Appendix 4:

Mary River Project 2011 Potential Quarry and Borrow Investigations

Mary River

2011 Potential Quarry and Borrow Investigations

2011-11-21	B	Approved for Use	E. Neufeld	R. Halim	J. Cleland	
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			HATCH			CLIENT

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1. Introduction

Baffinland Iron Mines Corporation (Baffinland) is planning to develop the Mary River iron ore deposits on North Baffin Island in the Qikiqtani Region of Nunavut. This project will require a large volume of rockfill and borrow material for the development of the site infrastructure at the Mary River mine site and Steensby Inlet port site, as well as for the construction of an approximately 140 km railway between the mine site and the port site.

Site investigations have been conducted by Thurber Engineering Ltd (Thurber), under the direction of Hatch Ltd. (Hatch) at the quarries and borrow areas in the summer of 2011.

This report reviews previous studies and investigations for the potential borrow and quarry areas, summarizes the2011 site investigations and presents recommendations for further development of these quarry and borrow areas.

2. Background

The following supporting documents have been identified that refer to borrow and quarry areas for the Mary River project:

- Canarail Consultants Inc. (Canarail), "Additional Quarry Sites", TDM No. 159952-5000-121-032 [Ref 1].
- AMEC Americas Limited (AMEC), "Summary of Aggregate Resource Evaluation Testing Program, Baffinland Iron Mine Mary River Project" [Ref 2].
- Knight Piésold Consulting (KP), "Mary River Project Quarry Sites' Screening" [Ref 3].
- AMEC, "Interim ML/ARD Assessment of Railway Quarry Rock Samples, Baffinland Mary River Project – Issued for DEIS" [Ref 4].

These documents were used in the preparation of the Draft Environmental Impact Statement (DEIS), issued in December 2010 [Ref. 5].

Very limited drilling investigations were undertaken at these sites, but the investigation programs from 2006 to 2008 included some drilling to collect samples for preliminary laboratory testing to assess the suitability of the material for granular fill and ballast uses. Preliminary testing was also completed to assess the material's potential for Acid Rock Drainage (ARD). No specific testing was done to assess the material's suitability for use as concrete aggregate, except for a limited number of physical tests on rock samples for use as potential ballast material. In particular, it does not appear that any testing for alkali-aggregate reactivity has been conducted to determine the suitability of the rocks from the quarry and borrow area at the Mary River site and potential quarries at Steensby Inlet, where concrete will be used during construction of the project. Identified quarry and borrow areas at Mary River (QMR2 and Borrow Area #3) and at Steensby Inlet (QS-1, QS-2, QS-3 and QS-3A) are shown in Appendix A on figures from the DEIS [Ref 5]. A

potential borrow area around Station 128+000 was identified in 2011 and may be the closest potential source for fine aggregates for Steensby Inlet. The location of this borrow area is not shown on these figures.

3. Review of Previous Investigations and Laboratory Testing

3.1 "Additional Quarry Sites" Report

Canarail's "Additional Quarry Sites" report [Ref 1] identifies 43 quarry sites to be added to the quarry sites previously identified by KP. The report also states that twelve of KP's quarry sites were removed based on access difficulties, haul lengths, long upgrade haul distances, construction methodologies, quarry sizes and potential capacities. It was not expected that all of the 69 quarry sites would be developed, but it was felt that it would be better to identify too many rather than too few quarry sites. The report provided estimated volumes for all the sites and stated that Q133+500, also known as BAL-1, in the southern portion of the line will be used as ballast material. This report uses data from existing reports and field reconnaissance.

3.2 "Summary of Aggregate Resource Evaluation Testing Program" Report

AMEC's "Summary of Aggregate Resource Evaluation Testing Program" report [Ref 2] summarizes laboratory testing done on potential sources of ballast, sub-ballast and rockfill material.

The test results on the ballast sources BAL-1 (Q133+500), BAL-2 (Q138+100), BAL-3 (Q139+600) and BAL-4 (Q139+600) are summarized as follows:

- All samples met the ballast specification requirements for degraded aggregate cement value (CV), bulk specific gravity, magnesium sulphate soundness and absorption.
- None of the samples met the shape factor requirements.
- All samples except one sample from BAL-1 (Q133+500) had losses that exceeded that maximum allowable limit in the Los Angeles abrasion test.
- All samples for BAL-2 (Q138+100), BAL-3 (Q139+600) and BAL-4 (Q139+600) met the requirements for the mill abrasion (MA) test, but only one sample from BAL-1 (Q133+500) met the test requirements.
- All the samples are below the maximum Petrographic Number (PN) requirement specified in Ontario provincial standards for high quality coarse aggregate used in highway road construction [Ref 6].

These results indicate that none of the BAL sources meet all the specification requirements for ballast stone. However, some of the poor test results may have been affected by the limitations of the method of sample preparation. All the samples show good resistance to freezing and thawing conditions.

Limited testing on sub-ballast and rockfill sources was undertaken at Q50+000, Q56+750, Q64+400, Q67+200, Q77+200 and Q82+700. The test results showed that the fines are non-plastic. Micro-deval abrasion testing on the coarse and fine aggregate fractions showed that the mass loss was below maximum losses specified in Ontario provincial standards [Ref 7]. These results indicate that the material could potentially be suitable for railway construction, although it will require additional testing.

The report recommended that additional testing be carried out on the ballast and sub-ballast sources to confirm these test results. In particular, the report recommends that testing be done at the quarry areas at Steensby Inlet, QS1, QS2, QS3 and QS3A, to assess their potential as concrete aggregate, ballast, sub-ballast, rockfill or other construction aggregate material. Also, it recommends that the fine aggregate source at Mary River be tested to assess its suitability for concrete fine aggregate uses.

The report did not identify or discuss any potential ballast materials at the northern end of the railway line. It is not known why the ballast materials were only planned to be sourced from the south end of the railway line. It was understood, however, that the southern end of the railway line passes through a number of rock cuts consisting of granitic rock, which might have been assumed to be hard and durable rock sources suitable for ballast material.

3.3 "Quarry Sites' Screening" Report

KP's "Mary River Project Quarry Sites' Screening" report [Ref 3] shows preliminary bounds and volumes for road and railway construction for 68 of the 69 quarry sites recommended by Canarail's "Additional Quarry Sites" report [Ref 1]. Outer boundaries are shown for each quarry for land tenure purposes and to provide flexibility to the contractor during quarry development. The report shows the areas of excavation that would be required for 1.5 times the volume excavation, assuming one10 m lift is used, as well as proposed permit areas, areas of potential access to quarries and substitute quarry locations in environmentally sensitive areas.

The report did not discuss Q40+600 or QS3, and did not provide volumes for QS1, QS2 or QS3A, because these sources were not anticipated to be used at the time. The report also does not provide volumes of material for material which could potentially be obtained from construction of the tunnels or the ore loading dock.

3.4 "Interim ML/ARD Assessment of Railway Quarry Rock Samples" Report

AMEC's "Interim ML/ARD Assessment of Railway Quarry Rock Samples" Report [Ref 4] assesses the metal leaching and acid rock drainage (ML/ARD) characteristics of rock samples collected by KP in 2008 along the rail alignment. Surface saw-cut sampling was used for ballast material suitability testing, chip sampling and core sampling for geochemical testing and surface grab sampling for durability testing. AMEC only used core samples for the ML/ARD testing, but the remainder of the samples are still stored at the SGS lab in Lakefield, Ontario.

The report provides a geological survey along the rail alignment, stating that the most northern approximately 29 km portion of the rail alignment crosses Paleozoic sedimentary rock and Precambrian rock. The southern 120 km portion of the rail alignment crosses only Precambrian

rock. The Paleozoic sedimentary rock includes sandstones, and the Precambrian rock includes gneisses.

Thirty-eight core samples from 26 boreholes were tested by SGS, taken every 3 to 7 km along the rail alignment. These included 7 sandstone, 6 granite and 25 granitoid gneiss samples.

The testing included acid-base accounting (ABA), Net Acid Generation (NAG), total metals by aqua regia digestion with ICP-MS finish, leachable metals, and mineralogy.

The report concluded that:

- The three types of materials tested are all suitable for quarry source material with a low potential for ML/ARD;
- Two gneiss samples had neutralization potential ratio (NPR) results that were unacceptably low, but the remainder of the samples did not show low NPR results. These samples were located at Station 64+400 and Station 95+200. However, samples between these stations had acceptable NPR results, indicating that a continuous area of low NPR likely does not exist between Station 64+400 and Station 95+200. This area should be investigated further;
- The sandstone and intrusive granite rocks are more homogeneous and may require less characterization prior to detailed development, but the less homogenous gneissic rocks should be characterized in more detail, especially around Cockburn Lake, to ensure that the rock does not have potential for ML/ARD;
- ML/ARD conditions may be caused by low sulphide content in the rock, and that sulphide contents should be identified in future sampling; and
- The regional geological information should be better characterized to identify potential ML/ARD areas.

3.5 Draft Environmental Impact Statement Report

Table A1 of Appendix 10D-6 in the DEIS provides volumes for most of the quarries. The DEIS adds Q40+600 and provides volumes for QS2 to the list given by KP in the "Quarry Sites' Screening" report [Ref 3], but still does not include QS1, QS3A or QS3. The volumes are unchanged from the KP report. The DEIS also does not provide volumes of material for material which could potentially be obtained from construction of the tunnels or the ore loading dock.

Appendix 3D of the DEIS also contains drawings of possible access roads to the quarry sites prepared by Dillon Consulting.

4. 2011 Investigation Program

4.1 Overview

The DEIS identifies 69 potential quarry locations, outlined in Table 1 below. It was not possible to drill at each of the 69 quarry locations due to time limitations. It should be noted that some of the potential quarry sites were located in areas where water sources for drilling were not

available nearby. Where water sources for drilling were not available nearby, helicopters were used to transport and supply drilling water, affecting the utilization of the helicopter time for the other drilling programs, and hence jeopardizing the completion of the remaining 2011 drilling investigations. In the interests of completing as many boreholes as possible, many of the potential quarry areas without nearby water sources were not drilled. Visual observation of these sites indicated that there are abundant sources of rock materials.

During the 2011 investigation program, boreholes were drilled at 35 quarry locations which had not previously been exploited or tested, at four additional locations along the proposed tunnels and at five locations at the ore loading dock at Steensby Inlet. Drilling was carried out under field supervision from Thurber. As drilling had never occurred at most of the sites, the purpose of the 2011 drilling program at the quarry sites was to confirm the availability of bedrock at the site, to confirm the rock depth and collect samples for physical and ARD tests. At Mary River and Steensby Inlet, samples were also collected for alkali-aggregate reactivity (AAR) tests to assess the material's potential for use as concrete aggregates.

Quarry QS3 is not discussed in the DEIS, but was mentioned in a 2008 KP investigation report [Ref 8]. This site is located on a bedrock knob adjacent to QS3A and it could be developed for sources of rock material at Steensby Inlet. It has been included in Table 1 for completeness.

Rock excavated during the construction of two tunnels in the southern portion of the rail alignment and at the ore loading dock at Steensby Inlet has also been identified as a potential source of rockfill materials. The four boreholes drilled along the tunnel locations and the five boreholes at the ore loading dock are included in Tables 1 and 2.

Table 1 also includes the approximate stations and coordinates of the potential quarry and borrow areas, the volumes of material anticipated to be sourced from the quarry and borrow areas, and whether a borehole was drilled at the quarry or borrow area in 2011. Table 2 summarizes the boreholes drilled in 2011, along with the quarry and borrow samples sent for lab testing. Borehole logs from the 2011 drilling program at the potential quarry and borrow sites are found in Appendix B [Ref 9].

Concrete will be required for construction of the Mary River and Steensby Inlet infrastructure. Material from potential quarries at the Mary River and Steensby Inlet sites will be tested to assess their suitability for concrete coarse aggregate in addition to their suitability as ballast and rockfill material. Additional samples were collected from Borrow Area #3 and from a potential borrow area in the vicinity of Station 128+000 for testing to meet suitability requirements for concrete fine aggregates.

4.2 Rock Samples

In general, the 16 quarry boreholes that were selected for sampling were chosen based on the distance from rail line and depth to bedrock. Boreholes closer to the railway and with bedrock at shallower depth were preferred over boreholes farther from the railway and with greater amounts of overburden.

The depth of samples for physical characteristic testing from the 16 boreholes was selected randomly. A section of core was selected that was representative of the average bedrock conditions.

The depth of samples for ARD testing was based on rock mineralogy. Sections of rock were selected that appeared to contain sulfide minerals such as pyrite. Where no evidence of sulfide minerals was found, the sample depth was selected randomly.

4.3 Bedrock Depth and Type

Table 2 and Figure 3 show the depth to bedrock in each borehole.

Bedrock was encountered in 42 of the 44 boreholes. At boreholes Q28+400 and Q31+500, bedrock was not encountered at end of drilling depths of 24.2 m and 13.2 m, respectively.

Sandstone bedrock was found at boreholes Q4+100, Q7+500 and Q18+100, and granitic gneiss bedrock was encountered at the remaining 39 boreholes. This confirms the geologic characterization of the railway line found in AMEC's "Interim ML/ARD Assessment of Railway Quarry Rock Samples" Report [Ref 4], as discussed in Section 3.4 of this report.

The depth to bedrock encountered in the boreholes varied along the rail alignment. Thirty-one boreholes had depths to bedrock of 5 m or less, six boreholes had depths to bedrock between 5 m and 10 m, and seven boreholes had depths to bedrock greater than 10 m. The maximum depth to bedrock recorded was 35 m. The boreholes with a depth to bedrock greater than 10 m are all found in the northernmost 40 km along the rail alignment. South of this point, the average depth is much lower at 2.5 m, indicating that the area has more prominent bedrock outcrops along the railway line.

4.4 RQD

The bedrock may be used for rail embankment material or ballast material if it has the required physical characteristics and does not show potential for ML/ARD. For ballast material, it is important that the rock be of good quality.

The Rock Quality Designation (RQD) gives an indication of rock soundness and quality. Rock with RQD values between 75% and 100% is classified as good to excellent, while rock with RQD values between 0% to 75% is classified as very poor, poor and fair. Table 2 summarizes the total thickness and percent in each borehole of very poor to fair rock. There is no discernible correlation between depth of rock and rock strength. Figure 3 summarizes the % of very poor to fair rock in each borehole.

Of the potential ballast sites which were previously investigated, only site BAL-1 (Q133+500) was not investigated in 2011. The borehole advanced in the vicinity of BAL-2 (Q138+100) consisted of 41% poor to fair rock, with RQD values ranging from 47% to 73%. The borehole advanced in the vicinity of BAL-3 (Q139+600) and BAL-4 (Q139+600), had no very poor to fair rock , confirming that it could be a very suitable source for ballast material.

4.5 Point Load Testing

Point load tests were conducted on the rock, with results provided in Appendix C. In general, the most weak rock is found between Q7+500 and Q22+500, with a few weak areas between Q42+000 and Q53+700, and at Q88+800, QTR-12 (Station 101+100) and NTUN-DH03 (Station 102+930). Between these weaker areas, and from Station 114+600 to the end of the rail alignment, the rock is almost exclusively very strong to extremely strong (100 MPa to 330 MPa).

5. Laboratory Testing

Laboratory testing programs have been previously carried out by AMEC and SGS Group (SGS) using samples collected by KP. It was determined that testing of the 2011 investigation material should be carried out by AMEC and SGS to provide continuity with previous programs. The samples that were collected are summarized in Table 2. Sand samples were also collected from Borrow Area #3 and from a potential borrow area in the vicinity of Station 128+000 for testing to meet suitability requirements for concrete fine aggregates.

The tests to be conducted will be the same as those done in previous programs [Ref 2 and Ref 4], as the 2011 investigation program for potential rock quarry sites was intended to provide additional information on the previously identified potential quarries. Physical and geochemical testing results are not available at this time and will be reported separately by AMEC.

6. Preliminary Recommendations

The 2011 drilling program has increased the knowledge about the potential quarry and borrow areas by better characterizing the subsurface conditions at the potential sites and by taking samples for testing.

As the next step after the 2011 drilling program and prior to the final design, the following activities are recommended. It should be noted that these recommendations are only based on limited field test results from drilling; laboratory test results are not yet available and may change the recommendations indicated below:

- Additional investigations should be conducted to complete drilling at the potential quarries outlined in Table 1 which were not drilled in 2011. It is not necessary to investigate the quarries used exclusively for construction of the access road;
- Alternative quarry sites should be identified to replace sites where the 2011 drilling program showed deep bedrock or no bedrock. Prior to this, it should be determined whether the borehole results were anomalies, and the sites should be checked for the presence of bedrock outcrops. If so, additional drilling should be conducted at these sites;
- When physical and geochemical testing is completed and reported by AMEC, the potential quarries will need to be re-evaluated on the basis of the test results. The quarries should be revisited, alternative quarries may be added if necessary and volumes of the quarries should

be adjusted based on the information from the current investigation program. The volume of material that can be extracted from rock cut areas and tunnels will be provided by Canarail/EBA Engineering;

- Additional investigations should be conducted at a number of quarry sites to confirm the thickness of overburden, particularly for quarries which will potentially supply large volumes of materials;
- When the laboratory test results are completed and reported, potential ballast sources should be assessed at QMR2, around Station 22+500 and 50+000, and at QS1, QS2 and QS3A;
- Borrow areas containing large boulders which could be crushed into rock aggregates should be considered, particularly in the most northern 35 km portion of the railway line; and
- Additional rock samples from the 2011 investigation program may need to be tested for ARD and physical characteristics, such as samples from boreholes drilled at other potential rock cut areas which could be used as rockfill material.

7. References

1. Canarail Consultants Inc, "Additional Quarry Sites", TDM No. 159952-5000-121-032 Rev. C, December 5, 2008.
2. AMEC Americas Limited, "Summary of Aggregate Resource Evaluation Testing Program, Baffinland Iron Mine Mary River Project", File No. TC83911 Phase 2000, January 13, 2009.
3. Knight Piésold Consulting, "Mary River Project Quarry Sites' Screening", File No., NB102-181/25-A.01, Cont. No. NB10-00321, June 25, 2010.
4. AMEC Americas Limited, "Interim ML/ARD Assessment of Railway Quarry Rock Samples, Baffinland Mary River Project – Issued for DEIS", File No. TC 101507, December 14, 2010.
5. Knight Piésold Consulting, "Mary River Project, Draft Environmental Impact Statement", December 2010.
6. Ontario Provincial Standard Specification, "Material Specification for Aggregates – Hot Mix Asphalt", OPSS 1003, November 2006.
7. Ontario Provincial Standard Specification, "Material Specification for Aggregates – Base, Subbase, Select Subgrade, and Backfill Material", OPSS 1010, November 2003.
8. Knight Piésold Consulting, "Baffinland Iron Mines Corporation, Mary River Project, Rail Alignment, Steensby Port Site Infrastructure & Borrow Sources, 2008 Site Investigations Summary Report", Ref. No. NB102-181/24-2, December 31, 2010.
9. Thurber Engineering Limited, "2011 Geotechnical Investigation – Factual Report", under preparation.

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Tables

Table 1: Quarry Summary

Quarry Name	Approximate Station[1]	Northing Coordinates	Easting Coordinates	Volume with Contingency (m^3)[2]			Drilled in 2011
				Railway	Road	Total	
QMR2	Mary River	7,914,203	560,128	491,079	47,052	538,130	Yes
Q-0+500	-0+500	7,911,899	563,668	826,508	196,174	1,022,683	Yes
Q4+100	4+100	7,909,418	566,698	570,968	199,833	770,801	Yes
Q7+500	7+500	7,907,667	569,432	619,585	174,374	793,959	Yes
Q10+250	10+250	7,905,378	572,883	1,007,536	206,620	1,214,157	Yes
Q14+500	14+200	7,904,382	575,868	1,232,091	240,446	1,472,537	Yes
Q18+100	18+100	7,902,853	578,804	1,463,455	263,943	1,727,398	Yes
Q22+500	22+500	7,901,663	583,415	1,484,696	230,582	1,715,278	Yes
Q25+500	25+500	7,900,221	586,954	755,019	124,801	879,820	Yes
Q28+400	28+400N	7,898,617	588,240	158,886	104,426	263,312	Yes
Q31+500	31+500N	7,897,863	590,944	53,356	128,885	182,242	Yes
Q35+000	35+000N	7,896,866	594,445	77,971		77,971	
Q35+500	35+500N	7,896,244	595,477	248,555	118,172	366,726	Yes
Q38+700	38+700N	7,893,140	596,368	342,908	116,780	459,687	Yes
Q40+600	40+600N	7,889,375	596,009	812,884	153,489	966,373	
Q42+000	42+000N	7,890,881	598,151	305,177	96,131	401,308	Yes
Q44+300	44+300N	7,888,054	598,208	302,919	62,185	365,104	Yes
Q44+000	44+000	7,885,927	596,138	178,149	38,931	217,080	Yes
Q45+000	45+000	7,884,724	596,201	54,862	29,020	83,882	Yes
Q45+800	45+800	7,884,147	596,990	34,368	42,430	76,798	
Q48+000	48+000	7,882,597	598,495	28,241	58,397	86,637	
Q50+000	50+000	7,881,100	597,357	134,915	70,757	205,672	Yes
Q53+700	53+700	7,877,567	597,616	339,267	78,350	417,616	Yes
Q56+750	56+750	7,875,280	598,852	426,916	87,668	514,583	Yes
Q60+000	60+000	7,871,954	599,087	327,131	102,084	429,214	
Q64+400	64+400	7,868,565	600,221	203,898	94,957	298,854	
Q67+200	67+200	7,865,619	600,161	156,728	79,560	236,288	
Q71+000	71+000	7,863,169	602,398	161,614	71,915	233,530	
Q74+200	74+200	7,860,226	603,469	109,863	63,161	173,024	
Q77+200	77+200	7,857,588	604,840	86,660	65,983	152,642	
Q79+600	79+600	7,855,411	605,366	145,051	77,616	222,666	
Q82+700	82+700	7,852,449	605,710	166,692	90,198	256,890	Yes
Q85+200	85+200	7,850,087	606,073	227,871	89,196	317,067	Yes
Q88+800	88+800	7,846,674	605,956	238,151	63,999	302,150	Yes
QTR21	90+400	7,845,379	605,707		51,239	51,239	
Q92+000	92+000	7,843,535	605,816	98,287		98,287	
QTR22	92+000	7,843,330	605,243		47,682	47,682	
QTR23	93+600	7,841,721	606,018		33,456	33,456	
Q95+400	95+150	7,840,905	607,500	16,898	56,143	73,041	
Q96+100	96+100	7,840,533	608,580	17,031	149,531	166,562	
Q96+700	96+700	7,839,908	608,976	6,493		6,493	
QTR10	97+300	7,839,328	611,431		203,081	203,081	
QTR11	98+700	7,838,013	611,995		134,433	134,433	
QTR6	98+900	7,836,409	611,377		101,012	101,012	
QTR13	100+700	7,833,967	609,448		165,509	165,509	Yes

Quarry Name	Approximate Station[1]	Northing Coordinates	Easting Coordinates	Volume with Contingency (m^3)[2]			Drilled in 2011
				Railway	Road	Total	
QTR12	101+100	7,836,190	610,857		162,040	162,040	Yes
NTUN-DH01	102+540	7,835,656	605,976				Yes
NTUN-DH03	102+930	7,835,382	605,698				Yes
NTUN-DH05	103+140	7,835,245	605,535				Yes
STUN-DH03	108+180	7,832,812	601,490				Yes
QTR7	108+300	7,832,685	608,302		132,606	132,606	
QTR17	105+700	7,832,984	603,944		948,392	948,392	
QTR14	104+300	7,831,608	607,681		171,297	171,297	
QTR15	105+200	7,830,326	606,224		227,039	227,039	
QTR16	106+200	7,830,731	603,228		905,620	905,620	
Q110+200	110+200	7,831,193	600,359	253,809		253,809	
QTR8	112+000	7,830,182	602,012		603,136	603,136	
Q114+600	114+600	7,827,828	597,850	382,501		382,501	Yes
QTR9	116+500	7,826,260	600,261		361,991	361,991	Yes
Q116+800	116+800	7,826,194	597,422	764,455		764,455	Yes
QTR18	120+600	7,822,808	599,870		536,571	536,571	
QTR4A	123+000	7,820,410	598,555	958,066	636,598	1,594,664	Yes
QTR19	126+900	7,816,806	597,863		451,609	451,609	
Q127+800	127+800	7,815,755	598,770	545,218		545,218	
Q128+000	128+000	7,813,922	598,828		222,278	222,278	
Q131+100	131+100	7,813,509	600,177	112,666	191,240	303,906	Yes
Q133+500	133+500	7,811,052	601,482				
QTR20	134+100	7,810,467	598,087		169,565	169,565	
Q138+100	138+100	7,807,612	598,865		104,996	104,996	Yes
Q139+600	139+600	7,806,105	598,727		119,999	119,999	Yes
QS3A	Steensby	7,800,000	595,698				Yes
QS3	Steensby	7,799,349	597,500				
QS2	Steensby	7,801,066	595,200		300,000	300,000	Yes
QS1	Steensby	7,803,054	593,500				Yes
SI-OLD-004	Steensby	7,798,314	592,879				Yes
SI-OLD-005	Steensby	7,798,331	592,860				Yes
SI-OLD-006	Steensby	7,798,409	592,876				Yes
SI-OLD-007	Steensby	7,798,424	592,840				Yes
SI-OLD-008	Steensby	7,798,489	592,891				Yes

Notes:

[1] Two sets of stationing are used along the rail alignment. Following the Ravn River realignment, which extends from approximately station 26+100 to station 46+582.93, the stationing resets to 43+830 to be consistent with the stationing used prior to the Ravn River realignment. To avoid confusion, stationing along the Ravn River realignment has an "N" suffix.

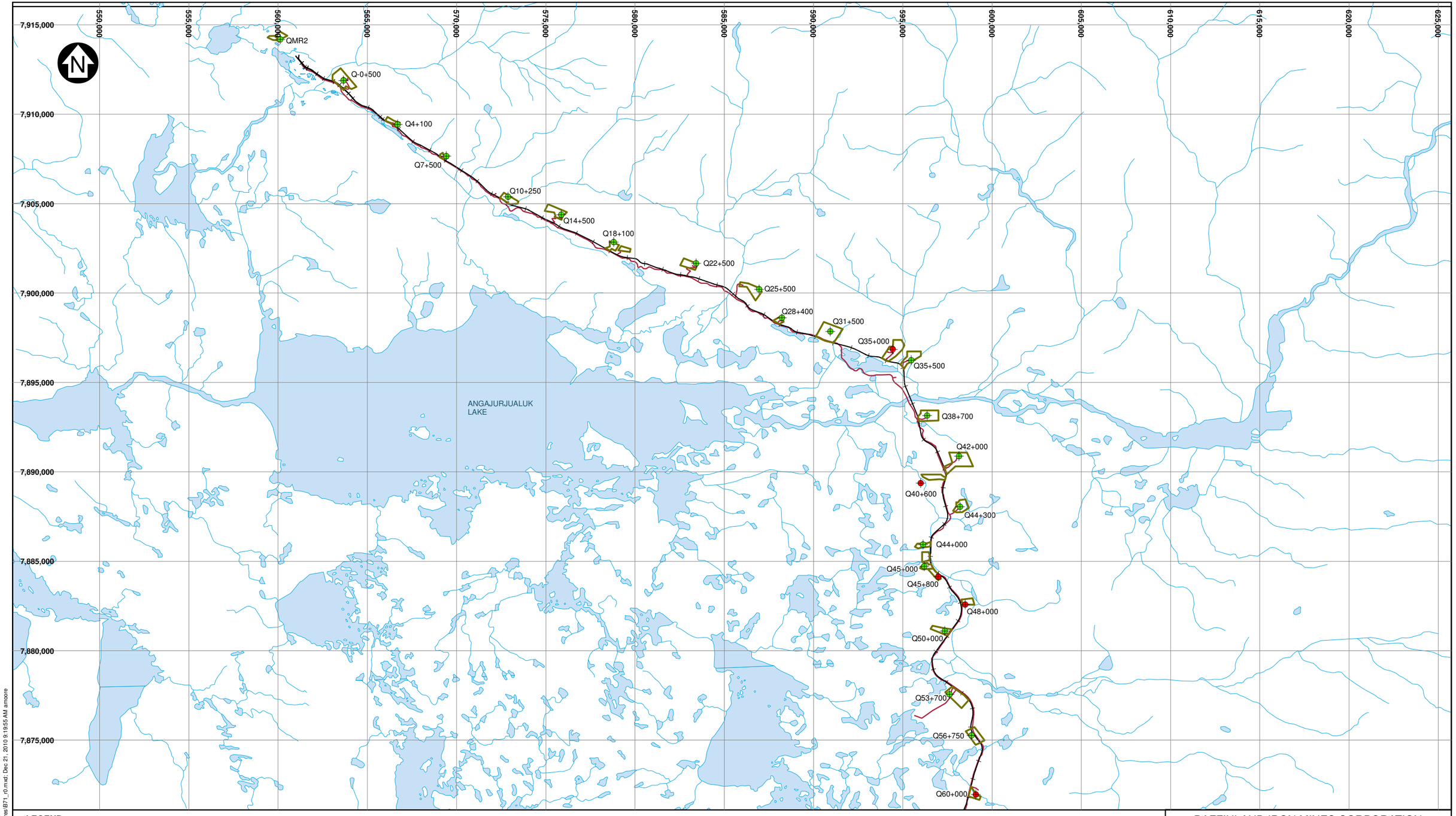
[2] Volumes obtained from the DEIS [Ref 5].

Table 2: Borehole Statistics

Borehole Name	Date Started	Date Completed	Borehole Depth (m)	Bedrock Depth (m)	Very Poor to Fair Rock Thickness (m)	% Very Poor to Fair Rock	Rock Type	Physical Testing	Depth of Physical Sample (m)	Depth of ARD Sample (m)
QMR2	7-Aug-11	7-Aug-11	26.0	0.90	1.1	4%	Granitic Gneiss	yes	2.0 to 7.0	11.25 to 11.35
Q0+500	30-Jul-11	31-Jul-11	30.0	16.15	13.85	100%	Granitic Gneiss			26.7 to 26.8
Q4+100	29-Jul-11	30-Jul-11	62.0	35.00	27	100%	Sandstone			53.43 to 53.5
Q7+500	28-Jul-11	29-Jul-11	50.0	21.80	19.2	68%	Sandstone			40.9 to 41
Q10+250	25-Jul-11	26-Jul-11	41.0	8.00	33	100%	Granitic Gneiss			22.9 to 23
Q14+500	24-Jul-11	24-Jul-11	47.2	11.20	33	92%	Granitic Gneiss			25.1 to 25.2
Q18+100	23-Jul-11	23-Jul-11	38.0	5.00	No data	No data	Sandstone			17.6 to 17.7
Q22+500	22-Jul-11	22-Jul-11	62.0	2.00	3	5%	Granitic Gneiss			20.4 to 20.5
Q25+500	22-Jul-11	22-Jul-11	32.3	5.34	2.9	11%	Granitic Gneiss	yes	8.34 to 13.3	6.7 to 6.8
Q28+400	18-Jul-11	18-Jul-11	24.2	> 24.2	-	-	No bedrock found			
Q31+500	19-Jul-11	19-Jul-11	13.2	> 13.2	-	-	No bedrock found			
Q35+500	17-Jul-11	17-Jul-11	26.2	2.45	11.75	49%	Granitic Gneiss			19.53 to 19.65
Q38+700	16-Jul-11	16-Jul-11	50.4	31.20	7.2	38%	Granitic Gneiss			38.15 to 38.24
Q42+000	16-Jul-11	16-Jul-11	23.4	5.67	8.73	49%	Granitic Gneiss	yes	12.75 to 18.0	21.57 to 21.67
Q44+300	15-Jul-11	15-Jul-11	14.4	1.90	-	0%	Granitic Gneiss			5.24 to 5.33
Q44+000	15-Jul-11	15-Jul-11	23.0	5.00	18	100%	Granitic Gneiss	yes	8.0 to 12.9	18.8 to 18.9
Q45+000	14-Jul-11	14-Jul-11	14.3	2.20	-	0%	Granitic Gneiss			7.45 to 7.56
Q50+000	14-Jul-11	14-Jul-11	16.9	0.44	-	0%	Granitic Gneiss	yes	7.79 to 13.1	14.8 to 14.9
Q53+700	13-Jul-11	13-Jul-11	29.2	7.70	-	0%	Granitic Gneiss	yes	14.2 to 19.4	23.2 to 23.3
Q56+750	11-Jul-11	11-Jul-11	11.2	4.41	-	0%	Granitic Gneiss	yes	4.7 to 9.7	10.8 to 10.9
Q82+700	22-Jul-11	22-Jul-11	16.0	1.65	9.35	65%	Granitic Gneiss	yes	4.55 to 9.5	4.2 to 4.3
Q85+200	20-Jul-11	21-Jul-11	25.9	2.58	8.52	37%	Granitic Gneiss			
Q88+800	17-Jul-11	18-Jul-11	15.0	0.10	4.4	30%	Granitic Gneiss			7.89 to 7.98

Borehole Name	Date Started	Date Completed	Borehole Depth (m)	Bedrock Depth (m)	Very Poor to Fair Rock Thickness (m)	% Very Poor to Fair Rock	Rock Type	Physical Testing	Depth of Physical Sample (m)	Depth of ARD Sample (m)
QTR13	14-Jul-11	14-Jul-11	15.1	5.00	3.1	31%	Granitic Gneiss	yes	5.2 to 10.2	11.3 to 11.45
QTR12	15-Jul-11	15-Jul-11	20.5	2.85	11.65	66%	Granitic Gneiss			8.8 to 8.92
NTUN-DH01	3-Aug-11	3-Aug-11	34.8	6.45	1.35	5%	Granitic Gneiss			13.0 to 13.4
NTUN-DH03	1-Aug-11	13-Aug-11	121.6	4.50	0.00	0%	Granitic Gneiss			109.2 to 109.6
NTUN-DH05	30-Jul-11	30-Jul-11	82.3	2.99	3.00	4%	Granitic Gneiss			
STUN-DH03	29-Jul-11	31-Jul-11	87.45	3.30	0.00	0%	Granitic Gneiss			63.0 to 63.4
Q114+600	25-Jul-11	25-Jul-11	33.6	2.30	-	0%	Granitic Gneiss	yes	9.4 to 14.52	16.95 to 17.05
QTR9	25-Jul-11	26-Jul-11	32.4	0.30	2.1	7%	Granitic Gneiss			29.75 to 29.86
Q116+800	26-Jul-11	26-Jul-11	32.4	1.93	-	0%	Granitic Gneiss	yes	12.75 to 17.39	9.1 to 9.2
QTR4A	4-Aug-11	4-Aug-11	32.45	0.51	14	44%	Granitic Gneiss	yes	19.9 to 24.9	15.5 to 15.6
Q131+100	5-Aug-11	5-Aug-11	20.48	8.35	3.15	26%	Granitic Gneiss	yes	11.48 to 16.1	17.6 to 17.7
Q138+100	16-Jul-11	17-Jul-11	30.93	0.00	12.7	41%	Granitic Gneiss	yes	17.29 to 22.18	6.1 to 6.2
Q139+600	19-Jul-11	19-Jul-11	13.9	0.00	-	0%	Granitic Gneiss			
QS1	6-Aug-11	6-Aug-11	17.52	0.00	6.02	34%	Granitic Gneiss	yes	9.6 to 14.52	15.6 to 15.75
QS2	24-Jul-11	25-Jul-11	30.0	0.00	3.2	11%	Granitic Gneiss			5.9 to 6.04
QS3A	23-Jul-11	23-Jul-11	15.1	0.00	11.8	78%	Granitic Gneiss	yes	4.97 to 10.0	15.6 to 15.75
SI-OLD-004	8-Aug-11	8-Aug-11	32.23	0.00	3	9%	Granitic Gneiss			
SI-OLD-005	9-Aug-11	10-Aug-11	31.96	0.00	5	16%	Granitic Gneiss			7.5 to 7.9
SI-OLD-006	10-Aug-11	11-Aug-11	38.38	0.00	6	16%	Granitic Gneiss			
SI-OLD-007	11-Aug-11	11-Aug-11	32.4	0.00	11.4	35%	Granitic Gneiss			8.1 to 8.5
SI-OLD-008	12-Aug-11	12-Aug-11	35.61	0.00	13.4	38%	Granitic Gneiss			

Figures



LEGEND:

- PROPOSED RAILWAY ALIGNMENT
- PROPOSED ACCESS ROAD
- PROPOSED QUARRY LEASE BOUNDARY AREA
- WATER BODY
- QUARRIES DRILLED IN 2011
- QUARRIES NOT DRILLED IN 2011
- RIVER/STREAM/DRAINAGE

0 2 4 6 8 Kilometers

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D

NOTES:

1. BASE MAP 1:250,000 © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA, DEPARTMENT OF NATURAL RESOURCES (2004).
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. QUARRY LEASE BOUNDARY AREAS AND ACCESS ROAD PROVIDED BY KNIGHT PIESOLD.
4. RAILWAY ALIGNMENT PROVIDED BY CANARAIL CONSULTANTS INC. (AUGUST 12, 2010).
5. THE RAILWAY AND CONSTRUCTION ACCESS ROAD PRELIMINARY DESIGNS, INCLUDING THE LOCATION OF ALL WATERCOURSE CORSSINGS, ARE PRESENTED AS PLAN AND PROFILE DRAWINGS BY CANARAIL IN VOLUME 3 APPENDICES TO THE EIS.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

2011 GEOTECHNICAL INVESTIGATIONS QUARRY SITES

Figure 1

P/A NO.	REF NO.
	REV A

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575,000 580,000 585,000 590,000 595,000 600,000 605,000 610,000 615,000 620,000 625,000

7,865,000 7,860,000 7,855,000 7,850,000 7,845,000 7,840,000 7,835,000 7,830,000 7,825,000 7,820,000 7,815,000 7,810,000 7,805,000 7,800,000

Q64+400
Q67+200
Q71+000
Q74+200
Q77+200
Q79+600
Q82+700
Q85+200
Q88+800
QTR21
Q92+000
QTR22
QTR23
Q95+400
Q96+100
Q96+700
QTR10
QTR11
QTR6
QTR12
NTUN-DH01
NTUN-DH03
NTUN-DH05
QTR13
STUN-DH03
QTR17
QTR7
QTR14
Q110+200
QTR16
QTR8
QTR15
Q114+600
Q116+800
QTR9
QTR18
QTR4A
QTR19
Q127+800
Q128+000
Q131+100
Q133+500
QTR20
Q138+100
Q139+600
QS1
QS2
QS3A
QS3
SI-OLD-007
SI-OLD-005
SI-OLD-008
SI-OLD-006
SI-OLD-004

COCKBURN LAKE

STEENSBY INLET

0 2 4 6 8 Kilometers

LEGEND:

- PROPOSED RAILWAY ALIGNMENT
- PROPOSED ACCESS ROAD
- PROPOSED QUARRY LEASE BOUNDARY AREA
- WATER BODY
- QUARRIES DRILLED IN 2011
- QUARRIES NOT DRILLED IN 2011
- RIVER/STREAM/DRAINAGE

NOTES:

1. BASE MAP 1:250,000 © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA, DEPARTMENT OF NATURAL RESOURCES (2004).
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
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4. RAILWAY ALIGNMENT PROVIDED BY CANARAIL CONSULTANTS INC. (AUGUST 12, 2010).
5. THE RAILWAY AND CONSTRUCTION ACCESS ROAD PRELIMINARY DESIGNS, INCLUDING THE LOCATION OF ALL WATERCOURSE CORSSINGS, ARE PRESENTED AS PLAN AND PROFILE DRAWINGS BY CANARAIL IN VOLUME 3 APPENDICES TO THE EIS.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

2011 GEOTECHNICAL INVESTIGATIONS QUARRY SITES

Figure 2

P/A NO.

REF NO.

REV A

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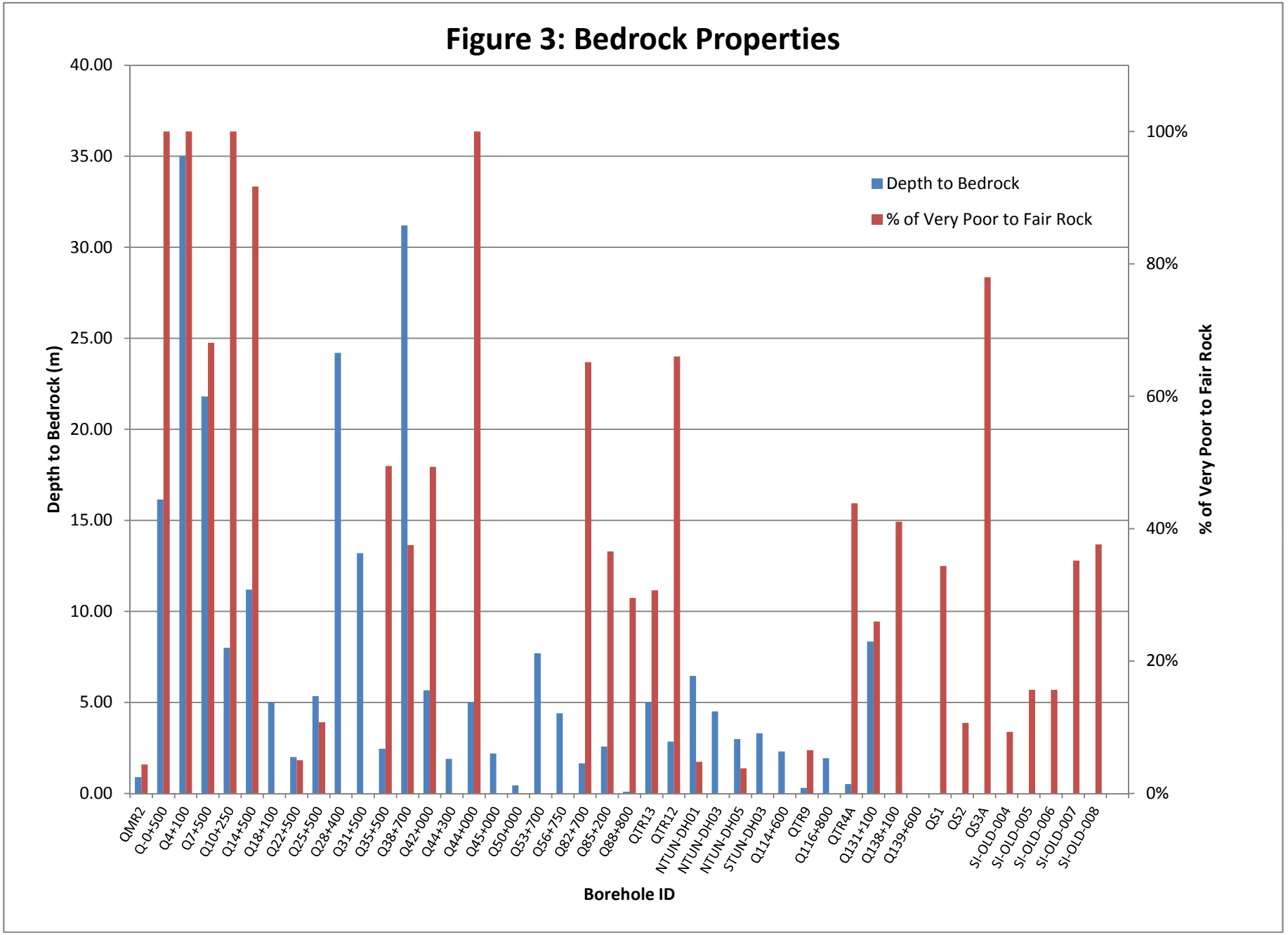
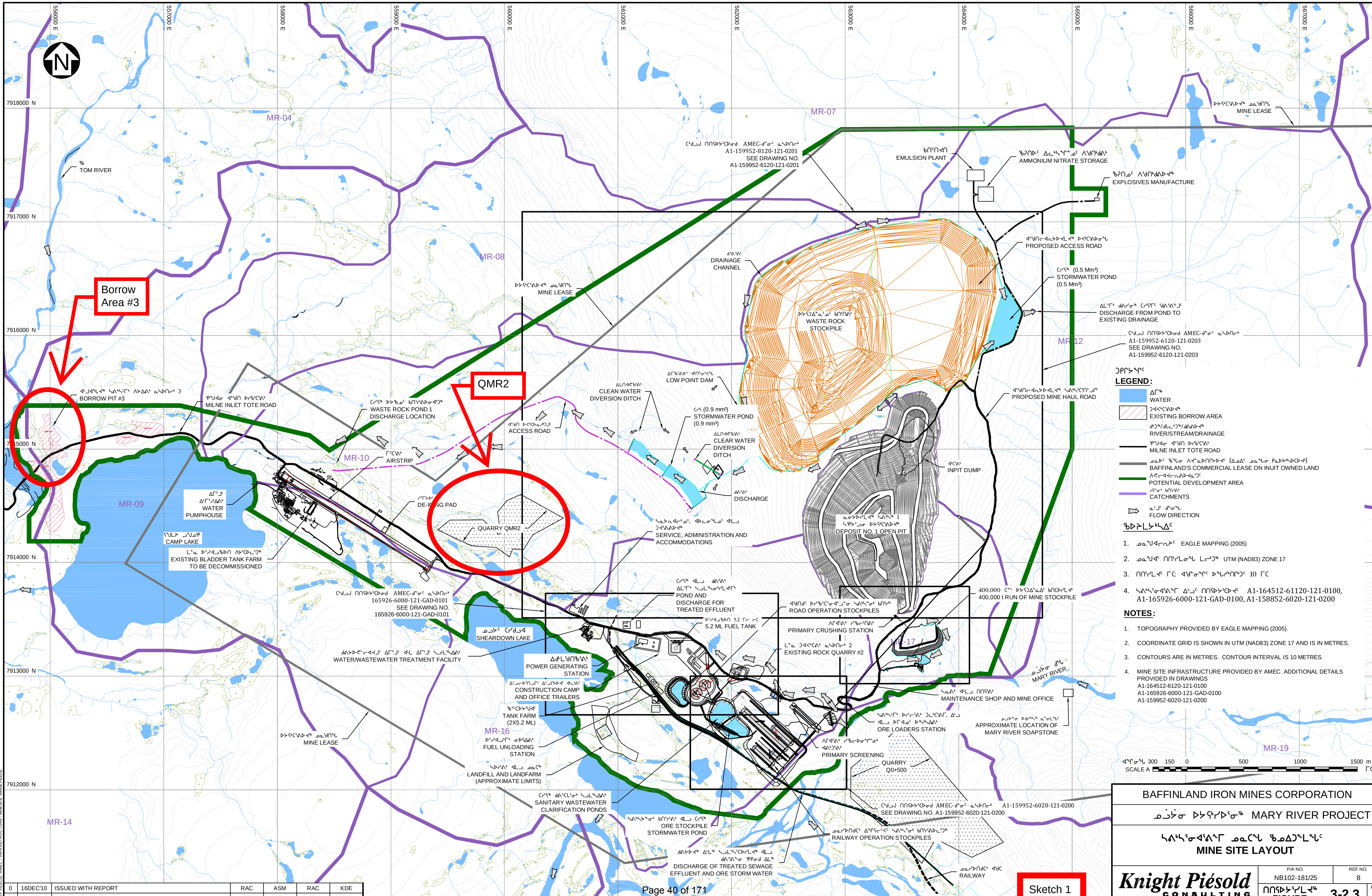
Figure 3: Bedrock Properties



Appendix A: Sketches



Borrow Area #3
QMR2
TOM RIVER
BORROW PIT #3
MILNE INLET TOTE ROAD
WASTE ROCK POND 1 DISCHARGE LOCATION
ACCESS ROAD
AIRSTRIP
DE-ICING PAD
QUARRY QMR2
WATER PUMPHOUSE
CAMP LAKE
EXISTING BLADDER TANK FARM TO BE DECOMMISSIONED
SEE DRAWING NO. 165926-6000-121-GAD-0101
SHEARDOWN LAKE
WATER/WASTEWATER TREATMENT FACILITY
POWER GENERATING STATION
CONSTRUCTION CAMP AND OFFICE TRAILERS
TANK FARM (2X5.2 ML)
FUEL UNLOADING STATION
MINE LEASE
LANDFILL AND LANDFARM (APPROXIMATE LIMITS)
SANITARY WASTEWATER CLARIFICATION PONDS
ORE STOCKPILE STORMWATER POND
DISCHARGE OF TREATED SEWAGE EFFLUENT AND ORE STORM WATER
RAILWAY OPERATION STOCKPILES
RAILWAY
SEE DRAWING NO. A1-159952-6020-121-0200
QUARRY Q0+500
PRIMARY SCREENING
ORE LOADERS STATION
APPROXIMATE LOCATION OF MARY RIVER SOAPSTONE
MAINTENANCE SHOP AND MINE OFFICE
MARY RIVER
EXISTING ROCK QUARRY #2
PRIMARY CRUSHING STATION
5.2 ML FUEL TANK
ROAD OPERATION STOCKPILES
400,000 t RUN OF MINE STOCKPILE
POND AND DISCHARGE FOR TREATED EFFLUENT
SERVICE, ADMINISTRATION AND ACCOMMODATIONS
DEPOSIT NO. 1 OPEN PIT
INPIT DUMP
DISCHARGE
CLEAR WATER DIVERSION DITCH
STORMWATER POND (0.9 mm³)
CLEAN WATER DIVERSION DITCH
LOW POINT DAM
DRAINAGE CHANNEL
WASTE ROCK STOCKPILE
PROPOSED MINE HAUL ROAD
SEE DRAWING NO. A1-159952-6120-121-0203
DISCHARGE FROM POND TO EXISTING DRAINAGE
STORMWATER POND (0.5 Mm³)
PROPOSED ACCESS ROAD
EXPLOSIVES MANUFACTURE
AMMONIUM NITRATE STORAGE
EMULSION PLANT
SEE DRAWING NO. A1-159952-6120-121-0201
MINE LEASE
MR-04 MR-07 MR-08 MR-09 MR-10 MR-12 MR-14 MR-16 MR-17 MR-19
LEGEND:
WATER
EXISTING BORROW AREA
RIVER/STREAM/DRAINAGE
MILNE INLET TOTE ROAD
BAFFINLAND'S COMMERCIAL LEASE ON INUIT OWNED LAND
POTENTIAL DEVELOPMENT AREA
CATCHMENTS
FLOW DIRECTION
1. EAGLE MAPPING (2005)
2. UTM (NAD83) ZONE 17
4. A1-164512-61120-121-0100, A1-165926-6000-121-GAD-0100, A1-158852-6020-121-0200
NOTES:
1. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005).
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS 10 METRES.
4. MINE SITE INFRASTRUCTURE PROVIDED BY AMEC. ADDITIONAL DETAILS PROVIDED IN DRAWINGS A1-164512-6120-121-0100 A1-165926-6000-121-GAD-0100 A1-159952-6020-121-0200
SCALE A 300 150 0 500 1000 1500 m
BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT
MINE SITE LAYOUT
Knight Piésold CONSULTING
P/A NO. NB102-181/25
REF NO. 8
FIGURE 3-2.3
REV 0
0 | 16DEC'10 | ISSUED WITH REPORT | RAC | ASM | RAC | KDE
REV | DATE | DESCRIPTION | DESIGNED | DRAWN | CHK'D | APP'D

Sketch 1

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594500 E
596000 E
597500 E
599000 E
7808000 N
7806500 N
7805000 N
7803500 N
7802000 N
7800500 N
7799000 N
7797500 N

ᐃᓚᐹᑦᑐᓕᕐᔪᐊᖅ
IKPIKITTURJUAQ BAY

ᐃᓚᖃᕐᑕᐅᓯᒪᔪᖅ ᐊᒥᓱᓕᕆᔨᒃᑯᐊᓂᖅ
WATER SUPPLY INTAKE AND PUMPHOUSE

10ᑭᓪᓗᑦ ᐃᒥᖅᓯᐅᑦ
10 Km LAKE WATER SOURCE

ᓄᓇᓕᐅᑎᓯᒪᔪᖅ ᐊᒥᓱ
RAILWAY

ᓴᖅᑭᒃ ᐃᑲᔪᐃᑦ
SNOWMOBILE CROSSING

ᐊᒡᓕᑎ ᐊᒥᓱ ᐃᓚᖃᑎᒃᓴᑦ ᓯᓚᐅᖅᓯᖓ
ACCESS ROAD AND WATER SUPPLY PIPELINE

ᕿᐊᑦᑕᐃᑦ (Q139+600)
QUARRY SITE (Q139+600)

QS1
QS2
QS3
QS3A

ᐊᑦᑕᐃᓇᖅ
LANDFILL

ᐃᓄᒪᓐᓂᖅ
POWER GENERATING STATION

ᐅᑦᑎᕐᑐᒃᓴᑦ ᐃᑦᓯᓪᓚᖓ
ACCOMMODATION COMPLEX (PERMANENT)

ᓄᓇᓕᐅᑎᓂᑦ ᐊᒡᒐᑎᑦᑕᓐᓄᑦ ᐱᓕᓂᐃᑦ
RAIL MAINTENANCE BUILDING

ᓄᓇᖅ
OUTPOST CAMP

ᐊᑦᑕᓯᓂᐅᓂᐃᑦ ᐊᒪᓚ ᐊᑦᑕᓯᓂᓐᓄᑦ ᐃᐱᕈᑎᐃᑦ
WASTE STORAGE AREA AND INCINERATOR

ᐅᑦᓱᓂᓗᖅᐳᑎᐃᑦ
FUEL STORAGE

ᐃᓚᖅᐅᑎ ᑕᓐᖅ
STORM WATER MANAGEMENT POND

ᐃᓄᐃᐅᑦᓴᓕᓐᓂᒃᑯᑦ ᐃᒥᑦᔨ ᐊᒪᓚ ᐃᒥᑦᔨ ᓴᓗᓴᖅᓯᐃᓐᓇᑦ
WASTEWATER TREATMENT FACILITY

ᐃᓚᓴᓗᑦ ᐃᑦᑕᓱᐃᑦ
POTENTIAL SEWAGE OUTFALL LOCATIONS (APPROXIMATE)

ᐊᑦᑕᓯᓂᐅᓂᐃᑦ ᐅᑎᕐᓯᐅᓂᐃᑦ
PERMANENT LAYDOWN AREAS

ᑕᖅᑎᐅᑦ ᐃᓂᓴᓐᖓᓐᓄᑦ ᐱᓵᒧᑎᓂᐃᑦ
AMMONIUM NITRATE STORAGE

ᑕᓐᓂᓗᒍ ᑎᑎᕋᐅᓪᓚᐅᓂᓄᑦ
AMEC-ᑯᓐᓄᑦ ᓇᓴᐅᑎᓐᓄᑦ
A1-159952-8120-121-0203
SEE AMEC DRAWING NO. A1-159952-8120-121-0203

ᐊᑦᑕᓯᓂᐅᓂᐃᑦ ᓂᐊᖅᑐᓂᐃᑦ
WASTE TRANSFER STATION

%ᐃᑦᓚᐅᑦᑐᑦ ᐅᑦᑎᕐᓯᐅᓂᓄᑦ
(600ᓄᑦ ᐃᓄᐅᓂᓄᑦ)
CONSTRUCTION CAMP (600 P)

ᓴᖅᑭᑦ ᐅᓇᓕᐅᑎᓂᐃᑦ ᓄᓇᕐᐳᑎᐃᓕᐅᑦ
TWIN ROTARY RAIL CAR DUMPER (600 MTPH)

ᐃᓚᖅᑕᐅᑎ
CAUSEWAY

ᐃᑦᑕᒋᐊᖅ 3 ᑭᓚᒥᑦᑕᓂᖅ (ᐃᑦᓚᓕᐅᑎᓗᒍ)
3 KM LAKE WATER SOURCE (CONSTRUCTION PHASE)

ᓇᑦᓯᖏᓐᓄᑦ ᐃᑦᓚᓕᐅᑎᓂᐃᑦ
AIRCRAFT SERVICES

ᒥᑦᑕᐃᓇᖅ
AIRSTRIP

ᐅᓪᓗᑕᒪᓕᒃ ᑎᑦᑕᐃᓇᖅ
HELICOPTER PAD

ᐅᓚᑦᑕᐃᓐᓇᖅ ᓂᐅᐃᐃᓚᐅᓂᓄᑦ ᐃᓕᓴᐅᓂᐃᑦ
(ᒪᑐᐃᖏᓚᓐᓂ ᐃᑦᓚᓕᐅᑦᓂᖓᓐᓂᓂᓄ)
CONSTRUCTION DOCKS (TEMP)

ᐃᓚᖅᑕᐅᑎ ᑲᓇᐃᑦ
ORE STOCKPILE STORMWATER POND

ᓴᖅᑭᒃᑯᑦ ᐅᓇᓕᐅᑎᓂᐃᑦ ᐊᒪᓚ ᐅᒥᐊᓕᒃ ᐅᑦᑎᕐᓯᐅᓂᐃᑦ ᐃᓚᓐᓄᑦ
EMERGENCY AND TUG FUEL STORAGE

ᓴᖅᑭᒃᑯᑦ ᐅᑎᕐᓯᐃᑦ
ORE LOADING DOCK, ATCO SHELTER & TUG REFUELING

ᓴᖅᑭᒃᑯᑦ ᐅᑎᕐᓯᐃᑦ
ORE STOCKPILES

ᐅᒥᐊᓕᒃ ᐅᑦᑎᕐᓯᐅᓂᐃᑦ ᐃᓕᓴᐅᓂᐃᑦ
FREIGHT DOCK

ᑕᖅᑎᐅᑦ ᑎᑎᕋᐅᓪᓚᐅᓂᓄᑦ AMEC-ᑯᓐᓄᑦ ᓇᓴᐅᑎᓐᓄᑦ
A1-159952-8120-121-0201
SEE AMEC DRAWING NO. A1-159952-8120-121-0201

ᖃᓄᐃᓕᒃᑲᓪᓚᕆᐊᖃᖅ
STEENSBY INLET

ᓄᓇᕗᑦ ᐅᑦᓴᕐᓂᐅᓂᖅ ᐊᒪᓚ ᖃᓄᐃᓕᒃᑲᓪᓚᕆᐊᖃᖅ
EXPLOSIVES MANUFACTURE AND MAGAZINES

ᐊᑦᑕᓯᓂᐅᓂᐃᑦ ᐃᓕᓴᐅᓂᐃᑦ
ROCK CUT FOR AIRSTRIP CONSTRUCTION

ᑐᓴᐅᒃᑐᖅ
LEGEND:

- ᐃᒥᖅ WATER
- ᓴᖅᑭᑐᓂᖓᓐᓄᑦ ᓄᓇ WETLAND
- ᓄᓇ ᐱᖁᑎᐊᖅ ᐃᑦᓚᓕᐅᑎᓚᒥᑦ LAYDOWN AREA (CONSTRUCTION PHASE)
- ᐃᑦᓚᓕᐅᑦᓇᐅᑎᓚᒍ ᐃᑦᓚᑦ CONSTRUCTION PHASE INFRASTRUCTURE
- ᑯᒋᖏᖅ/ᑯᒪᓕᒋᖏᖅ/ᑯᐊᐱᐅᓕᖏᖅ RIVER/STREAM/DRAINAGE
- ᓱᓕᑦᓄᑦ ᑲᑎᕐᓂᐊᖅ CATCHMENTS
- ᐱᓕᓕᐊᑦᓂᐊᓕᐅᖏᓐᓄᑦ POTENTIAL DEVELOPMENT AREA
- ᓄᓇᕗᑎᓂᑦ ᐊᒡᒐᑎᑦᑕᓐᓄᑦ PROPOSED RAILWAY ALIGNMENT

ᖃᐅᔨᓴᓕᕆᓚᐅᑦ

1. ᓄᓇᖓᐊᓕᓂᔨᑦ EAGLE MAPPING (2005)
2. ᓄᓇᖓᐊᖅ ᑎᑎᕐᓗᓂᖓ ᒪᓕᒃᑐᖅ UTM (NAD83) ZONE 17
3. ᑎᑎᕐᓗᒪᓕᒃ ᒥᑦ: ᐊᖏᓂᑐᖅᑎᑦ ᐅᖓᓗᕐᑎᑎᑐᑦ 5 ᒥᑦ
4. ᐅᐅᕐᑦᕼᐃᐅᔪᖅ ᑎᑎᕋᐅᑦᔨᕐᓗᓂᖓ AMEC

NOTE(S):

1. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005).
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS 5 METRES.
4. MINE SITE INFRASTRUCTURE PROVIDED BY AMEC DRAWINGS NO. A1-159952-9120-121-0106 AND A1-164512-8120-121-0900.

ᐊᖏᓂᖓ 300 150 0 500 1000 1500 m
SCALE

BAFFINLAND IRON MINES CORPORATION
ᓄᓕᒃᑐᓂ ᐅᐸᕐᓗᐅᑦᓂᖅ MARY RIVER PROJECT
ᐃᑲᐱᑦᑐᕐᕆᐊᑦ ᓄᓇᕈᖓ ᖃᓄᐃᓐᓇᒪᖓᑦ
STEENSBY PORT LAYOUT

Knight Piésold CONSULTING

P/A NO.	REF NO.
NB102-181/25	8

ᑎᑎᕋᐅᓕᕐᓂᖅ FIGURE **3-2.9** REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'10	ISSUED WITH REPORT	RAC	ASM	RAC	KDE

Sketch 2

Appendix B: Borehole Logs

RECORD OF BOREHOLE QMR-2

PROJECT : Mary River Project
LOCATION : Mary River - Quarry
STARTED : August 7, 2011
COMPLETED : August 7, 2011

Project No. 19-1605-126
DRILLER: BOART LONGYEAR, LM-55
N 7 914 203 E 560 128
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
		COBBLES (< 100mm), granitic, fines washed out										
				0.90								0.90
1	NQ Diamond Drill	**GRANITIC GNEISS**, slightly weathered to fresh, very strong, quartz-rich, grey			1	RUN			TCR=70% SCR=70% RQD=70%		FI	
2												
3					2	RUN			TCR=100% SCR=100% RQD=95%			
4												
5												
6					3	RUN			TCR=100% SCR=100% RQD=100%			
7												
8					4	RUN			TCR=100% SCR=100% RQD=90%			
9												
10												
11					5	RUN			TCR=100% SCR=100% RQD=99%			
12												
13												
14		some quartz veins (100mm)			6	RUN			TCR=100% SCR=100% RQD=94%			
15												
16												
17		large plagioclase crystal at 17.0m to 17.69m			7	RUN			TCR=97% SCR=97% RQD=93%			
18												
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Boucher/Clarke
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QMR-2

PROJECT : Mary River Project
LOCATION : Mary River - Quarry
STARTED : August 7, 2011
COMPLETED : August 7, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 914 203 E 560 128

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21	NQ Diamond Drill				8	RUN			TCR=100% SCR=100% RQD=100%			
22												
23											1	
24											6	
25					9	RUN			TCR=100% SCR=100% RQD=94%			
26		END OF BOREHOLE AT 26.00m.		26.00								
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Boucher/Clarke
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q-000+500

PROJECT : Mary River Project
LOCATION : -0+500 - Quarry
STARTED : July 30, 2011
COMPLETED : July 31, 2011

DRILLER: BOART LONGYEAR
N 7 911 899 E 563 668

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT	EXCESS ICE CONTENT, PERCENT / WATER CONTENT, PERCENT	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	no recovery			1	RUN		0				
2				2.15								
3		**GRAVEL**, granitic, fines washed out			2	RUN		13				
4												
5				5.15								
6		**SAND** and **GRAVEL**, trace to some silt, grey to brown layer of grey sand (120mm)			3	RUN		70			80	6.10
7		ICE and SAND inclusions (Vs) at 6.50m to 7.00m some zones of frozen soil (Nbn) at 7.20m to 8.15m (Vr)										
8												8.15
9					4	RUN		90				
10		some cobbles										
11												
12					5	RUN		57				
13									Grain Size Analysis: Gr 43%/ Sa 42%/ Si & Cl 15%			
14				14.15								
15		**GRAVEL**, sandy, trace to some silt and clay, some fractures with clay infilling, with completely weathered shale fragments, brown to red			6a	RUN		80				
16				16.15								16.15
17		**GRANITIC GNEISS**, moderately weathered, some fibrous minerals, some clay gouges, red, grey clay at 17.12m (30mm)			6b	RUN			TCR=92% SCR=75% RQD=13%			
18		highly weathered, massive, highly broken, medium strong, reddish brown			7	RUN			TCR=53% SCR=15% RQD=7%			
19												

EXCESS ICE CONTENT, PERCENT: ice; 10 20 30 40
WATER CONTENT, PERCENT: wp w wl; 10 20 30 40
COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT: 50 100 150 200 250
THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Clarke/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q-000+500

PROJECT : Mary River Project
LOCATION : -0+500 - Quarry
STARTED : July 30, 2011
COMPLETED : July 31, 2011

DRILLER: BOART LONGYEAR
N 7 911 899 E 563 668

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
20	NQ Diamond Drill	residual to completely weathered, extremely to very weak, very dark reddish brown										FROZEN / UNFROZEN / UNCERTAIN
21					8	RUN			TCR=50% SCR=10% RQD=0%			
22												
23		silty sand, trace clay (300mm)										
24		residual to highly weathered, very weak to weak			9	RUN			TCR=50% SCR=12% RQD=0%			
25												
26											FI	
27											2 2 2 2 5 5 2 5 6 5 4 6	
28		becoming slightly weathered, massive, medium strong, pinkish grey			10	RUN			TCR=67% SCR=29% RQD=22%			
29					11	RUN			TCR=100% SCR=29%			
30		END OF BOREHOLE AT 30.00m.		30.00								
31												
32												
33												
34												
35												
36												
37												
38												
39												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Clarke/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q004+100

PROJECT : Mary River Project
LOCATION : 4+100 - Quarry
STARTED : July 29, 2011
COMPLETED : July 30, 2011

DRILLER: BOART LONGYEAR
N 7 909 418 E 566 698

Project No. 19-1605-126
SHEET 1 OF 4
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT	EXCESS ICE CONTENT, PERCENT / WATER CONTENT, PERCENT	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRAVEL** and **COBBLES** (<160mm), granitic, angular to subrounded, fines washed out			1	RUN		25				
2		no recovery fines washed away			2	RUN		0				
5		**SAND**, medium to coarse grained, some gravel (< 45mm), pink to grey		5.11	3	RUN		32	Grain Size Analysis: Gr 16%/ Sa 84%/ Si & Cl 0%			
8		gravelly			4	RUN		29				
9		ICE with soil inclusions at 9.00m to 9.23m		9.61						90		9.00 9.23
10		**GRAVEL**, with some zones of silty fine sand, some cobbles (180mm), some fines washed out			5	RUN						
12		boulders (270mm to 300mm) with some cobbles, medium to coarse sand			6	RUN		100				
13		cobbles (<170mm)			7	RUN		63				
14		**SAND** and **GRAVEL** (<40mm), grey, some fines washed out		14.00	8	RUN		33				
17		**GRAVEL** and **COBBLES**, granitic, grey, fines washed out		17.00	9	RUN		25				
18												
19												

EXCESS ICE CONTENT, PERCENT: ice 10 20 30 40
WATER CONTENT, PERCENT: wp w wl 10 20 30 40

THERMISTER/ GROUND COND.: FROZEN, UNFROZEN, UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Clarke/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q004+100

PROJECT : Mary River Project
LOCATION : 4+100 - Quarry
STARTED : July 29, 2011
COMPLETED : July 30, 2011

DRILLER: BOART LONGYEAR
N 7 909 418 E 566 698

Project No. 19-1605-126
SHEET 2 OF 4
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
				20.20								FROZEN / UNFROZEN / UNCERTAIN
21	NQ Diamond Drill	no recovery			10	RUN		0				
22												
23					11	RUN		0				
24												
25												
26					12	RUN		0				
27												
28												
29												
30					13	RUN		43				
31		**SILT**, clayey, trace gravel, wet, brown		30.80								
32		**SAND** and **GRAVEL**, occasional boulders (< 300mm), with silty clay interbeds		32.00								
33					14	RUN		67				
34												
35		**SANDSTONE**, residual to completely weathered, extremely to very weak, brown		35.00								35.00
36		completely to moderately weathered, massive, medium strong, light greyish brown			15	RUN			TCR=33% SCR=33% RQD=4%		FI 8 8 9 6 >25	
37												
38												
39		residual to highly weathered, medium strong			16	RUN			TCR=13% SCR=6% RQD=0%			

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Clarke/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q004+100

PROJECT : Mary River Project
LOCATION : 4+100 - Quarry
STARTED : July 29, 2011
COMPLETED : July 30, 2011

DRILLER: BOART LONGYEAR
N 7 909 418 E 566 698

Project No. 19-1605-126
SHEET 3 OF 4
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
41	NQ Diamond Drill	highly broken										
42					17	RUN			TCR=5% SCR=18% RQD=6%			
43												
44		highly to moderately weathered, massive, medium strong										
45					18	RUN			TCR=67% SCR=44% RQD=25%			
46												
47		moderately weathered									4	
											1	
48											3	
											4	
					19	RUN			TCR=81% SCR=58% RQD=21%		4	
49											3	
											>25	
											3	
50											3	
											5	
											20	
											20	
51					20	RUN			TCR=77% SCR=43% RQD=15%		4	
											3	
											6	
52											6	
											4	
											2	
53											6	
											5	
											10	
54											8	
											7	
					21	RUN			TCR=87% SCR=61% RQD=24%		2	
55											4	
											5	
											2	
56											2	
											10	
											4	
57											5	
											9	
											>25	
					22	RUN			TCR=100% SCR=6% RQD=30%		3	
58											4	
											1	
											2	
59		slightly weathered, alternating brown and grey									3	
											9	
											2	
											3	
											>25	

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Clarke/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q004+100

PROJECT : Mary River Project
LOCATION : 4+100 - Quarry
STARTED : July 29, 2011
COMPLETED : July 30, 2011

DRILLER: BOART LONGYEAR
N 7 909 418 E 566 698

Project No. 19-1605-126
SHEET 4 OF 4
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
61					23	RUN			TCR=75% SCR=62% RQD=14%		3	
62		END OF BOREHOLE AT 62.00m.		62.00								
63												
64												
65												
66												
67												
68												
69												
70												
71												
72												
73												
74												
75												
76												
77												
78												
79												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Clarke/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q007+500

PROJECT : Mary River Project
LOCATION : 7+500 - Quarry
STARTED : July 28, 2011
COMPLETED : July 29, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 907 667 E 569 432

Project No. 19-1605-126
SHEET 1 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**COBBLES** (<100mm), granitic, fines washed out, very poor recovery			1	RUN		8				
2												
3		**SAND**, trace silt, trace gravel, trace cobbles, brown		3.00	2	RUN		33				
4												
5												
6		cobbles (~75mm)			3	RUN		50				
7												
8												
9												
10		cobbles (<190mm)			4	RUN		50				
11												
12												
13		cobbles (<140mm)			5	RUN		50				
14												
15												
16					6	RUN		17				
17				16.90							FI	
		BOULDER, sandstone, completely weathered, very weak, greyish brown									>25	
18					7	RUN			TCR=100% SCR=43% RQD=28%		3	
											4	
19											4	
											5	
											4	
											4	
											5	
											>25	
				20.00							>25	

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q007+500

PROJECT : Mary River Project
LOCATION : 7+500 - Quarry
STARTED : July 28, 2011
COMPLETED : July 29, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 907 667 E 569 432

Project No. 19-1605-126
SHEET 2 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21	NQ Diamond Drill	**SILT**, clayey, trace sand, firm, grey, moist										
				21.80	8	RUN		100				21.80
22		**SANDSTONE**, moderately to faintly weathered, medium strong to strong, light greyish brown										
23											3	
											3	
24											2	
											1	
		faintly weathered, strong			9	RUN			TCR=100% SCR=95% RQD=57%		2	
25											2	
											0	
											>25	
26											3	
											2	
											4	
27		vertical joints from 27.7m to 27.9m									2	
											1	
					10	RUN			TCR=100% SCR=93% RQD=81%		4	
28											1	
											5	
											3	
29											0	
											2	
											1	
											6	
30		vertical joints from 29.7m to 30.0m, 31.4m to 31.6m									7	
											3	
					11	RUN			TCR=100% SCR=65% RQD=57%		5	
31											2	
											1	
											3	
32											5	
											1	
											1	
											2	
33		faintly weathered to fresh									2	
											4	
					12	RUN			TCR=100% SCR=97% RQD=92%		1	
34											1	
											2	
											0	
											2	
35		faintly weathered, closely to moderately spaced, medium strong									2	
											1	
											2	
36											2	
											2	
											2	
					13	RUN			TCR=100% SCR=59% RQD=49%		8	
37											>25	
											>25	
											>25	
											5	
38											4	
											3	
											3	
39											2	
											0	
					14	RUN			TCR=87% SCR=72% RQD=34%		5	
											4	

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q007+500

PROJECT : Mary River Project
LOCATION : 7+500 - Quarry
STARTED : July 28, 2011
COMPLETED : July 29, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 907 667 E 569 432

Project No. 19-1605-126
SHEET 3 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT	EXCESS ICE CONTENT, PERCENT / WATER CONTENT, PERCENT	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
41	NQ Diamond Drill										1	FROZEN
											1	UNFROZEN
											1	UNCERTAIN
											2	
42											3	
											11	
											3	
					15	RUN			TCR=100% SCR=46% RQD=30%		7	
43											5	
											8	
											4	
44											8	
											3	
											6	
											2	
45											4	
											3	
					16	RUN			TCR=100% SCR=94% RQD=78%		2	
											3	
46											2	
											2	
											2	
47											1	
											3	
											3	
											2	
48											2	
					17	RUN			TCR=100% SCR=95% RQD=74%		4	
											2	
49											3	
											2	
											2	
50											1	
		END OF BOREHOLE AT 50.00m.		50.00								
51												
52												
53												
54												
55												
56												
57												
58												
59												

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 50 100 150 200 250
EXCESS ICE CONTENT, PERCENT: ice; 10 20 30 40
WATER CONTENT, PERCENT: wp w wl; 10 20 30 40

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q010+250

PROJECT : Mary River Project
LOCATION : 10+250 - Quarry
STARTED : July 25, 2011
COMPLETED : July 26, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 905 378 E 572 883

Project No. 19-1605-126
SHEET 1 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**SILT**, sandy, trace gravel (inferred), occasional boulders (<400mm) and cobbles, coarse to medium grained, subrounded, grey to light brown and pink, fines washed out			1	RUN		49				
2												
3		cobbles (100mm to 200mm)			2	RUN		47				
4												
5		sandy silt, trace gravel from 5.0m to 5.5m										
6					3	RUN		48				
7												
8				8.00								8.00
9		**GRANITIC GNEISS**, moderately weathered, medium to coarse grained, highly to moderately fractured, grey to pink			4	RUN			TCR=100% SCR=100% RQD=63%			
10												
11												
12					5	RUN			TCR=100% SCR=100% RQD=73%			
13												
14												
15					6	RUN			TCR=100% SCR=100% RQD=47%			
16												
17												
18					7	RUN			TCR=100% SCR=100% RQD=37%			
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q010+250

PROJECT : Mary River Project
LOCATION : 10+250 - Quarry
STARTED : July 25, 2011
COMPLETED : July 26, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 905 378 E 572 883

Project No. 19-1605-126
SHEET 2 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21	NQ Diamond Drill				8	RUN			TCR=100% SCR=100% RQD=60%			
22												
23												
24					9	RUN			TCR=100% SCR=100% RQD=64%			
25												
26		moderately to slightly weathered, closely to moderately spaced, very to extremely strong									FI 1	
27											2	
28					10	RUN			TCR=100% SCR=50% RQD=19%		6 4 7 5 4 3 >25 >25	
29		moderately weathered									2	
30											2 2 3 4	
31					11	RUN			TCR=100% SCR=60% RQD=41%		5 2 5 2 3	
32											3	
33											3 4 6	
34					12	RUN			TCR=100% SCR=50% RQD=38%		3 6 7 7 >25	
35											3 1	
36											2 >25 5	
37					13	RUN			TCR=100% SCR=50% RQD=42%		10 5 >25 1	
38											1 2 3	
39					14	RUN			TCR=100% SCR=49% RQD=35%		1 2 4 3 8 15	

THERMISTER/ GROUND COND.: FROZEN, UNFROZEN, UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q010+250

PROJECT : Mary River Project
LOCATION : 10+250 - Quarry
STARTED : July 25, 2011
COMPLETED : July 26, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 905 378 E 572 883

Project No. 19-1605-126
SHEET 3 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
41		END OF BOREHOLE AT 41.00m.		41.00							2 >25 2	FROZEN UNFROZEN UNCERTAIN
42												
43												
44												
45												
46												
47												
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q014+500

PROJECT : Mary River Project
LOCATION : 14+500 - Quarry
STARTED : July 24, 2011
COMPLETED : July 24, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 904 382 E 575 868

Project No. 19-1605-126
SHEET 1 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	Diamond Drill	**BOULDERS** and **COBBLES**, grey to pink, fines washed out			1	RUN		47				
2												
3					2	RUN		100				
4												
5				5.20								
6		**BOULDERS**, granitic, dark brown to red, highly weathered, highly fractured			3	RUN		100				
7												
8												
9					4	RUN		100				
10		clayey silt, some gravel, brown, moist from 9.50m to 9.70m										
11				11.20								11.20
12		**GRANITIC GNEISS**, medium to coarse grained, highly weathered, highly fractured, brownish red to pink			5	RUN			TCR=100% SCR=43% RQD=43%			
13												
14		moderately weathered, moderately spaced										
15												
16					6	RUN			TCR=100% SCR=100% RQD=37%			
17												
18												
19					7	RUN			TCR=100% SCR=100% RQD=53%			

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q014+500

PROJECT : Mary River Project
LOCATION : 14+500 - Quarry
STARTED : July 24, 2011
COMPLETED : July 24, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 904 382 E 575 868

Project No. 19-1605-126
SHEET 2 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21		slightly weathered			8	RUN			TCR=100% SCR=100% RQD=70%			
22												
23												
24					9	RUN			TCR=100% SCR=100% RQD=47%			
25												
26												
27					10	RUN			TCR=100% SCR=100% RQD=77%			
28												
29		slightly to moderately weathered										
30	Diamond Drill				11	RUN			TCR=100% SCR=100% RQD=45%			
31												
32												
33					12	RUN			TCR=100%			
34												
35												
36					13	RUN			TCR=100%			
37												
38		strong to very strong, massive									FI 15	
39											5 3 2 10	
					14	RUN			TCR=100% SCR=49% RQD=40%		2	

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q014+500

PROJECT : Mary River Project
LOCATION : 14+500 - Quarry
STARTED : July 24, 2011
COMPLETED : July 24, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 904 382 E 575 868

Project No. 19-1605-126
SHEET 3 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
41	Diamond Drill	slightly weathered									5 4 25 9	FROZEN / UNFROZEN / UNCERTAIN
42											2 3 1 8	
43					15	RUN			TCR=100% SCR=77% RQD=62%		2 5 1 1	
44											3 2 2 10	
45											4 5	
46					16	RUN			TCR=100% SCR=66% RQD=41%		10 2 10 3	
47		END OF BOREHOLE AT 47.20m.		47.20							2 2	
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q018+100

PROJECT : Mary River Project
LOCATION : 18+100 - Quarry
STARTED : July 23, 2011
COMPLETED : July 23, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 902 853 E 578 804

Project No. 19-1605-126
SHEET 1 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. (m)	NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS / DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRAVEL**, some cobbles, granitic, grey, fines washed out			1	RUN		50				
2		cobbles (<110mm)										
3					2	RUN		50				
4												
5		**SANDSTONE**, slightly to moderately weathered, weak to medium strong, bedded, brown		5.00								5.00
6					3	RUN			TCR=100%			
7												
8					4	RUN			TCR=100%			
9												
10		becoming reddish brown										
11					5	RUN			TCR=100%			
12												
13												
14					6	RUN			TCR=100%			
15												
16												
17					7	RUN			TCR=100%			
18												
19		uncemented sand interbeds from 19.2m to 19.3m and 19.8m to 19.9m										

THERMISTER/ GROUND COND.: FROZEN, UNFROZEN, UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Ametrano
CHECKED : MB

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q018+100

PROJECT : Mary River Project
LOCATION : 18+100 - Quarry
STARTED : July 23, 2011
COMPLETED : July 23, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 902 853 E 578 804

Project No. 19-1605-126
SHEET 2 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21	NQ Diamond Drill				8	RUN			TCR=100%			
22												
23												
24					9	RUN			TCR=100%			
25												
26												
27					10	RUN			TCR=100%			
28												
29												
30					11	RUN			TCR=100%			
31												
32		uncemented sand interbeds from 32.26m to 33.30m										
33					12	RUN			TCR=100%			
34												
35		sandy gravel layer from 35.0m and 35.4m, 35.7m to 35.8m										
36					13	RUN			TCR=100%			
37												
38												
39					14	RUN			TCR=100%			

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Ametrano
CHECKED : MB

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q018+100

PROJECT : Mary River Project
LOCATION : 18+100 - Quarry
STARTED : July 23, 2011
COMPLETED : July 23, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 902 853 E 578 804

Project No. 19-1605-126
SHEET 3 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
41		END OF BOREHOLE AT 41.00m.		41.00								
42												
43												
44												
45												
46												
47												
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Ametrano
CHECKED : MB

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q022+500

PROJECT : Mary River Project
LOCATION : 22+500 - Quarry
STARTED : July 22, 2011
COMPLETED : July 22, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 901 663 E 583 415

Project No. 19-1605-126
SHEET 1 OF 4
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**BOULDERS**, granitic, moderately weathered, moderately spaced, grey to pink			1	RUN		75				
2				2.00								2.00
3		**GRANITIC GNEISS**, fresh, moderately fractured, medium to coarse grained, grey to pink			2	RUN			TCR=100% SCR=100% RQD=80%			
4												
5					3	RUN			TCR=100% SCR=100% RQD=100%			
6												
7												
8					4	RUN			TCR=100% SCR=100% RQD=98%			
9												
10												
11		moderately weathered			5	RUN			TCR=100% SCR=100% RQD=73%			
12												
13												
14		faintly weathered			6	RUN			TCR=100% SCR=100% RQD=98%			
15												
16												
17		fresh			7	RUN			TCR=100% SCR=100% RQD=97%			
18												
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q022+500

PROJECT : Mary River Project
LOCATION : 22+500 - Quarry
STARTED : July 22, 2011
COMPLETED : July 22, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 901 663 E 583 415

Project No. 19-1605-126
SHEET 2 OF 4
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21	NQ Diamond Drill	slightly fractured			8	RUN			TCR=100% SCR=100% RQD=80%			FROZEN / UNFROZEN / UNCERTAIN
22												
23												
24					9	RUN			TCR=100% SCR=100% RQD=95%			
25												
26												
27					10	RUN			TCR=100% SCR=100% RQD=92%			
28												
29												
30					11	RUN			TCR=100% SCR=100% RQD=89%			
31												
32												
33					12	RUN			TCR=100% SCR=100% RQD=92%			
34												
35												
36					13	RUN			TCR=100% SCR=100% RQD=90%			
37												
38												
39					14	RUN			TCR=100% SCR=100% RQD=93%			

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q022+500

PROJECT : Mary River Project
LOCATION : 22+500 - Quarry
STARTED : July 22, 2011
COMPLETED : July 22, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 901 663 E 583 415

Project No. 19-1605-126
SHEET 3 OF 4
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
41	NQ Diamond Drill											
42					15	RUN			TCR=100% SCR=100% RQD=92%			
43												
44												
45					16	RUN			TCR=100% SCR=100% RQD=90%			
46												
47												
48					17	RUN			TCR=100% SCR=100% RQD=92%			
49												
50												
51					18	RUN			TCR=100% SCR=100% RQD=95%			
52												
53												
54					19	RUN			TCR=100% SCR=100% RQD=97%			
55												
56												
57					20	RUN			TCR=100% SCR=100% RQD=100%			
58												
59												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q022+500

PROJECT : Mary River Project
LOCATION : 22+500 - Quarry
STARTED : July 22, 2011
COMPLETED : July 22, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 901 663 E 583 415

Project No. 19-1605-126
SHEET 4 OF 4
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
61					21	RUN			TCR=100% SCR=100% RQD=97%			
62		END OF BOREHOLE AT 62.00m.		62.00								
63												
64												
65												
66												
67												
68												
69												
70												
71												
72												
73												
74												
75												
76												
77												
78												
79												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q025+500

PROJECT : Mary River Project
LOCATION : 25+500 - Quarry
STARTED : July 22, 2011
COMPLETED : July 22, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 900 221 E 586 954

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
0	NQ Diamond Drill	**BOULDERS**, granitic, medium to coarse grained, trace cobbles, subrounded, dark grey to grey and pink, moderately fractured			1	RUN		76				
1												
2												
3					2	RUN			TCR=100% SCR=100% RQD=95%			
4												
5				5.34								5.34
5		**GRANITIC GNEISS**, slightly weathered, medium to coarse grained, slightly fractured, grey to pink			3	RUN			TCR=100% SCR=100% RQD=95%			
6												
7												
8		fresh			4	RUN			TCR=100% SCR=100% RQD=93%			
9												
10												
11												
12					5	RUN			TCR=100% SCR=100% RQD=97%			
13												
14												
15					6	RUN			TCR=100% SCR=100% RQD=100%			
16												
17											FI	
17		very thickly foliated, very to extremely strong									1	
18		horizontal break at 18.2m and 19.9m									1	
18											2	
19					7	RUN			TCR=100% SCR=85% RQD=79%		2	
											3	
											1	
											0	
											0	
											1	

THERMISTER/ GROUND COND.: FROZEN, UNFROZEN, UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q025+500

PROJECT : Mary River Project
LOCATION : 25+500 - Quarry
STARTED : July 22, 2011
COMPLETED : July 22, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 900 221 E 586 954

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21	NQ Diamond Drill										1	FROZEN
											1	UNFROZEN
											0	UNCERTAIN
22					8	RUN			TCR=100% SCR=97% RQD=95%		0	
											1	
											1	
23		dark greyish to black foliations from 23.34m to 23.54m and 23.86m to 24.13m									2	
											1	
											1	
24											0	
											3	
											0	
25					9	RUN			TCR=100% SCR=93% RQD=87%		1	
											1	
											1	
26		sub-vertical breaks from 26.3m to 26.7m									2	
											0	
											0	
27		dark greyish to black foliations from 26.68m to 26.89m									2	
											2	
											2	
28					10	RUN			TCR=100% SCR=92% RQD=92%		1	
											2	
											0	
29		medium to extremly strong, slightly weathered to fresh									0	
											1	
											0	
30		highly broken from 30.5m to 3.9m									0	
											0	
		vertical breaks from 30.0m to 31.5m									2	
31					11	RUN			TCR=100% SCR=47% RQD=47%		3	
											>25	
											>25	
32											2	
											0	
											1	
				32.34							1	
		END OF BOREHOLE AT 32.34m.										
33												
34												
35												
36												
37												
38												
39												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia/Ametrano
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q028+400

PROJECT : Mary River Project
LOCATION : 28+400 - Quarry
STARTED : July 18, 2011
COMPLETED : July 18, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 898 617 E 588 240

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRAVEL**, occasional cobbles and boulders, grey to pink, subangular to subrounded, fines washed out			1	RUN		15				
2				2.40								
3		no recovery			2	RUN		0				
4												
5				5.40								
6		**GRAVEL**, some cobbles, occasional boulders (<480mm), granitic, angular to subangular, grey to pink			3	RUN		25				
7												
8				8.40								8.40
9		**SAND**, some silt, some gravel, brown, frozen (Nbn)			4	RUN		57				
10												
11				11.40								11.40
12		**SAND** and **GRAVEL** (INFERRED), with cobbles and boulders (350mm), grey to pink, angular to subangular			5	RUN		41				
13												
14		coarse sand, some gravel, some cobbles, trace silt, frozen (Nf)										14.40
15					6	RUN		73				
16												
17												17.40
18				18.00								
19		**COBBLES** and **BOULDERS**, granitic, trace to some coarse sand, grey to pink			7	RUN		100				

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q028+400

PROJECT : Mary River Project
LOCATION : 28+400 - Quarry
STARTED : July 18, 2011
COMPLETED : July 18, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 898 617 E 588 240

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21												
22					8	RUN		71				
23												
24					9	RUN		100				
		END OF BOREHOLE AT 24.20m.		24.20								24.20
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q031+500

PROJECT : Mary River Project
LOCATION : 31+500 - Quarry
STARTED : July 19, 2011
COMPLETED : July 19, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 897 863 E 590 944

Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**BOULDERS** and **COBBLES**, some gravel, pink to dark grey, angular to sub-angular, fines washed out			1	RUN		54				
2				2.20								
3		no recovery			2	RUN		0				
4												
5				5.20								
6		**GRAVEL** and **COBBLES**, some boulders, trace sand, pink to light grey and dark grey, fines washed out			3	RUN		66				
7												
8												
9					4	RUN		76				
10												
11												
12					5	RUN		66				
13				13.20								13.20
		END OF BOREHOLE AT 13.20m.										
14												
15												
16												
17												
18												
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q035+500

PROJECT : Mary River Project
LOCATION : 35+500 - Quarry
STARTED : July 17, 2011
COMPLETED : July 17, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 896 244 E 595 477

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT	EXCESS ICE CONTENT, PERCENT / WATER CONTENT, PERCENT	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**COBBLES**, organics, subangular to subrounded		0.30								
		BOULDERS, trace cobbles, slightly weathered, fines washed out			1	RUN		70				
2				2.45								2.45
3		**GRANITIC GNEISS**, medium to coarse grained, slightly weathered, highly to moderately jointed, dark grey to pink										
4					2	RUN			TCR=83% SCR=83% RQD=47%			
5												
6												
7					3	RUN			TCR=100% SCR=100% RQD=53%			
8												
9												
10					4	RUN			TCR=100% SCR=100% RQD=45%			
11												
12												
13					5	RUN			TCR=100% SCR=100% RQD=88%			
14												
15												
16					6	RUN			TCR=100% SCR=100% RQD=77%			
17												
18		becoming fresh, slightly jointed										
19					7	RUN			TCR=100% SCR=100% RQD=78%			

EXCESS ICE CONTENT, PERCENT: ice; 10 20 30 40
WATER CONTENT, PERCENT: wp w wl; 10 20 30 40

THERMISTER/ GROUND COND.: FROZEN, UNFROZEN, UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia/Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q035+500

PROJECT : Mary River Project
LOCATION : 35+500 - Quarry
STARTED : July 17, 2011
COMPLETED : July 17, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 896 244 E 595 477

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21												
22					8	RUN			TCR=100% SCR=100% RQD=78%			
23		slightly weathered, closely jointed										
24												
25					9	RUN			TCR=100% SCR=91% RQD=60%			
26				26.20								
		END OF BOREHOLE AT 26.20m.										
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia/Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q038+700

PROJECT : Mary River Project
LOCATION : 38+700 - Quarry
STARTED : July 16, 2011
COMPLETED : July 16, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 893 140 E 596 368

Project No. 19-1605-126
SHEET 1 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRAVEL**, **COBBLES** and **BOULDERS**, granitic, angular to subangular, grey, fines washed out			1	RUN		28				
2				2.40								
3		no recovery, all material washed out			2	RUN		0				
4												
5				5.40								
6		**GRAVEL**, trace sand, grey, very poor recovery, most material washed			3	RUN		4				
7												
8												
9												
10					4	RUN		8				
11				11.40								
12		no recovery			5	RUN		0				
13												
14												
15												
16					6	RUN		0				
17				17.40								
18		**GRAVEL**, some cobbles (<105mm), granitic, subangular, grey, fines washed out			7	RUN		14				
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q038+700

PROJECT : Mary River Project
LOCATION : 38+700 - Quarry
STARTED : July 16, 2011
COMPLETED : July 16, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 893 140 E 596 368

Project No. 19-1605-126
SHEET 2 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
				20.40								
21		no recovery										
22		artesian condition encountered (2m above ground surface) at 22.0m			8	RUN		0				
23				23.40								
24		**GRAVEL**, some cobbles (<70mm), granitic, subrounded to subangular, fines washed out										
25					9	RUN		4				
26												
27												
28					10	RUN		10				
29												
30	NQ Diamond Drill	**SAND**, some gravel, some silt, some cobbles, brown		29.40								
31				31.20	11	RUN		84				31.20
32		**GRANITIC GNEISS**, slightly to faintly weathered, medium to coarse grained, closely jointed, pink to grey										
33												
34					12	RUN			TCR=100% SCR=100% RQD=64%			
35												
36												
37					13	RUN			TCR=100% SCR=93% RQD=57%			
38												
39		becoming fresh, moderately to widely jointed			14	RUN			TCR=100% SCR=100% RQD=78%			

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q038+700

PROJECT : Mary River Project
LOCATION : 38+700 - Quarry
STARTED : July 16, 2011
COMPLETED : July 16, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 893 140 E 596 368

Project No. 19-1605-126
SHEET 3 OF 3
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
41												
42												
43	NQ Diamond Drill				15	RUN			TCR=100% SCR=100% RQD=87%			
44												
45												
46					16	RUN			TCR=100% SCR=99% RQD=91%			
47												
48												
49					17	RUN			TCR=100% SCR=97% RQD=80%			
50												
		END OF BOREHOLE AT 50.40m.		50.40								
51												
52												
53												
54												
55												
56												
57												
58												
59												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q042+000

PROJECT : Mary River Project
LOCATION : 42+000 - Quarry
STARTED : July 16, 2011
COMPLETED : July 16, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 890 881 E 598 151

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT	EXCESS ICE CONTENT, PERCENT / WATER CONTENT, PERCENT	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRAVEL**, **COBBLES** and **BOULDERS**, granitic, subrounded to subangular, grey to pink, fines washed out			1	RUN		11				
2												
3					2	RUN		5				
4												
5				5.67								5.67
6		**GRANITIC GNEISS**, fresh, medium to coarse grained, moderately spaced joints, grey to pink			3	RUN			TCR=100% SCR=82% RQD=65%			
7												
8												
9		moderately to widely spaced			4	RUN			TCR=80% SCR=71% RQD=59%			
10												
11												
12		widely spaced			5	RUN			TCR=100% SCR=100% RQD=74%			
13												
14												
15					6	RUN			TCR=100% SCR=100% RQD=82%			
16												
17												
18					7	RUN			TCR=100% SCR=100% RQD=87%			
19												

EXCESS ICE CONTENT, PERCENT: ice; 10 20 30 40
WATER CONTENT, PERCENT: wp w wl; 10 20 30 40
COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT: 50 100 150 200 250
THERMISTER/ GROUND COND.: FROZEN, UNFROZEN, UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q042+000

PROJECT : Mary River Project
LOCATION : 42+000 - Quarry
STARTED : July 16, 2011
COMPLETED : July 16, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 890 881 E 598 151

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21												
22					8	RUN			TCR=100% SCR=100% RQD=78%			
23				23.37								
24		END OF BOREHOLE AT 23.37m.										
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q044+300

PROJECT : Mary River Project
LOCATION : 44+300 - Quarry
STARTED : July 15, 2011
COMPLETED : July 15, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 888 054 E 598 208

Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRAVEL** and **COBBLES**, some sand, trace silt, brown			1	RUN		65				
2				1.90								1.90
		GRANITIC GNEISS, slightly weathered, medium to coarse grained, closely jointed, grey to pink										
3												
4					2	RUN			TCR=100% SCR=100% RQD=80%			
5												
6												
7					3	RUN			TCR=100% SCR=99% RQD=81%			
8												
9		becoming faintly weathered, moderately to widely jointed										
10					4	RUN			TCR=99% SCR=99% RQD=81%			
11												
12												
13					5	RUN			TCR=100% SCR=98% RQD=84%			
14				14.40								
		END OF BOREHOLE AT 14.40m.										
15												
16												
17												
18												
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q044+000

PROJECT : Mary River Project
LOCATION : 44+000 - Quarry
STARTED : July 15, 2011
COMPLETED : July 15, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 885 927 E 596 138

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRAVEL** and **COBBLES**, granitic, subrounded to subangular, grey, fines washed out			1	RUN		9				
2												
3					2	RUN		26				
4												
5				5.00								5.00
6		**GRANITIC GNEISS**, slightly weathered, medium grained, closely spaced joints, grey to pink			3	RUN			TCR=93% SCR=50% RQD=50%			
7												
8		becoming fresh, moderately spaced										
9					4	RUN			TCR=97% SCR=97% RQD=55%			
10												
11												
12					5	RUN			TCR=98% SCR=98% RQD=57%			
13												
14												
15					6	RUN			TCR=100% SCR=25% RQD=7%			
16												
17												
18					7	RUN			TCR=100% SCR=92% RQD=59%			
19												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q044+000

PROJECT : Mary River Project
LOCATION : 44+000 - Quarry
STARTED : July 15, 2011
COMPLETED : July 15, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 885 927 E 596 138

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21		moderately to widely spaced			8	RUN			TCR=100% SCR=95% RQD=64%			
22												
23				23.00								
		END OF BOREHOLE AT 23.00m.										
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q045+000

PROJECT : Mary River Project
LOCATION : 45+000 - Quarry
STARTED : July 14, 2011
COMPLETED : July 14, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 884 724 E 596 201

Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
0	NQ Diamond Drill	**GRAVEL**, light grey to pink, sub-angular to sub-rounded **COBBLES** and **BOULDERS**, some gravel, granitic, angular, grey		0.11	1	RUN		79				2.20
2		**GRANITIC GNEISS**, faintly weathered, fine to medium grained, moderately to widely jointed, black to light grey		2.20	2	RUN			TCR=99% SCR=98% RQD=89%			
4												
6					3	RUN			TCR=100% SCR=100% RQD=85%			
8												
10					4	RUN			TCR=100% SCR=100% RQD=89%			
12												
14				14.30	5	RUN			TCR=100% SCR=97% RQD=88%			
		END OF BOREHOEL AT 14.30m.										
16												
18												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q050+000

PROJECT : Mary River Project
LOCATION : 50+000 - Quarry
STARTED : July 14, 2011
COMPLETED : July 14, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 881 100 E 597 357

Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
		GRAVEL and **BOULDER**		0.44								0.44
1	NQ Diamond Drill	**GRANITIC GNEISS**, slightly weathered, medium to coarse grained, strong, black, grey, red			1	RUN		87				
2												
3					2	RUN			TCR=100% SCR=91% RQD=84%			
4												
5												
6					3	RUN			TCR=100% SCR=85% RQD=93%			
7												
8		becoming fresh, moderately jointed										
9					4	RUN			TCR=97% SCR=97% RQD=78%			
10												
11		closely jointed										
12					5	RUN			TCR=99% SCR=99% RQD=89%			
13												
14		faintly weathered, closely to moderately jointed										
15					6	RUN			TCR=100% SCR=99% RQD=84%			
16												
17		END OF BOREHOLE AT 16.90m.		16.90								
18												
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Van Luver/Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q053+700

PROJECT : Mary River Project
LOCATION : 53+700 - Quarry
STARTED : July 13, 2011
COMPLETED : July 13, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 877 567 E 597 616

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**COBBLES** and **BOULDERS**, some gravel, granitic, angular to subangular, grey			1	RUN		43				
2				2.20								
3		**SAND** and **GRAVEL**, some cobbles, some silt, wet, brown, some fines washed out			2	RUN		57				
4				4.70								
5		**BOULDERS** and **COBBLES**, angular to subangular, some gravel, pink and dark grey, some fines washed out										
6					3	RUN		76				
7				7.70								7.70
8		**GRANITIC GNEISS**, faintly weathered to fresh, medium to coarse grained, moderately jointed, grey to pink										
9												
10					4	RUN			TCR=100% SCR=100% RQD=100%			
11												
12												
13					5	RUN			TCR=98% SCR=98% RQD=86%			
14												
15												
16					6	RUN			TCR=99% SCR=99% RQD=96%			
17												
18												
19					7	RUN			TCR=100% SCR=100% RQD=98%			

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Van Luver/Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q053+700

PROJECT : Mary River Project
LOCATION : 53+700 - Quarry
STARTED : July 13, 2011
COMPLETED : July 13, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 877 567 E 597 616

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21	NQ Diamond Drill				8	RUN			TCR=100% SCR=100% RQD=90%			
22												
23												
24					9	RUN			TCR=98% SCR=98% RQD=88%			
25												
26												
27					10	RUN			TCR=100% SCR=100% RQD=99%			
28												
29				29.20								
		END OF BOREHOLE AT 29.20m.										
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Van Luver/Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q056+750

PROJECT : Mary River Project
LOCATION : 56+750 - Quarry
STARTED : July 11, 2011
COMPLETED : July 11, 2011

DRILLER: BOART LONGYEAR
N 7 875 280 E 598 852

Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**COBBLES** and **BOULDERS**, some gravel, angular to subangular, pink to dark grey			1	RUN		78				
2												
3					2	RUN		100				
4				4.41								4.41
5		**GRANITIC GNEISS**, faintly weathered, closely jointed, medium grained, pink to grey fresh, moderately jointed, medium to very coarse grained, pink to dark grey										
6		highly mafic from 6.40 to 6.80m										
7					3	RUN			TCR=100% SCR=100% RQD=76%			
8												
9												
10					4	RUN			TCR=100% SCR=100% RQD=87%			
11				11.20								
		END OF BOREHOLE AT 11.20m.										
12												
13												
14												
15												
16												
17												
18												
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Schneider
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q082+700

PROJECT : Mary River Project
LOCATION : 82+700 - Quarry
STARTED : July 22, 2011
COMPLETED : July 22, 2011

Project No. 19-1605-126

DRILLER: WALKER DRILLING, D-50
N 7 852 449 E 605 710

SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT	EXCESS ICE CONTENT, PERCENT / WATER CONTENT, PERCENT	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRAVEL**, subrounded to subangular, pinkish grey		1.65	1	RUN		62				1.65
2		**GRANITIC GNEISS**, slightly weathered, fine grained, highly fractured, grey to pink										
3					2	RUN			TCR=100% SCR=58% RQD=0%			
4												
5					3	RUN			TCR=100% SCR=92% RQD=42%			
6		occasional quartz seams										
7					4	RUN			TCR=100% SCR=100% RQD=67%			
8					5	RUN			TCR=97% SCR=97% RQD=82%			
9												
10					6	RUN			TCR=100% SCR=100% RQD=52%			
11					7	RUN			TCR=100% SCR=100% RQD=52%			
12												
13		highly weathered, highly fractured			8	RUN			TCR=97% SCR=29% RQD=29%			
14					9	RUN			TCR=99% SCR=72% RQD=52%			
15												
16				16.00	10	RUN			TCR=100% SCR=100% RQD=100%			
		END OF BOREHOLE AT 16.00m.										
17												
18												
19												

EXCESS ICE CONTENT, PERCENT: ice 10 20 30 40
WATER CONTENT, PERCENT: wp w wl 10 20 30 40

ADDITIONAL LAB. TESTING: FI

THERMISTER/ GROUND COND.: FROZEN / UNFROZEN / UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q085+200

PROJECT : Mary River Project
LOCATION : 85+200 - Quarry
STARTED : July 20, 2011
COMPLETED : July 21, 2011

DRILLER: WALKER DRILLING, D-50
N 7 850 087 E 606 073

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRAVEL** and **COBBLES**, granitic, red/black/grey, fines washed out			1	RUN		45				
2					2	RUN		0				
					3a	RUN		33				
				2.58								2.58
3		**GRANITE**, highly weathered, highly fractured, red/black			3b	RUN			TCR=100% SCR=0% RQD=0%		FI 3	
4		vertical joint			4	RUN			TCR=95% SCR=22% RQD=12%		4 3 4 3 2	
5				5.40	5	RUN			TCR=46% SCR=0% RQD=0%		3 2	
6		**GRANITIC GNEISS**, slightly weathered, moderately fractured, grey, black, red			6	RUN			TCR=86% SCR=82% RQD=56%		1 1	
					7	RUN			TCR=100% SCR=96% RQD=96%		1	
7					8	RUN			TCR=100% SCR=100% RQD=100%		6	
					9	RUN			TCR=100% SCR=100% RQD=100%		1	
					10	RUN			TCR=100% SCR=98% RQD=98%		1 3	
8					11	RUN			TCR=100% SCR=45% RQD=36%		3 3 3	
9											2	
10					12	RUN			TCR=99% SCR=99% RQD=92%		2 1 1 1 1	
11		moderately weathered, medium strong, grey/white and black, medium to coarse grained			13	RUN			TCR=100% SCR=87% RQD=75%		2 0 1 3	
12											2	
13					14	RUN			TCR=100% SCR=78% RQD=78%		2 1 2 2	
14		slightly weathered			15	RUN			TCR=100% SCR=77% RQD=77%		2 0 1 2 2	
15											3	
16					16	RUN			TCR=100% SCR=95% RQD=68%		3 5 2 1 1	
17		strong			17	RUN			TCR=100% SCR=93% RQD=92%		1 0 0 3	
18					18	RUN			TCR=100% SCR=97% RQD=93%		3 0 0 1 0 1	
19												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Letts
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q085+200

PROJECT : Mary River Project
LOCATION : 85+200 - Quarry
STARTED : July 20, 2011
COMPLETED : July 21, 2011

DRILLER: WALKER DRILLING, D-50
N 7 850 087 E 606 073

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT	EXCESS ICE CONTENT, PERCENT / WATER CONTENT, PERCENT	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21					19	RUN			TCR=84% SCR=73% RQD=63%		1 1	FROZEN
					20	RUN			TCR=100% SCR=100% RQD=100%		1	
22					21	RUN			TCR=99% SCR=96% RQD=80%		1 1	
23												
24					22	RUN			TCR=100% SCR=95% RQD=95%			
25					23	RUN			TCR=99% SCR=86% RQD=86%		1 2 2 2 1	
26		END OF BOREHOLE AT 25.89m.		25.89								
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT — 50 100 150 200 250

EXCESS ICE CONTENT, PERCENT — ice — 10 20 30 40
WATER CONTENT, PERCENT — wp w wl — 10 20 30 40

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Letts
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q088+800

PROJECT : Mary River Project
LOCATION : 88+800 - Quarry
STARTED : July 17, 2011
COMPLETED : July 18, 2011

DRILLER: WALKER DRILLING, D-50
N 7 846 674 E 605 956

Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
		ORGANICS: (100mm)		0.10							FI	0.10
1	NQ Diamond Drill	**GRANITIC GNEISS**, slightly weathered, medium grained, medium strong, black/pink/red			1	RUN			TCR=89% SCR=86% RQD=76%		2 2 4 1 3	
2					2	RUN			TCR=97% SCR=97% RQD=82%		1 2 1	
3		strong to very strong			3	RUN					2	
4					4	RUN			TCR=73% SCR=69% RQD=60%		4	
					5	RUN			TCR=88% SCR=67% RQD=26%		3	
5					6	RUN			TCR=100% SCR=100% RQD=92%		3	
					7	RUN			TCR=100% SCR=83% RQD=48%		4	
					8	RUN			TCR=100% SCR=100% RQD=100%		>5	
6					9	RUN			TCR=96% SCR=92% RQD=81%		1 2	
7					10	RUN			TCR=58% SCR=33% RQD=0%		2	
8					11	RUN			TCR=100% SCR=88% RQD=70%		2	
9					12	RUN			TCR=100% SCR=100% RQD=68%		2 2 3	
10					13	RUN			TCR=94% SCR=94% RQD=91%		3 2 3	
11					14	RUN			TCR=100% SCR=100% RQD=78%		3 0	
12					15	RUN			TCR=79% SCR=79% RQD=74%		1 1	
13					16	RUN			TCR=100% SCR=98% RQD=96%		2 2 2	
14					17	RUN			TCR=85% SCR=80% RQD=80%		1 1 1	
					18	RUN			TCR=100% SCR=100% RQD=100%		1	
15		END OF BOREHOLE AT 15.00m.		15.00	19	RUN			TCR=100% SCR=100% RQD=100%		0	
16												
17												
18												
19												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Selman/Letts
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QTR-13

PROJECT : Mary River Project
LOCATION : 100+700 - Quarry
STARTED : July 14, 2011
COMPLETED : July 14, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 833 967 E 609 448

Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT	EXCESS ICE CONTENT, PERCENT / WATER CONTENT, PERCENT	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRAVEL** and **COBBLES** (< 100mm), red/dark grey, angular to sub-angular			1	RUN		64				
2				2.20								
3		**COBBLES**, **BOULDERS** (< 320mm) and **GRAVEL**, red/dark grey, angular to subangular			2	RUN		97				
4												
5				5.00								5.00
6		**GRANITIC GNEISS**, faintly weathered, medium to coarse grained, strong, red/dark grey			3	RUN			TCR=100% SCR=100% RQD=82%			
7												
8		slightly to moderately weathered, medium strong										
9												
10					4	RUN			TCR=100% SCR=81% RQD=45%			
11												
12												
13					5	RUN			TCR=98% SCR=98% RQD=97%			
14												
15		strong to very strong			6	RUN			TCR=100% SCR=100% RQD=94%			
				15.10								
16		END OF BOREHOLE AT 15.10m.										
17												
18												
19												

EXCESS ICE CONTENT, PERCENT: ice; 10 20 30 40
WATER CONTENT, PERCENT: wp w wl; 10 20 30 40

THERMISTER/ GROUND COND.: FROZEN, UNFROZEN, UNCERTAIN

COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT; 50 100 150 200 250

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Young
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QTR-12

PROJECT : Mary River Project
LOCATION : 101+100 - Quarry
STARTED : July 15, 2011
COMPLETED : July 15, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 836 190 E 610 857

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**COBBLES**, **GRAVEL** and **BOULDERS** (<450mm), dark grey, pink/white, subangular to subrounded			1	RUN		95				
2												
3				2.85								2.85
		GRANITIC GNEISS, faintly to slightly weathered, medium strong to strong, medium to coarse grained, dark grey, white, pink			2	RUN			TCR=100% SCR=97% RQD=43%		FI 10	
4												
5												
6					3	RUN			TCR=100% SCR=100% RQD=92%		5	
7												
8												
9					4	RUN			TCR=100% SCR=93% RQD=60%		10	
10												
11												
12		slightly to moderately weathered			5	RUN			TCR=100% SCR=74% RQD=74%		1 1 2 2 1 2 1 2 2 1 0	
13												
14												
15					6	RUN			TCR=103% SCR=84% RQD=81%		2 2 3 1 2 2 1 1 1 0	
16												
17												
18					7	RUN			TCR=97% SCR=65% RQD=65%		0 1 2 1 1 1 1 0	
19												

THERMISTER/ GROUND COND.: FROZEN, UNFROZEN, UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Young
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QTR-12

PROJECT : Mary River Project
LOCATION : 101+100 - Quarry
STARTED : July 15, 2011
COMPLETED : July 15, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 836 190 E 610 857

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
				20.50								
		END OF BOREHOLE AT 20.50m.										
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Young
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH01

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : August 3, 2011
COMPLETED : August 3, 2011
DRILLER: BOART LONGYEAR, LM-55
N 7 835 656 E 605 976
Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	SAMPLES RECOVERY %
		GROUND SURFACE		90.21				
0	NQ Diamond Drill	no recovery						
2				2.60				
3		**SAND** and **GRAVEL**, some cobbles, granitic, rounded to subangular, fines washed out			1	RUN		61
4				4.80				
5		**GRAVEL** and **COBBLES** (<300mm), fines washed out			2A	RUN		100
6				6.45				
7		END OF SAMPLING AT 6.45m, START CORING. FOR ROCK DETAILS PLEASE REFER TO NTUN-DH01(R).						
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

COMMENTS
DYNAMIC CONE PENETRATION RESISTANCE PLOT
50 100 150 200 250

EXCESS ICE CONTENT, PERCENT
ice
10 20 30 40
WATER CONTENT, PERCENT
wp w wl
10 20 30 40

ADDITIONAL LAB. TESTING

THERMISTER/ GROUND COND.
FROZEN
UNFROZEN
UNCERTAIN
6.45

GROUNDWATER ELEVATIONS
SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)
DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan
CHECKED : MB

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH01(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : August 3, 2011
COMPLETED : August 3, 2011

INCLINATION: 64° AZIMUTH: 223°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 656 E 605 976

Project No. 19-1605-126
SHEET 1 OF 2
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA DIP wrt Core Axis	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)
		GROUND SURFACE	90.21										
7	NQ Diamond Drill	**GRANITIC GNEISS**, moderately weathered, strong, open joints with silty infill, dark grey evidence of water travel	6.45	2B	15	15						J	
8		some heavily fractured zones weathered, stepped joint with silty infill at 7.90m weathered, heavily shattered zone at 8.25 and 8.90m diagonal, weathered, closed joint at 8.44 and 8.69m sub-horizontal to diagonal, weathered joints (3) at 9.47m		3	11	60						J	
9												J	
10												J	
11		very strong, moderately spaced discontinuities, coarse grained sub-vertical weathered joint at 11.23m		4	12	60						J	
12												J - along vein	
13		diagonal, weathered joint at 12.40 and 12.60m										J	
14		horizontal, weathered joint at 13.75m weathered, open joint at 14.20m fresh, strong, very widely spaced, sub-horizontal, pink with grey foliation		5	14	60						J	
15												J	
16													
17		slightly weathered, moderately spaced, pink with dark grey foliation		6	17	60						J	
18		joint with black staining on surface, green, soft, waxy infill at 17.63m slightly weathered joint, soft, brown, clay infill at 18.20m										J	
19		joint with black staining on surface, green, soft, waxy infill at 19.01m										J	
20		dark grey biotite schist banding at 19.70m widely spaced, dark grey with pink banding		7	9	60							
21		biotite schist seam with 2 parallel sub-horizontal breaks at 20.87m										J J J	
22													
23		dark grey and pink foliations mechanical joints		8	8	60							
24													
25													
26		slightly weathered, moderately spaced											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH01(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : August 3, 2011
COMPLETED : August 3, 2011

INCLINATION: 64° AZIMUTH: 223°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 656 E 605 976

Project No. 19-1605-126
SHEET 2 OF 2
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA DIP wrt Core Axis	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE													
27	NQ Diamond Drill	parallel, sub-horizontal fresh joints (2) at 26.74m			9	11	60						J		
28		heavily fractured zone at 28.22 to 28.80m											J		
29		fresh, widely spaced, pink with grey foliation all joints are mechanical breaks													
30					10	10	60								
31															
32		massive													
33					11	11	60								
34															
35		sub-vertical, weathered, stepped open joint with silty infill at 34.45m		34.80									J		
		END OF BOREHOLE AT 34.80m.													
36															
37															
38															
39															
40															
41															
42															
43															
44															
45															
46															

Unconfined Compressive Strength (Mpa): 50 100 150

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH03

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : August 1, 2011
COMPLETED : August 2, 2011
DRILLER: BOART LONGYEAR, LM-55
N 7 835 382 E 605 698
Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		146.68								
		no sampling										
1	NQ Diamond Drill	**GRAVEL** and **COBBLES** (<170mm), granitic, fine to medium grained, subangular to subrounded, pinkish red to greyish black		1.17								
2												
3					1A	RUN		30				
4				4.50								4.50
5		END OF SAMPLING AT 4.50m, START CORING. FOR ROCK DETAILS PLEASE REFER TO NTUN-DH03(R).										
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill/Dunstan
CHECKED : MB

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : August 1, 2011
COMPLETED : August 2, 2011

INCLINATION: 44° AZIMUTH: 63°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 382 E 605 698

Project No. 19-1605-126
SHEET 1 OF 6
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	COLOUR / % RETURN FLUSH	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)
		GROUND SURFACE		146.68										
5	NQ Diamond Drill	**GRANITIC GNEISS**, slightly weathered, strong, moderately to thinly spaced, pink with dark and light grey foliations		4.50	1B	45							J	
					2								J J J	
6														
7					3	19	75						J J J	
8													J	
9		diagonal, faintly weathered joints (2) at 8.72m			4	11	100						J J	
		diagonal open joint, some weathering at 8.88 and 9.05m											J J J	
10		multi-planar, open joint at 9.25m											J J	
		diagonal, faintly weathered joint at 10.00m											J	
11		fresh, massive, very widely spaced discontinuities, sub-horizontal foliation												
		diagonal, fresh open joint at 11.30m			5	7	100						J	
12														
13														
14														
		diagonal open joint at 14.42m			6	9	100						J	
15														
16														
17														
		biotite schist banding at 17.22m												
18					7	11	100						J	
		diagonal, irregular fresh joint at 18.10m											J - partially open	
		horizontal, irregular slightly weathered joint at 18.26m											J	
19		sub-vertical open joint with rust at 18.57m												
		mechanical breaks												
20														
21					8	12	100							
22														
23		faintly weathered, moderately spaced discontinuities, trace biotite schist												
		diagonal, faintly weathered joint at 23.60 and 23.67m			9	10	100						J J J	
24														

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : August 1, 2011
COMPLETED : August 2, 2011

INCLINATION: 44° AZIMUTH: 63°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 382 E 605 698

Project No. 19-1605-126
SHEET 2 OF 6
DATUM CGVD28

FR-FRACTURE, CL-CLEAVAGE, SH-SHEAR, VN-VEIN
F-FAULT, J-JOINT, P-POLISHED, S-SLICKENSIDED
SM-SMOOTH, R-ROUGH, ST-STEPPED, PL-PLANAR
FO-FOLIATED, UE-UNEVEN, W-WAVY, C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR / % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE													
25															
26		diagonal, irregular, fresh closed joint at 25.60m quartz veins (30mm) at 25.90 and 26.10m													
27					10	15	100								
28															
29					11	14									
30		diagonal, faintly weathered open joint at 29.40m											J		
31					12	11	100								
32															
33		fresh, very widely spaced discontinuities, foliations are sub-horizontal													
34	NQ Diamond Drill	diagonal, slightly weathered closed joint at 33.64m			13	12	100						J		
35		foliations are sub-vertical													
36					14	7	100								
37															
38															
39					15	7	100								
40															
41															
42		quartz vein (50mm) at 41.55m			16	10									
43															
44															

Unconfined Compressive Strength (Mpa): 50, 100, 150

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : August 1, 2011
COMPLETED : August 2, 2011

INCLINATION: 44° AZIMUTH: 63°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 382 E 605 698

Project No. 19-1605-126
SHEET 3 OF 6
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR / % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE						80 60 40 20	80 60 40 20	80 60 40 20	5 10 15 20	0 30 60 90		50 100 150	
45					17	6	100								
46		pale white infill on joint surfaces											J J - partially open		
47		slightly weathered, banded, fine grained, pinkish grey to greyish black			18								J		
48															
49															
50					19	12	0								
51															
52															
53					20	11	0								
54	NQ Diamond Drill														
55															
56					21	8	0								
57													J - partially open		
58															
59					22		0								
60															
61													J		
62					23		0						J		
63															
64		soft white infill in joints up to 1mm thick											J J J		

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : August 1, 2011
COMPLETED : August 2, 2011

INCLINATION: 44° AZIMUTH: 63°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 382 E 605 698

Project No. 19-1605-126
SHEET 4 OF 6
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE													
65													J		
66					24		0								
67															
68															
69		soft white infill in joints up to 1mm thick			25		0						J J		
70															
71															
72					26		0								
73		soft white infill in joints											J J		
74	NQ Diamond Drill														
75					27		0								
76													J		
77		soft greyish green mud in joints up to 3mm thick													
78					28		0								
79													J J J		
80															
81					29		0								
82															
83															
84					30		0						J - partially open		

Unconfined Compressive Strength (Mpa): 50, 100, 150

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : August 1, 2011
COMPLETED : August 2, 2011

INCLINATION: 44° AZIMUTH: 63°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 382 E 605 698

Project No. 19-1605-126
SHEET 5 OF 6
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE													
85															
86		moderately weathered, moderately spaced, pink with dark grey diagonal foliations diagonal, planar, dark brown, weathered joint at 86.08m sub-horizontal, planar, dark grey, weathered joint at 86.34m			31		50					J J J		
87															
88															
89		diagonal, planar, weathered joint at 88.90, 91.30, and 91.50m										J			
90					32	9	50								
91		grey silty infill										J			
92		diagonal, planar, slightly weathered, closed joint at 91.74 and 92.05m										J J J J			
93					33	10	50								
94	NQ Diamond Drill														
95		fresh, very widely spaced, mechanical joints													
96					34	9	50								
97															
98		slightly weathered, widely spaced										J			
99					35	14	50								
100												J J			
101		diagonal, faintly weathered, parallel planar joints (3) at 100.95 to 101.12m										J J J			
102					36	6	50								
103		dark grey biotite schist banding at 103.10m													
104		faintly weathered, very widely spaced discontinuities													

Unconfined Compressive Strength (Mpa): 50 100 150

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : August 1, 2011
COMPLETED : August 2, 2011

INCLINATION: 44° AZIMUTH: 63°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 382 E 605 698

Project No. 19-1605-126
SHEET 6 OF 6
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA DIP wrt Core Axis	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE													
105	NQ Diamond Drill	sub-horizontal, planar, weathered joint at 104.83m			37	9	50						J		
106															
107		very widely spaced discontinuities diagonal, parallel, planar, slightly weathered joints (2) at 106.60m											J J		
108					38	10	50								
109															
110		diagonal, planar, weathered joint at 110.02m											J		
111					39	11	50								
112															
113		diagonal, planar, weathered joint at 112.54m											J		
114		diagonal, irregular, weathered open joint at 113.86m			40	10	50						J		
115															
116													J		
117					41	11	50								
118		quartz vein, crystalline structure, 2 mechanical breaks with irregular rough surfaces													
119		widely spaced discontinuities													
120					42	8	50								
121		diagonal, planar, weathered joint at 120.97 and 121.43m											J J		
		END OF BOREHOLE AT 121.60m.		121.60											
122															
123															
124															

Unconfined Compressive Strength (Mpa): 50, 100, 150

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH05

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : July 30, 2011
COMPLETED : July 31, 2011
DRILLER: BOART LONGYEAR, LM-55
N 7 835 245 E 605 535
Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		148.79								
1	NQ Diamond Drill	no sampling										
				1.30								
2		**GRAVEL** and **COBBLES**, granitic, boulders up to 710mm			1A	RUN		100				
3				2.99								2.99
		END OF SAMPLING AT 2.99m, START CORING. FOR ROCK DETAILS PLEASE REFER TO NTUN-DH05(R).										

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan
CHECKED : MB

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH05(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : July 30, 2011
COMPLETED : July 31, 2011

INCLINATION: 70° AZIMUTH: 45°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 245 E 605 535

Project No. 19-1605-126
SHEET 1 OF 4
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / % RETURN / COLOUR	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)
		GROUND SURFACE		148.79										
	NQ Diamond Drill	**GRANITIC GNEISS**, faintly weathered, medium grained, strong, widely spaced, pink with dark grey sub-horizontal foliation		2.99	1B	19								
4		diagonal, open joint at 3.87m										90	J	
		diagonal, stepped joint at 4.17m										85	J	
		diagonal, faintly weathered, open joint at 4.30m										80	J-FO	
5														
		diagonal, faintly weathered, open joint at 5.40m			2	13	light grey 100					90	J	
		diagonal, weathered, stepped open joint at 5.50m										85	J	
6		biotite schist banding at 5.55m										80	J	
		diagonal, closed joint at 5.70m												
7														
		diagonal, closed joint at 8.12m			3	12	light grey 100					90	J	
8														
		six quartz veins (2-10mm)										90	J-VN	
												85	J-VN	
9												85	J-VN	
												80	J-VN	
10														
		very widely spaced, pink with dark grey and white diagonal foliation			4	6	light grey 100							
11														
12														
		diagonal, open joint with faint black mineral infill at 12.39m										90	J	
13														
		sand seam, fine grained, trace silt, medium grey at 13.30m (~50mm)												
14														
		sub-vertical, weathered, open joint at 14.25m			5	16						0	J	
15														
16														
		pink with dark grey and light grey sub-horizontal foliation												
17														
18					6	10	grey 100							
19														
		pink with dark grey and light grey diagonal foliation												
20														
21					7	9	light grey 100							
22														
		pink with dark grey and light grey sub-horizontal foliation												

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH05(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : July 30, 2011
COMPLETED : July 31, 2011

INCLINATION: 70° AZIMUTH: 45°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 245 E 605 535

Project No. 19-1605-126
SHEET 2 OF 4
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR / % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE						80 60 40 20	80 60 40 20	80 60 40 20	5 10 15 20	0 30 60 90		50 100 150	● Point Load Test Diametral ▲ Point Load Test Axial ⊠ Laboratory UCS Test
24	NQ Diamond Drill	sub-horizontal, open joint with silty infill at 22.95m diagonal, closed joint at 23.65m			8	8	light grey 100					J J J			
25		diagonal, irregular joint at 24.72m										J			
26		diagonal, faintly weathered, closed joint at 25.47m diagonal, irregular, open joint with mineral infill at 25.79m										J J			
27		diagonal, weathered, open joint with rust at 26.42m			9	6						J			
28															
29		diagonal, planar, parallel open joints with mineral infill at 28.30, 28.82, and 28.97m										J J J			
30		heavily fractured zone with multiple joints on different axis, weathered, with mineral infill, sub-vertical at 29.75 to 29.90m diagonal, weathered joints at 30.34, 30.55, and 30.99m			10	8	light grey 100					J J-VN J-FO J J J			
31												FR			
32		closely spaced discontinuities, numerous diagonal and sub-vertucal open joints with heavy weathering, rust, and mineral infill										J J J J J			
33		fractured zone at 32.70 to 33.00m			11	7	brown 25					J J			
34		fractured zone at 34.20m heavily fractured zone at 34.30 to 35.30m										J-VN			
35															
36		fractured zone at 36.10 to 36.40m			12	9	red 25					J J			
37		slightly weathered, banded, fine to medium grained, pinkish grey to black										J J J-FO J-FO			
38												J J-FO J-FO J-FO			
39					13	14						J-FO J-FO J J			
40												J-FO			
41												J-FO			
42					14	8	50					J J			

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH05(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : July 30, 2011
COMPLETED : July 31, 2011

INCLINATION: 70° AZIMUTH: 45°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 245 E 605 535

Project No. 19-1605-126
SHEET 3 OF 4
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)
		GROUND SURFACE												
44	NQ Diamond Drill	fractures with greenish clay infill at 42.84 to 42.94m											F F J-VN	
45					15	3	50						J-FO J	
46		greenish clay infill in all fractures in run												
47													J J	
48					16	7	50						J-VN J-VN J J-VN J-VN	
49													J J	
50														
51					17	12	25							
52													J J	
53													J-VN	
54		fractures with greyish green clay infill at 53.93m fractured zone at 54.20 to 54.50m			18	8	75						J J J J J J-FO	
55														
56		some fractures with greenish grey clay infill at 55.30 to 58.30m											J	
57					19	9	75						J J J-FO	
58													J J	
59													J-VN	
60					20	8								
61														
62		talc infill			21	7	25						J	

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE NTUN-DH05(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - North Tunnel
STARTED : July 30, 2011
COMPLETED : July 31, 2011

INCLINATION: 70° AZIMUTH: 45°
DRILLER: BOART LONGYEAR, LM-55
N 7 835 245 E 605 535

Project No. 19-1605-126
SHEET 4 OF 4
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)
		GROUND SURFACE												
64	NQ Diamond Drill	some fractures with greyish green clay infill											J J	
65													J J J J J J J	
66					22	18	25							
67														
68													J J	
69					23	13	20							
70														
71													J FO	
72					24	7	25						J J	
73														
74		soft infill in joints, possibly talc											J J J J	
75					25	8	50							
76													J J	
77		talc coating in joints											J J J J J	
78					26	12	50						J-FO	
79														
80													J-FO	
81					27	10	50						J-FO	
82		END OF BOREHOLE AT 82.30m.		82.30										

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE STUN-DH03

PROJECT : Mary River Project
LOCATION : Cockburn Lake - South Tunnel
STARTED : July 29, 2011
COMPLETED : July 29, 2011

Project No. 19-1605-126
DRILLER: BOART LONGYEAR, LM-55
N 7 832 812 E 601 490
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		111.22								
1	NQ Diamond Drill	no sampling										
2												
3				3.30								3.30
4		END OF SAMPLING AT 3.30m, START CORING. FOR ROCK DETAILS PLEASE REFER TO STUN-DH03(R).										
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill
CHECKED : MB

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE STUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - South Tunnel
STARTED : July 29, 2011
COMPLETED : July 29, 2011

INCLINATION: 56° AZIMUTH: 268°
DRILLER: BOART LONGYEAR, LM-55
N 7 832 812 E 601 490

Project No. 19-1605-126
SHEET 1 OF 5
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE		111.22											
	NQ Diamond Drill	**GRANITIC GNEISS**, slightly weathered, fine to medium grained, weakly banded, pinkish grey to black		3.30											
4													J		
					1	10	50						J J J J		
5															
6															
7													J J		
					2	5	0						J		
8															
9													J J		
10		possible silty sand seam at 9.95m													
					3	33	0						J J J		
11															
12															
13		potassium feldspar vein (130mm) at 13.20m											VN		
					4	15	0								
14															
15															
16													J		
					5	10	0								
17															
18													J FR		
19															
20					6	8	0						J		
21															
22													J		
					7	9	20						FR		
23															

Unconfined Compressive Strength (Mpa): 50 100 150

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill/Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE STUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - South Tunnel
STARTED : July 29, 2011
COMPLETED : July 29, 2011

INCLINATION: 56° AZIMUTH: 268°
DRILLER: BOART LONGYEAR, LM-55
N 7 832 812 E 601 490

Project No. 19-1605-126
SHEET 2 OF 5
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE						80 60 40 20	80 60 40 20	80 60 40 20	5 10 15 20	0 30 60 90		50 100 150	
24	NQ Diamond Drill	clay coating in joint surfaces											J		
25															
26					8	8	25								
		possible sand seam in joint at 26.40m											J		
27															
28													J		
29					9	10	25								
30															
31													J		
													J		
32					10	5	25						J		
													J-FO		
33													J		
													J		
34													J		
35		small fault (20mm) with clay guage infill at 35.20m			11	5	25						J-FO		
		potassium feldspar vein (120mm) at 35.60m											VN		
36													J		
37															
38					12	15	25						F		
		potassium feldspar vein at 38.60m											VN		
39													J		
													J-VN		
40													J		
													J-FO		
													J-FO		
													J		
41					13	3	25						FR-FO		
													J		
42													FR-FO		
													J		
43													J		

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill/Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE STUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - South Tunnel
STARTED : July 29, 2011
COMPLETED : July 29, 2011

INCLINATION: 56° AZIMUTH: 268°
DRILLER: BOART LONGYEAR, LM-55
N 7 832 812 E 601 490

Project No. 19-1605-126
SHEET 3 OF 5
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)
		GROUND SURFACE												
44	NQ Diamond Drill				14	3	25						J J-FO J-FO J-FO	
45													J J J	
46					15	5	25						J J J	
47													J	
48		sub-vertical fracture at 48.45m											J	
49					16	10	25						J J J	
50														
51													J	
52					17	3	25						J-FO	
53														
54													J	
55													J J	
56		fault, 560mm aperture at 55.60m			18	5	25						J J F F	
57													J J J J	
58		faintly weathered, strong, sub-horizontal foliation, moderate spacing, pink mottled with dark grey and white diagonal, weathered joint at 58.37m			19	10	dark grey 100						J J J J J	
59														
60		diagonal, faintly weathered, planar joint at 59.50m											J	
61		heavily fractured at 61.11 to 61.29m			20	11	light grey 100						J J J	
62														
63													J	

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill/Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE STUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - South Tunnel
STARTED : July 29, 2011
COMPLETED : July 29, 2011

INCLINATION: 56° AZIMUTH: 268°
DRILLER: BOART LONGYEAR, LM-55
N 7 832 812 E 601 490

Project No. 19-1605-126
SHEET 4 OF 5
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE						80 60 40 20	80 60 40 20	80 60 40 20	5 10 15 20	0 30 60 90		50 100 150	● Point Load Test Diametral ▲ Point Load Test Axial ⊠ Laboratory UCS Test
64															
65		horizontal, irregular, closed joint at 65.15m			21	9							J J		
66															
67		fresh, very wide spacing, medium grey with dark grey and pink sub-horizontal foliations													
68					22	15	light grey 100								
69															
70													J		
71	NQ Diamond Drill	diagonal, planar, weathered joints at 70.46 and 70.70m			23	13	light grey 100						J		
72															
73															
74					24	14	light grey 100								
75															
76															
77					25	10	light grey 100								
78															
79															
80		diagonal, irregular, closed joint at 79.65m			26	12	light grey 100						J J-FO J		
81															
82		becoming pinker													
83		diagonal, planar, weathered, open joints at 82.59 to 84.22m			27	11	light grey 100						J		

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill/Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE STUN-DH03(R)

PROJECT : Mary River Project
LOCATION : Cockburn Lake - South Tunnel
STARTED : July 29, 2011
COMPLETED : July 29, 2011

INCLINATION: 56° AZIMUTH: 268°
DRILLER: BOART LONGYEAR, LM-55
N 7 832 812 E 601 490

Project No. 19-1605-126
SHEET 5 OF 5
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH	COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE														
84	NQ Diamond Drill													J		
85																
86					28	10		light grey 100								
87		sub-vertical, undulating to planar, weathered, open joint with mineral infill at 86.55m												J		
		END OF BOREHOLE AT 87.45m.		87.45												
88																
89																
90																
91																
92																
93																
94																
95																
96																
97																
98																
99																
100																
101																
102																
103																

Unconfined Compressive Strength (Mpa): 50 100 150

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill/Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q114+600

PROJECT : Mary River Project
LOCATION : 114+600 - Quarry
STARTED : July 25, 2011
COMPLETED : July 25, 2011

DRILLER: BOART LONGYEAR
N 7 827 828 E 597 850

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
		TOPSOIL		0.20								
1		**BOULDERS** and **COBBLES**, granitic, grey			1	RUN						
2				2.30								2.30
3		**GRANITIC GNEISS**, slightly weathered, fine grained, slightly fractured, black, grey										
4					2	RUN			TCR=100% SCR=100% RQD=77%			
5												
6												
7					3	RUN			TCR=100% SCR=81% RQD=81%			
8												
9												
10	NQ Diamond Drill				4	RUN			TCR=100% SCR=100% RQD=100%			
11												
12		layers of biotite interbeds										
13					5	RUN			TCR=100% SCR=100% RQD=100%			
14												
15		quartz crystal										
16					6	RUN			TCR=100% SCR=100% RQD=100%			
17		biotite schist at 16.90m										
18		biotite schist (100mm) at 18.2m										
19					7	RUN			TCR=100% SCR=100% RQD=92%			

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q114+600

PROJECT : Mary River Project
LOCATION : 114+600 - Quarry
STARTED : July 25, 2011
COMPLETED : July 25, 2011

DRILLER: BOART LONGYEAR
N 7 827 828 E 597 850

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21												
22					8	RUN			TCR=100% SCR=100% RQD=90%			
23												
24	NQ Diamond Drill	biotite interbeds										
25					9	RUN			TCR=100% SCR=100% RQD=77%			
26												
27												
28					10	RUN			TCR=100% SCR=100% RQD=100%			
29												
30												
31												
32					11	RUN			TCR=100% SCR=100% RQD=100%			
33												
				33.60								
34		END OF BOREHOLE AT 33.60m.										
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Khabbaznia
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QTR-09

PROJECT : Mary River Project
LOCATION : 116+500 - Quarry
STARTED : July 25, 2011
COMPLETED : July 26, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 826 260 E 600 261

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
		COBBLES(150mm) and **GRAVEL**		0.30								0.30
		GRANITIC GNEISS, fresh, very strong, light grey and pink										
1	NQ Diamond Drill				1	RUN			TCR=63% SCR=54% RQD=31%			
2												
3												
4					2	RUN			TCR=103% SCR=100% RQD=100%			
5												
6												
7					3	RUN			TCR=100% SCR=97% RQD=97%			
8												
9												
10					4	RUN			TCR=100% SCR=100% RQD=99%			
11												
12												
13					5	RUN			TCR=100% SCR=98% RQD=93%			
14												
15												
16					6	RUN			TCR=100% SCR=100% RQD=95%			
17												
18												
19					7	RUN			TCR=100% SCR=100% RQD=97%			

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Mediwake/Braverman
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QTR-09

PROJECT : Mary River Project
LOCATION : 116+500 - Quarry
STARTED : July 25, 2011
COMPLETED : July 26, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 826 260 E 600 261

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21												
22					8	RUN			TCR=100% SCR=100% RQD=100%			
23												
24												
25	NQ Diamond Drill				9	RUN			TCR=100% SCR=100% RQD=100%			
26												
27												
28					10	RUN			TCR=100% SCR=97% RQD=77%			
29												
30												
31					11	RUN			TCR=100% SCR=100% RQD=100%			
32				32.40								
		END OF BOREHOLE AT 32.40m.										
33												
34												
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.
FROZEN
UNFROZEN
UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Mediwake/Braverman
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q116+800

PROJECT : Mary River Project
LOCATION : 116+800 - Quarry
STARTED : July 26, 2011
COMPLETED : July 26, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 826 194 E 597 422

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**COBBLES** and **GRAVEL**, fines washed out			1	RUN		61				
2				1.93							FI	1.93
3		**GRANITIC GNEISS**, fresh, moderately spaced, very strong, with diagonal foliations, horizontal to subhorizontal closed joints, grey, pink, white			2	RUN			TCR=100% SCR=92% RQD=92%			
4												
5												
6					3	RUN			TCR=100% SCR=94% RQD=94%			
7												
8												
9		open diagonal joint with black weathering at 9.20m			4	RUN			TCR=100% SCR=96% RQD=96%			
10												
11												
12					5	RUN			TCR=100% SCR=97% RQD=94%			
13												
14					6	RUN			TCR=100% SCR=93% RQD=93%			
15		white quartzite banding at 14.8m										
16					7	RUN			TCR=100% SCR=93% RQD=93%			
17												
18		becoming widely spaced massive										
19					8	RUN			TCR=100% SCR=100% RQD=100%			

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q116+800

PROJECT : Mary River Project
LOCATION : 116+800 - Quarry
STARTED : July 26, 2011
COMPLETED : July 26, 2011

DRILLER: BOART LONGYEAR, LM-55
N 7 826 194 E 597 422

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21	NQ Diamond Drill										0	FROZEN
											0	UNFROZEN
											0	UNCERTAIN
											1	
22					9	RUN			TCR=100% SCR=96% RQD=96%		0	
											3	
											0	
23		biotite schist interbeds from 22.32m to 22.49m									3	
											0	
											1	
24		very widely spaced joints									3	
											0	
											0	
25					10	RUN			TCR=100% SCR=99% RQD=99%		0	
											0	
											0	
26											0	
											0	
											1	
27		closely spaced joints									0	
											0	
											0	
28					11	RUN			TCR=100% SCR=90% RQD=90%		0	
											1	
											3	
29											0	
											0	
											0	
30											0	
											5	
											0	
31					12	RUN			TCR=100% SCR=100% RQD=100%		0	
											0	
											0	
32											0	
											0	
											3	
				32.39								
		END OF BOREHOLE AT 32.39m.										
33												
34												
35												
36												
37												
38												
39												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QTR-04A

PROJECT : Mary River Project
LOCATION : 123+000 - Quarry
STARTED : August 4, 2011
COMPLETED : August 4, 2011

Project No. 19-1605-126

DRILLER: BOART LONGYEAR, LM-55
N 7 820 410 E 598 555

SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
		GRAVEL, granitic, light grey to reddish brown, sub-angular to sub-rounded, fine to medium grained		0.51	1A	RUN						0.51 FROZEN
1	NQ Diamond Drill	**GRANITIC GNEISS**, slightly to moderately weathered, closely spaced foliations, medium grained, strong, grey to pink										
2					1B	RUN			TCR=84% SCR=62%			
3											FI	
4					2	RUN			TCR=100% SCR=98% RQD=69%		0 0 0 2 0 1 6 1 1 2 0 0 0 2 3	
5												
6												
7					3	RUN			TCR=100% SCR=100% RQD=71%		>25 >25 1 0 0 1 0 0 0 0 1 1 1 0 1 0 0 1 3 1 1 3 1 0	
8												
9		slightly weathered, moderately spaced										
10					4	RUN			TCR=100% SCR=98% RQD=82%			
11												
12												
13					5	RUN			TCR=100% SCR=94% RQD=71%			
14												
15		moderately to highly weathered, closely spaced joints, numerous open joints with silt/sand infill										
16					6	RUN			TCR=100% SCR=8% RQD=0%			
17												
18		heavily fractured from 17.45m to 21.05m										
19					7	RUN			TCR=100% SCR=100% RQD=90%		0 1 1 1	

THERMISTER/ GROUND COND.: FROZEN, UNFROZEN, UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill/Dunstan
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QTR-04A

PROJECT : Mary River Project
LOCATION : 123+000 - Quarry
STARTED : August 4, 2011
COMPLETED : August 4, 2011

Project No. 19-1605-126
DRILLER: BOART LONGYEAR, LM-55
N 7 820 410 E 598 555
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21											0	
											0	
											1	
											5	
22					8	RUN			TCR=100% SCR=90% RQD=81%		3	
											1	
											1	
23											0	
											1	
											0	
											0	
24											0	
											1	
											1	
											1	
25					9	RUN			TCR=100% SCR=89% RQD=78%		0	
											0	
											4	
26	NQ Diamond Drill										2	
27											3	
											0	
											0	
28					10	RUN			TCR=100% SCR=90% RQD=85%		0	
											2	
											1	
29											0	
											0	
		trace biotite schist banding									0	
30											0	
		sub-vertical joints with red silty infill from 30.0m to 30.3m									1	
											4	
31					11	RUN			TCR=100% SCR=95% RQD=84%		3	
											0	
											0	
32											1	
											0	
				32.45							1	
		END OF BOREHOLE AT 32.45m.									0	
33												
34												
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.: FROZEN, UNFROZEN, UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill/Dunstan
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q131+100

PROJECT : Mary River Project
LOCATION : 131+100 - Quarry
STARTED : August 5, 2011
COMPLETED : August 5, 2011

DRILLER: BOART LONGYEAR
N 7 813 509 E 600 177

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**SAND** and **GRAVEL** (INFERRED), some cobbles (< 170mm), trace silt, occasional boulders (< 740mm), granitic, pinkish red to greyish black, moist			1	RUN		19				
2												
3					2	RUN		67				
4												
5				5.48								
6		**SAND** and **GRAVEL**, some silt, trace cobbles and boulders (< 210mm), granitic			3	RUN		100				
7												
8				8.35								8.35
9		**GRANITIC GNEISS**, moderately weathered, fine grained, banded, strong										
10					4	RUN			TCR=100% SCR=90% RQD=72%			
11		highly fractured zone at 11.1m (0.10m) with clayey infill									FI	
12											1	
13					5	RUN			TCR=100% SCR=84% RQD=75%		1	
14											>25	
15		becoming moderately spaced, with white foliations									3	
16					6	RUN			TCR=100% SCR=98% RQD=89%		>25	
17											1	
18											0	
19					7	RUN			TCR=100% SCR=98% RQD=94%		0	
											1	
											1	
											1	
											>25	
											3	
											>25	
											1	
											0	
											0	
											0	
											0	
											1	
											1	
											1	
											0	
											0	
											0	
											1	
											0	
											1	
											0	
											0	
											0	
											0	

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill/Dunstan
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q131+100

PROJECT : Mary River Project
LOCATION : 131+100 - Quarry
STARTED : August 5, 2011
COMPLETED : August 5, 2011

DRILLER: BOART LONGYEAR
N 7 813 509 E 600 177

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	SAMPLES: RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
				20.48							0	
		END OF BOREHOLE AT 20.48m.										
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

THERMISTER/ GROUND COND.
FROZEN
UNFROZEN
UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill/Dunstan
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q138+100

PROJECT : Mary River Project
LOCATION : 138+100 - Quarry
STARTED : July 16, 2011
COMPLETED : July 17, 2011

DRILLER: WALKER DRILLING
N 7 807 612 E 598 865

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. (m)	NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS / DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRANITIC GNEISS**, moderately weathered, medium to coarse grained, pink to grey			1	RUN			TCR=86% SCR=69% RQD=52%			
2		becoming moderately strong, slightly weathered			2	RUN			TCR=97% SCR=82% RQD=70%			
3												
4												
5					3	RUN			TCR=98% SCR=80% RQD=47%			
6		with black bands (mm scale), greenish clay infilled gouge at 6.24m										
7					4	RUN			TCR=99% SCR=99% RQD=80%			
8												
9					5	RUN			TCR=98% SCR=97% RQD=85%			
10					6	RUN			TCR=98% SCR=98% RQD=68%			
11		moderately strong, slightly weathered										
12					7	RUN			TCR=86% SCR=76% RQD=52%			
13					8	RUN			TCR=97% SCR=87% RQD=81%			
14												
15		medium strong to strong, moderately weathered			9	RUN			TCR=100% SCR=96% RQD=96%			
16					10	RUN			TCR=92% SCR=81% RQD=73%			
17		strong, faintly weathered										
18					11	RUN			TCR=99% SCR=93% RQD=81%			
19					12	RUN			TCR=97% SCR=90% RQD=79%			

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Singh
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q138+100

PROJECT : Mary River Project
LOCATION : 138+100 - Quarry
STARTED : July 16, 2011
COMPLETED : July 17, 2011

DRILLER: WALKER DRILLING
N 7 807 612 E 598 865

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21	NQ Diamond Drill	becoming strong, fresh			13	RUN			TCR=98% SCR=92% RQD=88%			FROZEN / UNFROZEN / UNCERTAIN
22					14	RUN			TCR=99% SCR=95% RQD=90%			
23												
24					15	RUN			TCR=90% SCR=90% RQD=80%			
25					16	RUN			TCR=97% SCR=93% RQD=70%			
26												
27					17	RUN			TCR=94% SCR=91% RQD=86%			
28					18	RUN			TCR=100% SCR=93% RQD=91%			
29												
30					19	RUN			TCR=97% SCR=92% RQD=88%			
31		END OF BOREHOLE AT 30.95m.		30.93								
32												
33												
34												
35												
36												
37												
38												
39												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Singh
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE Q139+600

PROJECT : Mary River Project
LOCATION : 139+600 - Quarry
STARTED : July 19, 2011
COMPLETED : July 19, 2011

DRILLER: WALKER DRILLING
N 7 806 105 E 598 727

Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRANITIC GNEISS**, slightly weathered, medium strong, medium to coarse grained, grey, pink, black			1	RUN			TCR=99% SCR=99% RQD=96%		FI 0 2 3 0 0	FROZEN
2					2	RUN			TCR=100% SCR=100% RQD=100%		0	UNFROZEN
3											0	UNCERTAIN
4					3	RUN			TCR=95% SCR=91% RQD=91%		2 1 1 1 3	
5					4	RUN			TCR=95% SCR=89% RQD=77%		2 2 0 1 3	
6					5	RUN			TCR=99% SCR=96% RQD=84%		0 0 2 2	
7					6	RUN			TCR=100% SCR=100% RQD=100%			
8					7	RUN			TCR=91% SCR=91% RQD=88%		2 0 0 0 0	
9					8	RUN			TCR=100% SCR=100% RQD=98%			
10					9	RUN			TCR=99% SCR=80% RQD=80%			
11												
12												
13												
14		END OF BOREHOLE AT 13.89m.		13.89								
15												
16												
17												
18												
19												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Santos/Singh
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QS-3A

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Quarry
STARTED : July 23, 2011
COMPLETED : July 23, 2011

DRILLER: WALKER DRILLING
N 7 800 000 E 595 698

Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
0	NQ Diamond Drill	**GRANITIC GNEISS**, highly weathered and fractured, coarse grained, weak, pinkish grey			1	RUN			TCR=37% SCR=25% RQD=25%			
1					2	RUN			TCR=98% SCR=56% RQD=40%			
2											FI	
3					3	RUN			TCR=100% SCR=69% RQD=26%		5 >10 3 2 2 5 3	
4		clay infill at 4.4m									0 1 2 4	
5											5 >10 1	
6					4	RUN			TCR=100% SCR=74% RQD=41%		2 2 4 3 4	
7		moderately to highly weathered			5	RUN			TCR=100% SCR=74% RQD=33%		>10 1 2 2	
8					6	RUN			TCR=100% SCR=88% RQD=35%		4 3 4	
9		moderately weathered			7	RUN			TCR=100% SCR=95% RQD=89%		>10 4 2 0 5	
10		highly weathered									3 >10 >10	
11		vertical joint, clay infill			8	RUN			TCR=100% SCR=53% RQD=27%		2 2 2 2 3	
12					9	RUN			TCR=100% SCR=100% RQD=69%		1 >10 >10	
13		slightly to moderately weathered									>10 6 2 0	
14					10	RUN			TCR=100% SCR=94% RQD=92%		7 >10 >10	
15				15.13							2 1 2	
		END OF BOREHOLE AT 15.13m.										
16												
17												
18												
19												

THERMISTER/ GROUND COND.: FROZEN; UNFROZEN; UNCERTAIN

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Singh/Ramos
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QS-2

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Quarry
STARTED : July 24, 2011
COMPLETED : July 25, 2011

DRILLER: WALKER DRILLING
N 7 801 066 E 595 200

Project No. 19-1605-126
SHEET 1 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRANITIC GNEISS**, faintly to slightly weathered, coarse grained, medium strong, black, grey, pink			1	RUN			TCR=100% SCR=100% RQD=95%		FI 0 0 3 1 1 1 1 1 0	FROZEN / UNFROZEN / UNCERTAIN
2					2	RUN			TCR=100% SCR=100% RQD=100%		0 0 3 0 2 0	
3												
4					3	RUN			TCR=98% SCR=98% RQD=98%		0 1 0 0 0 0	
5												
6					4	RUN			TCR=100% SCR=97% RQD=97%		0 1 0 0 0 0	
7												
8					5	RUN			TCR=91% SCR=91% RQD=86%		0 2 0 0 0 1	
9												
10					6	RUN			TCR=100% SCR=100% RQD=92%		1 0 0 0 1 0	
11												
12					7	RUN			TCR=100% SCR=96% RQD=92%		3 0 2 0 0 0	
13												
14		slightly weathered, medium to coarse grained			8	RUN			TCR=98% SCR=93% RQD=81%		0 0 0 0 2 3	
15												
16		strong, fresh to faintly weathered			9	RUN			TCR=99% SCR=95% RQD=91%		1 0 0 0 0 0	
17												
18		massive			10	RUN			TCR=100% SCR=92% RQD=88%		1 2 0 0	
19												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Ramos/Singh
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QS-2

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Quarry
STARTED : July 24, 2011
COMPLETED : July 25, 2011

DRILLER: WALKER DRILLING
N 7 801 066 E 595 200

Project No. 19-1605-126
SHEET 2 OF 2
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
21	NQ Diamond Drill	weak, highly weathered from 21.1m to 22.9m			11	RUN			TCR=100% SCR=53% RQD=47%		0 0 >10 >10 >10 >10 >10	FROZEN UNFROZEN UNCERTAIN
22											>10	
23					12	RUN			TCR=100% SCR=0% RQD=0%		>10 >10 0	
24					13	RUN			TCR=100% SCR=100% RQD=100%		0 0 0 0	
25											0 0	
26					14	RUN			TCR=100% SCR=100% RQD=100%		1 0 0 0	
27											0 0 0	
28											0 0 0	
29					15	RUN			TCR=100% SCR=91% RQD=79%		0 3 2 1 1	
30		END OF BOREHOLE AT 30.00m.		30.00								
31												
32												
33												
34												
35												
36												
37												
38												
39												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Ramos/Singh
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE QS-1

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Quarry
STARTED : August 6, 2011
COMPLETED : August 6, 2011
DRILLER: BOART LONGYEAR, LM-55
N 7 803 054 E 593 500
Project No. 19-1605-126
SHEET 1 OF 1
DATUM: CGVD28

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	COMMENTS: DYNAMIC CONE PENETRATION RESISTANCE PLOT (50 100 150 200 250)	EXCESS ICE CONTENT, PERCENT (ice; 10 20 30 40) / WATER CONTENT, PERCENT (wp w wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	THERMISTER/ GROUND COND.
		GROUND SURFACE		0.00								
1	NQ Diamond Drill	**GRANITIC GNEISS**, slightly weathered, medium grained, foliated, pinkish grey			1	RUN			TCR=89% SCR=86% RQD=84%		FI 3 0 1 3 2 1 1 0	FROZEN / UNFROZEN / UNCERTAIN
2												
3		clay infill in some joints									1 1 1 4 0	
4					2	RUN			TCR=100% SCR=100% RQD=94%		2 1 3 0 4	
5											2 2 0 1 3	
6												
7					3	RUN			TCR=100% SCR=100% RQD=72%		1 2 1 1	
8												
9											3 1 1 1 1	
10					4	RUN			TCR=100% SCR=100% RQD=93%		2 4 2 1 1	
11												
12											3 1 0 4 1	
13					5	RUN			TCR=100% SCR=100% RQD=76%		1 0 1 2 1	
14											4	
15		highly weathered from 14.52m to 16.00m, vertical joint										
16					6	RUN			TCR=100% SCR=56% RQD=50%		0 0 0 0 0	
17				17.52							0	
		END OF BOREHOLE AT 17.52m.										
18												
19												

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill
CHECKED : KS

THURBER

THURBER2S(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE SI-OLD-004

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Ore Loading Dock
STARTED : August 8, 2011
COMPLETED : August 8, 2011
INCLINATION: AZIMUTH:
DRILLER: BOART LONGYEAR, LM-55
N 7 798 314 E 592 879
Project No. 19-1605-126
SHEET 1 OF 2
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE		4.54											
1	NQ Diamond Drill	**GRANITIC GNEISS**, faintly weathered, moderately wide horizontal foliation, strong, pink with dark and light grey foliations			1								J, open (25mm), irregular J, closed, planar, horizontal J, planar, diagonal J, planar, horizontal J, closed, planar, horizontal		
2															
3					2								J, closed, irregular, horizontal		
4		slightly weathered											J, closed, irregular, horizontal, weathered J, closed, diagonal, black staining J, closed, black crystalline intrusion J, closed, black crystalline intrusion		
5													J, closed, irregular, diagonal, black staining		
6					3								J, open, sub-vertical, weathered (5.48 to 5.69m) J, open, diagonal, weathered		
7													J, closed, sub-horizontal, black staining		
8													J, closed, sub-horizontal J, 2mm aperture, stepped, vertical, silt infill (8.23 to 10.36m)		
9					4										
10		becoming coarse grained													
11															
12		strong to very strong, wide spacing			5								J, closed, horizontal, weathered J, sub-vertical, weathered (12.06 to 12.25m)		
13															
14													J, closed, horizontal, black staining J, closed, horizontal, black staining		
15					6										
16															
17															
18					7										
19															

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE SI-OLD-004

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Ore Loading Dock
STARTED : August 8, 2011
COMPLETED : August 8, 2011
INCLINATION: AZIMUTH:
DRILLER: BOART LONGYEAR, LM-55
N 7 798 314 E 592 879
Project No. 19-1605-126
SHEET 2 OF 2
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / COLOUR % RETURN	RECOVERY TOTAL CORE % (80 60 40 20)	RECOVERY SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER .3 m (5 10 15 20)	DISCONTINUITY DATA: DIP wrt Core Axis (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa) (50 100 150)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE													
21					8										
22															
23		100mm white silt/sandy silt infill at 23.23m											J, 100mm of white sandy silt infill		
24					9										
25	NQ Diamond Drill														
26															
27					10										
28															
29															
30					11										
31															
32		END OF BOREHOLE AT 32.23m.		32.23											
33															
34															
35															
36															
37															
38															
39															

Unconfined Compressive Strength (Mpa) (50 100 150)

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE SI-OLD-005

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Ore Loading Dock
STARTED : August 9, 2011
COMPLETED : August 10, 2011
INCLINATION: AZIMUTH:
DRILLER: BOART LONGYEAR, LM-55
N 7 798 331 E 592 860
Project No. 19-1605-126
SHEET 1 OF 2
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / % RETURN / COLOUR	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)
		GROUND SURFACE		4.05										
1	NQ Diamond Drill	**GRANITIC GNEISS**, faintly weathered, closely spaced sub-horizontal foliation, strong, pink, white and grey			1								J, closed, sub-vertical, brown weathering (0.12 to 0.24m) J, 3 parallel, closed, diagonal (0.64 to 0.84m)	
2													J, open, 4mm silty infill	
3					2								J, open, 3mm, diagonal	
4													J, closed, diagonal, black staining J, closed, diagonal, black staining	
5		becoming strong to very strong, widely spaced foliation											J, closed, irregular, horizontal, brown weathering J, closed, horizontal, black weathering	
6					3								J, closed, horizontal to sub-horizontal J, closed, horizontal to sub-horizontal J, closed, horizontal to sub-horizontal J, closed, horizontal to sub-horizontal	
7													J, closed, horizontal to sub-horizontal J, closed, horizontal to sub-horizontal J, closed, horizontal to sub-horizontal	
8														
9		becoming very coarse grained moderately weathered			4								J, closed, vertical, red weathering (9.08 to 9.36m)	
10													J, closed, vertical, red weathering (9.98 to 10.39m)	
11														
12					5								J, closed, horizontal	
13													J, closed, horizontal J, open, 2mm, horizontal	
14		becoming fresh												
15					6								J, closed, horizontal J, open, 3mm, horizontal	
16													J, open, 2mm, irregular, horizontal J, open, 2mm, irregular, horizontal	
17		biotite schist, dark grey banding (150mm) at 16.6m												
18					7								J, closed, sub-horizontal J, closed, vertical, black weathering (17.37 to 17.66m)	
19													J, closed, planar, diagonal	
													J, closed, horizontal	

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE SI-OLD-005

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Ore Loading Dock
STARTED : August 9, 2011
COMPLETED : August 10, 2011
INCLINATION: AZIMUTH:
DRILLER: BOART LONGYEAR, LM-55
N 7 798 331 E 592 860
Project No. 19-1605-126
SHEET 2 OF 2
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE						80 60 40 20	80 60 40 20	80 60 40 20	5 10 15 20	0 30 60 90		50 100 150	
21	NQ Diamond Drill				8								J, closed, planar, vertical (20.23 to 20.46m)		
22															
23															
24					9										
25													J, closed, planar, sub-vertical, black weathering (24.90 to 25.02m)		
26					10								J, closed, planar, diagonal, grey and black weathering (25.89 to 25.96m) J, sub-vertical, 70°		
27													J, sub-vertical, 70°		
28													J, sub-vertical, 70° J, horizontal J, horizontal		
29													J, sub-vertical, 70°		
30					11								J, horizontal J, horizontal		
31													J, horizontal J, sub-vertical J, sub-vertical J, sub-vertical		
32		END OF BOREHOLE AT 31.96m.		31.96											
33															
34															
35															
36															
37															
38															
39															

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan/Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE SI-OLD-006

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Ore Loading Dock
STARTED : August 10, 2011
COMPLETED : August 11, 2011
INCLINATION: AZIMUTH:
DRILLER: BOART LONGYEAR, LM-55
N 7 798 409 E 592 876
Project No. 19-1605-126
SHEET 1 OF 2
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE		9.09											
1	NQ Diamond Drill	**GRANITIC GNEISS**, slightly weathered, fine to medium grained foliation, strong, pinkish grey to black			1										
2													J, sub-horizontal J, sub-vertical, 80°		
3		heavily fractured zone from 2.3m to 2.6m moderately weathered, sub-vertical foliation													
4					2								J, closed, sub-vertical, rusty weathering (3.97 to 4.18m) J, closed, sub-vertical, rusty weathering (4.45 to 4.64m)		
5		becoming grey biotite schist at 4.89 to 5.38m													
6					3								J, sub-vertical J, sub-vertical		
7													J, horizontal		
8													J, horizontal		
9					4										
10													J, sub-vertical		
11													J, sub-vertical		
12					5								J, sub-vertical, 60°		
13															
14															
15		100mm white silty sand seam at 15.35m			6										
16															
17		fractures have silty sand infill from 16.6m to 17.3m													
18		most fractures have trace silty sand infill from 17.38 to 20.38m			7										
19															

Unconfined Compressive Strength (Mpa): 50 100 150

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE SI-OLD-006

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Ore Loading Dock
STARTED : August 10, 2011
COMPLETED : August 11, 2011

INCLINATION: AZIMUTH:
DRILLER: BOART LONGYEAR, LM-55
N 7 798 409 E 592 876

Project No. 19-1605-126
SHEET 2 OF 2
DATUM CGVD28

FR-FRACTURE, CL-CLEAVAGE, SH-SHEAR, VN-VEIN
F-FAULT, J-JOINT, P-POLISHED, S-SLICKENSIDED
SM-SMOOTH, R-ROUGH, ST-STEPPED, PL-PLANAR
FO-FOLIATED, UE-UNEVEN, W-WAVY, C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH	COLOUR / % RETURN	RECOVERY TOTAL CORE % (80 60 40 20)	RECOVERY SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER .3 m (5 10 15 20)	DISCONTINUITY DATA: DIP wrt Core Axis (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa) (50 100 150)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE														
21																
22					8											
23																
24																
25					9											
26																
27																
28					10											
29																
30																
31					11											
32																
33																
34					12											
35																
36																
37					13											
38																
		END OF BOREHOLE AT 38.38m.		38.38												
39																

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Hill
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE SI-OLD-007

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Ore Loading Dock
STARTED : August 11, 2011
COMPLETED : August 11, 2011
INCLINATION: AZIMUTH:
DRILLER: BOART LONGYEAR, LM-55
N 7 798 424 E 592 840
Project No. 19-1605-126
SHEET 1 OF 2
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH	COLOUR / % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE		2.93												
1	NQ Diamond Drill	**GRANITIC GNEISS**, moderately weathered, closely spaced sub-horizontal foliation, strong, pinkish grey highly fractured at 0.45m to 0.64m			1									J, open, fresh (0.84 to 0.91m) J, closed, sub-vertical, white weathering (0.95 to 2.10m) J, closed, diagonal, fresh		
2																
3		highly fractured, some sand infill in open joints, sub-vertical joint running through 80% of run			2											
4																
5																
6														J, open, diagonal, black weathering J, open, diagonal, black weathering J, open, diagonal, black weathering		
7					3									J, closed, vertical, weathered (6.80 to 6.90m) J, closed, vertical, weathered (7.11 to 7.20m) J, open, vertical, weathering and infill (7.32 to 8.40m)		
8																
9		dark grey biotite schist zones, slightly weathered												J, closed, irregular, diagonal, weathered J, closed, irregular, diagonal, weathered		
10					4									J, closed, irregular, diagonal, weathered		
11		highly fractured biotite schist at 10.43m to 10.56m														
12		becoming slightly weathered, moderately spaced foliation												J, closed, diagonal, brown weathering		
13					5									J, open, irregular, vertical, brown weathering (12.98 to 13.23m)		
14														J, closed, diagonal J, closed, sub-vertical, black weathering (14.29 to 14.40m)		
15														J, closed, planar, vertical, brown weathering (14.62 to 14.87m)		
16					6											
17														J, closed, diagonal, weathered		
18		becoming very coarse grained												J, closed, diagonal, weathered (17.52 to 17.78) J, closed, diagonal, black weathering		
19		biotite seam with diagonal closed joint at 18.74 to 18.89m			7									J, closed, diagonal, black weathering J, closed, sub-vertical, black weathering (19.50 to 19.60m)		

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE SI-OLD-007

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Ore Loading Dock
STARTED : August 11, 2011
COMPLETED : August 11, 2011
INCLINATION: AZIMUTH:
DRILLER: BOART LONGYEAR, LM-55
N 7 798 424 E 592 840
Project No. 19-1605-126
SHEET 2 OF 2
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE													
21	NQ Diamond Drill	white crystaline infill from 21.3m to 21.5m			8								J, closed, diagonal, black weathering J, closed, vertical, black weathering (20.40 to 20.48m) J, closed, horizontal, black weathering J, open, 3mm, white crystalline infill, weathered (21.34 to 21.55m)		
22		heavily fractured vertical joint from 22.3m to 22.6m											J, heavily fractured, vertical, black weathering (22.33 to 22.63m)		
23		becoming faintly weathered													
24					9								J, closed, planar, sub-vertical, red weathering (24.18 to 24.29m)		
25													J, closed, irregular, horizontal, fresh J, closed, irregular, horizontal, fresh		
26													J, closed, planar, sub-vertical, grey weathering (25.90 to 26.02m)		
27													J, closed, planar, sub-vertical, black weathering (26.82 to 27.04m) J, closed, irregular, horizontal, brown weathering		
28					10										
29		biotite schist banding (<300mm)													
30															
31					11								J, closed, irregular, horizontal, weathered J, closed, irregular, horizontal, weathered J, closed, sub-vertical, black weathering (31.30 to 31.62m)		
32															
		END OF BOREHOLE AT 32.40m.		32.40											
33															
34															
35															
36															
37															
38															
39															

Unconfined Compressive Strength (Mpa): 50, 100, 150

FIELD/LABORATORY TESTING RESULTS
- ● Point Load Test Diametral
- ▲ Point Load Test Axial
- ⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE SI-OLD-008

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Ore Loading Dock
STARTED : August 12, 2011
COMPLETED : August 12, 2011

INCLINATION: AZIMUTH:
DRILLER: BOART LONGYEAR, LM-55
N 7 798 489 E 592 891

Project No. 19-1605-126
SHEET 1 OF 2
DATUM CGVD28

FR-FRACTURE F-FAULT SM-SMOOTH FO-FOLIATED
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / COLOUR / % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)
		GROUND SURFACE		5.80										
1	NQ Diamond Drill	**GRANITIC GNEISS**, moderately weathered, medium grained, closely spaced foliation, strong, pink with grey			1								J, closed, planar, sub-vertical, black weathering (0.00 to 0.34m)	
2		heavily weathered zones, frequent black biotite schist seams, frequent sub-vertical bands			2									
3														
4														
5		slightly weathered			3								J, closed, horizontal, black weathering	
6		dark grey biotite schist zones, highly fractured zones			4								J, closed, horizontal, black weathering J, heavily fractured, diagonal, weathered (5.80 to 6.15m)	
7													J, closed, diagonal, black weathering (6.52 to 6.71m) J, closed, sub-vertical, heavily weathered (6.77 to 6.86m)	
8													J, closed, horizontal, black weathering J, closed, horizontal, black weathering	
9														
10					5								J, closed, irregular, horizontal J, closed, planar, diagonal, black weathering (9.31 to 9.47m)	
11													J, open, 2mm, sub-vertical, dark brown weathering (10.75 to 11.11m)	
12														
13					6								J, closed, planar, horizontal, red weathering J, closed, planar, horizontal, red weathering J, closed, irregular, heavily fractured, vertical, brown weathering (12.93 to 13.16m)	
14													J, closed, planar, diagonal, brown weathering (13.59 to 13.71m)	
15		dark grey biotite schist banding broken schist seam, irregular and horizontal											J, closed, diagonal, black weathering (14.73 to 14.86m)	
16					7									
17		fractured zone												
18		some coarse grained zones												
19					8								J, open, 2mm, stepped, diagonal, brown weathering	
													J, closed, irregular, vertical, grey weathering (19.57 to 20.49m)	

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

RECORD OF BOREHOLE SI-OLD-008

PROJECT : Mary River Project
LOCATION : Steensby Inlet - Ore Loading Dock
STARTED : August 12, 2011
COMPLETED : August 12, 2011
INCLINATION: AZIMUTH:
DRILLER: BOART LONGYEAR, LM-55
N 7 798 489 E 592 891
Project No. 19-1605-126
SHEET 2 OF 2
DATUM CGVD28

FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN
F-FAULT J-JOINT P-POLISHED S-SLICKENSIDED
SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR
FO-FOLIATED UE-UNEVEN W-WAVY C-CURVED

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	SYMBOLIC LOG	ELEV. (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER .3 m	DISCONTINUITY DATA: DIP wrt Core Axis	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Unconfined Compressive Strength (Mpa)	FIELD/LABORATORY TESTING RESULTS
		GROUND SURFACE						80 60 40 20	80 60 40 20	80 60 40 20	5 10 15 20	0 30 60 90		50 100 150	
21	NQ Diamond Drill	medium grained with dark grey diagonal foliations			9								J, closed, diagonal, red weathering J, closed, sub-vertical, red weathering (21.41 to 21.52m)		
22													J, closed, diagonal, red weathering		
23													J, closed, diagonal, red weathering		
24		coarse grained, massive, occasional biotite schist banding			10										
25															
26															
27		very coarse grained			11								J, closed, irregular, diagonal, black weathering (27.45 to 27.60m)		
28		300mm biotite schist band at 27.75m											J, closed, irregular, diagonal, black weathering (28.12 to 28.36m) J, closed, irregular, vertical, black weathering (28.54 to 29.12m)		
29															
30		medium grained, with fine seams of dark grey biotite schist bands			12								J, closed, planar, sub-vertical, fresh (30.04 to 31.34m)		
31															
32													J, closed, planar, diagonal, fresh (31.97 to 32.04m) J, closed, diagonal, black weathering (32.15 to 32.35m)		
33		dark grey biotite schist from 32.61m to 32.24m fractured zone, weathered at 33.20 to 33.90m			13								J, closed, diagonal, black and red weathering (33.37 to 33.50m)		
34													J, closed, sub-vertical, black weathering (34.45 to 34.80m)		
35															
		END OF BOREHOLE AT 35.61m.		35.61											
36															
37															
38															
39															

FIELD/LABORATORY TESTING RESULTS
● Point Load Test Diametral
▲ Point Load Test Axial
⊠ Laboratory UCS Test

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : Dunstan
CHECKED : MB

THURBER

ROCKM(5126) 5126.GPJ 11/9/11

Appendix C: Point Load Test Data

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/28/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/30/2011
Core Size :	NQ **BH No :** Q7+500	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	10	26.0	D	0.5	47.5	138.3	5.2	Sandstone	Weak
2	13	35.1	D	0.5	47.5	110.5	5.2	Sandstone	Weak
3	13	37.5	D	3.5	47.5	114.8	36.4	Sandstone	Medium Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/25/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/30/2011
Core Size :	NQ **BH No :** Q10+250	**Tester :**	SH

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	4	8.0	D	21.5	47.5	88.8	223.5	Granitic Gneiss	Very Strong
2	4	8.1	A	24.5	47.5	48.8	206.9	Granitic Gneiss	Very Strong
3	4	9.7	D	0.5	47.5	85.0	5.2	Granitic Gneiss	Weak
4	5	12.5	D	-	47.5	102.8		Granitic Gneiss	
5	5	12.7	D	15.5	47.5	60.5	161.1	Granitic Gneiss	Very Strong
6	6	15.7	A	0.5	47.5	60.9	3.6	Granitic Gneiss	Very Weak
7	7	18.0	D	13.5	47.5	75.3	140.3	Granitic Gneiss	Very Strong
8	7	18.2	A	8.0	47.5	74.1	48.8	Granitic Gneiss	Medium Strong
9	8	20.4	D	11.5	47.5	63.7	119.5	Granitic Gneiss	Very Strong
10	8	22.3	A	16.0	47.5	68.5	103.8	Granitic Gneiss	Very Strong
11	9	23.5	D	6.5	47.5	78.1	67.6	Granitic Gneiss	Strong
12	9	23.5	A	12.0	47.5	54.0	93.6	Granitic Gneiss	Strong
13	10	26.5	A	16.5	47.5	73.9	101.0	Granitic Gneiss	Very Strong
14	10	26.6	D	16.5	47.5	51.2	171.5	Granitic Gneiss	Very Strong
15	10	27.0	A	11.5	47.5	53.1	90.9	Granitic Gneiss	Strong
16	10	28.1	D	18.0	47.5	85.3	187.1	Granitic Gneiss	Very Strong
17	11	30.5	A	-	47.5	62.0		Granitic Gneiss	
18	11	30.5	D	5.0	47.5	94.4	52.0	Granitic Gneiss	Strong
19	11	31.9	A	7.0	47.5	36.5	74.0	Granitic Gneiss	Strong
20	12	34.0	D	5.5	47.5	54.4	57.2	Granitic Gneiss	Strong
21	12	34.8	A	27.0	47.5	55.3	207.0	Granitic Gneiss	Very Strong
22	12	34.7	D	16.0	47.5	73.4	166.3	Granitic Gneiss	Very Strong
23	12	34.9	D	12.0	47.5	66.8	124.7	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/24/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/30/2011
Core Size :	NQ **BH No :** Q14+500	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	5	11.2	D	4.0	47.5	118.6	41.6	Granitic Gneiss	Medium Strong
2	6	14.8	D	23.0	47.5	88.7	239.1	Granitic Gneiss	Very Strong
3	7	17.8	D	1.0	47.5	113.7	10.4	Granitic Gneiss	Weak

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/23/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** Q18+100	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	3	7.8	D	0.5	47.5	129.8	5.2	Sandstone	Weak
2	5	11.4	D	0.5	47.5	116.1	5.2	Sandstone	Weak
3	6	14.1	D	0.5	47.5	133.0	5.2	Sandstone	Weak
4	6	14.5	D	0.5	47.5	126.8	5.2	Sandstone	Weak
5	6	15.0	D	0.5	47.5	171.0	5.2	Sandstone	Weak
6	6	16.0	D	3.5	47.5	141.6	36.4	Sandstone	Medium Strong
7	9	26.0	D	0.8	47.5	85.2	7.8	Sandstone	Weak
8	12	33.0	D	0.5	47.5	87.8	5.2	Sandstone	Weak
9	14	38.0	D	0.8	47.5	120.9	7.8	Sandstone	Weak

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/22/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** Q22+500	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	2	2.3	D	0.5	47.5	105.5	5.2	Granitic Gneiss	Weak
2	2	4.5	D	13.0	47.5	147.2	135.1	Granitic Gneiss	Very Strong
3	3	5.2	D	16.0	47.5	105.4	166.3	Granitic Gneiss	Very Strong
4	4	8.2	D	23.5	47.5	122.9	244.3	Granitic Gneiss	Very Strong
5	4	10.0	D	1.5	47.5	89.2	15.6	Granitic Gneiss	Weak
6	4	10.8	D	2.0	47.5	120.2	20.8	Granitic Gneiss	Weak
7	6	16.8	D	21.0	47.5	108.9	218.3	Granitic Gneiss	Very Strong
8	8	20.6	D	7.0	47.5	100.4	72.8	Granitic Gneiss	Strong
9	9	23.5	D	5.5	47.5	81.0	57.2	Granitic Gneiss	Strong
10	10	26.0	D	7.0	47.5	78.4	72.8	Granitic Gneiss	Strong
11	10	29.1	D	19.0	47.5	99.8	197.5	Granitic Gneiss	Very Strong
12	11	29.3	D	7.5	47.5	132.9	78.0	Granitic Gneiss	Strong
13	14	39.8	D	35.0	47.5	86.8	363.8	Granitic Gneiss	Extremely Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/22/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** Q25+500	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	3	5.4	D	30.0	47.5	74.2	311.8	Granitic Gneiss	Extremely Strong
2	5	11.6	D	26.0	47.5	88.3	270.3	Granitic Gneiss	Extremely Strong
3	6	14.3	D	17.5	47.5	86.8	181.9	Granitic Gneiss	Very Strong
4	11	32.1	D	18.0	47.5	108.6	187.1	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/17/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** Q35+500	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	2	2.6	D	14.5	47.5	190.0	150.7	Granitic Gneiss	Very Strong
2	3	7.5	D	13.5	47.5	101.2	140.3	Granitic Gneiss	Very Strong
3	5	11.5	D	13.0	47.5	131.7	135.1	Granitic Gneiss	Very Strong
4	5	14.4	D	18.5	47.5	125.9	192.3	Granitic Gneiss	Very Strong
5	7	18.2	D	16.0	47.5	190.0	166.3	Granitic Gneiss	Very Strong
6	8	21.5	D	25.0	47.5	76.0	259.9	Granitic Gneiss	Extremely Strong
7	9	25.5	D	14.0	47.5	155.0	145.5	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/16/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** Q38+700	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	11	32.3	D	25.0	47.5	126.5	259.9	Granitic Gneiss	Extremely Strong
2	12	33.0	D	22.5	47.5	135.3	233.9	Granitic Gneiss	Very Strong
3	14	38.5	D	16.5	47.5	161.0	171.5	Granitic Gneiss	Very Strong
4	14	41.5	D	21.0	47.5	77.2	218.3	Granitic Gneiss	Very Strong
5	16	47.1	D	14.5	47.5	99.7	150.7	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/16/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** Q42+000	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	3	7.8	D	20.5	47.7	113.9	211.7	Granitic Gneiss	Very Strong
2	3	8.2	D	11.5	47.5	89.8	119.5	Granitic Gneiss	Very Strong
3	6	14.5	D	15.8	47.5	164.0	163.7	Granitic Gneiss	Very Strong
4	7	19.5	D	0.5	47.5	107.0	5.2	Granitic Gneiss	Weak
5	8	20.5	D	22.5	47.5	97.5	233.9	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/15/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/27/2011
Core Size :	NQ **BH No :** Q44+000	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	7	17.4	D	5.5	47.5	106.6	57.2	Granitic Gneiss	Strong
2	7	18.6	D	30.0	47.5	84.9	311.8	Granitic Gneiss	Extremely Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/15/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/28/2011
Core Size :	NQ **BH No :** Q44+300	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	2	2.5	D	17.0	47.5	94.8	176.7	Granitic Gneiss	Very Strong
2	2	5.3	D	1.0	47.5	75.5	10.4	Granitic Gneiss	Weak
3	3	8.2	D	19.5	47.5	93.9	202.7	Granitic Gneiss	Very Strong
4	4	9.3	D	20.0	47.5	77.7	207.9	Granitic Gneiss	Very Strong
5	4	11.2	D	27.0	47.5	118.5	280.6	Granitic Gneiss	Extremely Strong
6	5	14.3	D	26.0	47.5	101.7	270.3	Granitic Gneiss	Extremely Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/14/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** Q45+000	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	2	2.5	D	21.5	47.5	105.5	223.5	Granitic Gneiss	Very Strong
2	2	4.9	D	2.0	47.5	147.2	20.8	Granitic Gneiss	Weak
3	3	5.1	D	29.0	47.5	105.4	301.4	Granitic Gneiss	Extremely Strong
4	4	9.5	D	0.5	47.5	122.9	5.2	Granitic Gneiss	Weak
5	5	11.8	D	13.0	47.5	89.2	135.1	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/14/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** Q50+000	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	2	1.9	D	1.0	47.5	101.8	10.4	Granitic Gneiss	Weak
2	3	4.9	D	18.0	47.5	133.6	187.1	Granitic Gneiss	Very Strong
3	4	8.6	D	15.5	47.5	47.1	161.1	Granitic Gneiss	Very Strong
4	5	13.7	D	1.5	47.5	137.4	15.6	Granitic Gneiss	Weak
5	6	14.7	D	14.0	47.5	114.4	145.5	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/13/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/28/2011
Core Size :	NQ **BH No :** Q53+700	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	4	10.6	D	1.3	47.5	63.2	13.0	Granitic Gneiss	Weak

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/22/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/13/2011
Core Size :	NQ **BH No :** Q82+700	**Tester :**	CC

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	6	9.8	D	23.5	47.5	107.8	244.3	Granitic Gneiss	Very Strong
2	6	9.8	A	30.0	47.5	39.4	299.1	Granitic Gneiss	Extremely Strong
3	7	11.1	D	26.0	47.5	61.3	270.3	Granitic Gneiss	Extremely Strong
4	7	11.1	A	22.8	47.5	33.7	256.2	Granitic Gneiss	Extremely Strong
5	7	12.1	D	12.0	47.5	85.2	124.7	Granitic Gneiss	Very Strong
6	7	12.1	D	15.8	47.5	85.2	163.7	Granitic Gneiss	Very Strong
7	7	12.1	A	22.5	47.5	39.3	224.8	Granitic Gneiss	Very Strong
8	9	14.8	D	24.0	47.5	85.7	249.5	Granitic Gneiss	Very Strong
9	9	14.8	A	28.0	47.5	41.8	266.3	Granitic Gneiss	Extremely Strong
10	10	15.9	D	27.0	47.5	102.5	280.6	Granitic Gneiss	Extremely Strong
11	10	15.9	A	22.5	47.5	46.1	198.4	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/18/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/27/2011
Core Size :	NQ **BH No :** Q88+800	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	1	1.4	D	11.5	47.5	182.0	119.5	Granitic Gneiss	Very Strong
2	3	3.4	D	18.0	47.5	152.2	187.1	Granitic Gneiss	Very Strong
3	6	5.0	D	20.8	47.5	102.1	215.7	Granitic Gneiss	Very Strong
4	13	9.6	D	17.5	47.5	122.5	181.9	Granitic Gneiss	Very Strong
5	15	12.5	D	2.0	47.5	151.6	20.8	Granitic Gneiss	Weak

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/25/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/12/2011
Core Size :	NQ **BH No :** Q114+600	**Tester :**	BT

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	2	2.5	D	21.0	47.5	89.3	218.3	Granitic Gneiss	Very Strong
2	2	2.5	A	31.0	47.5	47.8	266.0	Granitic Gneiss	Extremely Strong
3	2	3.8	D	13.3	47.5	101.6	137.7	Granitic Gneiss	Very Strong
4	2	3.8	A	26.5	47.5	50.7	217.1	Granitic Gneiss	Very Strong
5	2	5.0	D	18.5	47.5	100.0	192.3	Granitic Gneiss	Very Strong
6	2	5.0	A	26.5	47.5	51.3	215.3	Granitic Gneiss	Very Strong
7	3	5.8	D	19.8	47.5	78.8	205.3	Granitic Gneiss	Very Strong
8	3	5.8	A	24.5	47.5	44.8	220.9	Granitic Gneiss	Very Strong
9	3	7.1	D	11.8	47.5	86.5	122.1	Granitic Gneiss	Very Strong
10	3	7.2	A	31.0	47.5	45.4	276.6	Granitic Gneiss	Extremely Strong
11	3	8.0	D	20.5	47.5	88.6	213.1	Granitic Gneiss	Very Strong
12	3	8.0	A	24.0	47.5	39.0	241.1	Granitic Gneiss	Very Strong
13	4	9.3	D	21.3	47.5	88.6	220.9	Granitic Gneiss	Very Strong
14	6	14.5	D	18.0	47.5	92.4	187.1	Granitic Gneiss	Very Strong
15	6	15.6	A	27.0	47.5	52.2	216.3	Granitic Gneiss	Very Strong
16	6	16.6	D	16.7	47.5	93.9	173.6	Granitic Gneiss	Very Strong
17	6	16.6	A	23.0	47.5	44.3	209.3	Granitic Gneiss	Very Strong
18	7	17.7	D	19.5	47.5	74.6	202.7	Granitic Gneiss	Very Strong
19	7	17.8	A	28.0	47.5	42.6	262.5	Granitic Gneiss	Extremely Strong
20	7	18.5	D	15.3	47.5	76.3	158.5	Granitic Gneiss	Very Strong
21	7	18.6	A	12.5	47.5	47.5	107.7	Granitic Gneiss	Very Strong
22	7	19.6	A	34.0	47.5	58.8	248.3	Granitic Gneiss	Very Strong
23	7	19.7	D	19.8	47.5	84.5	205.3	Granitic Gneiss	Very Strong
24	8	20.7	A	19.3	47.5	79.7	111.1	Granitic Gneiss	Very Strong
25	8	20.7	D	24.3	47.5	42.0	252.1	Granitic Gneiss	Extremely Strong
26	8	21.6	A	24.5	47.5	49.0	206.3	Granitic Gneiss	Very Strong
27	8	21.8	D	19.0	47.5	86.5	197.5	Granitic Gneiss	Very Strong
28	8	22.2	A	15.8	47.5	48.5	133.6	Granitic Gneiss	Very Strong
29	8	22.5	D	23.0	47.5	87.5	239.1	Granitic Gneiss	Very Strong
30	9	23.9	D	19.8	47.5	91.9	205.3	Granitic Gneiss	Very Strong
31	9	23.9	A	35.0	47.5	47.9	299.9	Granitic Gneiss	Extremely Strong
32	9	24.6	D	19.5	47.5	90.3	202.7	Granitic Gneiss	Very Strong
33	9	24.7	A	29.0	47.5	50.5	238.4	Granitic Gneiss	Very Strong
34	9	25.7	D	12.0	47.5	113.6	46.3	Granitic Gneiss	Medium Strong
35	9	25.8	A	14.8	47.5	49.9	122.5	Granitic Gneiss	Very Strong

36	10	26.8	D	13.3	47.5	87.6	137.7	Granitic Gneiss	Very Strong
37	10	26.9	A	24.3	47.5	44.7	219.0	Granitic Gneiss	Very Strong
38	10	27.0	D	13.0	47.5	75.4	135.1	Granitic Gneiss	Very Strong
39	10	27.0	A	27.0	47.5	50.2	223.0	Granitic Gneiss	Very Strong
40	10	28.1	D	16.3	47.5	81.0	168.9	Granitic Gneiss	Very Strong
41	10	28.1	A	20.0	47.5	50.8	163.6	Granitic Gneiss	Very Strong
42	10	28.9	D	12.8	47.5	87.8	132.5	Granitic Gneiss	Very Strong
43	10	28.9	A	24.3	47.5	49.4	202.8	Granitic Gneiss	Very Strong
44	11	29.9	D	22.5	47.5	82.7	233.9	Granitic Gneiss	Very Strong
45	11	29.9	A	19.5	47.5	45.0	175.3	Granitic Gneiss	Very Strong
46	11	31.2	D	18.0	47.5	85.3	187.1	Granitic Gneiss	Very Strong
47	11	31.3	A	24.3	47.5	44.5	219.9	Granitic Gneiss	Very Strong
48	11	32.2	D	20.0	47.5	85.9	207.9	Granitic Gneiss	Very Strong
49	11	32.3	A	24.3	47.5	50.6	199.2	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/26/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/13/2011
Core Size :	NQ **BH No :** Q116+800	**Tester :**	BT

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	1	2.8	A	21.3	47.5	45.0	191.1	Granitic Gneiss	Very Strong
2	2	3.2	D	14.8	47.5	83.8	153.3	Granitic Gneiss	Very Strong
3	2	4.5	D	14.5	47.5	98.3	150.7	Granitic Gneiss	Very Strong
4	2	4.6	A	22.5	47.5	39.2	225.1	Granitic Gneiss	Very Strong
5	3	5.6	D	13.8	47.5	84.8	142.9	Granitic Gneiss	Very Strong
6	3	5.7	A	20.8	47.5	50.3	171.0	Granitic Gneiss	Very Strong
7	3	6.7	D	10.5	47.5	96.1	109.1	Granitic Gneiss	Very Strong
8	3	6.7	A	25.0	47.5	52.8	198.6	Granitic Gneiss	Very Strong
9	3	7.8	D	17.3	47.5	95.5	179.3	Granitic Gneiss	Very Strong
10	3	7.8	A	32.0	47.5	52.3	256.1	Granitic Gneiss	Extremely Strong
11	4	8.5	A	11.0	47.5	43.4	101.6	Granitic Gneiss	Very Strong
12	4	8.9	D	23.5	47.5	90.3	244.3	Granitic Gneiss	Very Strong
13	4	9.6	D	13.5	47.5	87.0	140.3	Granitic Gneiss	Very Strong
14	4	10.0	A	13.3	47.5	42.2	125.1	Granitic Gneiss	Very Strong
15	4	10.6	D	15.3	47.5	76.9	158.5	Granitic Gneiss	Very Strong
16	5	11.4	D	18.8	47.5	86.7	194.9	Granitic Gneiss	Very Strong
17	5	11.4	A	22.0	47.5	47.5	189.8	Granitic Gneiss	Very Strong
18	5	12.7	D	16.3	47.5	91.6	168.9	Granitic Gneiss	Very Strong
19	5	12.7	A	26.5	47.5	46.4	232.6	Granitic Gneiss	Very Strong
20	8	18.0	D	18.5	47.5	89.7	192.3	Granitic Gneiss	Very Strong
21	8	18.1	A	15.3	47.5	48.8	128.7	Granitic Gneiss	Very Strong
22	8	19.1	A	30.0	47.5	91.1	156.1	Granitic Gneiss	Very Strong
23	8	19.2	D	20.5	47.5	50.2	213.1	Granitic Gneiss	Very Strong
24	9	20.4	D	18.5	47.5	79.4	192.3	Granitic Gneiss	Very Strong
25	9	20.4	A	19.8	47.5	47.7	169.6	Granitic Gneiss	Very Strong
26	9	21.6	D	18.5	47.5	95.6	192.3	Granitic Gneiss	Very Strong
27	9	21.7	A	26.0	47.5	47.8	223.2	Granitic Gneiss	Very Strong
28	9	22.4	D	17.8	47.5	79.2	184.5	Granitic Gneiss	Very Strong
29	10	23.6	D	16.8	47.5	85.8	174.1	Granitic Gneiss	Very Strong
30	10	23.6	A	15.5	47.5	49.1	130.1	Granitic Gneiss	Very Strong
31	10	24.7	D	20.3	47.5	70.5	210.5	Granitic Gneiss	Very Strong
32	10	24.7	A	23.3	47.5	51.1	189.3	Granitic Gneiss	Very Strong
33	11	26.4	D	18.5	47.5	99.2	46.3	Granitic Gneiss	Medium Strong
34	11	26.4	A	21.8	47.5	49.8	180.8	Granitic Gneiss	Very Strong
35	11	27.3	D	16.8	47.5	94.0	174.1	Granitic Gneiss	Very Strong

36	11	27.4	A	18.3	47.5	50.6	149.8	Granitic Gneiss	Very Strong
37	11	28.6	D	16.8	47.5	92.2	174.1	Granitic Gneiss	Very Strong
38	11	28.8	A	21.8	47.5	48.2	185.4	Granitic Gneiss	Very Strong
39	12	29.8	D	21.0	47.5	111.2	218.3	Granitic Gneiss	Very Strong
40	12	29.8	A	19.8	47.5	49.1	165.9	Granitic Gneiss	Very Strong
41	12	30.9	D	18.5	47.5	95.6	192.3	Granitic Gneiss	Very Strong
42	12	30.9	A	23.3	47.5	47.6	200.1	Granitic Gneiss	Very Strong
43	12	32.1	D	19.5	47.5	96.0	202.7	Granitic Gneiss	Very Strong
44	12	32.1	A	22.8	47.5	46.3	199.9	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	8/5/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/12/2011
Core Size :	NQ **BH No :** Q131+100	**Tester :**	CC

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	4	8.6	D	21.3	47.5	104.3	220.9	Granitic Gneiss	Very Strong
2	4	8.7	A	25.7	47.5	39.0	257.9	Granitic Gneiss	Extremely Strong
3	4	9.8	D	24.0	47.5	102.3	249.5	Granitic Gneiss	Very Strong
4	4	9.8	A	28.0	47.5	44.2	255.3	Granitic Gneiss	Extremely Strong
5	4	10.7	D	22.8	47.5	77.0	236.5	Granitic Gneiss	Very Strong
6	4	10.8	A	18.5	47.5	34.9	202.5	Granitic Gneiss	Very Strong
7	6	16.3	D	16.0	47.5	108.0	166.3	Granitic Gneiss	Very Strong
8	6	16.3	A	14.5	47.5	46.2	127.7	Granitic Gneiss	Very Strong
9	6	17.3	D	24.3	47.5	79.9	252.1	Granitic Gneiss	Extremely Strong
10	6	17.3	A	26.5	47.5	44.3	241.3	Granitic Gneiss	Very Strong
11	7	18.5	D	17.8	47.5	106.8	184.5	Granitic Gneiss	Very Strong
12	7	18.5	A	18.0	47.5	43.1	167.4	Granitic Gneiss	Very Strong
13	7	19.4	D	22.0	47.5	101.1	228.7	Granitic Gneiss	Very Strong
14	7	19.5	A	27.5	47.5	47.5	237.2	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/16/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/12/2011
Core Size :	NQ **BH No :** Q138+100	**Tester :**	CC

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	1	0.3	D	11.3	47.5	130.3	116.9	Granitic Gneiss	Very Strong
2	1	0.6	A	25.8	47.5	48.1	219.9	Granitic Gneiss	Very Strong
3	2	1.5	D	10.0	47.5	97.2	103.9	Granitic Gneiss	Very Strong
4	2	1.5	A	16.8	47.5	42.9	156.1	Granitic Gneiss	Very Strong
5	2	2.6	D	9.0	47.5	111.8	93.5	Granitic Gneiss	Strong
6	2	2.6	A	25.5	47.5	50.8	208.7	Granitic Gneiss	Very Strong
7	2	3.5	D	11.0	47.5	89.2	114.3	Granitic Gneiss	Very Strong
8	2	3.5	A	17.5	47.5	41.2	168.5	Granitic Gneiss	Very Strong
9	3	4.6	D	11.0	47.5	100.4	114.3	Granitic Gneiss	Very Strong
10	3	4.6	A	10.0	47.5	41.9	95.1	Granitic Gneiss	Strong
11	3	5.6	D	17.3	47.5	80.2	179.3	Granitic Gneiss	Very Strong
12	3	5.6	A	9.5	47.5	30.8	114.5	Granitic Gneiss	Very Strong
13	4	6.7	D	15.0	47.5	90.6	155.9	Granitic Gneiss	Very Strong
14	4	6.8	A	21.8	47.5	46.1	191.8	Granitic Gneiss	Very Strong
15	4	7.9	D	16.0	47.5	74.7	166.3	Granitic Gneiss	Very Strong
16	4	7.8	A	18.0	47.5	47.0	156.3	Granitic Gneiss	Very Strong
17	5	8.8	D	12.3	47.5	77.0	127.3	Granitic Gneiss	Very Strong
18	5	8.8	A	20.0	47.5	42.0	189.6	Granitic Gneiss	Very Strong
19	6	9.8	D	13.5	47.5	95.1	140.3	Granitic Gneiss	Very Strong
20	6	9.8	A	25.5	47.5	44.4	231.5	Granitic Gneiss	Very Strong
21	6	10.8	D	10.0	47.5	82.8	103.9	Granitic Gneiss	Very Strong
22	6	10.8	A	16.5	47.5	36.6	173.9	Granitic Gneiss	Very Strong
23	7	11.9	D	15.3	47.5	85.8	158.5	Granitic Gneiss	Very Strong
24	7	11.9	A	19.8	47.5	34.6	217.7	Granitic Gneiss	Very Strong
25	8	13.1	D	11.0	47.5	82.6	114.3	Granitic Gneiss	Very Strong
26	8	13.0	A	16.3	47.5	34.0	181.5	Granitic Gneiss	Very Strong
27	8	13.7	D	16.5	47.5	101.6	171.5	Granitic Gneiss	Very Strong
28	8	13.8	A	19.8	47.5	43.4	182.4	Granitic Gneiss	Very Strong
29	9	15.3	D	12.0	47.5	97.2	124.7	Granitic Gneiss	Very Strong
30	9	15.4	A	15.5	47.5	30.1	190.4	Granitic Gneiss	Very Strong
31	10	16.2	D	19.5	47.5	98.2	202.7	Granitic Gneiss	Very Strong
32	10	16.2	A	34.0	47.5	48.6	288.0	Granitic Gneiss	Extremely Strong
33	10	17.1	D	14.0	47.5	85.0	145.5	Granitic Gneiss	Very Strong
34	10	17.1	A	15.3	47.5	35.9	46.3	Granitic Gneiss	Medium Strong
35	14	22.4	D	10.0	47.5	94.8	103.9	Granitic Gneiss	Very Strong

36	14	22.5	A	15.0	47.5	51.4	121.7	Granitic Gneiss	Very Strong
37	15	23.6	D	11.0	47.5	90.4	114.3	Granitic Gneiss	Very Strong
38	15	23.6	A	22.5	47.5	42.8	210.2	Granitic Gneiss	Very Strong
39	15	24.7	D	9.5	47.5	105.0	98.7	Granitic Gneiss	Strong
40	15	24.8	A	14.5	47.5	42.9	135.3	Granitic Gneiss	Very Strong
41	16	25.9	D	14.0	47.5	84.6	145.5	Granitic Gneiss	Very Strong
42	16	25.9	A	22.5	47.5	38.9	226.5	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/19/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** Q139+600	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	4	4.6	D	1.5	47.5	105.5	15.6	Granitic Gneiss	Weak
2	6	9.0	D	7.0	47.5	147.2	72.8	Granitic Gneiss	Strong
3	7	10.7	D	9.5	47.5	105.4	98.7	Granitic Gneiss	Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	8/7/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/13/2011
Core Size :	NQ **BH No :** QMR2	**Tester :**	CC

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	1	1.3	A	20.3	47.5	112.0	89.8	Granitic Gneiss	Strong
2	1	1.3	D	22.8	47.5	48.7	236.5	Granitic Gneiss	Very Strong
3	3	7.2	A	-	47.5	94.1		Granitic Gneiss	
4	3	7.2	D	10.3	47.5	44.7	106.5	Granitic Gneiss	Very Strong
5	4	8.8	A	15.5	47.5	104.3	72.6	Granitic Gneiss	Strong
6	4	8.8	D	17.0	47.5	39.0	176.7	Granitic Gneiss	Very Strong
7	4	9.4	A	16.3	47.5	102.3	77.3	Granitic Gneiss	Strong
8	4	9.3	D	22.5	47.5	44.2	233.9	Granitic Gneiss	Very Strong
9	4	10.4	A	23.3	47.5	77.0	137.9	Granitic Gneiss	Very Strong
10	4	10.4	D	11.3	47.5	34.9	116.9	Granitic Gneiss	Very Strong
11	5	11.8	A	12.3	47.5	108.0	55.9	Granitic Gneiss	Strong
12	5	11.6	D	19.0	47.5	108.0	197.5	Granitic Gneiss	Very Strong
13	5	12.8	A	19.0	47.5	46.2	167.3	Granitic Gneiss	Very Strong
14	5	12.8	D	12.5	47.5	79.9	129.9	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	6/8/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/12/2011
Core Size :	NQ **BH No :** QS1	**Tester :**	BT

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	1	1.2	D	16.0	47.5	47.5	166.3	Granitic Gneiss	Very Strong
2	1	1.2	A	20.0	47.5	47.5	172.3	Granitic Gneiss	Very Strong
3	1	2.4	D	21.3	47.5	47.6	220.9	Granitic Gneiss	Very Strong
4	1	2.4	A	23.3	47.5	47.5	200.3	Granitic Gneiss	Very Strong
5	2	3.4	D	17.0	47.5	71.0	176.7	Granitic Gneiss	Very Strong
6	2	3.4	A	24.5	47.5	46.0	216.4	Granitic Gneiss	Very Strong
7	2	4.3	D	19.5	47.5	79.4	202.7	Granitic Gneiss	Very Strong
8	2	4.3	A	25.3	47.5	45.8	224.1	Granitic Gneiss	Very Strong
9	2	4.7	D	21.3	47.5	88.4	220.9	Granitic Gneiss	Very Strong
10	2	4.9	A	30.0	47.5	55.9	227.9	Granitic Gneiss	Very Strong
11	3	6.1	D	15.3	47.5	85.2	158.5	Granitic Gneiss	Very Strong
12	3	6.2	A	22.0	47.5	44.5	199.4	Granitic Gneiss	Very Strong
13	3	7.2	D	16.8	47.5	80.9	174.1	Granitic Gneiss	Very Strong
14	3	7.2	A	27.0	47.5	51.0	220.4	Granitic Gneiss	Very Strong
15	3	8.4	D	19.8	47.5	92.7	205.3	Granitic Gneiss	Very Strong
16	4	10.6	D	19.3	47.5	76.0	200.1	Granitic Gneiss	Very Strong
17	4	10.7	A	19.0	47.5	53.8	148.7	Granitic Gneiss	Very Strong
18	4	11.4	D	20.3	47.5	85.4	210.5	Granitic Gneiss	Very Strong
19	6	16.0	D	20.3	47.5	72.9	210.5	Granitic Gneiss	Very Strong
20	6	16.0	A	25.3	47.5	48.4	214.5	Granitic Gneiss	Very Strong
21	6	17.3	D	17.5	47.5	85.2	181.9	Granitic Gneiss	Very Strong
22	6	17.4	A	13.3	47.5	49.5	110.6	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/24/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/26/2011
Core Size :	NQ **BH No :** QS2	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	1	2.0	D	24.0	47.5	88.3	249.5	Granitic Gneiss	Very Strong
2	1	2.0	A	2.0	47.5	42.9	18.7	Granitic Gneiss	Weak
3	3	5.0	D	24.5	47.5	84.9	254.7	Granitic Gneiss	Extremely Strong
4	3	5.0	A	22.0	47.5	39.1	220.5	Granitic Gneiss	Very Strong
5	4	11.2	D	22.0	47.5	110.0	228.7	Granitic Gneiss	Very Strong
6	5	12.2	D	24.0	47.5	101.1	249.5	Granitic Gneiss	Very Strong
7	9	17.5	D	21.2	47.5	73.8	220.4	Granitic Gneiss	Very Strong
8	13	22.9	D	25.0	47.5	94.0	259.9	Granitic Gneiss	Extremely Strong
9	14	26.3	D	19.7	47.5	142.8	205.2	Granitic Gneiss	Very Strong
10	15	29.5	D	16.8	47.5	145.0	174.6	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/11/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/13/2011
Core Size :	NQ **BH No :** QS3A	**Tester :**	CC

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	2	1.2	D	20.0	47.5	112.0	207.9	Granitic Gneiss	Very Strong
2	2	1.2	A	21.3	47.5	48.7	179.7	Granitic Gneiss	Very Strong
3	3	1.9	A	7.5	47.5	94.1	38.1	Granitic Gneiss	Medium Strong
4	3	3.8	D	23.0	47.5	44.7	239.1	Granitic Gneiss	Very Strong
5	3	4.7	D	19.0	47.5	104.3	197.5	Granitic Gneiss	Very Strong
6	8	11.0	D	23.5	47.5	39.0	244.3	Granitic Gneiss	Very Strong
7	8	11.1	A	25.0	47.5	102.3	118.9	Granitic Gneiss	Very Strong
8	8	12.2	D	20.3	47.5	44.2	210.5	Granitic Gneiss	Very Strong
9	9	12.5	A	18.0	47.5	77.0	106.8	Granitic Gneiss	Very Strong
10	10	13.5	D	19.5	47.5	34.9	202.7	Granitic Gneiss	Very Strong
11	10	13.5	A	25.5	47.5	108.0	116.3	Granitic Gneiss	Very Strong
12	10	14.5	D	11.0	47.5	46.2	114.3	Granitic Gneiss	Very Strong
13	10	14.5	A	21.5	47.5	79.9	123.9	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	8/4/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/12/2011
Core Size :	NQ **BH No :** QTR4-1	**Tester :**	BT

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	1	2.4	D	10.0	47.5	106.1	103.9	Granitic Gneiss	Very Strong
2	1	2.4	A	15.8	47.5	43.9	144.2	Granitic Gneiss	Very Strong
3	1	3.1	D	18.8	47.5	84.3	194.9	Granitic Gneiss	Very Strong
4	1	3.1	A	18.8	47.5	42.6	175.8	Granitic Gneiss	Very Strong
5	1	3.5	D	17.8	47.5	99.7	184.5	Granitic Gneiss	Very Strong
6	1	3.5	A	17.3	47.5	44.5	156.4	Granitic Gneiss	Very Strong
7	2	3.9	A	15.0	47.5	36.2	159.6	Granitic Gneiss	Very Strong
8	2	3.9	D	12.5	47.5	107.6	129.9	Granitic Gneiss	Very Strong
9	2	4.9	A	24.5	47.5	47.7	210.6	Granitic Gneiss	Very Strong
10	2	4.9	D	18.3	47.5	93.3	189.7	Granitic Gneiss	Very Strong
11	3	6.3	D	16.0	47.5	126.4	166.3	Granitic Gneiss	Very Strong
12	3	6.4	A	29.0	47.5	51.8	233.7	Granitic Gneiss	Very Strong
13	3	7.2	A	30.0	47.5	45.2	268.7	Granitic Gneiss	Extremely Strong
14	3	7.3	D	13.3	47.5	121.1	137.7	Granitic Gneiss	Very Strong
15	4	8.6	A	19.5	47.5	52.9	154.7	Granitic Gneiss	Very Strong
16	4	8.7	D	24.8	47.5	102.0	257.3	Granitic Gneiss	Extremely Strong
17	4	9.3	D	30.0	47.5	110.5	311.8	Granitic Gneiss	Extremely Strong
18	4	9.4	A	29.8	47.5	47.0	258.5	Granitic Gneiss	Extremely Strong
19	4	10.3	D	12.0	47.5	92.4	124.7	Granitic Gneiss	Very Strong
20	4	10.7	A	23.0	47.5	53.9	179.7	Granitic Gneiss	Very Strong
21	4	11.3	D	17.3	47.5	99.7	179.3	Granitic Gneiss	Very Strong
22	4	11.4	A	21.0	47.5	52.9	166.5	Granitic Gneiss	Very Strong
23	5	12.2	D	12.8	47.5	101.7	132.5	Granitic Gneiss	Very Strong
24	5	12.2	A	17.0	47.5	55.1	130.6	Granitic Gneiss	Very Strong
25	5	13.4	A	27.5	47.5	50.2	227.0	Granitic Gneiss	Very Strong
26	5	13.4	D	20.0	47.5	89.9	207.9	Granitic Gneiss	Very Strong
27	5	14.1	A	14.0	47.5	38.1	143.2	Granitic Gneiss	Very Strong
28	5	14.1	D	9.8	47.5	87.3	101.3	Granitic Gneiss	Very Strong
29	6	14.5	D	11.0	47.5	106.3	114.3	Granitic Gneiss	Very Strong
30	7	17.8	D	16.3	47.5	89.6	168.9	Granitic Gneiss	Very Strong
31	7	20.4	D	14.0	47.5	87.0	145.5	Granitic Gneiss	Very Strong
32	7	20.4	A	24.8	47.5	44.6	224.1	Granitic Gneiss	Very Strong
33	9	25.8	A	16.8	47.5	41.7	159.6	Granitic Gneiss	Very Strong
34	9	25.8	D	18.8	47.5	102.5	46.3	Granitic Gneiss	Medium Strong
35	10	27.0	D	13.5	47.5	67.1	140.3	Granitic Gneiss	Very Strong

36	10	27.1	A	6.3	47.5	48.1	53.4	Granitic Gneiss	Strong
37	10	27.9	D	17.5	47.5	75.7	181.9	Granitic Gneiss	Very Strong
38	10	27.9	A	19.3	47.5	43.5	177.6	Granitic Gneiss	Very Strong
39	10	28.9	D	31.5	47.5	48.2	327.4	Granitic Gneiss	Extremely Strong
40	10	29.1	A	18.8	47.5	91.9	96.9	Granitic Gneiss	Strong
41	11	29.6	A	27.0	47.5	49.3	52.6	Granitic Gneiss	Strong
42	11	29.9	D	21.3	47.5	87.3	100.1	Granitic Gneiss	Very Strong
43	11	31.2	D	17.8	47.5	74.2	86.8	Granitic Gneiss	Strong
44	11	31.2	A	22.5	47.5	49.6	48.7	Granitic Gneiss	Medium Strong
45	11	32.3	A	23.5	47.5	49.6	99.0	Granitic Gneiss	Strong
46	11	32.3	D	17.3	47.5	91.3	46.3	Granitic Gneiss	Medium Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/25/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** QTR-9	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	1	0.7	D	18.5	47.5	87.3	192.3	Granitic Gneiss	Very Strong
2	1	1.6	D	28.0	47.5	66.3	291.0	Granitic Gneiss	Extremely Strong
3	1	5.5	D	23.0	47.5	86.6	239.1	Granitic Gneiss	Very Strong
4	5	12.9	D	17.5	47.5	94.7	181.9	Granitic Gneiss	Very Strong
5	5	15.7	D	15.5	47.5	86.9	161.1	Granitic Gneiss	Very Strong
6	8	20.3	D	20.5	47.5	132.5	213.1	Granitic Gneiss	Very Strong
7	8	23.5	D	16.5	47.5	106.8	171.5	Granitic Gneiss	Very Strong
8	11	30.7	D	8.0	47.5	79.5	83.2	Granitic Gneiss	Strong
9	11	30.8	D	23.5	47.5	103.0	244.3	Granitic Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/15/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	7/25/2011
Core Size :	NQ **BH No :** QTR-12	**Tester :**	BT

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	2	3.0	D	5.0	47.5	76.8	52.0	Granitic Gneiss	Strong
2	2	3.2	A	15.8	47.5	53.2	124.3	Granitic Gneiss	Very Strong
3	2	4.3	A	26.0	47.5	53.8	203.5	Granitic Gneiss	Very Strong
4	3	5.4	A	16.0	47.5	47.4	138.1	Granitic Gneiss	Very Strong
5	3	5.4	D	8.0	47.5	88.6	83.2	Granitic Gneiss	Strong
6	3	6.3	A	10.5	47.5	44.9	94.5	Granitic Gneiss	Strong
7	3	6.3	D	8.0	47.5	87.3	83.2	Granitic Gneiss	Strong
8	3	7.4	D	2.5	47.5	80.9	26.0	Granitic Gneiss	Medium Strong
9	3	7.5	A	14.3	47.5	47.1	123.6	Granitic Gneiss	Very Strong
10	4	8.5	D	0.5	47.5	66.1	5.2	Granitic Gneiss	Weak
11	4	8.5	A	3.0	47.5	43.4	27.8	Granitic Gneiss	Medium Strong
12	4	9.0	A	18.0	47.5	42.9	167.9	Granitic Gneiss	Very Strong
13	4	9.3	D	0.5	47.5	80.9	5.2	Granitic Gneiss	Weak
14	4	9.4	D	17.5	47.5	80.0	181.9	Granitic Gneiss	Very Strong
15	4	10.3	D	9.5	47.5	73.4	98.7	Granitic Gneiss	Strong
16	4	10.3	A	0.5	47.5	40.7	4.9	Granitic Gneiss	Very Weak
17	5	11.4	A	4.5	47.5	45.3	40.2	Granitic Gneiss	Medium Strong
18	5	11.4	D	0.5	47.5	91.1	5.2	Granitic Gneiss	Weak
19	5	12.5	A	9.5	47.5	43.5	87.7	Granitic Gneiss	Strong
20	5	12.5	D	11.5	47.5	85.9	119.5	Granitic Gneiss	Very Strong
21	5	13.7	A	9.5	47.5	48.8	80.2	Granitic Gneiss	Strong
22	5	13.7	D	3.0	47.5	87.5	31.2	Granitic Gneiss	Medium Strong
23	6	14.8	A	15.5	47.5	40.5	151.3	Granitic Gneiss	Very Strong
24	6	15.1	D	16.0	47.5	76.5	166.3	Granitic Gneiss	Very Strong
25	6	16.6	D	0.5	47.5	72.9	5.2	Granitic Gneiss	Weak
26	6	16.7	A	12.5	47.5	53.4	98.4	Granitic Gneiss	Strong
27	7	18.2	A	16.3	47.5	44.4	52.6	Granitic Gneiss	Strong
28	7	18.2	D	7.5	47.5	73.8	100.1	Granitic Gneiss	Very Strong
29	7	19.1	D	1.0	47.5	46.1	86.8	Granitic Gneiss	Strong
30	7	19.2	A	12.8	47.5	104.3	48.7	Granitic Gneiss	Medium Strong
31	7	20.3	A	20.0	47.5	53.1	99.0	Granitic Gneiss	Strong
32	7	20.3	D	25.5	47.5	85.0	46.3	Granitic Gneiss	Medium Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/14/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/29/2011
Core Size :	NQ **BH No :** QTR-13	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	4	11.4	D	24.0	47.5	123.4	249.5	Granitic Gneiss	Very Strong
2	5	13.2	D	24.5	47.5	102.2	254.7	Granitic Gneiss	Extremely Strong
3	6	14.8	D	32.0	47.5	72.9	332.6	Granitic Gneiss	Extremely Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	8/2/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/18/2011
Core Size :	NQ **BH No :** NTUN-DH03	**Tester :**	Sharif

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
19	17	43.7	A	20.0	47.7	52.6	158.7	Gneiss	Very Strong
20	17	43.7	D	16.0	47.6	53.9	165.6	Gneiss	Very Strong
21	17	43.9	A	16.5	47.5	56.6	124.2	Gneiss	Very Strong
22	17	43.9	D	14.0	47.6	54.7	145.1	Gneiss	Very Strong
23	17	44.8	A	12.5	47.7	53.8	97.6	Gneiss	Strong
24	17	44.8	D	16.0	47.6	63.4	166.0	Gneiss	Very Strong
25	17	45.1	A	13.0	47.5	58.3	95.6	Gneiss	Strong
26	17	45.5	D	17.5	47.6	69.6	181.6	Gneiss	Very Strong
27	17	45.9	A	15.5	47.6	40.8	150.2	Gneiss	Very Strong
28	17	45.9	D	14.5	47.6	69.0	150.1	Gneiss	Very Strong
29	17	46.5	A	17.5	47.5	46.3	153.9	Gneiss	Very Strong
30	17	46.5	D	18.5	47.8	67.8	190.3	Gneiss	Very Strong
3	18	46.9	A	22.0	47.9	46.7	190.9	Gneiss	Very Strong
4	18	47.0	D	16.0	47.5	60.0	166.4	Gneiss	Very Strong
5	18	47.5	A	11.0	47.5	44.8	99.2	Gneiss	Strong
6	18	47.5	D	16.5	48.6	49.2	165.4	Gneiss	Very Strong
7	18	47.9	A	26.0	48.0	54.4	200.2	Gneiss	Very Strong
8	18	47.9	D	23.5	47.8	72.4	241.7	Gneiss	Very Strong
9	18	48.5	A	15.5	48.5	46.6	133.4	Gneiss	Very Strong
10	18	48.9	D	13.5	47.7	63.4	139.5	Gneiss	Very Strong
11	18	49.4	A	16.5	48.3	48.0	139.3	Gneiss	Very Strong
12	18	49.4	D	20.5	47.5	64.8	213.3	Gneiss	Very Strong
13	19	49.6	A	12.5	48.1	47.4	107.0	Gneiss	Very Strong
14	19	49.7	D	21.5	47.4	61.8	223.9	Gneiss	Very Strong
15	19	50.5	A	14.0	48.2	40.7	134.6	Gneiss	Very Strong
16	19	50.5	D	18.0	47.4	45.4	187.6	Gneiss	Very Strong
17	19	50.8	A	20.0	47.6	40.4	195.4	Gneiss	Very Strong
18	19	50.8	D	18.0	48.1	52.1	183.3	Gneiss	Very Strong
1	20	54.2	A	21.5	47.8	47.2	185.4	Gneiss	Very Strong
2	20	54.2	D	21.0	48.0	48.8	214.6	Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	8/2/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/18/2011
Core Size :	NQ **BH No :** NTUN-DH03	**Tester :**	Sharif

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
15	19	50.5	A	18.0	47.9	40.0	176.0	Gneiss	Very Strong
16	19	50.5	D	20.0	47.8	48.0	205.8	Gneiss	Very Strong
17	19	51.1	A	20.5	47.7	52.8	162.3	Gneiss	Very Strong
18	19	51.1	D	20.5	47.5	54.8	212.8	Gneiss	Very Strong
19	19	51.6	A	21.0	47.4	43.8	193.2	Gneiss	Very Strong
20	19	51.6	D	18.5	47.6	57.3	191.7	Gneiss	Very Strong
21	19	52.4	A	14.0	48.1	37.8	142.5	Gneiss	Very Strong
22	19	52.4	D	11.5	47.4	51.7	119.8	Gneiss	Very Strong
24	19	52.5	A	18.0	47.7	67.4	117.9	Gneiss	Very Strong
23	19	52.6	D	16.5	48.4	70.9	166.6	Gneiss	Very Strong
25	20	52.9	A	23.5	47.8	47.3	202.2	Gneiss	Very Strong
26	20	53.0	D	17.0	48.1	56.3	173.5	Gneiss	Very Strong
27	20	53.4	A	17.0	47.7	50.4	139.5	Gneiss	Very Strong
28	20	53.4	D	21.0	47.8	67.5	216.0	Gneiss	Very Strong
29	20	53.8	A	17.0	48.2	52.7	133.8	Gneiss	Very Strong
30	20	53.8	D	22.5	47.9	73.2	231.2	Gneiss	Very Strong
2	21	54.5	D	21.5	47.5	64.3	223.4	Gneiss	Very Strong
1	21	55.0	A	17.0	47.5	61.7	119.6	Gneiss	Very Strong
3	21	55.5	A	21.5	47.5	44.3	195.8	Gneiss	Very Strong
4	21	55.6	D	21.0	47.5	54.3	218.1	Gneiss	Very Strong
5	22	55.8	A	26.0	47.5	49.0	219.0	Gneiss	Very Strong
6	22	55.9	D	21.5	48.3	56.6	217.8	Gneiss	Very Strong
7	22	56.3	D	20.5	47.5	73.3	212.8	Gneiss	Very Strong
8	22	56.3	A	22.5	47.5	41.6	215.0	Gneiss	Very Strong
9	22	57.0	A	13.5	47.5	40.0	132.8	Gneiss	Very Strong
10	22	57.1	D	17.0	48.0	62.5	173.8	Gneiss	Very Strong
11	22	58.0	A	20.5	47.6	65.2	137.9	Gneiss	Very Strong
12	22	58.0	D	17.5	47.4	64.6	182.3	Gneiss	Very Strong
13	22	58.5	A	25.0	47.5	51.3	202.9	Gneiss	Very Strong
14	22	58.6	D	23.0	47.5	53.7	239.1	Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	8/2/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/17/2011
Core Size :	NQ **BH No :** NTUN-DH03	**Tester :**	BT/CC

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
27	22	59.5	D	16.8	47.4	108.5	174.5	Gneiss	Very Strong
28	22	59.5	A	15.0	47.4	45.0	135.2	Gneiss	Very Strong
25	22	60.5	D	21.3	47.4	99.2	221.7	Gneiss	Very Strong
26	22	60.5	A	25.3	47.4	45.6	225.0	Gneiss	Very Strong
23	23	61.6	D	19.3	47.5	104.6	200.4	Gneiss	Very Strong
24	23	61.6	A	12.3	47.4	49.7	102.0	Gneiss	Very Strong
22	23	62.6	D	1.5	47.4	105.8	15.6	Gneiss	Weak
20	23	63.6	D	1.5	47.5	95.2	15.6	Gneiss	Weak
21	23	63.7	D	19.0	47.4	105.6	198.0	Gneiss	Very Strong
18	23	64.5	D	25.8	47.4	111.8	268.3	Gneiss	Extremely Strong
19	24	64.7	A	15.8	47.4	34.5	174.3	Gneiss	Very Strong
16	24	65.6	D	16.0	47.5	110.7	166.5	Gneiss	Very Strong
17	24	65.6	A	18.8	47.4	57.0	140.4	Gneiss	Very Strong
14	24	66.6	D	21.0	47.4	100.2	218.9	Gneiss	Very Strong
15	24	66.7	A	25.8	47.5	50.4	212.2	Gneiss	Very Strong
12	25	67.6	D	17.3	47.5	77.9	179.5	Gneiss	Very Strong
13	25	67.6	A	20.0	47.5	38.4	203.5	Gneiss	Very Strong
10	25	68.7	D	17.0	47.4	91.2	177.3	Gneiss	Very Strong
11	25	68.7	A	14.0	47.4	37.0	146.8	Gneiss	Very Strong
9	25	69.7	A	8.0	47.5	40.9	77.5	Gneiss	Strong
8	25	69.7	D	10.0	47.4	122.4	104.2	Gneiss	Very Strong
7	26	70.6	D	17.3	47.4	100.8	179.9	Gneiss	Very Strong
6	26	72.0	A	22.8	47.4	50.8	186.4	Gneiss	Very Strong
5	26	72.1	D	18.3	47.4	92.7	190.1	Gneiss	Very Strong
4	26	73.4	A	13.8	47.4	42.5	129.3	Gneiss	Very Strong
3	26	73.6	D	17.8	47.4	92.5	185.0	Gneiss	Very Strong
2	27	74.8	A	24.8	47.4	47.2	214.7	Gneiss	Very Strong
1	27	74.8	D	21.5	47.4	98.3	223.9	Gneiss	Very Strong
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* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	8/2/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/14/2011
Core Size :	NQ **BH No :** NTUN-DH03	**Tester :**	CC

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
25	26	74.9	A	14.5	47.5	36.0	154.9	Gneiss	Very Strong
24	26	75.0	D	24.3	47.5	84.2	252.4	Gneiss	Extremely Strong
23	27	76.0	A	17.5	47.6	36.9	183.2	Gneiss	Very Strong
22	27	76.0	D	23.0	47.5	88.8	239.1	Gneiss	Very Strong
20	28	77.2	D	21.5	47.5	106.0	223.6	Gneiss	Very Strong
21	28	77.2	A	16.3	47.5	44.8	146.4	Gneiss	Very Strong
18	28	78.2	D	22.0	47.5	92.6	228.8	Gneiss	Very Strong
19	28	78.3	A	24.5	47.6	41.8	232.9	Gneiss	Very Strong
16	28	79.1	D	19.5	47.5	94.6	203.0	Gneiss	Very Strong
17	28	79.2	A	21.0	47.5	41.8	200.2	Gneiss	Very Strong
15	29	80.4	A	19.5	47.5	51.5	157.9	Gneiss	Very Strong
14	29	80.4	D	13.0	47.5	101.4	135.0	Gneiss	Very Strong
13	29	81.6	A	19.0	47.5	40.9	184.0	Gneiss	Very Strong
12	29	81.6	D	18.5	47.6	86.1	191.9	Gneiss	Very Strong
11	29	82.5	D	19.3	47.5	97.0	200.2	Gneiss	Very Strong
9	30	83.4	D	17.0	47.4	89.1	177.1	Gneiss	Very Strong
10	30	83.4	A	14.5	47.5	38.4	147.5	Gneiss	Very Strong
7	30	84.5	D	19.5	47.6	91.0	202.2	Gneiss	Very Strong
8	30	84.6	A	16.5	47.5	35.5	178.0	Gneiss	Very Strong
5	30	85.4	D	13.0	47.6	104.4	134.8	Gneiss	Very Strong
6	30	85.5	A	12.0	47.6	36.7	126.2	Gneiss	Very Strong
3	31	86.6	D	18.0	47.2	117.9	188.9	Gneiss	Very Strong
4	31	86.7	A	18.5	47.1	53.3	146.7	Gneiss	Very Strong
1	31	87.7	D	27.0	47.6	104.3	279.7	Gneiss	Extremely Strong
2	31	87.7	A	23.0	47.6	50.3	189.2	Gneiss	Very Strong
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27									
28									
29									
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* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	8/2/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/14/2011
Core Size :	NQ **BH No :** NTUN-DH03	**Tester :**	CC

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
29	32	88.6	D	21.5	47.6	83.2	222.8	Gneiss	Very Strong
30	32	88.6	A	16.0	47.6	36.0	170.6	Gneiss	Very Strong
28	32	89.7	A	30.5	47.6	46.3	267.7	Gneiss	Extremely Strong
27	32	89.8	D	29.0	47.7	114.1	300.0	Gneiss	Extremely Strong
25	32	90.6	D	25.3	47.5	94.3	262.3	Gneiss	Extremely Strong
26	32	90.6	A	24.0	47.6	42.4	225.6	Gneiss	Very Strong
23	33	91.6	D	23.0	47.6	90.4	238.1	Gneiss	Very Strong
24	33	91.6	A	21.3	47.6	41.9	201.4	Gneiss	Very Strong
22	33	92.6	D	21.5	47.5	105.7	223.3	Gneiss	Very Strong
20	33	93.6	D	17.5	47.6	99.5	181.2	Gneiss	Very Strong
21	33	93.6	A	16.3	47.6	47.5	139.8	Gneiss	Very Strong
18	34	94.6	D	19.5	47.5	104.3	202.4	Gneiss	Very Strong
19	34	94.6	A	15.3	47.5	48.3	129.7	Gneiss	Very Strong
17	34	96.0	A	21.8	47.6	44.3	197.5	Gneiss	Very Strong
16	34	96.1	D	19.8	47.6	108.1	204.5	Gneiss	Very Strong
14	34	97.2	D	24.0	47.6	101.2	248.8	Gneiss	Very Strong
15	34	97.2	A	26.5	47.6	41.5	253.2	Gneiss	Extremely Strong
12	35	98.0	D	22.0	47.7	110.1	227.5	Gneiss	Very Strong
13	35	98.0	A	25.5	47.6	55.1	195.4	Gneiss	Very Strong
11	35	99.1	D	26.5	47.6	107.2	274.9	Gneiss	Extremely Strong
10	35	100.2	A	14.8	47.6	36.1	157.0	Gneiss	Very Strong
9	35	100.2	D	17.0	47.5	96.0	176.6	Gneiss	Very Strong
7	36	101.3	D	19.5	47.6	97.9	202.0	Gneiss	Very Strong
8	36	101.3	A	14.5	47.7	43.1	134.5	Gneiss	Very Strong
5	36	102.7	D	19.0	47.5	116.0	197.7	Gneiss	Very Strong
6	36	102.8	A	22.5	47.5	52.3	180.0	Gneiss	Very Strong
3	37	103.8	D	16.5	47.5	96.6	171.5	Gneiss	Very Strong
4	37	103.8	A	17.0	47.6	45.5	151.2	Gneiss	Very Strong
1	37	104.9	D	21.0	47.6	85.9	217.5	Gneiss	Very Strong
2	37	104.9	A	15.8	47.6	37.5	162.6	Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	8/2/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/14/2011
Core Size :	NQ **BH No :** NTUN-DH03	**Tester :**	CC

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
29	37	105.8	D	23.3	47.6	97.7	241.0	Gneiss	Very Strong
30	37	105.8	A	21.3	47.6	46.0	187.7	Gneiss	Very Strong
27	38	107.0	D	19.8	47.5	108.8	205.3	Gneiss	Very Strong
28	38	107.0	A	21.0	47.6	52.8	166.7	Gneiss	Very Strong
25	38	108.2	D	16.0	47.5	102.9	166.4	Gneiss	Very Strong
26	38	108.2	A	22.5	47.6	47.5	193.8	Gneiss	Very Strong
23	38	109.1	D	16.8	47.6	94.3	173.3	Gneiss	Very Strong
24	38	109.1	A	15.0	47.6	47.2	129.8	Gneiss	Very Strong
21	39	110.4	D	21.8	47.7	108.9	224.6	Gneiss	Very Strong
22	39	110.4	A	16.0	47.6	50.6	131.0	Gneiss	Very Strong
20	39	111.2	A	35.0	47.6	52.6	278.3	Gneiss	Extremely Strong
19	39	111.3	D	23.0	47.6	110.3	238.3	Gneiss	Very Strong
17	40	112.6	D	24.0	47.5	76.4	249.1	Gneiss	Very Strong
18	40	112.6	A	19.3	47.6	35.5	207.5	Gneiss	Very Strong
15	40	113.7	D	20.5	47.7	95.6	212.0	Gneiss	Very Strong
16	40	113.7	A	22.0	47.7	43.0	204.5	Gneiss	Very Strong
13	40	114.6	D	21.0	47.6	100.5	217.6	Gneiss	Very Strong
14	40	114.7	A	13.8	47.7	45.5	122.2	Gneiss	Very Strong
11	41	115.6	D	22.0	47.6	98.2	227.6	Gneiss	Very Strong
12	41	115.6	A	27.5	47.6	48.0	234.7	Gneiss	Very Strong
8	41	117.1	D	20.0	47.7	83.7	206.7	Gneiss	Very Strong
10	41	117.1	A	17.0	47.7	46.2	149.4	Gneiss	Very Strong
9	41	117.1	A	13.5	47.7	37.7	138.9	Gneiss	Very Strong
7	41	118.5	D	23.5	47.6	87.5	243.3	Gneiss	Very Strong
6	42	118.6	A	24.0	47.6	44.3	217.8	Gneiss	Very Strong
5	42	118.6	D	16.3	47.6	80.2	168.1	Gneiss	Very Strong
3	42	119.5	D	21.0	47.7	95.0	217.1	Gneiss	Very Strong
4	42	119.6	A	6.0	47.7	33.2	68.0	Gneiss	Strong
1	42	120.8	D	19.0	47.6	108.3	197.2	Gneiss	Very Strong
2	42	120.9	A	16.5	47.6	36.0	176.0	Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/27/2011
Core Size :	NQ3 **BH No :** NTUN-DH05	**Tester :**	AS

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
1	22	65.4	D	7.0	47.2	98.6	73.5	gneiss	Strong
2	22	65.8	D	17.3	47.6	74.3	178.8	gneiss	Very Strong
3	22	66.2	D	17.5	47.2	181.0	183.8	gneiss	Very Strong
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* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/28/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/2/2011
Core Size :	NQ **BH No :** STUN-DH03	**Tester :**	BT

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
2	22	70.1	D	12.0	47.7	89.4	124.1	Gneiss	Very Strong
3	22	70.4	A	18.5	47.7	43.6	170.1	Gneiss	Very Strong
1	22	71.3	A	19.8	47.7	46.2	173.5	Gneiss	Very Strong
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* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

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POINT LOAD TEST SHEET

Job No :	19-1605-126	**Client :**	HATCH
		Date Drilled :	7/29/2011
Project Name :	Mary River Project - Geotechnical Investigation	**Date Tested :**	8/2/2011
Core Size :	NQ **BH No :** STUN-DH03	**Tester :**	BT

Test No.	Run No.	Depth (m)	Axial or Diametral	Force (kN)	Diameter (mm)	Length (mm)	UCS (MPa)	Rock Type	Notes
30	23	71.3	D	18.8	47.6	106.7	194.0	Gneiss	Very Strong
28	23	72.5	D	12.0	47.6	95.5	124.2	Gneiss	Very Strong
29	23	72.5	A	20.3	47.6	42.0	191.6	Gneiss	Very Strong
26	24	73.6	D	15.5	47.7	88.5	160.2	Gneiss	Very Strong
27	24	73.6	A	17.0	47.7	47.5	146.2	Gneiss	Very Strong
24	24	74.5	D	18.0	47.6	88.6	186.4	Gneiss	Very Strong
25	24	74.5	A	25.0	47.6	54.8	192.5	Gneiss	Very Strong
22	25	75.5	D	15.0	47.6	109.1	155.6	Gneiss	Very Strong
23	25	75.5	A	13.0	47.6	46.0	114.7	Gneiss	Very Strong
21	25	76.4	D	9.5	47.6	74.5	98.3	Gneiss	Strong
19	25	77.7	D	16.5	47.6	78.0	170.8	Gneiss	Very Strong
20	25	77.7	A	24.0	47.6	43.2	222.3	Gneiss	Very Strong
17	26	79.1	D	17.0	47.6	102.6	176.0	Gneiss	Very Strong
18	26	79.2	A	24.0	47.7	46.8	208.9	Gneiss	Very Strong
15	26	80.0	D	16.5	47.6	98.9	170.7	Gneiss	Very Strong
16	26	80.1	A	21.5	47.7	47.4	185.2	Gneiss	Very Strong
13	26	80.8	D	16.5	47.7	93.1	170.4	Gneiss	Very Strong
14	26	80.8	A	23.0	47.7	47.3	198.2	Gneiss	Very Strong
11	27	82.0	D	18.5	47.7	79.4	190.9	Gneiss	Very Strong
12	27	82.1	A	19.5	47.7	42.0	184.2	Gneiss	Very Strong
9	27	82.7	D	17.0	47.7	78.7	175.6	Gneiss	Very Strong
10	27	82.7	A	20.0	47.7	47.7	171.4	Gneiss	Very Strong
7	27	83.9	D	18.0	47.7	88.5	185.8	Gneiss	Very Strong
8	27	84.0	A	21.3	47.7	43.5	195.6	Gneiss	Very Strong
5	28	85.1	D	21.0	47.7	88.3	216.7	Gneiss	Very Strong
6	28	85.1	A	16.0	47.7	42.4	150.2	Gneiss	Very Strong
3	28	86.5	D	18.0	47.7	80.6	185.7	Gneiss	Very Strong
4	28	86.5	A	26.5	47.7	47.2	228.7	Gneiss	Very Strong
1	28	87.0	D	16.5	47.7	78.1	170.3	Gneiss	Very Strong
2	28	87.1	A	23.0	47.7	40.1	225.4	Gneiss	Very Strong

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
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