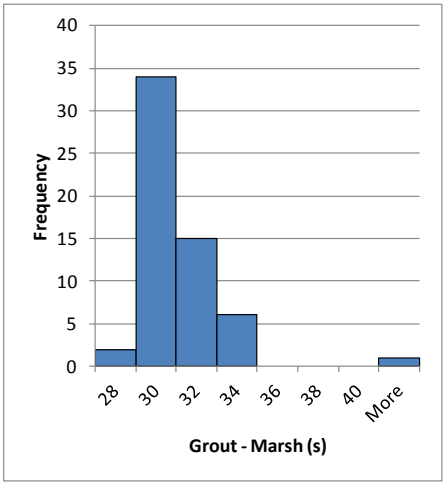


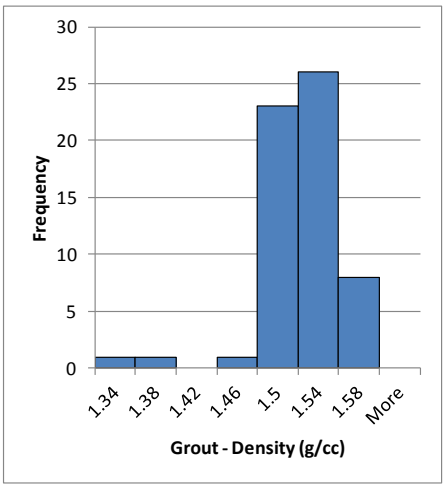



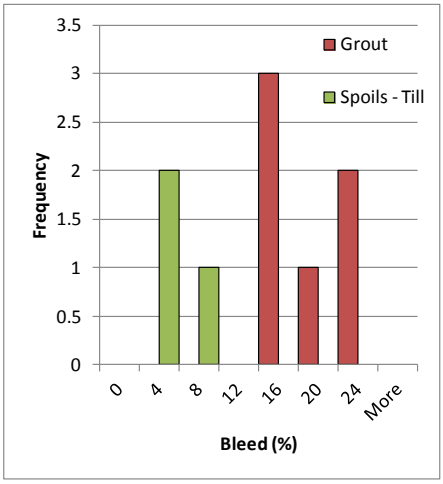
# E2-6 Jet Grout QA/QC Results

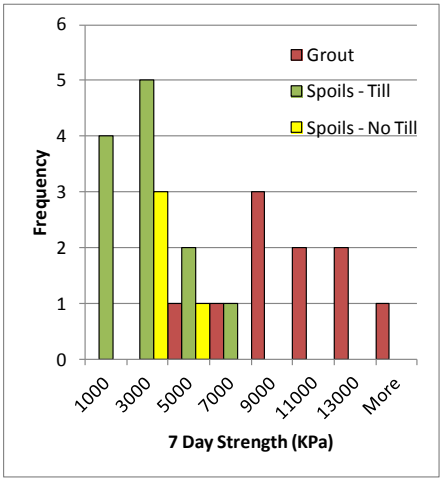
- Jet Grout QC Histograms
- Summary of Jet Grouting Quality Control

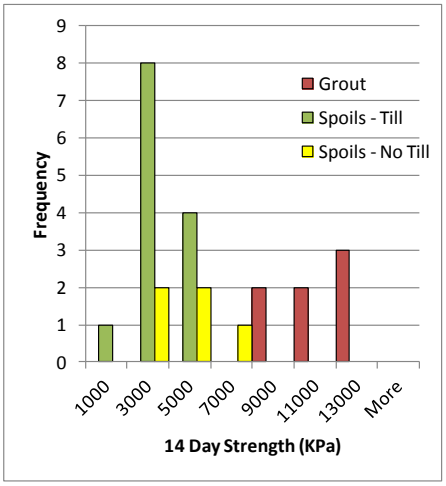
# Jet Grout QC Histograms

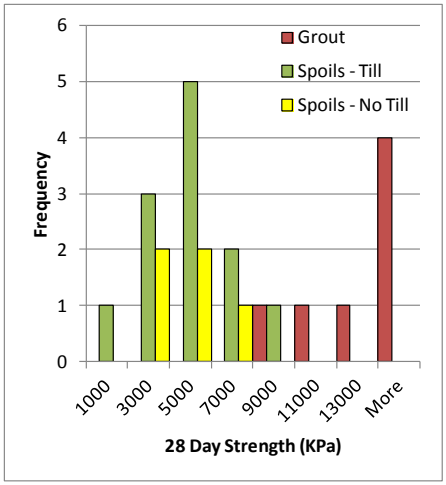



PROJECT

AEM

AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

**JET GROUTING QUALITY CONTROL**

Golder Associates

| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 10JAN12 | SCALE N/A | REV. 0 |
| CADD | YEW | 18JAN12 | **FIGURE E2-6.1** | |
| CHECK | GRB | 01DEC12 | | |
| REVIEW | FE | 01DEC12 | | |

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E2-6\01_Meadowbank Jet Grout QA Summary.pptx

# Summary of Jet Grouting Quality Control

## TABLE E2-6.1
## BAY-GOOSE DIKE - SUMMARY OF JET GROUTING QUALITY CONTROL

| HOLE | | TEST CONTROL | | GROUT PROPERTIES | | | | SPOILS | UCS | | | | | | | | TYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hole Name | Order P,S,T | Date Tested / Sampled (DD-MMM-YY) | Shift (D/N) | Marsh TIme (s) | Density (g/cm$^3$) | Temperature ( C ) | Bleed (%) | Bleed (%) | 7 day strength (kPa) | # Days | 14 day strength (kPa) | # Days | 28 day strength (kPa) | # Days | 56 day strength (kPa) | # Days | |
| 31+841.6 | P | 30-Oct-11 | D | -- | -- | -- | -- | -- | 1342 | 9 | 1622 | 16 | 2103 | 29 | -- | -- | Spoils |
| 31+834.4 | P | 31-Oct-10 | D | -- | -- | -- | -- | -- | 1260 | 8 | 1619 | 15 | 2128 | 28 | -- | -- | Spoils |
| 31+829.6 | P | 2-Nov-10 | D | -- | -- | -- | -- | -- | 992 | 10 | -- | -- | -- | -- | -- | -- | Spoils |
| 31+853.6 | P | 5-Nov-10 | D | -- | -- | -- | -- | -- | 2320 | 7 | 4800 | 14 | -- | -- | -- | -- | Spoils |
| 31+856 | P | 6-Nov-10 | D | -- | -- | -- | -- | -- | 1594 | 9 | 1686 | 15 | -- | -- | -- | -- | Spoils |
| 31+858.4 | P | 7-Nov-10 | D | -- | -- | -- | -- | -- | 2168 | 8 | 2625 | 14 | -- | -- | -- | -- | Spoils |
| 31+860.8 | P | 7-Nov-10 | D | 31.2 | 1.55 | 14.7 | -- | -- | 7650 | 8 | 7874 | 15 | -- | -- | -- | -- | Grout |
| 31+860.8 | P | 7-Nov-10 | D | 32.4 | 1.57 | 15.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+870.4 | P | 10-Nov-10 | D | -- | -- | -- | -- | -- | 2083 | 9 | 2659 | 14 | -- | -- | -- | -- | Spoils |
| 31+826 | S | 12-Nov-10 | D | -- | -- | -- | -- | -- | 2211 | 7 | 2612 | 14 | -- | -- | -- | -- | Spoils |
| 31+847.6 | S | 14-Nov-10 | D | -- | -- | -- | -- | -- | 508 | 7 | 556 | 14 | 1139 | 29 | 1500 | 57 | Spoils |
| 31+847.6 | S | 14-Nov-10 | D | 30.4 | 1.36 | 3.1 | -- | -- | 9308 | 7 | 9104 | 14 | 11433 | 29 | 12700 | 57 | Grout |
| 31+847.6 | S | 14-Nov-10 | D | 31.2 | 1.49 | 4.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+862 | S | 19-Nov-10 | D | -- | -- | -- | -- | -- | 2873 | 7 | 2950 | 14 | 3700 | 28 | -- | -- | Spoils |
| 31+862 | S | 19-Nov-10 | D | 33.2 | 1.48 | 7.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+869.2 | S | 20-Nov-10 | D | 31.2 | 1.55 | 1.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+878.8 | S | 7-Dec-10 | D | -- | -- | -- | -- | -- | 2060 | 8 | -- | -- | 3053 | 28 | -- | -- | Spoils |
| 31+887.2 | P | 10-Dec-10 | D | -- | -- | -- | -- | -- | 888 | 7 | -- | -- | 3400 | 31 | | | Spoils |
| 31+883.6 | S | 10-Dec-10 | D | 34.0 | 1.51 | 3.4 | -- | -- | 6627 | 7 | -- | -- | 18900 | 31 | -- | -- | Grout |
| 31+886 | S | 16-Dec-10 | D | 29.0 | 1.48 | 7.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+888.4 | S | 17-Dec-10 | D | -- | -- | 7.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+895.6 | S | 18-Dec-10 | D | -- | -- | 5.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+898 | S | 17-Dec-10 | D | -- | -- | 8.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+907.6 | S | 18-Dec-10 | D | -- | -- | 10.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+937.6 | P | 6-Jan-11 | D | -- | -- | 0.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+940.0 | P | 6-Jan-11 | D | -- | -- | 13.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+947.2 | P | 7-Jan-11 | D | -- | -- | 11.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+949.6 | P | 7-Jan-11 | D | -- | -- | 14.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+952.0 | P | 7-Jan-11 | D | -- | -- | 11.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+956.8 | P | 7-Jan-11 | N | -- | -- | -- | -- | -- | 2464 | 7 | 3300 | 14 | 4100 | 42 | -- | -- | Spoils |
| 31+964.0 | P | 8-Jan-11 | D | -- | -- | 22.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+966.4 | P | 8-Jan-11 | D | -- | -- | 13.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+925.3 | P | 9-Jan-11 | D | -- | -- | 15.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+928.0 | P | 9-Jan-11 | D | -- | -- | 18.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+930.4 | P | 9-Jan-11 | D | -- | -- | 12.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+932.5 | P | 9-Jan-11 | N | -- | -- | -- | -- | -- | 2568 | 10 | 2925 | 15 | 3000 | 29 | -- | -- | Spoils |
| 31+938.8 | P | 10-Jan-11 | D | -- | -- | 14.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+926.8 | S | 13-Jan-11 | D | 28.3 | 1.47 | 20.1 | -- | -- | 4834 | 7 | 4713 | 14 | 7585 | 28 | -- | -- | Grout |
| 31+926.8 | S | 13-Jan-11 | D | -- | -- | -- | -- | -- | 372 | 7 | -- | -- | 623 | 36 | -- | -- | Spoils |
| 31+924.4 | S | 13-Jan-11 | D | -- | -- | 26.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+929.2 | S | 13-Jan-11 | D | -- | -- | 11.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+931.6 | S | 14-Jan-11 | D | -- | -- | 14.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+934.0 | S | 14-Jan-11 | D | -- | -- | 18.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+953.2 | S | 14-Jan-11 | N | 30.0 | 1.52 | 14.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+955.6 | S | 15-Jan-11 | D | 28.1 | 1.48 | 16.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+969.4 | P | 15-Jan-11 | N | 29.0 | 1.55 | 15.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+975.4 | P | 16-Jan-11 | D | -- | -- | 10.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+978.4 | P | 16-Jan-11 | D | -- | -- | 17.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+981.4 | P | 16-Jan-11 | D | -- | -- | 6.8 | -- | -- | -- | -- | 2478 | 15 | 3100 | 29 | -- | -- | Spoils |
| 31+984.4 | P | 16-Jan-11 | N | -- | -- | 18.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+999.4 | P | 17-Jan-11 | D | -- | -- | 11.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+014.4 | P | 18-Jan-11 | D | -- | -- | 18.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+016.8 | P | 18-Jan-11 | D | -- | -- | 17.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+019.2 | P | 18-Jan-11 | N | -- | -- | 21.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+026.4 | P | 20-Jan-11 | N | -- | -- | 8.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+026.4 | P | 20-Jan-11 | N | -- | -- | 2.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+028.8 | P | 20-Jan-11 | N | -- | -- | 16.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+031.2 | P | 21-Jan-11 | D | -- | -- | 19.0 | -- | -- | 2656 | 7 | 4200 | 14 | 3500 | 28 | -- | -- | Spoils |
| 32+036 | P | 23-Jan-11 | D | -- | -- | 6.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+038.4 | P | 23-Jan-11 | N | -- | -- | 19.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+040.8 | S | 24-Jan-11 | D | -- | -- | 15.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+967.9 | S | 24-Jan-11 | N | -- | -- | 19.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+970.9 | S | 24-Jan-11 | N | -- | -- | 14.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+973.9 | S | 25-Jan-11 | D | -- | -- | 20.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+979.9 | S | 25-Jan-11 | D | -- | -- | 22.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+982.9 | S | 14-Feb-11 | N | 30.0 | 1.56 | 15.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |

## TABLE E2-6.1
## BAY-GOOSE DIKE - SUMMARY OF JET GROUTING QUALITY CONTROL

| HOLE | | TEST CONTROL | | GROUT PROPERTIES | | | | SPOILS | UCS | | | | | | | | TYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hole Name | Order P,S,T | Date Tested / Sampled (DD-MMM-YY) | Shift (D/N) | Marsh TIme (s) | Density (g/cm$^3$) | Temperature ( C ) | Bleed (%) | Bleed (%) | 7 day strength (kPa) | # Days | 14 day strength (kPa) | # Days | 28 day strength (kPa) | # Days | 56 day strength (kPa) | # Days | |
| 31+988.9 | S | 15-Feb-11 | D | -- | -- | 11.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+991.9 | S | 15-Feb-11 | D | -- | -- | 14.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+994.9 | S | 15-Feb-11 | D | 29.0 | 1.47 | 25.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+997.9 | S | 15-Feb-11 | D | -- | -- | 21.1. | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+001.1 | S | 15-Feb-11 | D | -- | -- | 13.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+002.8 | S | 16-Feb-11 | D | -- | -- | 10.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+004.5 | S | 17-Feb-11 | D | -- | -- | -- | -- | -- | 1465 | 8 | 1820 | 14 | 2540 | 28 | -- | -- | Spoils |
| 32+004.5 | S | 17-Feb-11 | D | 29.2 | 1.44 | 11.5 | -- | -- | 7119 | 8 | 7144 | 14 | 10121 | 28 | -- | -- | Grout |
| 32+013.2 | S | 17-Feb-11 | N | 31.0 | 1.54 | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+020.4 | S | 18-Feb-11 | N | 29.8 | 1.50 | 6.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+037.2 | S | 20-Feb-11 | N | 31.4 | 1.56 | 18.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+045.6 | P | 22-Feb-11 | N | 29.5 | 1.50 | 10.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+050.4 | P | 25-Feb-11 | N | -- | -- | -- | -- | -- | 4000 | 10 | 4800 | 14 | 4900 | 28 | -- | -- | Spoils |
| 32+042.0 | S | 27-Feb-11 | N | -- | 1.50 | 12.0 | -- | -- | 7690 | 8 | 10108 | 15 | 15300 | 30 | -- | -- | Grout |
| 32+044.4 | S | 28-Feb-11 | D | -- | -- | 16.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+046.8 | S | 28-Feb-11 | D | -- | -- | 16.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+049.2 | S | 28-Feb-11 | D | -- | -- | 14.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+051.6 | S | 28-Feb-11 | N | -- | -- | 15.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+054.0 | S | 1-Mar-11 | D | -- | -- | 16.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+056.4 | S | 1-Mar-11 | D | -- | -- | 16.9 | 20.0 | 2.0 | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+061.2 | S | 2-Mar-11 | D | 29.7 | 1.34 | 11.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+061.2 | S | 2-Mar-11 | D | -- | -- | 12.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Spoils |
| 32+063.6 | S | 1-Apr-11 | D | 27.8 | 1.50 | 21.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+067.2 | P | 1-Apr-11 | N | -- | -- | 16.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+069.6 | P | 1-Apr-11 | N | 29.0 | 1.50 | 20.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+072 | P | 2-Apr-11 | D | -- | -- | 27.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+074.4 | P | 2-Apr-11 | D | 29.0 | 1.52 | 16.9 | -- | -- | 1961 | 10 | 1986 | 17 | -- | -- | -- | -- | Grout |
| 32+074.4 | P | 2-Apr-11 | D | -- | -- | -- | -- | -- | 12091 | 10 | 12000 | 17 | -- | -- | -- | -- | Spoils |
| 32+076.8 | P | 2-Apr-11 | N | -- | -- | 20.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+079.2 | P | 3-Apr-11 | D | -- | -- | 22.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+081.6 | P | 4-Apr-11 | N | -- | -- | 16.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+084 | P | 5-Apr-11 | D | -- | -- | 19.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+086.4 | P | 5-Apr-11 | D | -- | -- | 24.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+088.8 | P | 5-Apr-11 | N | -- | -- | 21.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+091.2 | P | 5-Apr-11 | N | -- | -- | 23.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+093.6 | P | 6-Apr-11 | D | 31.0 | 1.54 | 22.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+096 | P | 6-Apr-11 | D | -- | -- | 21.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+098.4 | P | 6-Apr-11 | D | -- | -- | 20.7 | -- | 2.0 | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+100.8 | P | 6-Apr-11 | N | -- | -- | 23.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+103.2 | P | 6-Apr-11 | N | -- | -- | 18.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+105.6 | P | 6-Apr-11 | N | 30.0 | 1.51 | 15.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+066 | S | 7-Apr-11 | D | -- | -- | 18.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+068.4 | S | 7-Apr-11 | D | 29.0 | 1.53 | 28.0 | -- | -- | 6800 | 12 | -- | -- | 7900 | 28 | -- | -- | Grout |
| 32+068.4 | S | 7-Apr-11 | D | -- | -- | -- | -- | -- | 15700 | 12 | -- | -- | -- | -- | -- | -- | Spoils |
| 32+070.8 | S | 7-Apr-11 | D | -- | -- | 21.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+073.2 | S | 7-Apr-11 | N | -- | -- | 27.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+075.6 | S | 7-Apr-11 | N | 30.0 | 1.52 | 23.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+080.4 | S | 8-Apr-11 | N | 30.0 | 1.51 | 16.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+082.8 | S | 8-Apr-11 | N | -- | -- | 14.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+085.2 | S | 9-Apr-11 | D | -- | -- | 25.8 | -- | 5.0 | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+087.6 | S | 9-Apr-11 | D | 31.0 | 1.53 | 25.5 | 40.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+090 | S | 9-Apr-11 | D | -- | -- | 27.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+092.4 | S | 9-Apr-11 | D | -- | -- | 23.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+094.8 | S | 10-Apr-11 | D | -- | -- | 27.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+097.2 | S | 10-Apr-11 | N | 28.0 | 1.49 | 16.7 | -- | -- | 10476 | 9 | -- | -- | -- | -- | -- | -- | Grout |
| 32+097.2 | S | 10-Apr-11 | N | -- | -- | -- | -- | -- | 4800 | 9 | -- | -- | -- | -- | -- | -- | Spoils |
| 32+102 | S | 10-Apr-11 | N | -- | -- | 13.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 32+104.4 | S | 11-Apr-11 | D | -- | -- | 27.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+575 | P | 18-Apr-11 | D | 28.1 | 1.51 | 23.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+577.4 | P | 19-Apr-11 | D | 31.0 | 1.54 | 26.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+589.4 | P | 20-Apr-11 | D | -- | -- | -- | -- | -- | -- | -- | 2934 | 15 | 6700 | 30 | -- | -- | Spoils |
| 31+591.8 | P | 20-Apr-11 | D | 29.9 | 1.48 | 30.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+599 | P | 20-Apr-11 | N | -- | 1.54 | 12.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+611 | P | 21-Apr-11 | N | 40.6 | 1.58 | 18.3 | 14.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+588.2 | S | 22-Apr-11 | N | 31.0 | 1.51 | 11.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+600.2 | S | 23-Apr-11 | N | 29.2 | 1.52 | 22.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |

## TABLE E2-6.1
## BAY-GOOSE DIKE - SUMMARY OF JET GROUTING QUALITY CONTROL

| HOLE | | TEST CONTROL | | GROUT PROPERTIES | | | | SPOILS | UCS | | | | | | | | TYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hole Name | Order P,S,T | Date Tested / Sampled (DD-MMM-YY) | Shift (D/N) | Marsh TIme (s) | Density (g/cm$^3$) | Temperature ( C ) | Bleed (%) | Bleed (%) | 7 day strength (kPa) | # Days | 14 day strength (kPa) | # Days | 28 day strength (kPa) | # Days | 56 day strength (kPa) | # Days | |
| 30+362.75 | P | 12-May-11 | D | 30.0 | 1.49 | 18.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+368.75 | P | 12-May-11 | N | 28.4 | 1.5 | 13.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 31+371.75 | P | 12-May-11 | N | 33.3 | 1.5 | 15.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+383.25 | P | 13-May-11 | N | 33.5 | 1.5 | 16.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+386.75 | P | 14-May-11 | D | 31.0 | 1.5 | 21.7 | -- | -- | 4200 | 10 | 4500 | 16 | -- | -- | -- | -- | Spoils |
| 30+386.75 | P | 14-May-11 | D | 31.0 | 1.5 | 21.7 | -- | -- | 12300 | 10 | 12400 | 16 | 17600 | 30 | -- | -- | Grout |
| 30+398.75 | P | 14-May-11 | N | 32.6 | 1.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+401.75 | P | 14-May-11 | N | 29.2 | 1.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+404.75 | P | 14-May-11 | N | 30.2 | 1.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+416.75 | P | 15-May-11 | D | 30.0 | 1.5 | 17.8 | -- | 3.0 | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+422.75 | P | 15-May-11 | N | 30.0 | 1.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+428.75 | P | 15-May-11 | N | 28.4 | 1.5 | 21.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+364.25 | S | 16-May-11 | D | 31.0 | 1.5 | 28.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+370.25 | S | 16-May-11 | N | 29.0 | 1.6 | -- | -- | 16.0 | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+373.25 | S | 16-May-11 | N | 29.0 | 1.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+376.25 | S | 16-May-11 | N | 29.7 | 1.5 | 16.1 | -- | 15.0 | -- | -- | 6400 | 14 | 6600 | 28 | -- | -- | Spoils |
| 30+376.25 | S | 16-May-11 | N | 29.7 | 1.5 | 16.1 | -- | 15.0 | -- | -- | 12200 | 14 | 18000 | 28 | -- | -- | Grout |
| 30+382.25 | S | 17-May-11 | D | 31.0 | 1.5 | 27.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+388.25 | S | 17-May-11 | N | 30.0 | 1.5 | 13.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+391.25 | S | 17-May-11 | N | 29.0 | 1.5 | 26.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+400.25 | S | 17-May-11 | D | 30.0 | 1.5 | 32.8 | -- | 21.0 | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+409.25 | S | 18-May-11 | N | 30.2 | 1.5 | 28.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+412.25 | S | 18-May-11 | N | 29.0 | 1.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Grout |
| 30+421.25 | S | 19-May-11 | D | 29.0 | 1.5 | -- | -- | 21.0 | -- | -- | -- | -- | -- | -- | -- | -- | Grout |

# E2-7 Jet Grout QA Drilling Program

- Summary of Program
- Core Photographs
- Permeability Testing Reports

## Summary of Program

# JET GROUT QA PROGRAM – JANUARY 2011

The following summarizes the QA investigation program carried out in January 2011 within the jet grouted wall in Channel 2 of the Bay-Goose Dike. All areas of investigation had been jet grouted prior to crew demobilization for the winter break on December 20, 2010 and been given at minimum 28-days of grout curing time prior to initiating the QA program. With the intention of assessing the quality of the wall, the following activities were carried out as part of the program:

- Diamond cored drilling of 7 holes, set at an approximate spacing of 1 per 10 jet grouted columns, with specific locations selected based on field observations (i.e. deviation surveys, single nozzle injections, changes in column diameters).
- Geophysical surveying of each borehole within the jet grouted portion of the wall as well as the overlying CSB materials.
- Permeability 'slug' testing of the jet grouted portion of the wall as well as the overlying CSB materials.

## Hole Selection

Table 1 below summarizes the holes that were selected to investigate both the quality of the jet wall as well as areas where potential "windows" were suspected.

**Table 1: Summary of Jet Grouting QA Holes**

| Hole | Comment |
|---|---|
| QA1-31+847 | Adjacent to jet hole at 31+847.6 where the column diameter was extended to 2.13 m |
| QA2-31+905.8 | Between jet holes 31+906.4 and 31+905.2, both of which were jet grouted with a single nozzle |
| QA3-31+863.8 | Adjacent to jet hole 31+864.4 which deviated upstream |
| QA4-31+886.6 | Adjacent to jet hole 31+886 which underwent washing / large cavity development at surface |
| QA5-31+898.6 | Adjacent to jet hole 31+899.2 which deviated upstream |
| QA6-31+837.4 | Adjacent to jet hole 31+838 which deviated downstream |
| QA7-31+877 | Adjacent to jet hole 31+877.6 which was jet grouted with a single nozzle |

## Program Summary

A summary of activities and notes from the investigation program are provided below in Table 2, while results of successful Flexit surveys carried out within a number of the QA holes are provided in Table 3. Due to issues associated with hole collapse as well as PQ casing being dragged to depth during drilling, no successful geophysical logging could be carried out and therefore no data has been processed. Permeability testing analyses are provided in Appendix E2-7.2.

**Table 2: Summary of Activities**

| | |
|---|---|
| Jan 12, 2011 | Discussions / Meetings:<br>Between G. Blanchette (AEM), and G. Bonin (Golder): Agreed that QA holes to be sub-drilled no more than 10 ft into bedrock to allow full waveform sonic profiling to pick-up the difference between bedrock / treated till / treated soft zones.<br><br>General:<br>Forages Orbit-Garant Drilling (Orbit) mobilized to site and commenced setting up for the QA drilling program. |
| Jan 13, 2011 | General:<br>Drilled diamond core hole QA2-31+905.8. Carried out rising and falling head tests.<br><br>Summary:<br>■ 06:00 to 08:30 hrs – Completed set-up.<br>■ 08:30 to 16:30 hrs – Diamond cored QA2-31+905.8. Stopped at 17.4 m depth, approximately 0.5 m above the jet grout column / bedrock interface.<br>■ 16:30 to 18:30 hrs – Flushed hole, pulled drill rods to approximately 11 m depth, and carried out a rising and falling head test between 2.5 m (the ground water table) and 17.4 m (EOH). During testing, hole collapsed back / sedimented-in up to 12 m. Preliminary result: k = 8 x 10-6 m/sec<br>■ 18:30 to 21:30 hrs – Reamed rods back down to the bottom of the hole and drilled to 20.9 m.<br>■ 21:30 to 00:00 hrs – Pulled rods in preparation for carrying out downhole logging. Hole collapsed as rods were pulled. Reamed back down to 17.4 m depth and re-attempted to pull out. Hole collapsed again, back to 2.5 m below the ground surface.<br>■ 00:00 hrs contacted Raymond Leclerc (Orbit foreman) to discuss what had been encountered. Decided that geophysical logging of this borehole would not be possible. Told Raymond that a FlexIt survey of the hole was to be carried out. Raymond stated that it was possible to ream back down to bottom, circulate the rods and water gently until end of night shift.<br>■ 00:00 to 0:600 hrs – Reamed back to bottom of hole and circulated. Standby until end of shift. FlexIt survey of the drill hole to be carried out in the morning to determine inclination. |

| | |
|---|---|
| Jan 14, 2011 | Discussions / Meetings:<br>Between G. Blanchette (AEM), and G. Bonin (Golder): Confirmed that for core hole QA4-31+886.6, approximately 3 m of SW casing will be installed to reduce the potential collapse of materials from above the water table, and the flow of surface water directly back into the hole during hydrogeological testing.<br><br>General:<br>Carried out FlexIt survey and cemented QA2-31+905.8. Moved to QA4-31+886.6. Installed surface casing and cored to 18.0 m depth below ground surface.<br><br>Summary:<br>■ 06:00 to 08:30 hrs – Carried out FlexIt survey of QA2-31+905.8:<br>20.9m: -87.6°<br>15.9m: -87.5°<br>10.9m: -87.6°<br>5.9m: -87.2°<br>+1.2m (collar): -87.6°<br>■ 08:30 to 10:30 hrs – Cemented hole with 0.5:1 w:c, paint paddle mixed grout.<br>■ 10:30 to 12:30 hrs – Moved to QA4-31+886.6<br>■ 12:30 and 16:10 hrs – Road closed between Exploration Camp and Meadowbank. Waiting for SW casing gear to be delivered to site to commence installing surface casing.<br>■ 16:30 hrs to 06:00 hrs – Installed casing and cored to 18.0 m depth bgs. |
| Jan 15, 2011 | General:<br>Drilled QA4-31+886.6 and carried out an open hole, rising and falling head test. While reaming back down to the bottom of the hole, the core barrel broke off down hole. Carried out FlexIt survey, cemented and abandoned hole.<br><br>Summary:<br>■ 06:00 to 13:00 hrs – Drilled QA4-31+886.6 to 19.5 m depth and flushed hole.<br>■ 13:00 to 15:00 hrs – Pulled drill rods to approximately 13 m depth, and carried out a rising and falling head test between 1.65 m (the ground water table) and 19.5 m (EOH).<br>Preliminary result: k = 6 x 10-7 m/sec.<br>■ 15:00 to 18:00 hrs – While reaming rods back down to the bottom of the hole, the core barrel broke off down hole leaving the core tube sticking out the top of the barrel.<br>■ After discussion between AEM, Golder and Orbit, decided to abandon the drill hole.<br>■ 18:00 to 22:00 hrs – reamed HQ rods back down to the top of the core barrel.<br>■ 22:00 to 24:00 hrs – carried out FlexIt survey.<br>11.0m: -88.9°<br>6.0m: -88.8°<br>0.0m: -88.9° (at ground surface)<br>00:00 to 06:00 hrs – cemented QA4-31+886.6 and abandoned hole. |

| | |
|---|---|
| Jan 16, 2011 | General:<br>Drilled QA3-31+863.8 and carried out an open hole, rising and falling head test. Attempted to carry out gamma and conductivity probe surveys however the hole collapsed to 13 m depth. Hole to be reamed back to depth and geophysical logging re-attempted the next day.<br><br>Summary:<br>■ 06:00 to 18:30 hrs – Moved to QA3-31+863.8. Set-up for and installed SW casing to approximately 3 m depth bgs. Drilled to 19.5 m depth. Bedrock was encountered at 19.5 m. Started flushing hole in preparation for hydrogeological testing.<br>18:30 to 20:30 hrs – Pulled drill rods back to 14 m bgs. Set-up for and carried out rising and falling head tests between 0.7 m (water table) and 19.5 m depth.<br>Preliminary result: k = 5 x 10-7 m/sec.<br>■ 20:30 to 01:30 hrs – Reamed back down to bottom of hole and drilled to 22.5 m depth. Pulled back PQ rods to ground surface, removed core barrel, added a PQ-sized casing shoe, and reamed down to 12.5 m depth.<br>■ 01:30 to 02:30 hrs – Carried out FlexIt survey. Hole was open to 14 m depth at time.<br>■ 02:30 to 06:00 hrs – Attempted to carry out gamma and conductivity probe surveys of the open hole. Hole collapsed / sedimented back in on itself to 13 m depth bgs. |
| Jan 17, 2011 | General:<br>Reamed QA3-31+863.8; carried out geophysical logging; cemented and abandoned hole. Mobilized to QA1-31+847 and commenced casing/drilling.<br><br>Summary:<br>■ 06:00 to 10:30 hrs – Reamed back down to bottom of QA3-31+863.8, through the PQ rods, with HQ-size coring set-up. Flushed hole.<br>■ 10:30 to 17:30 hrs – Set-up for and attempted to carry out gamma, conductivity and full-waveform sonic surveys of the open hole. Hole collapsed / sedimented back in on itself to 15 m depth bgs.<br>■ 17:30 to 19:30 hrs – Abandoned hole. Reamed back down to bottom of hole with HQ-sized coring set-up. Cemented hole.<br>■ 19:30 to 6:00 hrs – Mobilized to QA1-31+847; cased PQ to 13.2 m; commenced drilling with HQ-sized coring set-up to 18 m. |

| | |
|---|---|
| Jan 18, 2011 | Discussions / Meetings:<br>Between G. Blanchette (AEM), and V. Rombough (Golder): QA grout holes QA5-8 to be moved onto the centreline of the curtain rather than off-line as the previous holes have been. Schedule for second part of QA program unknown; potentially at the beginning of March.<br><br>General:<br>Completed drilling QA1-31+847 and carried out rising and falling head tests both with packer setup as well as open hole.<br><br>Summary:<br>■ 6:00 to 12:30 hrs - Finished drilling QA1-31+847 with HQ-sized coring set-up to 19.5 m bgs. and flushed hole.<br>■ 12:30 to 18:30 hrs - Carried out rising and falling head tests between 11.5 m bgs and 18.56 m bgs. Tests were conducted both open hole and with packer setup.<br>Preliminary result: k = 6 x 10-6 m/sec.<br>■ 18:30 to 6:00 hrs - Reamed back down to 19.5 m bgs and continued drilling. Bedrock was encountered at 21 m bgs and was cored to 24 m bgs. Carried out Flex-It survey. |
| Jan 19, 2011 | General:<br>Carried out geophysical logging of QA1-31+847; cemented and abandoned hole afterwards. Mobilized to QA5-31+898.6 and began casing/drilling for permeability testing to be carried out the following morning (Jan. 20).<br><br>Summary:<br>■ 6:00 to 9:30 hrs – Completed drilling to 24 m bgs; flushed hole; carried out FlexIt survey.<br>■ 9:30 to 12:45 hrs– Pulled rods back to 13 m bgs; Setup for geophysics and conducted gamma, conductivity, and full-waveform sonic surveys of the open hole between 13 m bgs and 18.5 m bgs.<br>■ 12:45 14:30 hrs – Abandoned hole, reamed back down to bottom of hole with HQ-sized coring set-up. Cemented hole.<br>■ 14:30 to 6:00 hrs - Mobilized to QA5-31+898.6; commenced casing/drilling to 17.5 m. Permeability testing to be carried out the following morning. |

| | |
|---|---|
| Jan 20, 2011 | Discussions / Meetings:<br>Between G. Blanchette (AEM), and V. Rombough (Golder): During backfilling of hole QA1-31+847, grout did not appear at surface. This hole will need to be backfilled again eventually and will either be done with the jet rig setup or with TCG.<br><br>General:<br>Carried out permeability testing in QA5-31+898.6 in the morning. Drilled into bedrock and planned to carry out geophysical logging in the evening however the borehole did not stay open. Hole was cemented and abandoned.<br><br>Summary:<br>■ 6:30 to 14:00 hrs – permeability testing (rising and falling head) of QA5-31+898.6. Two intervals tested: 14 m-15.8 m and 12.5 m-15.8 m. Testing was carried out for the two intervals using HQ packer setups with the rods to 12.5 m.<br>■ 14:00 to 15:30 hrs – further permeability testing (rising and falling head) of QA5-31+898.6. Single interval tested open hole (without packers) from 12.5 m-15.8 m.<br>■ 15:30 to 21:00 hrs – Orbit drilled to 21 m in rock; carried out FlexIt testing.<br>■ 21:00 to 23:00 hrs – pulled HQ rods to 13.6 m where PQ rods had fallen to. Hole found to have collapsed to 14 m bgs. Re-drilled to 21 m depth.<br>■ 23:00 to 1:00 hrs – pull HQ rods to 13.6 m again; hole collapsed to 14.4 m bgs. Call made not to carry out geophysical logging due to collapse issues.<br>■ 1:00 to 6:00 hrs – hole abandoned / cemented. Prepared to mobilize to QA6-31+837.4. |
| Jan 21, 2011 | General:<br>Drilled QA6-31+837.4 with HQ3 to just slightly above bedrock. Could not run permeability testing with packers as they were bent by Orbit drillers. An open hole test was therefore carried out instead. Orbit then began drilling to depth in bedrock for geophysics to be carried out the following day.<br><br>Summary:<br>■ 06:00 to 22:00 hrs – Orbit mobilized to QA6-31+837.4; cased at surface; drilled HQ3 to 19 m bgs. Flushed hole.<br>■ 22:00 to 1:00 hrs – Orbit lost recovery tool downhole; fish out. Hole collapsed. Re-drilled to 19 m bgs.<br>■ 1:00 to 4:00 hrs – Pull rods to 14 m bgs. Carried out open hole permeability testing (rising and falling head). No permeability testing with packers as the drillers bent the HQ packer setup.<br>■ 4:00 to 6:00 hrs – Orbit continue to drill HQ3 to 3 m depth into rock. |

| | |
|---|---|
| Jan 22, 2011 | Discussions / Meetings:<br>Between G. Blanchette (AEM), and V. Rombough (Golder): The current diamond drill rig being used for the jet grouting QA program will be allocated to the Central Dike investigation beginning Tuesday, January 25th. Therefore it will only be possible to drill one additional hole, QA7-31+877, prior to the rig mobilizing from Bay-Goose to the Central Dike on Monday, January 24.<br><br>General:<br>Orbit continued the previous day's drilling of QA6-31+837.4 with HQ3 to a depth of 3 m into bedrock. During drilling the core barrel was once again lost down hole. No geophysical logging could therefore be carried out. Orbit then mobilized to and began casing / drilling of QA7-31+877 with permeability testing to be carried out the next day.<br><br>Summary:<br>■ 06:00 to 12:00 hrs – Orbit continued drilling with HQ3 in hole QA6-31+837.4; at noon they reported that the core barrel had been lost downhole once again.<br>■ 12:00 to 18:00 hrs – Cemented and abandoned QA6-31+837.4. Mobilized to QA7-31+877.<br>■ 18:00 to 6:00 hrs – Installed surface casing, drilled 6 m of PQ casing, drilled HQ to 18 m depth. Permeability testing to be carried out the following morning. |
| Jan 23, 2011 | General:<br>Completed drilling HQ to 18 m bgs in QA7-31+877; Carried out permeability testing and drilled to 3 m into bedrock. Hole collapsed and was abandoned / cemented.<br><br>Summary:<br>■ 06:00 to 14:00 hrs – Completed drilling HQ to 18 m bgs in QA7-31+877; PQ rods at 6 m bgs. Pulled rods to 14 m bgs. Carried out permeability testing from 14 – 18 m bgs (collapse detected in interval) both with packer setup as well as open hole.<br>■ 14:00 to 20:00 hrs – Drilled to 3 m in bedrock. Ran probe down hole, noted collapse. Made call not to carry out geophysical logging.<br>■ 20:00 to 6:00 hrs – Abandoned and cement backfilled hole. Prepared to demobilize rig for Central Dike investigation. |

**Table 3: Summary of Flexit Results**

| Hole | Depth (m) | Azi / Dir | Incl / Dip | Deviation (m) |
|---|---|---|---|---|
| QA1-31+847 | 0 | 64.2 | -87.6 | 0 |
| | 6 | 81.3 | -87.7 | 0.24 |
| | 11 | 124.8 | -87.7 | 0.44 |
| | 16 | 162.1 | -87.6 | 0.67 |
| | 21 | 125.4 | -87.5 | 0.92 |
| | | | | |
| QA2-31+905.8 | 1 | 345 | -87.6 | 0.04 |
| | 6 | 294.6 | -87.2 | 0.29 |
| | 11 | 232.3 | -87.6 | 0.46 |
| | 16 | 137.3 | -87.6 | 0.67 |
| | 21 | 349.1 | -87.5 | 0.92 |
| | | | | |
| QA3-31+863.8 | 13 | 91.1 | -87.3 | 0.61 |
| | | | | |
| QA4-31+886.6 | 0 | 53.6 | -88.9 | 0 |
| | 11 | 353.7 | -88.9 | 0.21 |
| | | | | |
| QA5-31+898.6 | 1.76 | 43.1 | -88.7 | 0.04 |
| | 5 | 199 | -88.5 | 0.13 |
| | 10 | 182.6 | -88.6 | 0.24 |
| | 15 | 244.3 | -88.6 | 0.37 |
| | 20 | 59.7 | -88.3 | 0.59 |

## Core Photographs

# Jet Grout QA Program
# QA1-31+847




**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 24.00 | **Golder Associates** | 24-JAN-2011 |

# Jet Grout QA Program
# QA2-31+905.8




**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 29.00 | **Golder Associates** | 24-JAN-2011 |

# Jet Grout QA Program
# QA3-31+863.8




**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 22.50 | **Golder Associates** | 24-JAN-2011 |

# Jet Grout QA Program
# QA4-31+886.6



**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 19.50 | **Golder Associates** | 24-JAN-2011 |

# Jet Grout QA Program
# QA5-31+898.6




**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 20.00 | **Golder Associates** | 24-JAN-2011 |

# Jet Grout QA Program
# QA6-31+837.4



**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 19.00 | **Golder Associates** | 31-JAN-2011 |

# Jet Grout QA Program
# QA7-31+877



**CHECK: GRB**

| | | |
|---|---|---|
| 0.00 – 23.00 | **Golder Associates** | 31-JAN-2011 |

# Permeability Testing Reports

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Borehole | QA_31+847 |
| Test Name | Test 2 |
| Test Date/Time | 18/01/2011, 00:00 |
| Interval | top: 3.07 m bottom: 18.56 m |
| Description | Rising head test |
| | Open hole, no packer |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 15.49 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.048 m | Tubing Radius | 0.048 m |
| Inclination | 0.0 deg | | |
| Test Volume | 112.120 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 99.77 | | | 7.4e-07 |
| SW-Init | dP-Event | 0.07222 | 99.40 | 24.4 * | | 7.4e-07 |
| SW | Slug | 0.07556 | 75.02 | 99.4 | | 7.4e-07 |

## Analysis Results

**Analysis "SW"**

Static Pressure: 99.77 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 1.0e-04 | 3.0e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 2.6e-07 | 0.0 |
| SW-Init | 7.4e-07 | 0.0 |
| SW | 7.4e-07 | 0.0 |

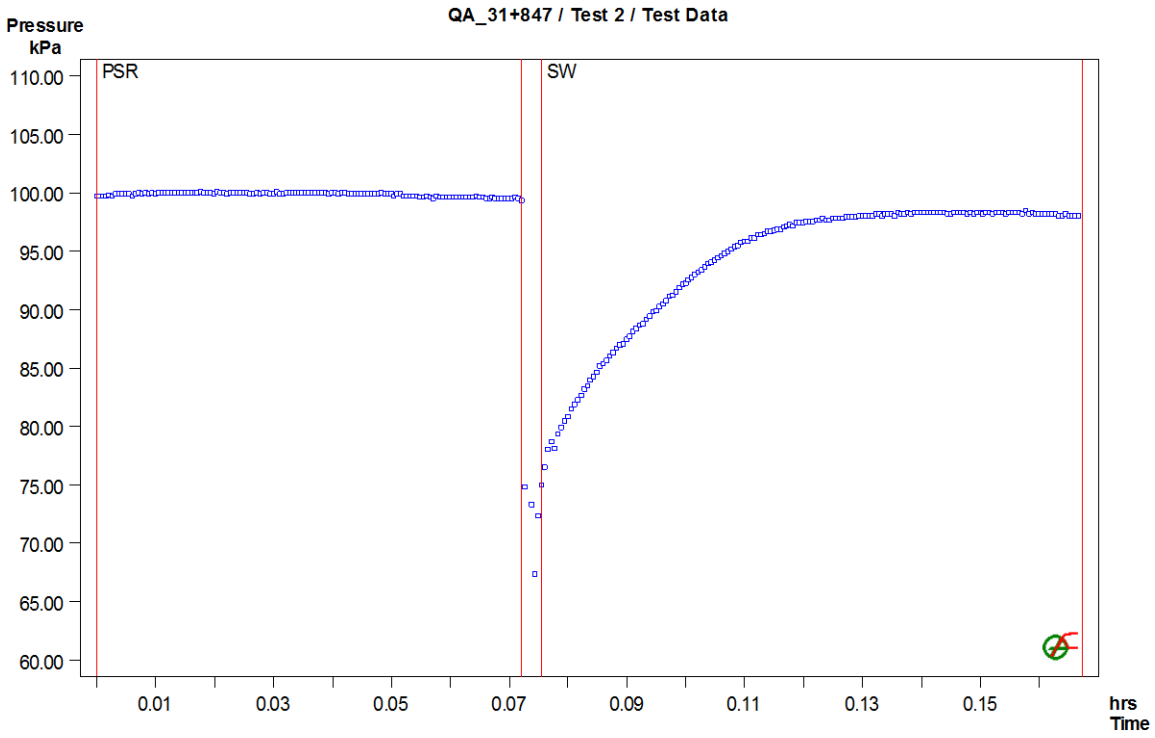



Figure 1: Pressure response and sequence definition

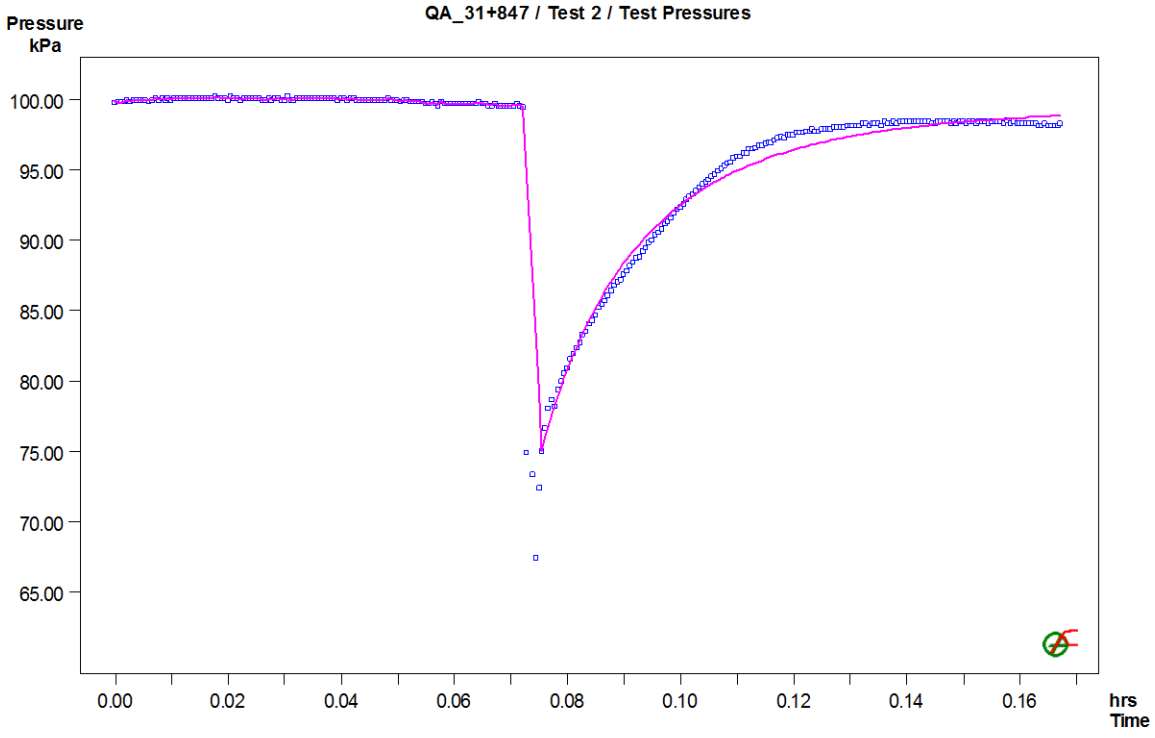



Figure 2: Pressure response and simulation: cartesian plot

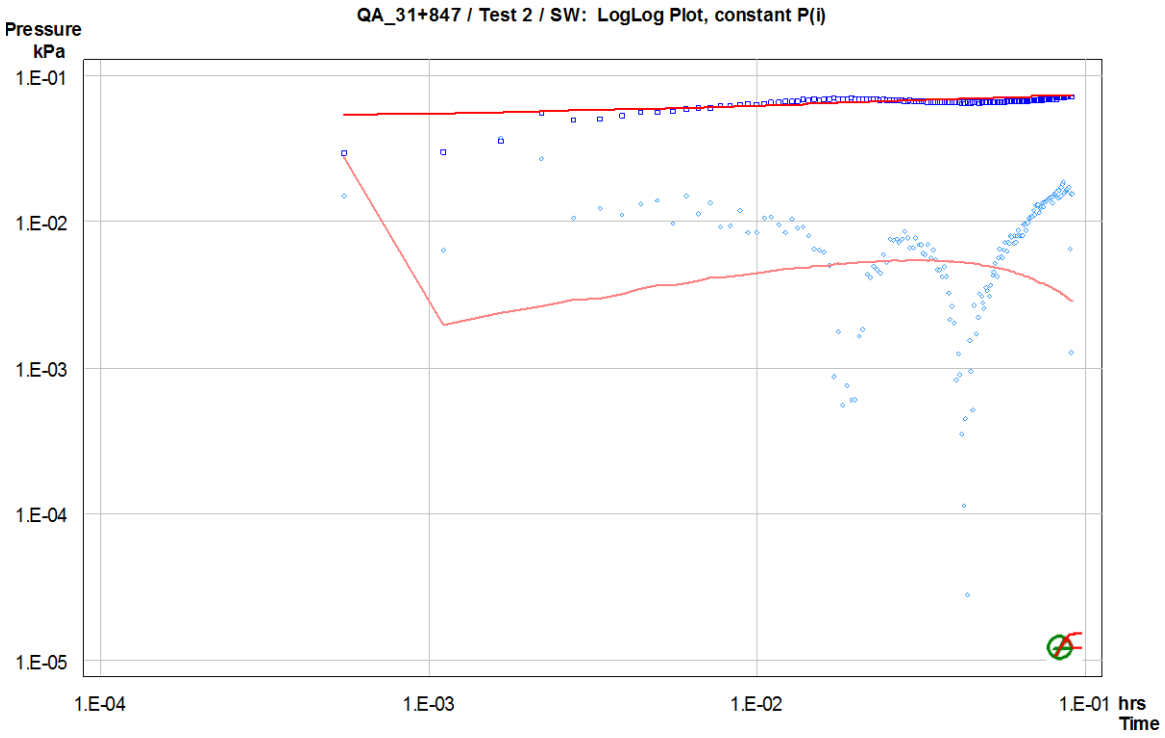



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SW sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Borehole | QA2-31+905.8 |
| Test Name | Test 1 |
| Test Date/Time | 13/01/2011, 18:00 |
| Interval | top: 2.50 m bottom: 17.40 m |
| Description | |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 14.90 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.061 m | Tubing Radius | 0.061 m |
| Inclination | 0.0 deg | | |
| Test Volume | 174.179 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| COM | Variable Pressure | 0.00000 | 80.05 | | | 1.2e-06 |
| INF | Variable Pressure | 0.11278 | 80.05 | | | 1.2e-06 |
| PSR | Recovery | 0.12111 | 80.70 | | | 1.2e-06 |
| SW-Init | dP-Event | 0.13500 | 80.31 | 38.4 * | | 1.2e-06 |
| SW | Slug | 0.14167 | 41.88 | 80.3 | | 1.2e-06 |
| End | Variable Pressure | 0.35500 | 79.40 | | | 1.2e-06 |

## Analysis Results

**Analysis "SW"**

Static Pressure: 80.05 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 1.3e-04 | 2.9e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| COM | 4.9e-07 | 0.0 |
| INF | 4.9e-07 | 0.0 |
| PSR | 4.9e-07 | 0.0 |
| SW-Init | 1.2e-06 | 0.0 |
| SW | 1.2e-06 | 0.0 |
| End | 4.9e-07 | 0.0 |

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Borehole | QA_31+863.8 |
| Test Name | Test 1 |
| Test Date/Time | 16/01/2011, 18:00 |
| Interval | top: 0.70 m bottom: 19.50 m |
| Description | Rising head test |
| | Open hole, no packer |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 18.80 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.061 m | Tubing Radius | 0.061 m |
| Inclination | 0.0 deg | | |
| Test Volume | 219.769 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 126.61 | | | 1.2e-06 |
| SW-Init | dP-Event | 0.12444 | 126.67 | 65.3 * | | 1.2e-06 |
| SW | Slug | 0.12722 | 61.34 | 126.7 | | 1.2e-06 |

## Analysis Results

**Analysis "SW"**

Static Pressure: 126.61 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 1.3e-04 | 3.7e-05 | 6.70 | 2.0 |
| Shell 2 | 3.6e-06 | 3.7e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 9.9e-06 | 0.0 |
| SW-Init | 1.2e-06 | 0.0 |
| SW | 1.2e-06 | 0.0 |

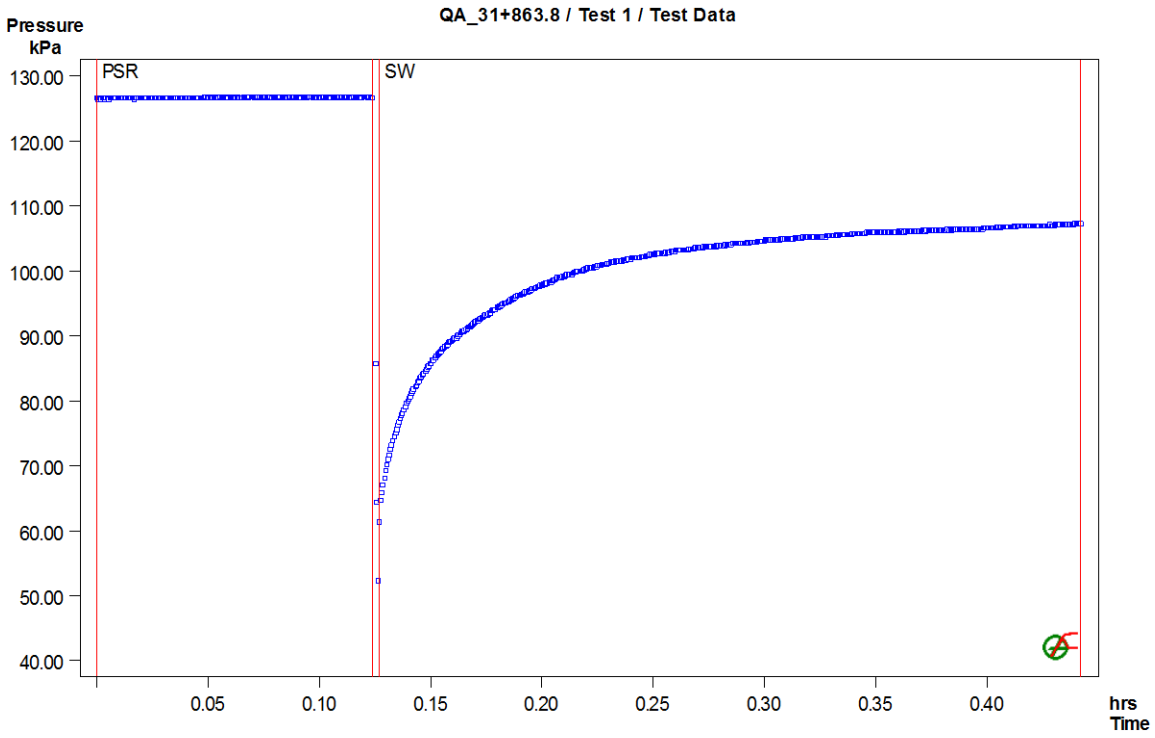



Figure 1: Pressure response and sequence definition

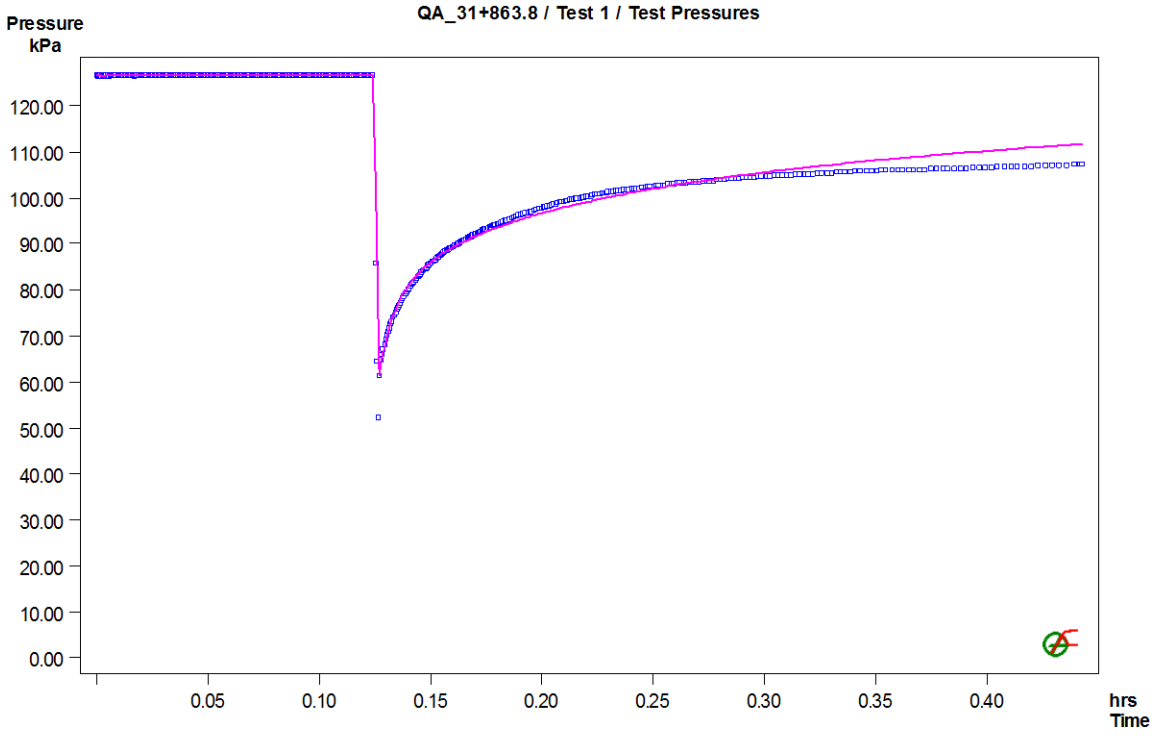



Figure 2: Pressure response and simulation: cartesian plot

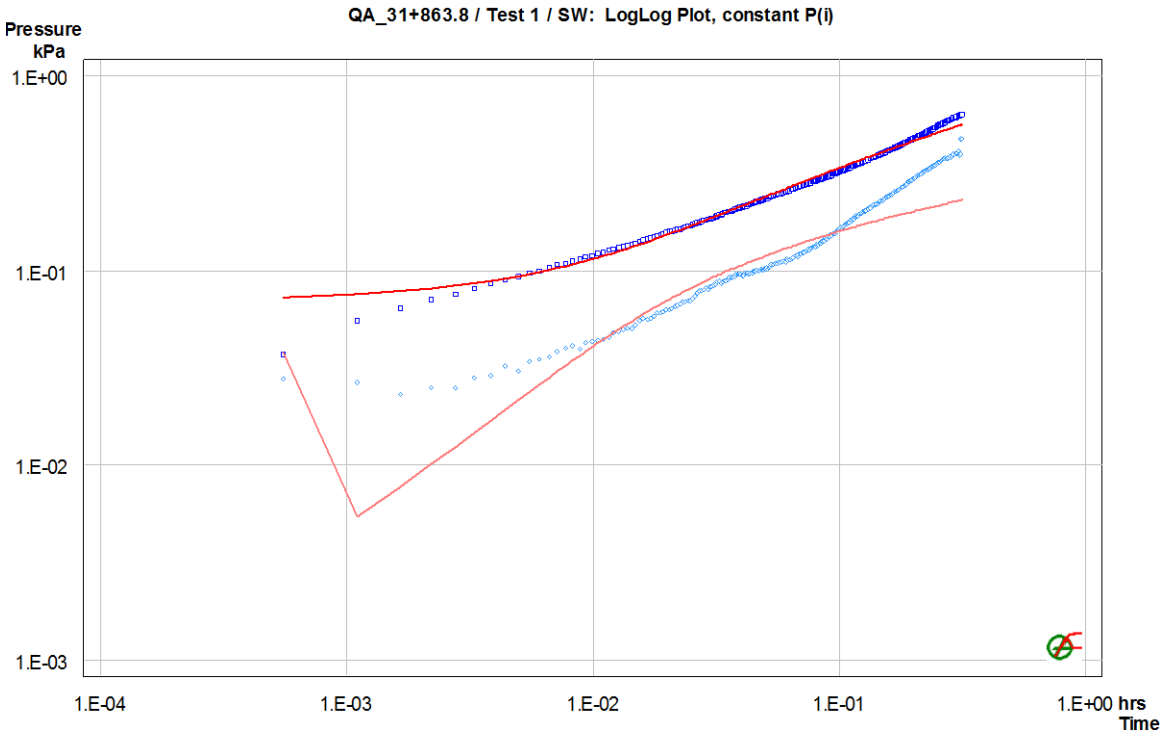



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SW sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Borehole | QA4-31+886 6_RH_FH |
| Test Name | Test 1 |
| Test Date/Time | 15/01/2011 |
| Interval | top: 1.65 m bottom: 19.50 m |
| Description | |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 17.85 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.061 m | Tubing Radius | 0.061 m |
| Inclination | 0.0 deg | | |
| Test Volume | 208.664 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| COM | Variable Pressure | 0.00000 | 128.02 | | | 1.2e-06 |
| PSR | Recovery | 0.31833 | 109.53 | | | 1.2e-06 |

| | | | | | |
|---|---|---|---|---|---|
| SW_Init | dP-Event | 0.42944 | 108.37 | 47.6 * | 1.2e-06 |
| SW | Slug | 0.43222 | 60.74 | 108.4 | 1.2e-06 |
| End | Variable Pressure | 1.08500 | 96.20 | | 1.2e-06 |

## Analysis Results

**Analysis "SW-1"**

Static Pressure: 95.76 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 9.9e-03 | 3.5e-05 | 0.50 | 2.0 |
| Shell 2 | 1.0e-05 | 3.5e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| COM | 4.9e-06 | 0.0 |
| PSR | 4.9e-06 | 0.0 |
| SW_Init | 1.2e-06 | 0.0 |
| SW | 1.2e-06 | 0.0 |
| End | 1.2e-06 | 0.0 |

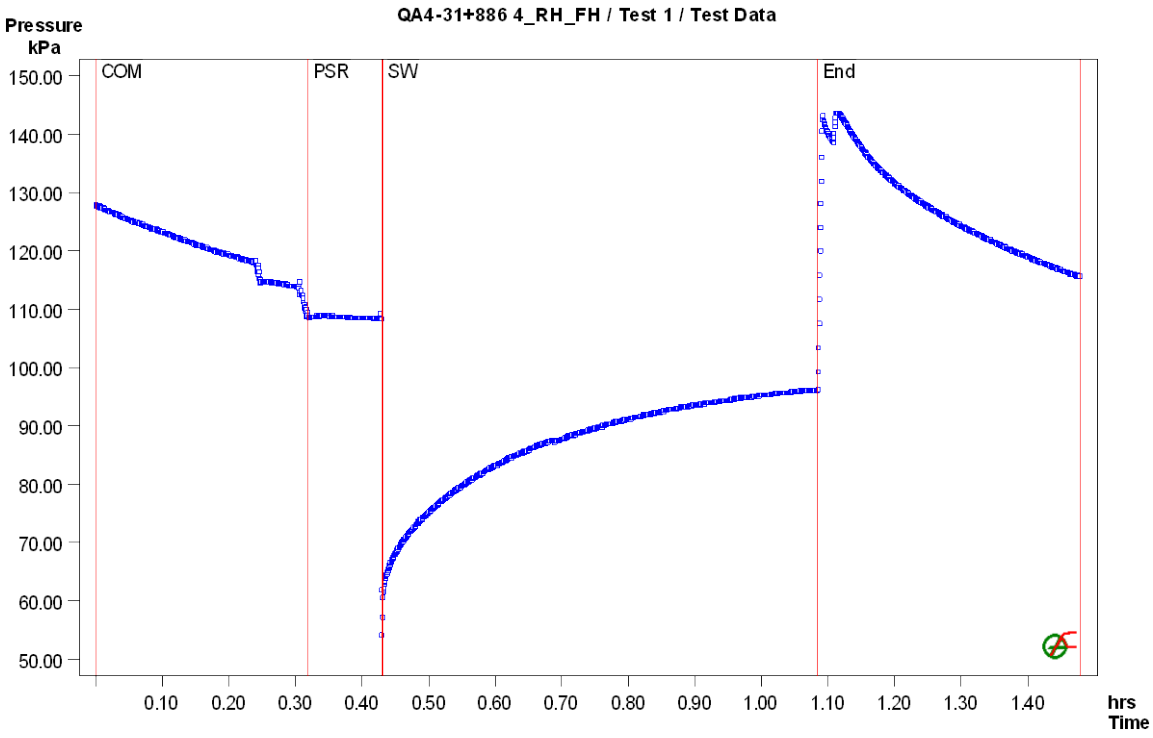



Figure 1: Pressure response and Sequence Definition

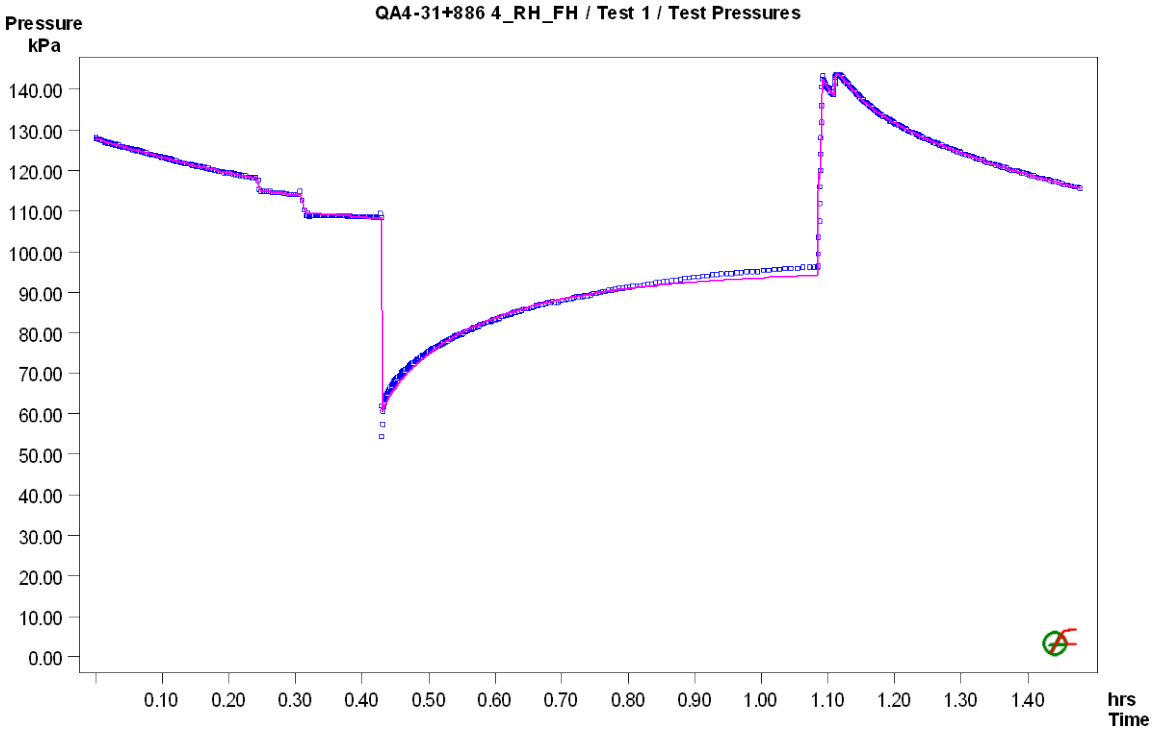



Figure 2: Pressure Response and Simulation: Cartesian Plot

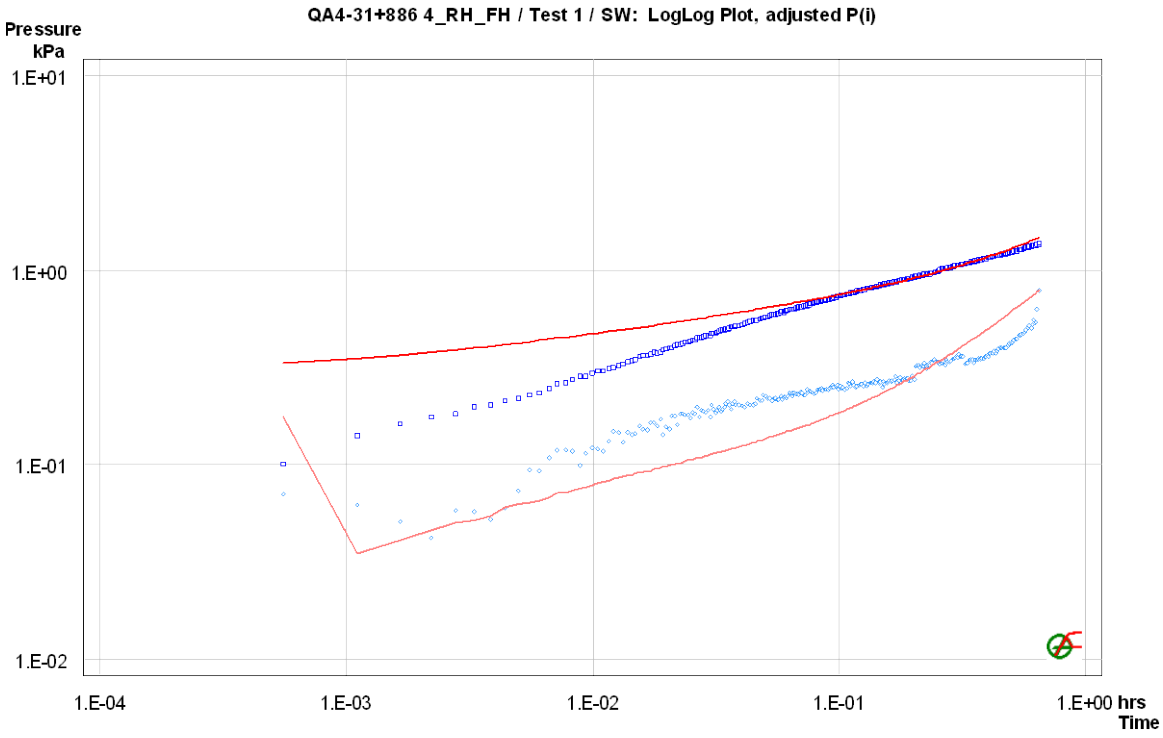



Figure 3: Pressure Response and Simulation: Log-Log Plot SW-Sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Borehole | QA5_31+898.6 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 14.00 m bottom: 17.60 m |
| Description | Rising head test |
| | Packer set-up |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 3.60 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.048 m | Tubing Radius | 0.039 m |
| Inclination | 0.0 deg | | |
| Test Volume | 26.058 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 116.10 | | | 4.8e-07 |
| SW-Init | dP-Event | 0.27944 | 116.48 | 33.8 * | | 4.8e-07 |
| SW | Slug | 0.28611 | 82.68 | 116.5 | | 4.8e-07 |

## Analysis Results

**Analysis "SW-1"**

Static Pressure: 117.20 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 8.4e-06 | 7.1e-06 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 8.9e-07 | -0.5 |
| SW-Init | 4.8e-07 | -0.5 |
| SW | 4.8e-07 | -0.5 |

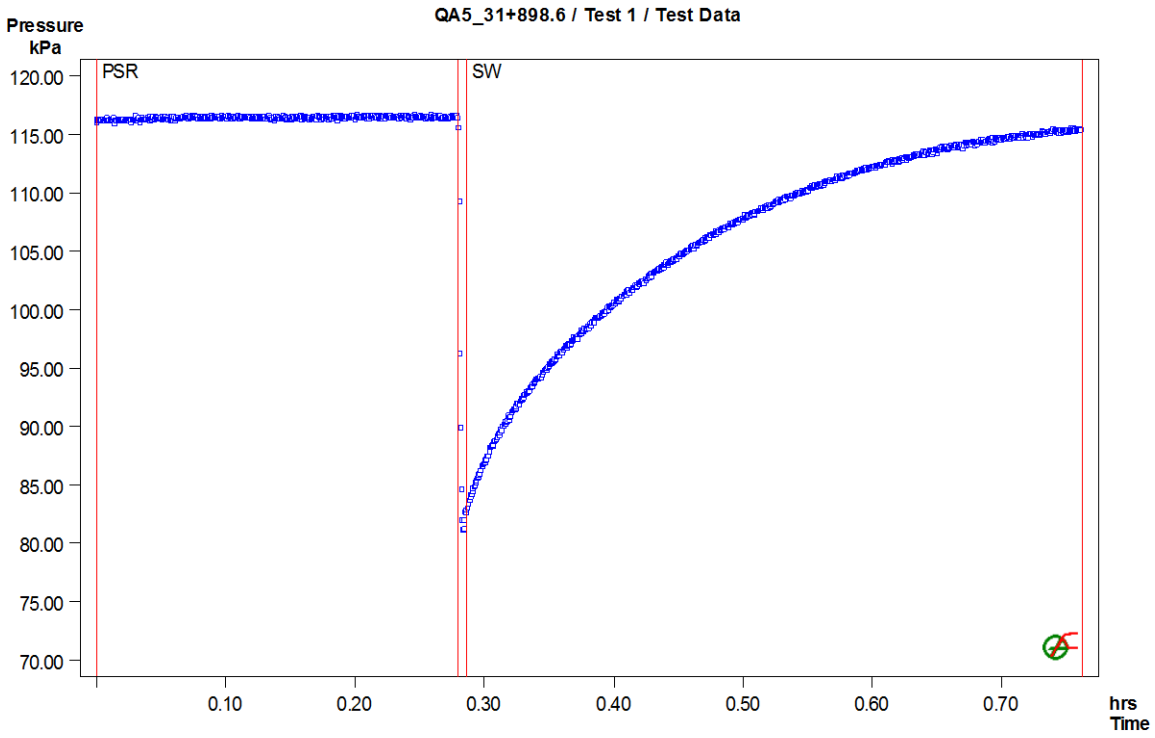



Figure 1: Pressure response and sequence definition

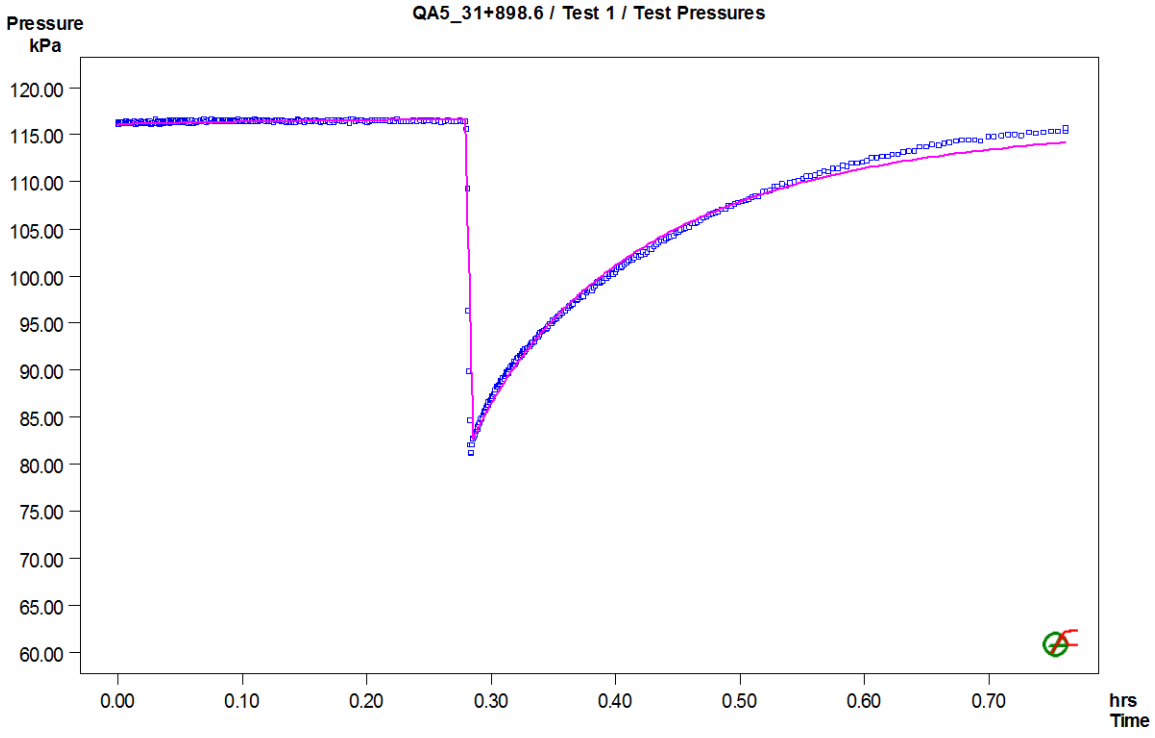



Figure 2: Pressure response and simulation: cartesian plot

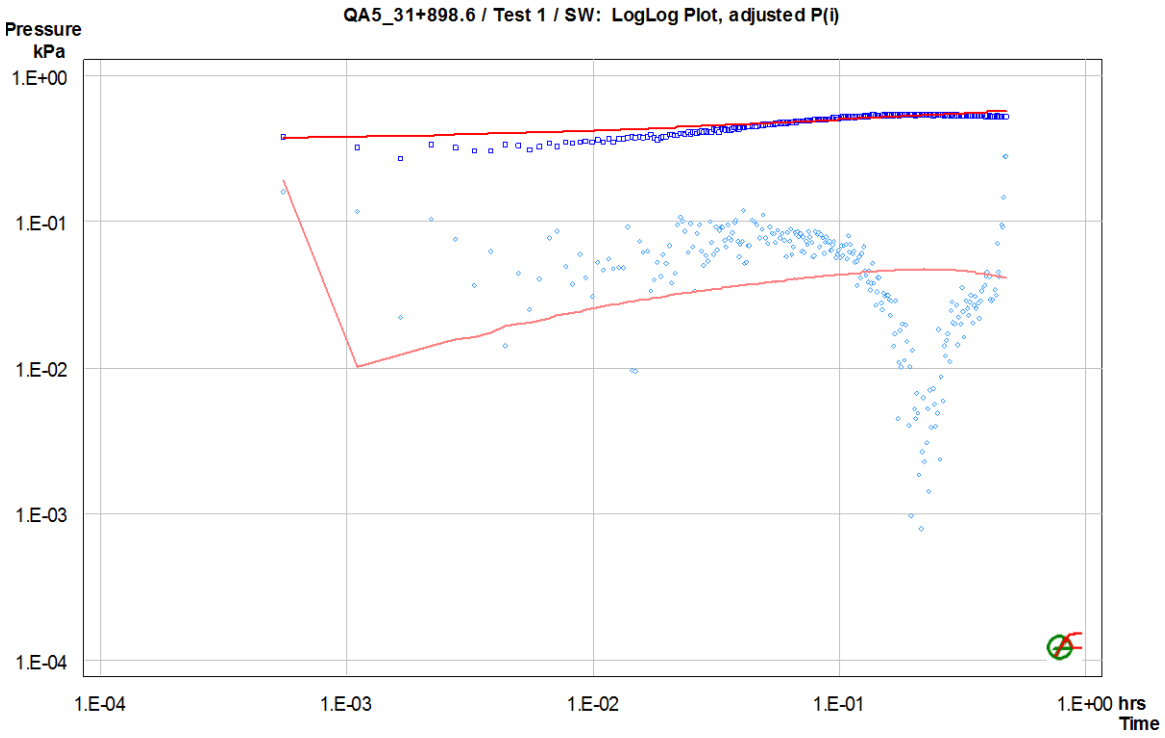



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SW sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Borehole | QA5-35+898.6 |
| Test Name | Test 2 |
| Test Date/Time | |
| Interval | top: 13.50 m bottom: 17.60 m |
| Description | Rising head test |
| | Packer set-up |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 4.10 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.048 m | Tubing Radius | 0.039 m |
| Inclination | 0.0 deg | | |
| Test Volume | 29.677 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 116.65 | | | 4.8e-07 |
| SW-Init | dP-Event | 0.06444 | 116.08 | 28.2 * | | 4.8e-07 |
| SW | Slug | 0.07000 | 87.83 | 116.1 | | 4.8e-07 |

## Analysis Results

**Analysis "SW-1"**

Static Pressure: 115.42 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 1.0e-02 | 1.0e-05 | 1.54 | 2.0 |
| Shell 2 | 3.0e-06 | 1.0e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 1.8e-07 | 0.0 |
| SW-Init | 4.8e-07 | 0.0 |
| SW | 4.8e-07 | 0.0 |

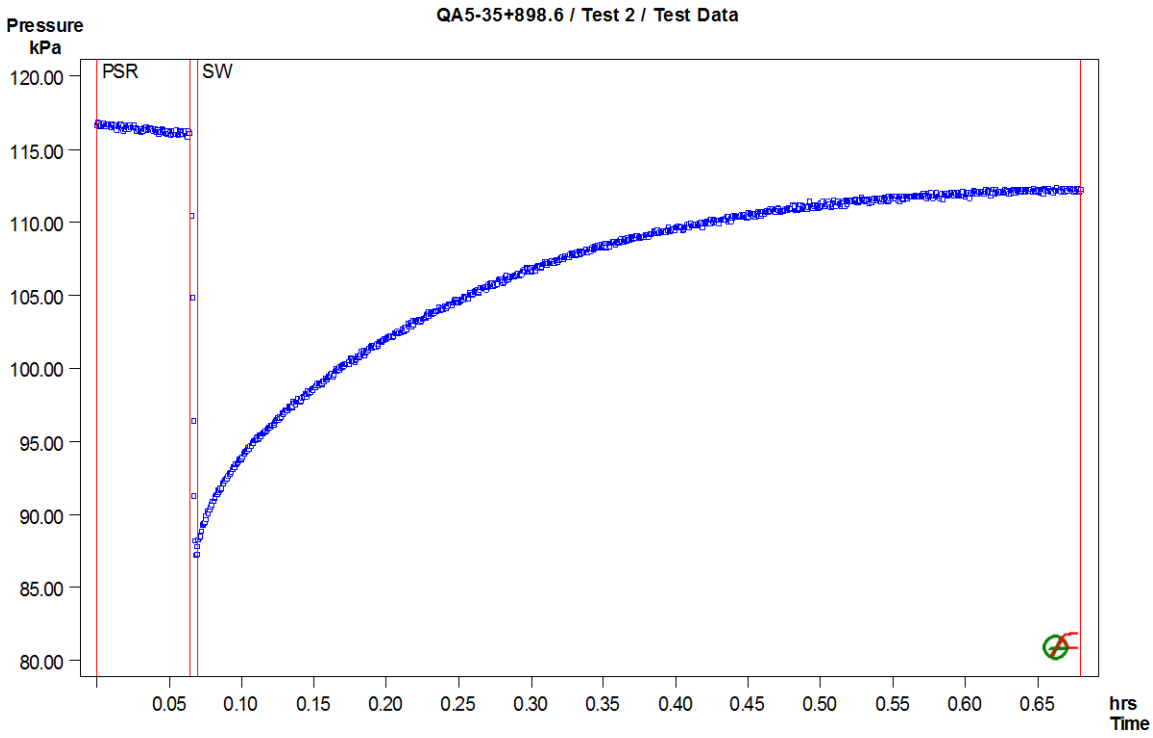



Figure 1: Pressure response and sequence definition

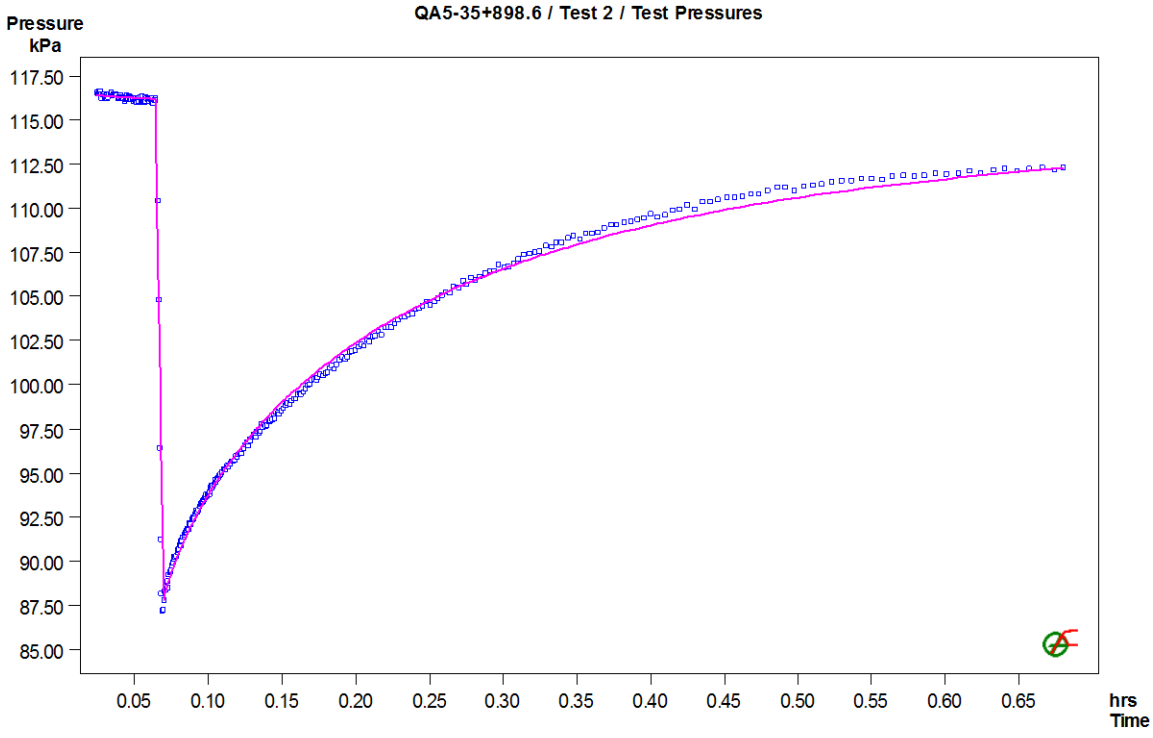



Figure 2: Pressure response and simulation: cartesian plot

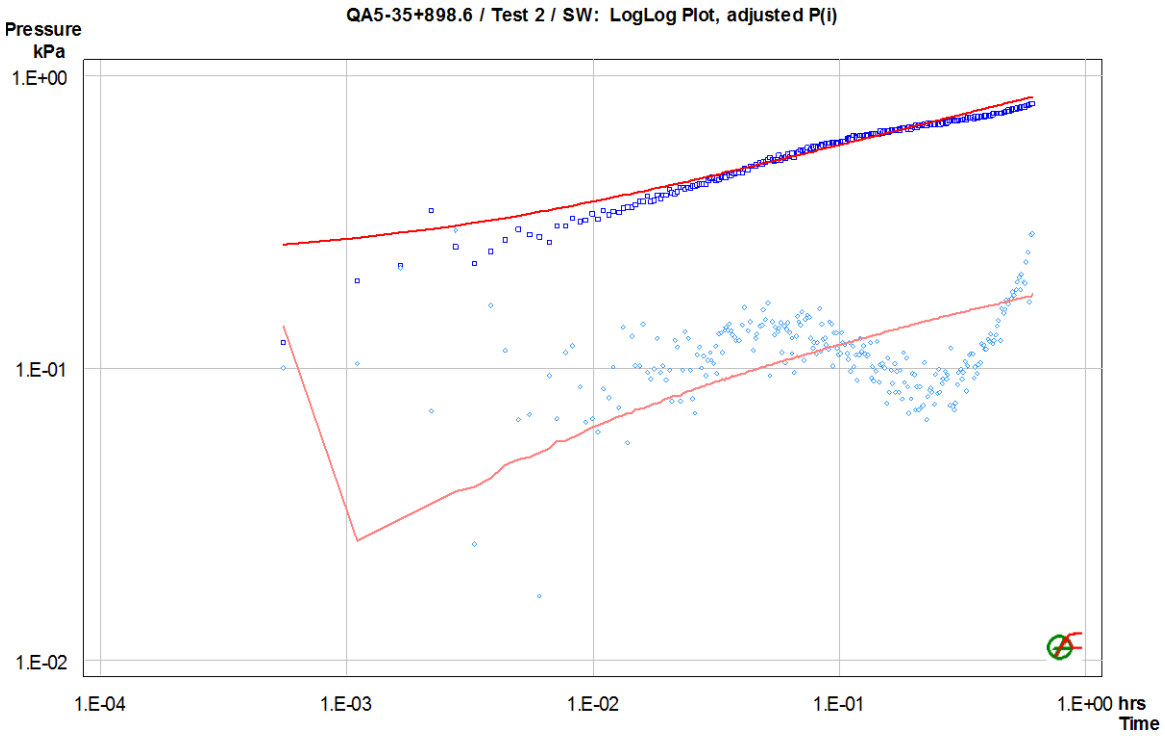



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SW sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Borehole | QA5_31+898.6 |
| Test Name | Test 3 (open hole) |
| Test Date/Time | |
| Interval | top: 3.92 m bottom: 17.6 m |
| Description | Rising head test |
| | Open hole, no packer |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 106.08 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.061 m | Tubing Radius | 0.061 m |
| Inclination | 0.0 deg | | |
| Test Volume | 1240.061 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 115.20 | | | 1.2e-06 |
| SW-Init | dP-Event | 0.03278 | 114.82 | 73.6 * | | 1.2e-06 |
| SW | Slug | 0.03778 | 41.20 | 114.8 | | 1.2e-06 |

## Analysis Results

**Analysis "SW-1"**

Static Pressure: 104.94 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 1.1e-05 | 2.1e-04 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 1.8e-06 | 0.0 |
| SW-Init | 1.2e-06 | 0.0 |
| SW | 1.2e-06 | 0.0 |

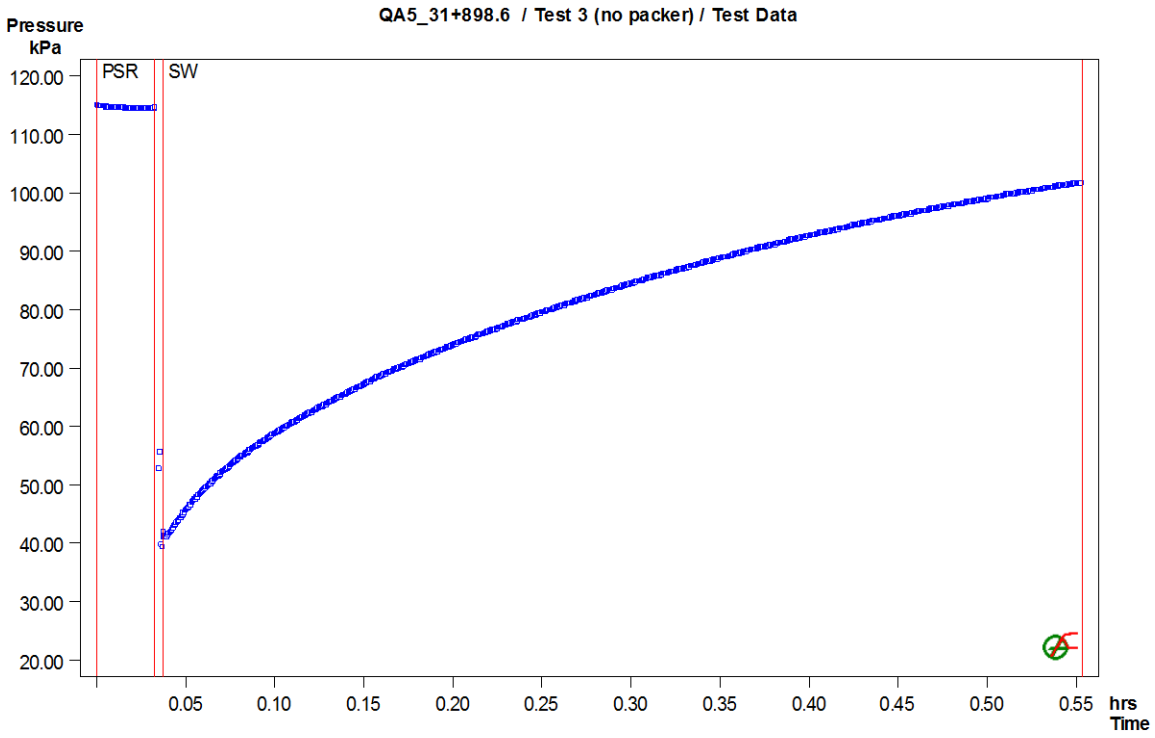



Figure 1: Pressure response and sequence definition

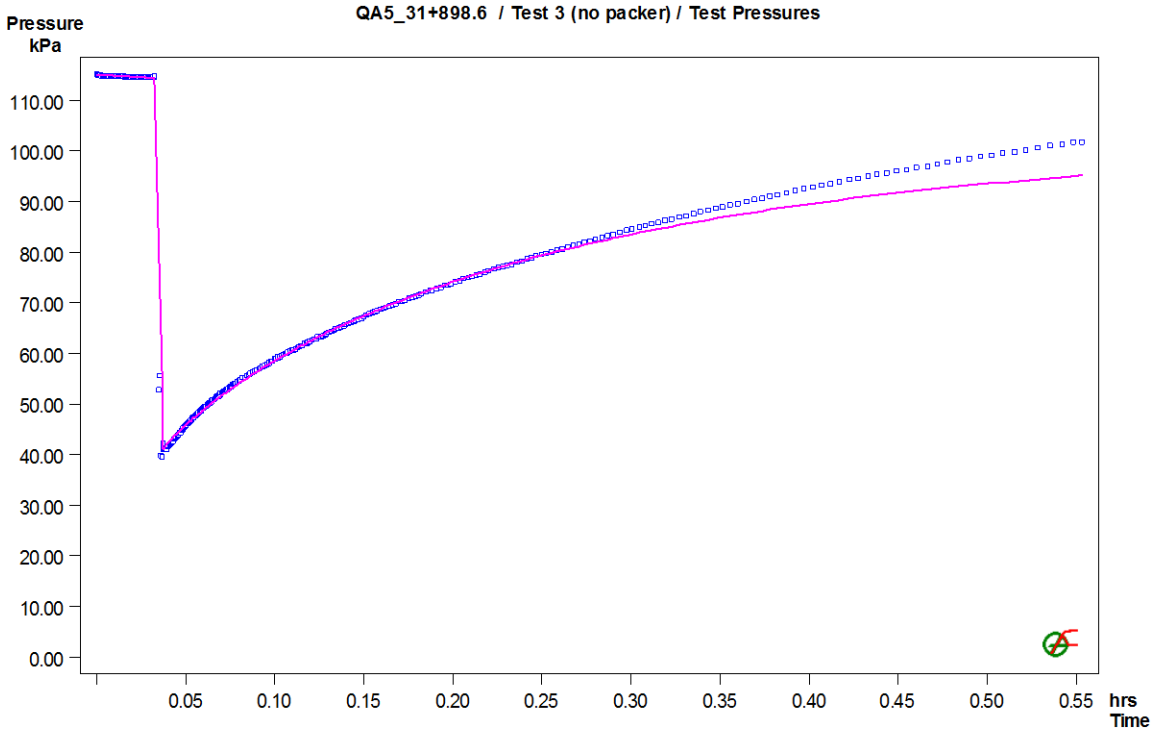



Figure 2: Pressure response and simulation: cartesian plot

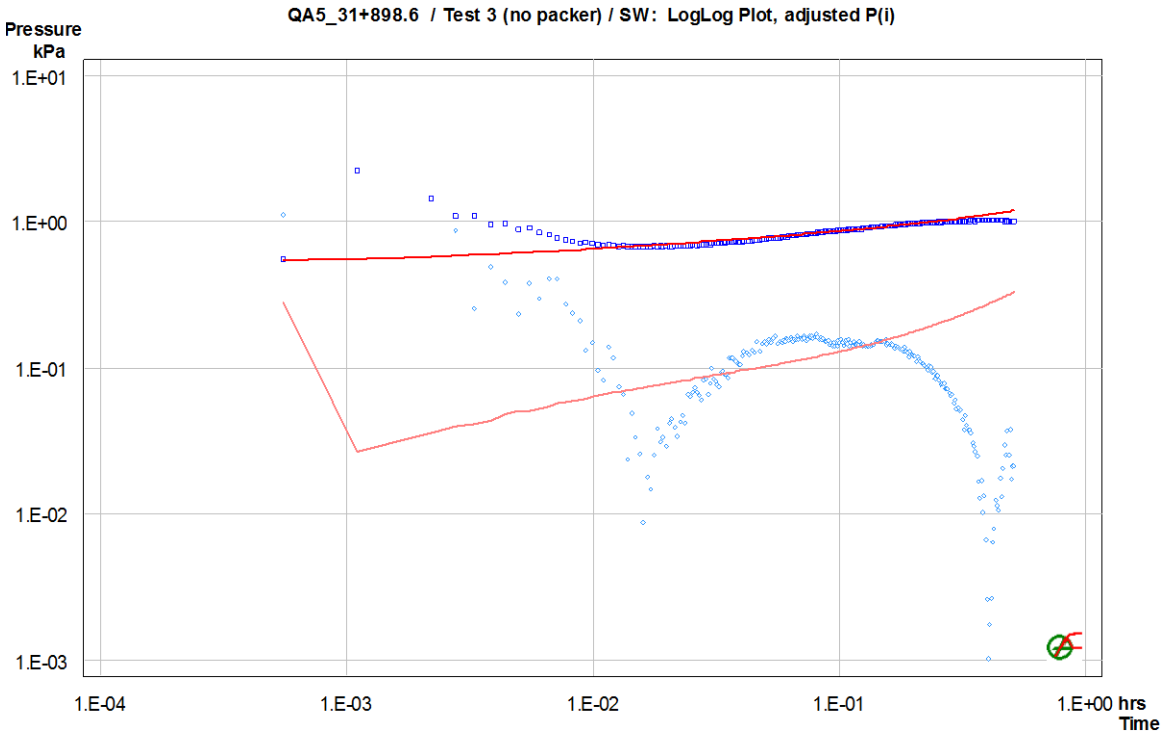



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SW sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Borehole | QA6-31+837.4 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 2.36 m bottom: 19.00 m |
| Description | Rising head test |
| | Open hole, no packer |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 16.64 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.048 m | Tubing Radius | 0.048 m |
| Inclination | 0.0 deg | | |
| Test Volume | 120.444 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 152.84 | | | 7.4e-07 |
| SW-Init | dP-Event | 0.07667 | 152.59 | 70.8 * | | 7.4e-07 |
| SW | Slug | 0.07889 | 81.80 | 152.6 | | 7.4e-07 |

## Analysis Results

**Analysis "SW-1"**

Static Pressure: 152.84 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 3.5e-05 | 3.3e-05 | 19.26 | 2.0 |
| Shell 2 | 2.2e-05 | 3.3e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 7.2e-07 | 0.0 |
| SW-Init | 7.4e-07 | 0.0 |
| SW | 7.4e-07 | 0.0 |

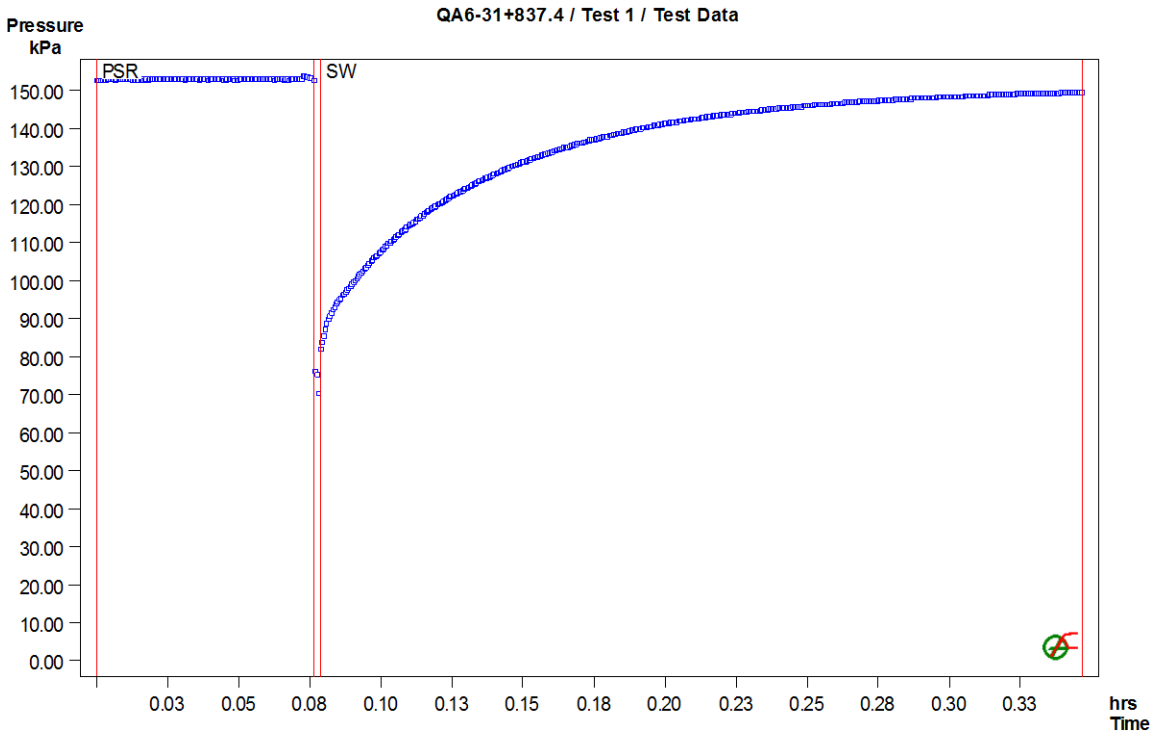



Figure 1: Pressure response and sequence definition

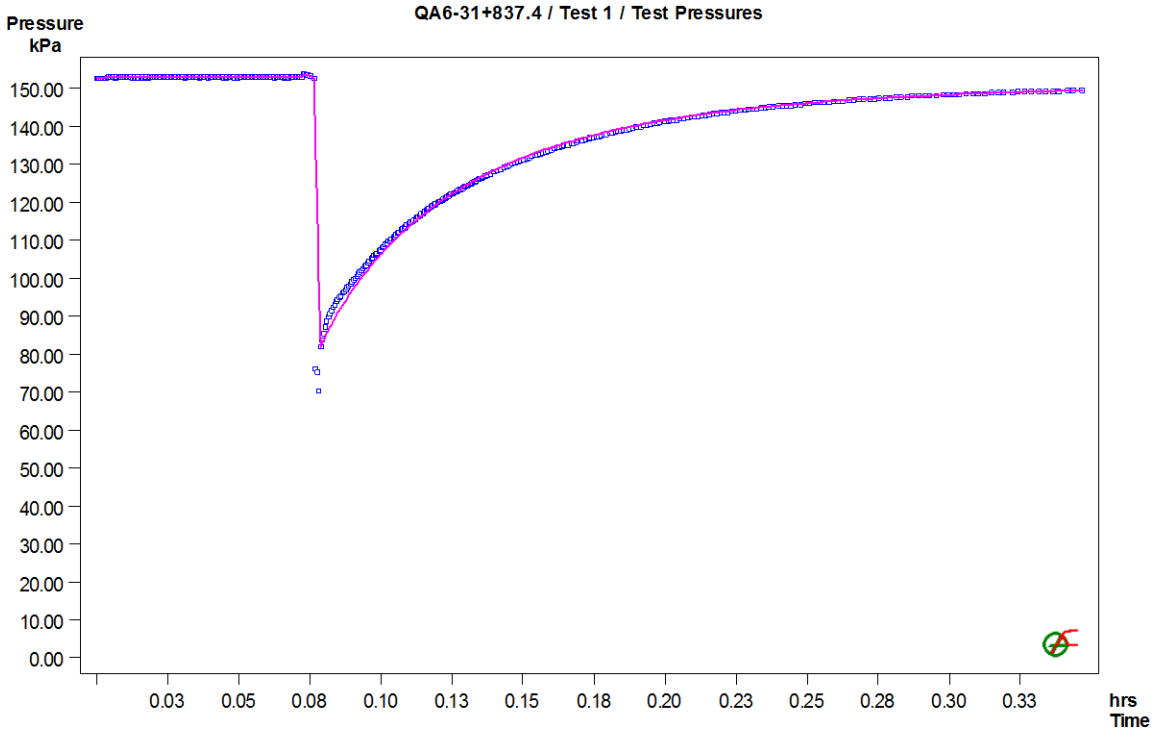



Figure 2: Pressure response and simulation: cartesian plot

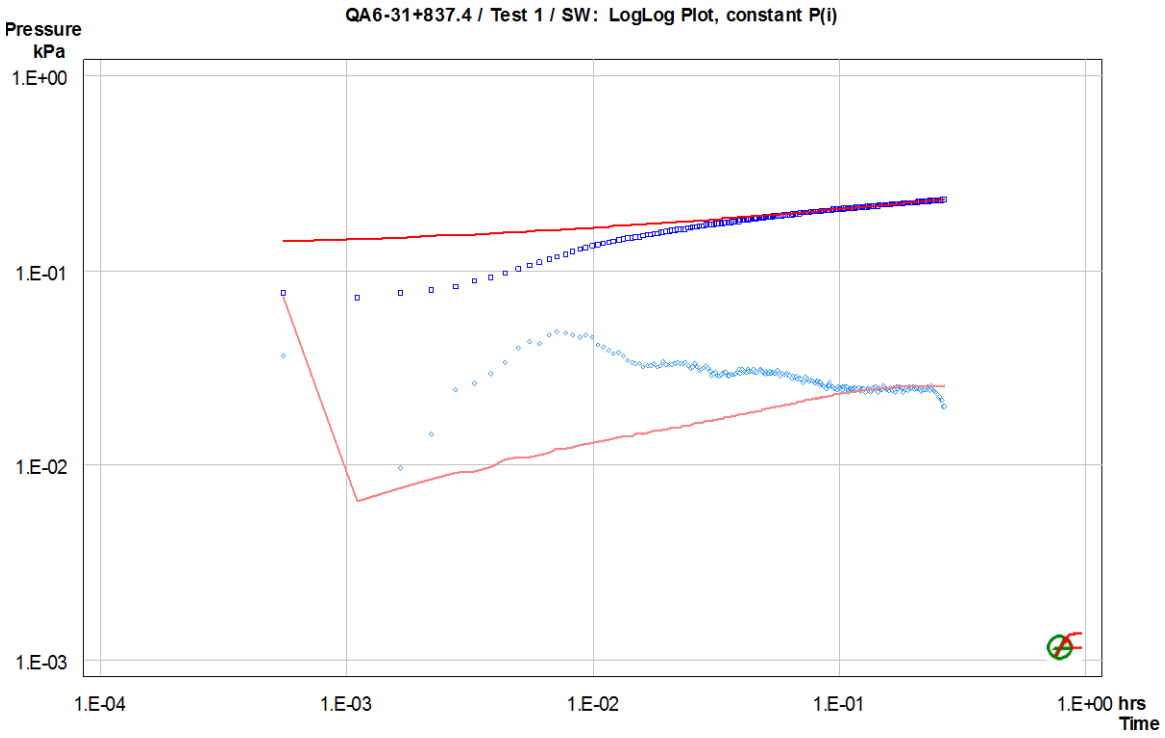



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SW sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Borehole | QA7_31+877 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 15.47 m bottom: 18.00 m |
| Description | Rising and falling head tests |
| | Packer set-up |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 2.53 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.048 m | Tubing Radius | 0.039 m |
| Inclination | 0.0 deg | | |
| Test Volume | 18.313 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [min] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 126.38 | | | 4.8e-07 |
| SW-Init | dP-Event | 4.56667 | 126.59 | 35.9 * | | 4.8e-07 |
| SW | Slug | 4.76667 | 90.73 | 126.6 | | 4.8e-07 |
| Setup Change | Variable Pressure | 7.66667 | 126.41 | | | 4.8e-07 |
| SI-Init | dP-Event | 18.83333 | 126.49 | -17.8 * | | 4.8e-07 |
| SI | Slug | 19.86667 | 144.31 | 126.5 | | 4.8e-07 |
| End | Variable Pressure | 24.10000 | 126.85 | | | 4.8e-07 |

## Analysis Results

**Analysis "SW-1"**

Static Pressure: 127.63 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 1.7e-04 | 5.0e-06 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 3.7e-07 | 0.0 |
| SW-Init | 4.8e-07 | 0.0 |
| SW | 4.8e-07 | 0.0 |
| Setup Change | 4.8e-07 | 0.0 |
| SI-Init | 4.8e-07 | 0.0 |
| SI | 4.8e-07 | 0.0 |
| End | 3.7e-07 | 0.0 |

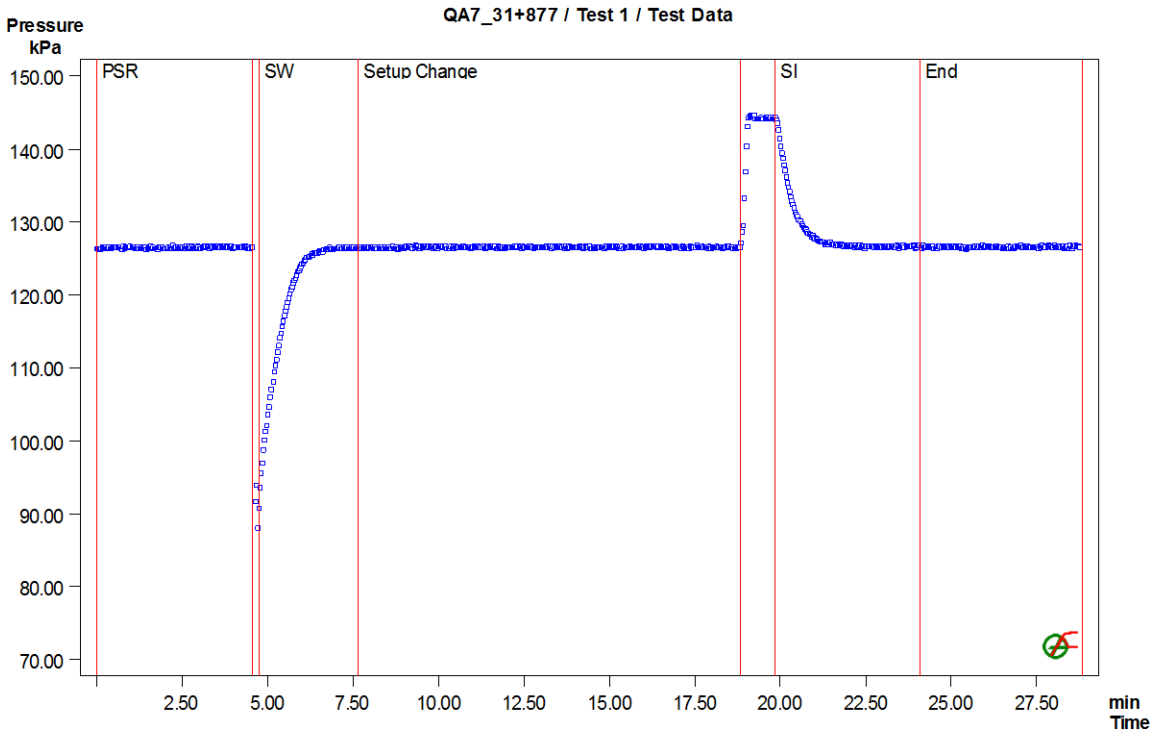



Figure 1: Pressure response and sequence definition

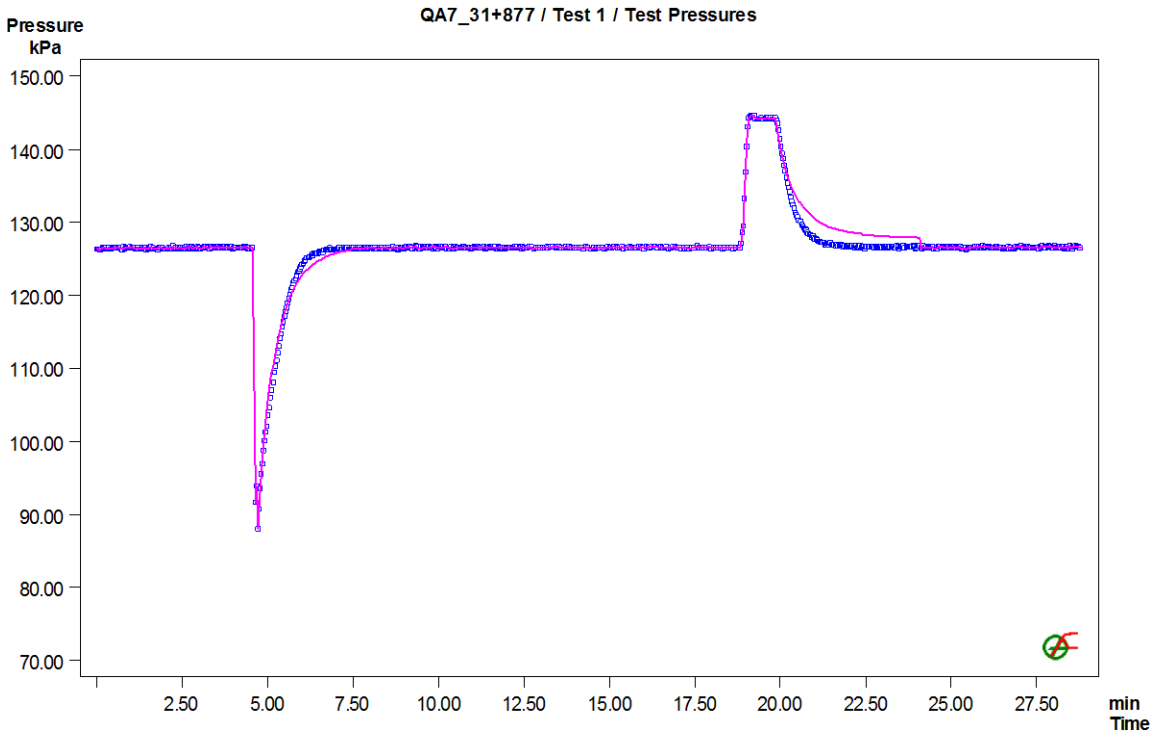



Figure 2: Pressure response and simulation: cartesian plot

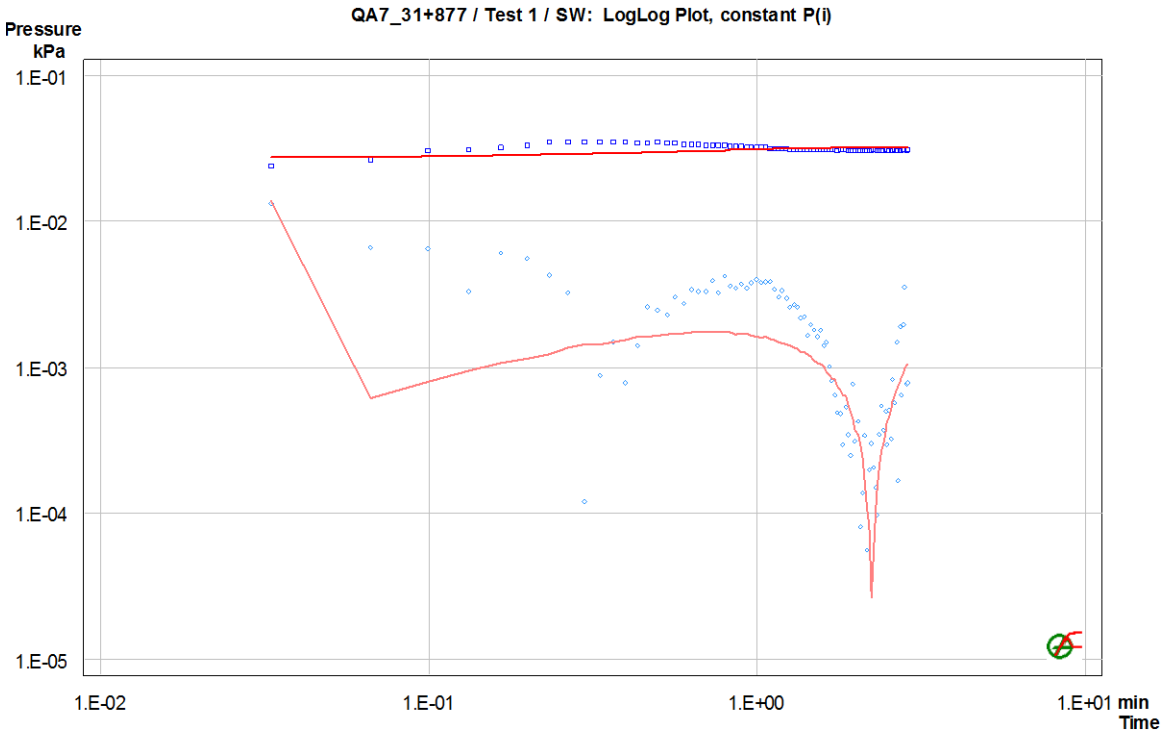



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SW sequence

# E2-8 Permeability Testing Program

- Summary of Permeability Testing in Jet Grouted Channels
- Permeability Testing Reports

# Summary of Permeability Testing in Jet Grouted Channels

Golder Associates

**TABLE E2-8.1**
**SUMMARY OF PERMEABILITY TESTING IN JET GROUTED CHANNELS**

AEM

| Area | Hole | Date | Test Number | Test Type | Using | Collar Elevation (masl) | Static Water Elevation (masl) | Static Level (mbgs) | Depth of Casing (mbgs) | Test Interval | | | Hydraulic Conductivity (m/sec) | Anticipated Depth to Top of Jet Wall (mbgs) | Anticipated Depth to top of Bedrock (mbgs) | Air Lift | Triconed to (mbgs) | Hole sedimented-in / collapsed to (mbgs) | Transducer Lowered to (mbgs) | Stickup | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | From (mbgs) | To (mbgs) | Length (m) | | | | | | | | | |
| CHANNEL 3 | S-31+583 | 13-May | 1 | FH | Tape | 137.28 | 133.7 | 3.58 | 3.66 | 3.66 | 9.44 | 5.78 | < 1E-07 | 12.05 | -- | w/ Rig | ~2.5 m above Jet (9.44 m) | 7.62 | -- | 0.1 | Water dropped < 1 cm in 15 min |
| | | | 2 | FH | RST / Tape | 137.28 | 133.7 | 3.58 | 3.66 | 3.66 | 15.24 | 11.58 | 2.E-08 | -- | 17.47 | w/ Rig | ~2.2 m above Rock (15.24 m) | 6.00 | 4.4 | 0.1 | Water dropped 0.71 m in 2 hrs |
| | S-31+589 | 12-May | 1 | FH | Tape | 137.32 | 133.7 | 3.62 | 3.66 | 3.66 | 10.06 | 6.40 | 4.E-07 | 11.89 | -- | w/ Rig | ~1.9 m above Jet (10.06 m) | 7.65 | -- | -- | Water dropped 3.2 m in 2 hrs |
| | T-31+590.5 | 13-May | 2 | FH | RST / Tape | 137.26 | 133.7 | 3.56 | 3.66 | 3.66 | 15.24 | 11.58 | < 1E-07 | -- | 18.03 | w/ Rig | ~2.8 m above Rock (15.24 m) | 6.00 | 4.2 | 0.03 | Water dropped 0.25 m in 15 min |
| | T-31+596.5 | 13-May | 1 | FH | Tape | 137.35 | 133.7 | 3.65 | 3.66 | 3.66 | 10.36 | 6.70 | < 1E-07 | 11.89 | -- | w/ Rig | ~1.5 m above Jet (10.36 m) | 7.24 | -- | 0.23 | Water dropped 0.34 m in 15 min |
| | | | 2 | FH | RST / Tape | 137.35 | 133.7 | 3.65 | 3.66 | 3.66 | 15.09 | 11.43 | 3.E-07 | -- | 17.32 | w/ Rig | ~2.2 m above Rock (15.09 m) | 7.65 | 8.77 | 0.23 | Water dropped 1.81 m in 2 hrs |
| | T-31+605.5 | 12-May | 1 | FH | Tape | 137.47 | 133.7 | 3.77 | 3.66 | 3.66 | 8.43 | 4.77 | 4.E-07 | 10.98 | -- | w/ Rig | ~2.5 m above Jet (8.43 m) | 6.76 | -- | -- | Water dropped < 1 cm in 15 min |
| | | | 2 | FH | Tape | 137.47 | 133.7 | 3.77 | 3.66 | 3.66 | 12.90 | 9.24 | 3.E-07 | -- | 15.42 | w/ Rig | ~2.5 m above Rock (12.9 m) | 8.02 | -- | -- | Water dropped 2.7 m in 2 hrs |
| CHANNEL 2 | S-31+853 | 04-Apr | 1 | -- | -- | 137.21 | 133.7 | 3.51 | 3.66 | 3.66 | 14 | 10.34 | -- | 15.45 | -- | -- | ~1.5 m above Jet (14 m) | Just below 6" casing | -- | -- | No test carried out due to collapse. |
| | | | 2 | RH | RST | 137.21 | 133.7 | 3.51 | 3.66 | 3.66 | 19.2 | 15.54 | < 1E-08 | -- | 20.09 | w/ N2 | ~1.5 m above Rock (19.2 m) | 13.62 | 10.10 | -- | No observed recharge in water level |
| | S-31+871 | 04-Apr | 1 | -- | -- | 137.15 | 133.7 | 3.45 | 3.66 | 3.66 | 12.5 | 8.84 | -- | 14.04 | -- | -- | ~1.5 m above Jet (12.5 m) | Just below 6" casing | -- | -- | No test carried out due to collapse. |
| | | | 2 | RH | Tape | 137.15 | 133.7 | 3.45 | 3.66 | 3.66 | 19.20 | 15.54 | 5.E-10 | -- | 20.68 | w/ N2 | ~1.5 m above Rock (19.2 m) | 13.30 | -- | -- | Water recharged 8 cm in 1 hr |
| | S-31+895 | 07-Apr | 1 | RH | RST | 137.01 | 133.7 | 3.31 | 3.66 | 3.66 | 12.91 | 9.25 | < 1E-08 | 14.81 | -- | w/ N2 | ~2 m above Jet (12.91 m) | 9.70 | 8.60 | -- | No observed recharge in water level |
| | | | 2 | RH | RST | 137.01 | 133.7 | 3.31 | 3.66 | 3.66 | 16.45 | 12.79 | < 1E-08 | -- | 17.98 | w/ N2 | ~1.5 m above Rock (16.45 m) | 11.90 | 10.00 | -- | No observed recharge in water level |
| | T-31+926.5 | 13-Apr | 1 | FH | RST | 137.25 | 133.7 | 3.55 | 3.66 | 3.66 | 9.75 | 6.09 | < 1E-08 | 10.83 | -- | w/ Rig | ~1 m above Jet (9.75 m) | 9.54 | 8.50 | -- | No observed drop in water level |
| | | | 2 | FH | RST | 137.25 | 133.7 | 3.55 | 3.66 | 3.66 | 13.10 | 9.44 | < 1E-08 | -- | 14.46 | w/ Rig | ~1.4 m above Rock (13.1 m) | 11.70 | 9.7 | -- | No observed drop in water level |
| SOUTH RIDGE | Q-31+928.75 | 16-Jun | 1 | RH/FH | Tape | 137.34 | 133.70 | 3.64 | 3.66 | 3.66 | 14.17 | 10.51 | < 1E-07 | -- | 14.08 | w/ Rig | 14.17 | -- | -- | 0.15 | Water recharged 2.5 cm in 30 min (RH); Water dropped 2.1 cm in 15 min (FH) |
| | Q-31+936.25 | 17-Jun | 1 | RH/FH | Tape | 137.33 | 133.7 | 3.63 | 3.66 | 3.66 | 8.20 | 4.54 | < 1E-08 | -- | 12.87 | w/ Rig | 8.20 | -- | -- | 0.15 | Water did not recharge in 20 min (RH); Water did not drop in 25 min (FH) |
| | S-31+949 | 15-Apr | 1 | FH | RST | 137.23 | 133.7 | 3.53 | 3.66 | 3.66 | 7.30 | 3.64 | < 1E-07 | 9.00 | -- | w/ Rig | ~1.7 m above Jet (7.3 m) | 7.10 | 6.00 | -- | No observed drop in water level |
| | | | 2 | FH | RST | 137.23 | 133.7 | 3.53 | 3.66 | 3.66 | 10.70 | 7.04 | < 1E-07 | -- | 12.28 | w/ Rig | ~1.6 m above Rock (10.7 m) | 9.90 | 9.00 | -- | No observed drop in water level |
| | Q-31+958.75 | 18-Jun | 1 | RH/FH | Tape | 137.39 | 133.7 | 3.69 | 3.66 | 3.66 | 11.50 | 7.84 | < 1E-07 | -- | 11.97 | w/ Rig | 11.50 | -- | -- | 0.13 | Water recovered 39 cm in 30 min (RH); Water dropped 21 cm in 30 min (FH) |
| | Q-31+967.75 | 19-Jun | 1 | FH | Tape | 137.50 | 133.7 | 3.80 | 3.66 | 3.66 | 12.50 | 8.84 | < 1E-07 | -- | 12.58 | w/ Rig | 12.50 | 7.90 | -- | 0.15 | Water did not recover in 35 min (RH); Water dropped 0.98 m in 30 min (FH) |
| | T-31+968.5 | 16-Apr | 1 | FH | RST | 137.39 | 133.7 | 3.69 | 3.66 | 3.66 | 7.30 | 3.64 | < 1E-07 | 8.98 | -- | w/ Rig | ~1.7 m above Jet (7.3 m) | 6.00 | 5.20 | -- | No observed drop in water level |
| | | | 2 | FH | RST | 137.39 | 133.7 | 3.69 | 3.66 | 3.66 | 11.00 | 7.34 | 5.E-08 | -- | 12.73 | w/ Rig | ~1.7 m above Rock (11 m) | 10.30 | 9.40 | -- | No observed drop in water level |
| | Q-31+976.75 | 21-Jun | 1 | FH | Tape | 137.35 | 133.7 | 3.65 | 3.66 | 3.66 | 13.41 | 9.75 | 1.E-07 | -- | 13.38 | w/ Rig | 13.41 | 11.20 | -- | 0.33 | Water did not recover in 30 min (RH); Water dropped 2.19 m in 30 min (FH) |
| | T-31+986.5 | 17-Apr | 1 | FH | RST | 137.44 | 133.7 | 3.74 | 3.66 | 3.66 | 9.10 | 5.44 | < 1E-08 | 10.91 | -- | w/ Rig | ~1.8 m above Jet (9.1 m) | 8.60 | 7.70 | -- | No observed drop in water level |
| | | | 2 | FH | RST | 137.44 | 133.7 | 3.74 | 3.66 | 3.66 | 11.90 | 8.24 | < 1E-08 | -- | 13.61 | w/ Rig | ~1.7 m above Rock (11.9 m) | 11.40 | 10.4 | -- | No observed drop in water level |
| | Q-31+999.25 | 23-Jun | 1 | FH | Tape | 137.36 | 133.7 | 3.66 | 3.66 | 3.66 | 15.60 | 11.94 | < 1E-08 | -- | 15.34 | w/ Rig | 15.60 | Communicated | -- | 0.33 | No observed drop in water level |
| | P-32+006 | 17-Apr | 1 | FH | RST | 137.26 | 133.7 | 3.56 | 3.66 | 3.66 | 9.10 | 5.44 | < 1E-08 | 10.70 | -- | w/ Rig | ~1.8 m above Jet (9.1 m) | 8.80 | 7.80 | -- | No observed drop in water level |
| | | | 2 | FH | RST | 137.26 | 133.7 | 3.56 | 3.66 | 3.66 | 13.70 | 10.04 | < 1E-08 | -- | 15.44 | w/ Rig | ~1.7 m above Rock (13.7 m) | 13.10 | 10.40 | -- | No observed drop in water level |
| | Q-32+006.75 | 24-Jun | 1 | FH | Tape | 137.36 | 133.7 | 3.66 | 3.66 | 3.66 | 13.70 | 10.04 | 1.E-07 | -- | 15.33 | w/ Rig | 13.71 | -- | -- | 0.2 | Water dropped 1.49 m in 25 min (FH) |
| CHANNEL 1 | S-32+021 | 18-Apr | 1 | FH | RST | 137.25 | 133.7 | 3.55 | 3.66 | 3.66 | 10.00 | 6.34 | < 1E-08 | 11.70 | -- | w/ Rig | ~1.7m above Jet (10 m) | 8.90 | 7.90 | -- | No observed drop in water level |
| | | | 2 | FH | RST | 137.25 | 133.7 | 3.55 | 3.66 | 3.66 | 16.40 | 12.74 | 1.E-07 | -- | 17.19 | w/ Rig | ~0.8 m above Rock (16.4 m) | -- | 15.40 | -- | Slight water drop observed |
| | S-32+039 | 20-Apr | 1 | FH | RST | 137.16 | 133.7 | 3.46 | 3.66 | 3.66 | 9.45 | 5.79 | 7.E-07 | 11.10 | -- | w/ Rig | ~1.7m above Jet (9.45 m) | 9.30 | 8.29 | -- | Slight water drop observed |
| | | | 2 | FH | RST | 137.16 | 133.7 | 3.46 | 3.66 | 3.66 | 18.90 | 15.24 | 5.E-07 | -- | 20.55 | w/ Rig | ~1.7 m above Rock (18.9 m) | 12.30 | 11.30 | -- | Slight water drop observed |
| | T-32+061.5 | 30-Apr | 1 | FH | RST | 136.93 | 133.7 | 3.23 | 9.67 | 9.67 | 11.90 | 2.23 | -- | 11.58 | -- | w/ Rig | 11.90 | 11.58 | 10 | -- | Quick water drop - suspected connection to outside of casing |
| | | 01-May | 2 | FH | RST | 136.93 | 133.7 | 3.23 | 9.67 | 9.67 | 17.80 | 8.13 | -- | -- | 22.80 | w/ Rig | ~ 5m above Rock (17.8 m) | 15.20 | 13.7 | -- | Quick water drop - suspected connection to outside of casing |
| | Q-32+069.75 | 07-Jul | 1 | FH | RST | 136.95 | 133.7 | 3.25 | 11 | 11 | 15.40 | 4.40 | 1.0E-07 | -- | -- | w/Rig | 15.40 | 15.00 | -- | -- | |
| | S-32+075 | 04-May | 1 | FH | RST | 136.91 | 133.7 | 3.21 | 11.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Casing installed through SB/CSB to 11.2 m - no test carried out |
| | | | 2 | FH | RST | 136.91 | 133.7 | 3.21 | 11.2 | 11.2 | 17.60 | 6.40 | -- | -- | 19.41 | w/ Rig | ~1.8 m above Rock (17.6 m) | 16.15 | 14.65 | -- | Quick water drop - suspected connection to outside casing |
| | S-32+087 | 08-May | 1 | FH | RST | 137.11 | 133.7 | 3.41 | 10.2 | 10.2 | 14.30 | 4.10 | 2.E-05 | -- | 15.87 | w/ Rig | ~1.6 m above Rock (14.3 m) | 14.12 | 12.62 | -- | Drop to 3.6 m after 60 min |
| | Q-32+098.25 | 07-Jul | 1 | FH | RST | 137.32 | 133.7 | 3.62 | 9.7 | 9.7 | 12.90 | 3.20 | 5E-07 | -- | -- | w/Rig | 12.90 | 12.60 | -- | -- | |
| | S-32+100.5 | 07-May | 2 | FH | RST | 137.39 | 133.7 | 3.69 | 7.9 | 7.9 | 12.60 | 4.70 | -- | -- | 14.18 | w/ Rig | ~1.5 m above Rock (12.6 m) | 12.60 | 11.5 | -- | Quick recharge and drop - data unretrieved |

# Permeability Testing Reports

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dyke |
| Source Well | 30+380.0 |
| Test Name | Test 1 |
| Test Date/Time | 29/04/2010, 14:40 |
| Interval | top: 3.40 m bottom: 11.70 m |
| Description | Open hole test |

## Basic Data

| | | |
|---|---|---|
| Test Interval | 8.30 m | |
| Porosity | 0.10 | |
| Well Radius | 0.058 m | Tubing Radius |
| Inclination | 0.0 deg | |
| Test Volume | 86.211 l | |
| Well Type | Source | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 80.20 | | | 1.1e-06 |
| SW-Init | dP-Event | 0.19222 | 80.20 | 40.1 * | | 1.1e-06 |
| SW | Slug | 0.23111 | 40.11 | 80.2 | | 1.1e-06 |

## Analysis Results

**Analysis "SW_Final"**

Static Pressure: 80.20 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 4.3e-09 | 1.6e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 6.9e-07 | 0.0 |
| SW-Init | 1.1e-06 | 0.0 |
| SW | 1.1e-06 | 0.0 |

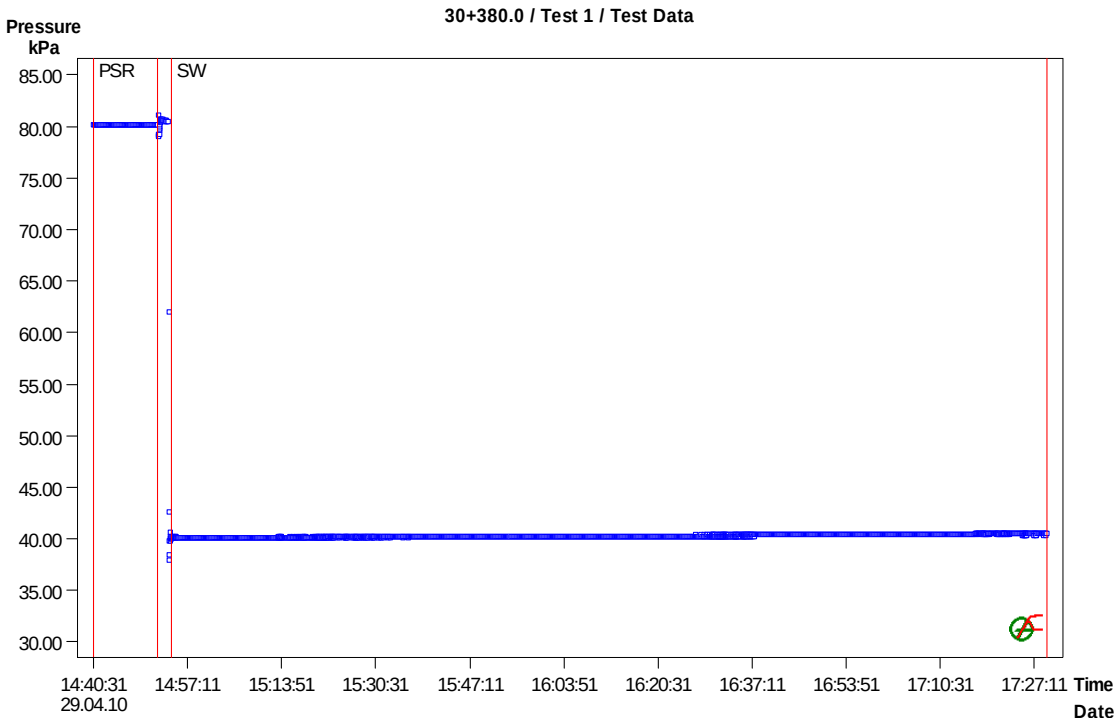



Figure 1: Pressure response and sequence definition

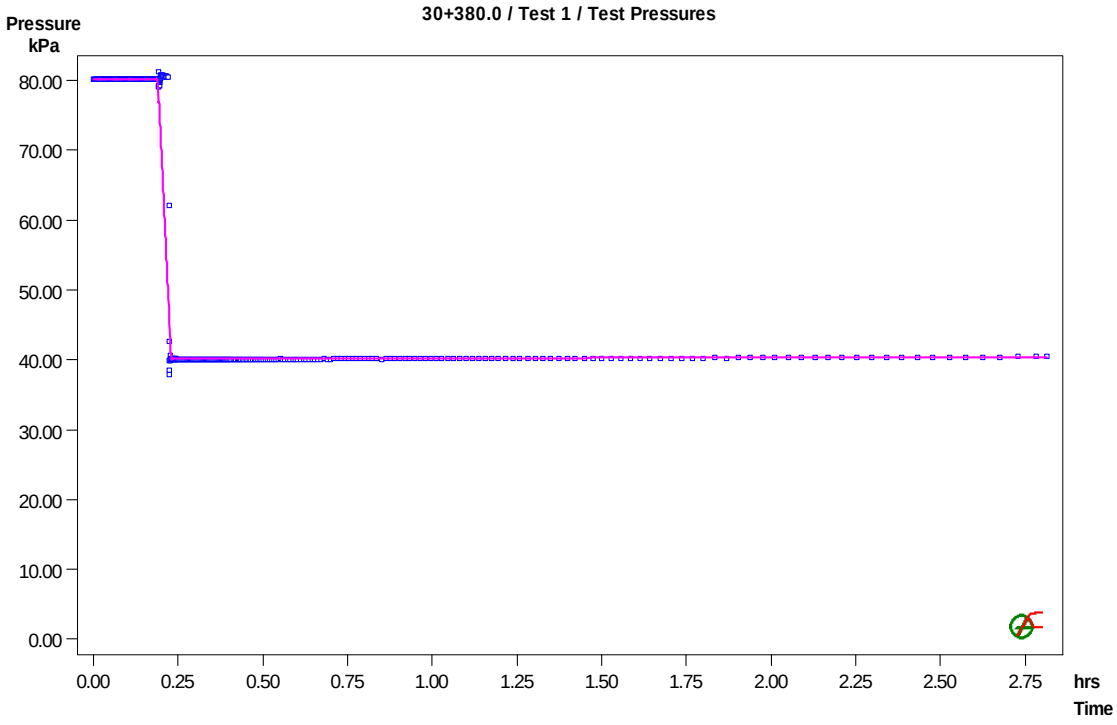



Figure 2: Pressure response and simulation: cartesian plot

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dyke |
| Source Well | 30+405.5 |
| Test Name | Test 1 |
| Test Date/Time | 27/04/2010, 15:30 |
| Interval | top: 3.00 m bottom: 10.00 m |
| Description | Open Hole Test |
| | Interval defined by bottom of Steel casing and End of Hole Depth |

## Basic Data

| | | |
|---|---|---|
| Test Interval | 7.00 m | |
| Porosity | 0.10 | |
| Well Radius | 0.044 m | Tubing Radius |
| Inclination | 0.0 deg | |
| Test Volume | 43.450 l | |
| Well Type | Source | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 66.62 | | | 6.3e-07 |
| SW-Init | dP-Event | 0.03389 | 66.62 | 24.1 * | | 6.3e-07 |
| SW | Slug | 0.04167 | 42.57 | 66.6 | | 6.3e-07 |

## Analysis Results

**Analysis "SW_Final"**

Static Pressure: 66.62 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 3.4e-06 | 1.4e-05 | 9.04 | 2.0 |
| Shell 2 | 1.1e-08 | 1.4e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 5.2e-07 | 0.0 |
| SW-Init | 6.3e-07 | 0.0 |
| SW | 6.3e-07 | 0.0 |

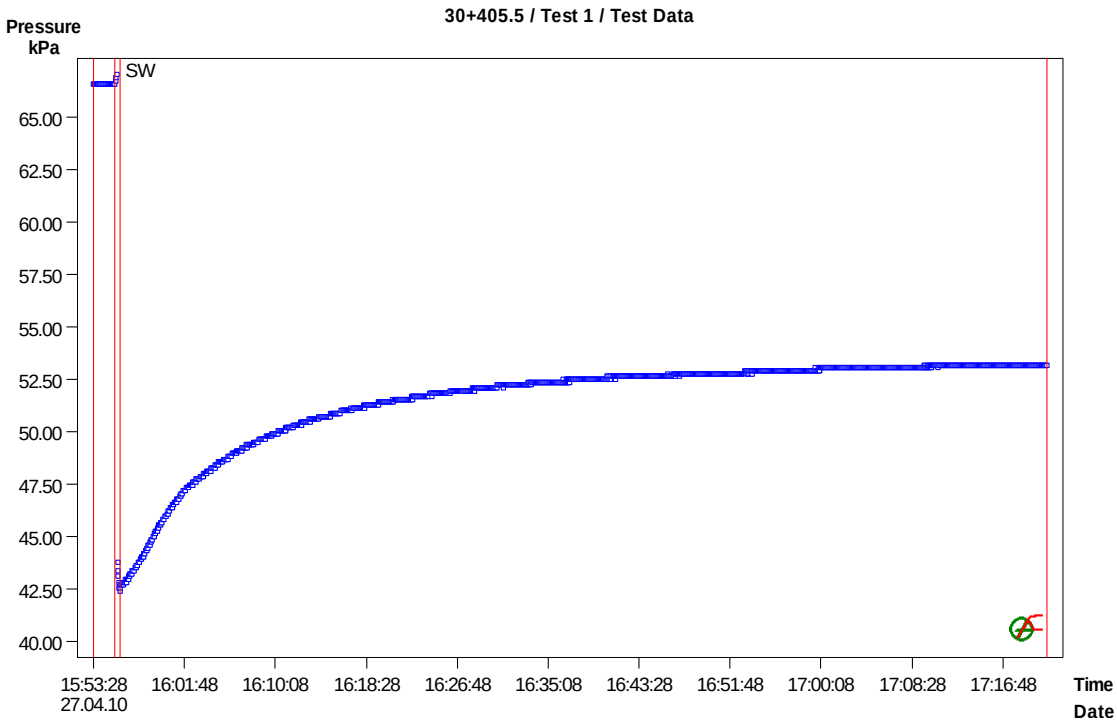



Figure 1: Pressure response and sequence definition

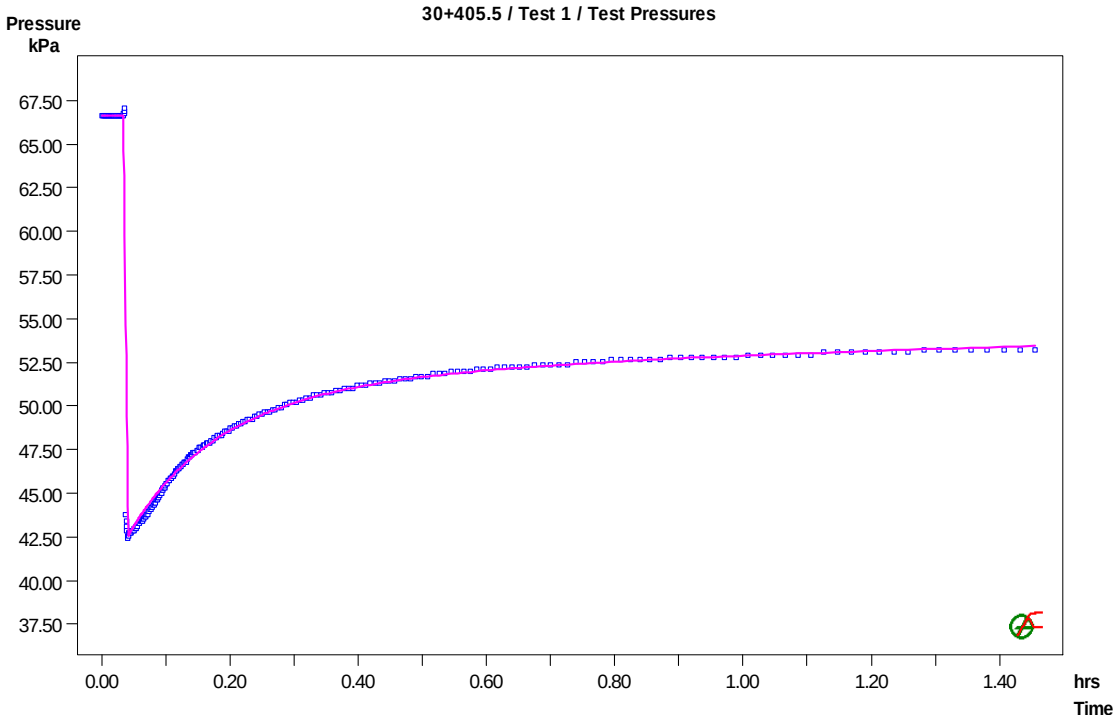



Figure 2: Pressure response and simulation: cartesian plot

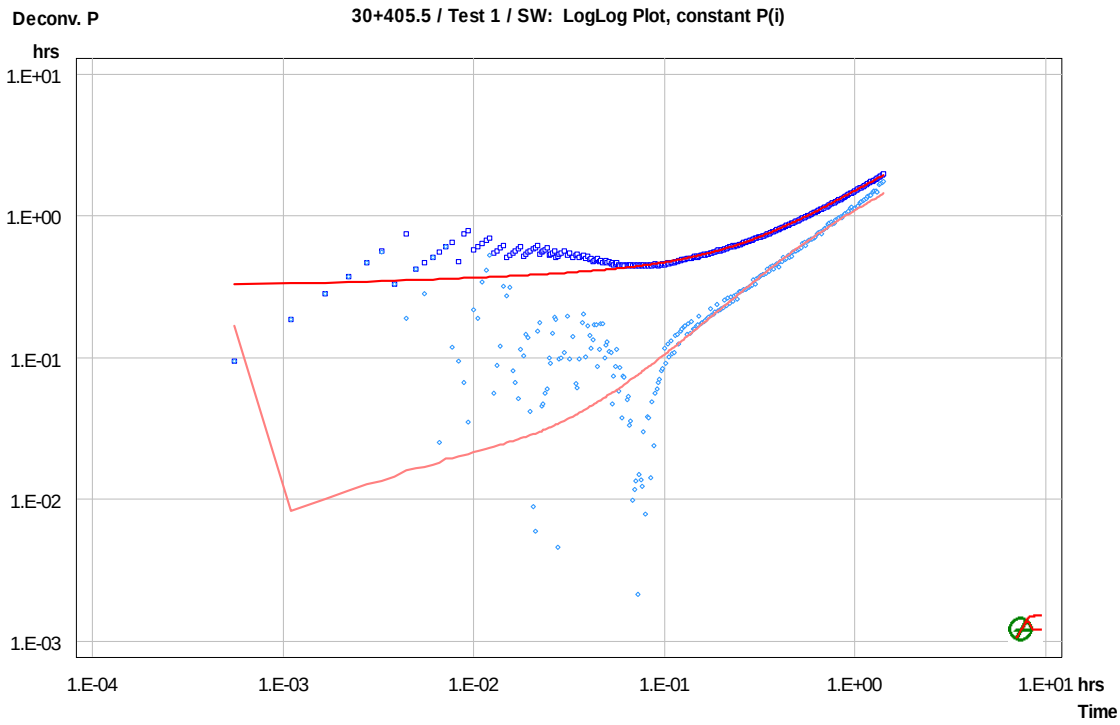



Figure 3: Pressure response, derivative and simulation: Log-Log diagnostic plot, SW-sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | S-31-583 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 9.44 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with water level tape |
| | Assumed virtual transducer at bottom of borehole to calculate pressure response |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 5.78 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 59.411 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 57.49 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.03333 | 57.49 | -37.1 * | | 1.9e-06 |
| SI | Slug | 0.05000 | 94.57 | 57.5 | | 1.9e-06 |

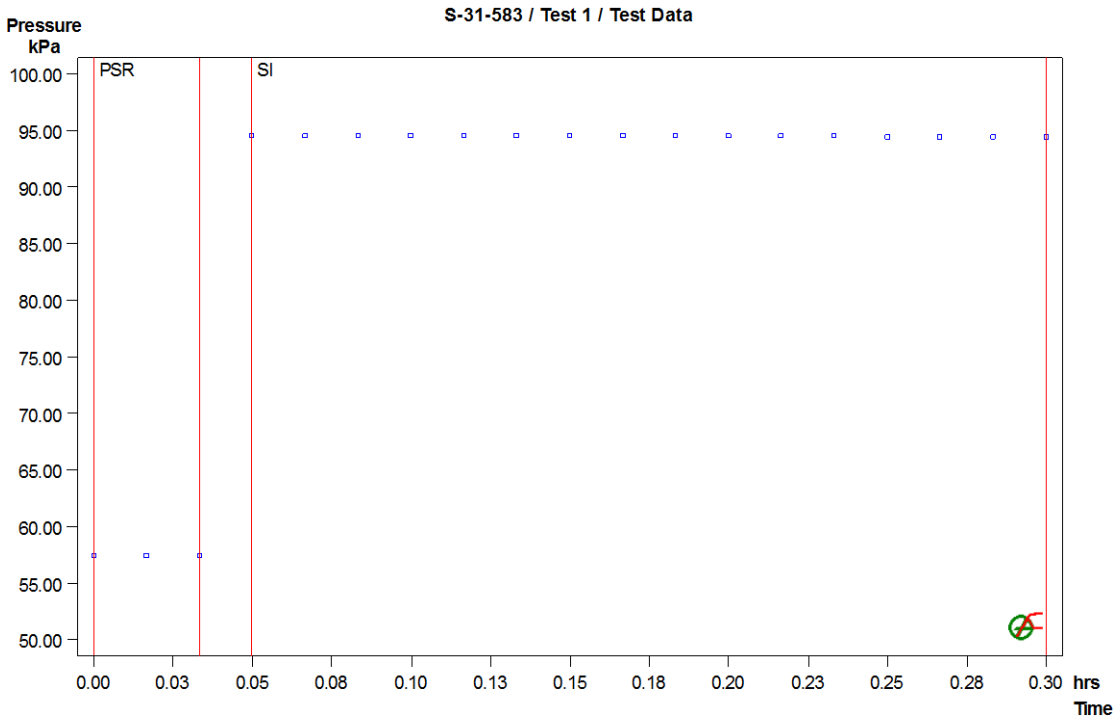



Figure 1: Pressure response and sequence definition

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | S-31 + 583 |
| Test Name | Test 2 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 15.24 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 11.58 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 118.198 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 2.20 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.06056 | 2.33 | -44.2 * | | 1.9e-06 |
| SI | Slug | 0.07889 | 46.49 | 2.3 | | 1.9e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 2.20 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 7.0e-06 | 2.3e-05 | 2.00 | 2.0 |
| Shell 2 | 1.9e-07 | 2.3e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 4.6e-05 | 0.0 |
| SI-Init | 1.9e-06 | 0.0 |
| SI | 1.9e-06 | 0.0 |

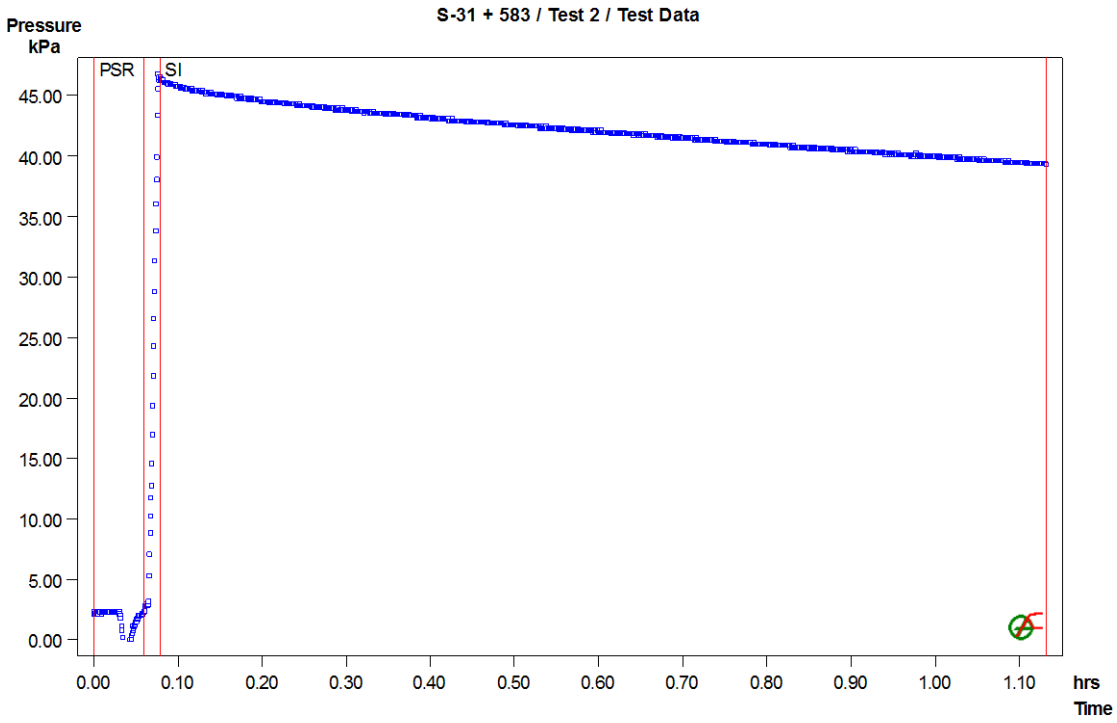



Figure 1: Pressure response and sequence definition

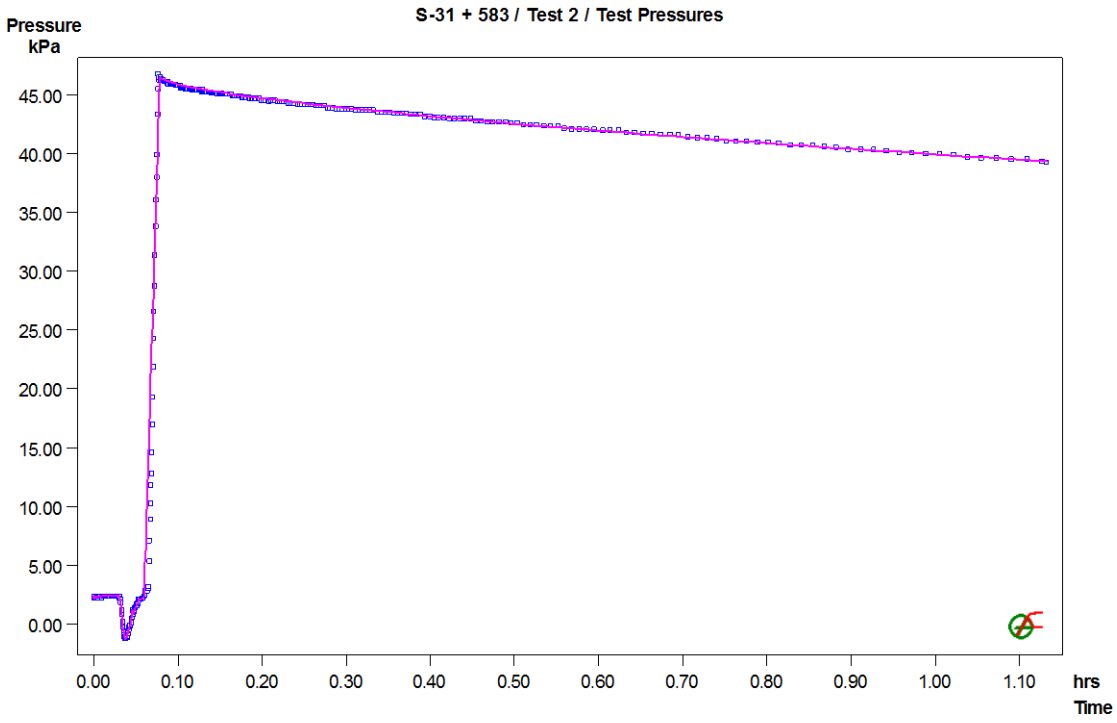



Figure 2: Pressure response and simulation: cartesian plot

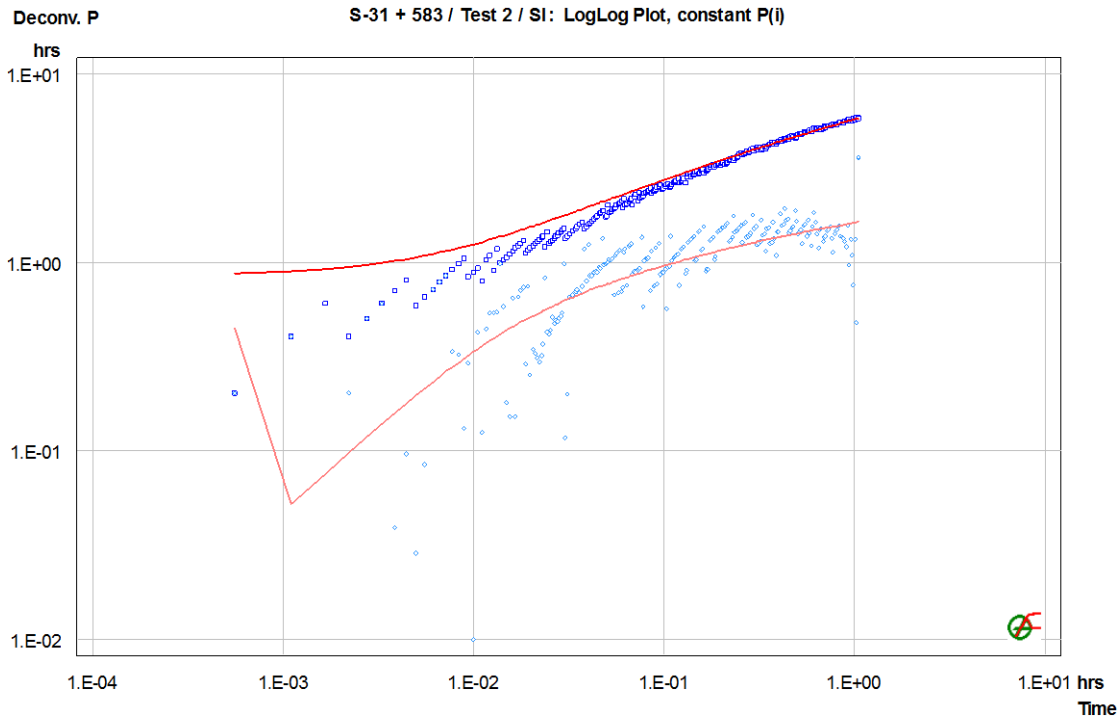



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SI sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | S-31+589 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 10.06 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with water level tape |
| | Assumed virtual transducer at bottom of borehole to calculate pressure response |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 6.40 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 65.325 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 63.18 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.03333 | 63.18 | -37.5 * | | 1.9e-06 |
| SI-a | Slug | 0.05000 | 100.65 | 63.2 | | 1.9e-06 |
| SI-b | Variable Pressure | 0.21667 | 87.51 | | | 1.0e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 63.15 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 9.6e-03 | 1.3e-05 | 9.63 | 2.0 |
| Shell 2 | 2.3e-06 | 1.3e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 1.3e-11 | 0.0 |
| SI-Init | 1.9e-06 | 0.0 |
| SI-a | 1.9e-06 | 0.0 |
| SI-b | 1.0e-06 | 0.0 |

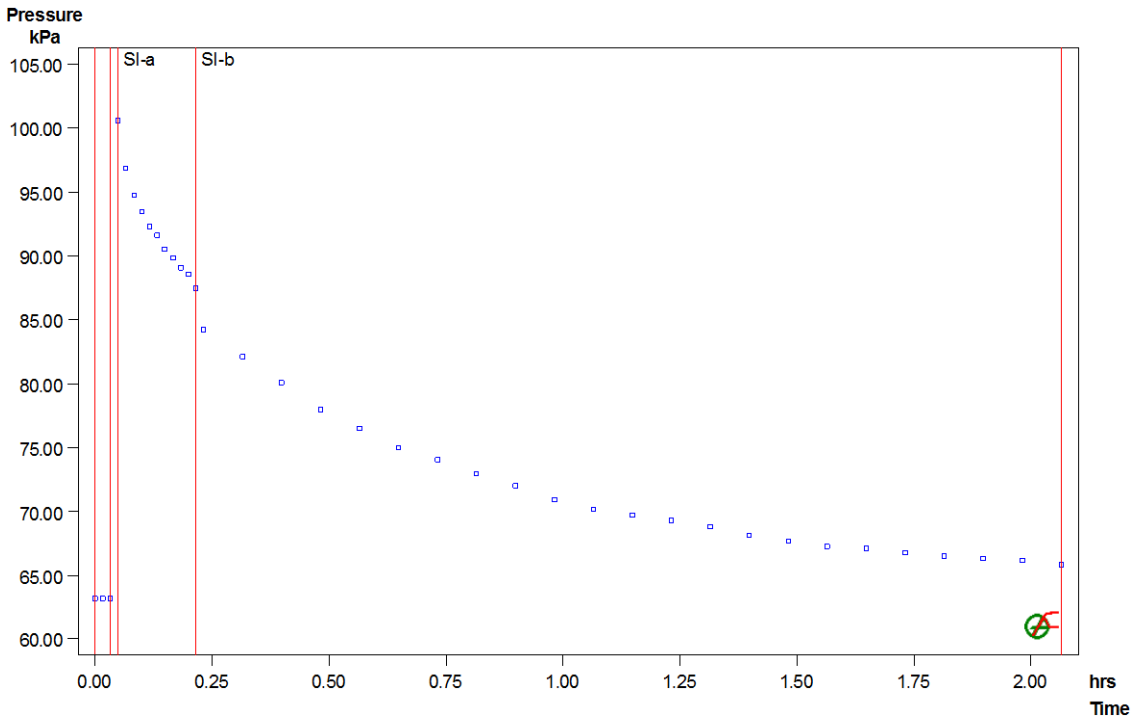



Figure 1: Pressure response and sequence definition

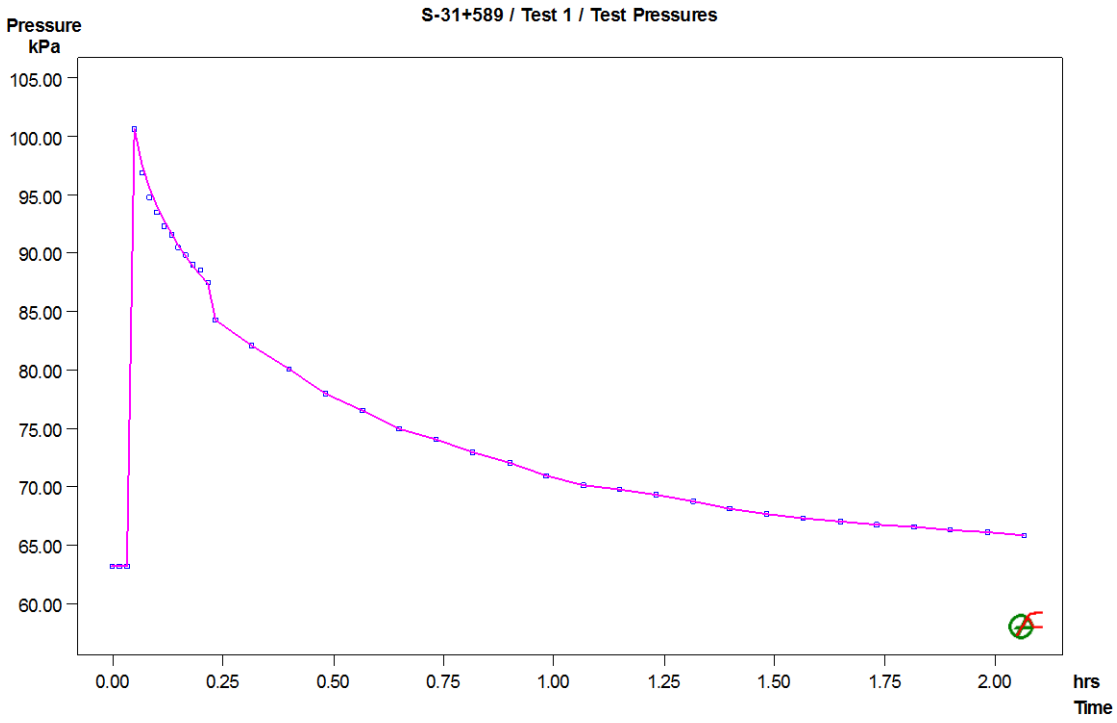



Figure 2: Pressure response and simulation: cartesian plot

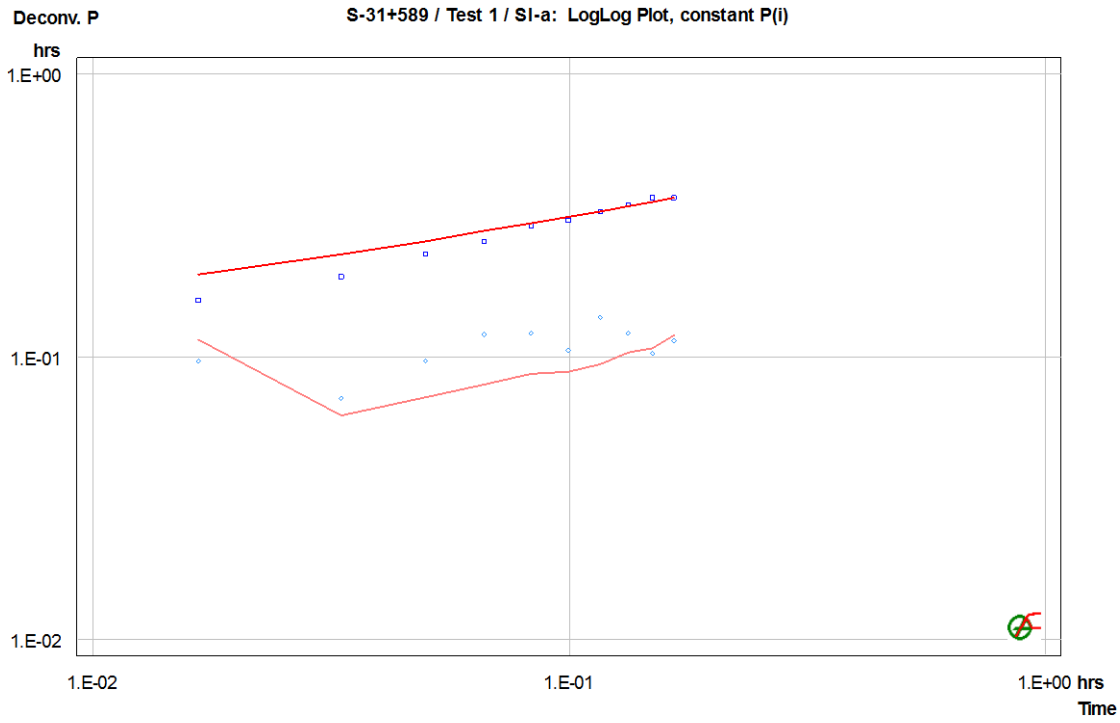



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SI-a sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | T-31+590.5 |
| Test Name | Test 2 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 15.24 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 11.58 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 118.198 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR-1 | Recovery | 0.00000 | 31.25 | | | 1.9e-06 |
| SI-1-Init | dP-Event | 0.06500 | 31.25 | -4.3 * | | 1.9e-06 |
| SI-1 | Slug | 0.07833 | 35.57 | 31.3 | | 1.9e-06 |
| Reset logger | Variable Pressure | 0.29278 | 33.35 | | | 1.9e-06 |
| SI-2-Init | dP-Event | 0.33056 | 33.72 | -3.5 * | | 1.9e-06 |
| SI-2 | Slug | 0.33611 | 37.17 | 33.7 | | 1.9e-06 |

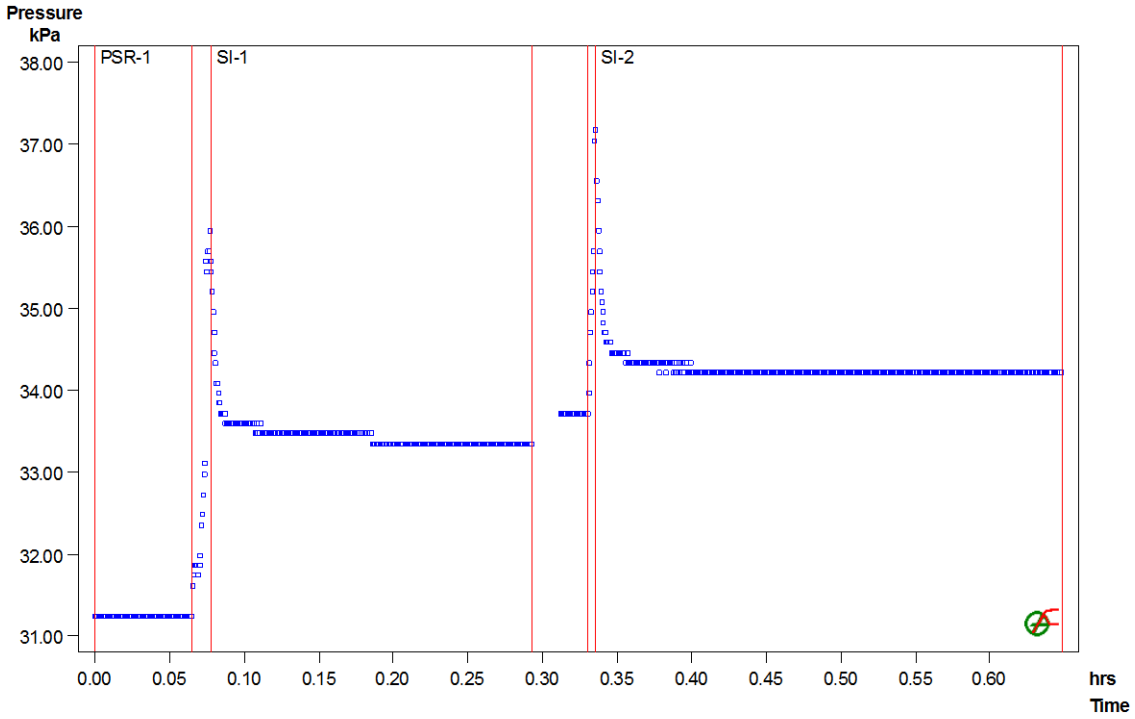



Figure 1: Pressure response and sequence definition

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | T-31+596.5 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 10.36 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with water level tape |
| | Assumed virtual transducer at bottom of borehole to calculate pressure response |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 6.70 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 68.387 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 65.83 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.03333 | 65.83 | -37.8 * | | 1.9e-06 |
| SI | Slug | 0.05000 | 103.59 | 65.8 | | 1.9e-06 |

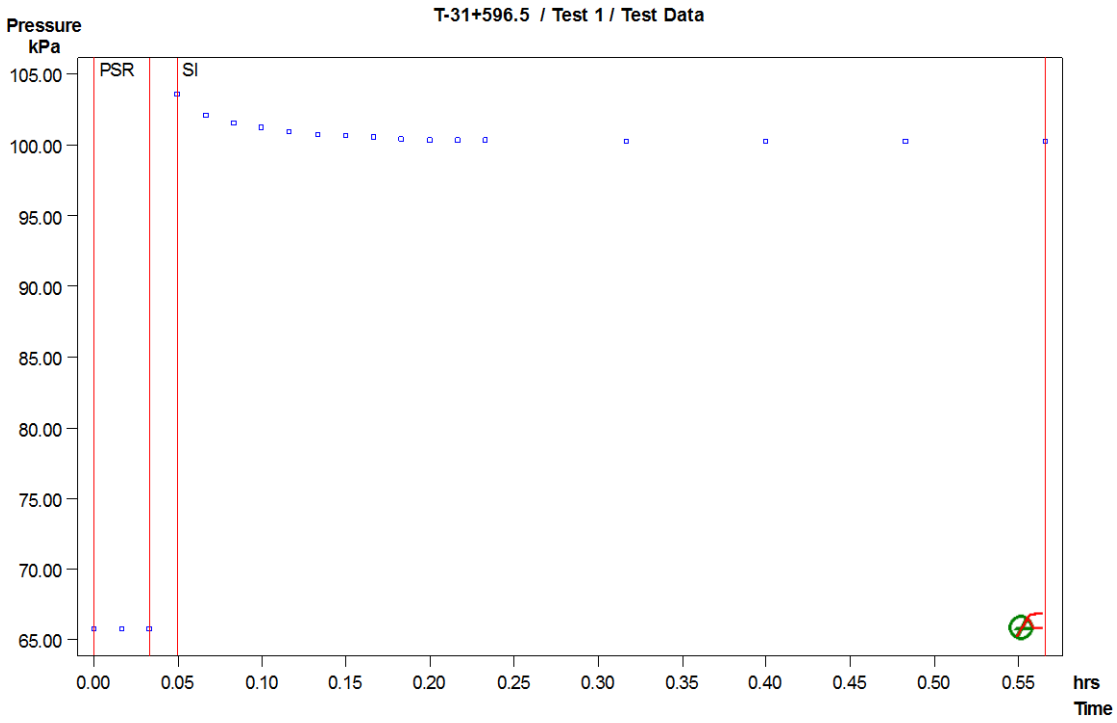



Figure 1: Pressure response and sequence definition

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | T-31+596.5 Test 2 |
| Test Name | Test 2 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 15.09 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Pressure record shows effective water column in borehole |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 11.43 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 116.666 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 76.29 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.19778 | 67.87 | -6.5 * | | 1.9e-06 |
| SI | Slug | 0.20833 | 74.37 | 67.9 | | 1.9e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 52.00 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 2.9e-05 | 2.2e-05 | 3.18 | 2.0 |
| Shell 2 | 3.2e-06 | 2.2e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 8.9e-07 | 0.0 |
| SI-Init | 1.9e-06 | 0.0 |
| SI | 1.9e-06 | 0.0 |

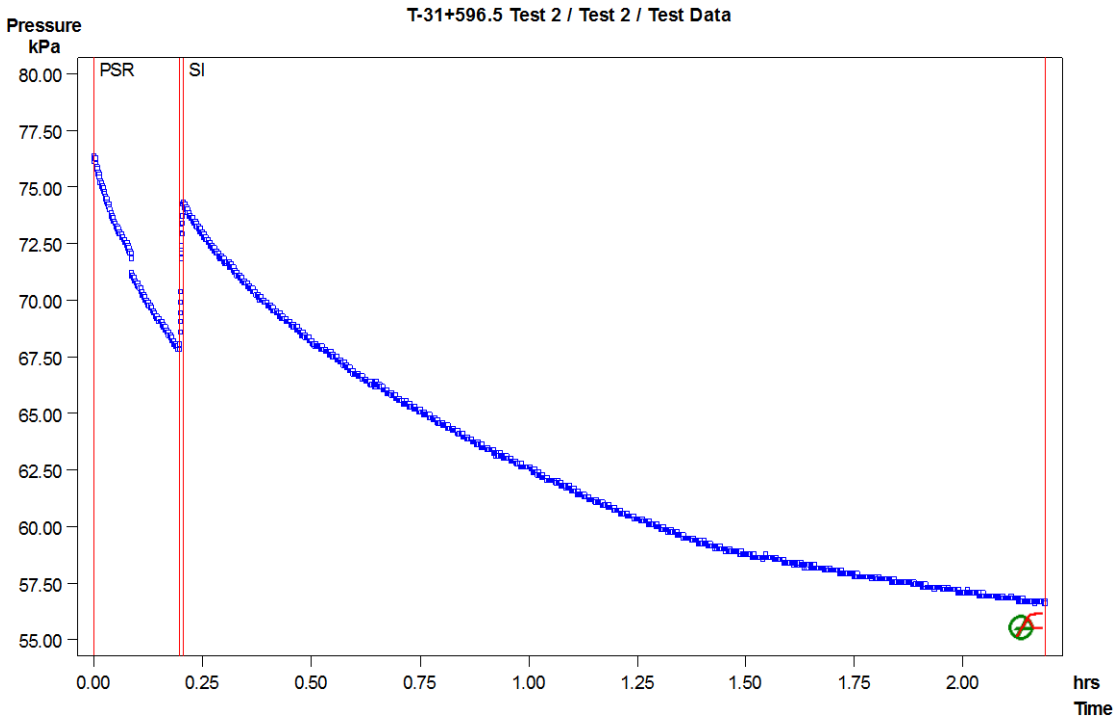



Figure 1: Pressure response and sequence definition

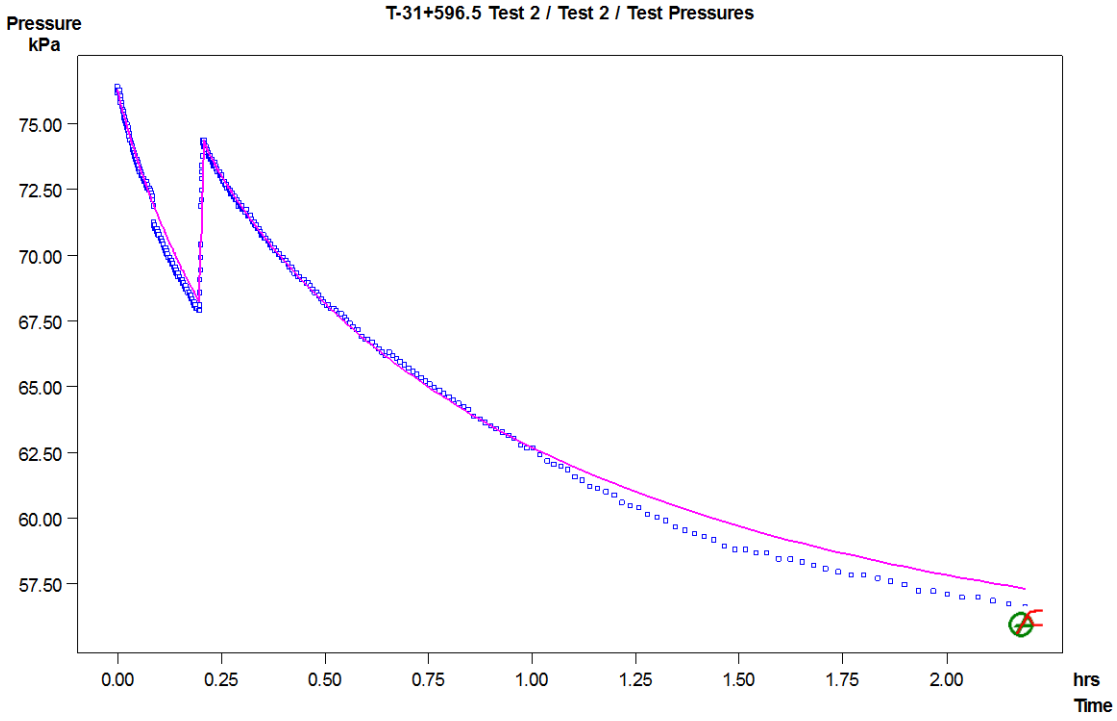



Figure 2: Pressure response and simulation: cartesian plot

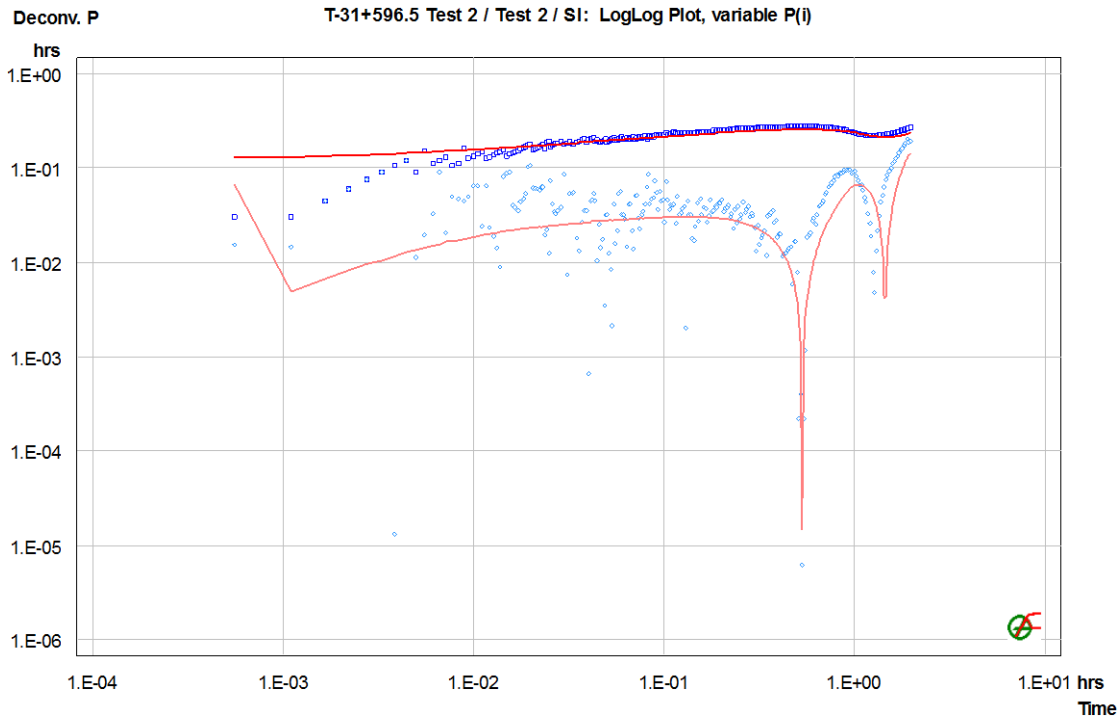



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SI sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | T-31+605.5 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 8.43 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with water level tape |
| | Assumed virtual transducer at bottom of borehole to calculate pressure response |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 4.77 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 48.688 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 45.71 | | | 1.9e-06 |
| SI-Int | dP-Event | 0.03333 | 43.61 | -38.9 * | | 1.9e-06 |
| SI-a | Slug | 0.05000 | 82.56 | 43.6 | | 1.9e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 45.71 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 2.4e-05 | 9.4e-06 | 5.69 | 2.0 |
| Shell 2 | 1.7e-06 | 9.4e-06 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 2.5e-05 | 0.0 |
| SI-Int | 1.9e-06 | 0.0 |
| SI-a | 1.9e-06 | 0.0 |

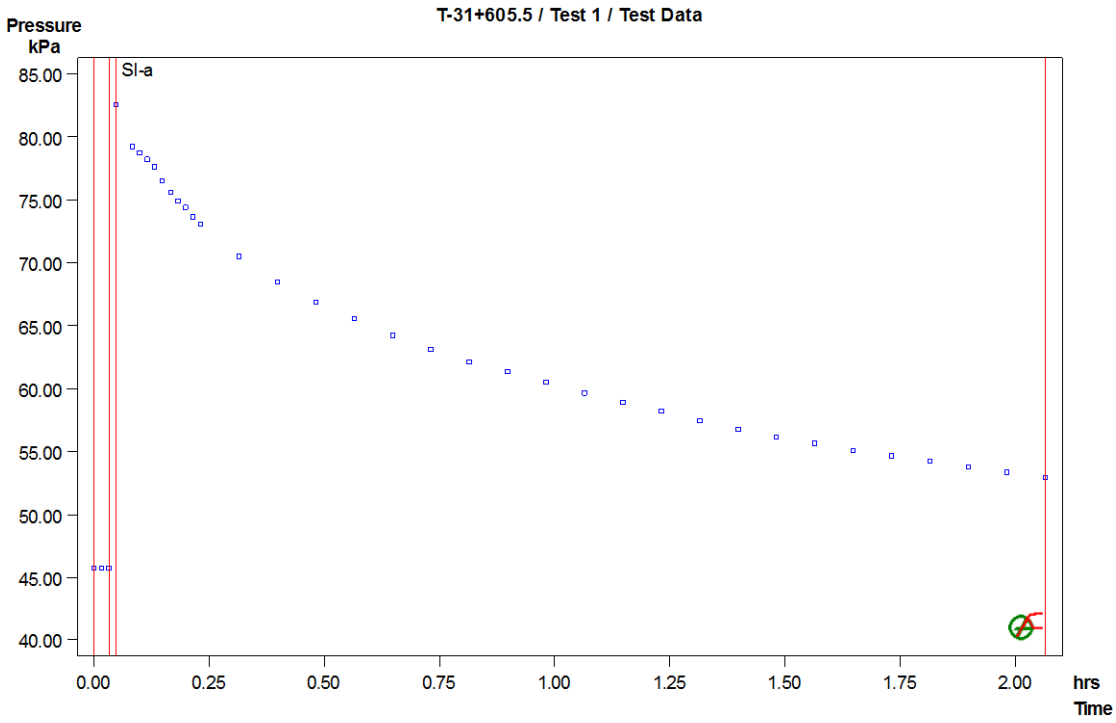



Figure 1: Pressure response and sequence definition

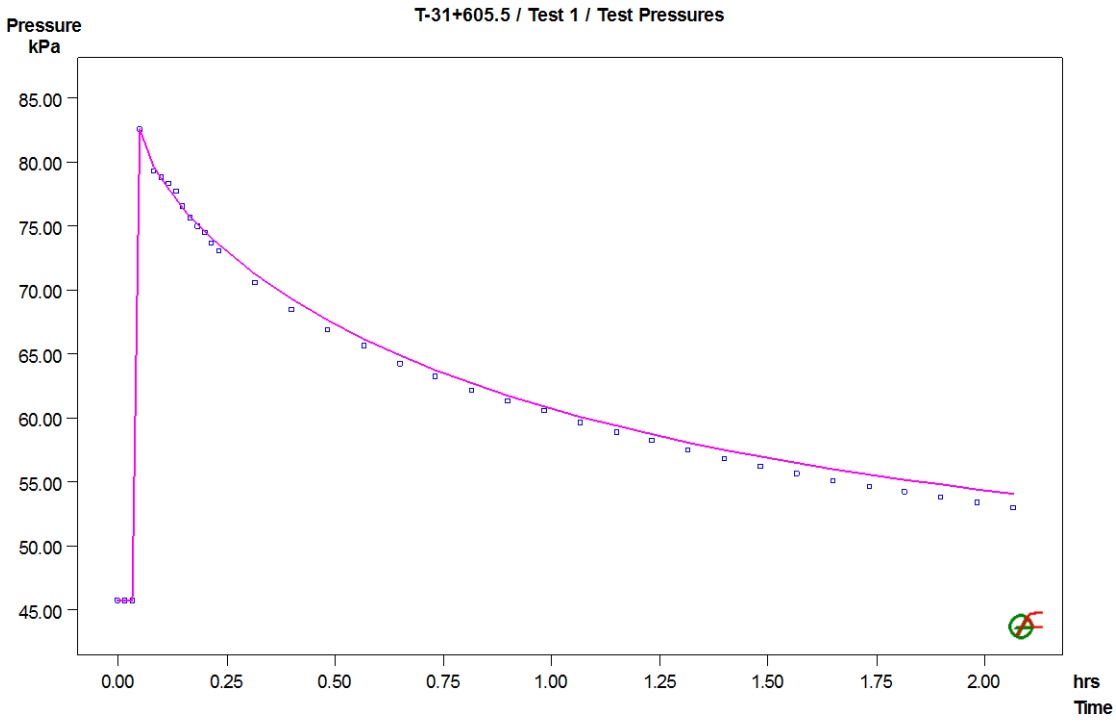



Figure 2: Pressure response and simulation: cartesian plot

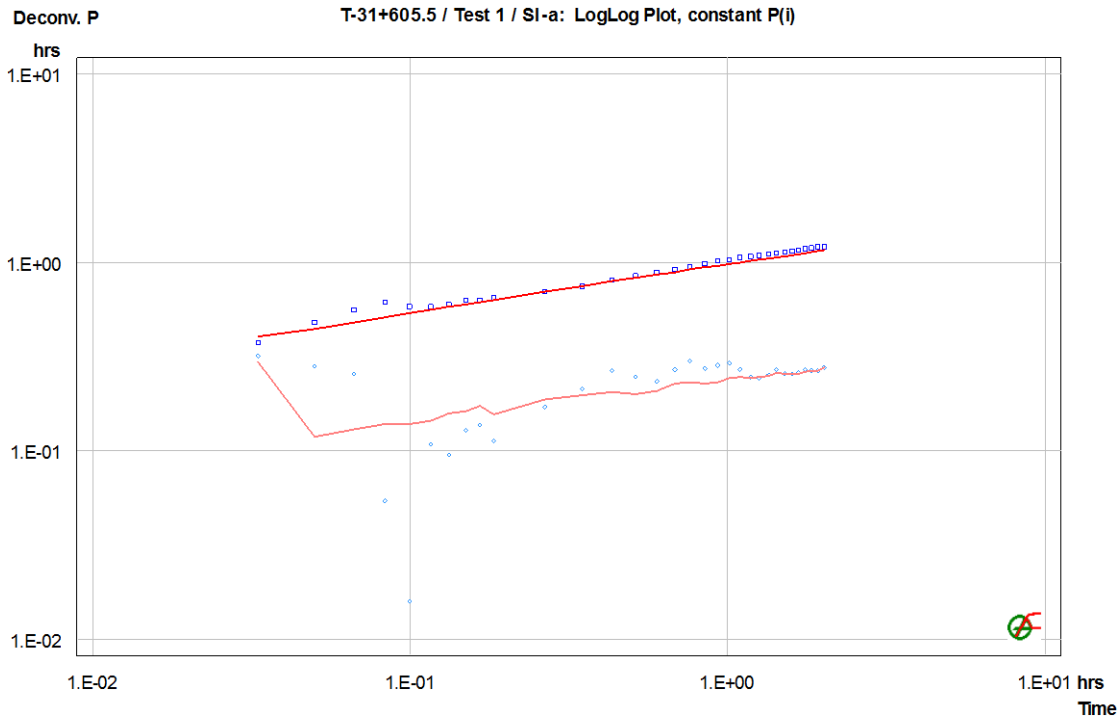
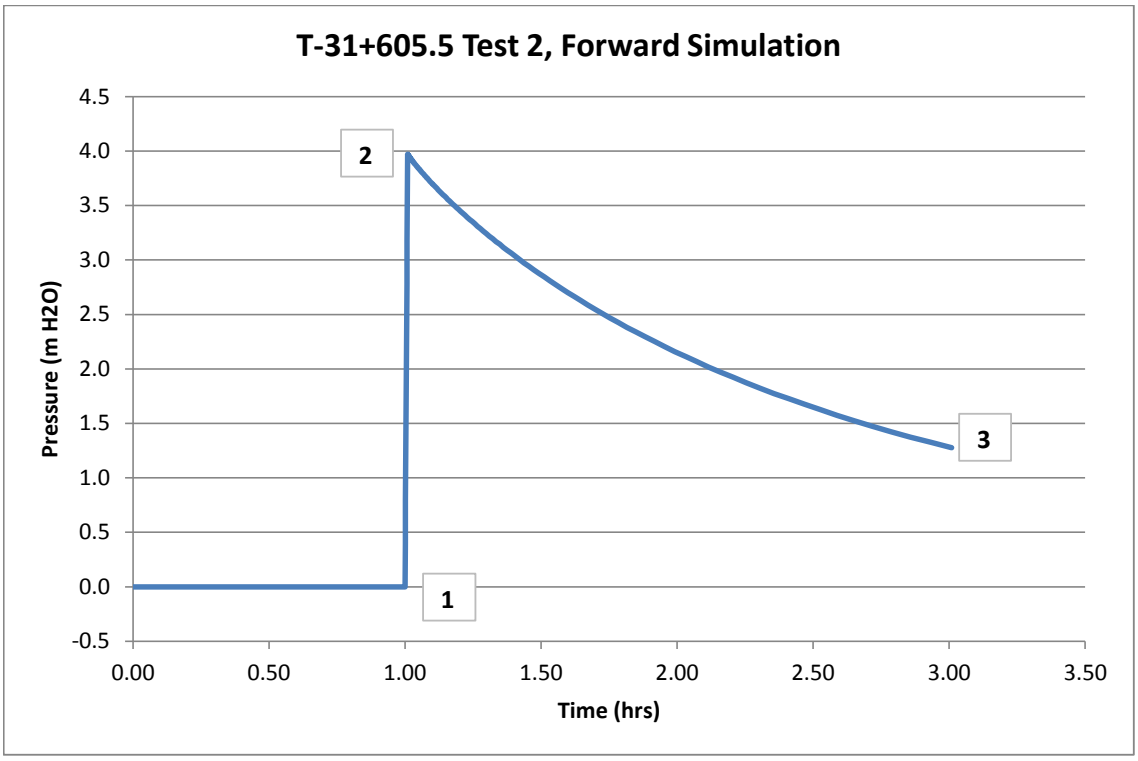



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SI-a sequence




**Observation Points**

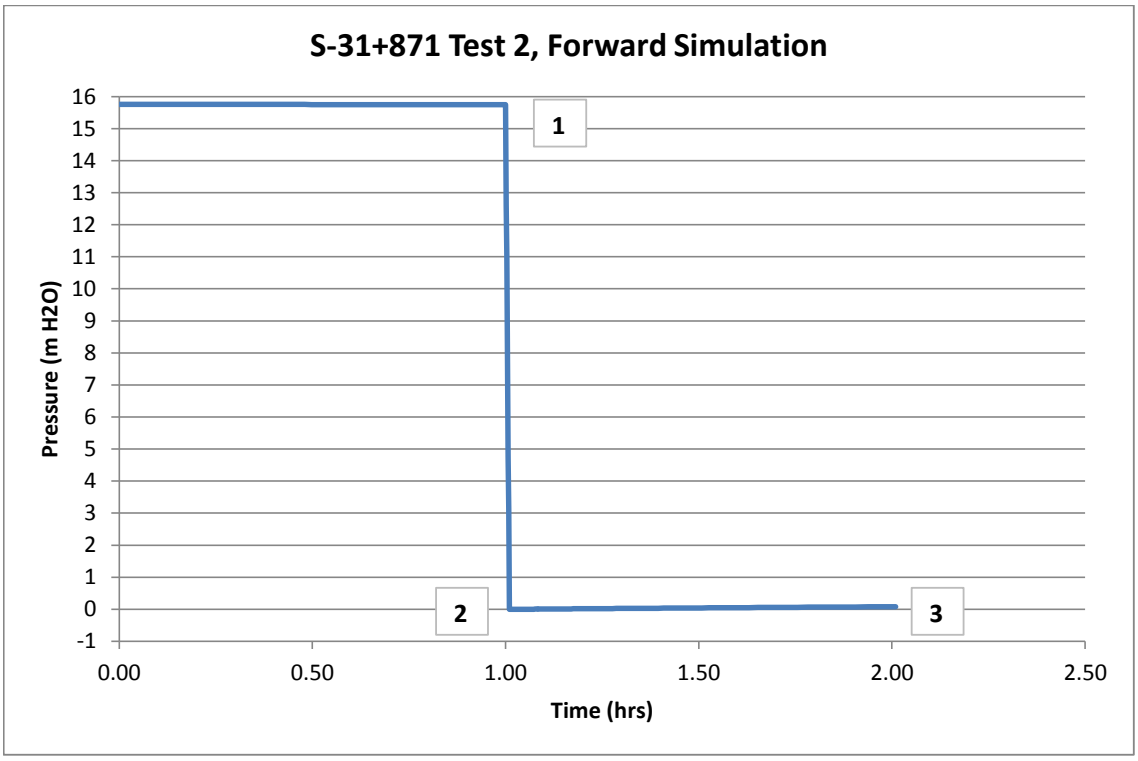
| | |
|---|---|
| 1 | Static water level |
| 2 | Changed pressure by 3.97 m (filled casing with water) |
| 3 | Water level dropped by 2.7 m after 2 hrs |

**Test Interval**

| | |
|---|---|
| Top (m bgs) | 3.66 |
| Bottom (m bgs) | 12.90 |
| Length (m) | 9.24 |
| | |
| Tubing radius (m) | 0.0762 |

**Parameters**

| | |
|---|---|
| T (m2/s) | 3.E-06 |
| K (m/s) | 3.E-07 |




**Observation Points**

| | |
|---|---|
| 1 | Static water level |
| 2 | Changed pressure by 15.75 m (removed water by airlifting) |
| 3 | Water level recharged by 0.08 m after 1 hr |

**Test Interval**

| | |
|---|---|
| Top (m bgs) | 3.66 |
| Bottom (m bgs) | 19.20 |
| Length (m) | 15.54 |
| | |
| Tubing radius (m) | 0.0572 |

**Parameters**

| | |
|---|---|
| T (m2/s) | 8.E-09 |
| K (m/s) | 5.E-10 |

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | Q-31+928.75 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 14.17 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with water level tape |
| | Assumed virtual transducer at bottom of borehole to calculate pressure response |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 10.51 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 107.276 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 103.30 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.03333 | 103.30 | -37.7 * | | 1.9e-06 |
| SI | Slug | 0.05000 | 140.97 | 103.3 | | 1.9e-06 |

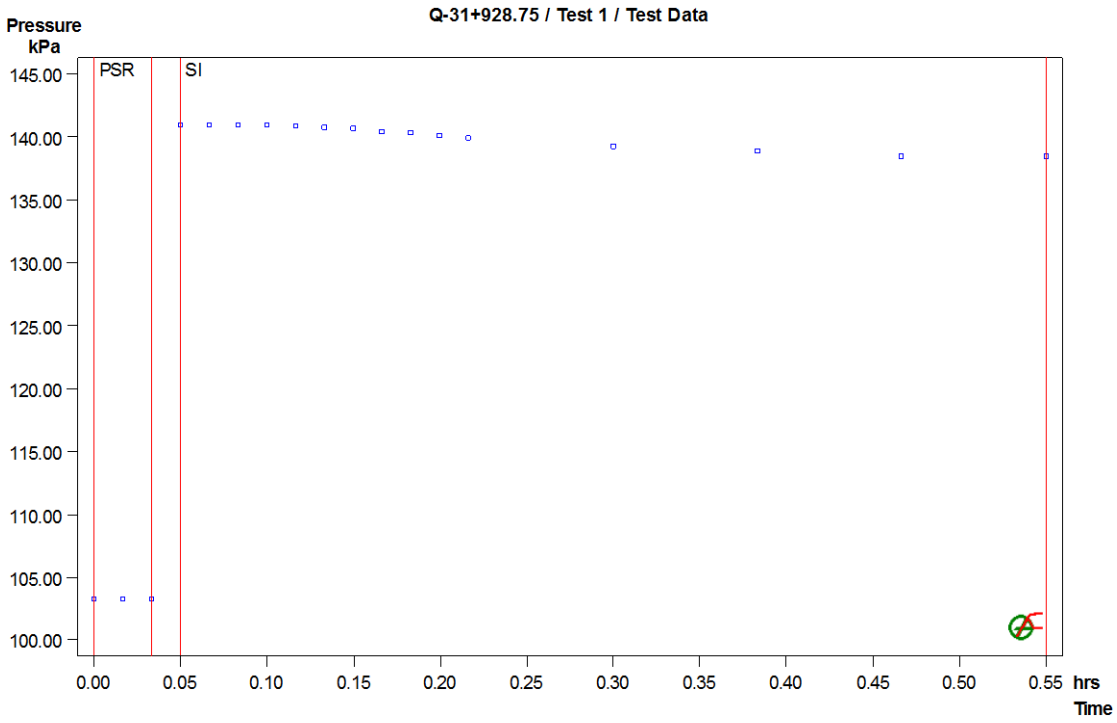



Figure 1: Pressure response and sequence definition

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | S31+949 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 7.30 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 3.64 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 37.154 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 4.77 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.06556 | 0.46 | -63.8 * | | 1.9e-06 |
| SI | Slug | 0.09333 | 64.28 | 0.5 | | 1.9e-06 |

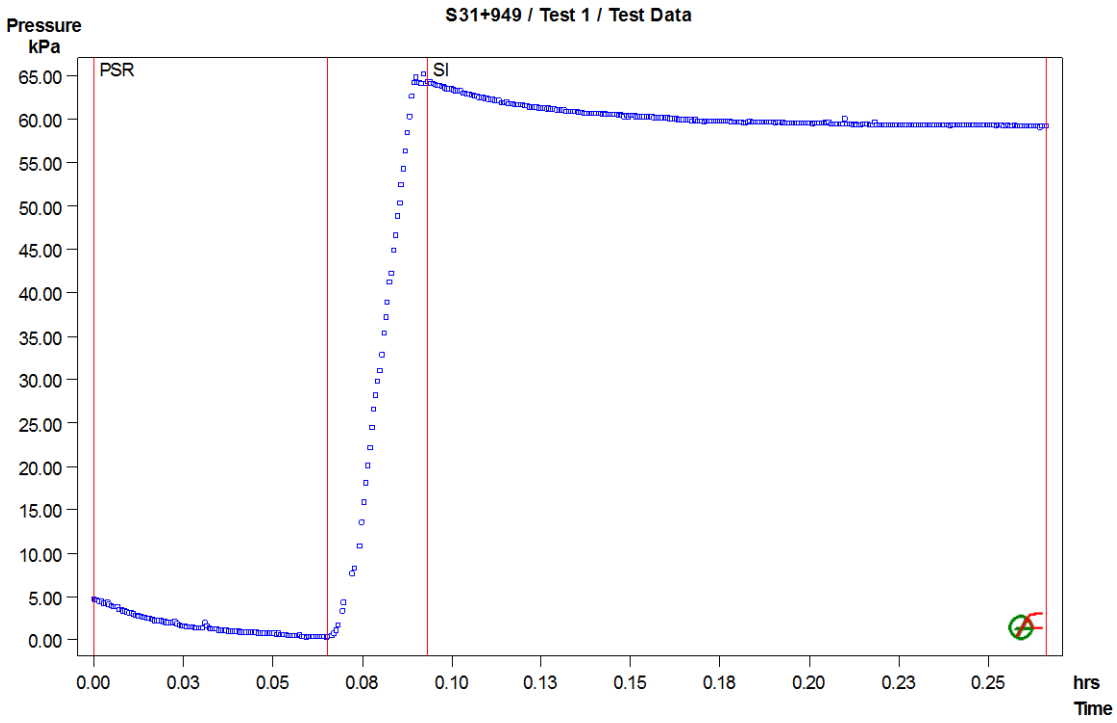



Figure 1: Pressure response and sequence definition

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | S-31+949 |
| Test Name | Test 2 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 10.70 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 7.04 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 71.858 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 4.23 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.06278 | 0.46 | -63.8 * | | 1.9e-06 |
| SI | Slug | 0.09111 | 64.28 | 0.5 | | 1.9e-06 |

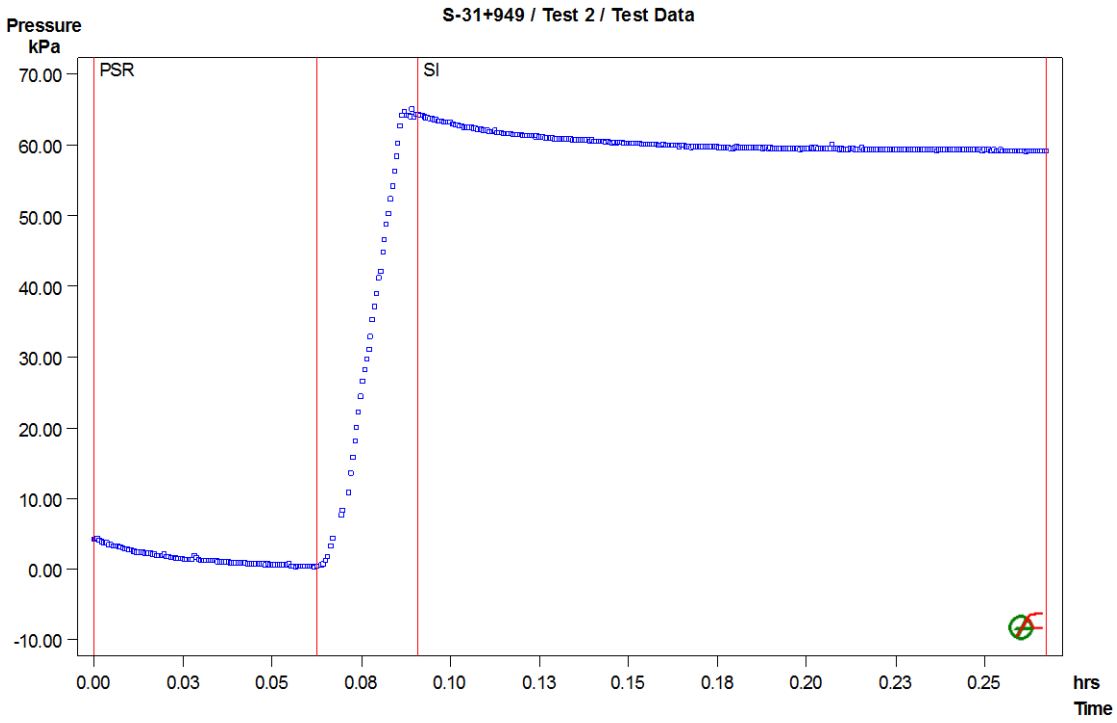



Figure 1: Pressure response and sequence definition

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | Q-31+958.75 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 11.50 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with water level tape |
| | Assumed virtual transducer at bottom of borehole to calculate pressure response |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 7.84 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 80.023 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 76.62 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.03333 | 76.62 | -38.2 * | | 1.9e-06 |
| SI | Slug | 0.05000 | 114.78 | 76.6 | | 1.9e-06 |

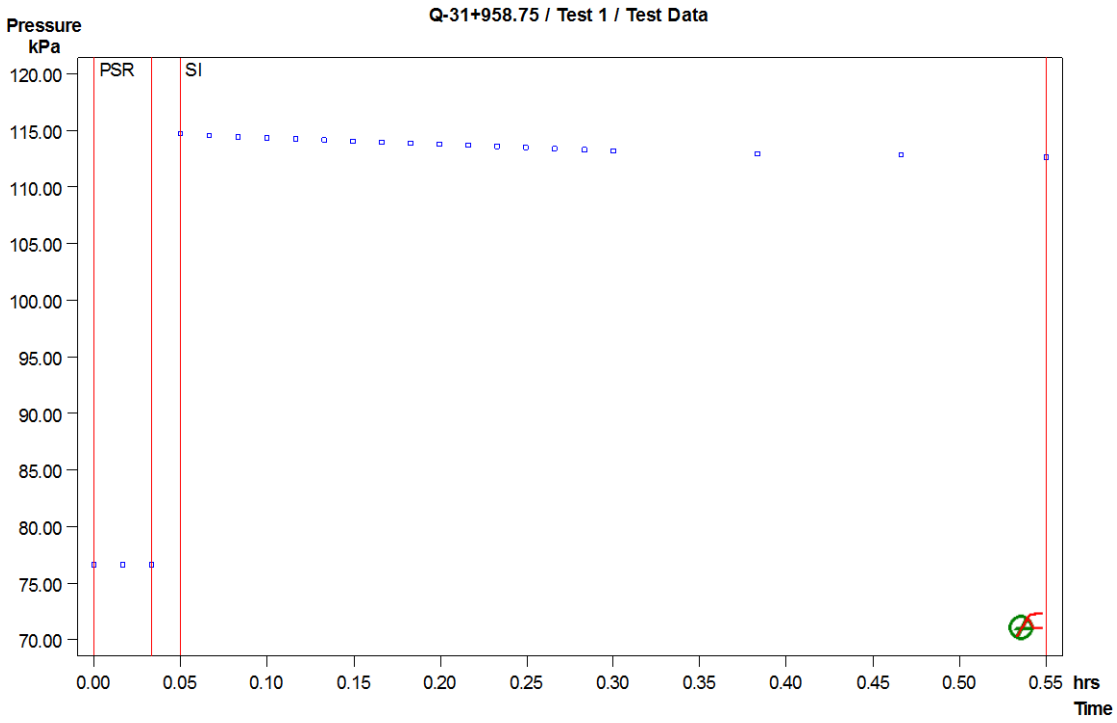



Figure 1: Pressure response and sequence definition

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | Q-31+967.75 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 12.50 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with water level tape |
| | Assumed virtual transducer at bottom of borehole to calculate pressure response |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 8.84 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 90.230 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 85.35 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.03333 | 85.35 | -39.2 * | | 1.9e-06 |
| SI | Slug | 0.05000 | 124.59 | 85.3 | | 1.9e-06 |

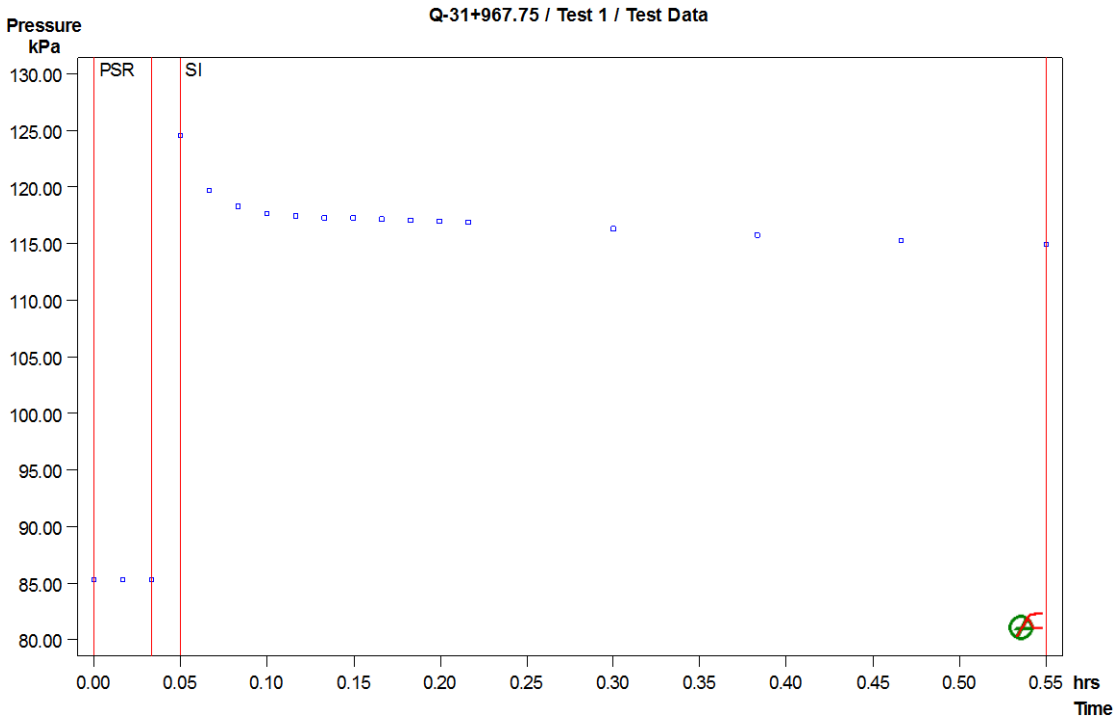



Figure 1: Pressure response and sequence definition

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | T-31+968.5 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 7.30 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 3.64 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 37.154 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 5.25 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.14556 | -0.22 | -94.5 * | | 1.9e-06 |
| SI | Slug | 0.17778 | 94.30 | -0.2 | | 1.9e-06 |

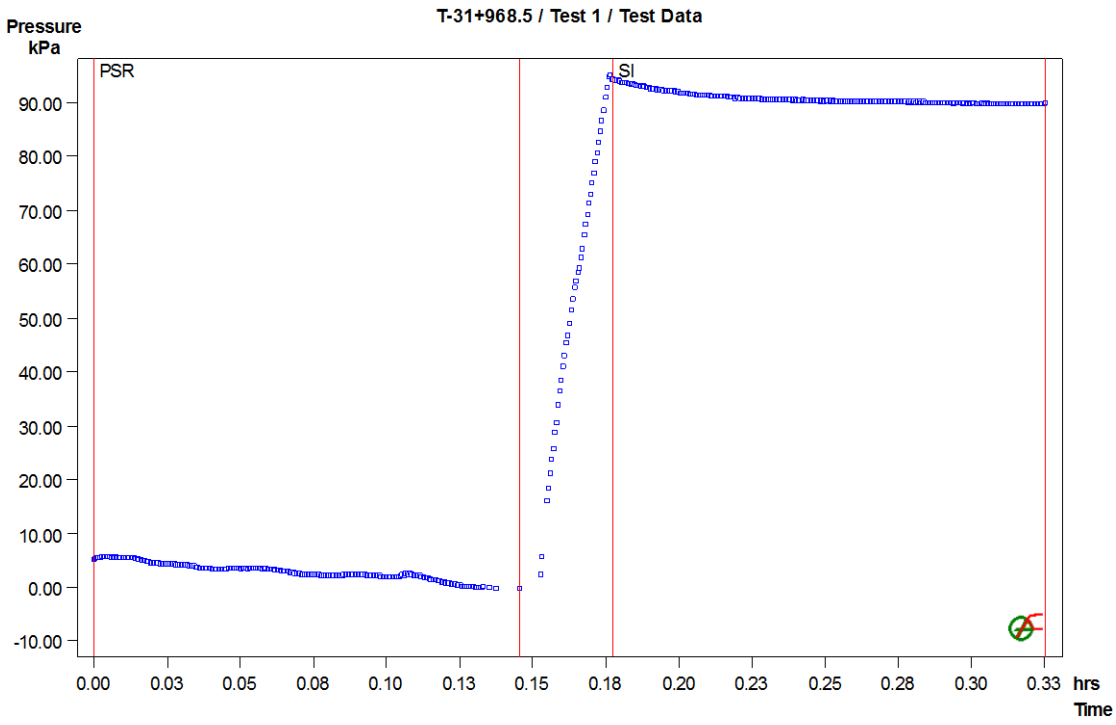



Figure 1: Pressure response and sequence definition

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | T-31+968.5 |
| Test Name | Test 2 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 11.00 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 7.34 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 74.920 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Variable Pressure | 0.00000 | 0.01 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.01944 | -0.35 | -57.0 * | | 1.9e-06 |
| SI | Slug | 0.03722 | 56.63 | -0.3 | | 1.9e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 0.01 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 2.0e-05 | 1.4e-05 | 5.00 | 2.0 |
| Shell 2 | 3.7e-07 | 1.4e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 6.3e-05 | 0.0 |
| SI-Init | 1.9e-06 | 0.0 |
| SI | 1.9e-06 | 0.0 |

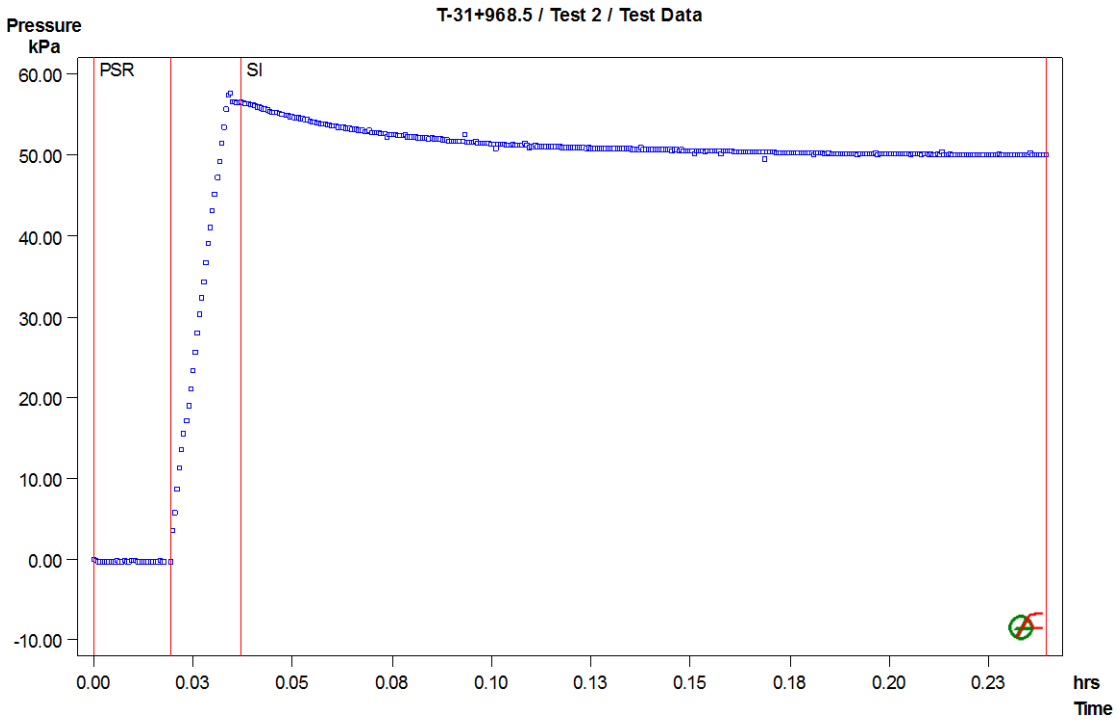



Figure 1: Pressure response and sequence definition

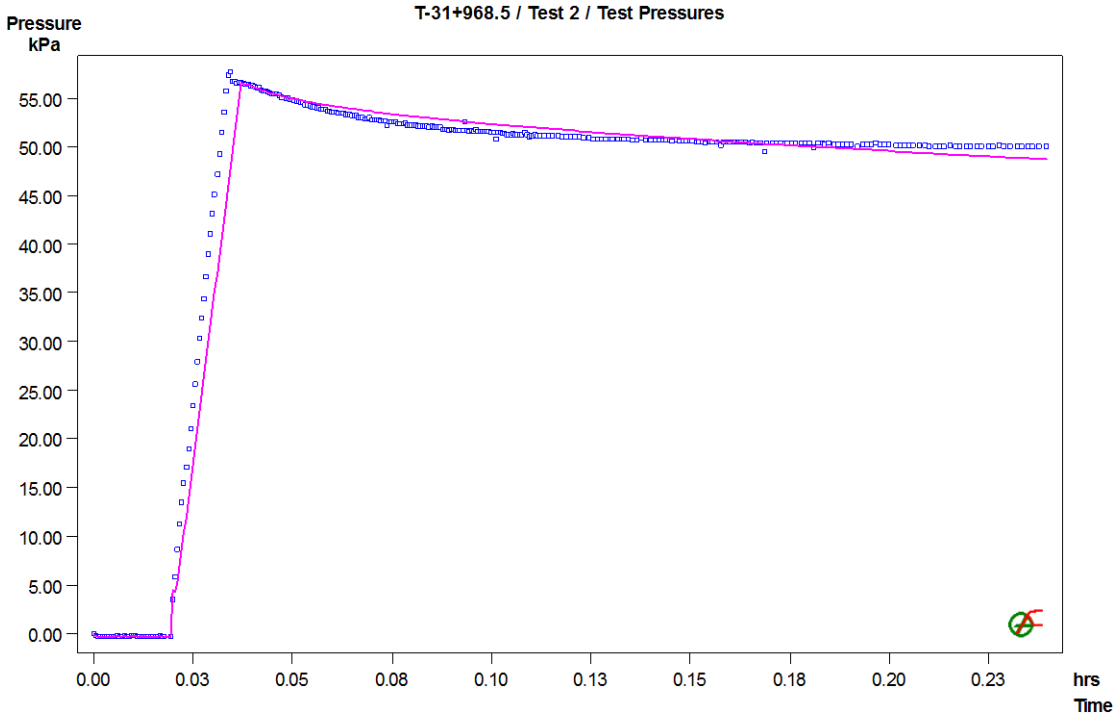



Figure 2: Pressure response and simulation: cartesian plot

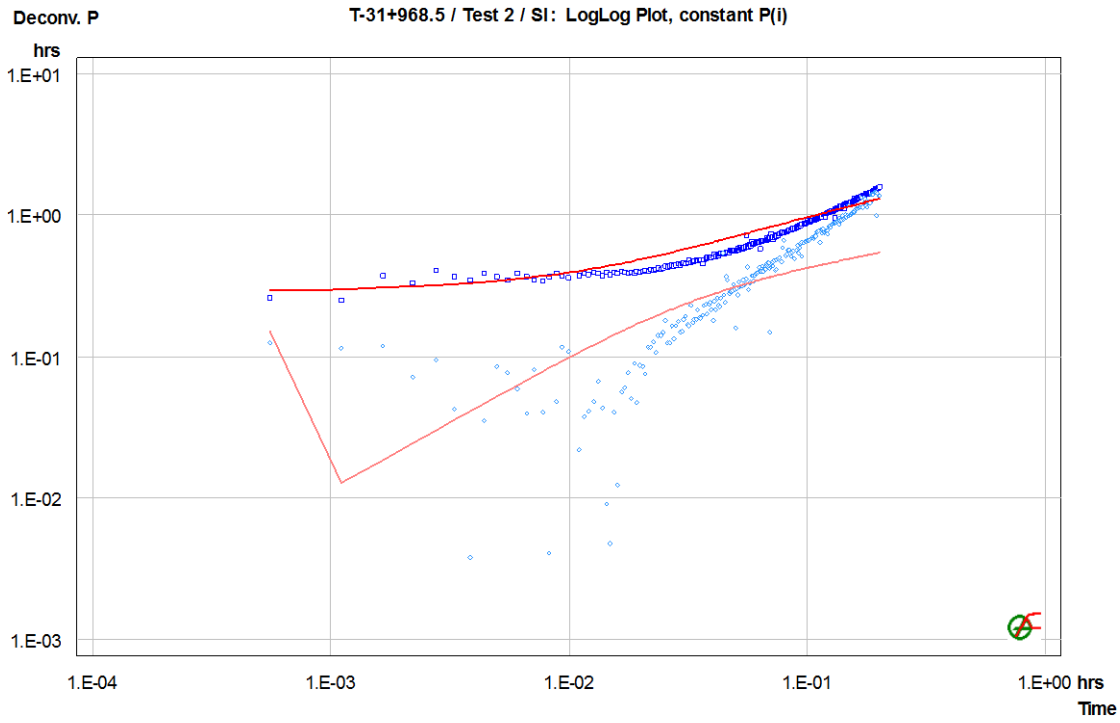



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SI sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | Q-31+976.75 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 13.41 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with water level tape |
| | Assumed virtual transducer at bottom of borehole to calculate pressure response |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 9.75 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 99.519 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 95.75 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.03333 | 95.75 | -37.8 * | | 1.9e-06 |
| SI-a | Slug | 0.05000 | 133.51 | 95.8 | | 1.9e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 95.75 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 1.1e-03 | 1.9e-05 | 16.88 | 2.0 |
| Shell 2 | 1.3e-06 | 1.9e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 6.2e-05 | 0.0 |
| SI-Init | 1.9e-06 | 0.0 |
| SI-a | 1.9e-06 | 0.0 |

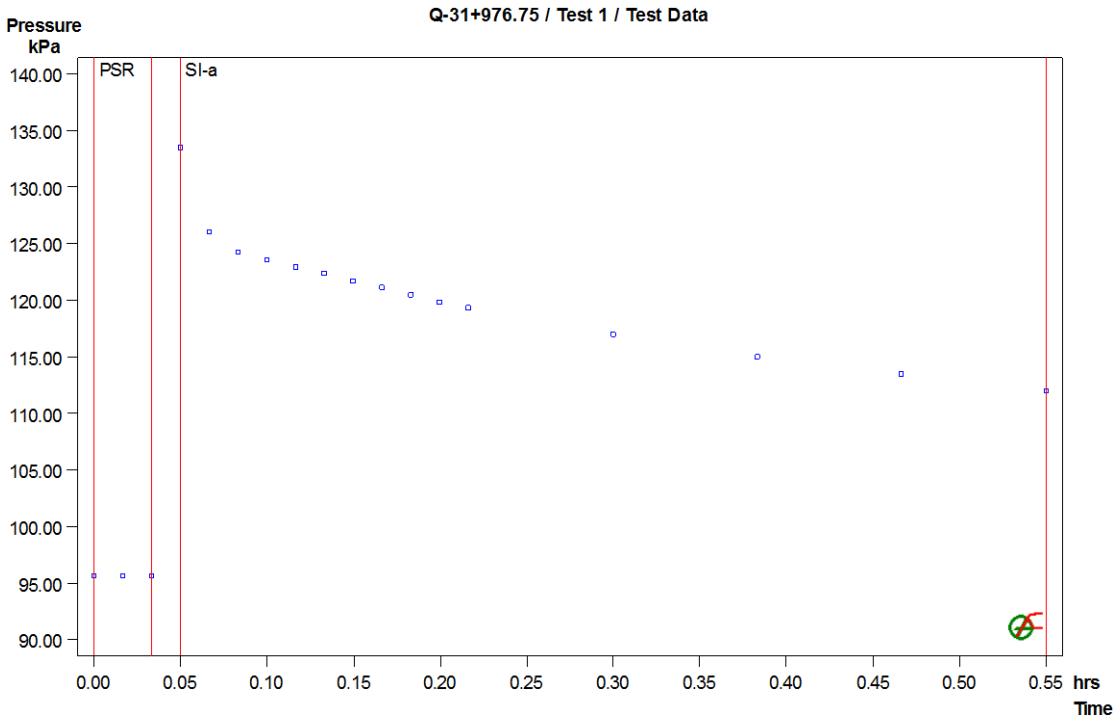



Figure 1: Pressure response and sequence definition

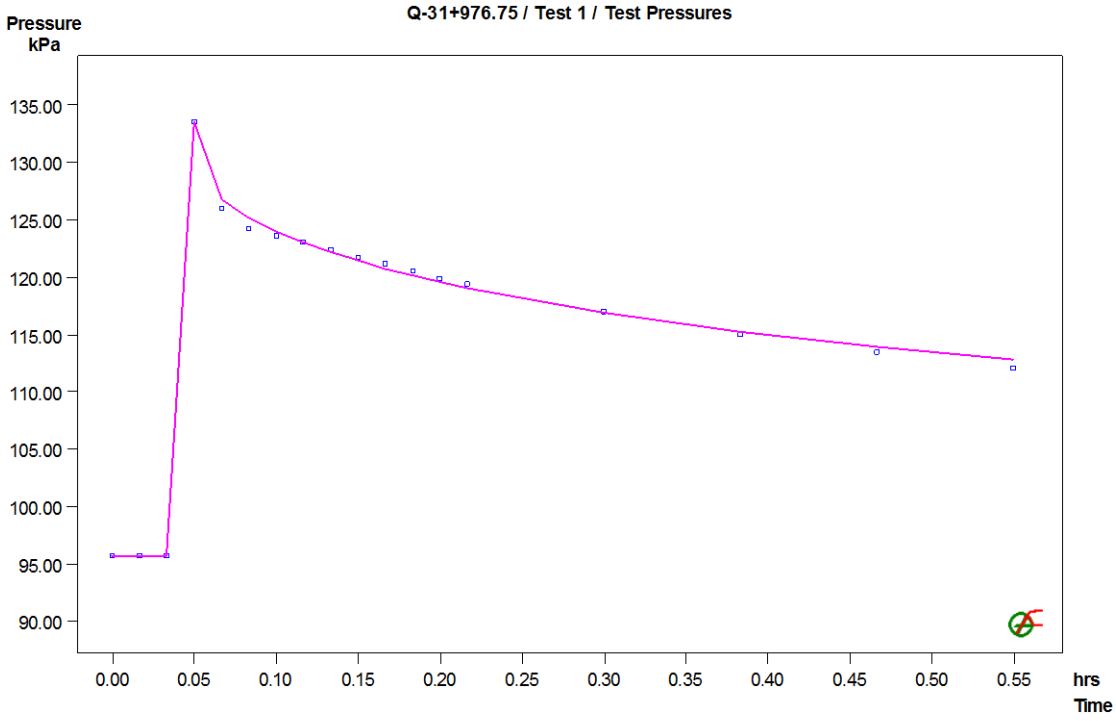



Figure 2: Pressure response and simulation: cartesian plot

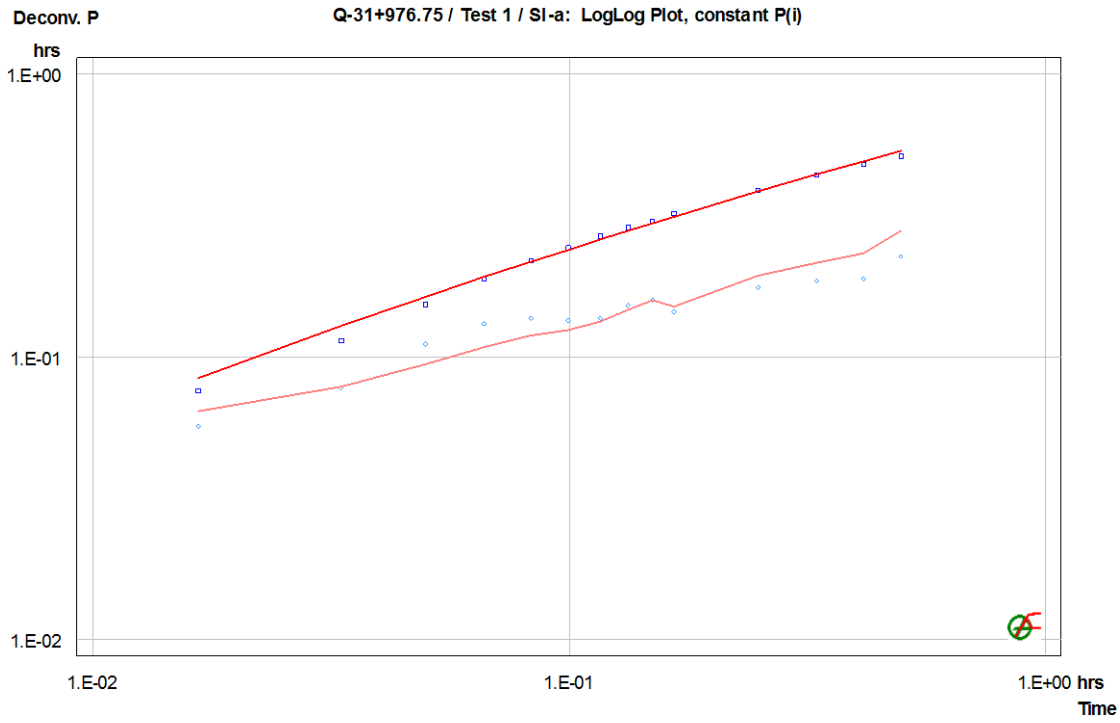



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SI-a sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | Q-32+006.75 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 13.70 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with water level tape |
| | Assumed virtual transducer at bottom of borehole to calculate pressure response |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 10.04 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 102.479 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 98.49 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.03333 | 98.49 | -37.9 * | | 1.9e-06 |
| SI | Slug | 0.05000 | 136.36 | 98.5 | | 1.9e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 98.49 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 1.0e-02 | 2.0e-05 | 38.71 | 2.0 |
| Shell 2 | 1.4e-06 | 2.0e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 1.7e-05 | 0.0 |
| SI-Init | 1.9e-06 | 0.0 |
| SI | 1.9e-06 | 0.0 |

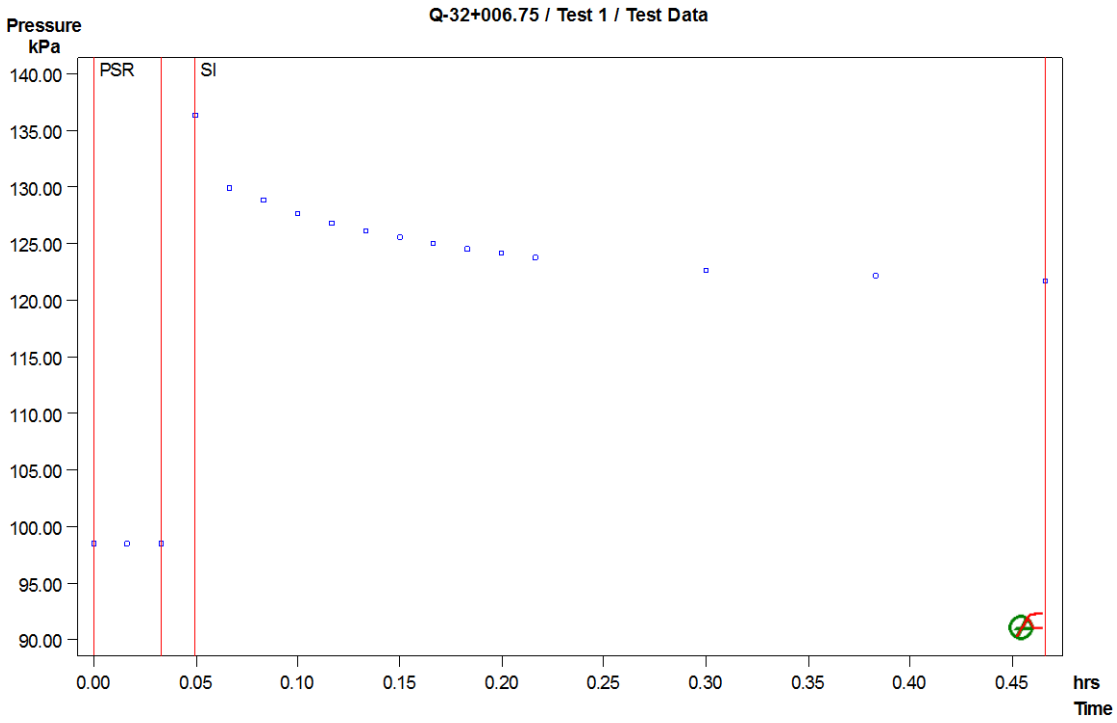



Figure 1: Pressure response and sequence definition

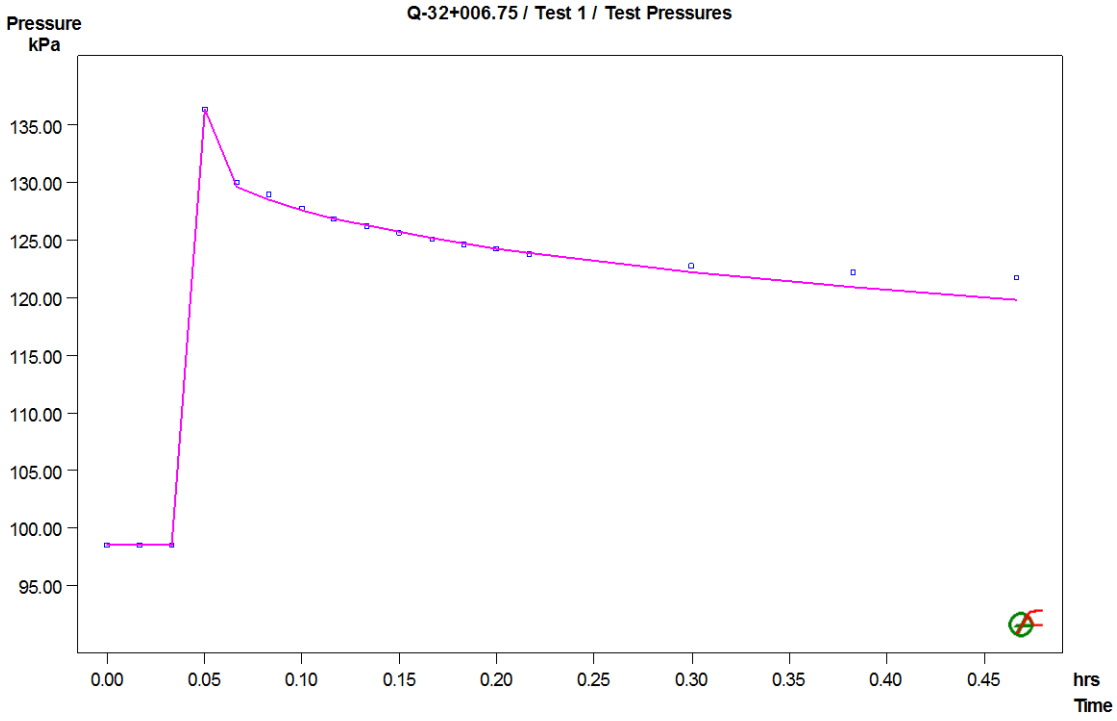



Figure 2: Pressure response and simulation: cartesian plot

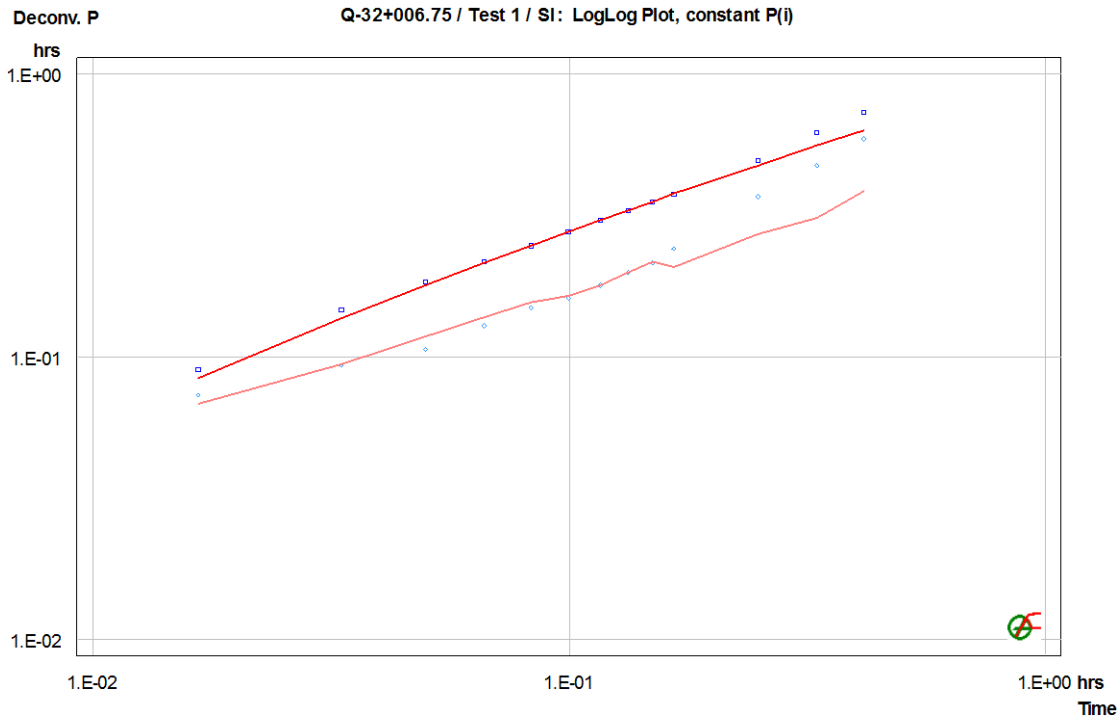



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SI sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | S-32+021 |
| Test Name | Test 2 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 16.40 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 12.74 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 130.038 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 102.37 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.06167 | 104.04 | -48.5 * | | 1.9e-06 |
| SI-a | Slug | 0.08389 | 152.49 | 104.0 | | 1.9e-06 |
| SI-b | Variable Pressure | 0.32889 | 142.50 | | | 1.0e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 108.07 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 1.0e-02 | 2.5e-05 | 2.74 | 2.0 |
| Shell 2 | 1.2e-06 | 2.5e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 1.4e-12 | 0.0 |
| SI-Init | 1.9e-06 | 0.0 |
| SI-a | 1.9e-06 | 0.0 |
| SI-b | 1.0e-06 | 0.0 |

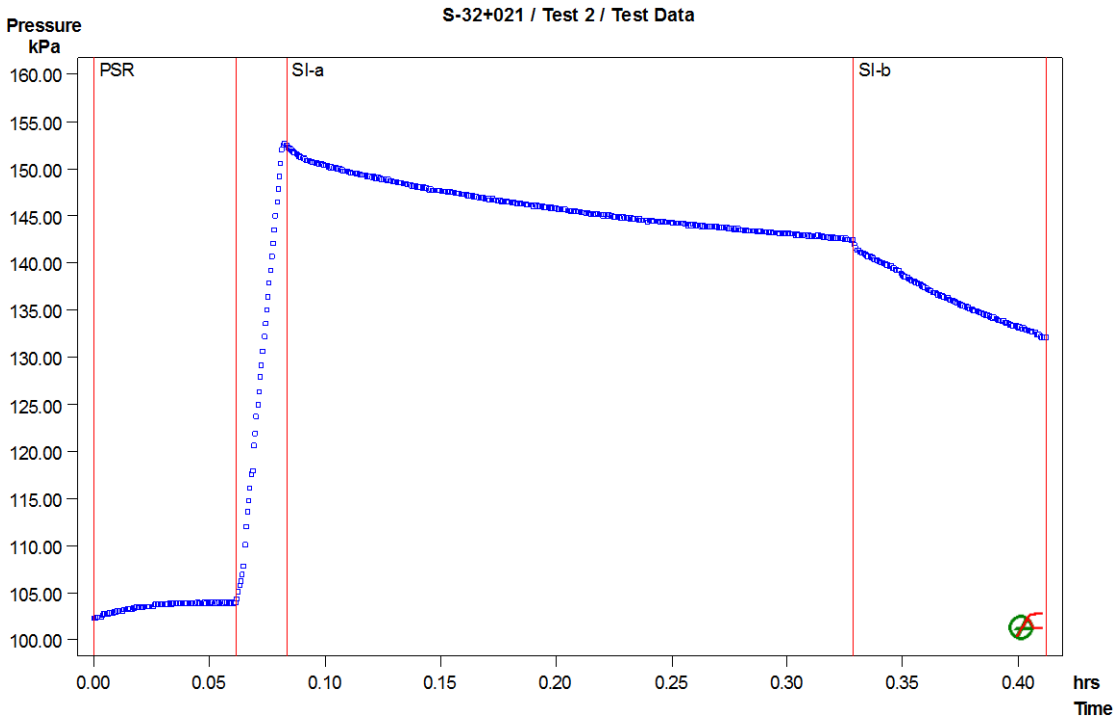



Figure 1: Pressure response and sequence definition

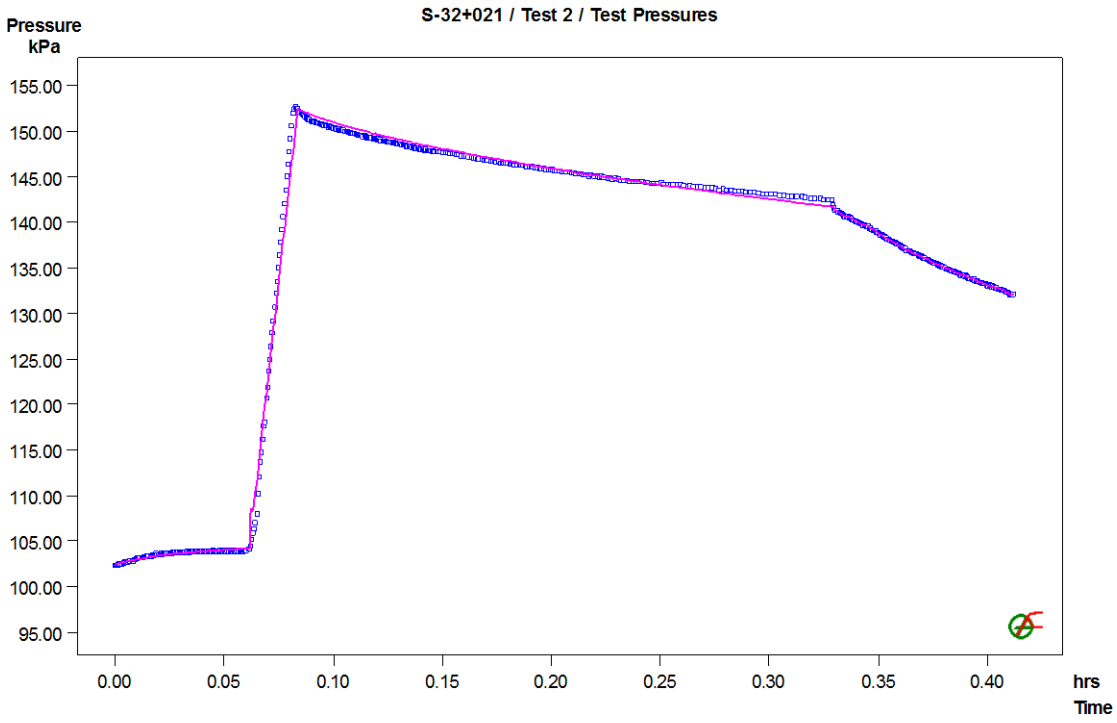



Figure 2: Pressure response and simulation: cartesian plot

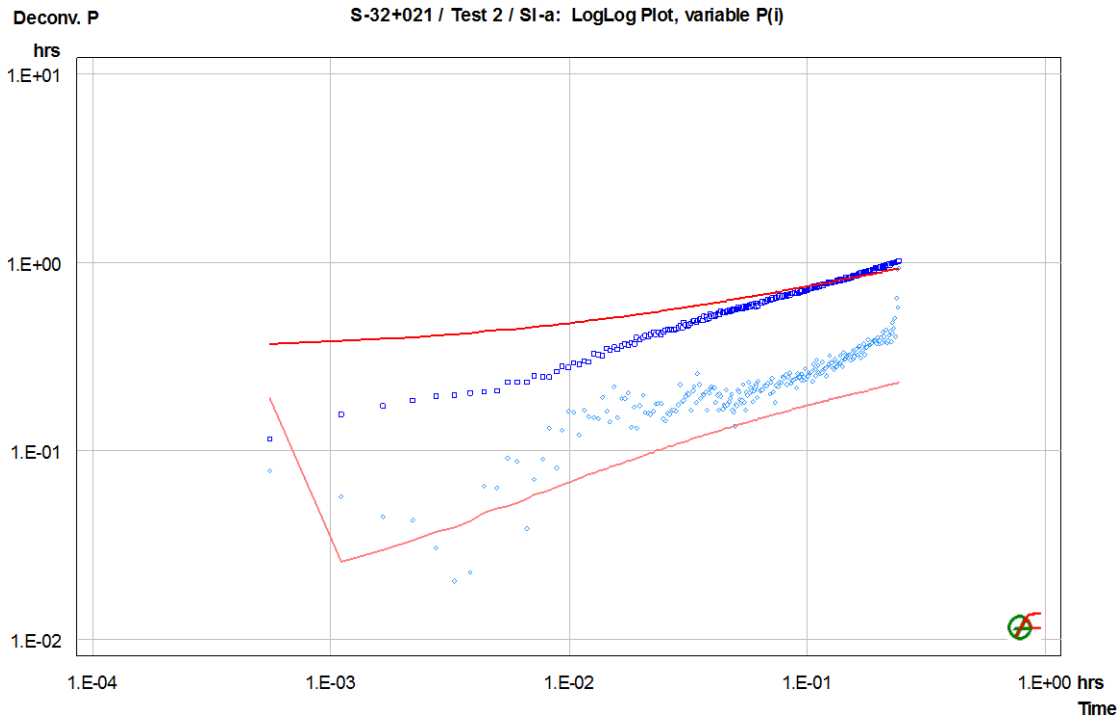



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SI-a sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | S-32+039 |
| Test Name | Test 1 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 9.45 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 5.79 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 59.099 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 18.17 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.03444 | 18.86 | -58.7 * | | 1.9e-06 |
| SI | Slug | 0.05944 | 77.60 | 18.9 | | 1.9e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 20.74 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 3.9e-06 | 1.1e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 1.5e-07 | 0.0 |
| SI-Init | 1.9e-06 | 0.0 |
| SI | 1.9e-06 | 0.0 |

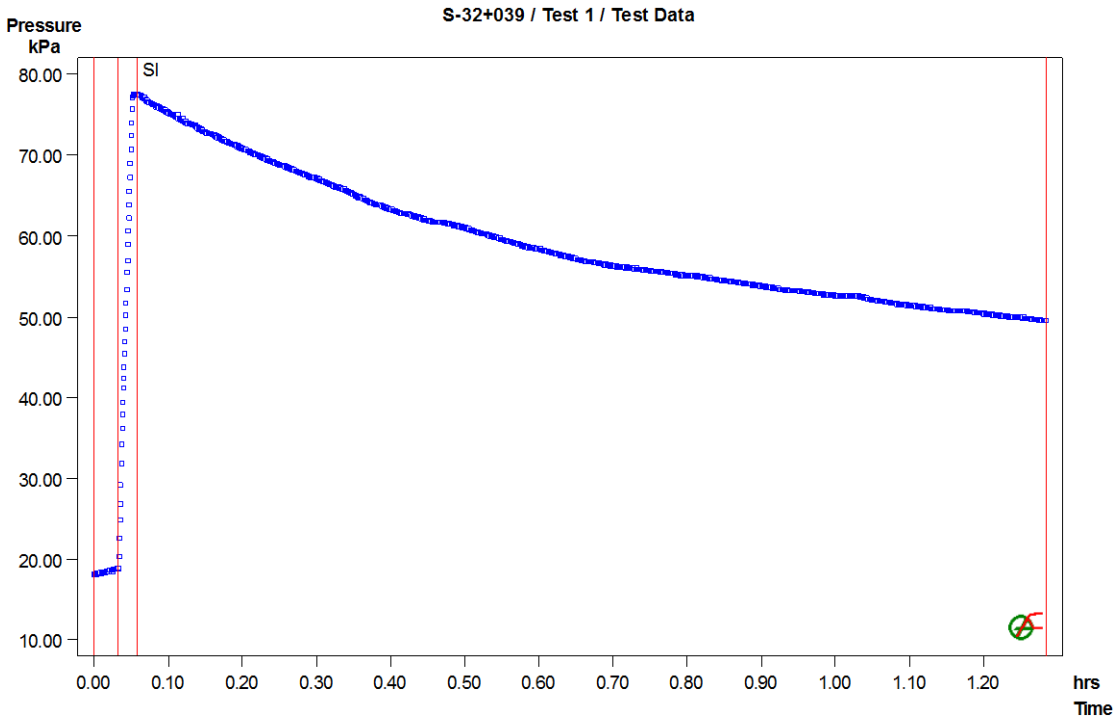



Figure 1: Pressure response and sequence definition

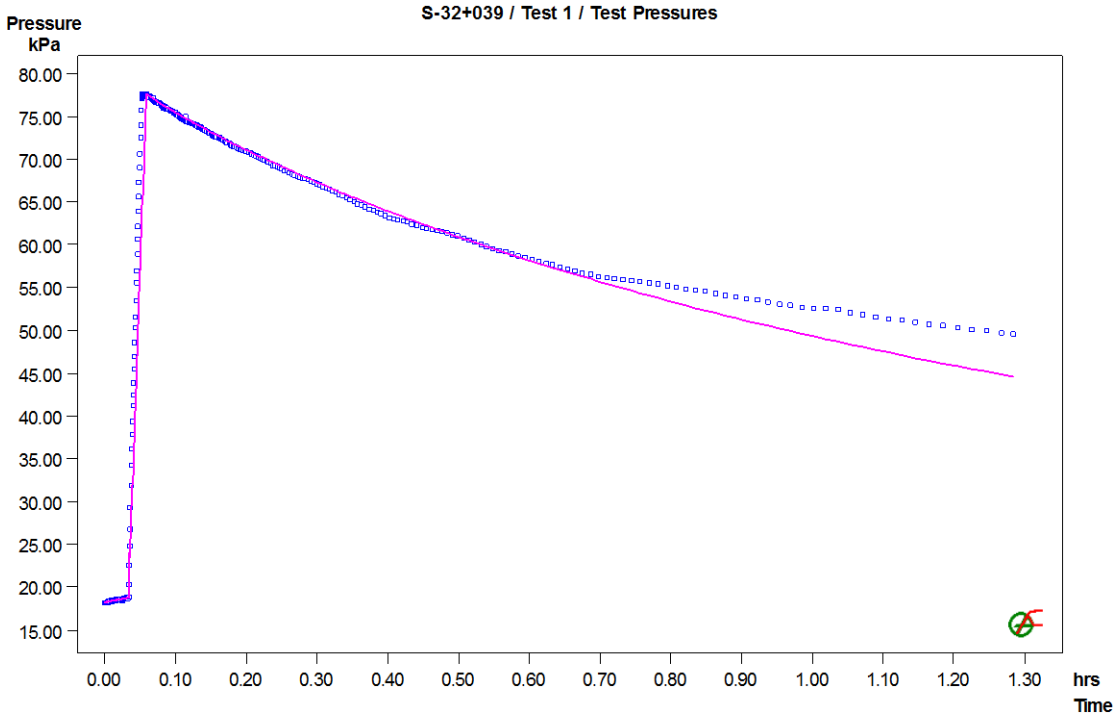



Figure 2: Pressure response and simulation: cartesian plot

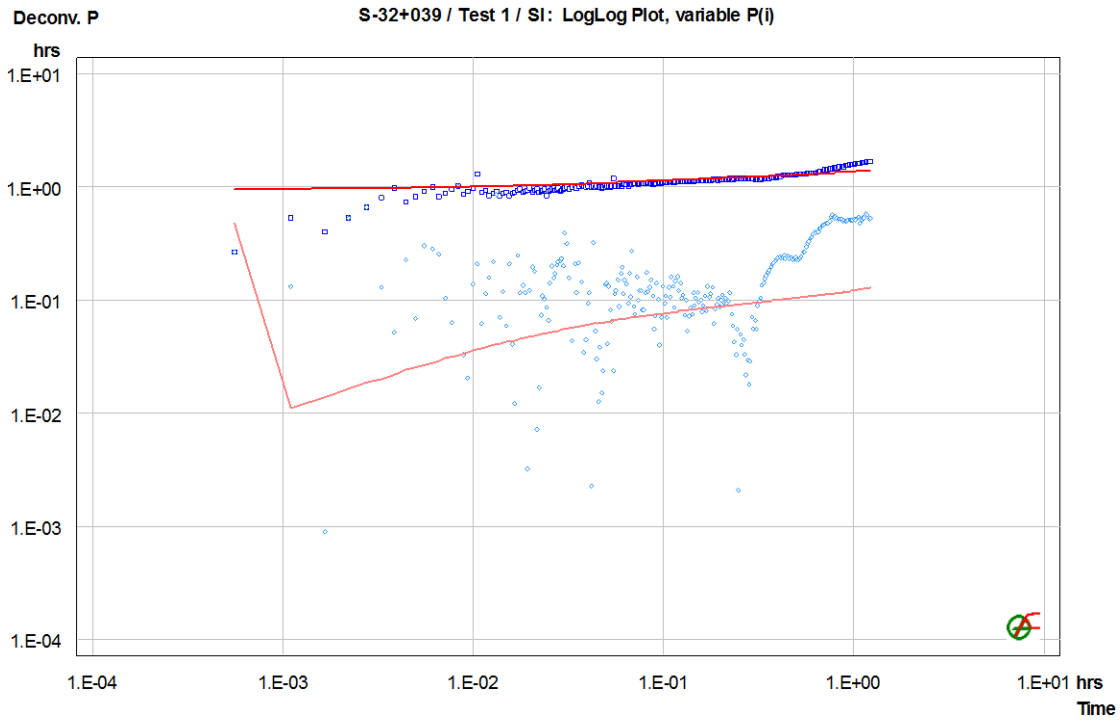



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SI sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dike |
| Source Well | S32+039 |
| Test Name | Test 2 |
| Test Date/Time | |
| Interval | top: 3.66 m bottom: 18.90 m |
| Description | Falling head test |
| | Open hole, no packers |
| | Measured with pressure transducer |
| | Pressure response shows effective water column above transducer |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 15.24 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.057 m | Tubing Radius | 0.076 m |
| Inclination | 0.0 deg | | |
| Test Volume | 155.555 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 44.41 | | | 1.9e-06 |
| SI-Init | dP-Event | 0.02833 | 45.69 | -62.4 * | | 1.9e-06 |
| SI | Slug | 0.07111 | 108.06 | 45.7 | | 1.9e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 83.30 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 3.1e-04 | 3.0e-05 | 3.06 | 2.0 |
| Shell 2 | 7.5e-06 | 3.0e-05 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 4.4e-06 | 0.0 |
| SI-Init | 1.9e-06 | 0.0 |
| SI | 1.9e-06 | 0.0 |

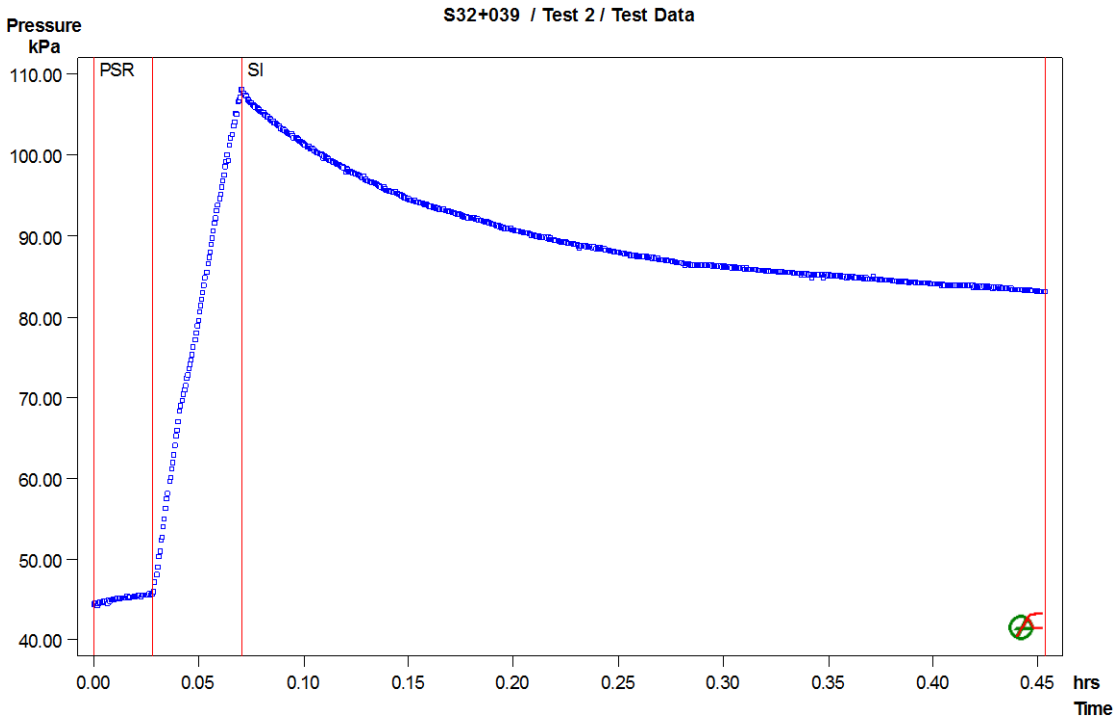



Figure 1: Pressure response and sequence definition

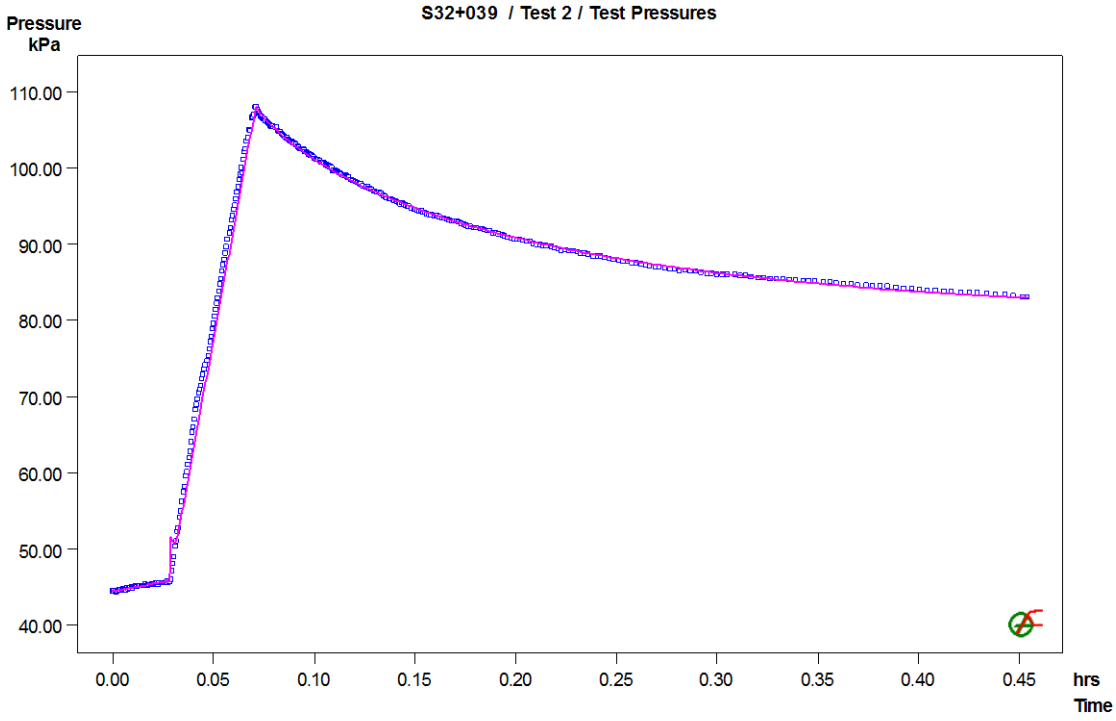



Figure 2: Pressure response and simulation: cartesian plot

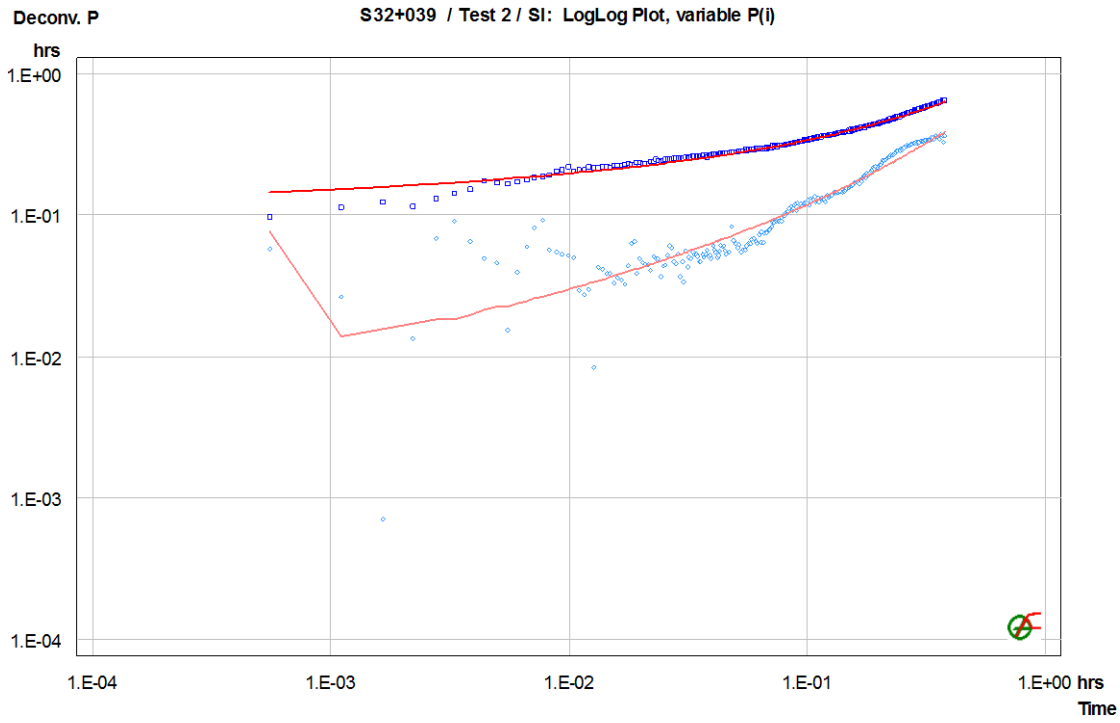



Figure 3: Deconvolved pressure response, derivative and simulation: Log-Log diagnostic plot, SI sequence

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dyke |
| Source Well | 32+069.75 |
| Test Name | Test 1 |
| Test Date/Time | 07/07/2011, 12:00 |
| Interval | top: 11.00 m bottom: 15.40 m |
| Description | Open Hole Test |
| | Assuming that water level moves only within 4.5" ID diameter casing |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 4.40 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.044 m | Tubing Radius | 0.057 m |
| Inclination | 0.0 deg | | |
| Test Volume | 27.311 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## Sequence Definition

| ame | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 31.50 | | | 1.0e-06 |
| SI-Init | dP-Event | 0.18611 | 33.84 | -97.6 * | | 1.0e-06 |
| SI | Slug | 0.21111 | 131.43 | 33.8 | | 1.0e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 37.52 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 9.3e-03 | 8.6e-06 | 1.00 | 2.0 |
| Shell 2 | 4.2e-07 | 8.6e-06 | 8.00 | 2.0 |
| Shell 3 | 2.4e-08 | 8.6e-06 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 2.3e-08 | 0.0 |
| SI-Init | 1.0e-06 | 0.0 |
| SI | 1.0e-06 | 0.0 |

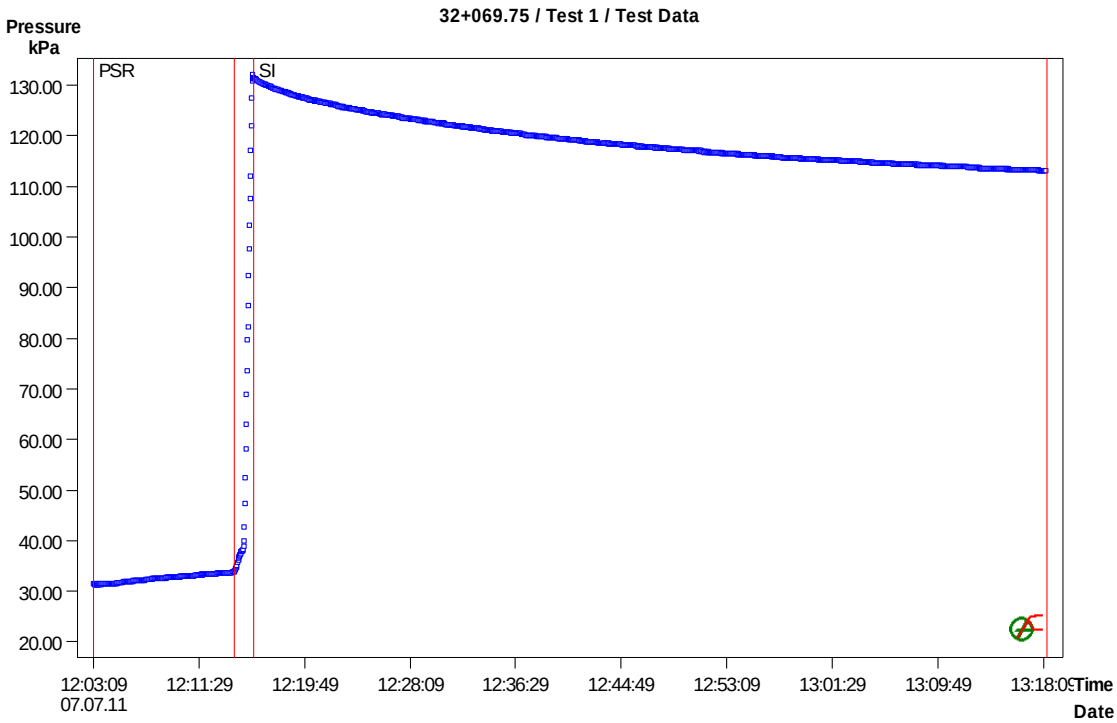



Figure 1: Pressure response and sequence definition

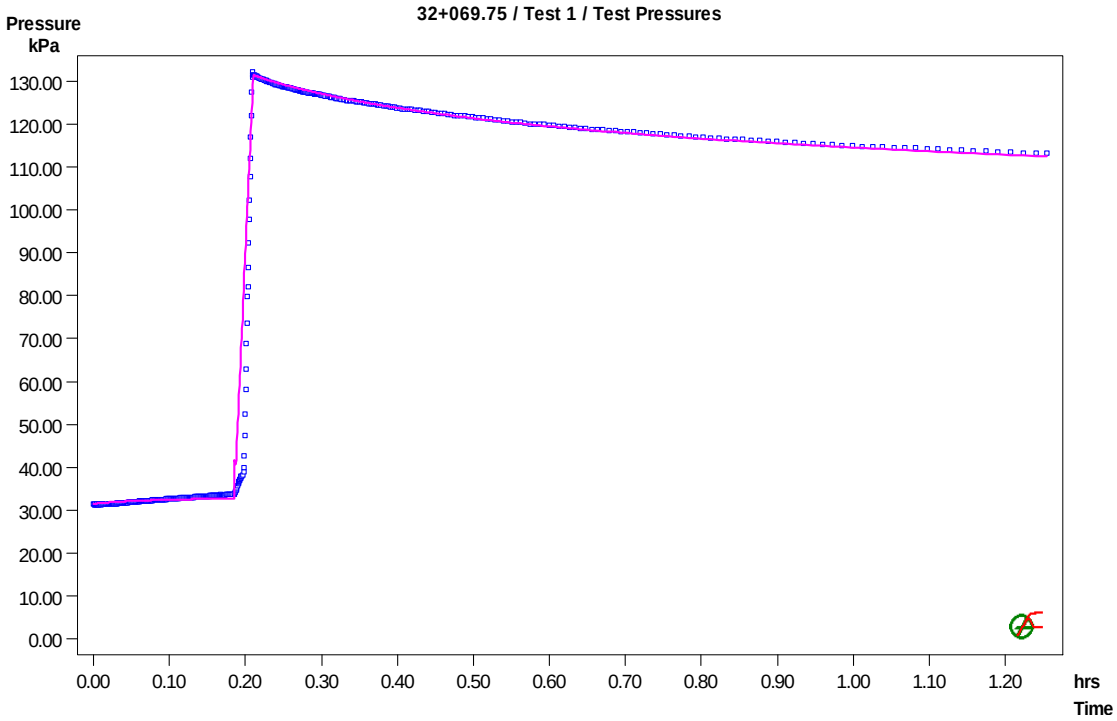



Figure 2: Pressure response and simulation: cartesian plot

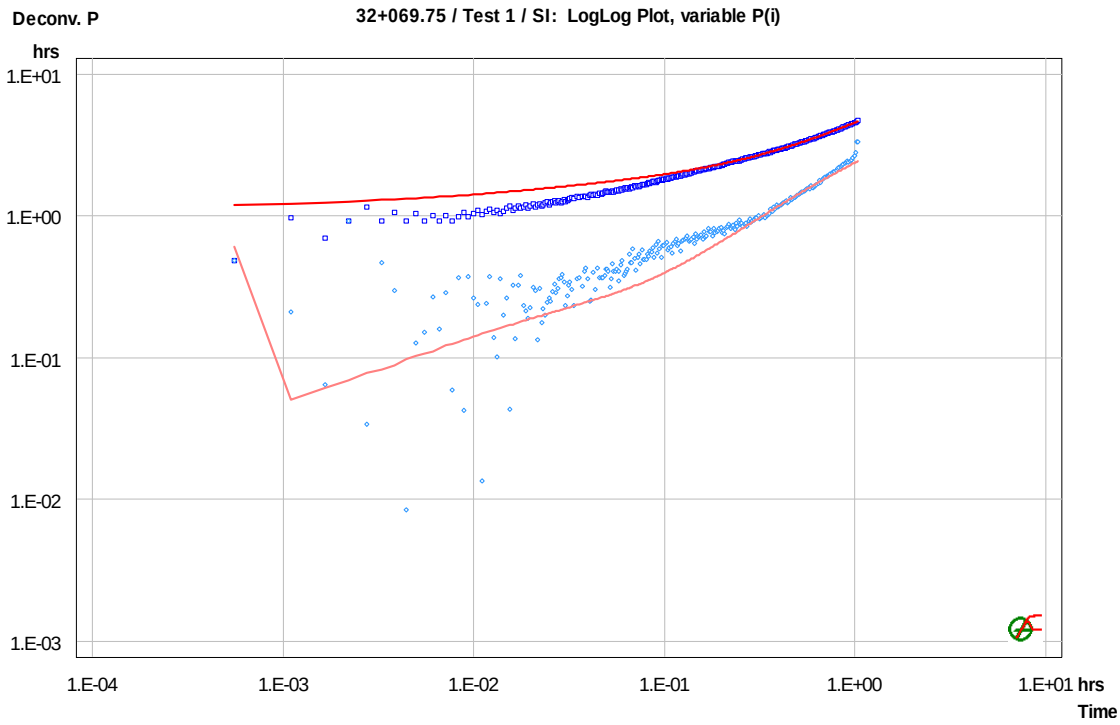
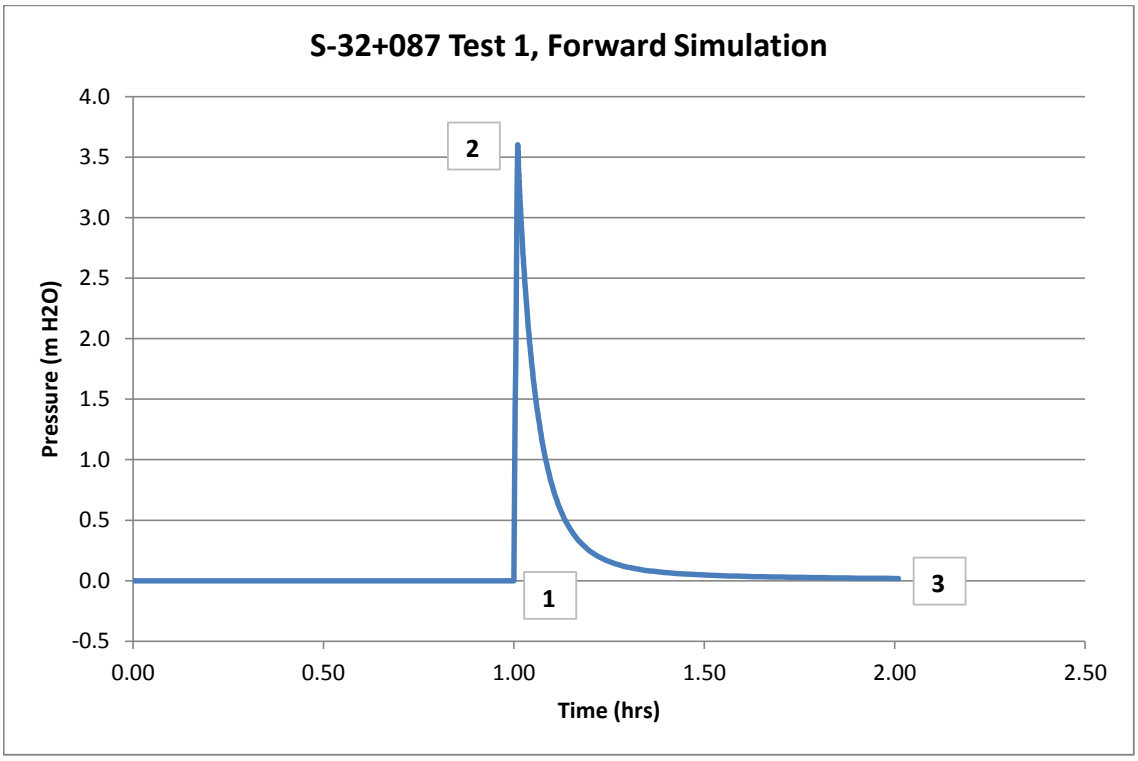



Figure 3: Pressure response, derivative and simulation: Log-Log diagnostic plot, SI-sequence




**Observation Points**

| | |
|---|---|
| 1 | Static water level |
| 2 | Changed pressure by 3.6 m (filled casing with water) |
| 3 | Water level dropped to 3.6 m below casing after 1 hr |

**Test Interval**

| | |
|---|---|
| Top (m bgs) | 10.2 |
| Bottom (m bgs) | 14.3 |
| Length (m) | 4.1 |
| | |
| Tubing radius (m) | 0.0762 |

**Parameters**

| | |
|---|---|
| T (m2/s) | 1.E-04 |
| K (m/s) | 2.E-05 |

# HYDROBENCH REPORT

| | |
|---|---|
| Project | Meadowbank |
| Site | Bay Goose Dyke |
| Source Well | 32+098.25 |
| Test Name | Test 1 |
| Test Date/Time | 07/07/2011, 18:30 |
| Interval | top: 9.70 m bottom: 12.90 m |
| Description | Open hole test |
| | assuming that water level only moves inside 4.5" ID casing |

## Basic Data

| | | | |
|---|---|---|---|
| Test Interval | 3.20 m | | |
| Porosity | 0.10 | | |
| Well Radius | 0.044 m | Tubing Radius | 0.057 m |
| Inclination | 0.0 deg | | |
| Test Volume | 19.908 l | | |
| Well Type | Source | | |

## Fluid Properties

| | |
|---|---|
| Viscosity | 0.001 Pa*s |
| Density | 1000.0 kg/m³ |
| Compressibility | 2.0e-09 1/Pa |

## History Definition

| Name | Category | Duration [hrs] | P(o) [kPa] | Rate [l/min] | C [m³/Pa] | Skin |
|---|---|---|---|---|---|---|
| Auto_History | Const. Pressure | 0.50 | 13.36 | | | 0.00 |

## Sequence Definition

| Name | Category | t(o) [hrs] | P(o) [kPa] | P(i) [kPa] | Rate [l/min] | C [m³/Pa] |
|---|---|---|---|---|---|---|
| PSR | Recovery | 0.00000 | 13.36 | | | 1.0e-06 |
| SI-Init | dP-Event | 0.87611 | 32.61 | -72.8 * | | 1.0e-06 |
| SI | Slug | 0.88722 | 105.41 | 32.6 | | 1.0e-06 |

## Analysis Results

**Analysis "SI_Final"**

Static Pressure: 77.91 kPa

Shell Parameters:

| Name | Transmissivity [m²/s] | Storativity [-] | Radius [m] | Flow Dimension [-] |
|---|---|---|---|---|
| Shell 1 | 8.1e-06 | 6.3e-06 | 12.41 | 2.0 |
| Shell 2 | 1.7e-06 | 6.3e-06 | 25.01 | 2.0 |
| Shell 3 | 1.2e-03 | 6.3e-06 | - - | 2.0 |

Sequence Parameters:

| Name | Wellbore Storage [m³/Pa] | Skin [-] |
|---|---|---|
| PSR | 4.9e-06 | 0.0 |
| SI-Init | 1.0e-06 | 0.0 |
| SI | 1.0e-06 | 0.0 |

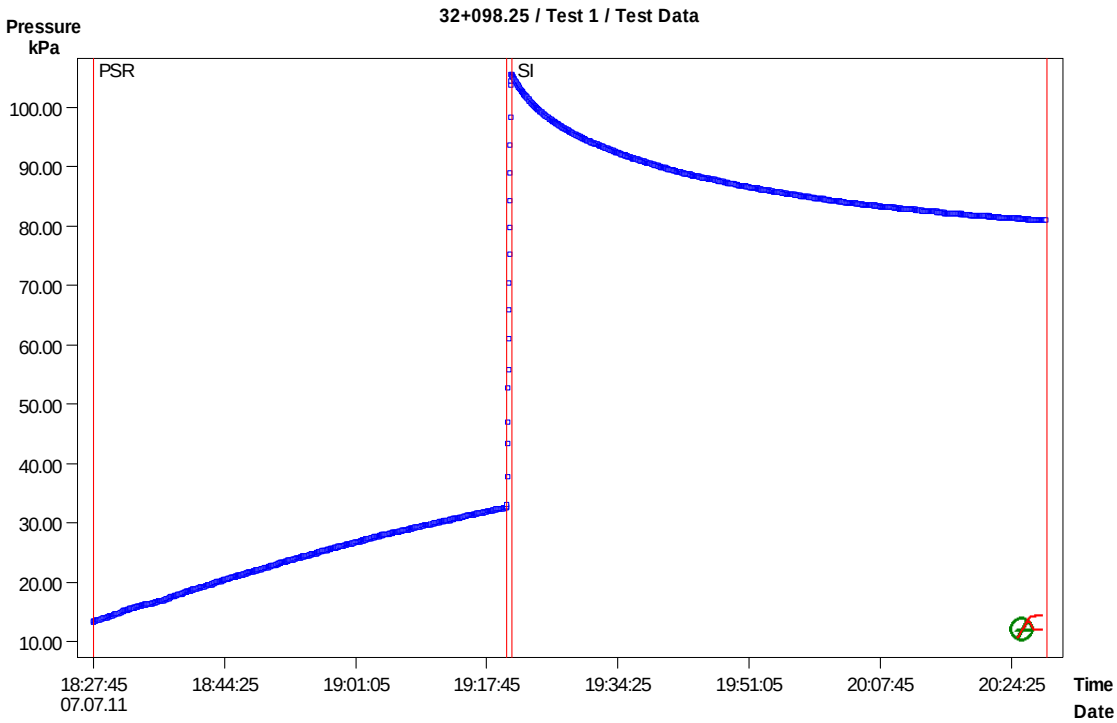



Figure 1: Pressure response and sequence definition

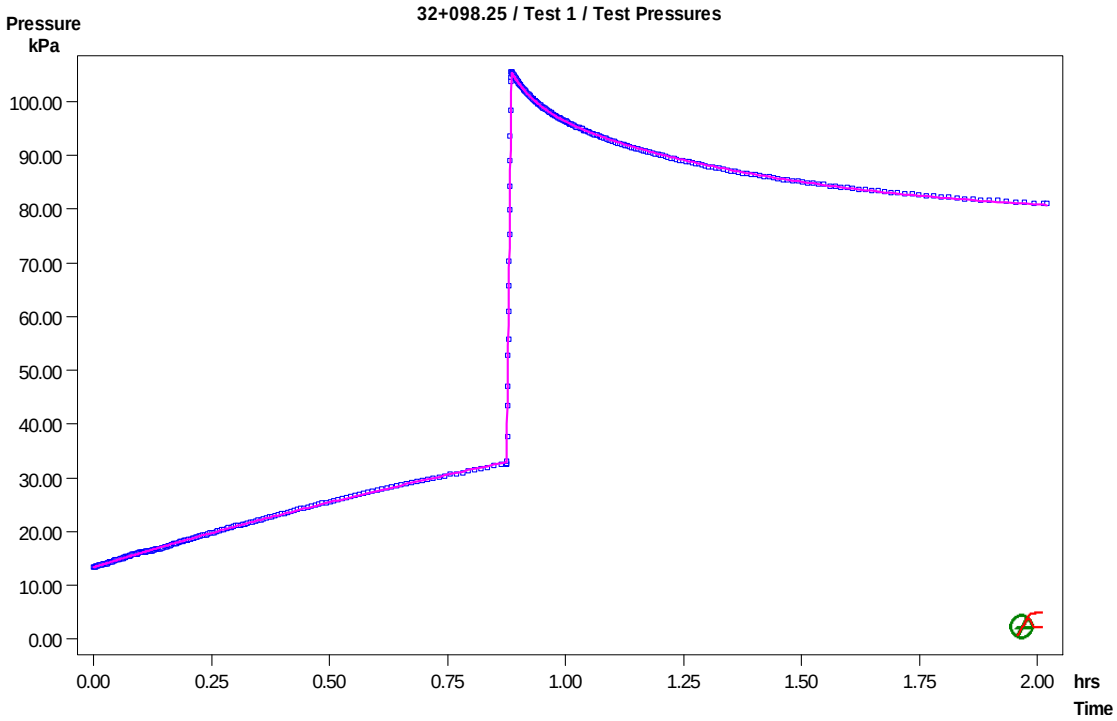



Figure 2: Pressure response and simulation: cartesian plot

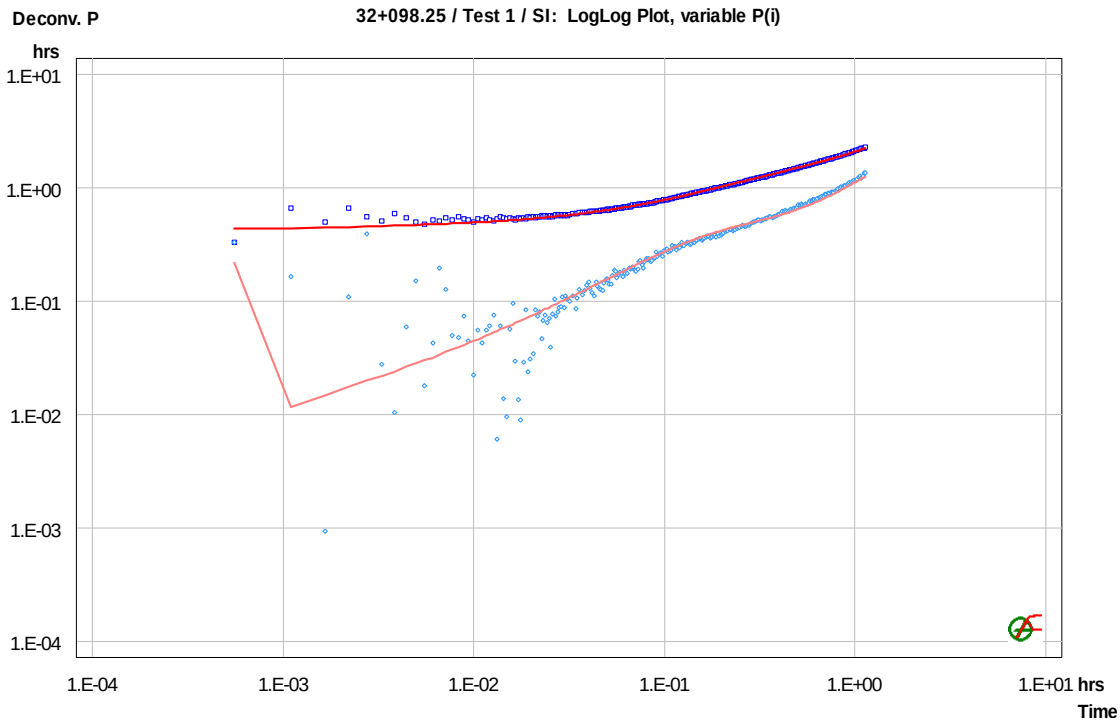



Figure 3: Pressure response, derivative and simulation: Log-Log diagnostic plot, SI-sequence

# E2-9 Large Diameter Probe Hole Investigation Program

- Summary of Program
- Permeability Testing Reports

## Summary of Program

**DATE** March 4, 2011 **PROJECT No.** 09-1428-5007 / 2000

**TO** Fiona Esford and Michel Julien
Golder Associates Ltd

**CC** Grant Bonin, Vafa Rombough

**FROM** Cortney Palleske **EMAIL** cpalleske@golder.com

## CHANNEL 2 10" DIAMETER PROBE HOLE INVESTIGATION

**31+938.6 (on centreline)**

Drilling of this hole was not observed. However, hole was reported to be dry (confirmed by inspection of cuttings). No voids were noted during drilling. No water table measured by water level tape, post-drilling.

**31+ 910 (on centreline)**

| Depth (ft bgs) | Description |
|---|---|
| 0 – 6' | Coarse, angular, frozen gravel/shot rock |
| 6' – 10' | Silt with sand and gravel. Frozen |
| 10' – 27' | Brown-grey, moist sandy, gravelly SILT |

Hole was observed to be dry. No voids noted.

**31+875.2 (possibly off centreline by about 0.5 m)**

| Depth (ft bgs) | Description |
|---|---|
| 0 – 5' | Coarse, angular, frozen gravel/shot rock |
| 5' – 9' | Silt with sand and gravel. Frozen |
| 9' – 20' | Brown-grey, moist sandy SILT some gravel fragments |
| 20' – 22' | Brown, wet sandy, gravelly SILT |
| 22' – 29' | Brown, saturated sand and gravel (finer material suspended in fluid) |

Water observed at 7.37 mbgs (approx 22'). No voids noted.

Portion of hole may have been upstream of wall. To be confirmed by survey and AutoCAD plotting.

**31+850 (on centreline)**

| Depth (ft bgs) | Description |
|---|---|
| 0 – 5' | Coarse, angular, frozen gravel/shot rock |
| 5' – 9' | Frozen sand/silt some gravel |
| 9' | Ice lens |
| 9' – 15' | Brown, moist sandy, silt with gravel |
| 15' – 20' | Brown, moist sandy silt with gravel |
| 20' | Brown wet sand and gravel |
| 22' – 27' | Brown wet sandy, gravelly silt |

No water observed. No voids noted.

Cortney Palleske

f:\mb bg grouting\bay-goose dike\03_reports\02_jet grouting\13_qa drilling program\channel 2 investigation mar 4.docx

**DATE** March 5, 2011 **PROJECT No.** 09-1428-5007 / 2000

**TO** Fiona Esford and Michel Julien
Golder Associates Ltd.

**CC** Grant Bonin, Vafa Rombough

**FROM** Cortney Palleske **EMAIL** cpalleske@golder.com

## CHANNEL 2 - 10" DIAMETER PROBE HOLE INVESTIGATION

**Water Levels For 4 Holes Drilled on March 4**

| Location | Water Level |
|---|---|
| 31+938.6 | Dry |
| 31+910 | Dry |
| 31+875.2 | 3 mbgs |
| 31+850 | Dry |

**March 5 Drilling**

Two 10 inch diameter holes were drilled at stations 31+956.8 and 31+976.9 respectively. Drilling took place between 10:30 am and 12:30 pm and was not observed by Golder. Conditions encountered were reported to be the same as those encountered yesterday; frozen material at surface and silty sand and gravel below. No ice lenses or voids were encountered. Water was encountered in both holes.
Water levels are shown below.

| Location | Water Level @ 13:10 | Water Level @ 14:10 | Water Level @ 17:30 |
|---|---|---|---|
| 31+956.8 | 4.5 mbgs | 4.0 mbgs | 3.3 mbgs |
| 31+976.9 | 3.35 mbgs | 3.0 mbgs (approx lake level) | 3.0 mbgs (approx lake level) |

The results from the drilling were deemed as adequate evidence that large underground voids are unlikely to exist.

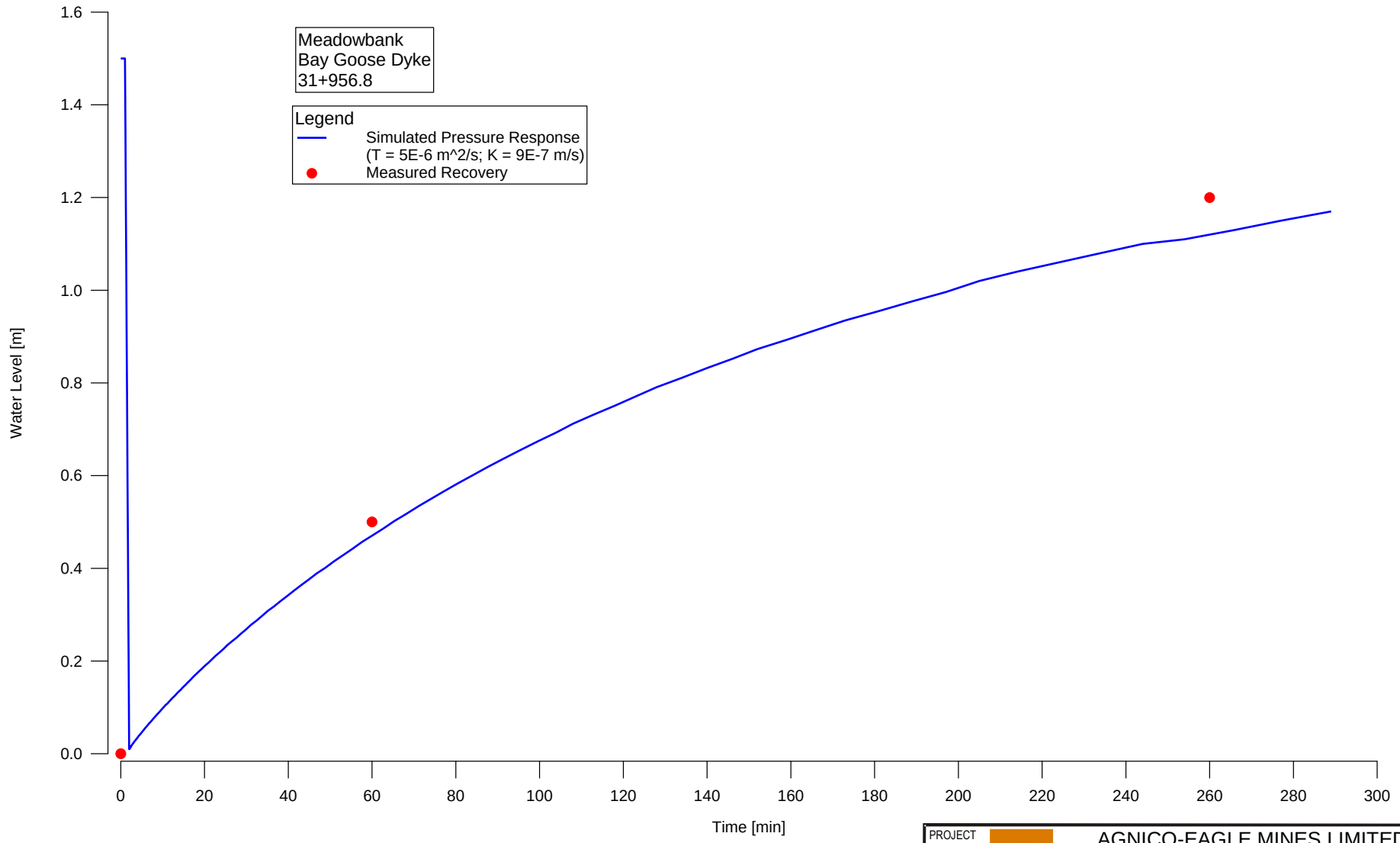
Further observation is expected to be carried out during future casing installation and tricone drilling in both Channel 2 and Channel 3.

Cortney Palleske

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# Permeability Testing Reports

O:\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E2-9\Figure E2-9 Hydrobench Results.ppt




PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

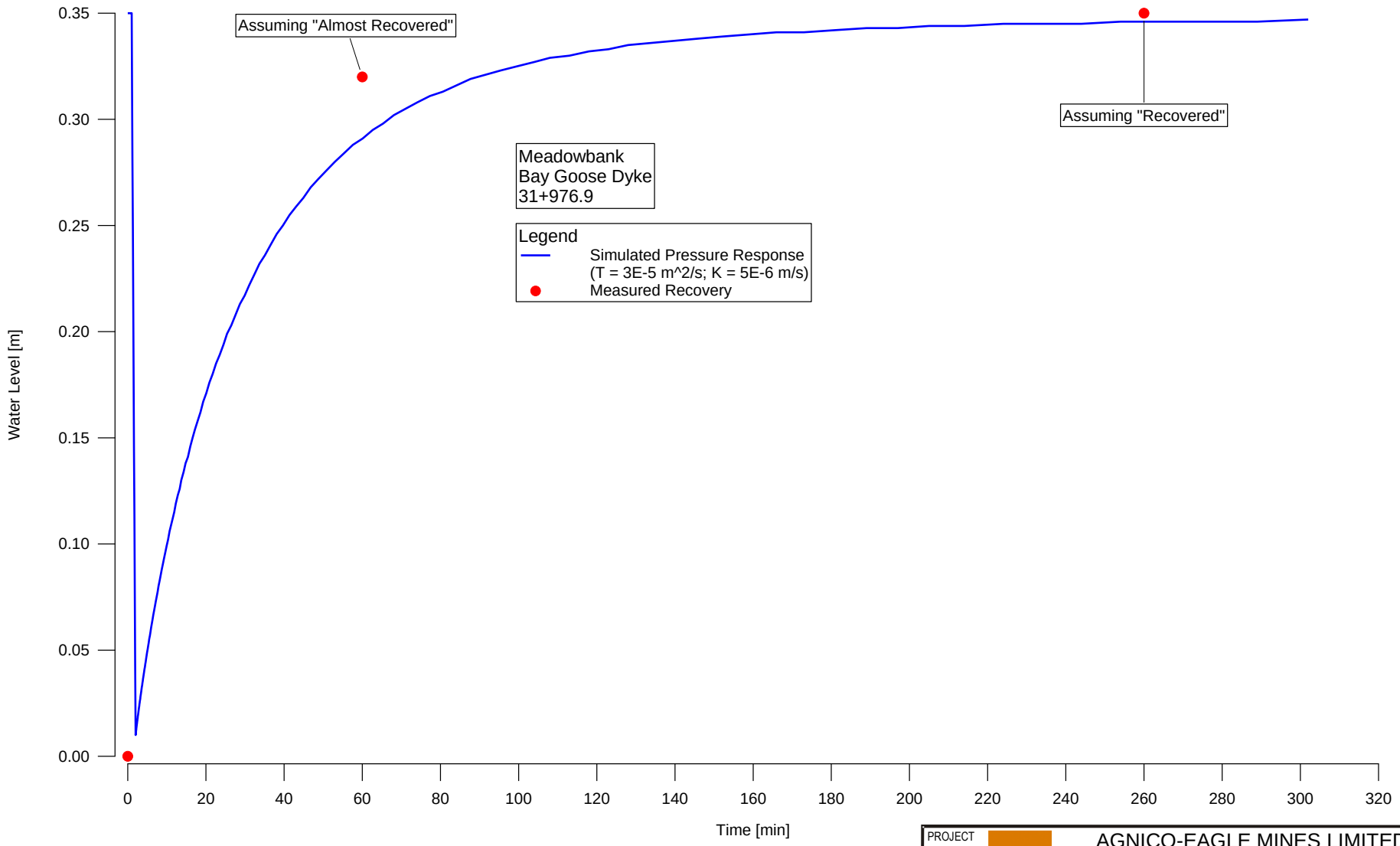
**PERMEABILITY TESTING RESULTS**
**STA 31+956.8**

Golder Associates

| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 17JUL12 | SCALE NTS | REV. 0 |
| CADD | YEW | 17JUL12 | | |
| CHECK | GRB | 01DEC12 | | |
| REVIEW | FE | 01DEC12 | | |

**FIGURE E2-9.1**

O:\Active\ 2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\Bay Goose Dike\As-Built Report and Appendixes\Rev 0\APP E\E2-9\Figure E2-9 Hydrobench Results.ppt




PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

**PERMEABILITY TESTING RESULTS**
**STA 31+976.9**

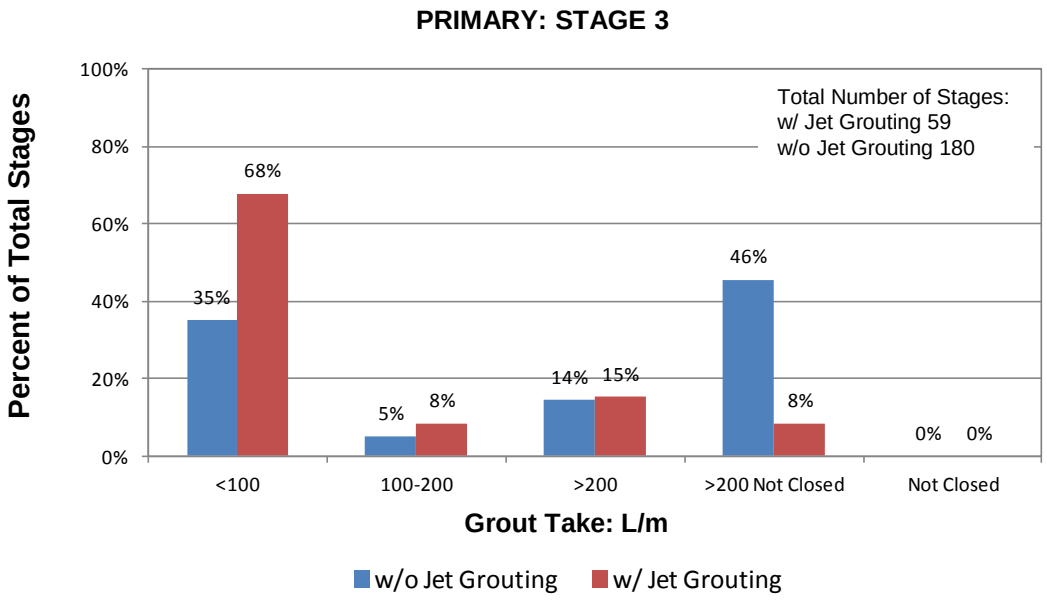
Golder Associates

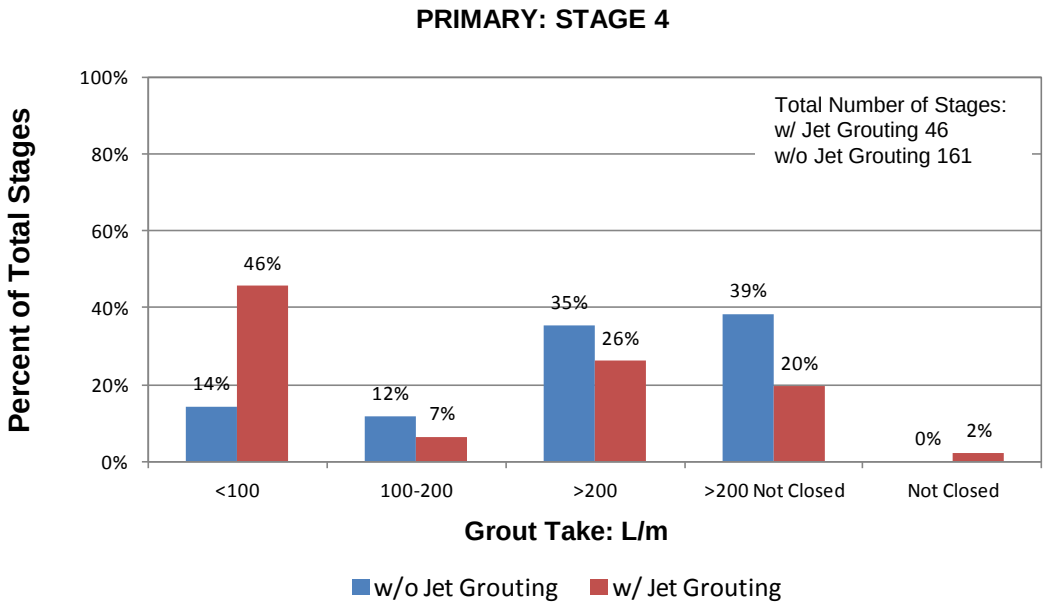
| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | VTR | 17JUL12 | SCALE NTS | REV. 0 |
| CADD | YEW | 17JUL12 | | |
| CHECK | GRB | 01DEC12 | | |
| REVIEW | FE | 01DEC12 | | |

**FIGURE E2-9.2**

# E2-10 Ground Improvement Achieved

\\BUR1-S-FILESRV1\DATA\Active_2009\1428\09-1428-5007 Meadowbank 2009 Dike Construction\5 - Field Data\Bay-Goose Grouting\As-Built Report\E2-10 - Ground Improvement Achieved\Meadowbank Jet Grout and Grout Comparison.pptx APRIL 5, 2012




**NOTES:**

1) Comparison of grout takes by the percent of the total number of stages completed in zones where jet grouting was carried out prior to casing installation versus those where it was not.
2) Jet grouting zones considered are: Channel 1, Channel 2, Channel 3, and Channel 1-2 (along South Ridge, between Channels 1 and 2).

PROJECT

AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE

# GROUND IMPROVEMENT ACHIEVED BAY-GOOSE DIKE SOUTH STAGE 3 & 4 - COMPARISON

Golder Associates

| | | | | |
|---|---|---|---|---|
| PROJECT No. 09-1428-5007 | | | PHASE No. 2000 | |
| DESIGN | GRB | 04APR12 | SCALE N/A | REV. 0 |
| CADD | JAB | 05APR12 | | |
| CHECK | GRB | 01DEC12 | | |
| REVIEW | FE | 01DEC12 | | |

**FIGURE E2-10.1**