AECOM
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Calgary, AB, Canada T2H 2V6
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403 254 3301 tel
403 270 9196 fax

March 13, 2012

Phyllis Beaulieu
Licensing Manager
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Dear Phyllis:

Project No: Water Use Licence No.: 1BR-CAP0914 2011 Annual Report

Regarding: PIN-2, Cape Young DEW Line Site

AECOM Canada Ltd. is providing the attached annual report form as per Section B.1 of the above-noted water use license. The report is being submitted on behalf of Defence Construction Canada and the Department of National Defence.

The remediation construction work at PIN-2 was completed in August 2011. Site activities included closure of the Tier II Disposal Facility and Non-Hazardous Waste Landfill, borrow restoration, demolition of the garage, excavation of landfills, excavation of contaminated soil areas and regrade areas. The following is a detailed summary of the work items completed during the 2011 summer construction season:

- All demolition activities were completed.
- All 23 remaining contaminated soil excavations were completed.
- All remaining landfills and buried debris areas requiring excavation and backfilling were completed, including:
    - Airstrip Landfill Lobe C, D, K, L, M, N, O, P, Q, R; Tower Buried Debris Area – Lobe B, C; Buried Debris Area 7; South Borrow Debris Area – Lobe B; Pallet Line West Landfill – Lobe E, F.
- All regrade areas were completed, including:
    - Airstrip Landfill – Lobes A, B, E, F, G, H, I, J; USAF Landfill; Station West Landfill; Buried Debris Area 14 – Lobes A, B, C; Tower Buried Debris Area – Lobes A, D; Pallet Line West Landfill – Lobe I; Buried Debris Area 2.
- The Non-Hazardous Waste Landfill (NWLF) was closed. Construction activities at the NWLF consisted primarily of waste placement, including demolition waste from the garage, and hangar, debris from buried debris excavation and site debris. Prior to the start of the 2011 construction season, it was discovered that two 65,000 gallon tanks had been categorized as non-hazardous waste and placed in the landfill in 2010. However, the tanks had been originally categorized as hazardous waste due to the presence of leachable lead concentrations which exceeded the DLCU Protocol criteria of 5 mg/L. At the start of the 2011

season, approximately 1.1 to 1.5 m of compacted waste and Type 6 granular material had been placed over top of the tank pieces, and it was not feasible to remove the material. To address the issue, the landfill surface was redesigned and consisted of the incorporation of a liner system using an oil resistant reinforced polyethylene geomembrane. The liner system was protected by providing layers of non-woven geotextile and Type 5 granular fill above and below the liner. The closure activities at the NWLF included the following:

  - Placement of remaining non-hazardous site waste, which was crushed using a D8 dozer during placement of layers not more than 0.5 m thick. Type 6 granular materials was placed to fill voids in waste layers and to provide temporary cover between waste lifts. Timber poles were disposed of within the landfill along the north side. The ends of the poles treated with creosote were cut off and wrapped in 6 mm polyethylene. Double-bagged asbestos from demolition activities was consolidated within an area in the northeast corner.
  - Final grading of Type 2 granular fill berms.
  - Placement of a liner, geotextile and Type 5 granular fill bedding layers.
  - Placement, compaction and final grading of the Type 2 granular fill cap.
  - Placement and final grading of the Type 1 Granular Fill on the exterior side slopes of the facility.
  - The final lift of cover material was placed on July 30, 2011.
- The Tier II Disposal Facility was closed. The following work was completed in 2011:
  - Placement of the remaining Tier II contaminated soil from site areas. The contaminated soils were placed in lifts of approximately 0.3 m and the soils were compacted with multiple passes of the dozer.
  - Placement of Tier II contaminated soil from the PIN-B Intermediate DEW Line site. The final lift of Tier II contaminated soil was placed on July 15, 2011.
  - Placement of Type 6 intermediate fill layer.
  - Installation of the upper liner including Type 5 granular fill embedment layers and geotextile.
  - Placement, compaction and final grading of the Type 2 granular fill cap.
  - Placement and final grading of the Type 1 granular fill on the exterior side slopes of the facility. The final lift of Type 1 granular material cover was placed on August 1, 2011.
  - Installation of two thermistors into the facility berms, and two thermistors into the facility centre.
  - Construction was completed on August 2, 2011 after the final data-logger for the thermistors was installed.
- Baseline monitoring was carried out at the landfills which remain on-site.

No further construction work is required at this site. However, removal of the PCB material currently in temporary storage remains and will be completed once the contract has been awarded.

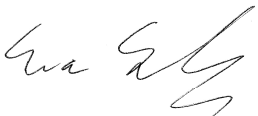
Community Consultations: The results of the community meetings held by DCC were submitted with the Project Description. The contractor typically holds a project start up meeting prior to each season.

Spill Incidences: None.

Monitoring Reports: See attached.

We trust the information provided is sufficient. Please feel free to contact the undersigned if you require any additional information.

Sincerely,
AECOM Canada Ltd.



Eva Schulz, P.Ag.
Eva.Schulz@aecom.com

EMS.
cc: Tamara Van Dyck, DCC

Encl. Annual Report Form; Updated Site Figures; Selected Site Photographs; Monitoring Reports

NWB Annual Report **Year being reported:** 2011

License No: 1BR-CAP0914 **Issued Date:** May 29, 2009
Expiry Date: May 31, 2014

Project Name: PIN-2, Cape Young

Licensee: Defence Construction Canada

Mailing Address:
Defence Construction Canada
DGME
101 Colonel By Drive,
Ottawa, Ontario, Canada. K1A 0K2

Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable):
AECOM Canada Ltd. - Engineering Consultant

General Background Information on the Project (*optional):

Licence Requirements: the licensee must provide the following information in accodance with
Part B Item 1

A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management.

Water Source(s): Un-named River

Water Quantity:	
65 for all purposes	Quantity Allowable Domestic (cu.m)
9.5 per day/51 days	Actual Quantity Used Domestic (cu.m)
n/a	Quantity Allowable Drilling (cu.m)
n/a	Total Quantity Used Drilling (cu.m)

Waste Management and/or Disposal

- ☑ Solid Waste Disposal
- ☑ Sewage — 388 cu.m of sewage and greywater were discharged to the sewage lagoon.
- ☐ Drill Waste
- ☑ Greywater
- ☑ Hazardous
- ☐ Other:

Additional Details:
Details of the waste management and disposal were provided in the application.

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: (as reported to the Spill Hot-line)
Date of Spill:
Date of Notification to an Inspector:

Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

There were no spills at PIN-2 in 2011.

Revisions to the Spill Contingency Plan

SCP submitted and approved - no revision required or proposed

Additional Details:

Revisions to the Abandonment and Restoration Plan

N/A - not applicable

Additional Details:

The entire project is an abandonment and restoration program.

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

Results of the Monitoring Program including:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where sources of water are utilized;

Details attached

Additional Details:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where wastes associated with the licence are

Details attached

Additional Details:

Results of any additional sampling and/or analysis that was requested by an Inspector

No additional sampling requested by an Inspector or the Board

Additional Details: (date of request, analysis of results, data attached, etc)

Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

No additional sampling requested by an Inspector or the Board

Additional Details: (Attached or provided below)

Any responses or follow-up actions on inspection/compliance reports

No inspection and/or compliance report issued by INAC

Additional Details: (Dates of Report, Follow-up by the Licensee)

Any additional comments or information for the Board to consider

Date Submitted:	March 13, 2011	
Submitted/Prepared by:	Eva Schulz	
Contact Information:	**Tel:**	403-270-9220
	Fax:	403-270-9196
	email:	eva.schulz@aecom.com

GPS Coordinates for water sources utilized

Source Description	UTM Zone 11N, NAD83	
	Northing	Easting
Un-Named River	68° 56'	116° 56'

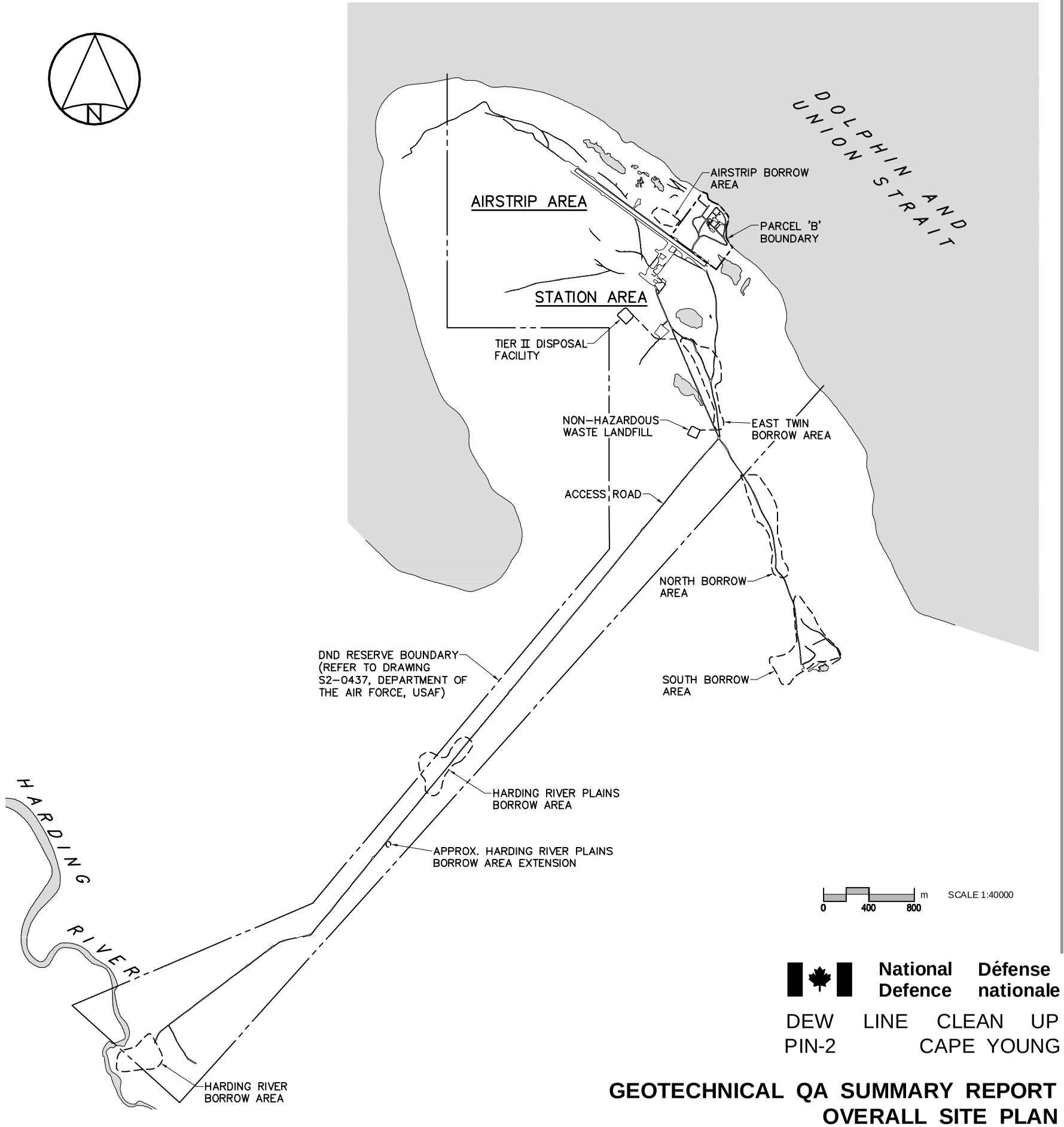
GPS Locations of areas of waste disposal

Location Description (type)	UTM Zone 11N, NAD83	
	Northing	Easting
Tier II Disposal Facility	7646295.4	502420.1
Tier II Disposal Facility	7646332.4	502457
Tier II Disposal Facility	7646288.3	502501.1
Tier II Disposal Facility	7646251.4	502464.1
Non-Hazardous Waste Landfill	7645247.2	503027.9
Non-Hazardous Waste Landfill	7645297.4	503052.7
Non-Hazardous Waste Landfill	7645272.6	503102.9
Non-Hazardous Waste Landfill	7645222.4	503078.1
sewage lagoon-cell 1	7646668	502817
sewage lagoon-cell 2	7646661	502807

LOCATION OF CAPE YOUNG WITHIN NUNAVUT TERRITORY
SCALE: NTS

POTENTIAL SOURCES FOR GRANULAR MATERIALS ***						
BORROW AREA	GRANULAR TYPE (SEE SECTION 02226 IN SPECIFICATION)					
	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6
PROPOSED AIRSTRIP	✔					
EAST TWIN	✔					
NORTH		✔*	✔			✔
SOUTH		✔*	✔			✔
HARDING RIVER PLAINS					✔	
HARDING RIVER				✔**		

* MATERIAL REQUIRES BLENDING WITH SILT TO PRODUCE TYPE 2 GRANULAR FILL.
** MATERIAL REQUIRES BLENDING WITH SAND AND GRAVEL TO PRODUCE TYPE 4 GRANULAR FILL.
*** REFER TO PIN-2 GEOTECHNICAL REPORT, DATED MARCH 2005.



National Défense / Defence nationale

DEW LINE CLEAN UP
PIN-2 CAPE YOUNG

GEOTECHNICAL QA SUMMARY REPORT
OVERALL SITE PLAN

AECOM

m
0 25 50
SCALE 1:2500

LEGEND

BM-1 2009 PERMANENT BENCHMARK LOCATION (1)

TP10-01 2010 TESTPIT LOCATION (3)

National Defence / Défense nationale

DEW LINE CLEAN UP
PIN-2 CAPE YOUNG

GEOTECHNICAL QA SUMMARY REPORT
AIRSTRIP AREA

AECOM

OLD CAMP BURIED DEBRIS AREA LOBE I (REGRADE #15)

USAF LANDFILL (REGRADE #16)

OLD CAMP BURIED DEBRIS AREA LOBE A (REGRADE #8)

OLD CAMP BURIED DEBRIS AREA LOBE D (REGRADE #10)

STATION WEST LANDFILL (REGRADE #17)

OLD CAMP BURIED DEBRIS AREA LOBE B,C (REGRADE #9)

OLD CAMP BURIED DEBRIS AREA LOBE H (REGRADE #14)

OLD CAMP BURIED DEBRIS AREA LOBE G (REGRADE #13)

OLD CAMP BURIED DEBRIS AREA LOBE E,J (REGRADE #11)

OLD CAMP BURIED DEBRIS AREA LOBE F (REGRADE #12)

HANGAR SOUTH BURIED DEBRIS (REGRADE #18)

CM3

DOLPHIN AND UNION STRAIT

PARCEL 'B' BOUNDARY

BURIED DEBRIS AREA 14 LOBE C (REGRADE #22)

BURIED DEBRIS AREA 14 LOBE A (REGRADE #20)

BURIED DEBRIS AREA 14 LOBE B (REGRADE #21)

STATION POL EAST BURIED DEBRIS (REGRADE #19)

TOWER BURIED DEBRIS LOBE D (REGRADE #24)

ACCESS ROAD

CM2

TOWER BURIED DEBRIS LOBE A (REGRADE #23)

ACCESS ROAD

MW09-01

CM1

MW09-04 B

VT-3

VT-4

TIER II DISPOSAL FACILITY

VT-1

VT-2

MW09-02

MW09-03

APPROX. ACCESS ROAD LOCATION

AIRSTRIP SOUTH LANDFILL (REGRADE #25)

0 40 80 m SCALE 1:4000

LEGEND

△CM1	EXISTING SURVEY CONTROL MONUMENT LOCATION (3)
⊕MW09-01	2009 MONITORING WELL LOCATION (3)
⊕MW09-04	2009 BACKGROUND MONITORING WELL LOCATION (1)
⊕VT-1	2011 VERTICAL THERMISTOR LOCATION (4)

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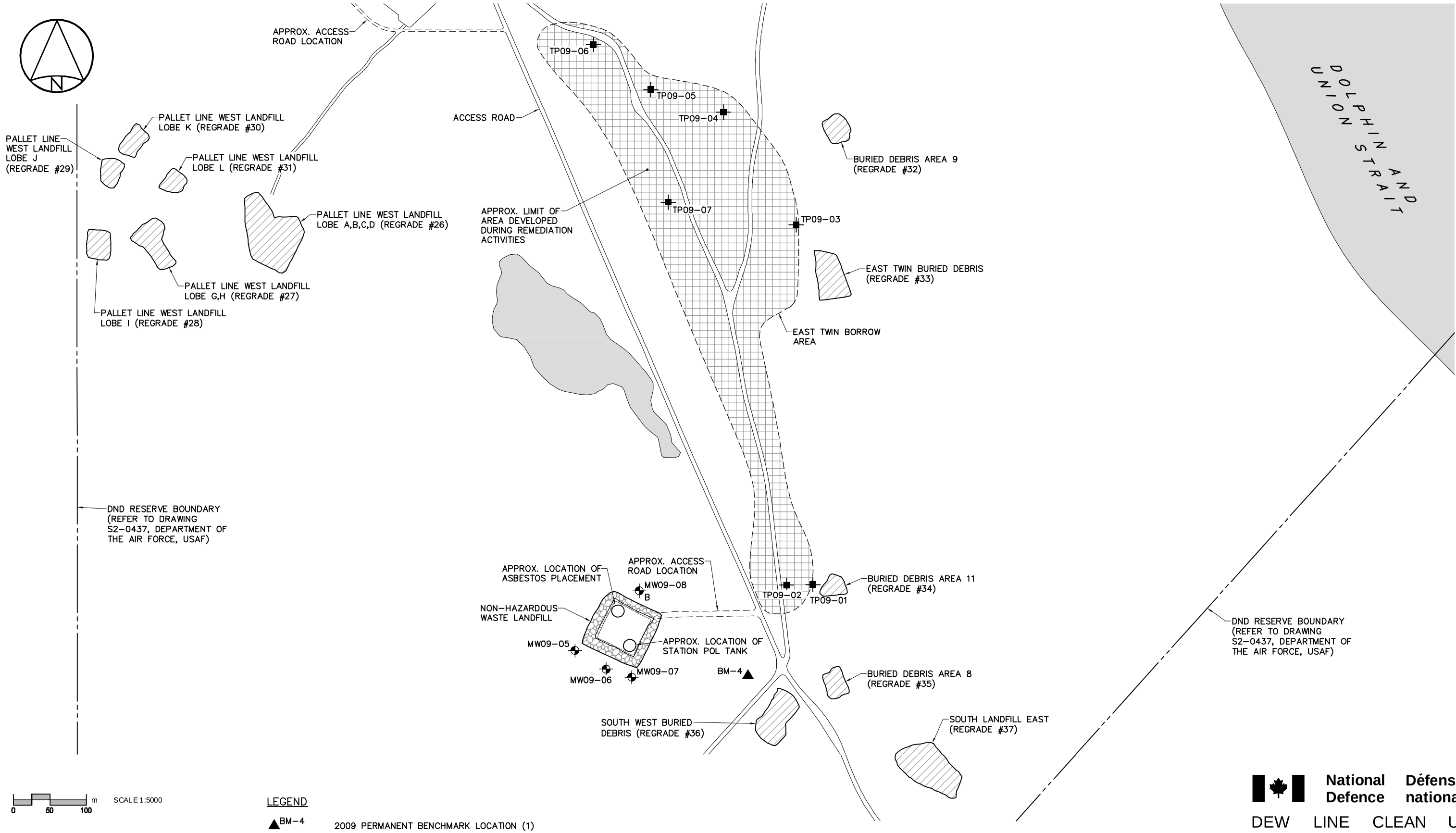
DEW LINE CLEAN UP
PIN-2 CAPE YOUNG

GEOTECHNICAL QA SUMMARY REPORT STATION AREA

FIGURE 3 of 6



0 50 100 m SCALE 1:5000

LEGEND

- BM-4 — 2009 PERMANENT BENCHMARK LOCATION (1)
- TP09-01 — 2009 TESTPIT LOCATION (7)
- MW09-05 — 2009 MONITORING WELL LOCATION (3)
- MW09-08 — 2009 BACKGROUND MONITORING WELL LOCATION (1)

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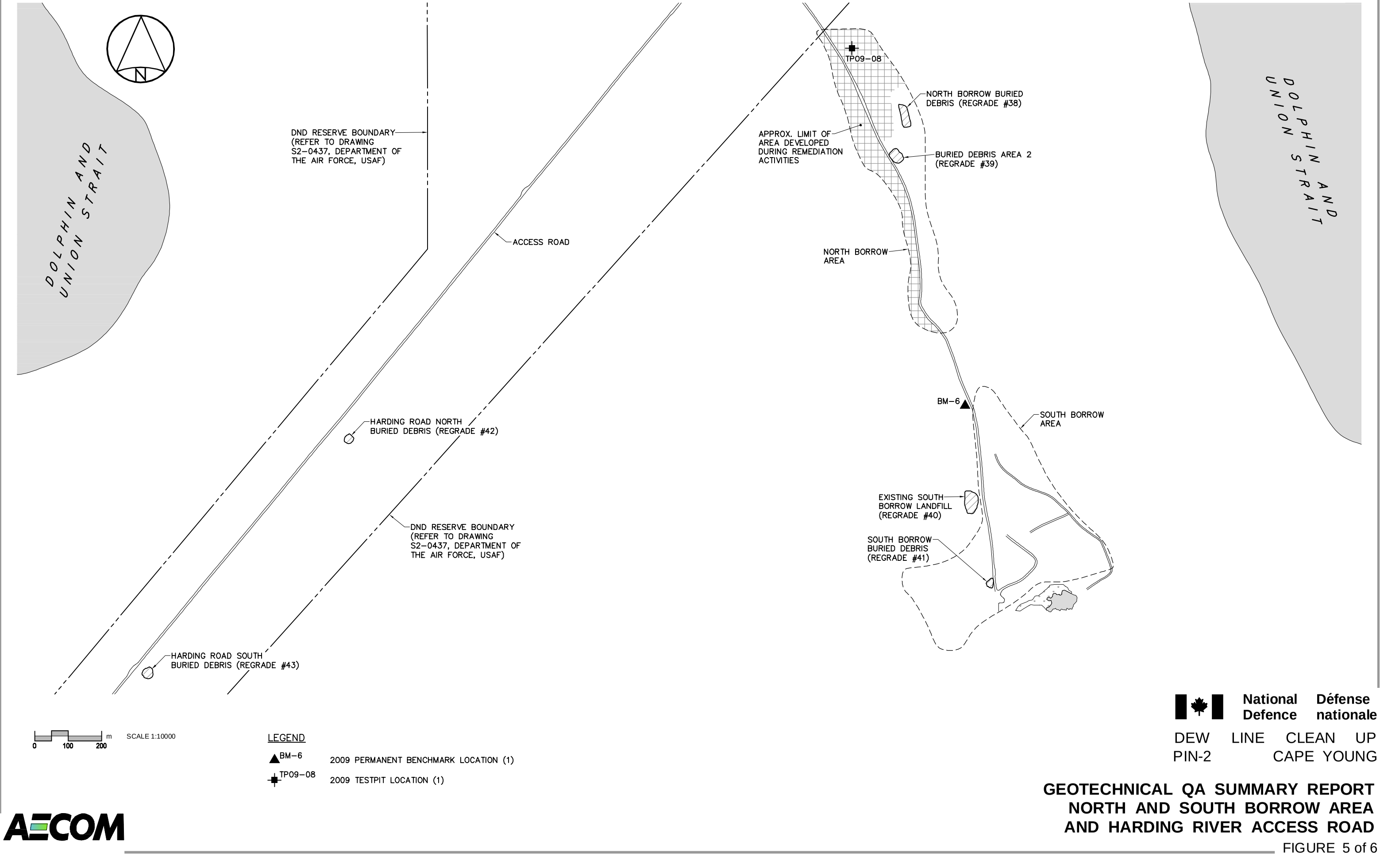
DEW LINE CLEAN UP
PIN-2 CAPE YOUNG

GEOTECHNICAL QA SUMMARY REPORT
EAST TWIN BORROW AREA

FIGURE 4 of 6



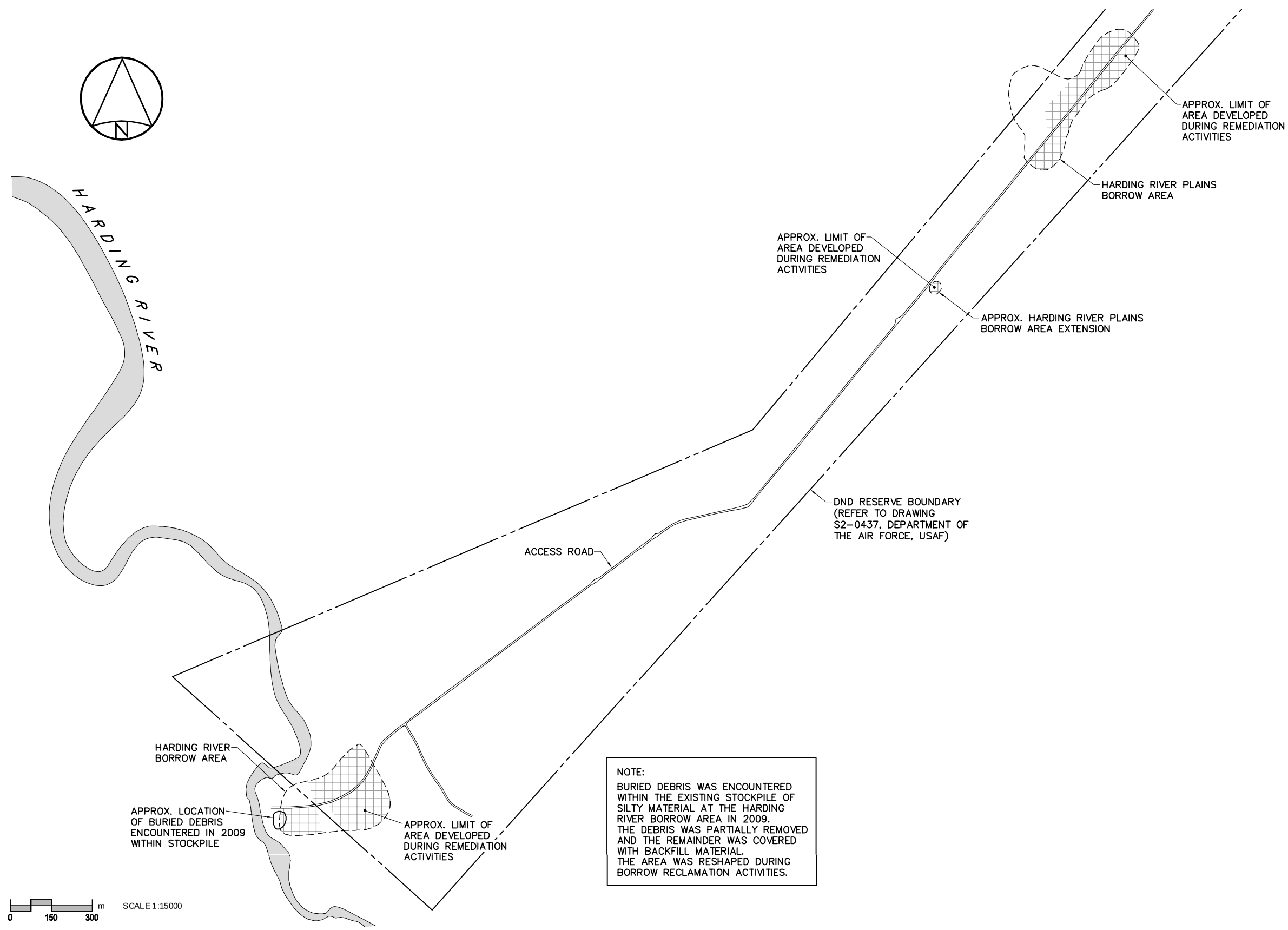
National Defence / Défense nationale

DEW LINE CLEAN UP
PIN-2 CAPE YOUNG

GEOTECHNICAL QA SUMMARY REPORT NORTH AND SOUTH BORROW AREA AND HARDING RIVER ACCESS ROAD

FIGURE 5 of 6

AECOM



NOTE:
BURIED DEBRIS WAS ENCOUNTERED WITHIN THE EXISTING STOCKPILE OF SILTY MATERIAL AT THE HARDING RIVER BORROW AREA IN 2009. THE DEBRIS WAS PARTIALLY REMOVED AND THE REMAINDER WAS COVERED WITH BACKFILL MATERIAL. THE AREA WAS RESHAPED DURING BORROW RECLAMATION ACTIVITIES.

National Défense
Defence nationale

DEW LINE CLEAN UP
PIN-2 CAPE YOUNG

GEOTECHNICAL QA SUMMARY REPORT
HARDING RIVER AREA

AECOM

PHOTOGRAPHIC LOG

Site Name:	Site Location:	Project No.
PIN-2, Cape Young	Nunavut	60212727

Photo No.	Date:
1	17-jun-11

Direction Photo Taken:

Description:
Tier II Facility at the start of the construction season

Photo No.	Date:
2	4-aug-11

Direction Photo Taken:

Description:
Completed Tier II Disposal Facility

PHOTOGRAPHIC LOG

Site Name:	Site Location:	Project No.
PIN-2, Cape Young	Nunavut	60212727

Photo No.	Date:
3	17-jun-11

Direction Photo Taken:

Description:
Non-Hazardous Waste Landfill at the start of the season.

Photo No.	Date:
4	4-aug-11

Direction Photo Taken:

Description:
Completed Non-Hazardous Waste Landfill

PHOTOGRAPHIC LOG

Site Name:	Site Location:	Project No.
PIN-2, Cape Young	Nunavut	60212727

Photo No.	Date:
5	25-jun-11

Direction Photo Taken:

Description:
Excavation of the Airstrip Landfill.

Photo No.	Date:
6	26-jun-11

Direction Photo Taken:

Description:
USAF Landfill regrade.

PHOTOGRAPHIC LOG

Site Name:	Site Location:	Project No.
PIN-2, Cape Young	Nunavut	60212727

Photo No.	Date:
7	24-jun-11

Direction Photo Taken:

Description:
Demolition of garage mezzanine.

Photo No.	Date:
8	26-jun-11

Direction Photo Taken:

Description:
Debris removal from Harding River area.

PHOTOGRAPHIC LOG

Site Name:	Site Location:	Project No.
PIN-2, Cape Young	Nunavut	60212727

Photo No.	Date:
9	26-jun-11

Direction Photo Taken:

Description:
Debris removal from Harding River area.

Photo No.	Date:
10	4-aug-11

Direction Photo Taken:

Description:
Harding River Plains borrow area following reshaping.

Tom Partridge
Environmental Sciences Group
The Royal Military College of Canada
PO Box 17000 Stn. Forces
Kingston, ON K7K 7B4

Tamara Van Dyck
Environmental Officer
Defence Construction Canada
DEW Line Cleanup PMO
101 Colonel By Drive
Ottawa ON K1A 0K2

Wednesday, February 22, 2012

RE: 2011 Report for Water Use License Number: 1BR-CAP0914

The following results of the Monitoring Program (MP) and/or Water Use License are provided by the Environmental Sciences Group to meet the requirements of the above-noted license for *PIN-2 (Cape Young)*

1. CAMP SEWAGE LAGOON

A sewage lagoon was constructed to service the PIN-2 construction camp in September 2009. The GPS coordinates that are required by the Water Use License for the sewage lagoon location are 7646646.0 N, 11W 0502873. Both cells were closed at the end of the 2011 field season.

Photo 1 (DSCN 3935): Berm between sewage cells, secondary cell seen at right of photo, taken facing south.

Photo 2 (DSCN 3934): Pin-2 Cell #1, facing south.

Photo 3 (Sewage Lagoon Closure – Aug.01.2011): Sewage lagoon with backfilling in progress, photo taken facing east.

Photo 4 (Sewage Lagoon Closure – Aug.02.2011): Sewage lagoon after completion of backfill, photo taken facing north east

2. SEWAGE EFFLUENT SAMPLES

The Water Use License and MP require that samples from treated sewage lagoon effluent at the point of discharge to the receiving water be collected prior to each discharge event. Two sewage effluent samples were collected in July 2011 of the PIN-2 sewage lagoon. A summary of the details of these results follows.

Sample Number	**Sample Location**	**GPS Coordinates**	**Sampling Date**
10-6825	Sewage Lagoon – Secondary cell Sewage Lagoon Cell #2 (south)	W0502807 N7646661	July 14, 2011
10-6826	Sewage Lagoon – Primary cell Sewage Lagoon Cell #1 (north)	W0502817 N7646668	July 14, 2011

A summary of the results for the parameters tested is provided below. Laboratory results are provided in Appendix A.

LOCATION: SEWAGE LAGOON –SEWAGE LAGOON CELL #1
GPS COORDINATES: W0502817 N7646668
SAMPLE: 11-6826
DATE: JULY 14, 2011

Parameter	Allowable Maximum Average Concentration	Units	Sample #: 11-6826
pH	6.0 to 9.0	pH units	**9.90**
Oil & Grease	None Visible	-	N/A
Total Suspended Solids (TSS)	180	mg/L	**370**
BOD	120	mg/L	**123**
E.coli	-	CFU/mL	3080
Total Coliforms	-	CFU/ 100 mL	13300

Photo 5 (P7140015): Sample 11-6826: Photo of sewage sample collected from the sewage lagoon, cell #1.

LOCATION: SEWAGE LAGOON – WEST CORNER OF SEWAGE LAGOON CELL #2
GPS COORDINATES: W0502807 N7646661
SAMPLE: 11-6825
DATE: JULY 14, 2011

Parameter	Allowable Maximum Average Concentration	Units	Sample #: 11-6825
pH	6.0 to 9.0	pH units	**10.67**
Oil & Grease	None Visible	-	N/A
Total Suspended Solids (TSS)	180	mg/L	**130**
BOD	120	mg/L	68
E.coli	-	CFU/mL	<1.0
Total Coliforms	-	CFU/ 100 mL	<1.0

Photo 6 (P7140013): Sample 11-6825: Sewage sample collected from the sewage lagoon, cell #2.

***There are no current plans to discharge the water from the Sewage Lagoon.*

We trust that the information provided meets current requirements. Please contact the undersigned if you have any questions or concerns.

Sincerely,

Tom Partridge
Environmental Sciences Group

cc: Eva Schulz (UMA)
Daniela Loock, Dean Morrow, Darren White, Shari, Reed, Tom Partridge (ESG)

APPENDIX A
LABORATORY RESULTS

ANALYTICAL SCIENCES GROUP AND SLOWPOKE-2 FACILITY AT RMC
GROUP DES SCIENCES ANALYTIQUES ET FACILITÉ SLOWPOKE-2 AU CMR
Dept. of Chem. and Chem. Eng. - Dépt. de chimie et de génie chimique
Royal Military College of Canada - Collège militaire royal du Canada
P.O. Box 17000 Stn. Forces, Kingston, ON, K7K 7B4
Tel: 613-541-6000 x6684 / Fax: 613-545-8341

Client: ESG
12 Verite Ave
Dept. of Chem. / Chem. Eng., RMC
P.O. Box 17000, Stn. Forces
Kingston, Ontario K7K 7B4
(613) 541-6000 ext 6567
Fax: (613) 541-6596

ASG Login No: 21868
Site: PIN-2
Client No: 11-103
Samples Received: 18-Jul-11
Date of analysis: 18-Jul-11
Method No: ASG 037
Date Reported: 18-Jul-11
Page: 1 of 1

RESULTS OF pH ANALYSIS

Sample I.D.	pH
6825*	10.67
6826	9.90

LABORATORY QA/QC

Sample I.D.	pH
6825* ; Duplicate	10.67 ; 10.66
Control	6.99
Control Target	7.00

ANALYTICAL SCIENCES GROUP AND SLOWPOKE-2 FACILITY AT RMC
GROUP DES SCIENCES ANALYTIQUES ET FACILITÉ SLOWPOKE-2 AU CMR
Dept. of Chem. and Chem. Eng. - Dépt. de chimie et de génie chimique
Royal Military College of Canada - Collège militaire royal du Canada
P.O. Box 17000 Stn. Forces, Kingston, ON, K7K 7B4
Tel: 613-541-6000 x6684 / Fax: 613-545-8341

Client : ESG
12 Verite Ave
Dept. of Chem. / Chem. Eng., RMC
P.O. Box 17000, Stn. Forces
Kingston, Ontario K7K 7B4
(613) 541-6000 ext 6567
Fax: (613) 541-6596

ASG Login No: 21868
Site: Pin-2
Client Login No: 11-103
Samples Received: 18-Jul-11
Date of analysis: 18-Jul-11
Method No: ASG 039
Date Reported: 19-Jul-11
Sheet: 1 of 1

RESULTS OF TOTAL SUSPENDED SOLIDS ANALYSIS

Sample I.D.	Sample Type^	Unit	Total Suspended Solids
6825*	SE	mg/L	130
6826	SE	mg/L	370

LABORATORY QA/QC

Duplicate ; 6825*	SE ; SE	mg/L	130 ; 130
Control	Control	mg/L	200
Control Target	Control	mg/L	200
Blank	Control	mg/L	< 1

^SW =Surface Water, SI = Sewage Influent SE = Sewage Effluent

ANALYTICAL SCIENCES GROUP AND SLOWPOKE-2 FACILITY AT RMC
GROUP DES SCIENCES ANALYTIQUES ET FACILITÉ SLOWPOKE-2 AU CMR
Dept. of Chem. and Chem. Eng. - Dépt. de chimie et de génie chimique
Royal Military College of Canada - Collège militaire royal du Canada
P.O. Box 17000 Stn. Forces, Kingston, ON, K7K 7B4
Tel: 613-541-6000 x6684 / Fax: 613-545-8341

Client: **ESG**
12 Verite Ave
Dept. of Chem. / Chem. Eng., RMC
P.O. Box 17000, Stn. Forces
Kingston, Ontario K7K 7B4
(613) 541-6000 ext 6567
Fax: (613) 541-6596

ASG Login No: 21868
Site: Pin-2
Client Login No: 11-103
Samples Received: 18-Jul-11
Date of analysis: 18-Jul-11
Method No: ASG 042
Date Reported: 23-Jul-11
Page: 1 of 1

RESULTS OF BOD ANALYSIS

Sample I.D.	Unit	BOD
6825	mg/L	68
6826	mg/L	123

LABORATORY QA/QC

Sample I.D.	Unit	BOD
Blank	mg/L	< 3.0
Control	mg/L	178
Control Target	mg/L	165

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110389

- CERTIFICATE OF ANALYSIS -

Client Sample ID: 6825 **Taiga Sample ID:** 001

Client Project: ESG Request No: 11-102
Sample Type: Wastewater
Received Date: 15-Jul-11
Sampling Date: 14-Jul-11
Sampling Time: 16:00
Location: PIN-2-conf-DLCU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100mL	15-Jul-11	SM9223:B	20
Escherichia coli	< 1.0	1.0	MPN/100mL	15-Jul-11	SM9223:B	20

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110389

- CERTIFICATE OF ANALYSIS -

Client Sample ID: 6826 **Taiga Sample ID:** 002

Client Project: ESG Request No: 11-102
Sample Type: Wastewater
Received Date: 15-Jul-11
Sampling Date: 14-Jul-11
Sampling Time: 16:00
Location: PIN-2-conf-DLCU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Microbiology						
Coliforms, Total	13300	100	MPN/100mL	15-Jul-11	SM9223:B	
Escherichia coli	3080	10.0	MPN/100mL	15-Jul-11	SM9223:B	

ReportDate: Tuesday, July 19, 2011
Print Date: Tuesday, July 19, 2011

Tom Partridge
Environmental Sciences Group
The Royal Military College of Canada
PO Box 17000 Stn. Forces
Kingston, ON K7K 7B4

Tamara Van Dyck
Environmental Officer
Defence Construction Canada
DEW Line Cleanup PMO
DGME
101 Colonel By Drive
Ottawa ON K1A 0K2

Wednesday, February 22, 2012

RE: Analytical Results for Wastewater Samples Collected at PIN-2 in June, 2011

The PIN-2 specifications require that "wash water, melt water collection, rinse water resulting from the cleaning of fuel tanks and pipelines, and/or any other liquid effluent stream" meet the following guidelines prior to their discharge to land (01560.4.1):

Parameter	Maximum Allowable Concentration	Units
pH	6-9	pH units
Total arsenic (As)	0.100	mg/L
Dissolved cadmium (Cd)	0.010	mg/L
Dissolved chromium (Cr)	0.100	mg/L
Dissolved cobalt (Co)	0.050	mg/L
Dissolved copper (Cu)	0.200	mg/L
Dissolved lead (Pb)	0.050	mg/L
Total mercury (Hg)	0.0006	mg/L
Dissolved nickel (Ni)	0.200	mg/L
Total zinc (Zn)	0.5	mg/L
Oil & grease	5	mg/L
PCBs	1.0	mg/L
Phenols	-	-
Benzene	0.370	mg/L
Toluene	0.002	mg/L
Ethylbenzene	0.090	mg/L

*Discharge to barren land, **Discharge to vegetated land

Phenols

The wastewater samples collected by ESG at PIN-2 in June, 2011 were not analyzed for phenols but they were analyzed for oil and grease. Research conducted by ESG[1] has

[1] Environmental Sciences Group. *DEW Line Clean Up Project – Phenols in Wastewater*. June, 2007.

determined that a) no federal, territorial or provincial criteria exist for the discharge of wastewater containing phenols to land at a minimum distance of 30-m from natural drainage courses b) the maximum concentration of phenols in DLCU wastewater to date (2.44 mg/L) is below the LC_{50} for freshwater fish and crustaceans and below the oral and dermal LD_{50}s for rats and rodents and c) phenols in excess of the maximum allowable concentration (MAC) have historically co-occurred with a visible oil & grease sheen and/or with an exceedance of the MAC for oil & grease. This information, and a subsequent decision to not test for phenols, has been presented to the NWB. To date, verbal agreement from the NWB has been received, but the project is awaiting written confirmation of the decision to suspend testing for phenols.

WASTEWATER SAMPLE

One wastewater sample was collected at PIN-2 in June 2011 and analyzed in July 2011. A summary of the details of these results follows. Laboratory results are provided in Appendix A.

LOCATION: AIRSTRIP LANDFILL LOBE D
GPS COORDINATES: 11W 0502574 7647453
SAMPLE: 11-6535
DATE: JUNE 30, 2011

Parameter	Maximum Allowable Concentration	Units	Sample # 11-6535
pH	6-9	pH units	7.58
Total Arsenic	0.100	mg/L	0.005
Dissolved Cadmium	0.010	mg/L	<0.001
Total Chromium	0.100	mg/L	<0.005
Dissolved Cobalt	0.050	mg/L	<0.003
Dissolved Copper	0.200	mg/L	<0.005
Dissolved Lead	0.050	mg/L	<0.010
Total Mercury	0.6	µg/L	<0.0004
Dissolved Nickel	0.200	mg/L	<0.005
Total Zinc	1.0	mg/L	0.12
Oil & Grease	None Visible and 5 mg/L	mg/L	Non Visible <2.0
PCBs	50* 5**	µg/L	<0.003
Phenols	20	µg/L	N/A

*Discharge to barren land, **Discharge to vegetated land

Photo 1 (P6300002): Sample 11-6535 Pin-2: Close angle of Airstrip Lobe D sample.

The water from the Airstrip Landfill Lobe D (11-6535) was displaced to land during backfill on July 18.

We trust that the information provided meets current requirements. Please contact the undersigned if you have any questions or concerns.

Sincerely,

Tom Partridge
Environmental Sciences Group

cc: Eva Schulz (UMA)
Daniela Loock, Dean Morrow, Darren White, Shari Reed, Tom Partridge (ESG)

APPENDIX A
LABORATORY RESULTS

ASU #	13696		**Report ID:**	PIN-2 W3				
Client:	ESG		**Date Submitted:**	04-Jul-11				
			Date tested:	06-Jul-11				
Site:	PIN-2		**Date:**	06-Jul-11				
	11-050		**Matrix:**	Water				
Report of Analysis								
Results relate only to the items tested								
Total Metals	Results in mg/L							
SAMPLE	Cu	Ni	Co	Cd	Pb	Zn	Cr	As
11-06535	-	-	-	-	-	0.121	-	0.005
Blank	-	-	-	-	-	<0.010	-	<0.003
Control	-	-	-	-	-	3.28	-	0.81
Control Target	-	-	-	-	-	3.00	-	0.80
Dissolved Metals	Results in mg/L							
SAMPLE	Cu	Ni	Co	Cd	Pb	Zn	Cr	As
11-06535	<0.005	<0.005	<0.003	<0.001	<0.010	-	<0.005	-
Blank	<0.005	<0.005	<0.003	<0.001	<0.010	-	<0.005	-
Control	1.69	1.73	1.73	0.85	8.73	-	0.89	-
Control Target	1.60	1.60	1.60	0.80	8.00	-	0.80	-

ASU #	13696		**Report ID:**	PIN-2 W4				
Client:	ESG		**Date Submitted:**	04-Jul-11				
			Date tested:	05-Jul-11				
Site:	PIN-2		**Date:**	05-Jul-11				
	11-050		**Matrix:**	water				
Report of Analysis								
Sample	Oil & Grease							
	mg/L							
11-06535	<2.0							
Blank	<2.0							
Control	15.5							
Control Target	15.8							
Results relate only to the items tested								

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ASG Login No: 21792
Site: PIN-2
Client No: 11-050
Samples Received: 04-Jul-11
Date of analysis: 05-Jul-11
Method No: ASG 037
Date Reported: 05-Jul-11
Page: 1 of 1

RESULTS OF pH ANALYSIS

Sample I.D.	pH
6535*	7.58

LABORATORY QA/QC

Sample I.D.	pH
6535* ; Duplicate	7.57 ; 7.59
Control	6.98
Control Target	7.00

The results reported here relate only to the items tested.

Prepared By: _____
Yi Wang, Analyst

Authorization: _____
Steve White, Senior Laboratory Analyst
pHw-21792r1.xls

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ASG Login No: 21792
Site: PIN-2
Client No: 11-052
Samples Received: 04-Jul-11
Date of analysis: 05-Jul-11
Method No: ASG 021
Date Reported: 06-Jul-11
Sheet: 1 of 1

RESULTS OF MERCURY ANALYSIS

Sample ID	Mercury mg/L
6535*	< 0.0004

*Average result of duplicates.
^ Acid digestion performed.
# Reported at 0.0004 mg/L detection limit.

LABORATORY QA/QC

Sample ID	Mercury mg/L
Duplicate ; 6535*	< 0.0004;< 0.0004
Blank	< 0.0004
Control Target	0.0040
Control Sample	0.0042

The results reported here relate only to the items tested.

Prepared By: _____
Yi Wang;
Analyst

Authorization: _____
Steve White;
Senior Laboratory Analyst
Test Report I.D: Hgw21792r1.xls

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ASG Login No: 21792
Site: Pin-2
Client No: 11-050
Samples Received: 04-Jul-11
Date of analysis: 05-Jul-11
Method No: ASG 015
Date Reported: 07-Jul-11
Sheet No: 1 of 1

RESULTS OF PCB IN WATER ANALYSIS

Sample Type **	Sample I.D.	Unit	Aroclor 1254	Aroclor 1260
W	6535*	mg/L	< 0.003	< 0.003

*Average result of duplicate
Report Values in PPM

LABORATORY QA/QC

	Blank	mg/L	< 0.003	< 0.003
	Duplicate ; 6535*	mg/L	< 0.003 ; < 0.003	< 0.003 ; < 0.003
	Control Sample	mg/L	< 0.003	0.013
	Control Sample Target	mg/L	< 0.003	0.015

** S = Soil , C = Concrete , PC = Paint Chip , SW = Swab , P = Plant , W = Water, L = Leachate

All results corrected for the recovery of the surrogate decachlorobiphenyl

The results reported here relate only to the items tested.

Prepared By: _____
Chad Hind, Analyst

Authorization: _____
Julie McDonald, Laboratory Manager
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ASG Login No: 21792
Site: Pin-2
Client Login No: 11-050
Samples Received: 4-Jul-11
Date of analysis: 5-Jul-11
Method No: ASG 023
Date Reported: 11-Jul-11
Page: 1 of 1

RESULTS OF BTEX IN WATER ANALYSIS

Compound	6535*	Blank	Duplicate ; 6535*	Control Sample	Control Target
	mg/L	mg/L	mg/L	mg/L	mg/L
Benzene	< 0.002	< 0.002	< 0.002 ; < 0.002	0.010	0.010
Toluene	< 0.002	< 0.002	< 0.002 ; < 0.002	0.010	0.010
Ethylbenzene	< 0.002	< 0.002	< 0.002 ; < 0.002	0.010	0.010
m+p-Xylene	< 0.002	< 0.002	< 0.002 ; < 0.002	0.020	0.020
o-Xylene	< 0.002	< 0.002	< 0.002 ; < 0.002	0.010	0.010

*Average result of duplicate
**Results corrected for surrogate toluene_d8
Results in PPM

The results reported here relate only to the items tested.

Prepared by : _____
Chad Hind ; Analyst

Authorization : _____
Julie McDonald ; Laboratory Manager
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