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Memo

To:	Chris Hanks, Bill Patterson, Lea-Marie Bowes-Lyon	**Date:**	September 22, 2010
cc:	Deborah Muggli, Christine Kowbel	**From:**	Tayfun Gurdal, Maritz Rykaart
Subject:	Design Brief: Roberts Bay Fuel Tank Farm Expansion – Secondary Containment	**Project #:**	1CH008.027

1 Introduction

Hope Bay Mining Limited (HBML), a wholly owned subsidiary of Newmont Mining Company (NMC) is currently in the process of constructing their Doris North Project (Project) in the Kitikmeot region of Nunavut, Canada. Fuel is brought to the site annually via sealift and stored on site in designated fuel tank farms, housed within appropriately designed and constructed secondary containment facilities. Currently, the Project has one 5.7 Million Litre (ML) diesel fuel tank in use at Roberts Bay, and another five 1.5 ML diesel fuel tanks are under construction at the Doris North Camp.

To ensure uninterrupted fuel supply throughout the year, HBML requires additional on-site fuel storage. They propose to construct a new tank farm at Roberts Bay that would contain an additional four 5.7 ML diesel fuel tanks and one 1.5 ML aviation fuel tank. Fuel will be pumped to these tanks from barges or ships moored in Roberts Bay via a dedicated fuel pipeline.

This proposed expansion will increase the on-site diesel fuel storage capacity from 14 ML to 36 ML and will allow for storage of 1.5 ML of jet fuel. The vast majority of the additional fuel capacity will be used for construction at the Project and mining related activities. Some of the fuel stored at the Project will be used for exploration activities in other areas of the Hope Bay belt. The annual fuel needs is approximately characterized in Table 1.

Table 1. Doris North Project Annual Fuel Needs

Fuel Type	Primary Use	Estimated Volume (ML)
Diesel	Normal Surface Operations	14.0
	Underground Mining	4.0
	Construction	5.0
	District Exploration	4.0
	Contingency	4.0
Aviation Fuel (Jet A)	Normal Operations	0.5
	District Exploration	0.5
	Contingency	0.5

This memo provides complete details of the secondary containment facility design that will be used to house the proposed new fuel tanks at Roberts Bay, as well as the secondary containment for the dedicated fuel pipeline. This should be read in conjunction with the attached set of detailed engineering drawings (Attachment A).

2 Design Concept

The existing fuel tank farms at Roberts Bay and Doris North Camp have been designed in accordance with all Federal and Territorial regulations and guidelines. In addition, NMC has internal 5-star Standards that were adopted, where they exceed the stated Federal and Territorial regulations and standards. The design of the new tank farm and secondary containment facility described in this design brief, are in exact conformance.

Since the Doris North Project is being constructed on KIA land, HBML has secured a Commercial Lease for the property. The proposed locations of all fuel tanks including the proposed expansion are within the Commercial Lease boundary. The KIA has approved this proposal.

3 Expansion Alternatives

Four alternate construction locations were considered for the new tank farm as described in this design brief. The following is a summary of these alternatives:

- <u>Expansion of the existing 5.7 ML fuel tank farm at Roberts Bay</u>. This would have been the preferred option from an operational point of view. The fuel is offloaded from the barges at Roberts Bay providing the most flexibility. Expansion of this tank farm would require drilling and blasting activities in very close proximity to the full 5.7 ML fuel tank. This would pose a significant safety risk to the construction and operational personnel. Draining the tank was not a practical option since the fuel is required for construction and there are no alternate fuel storage sites. As a result of these constraints this alternative was not selected.

- <u>Expansion of the existing 5 x 1.5 ML fuel tank farm at the Doris North Camp</u>. This option was not selected since sufficient bedrock was not available to found the tanks. Founding the tanks on overburden would require piling, which would not be cost-effective, especially considering the long-term risks. In addition, having the tanks located 5 km from the shoreline would require the fuel transfer to be completed via fuel trucks or a 5 km long pipeline. The fuel transfer must occur over a very short time frame to allow the barges to return to their home port prior to freezing up. These challenges when combined, present a significant risk for operational problems that may lead to environmental consequences.

- <u>Construction of a new tank farm within Quarry #2</u>. Quarry #2 is sufficiently big to construct the tank farm in and has a competent rock foundation. The distance of this facility from the shoreline complicates timely fuel offloading from the barges, as described in the previous alternative. Since Quarry #2 is active, construction of the tank farm would have to be delayed until the quarry was exhausted, or alternatively, quarry development would have to be ceased, which is not feasible at this time. This alternative was not pursued further.

- <u>Construction of a new tank farm south of the Roberts Bay laydown area</u>. This site has a large rock outcrop, which if drilled and blasted would provide a competent foundation for the tank farm. Drilling and blasting in this area will require the use of blast mats and other control measures to prevent health and safety risks to HBML and Contractor personnel, as well as damage to equipment and supplies on the adjacent laydown areas. Implementation of these controls would be practical and reasonable. This site is ideally located to facilitate fuel offloading with minimal risk, which identifies it as the preferred alternative.

4 System Design

4.1 Design criteria

After incorporating all Federal and Territorial regulation and guidelines, as well as NMC's 5-star standards (see Section 2 of this design brief), SRK consulted with the Prime contractor and their specialist sub-contractor who will be erecting the tanks in the tank farm to ensure constructability of the intended design. The inputs were collated and resulted in the following primary design criteria for the secondary containment facility for the new tank farm at Roberts Bay:

- All tanks will be founded on bedrock.
- The secondary containment capacity for the tank farm must be at least the capacity of the largest storage tank, plus 10% of the aggregate capacity of all other storage tanks in the facility.
- An operational minimum permanent clearance distance equivalent to 25% of the tank diameter is required around any tank.
- A temporary construction clearance of 9 m around all tanks is required.

The following secondary design criteria was adopted in the design, and specifically accounted for elements of constructability and operational use preference:

- The amount of drilling and blasting required to ensure the tanks can be founded on competent bedrock should be minimized; however, the base elevation must be sufficiently low so as not to require access ramps steeper than 7%.
- In addition to the regulated required secondary containment capacity (as stipulated above), an allowance must be made to contain the 1-in-100 year, 24-hour duration storm event.
- Over and above the regulated and storm water required secondary containment volume a Factor of Safety of 10% has been applied.
- Containment berms must have a minimum crest width of 3 m.
- Where the high-wall exceeds 8 m total height a catch-berm is provided for safety against rock falls and raveling.
- A slope of 0.17H:1V is used on the high-wall.
- A slope of 0.5% on base of the facility for drainage.
- The tank farm access road must have a minimum width of 6 m.

4.2 Survey Data

The design of the tank farm secondary containment facility was based on as-built topographical surveys of the Roberts Bay laydown area, as well as topographical contour maps produced from 2008 aerial photography supplied by HBML.

4.3 Foundation Conditions

Comprehensive geotechnical investigations have been carried out at the Doris North Site (SRK 2009). This information confirms that the area lies within the zone of continuous permafrost, with the permafrost being up to 550 m deep. Permafrost temperature at the surface is about -8ºC and the active layer is generally less than 1 m thick. Laboratory and in-situ tests on disturbed and undisturbed samples indicate that the overburden soils are predominantly comprised of marine silts and clays, and the pore-water in these soils have high salinity, depressing the freezing point to -2ºC. The ice-rich overburden soils are typically between 5 and 20 m deep, before encountering competent bedrock, predominantly basalt. Bedrock is frequently exposed, rising columnar 5 to 100 m above the surrounding landscape.

Due to poor foundation conditions presented by the overburden soils, it was deemed appropriate to construct the Roberts Bay tank farm on a competent bedrock foundation. This was accomplished through drilling and blasting of a natural bedrock outcrop zone at the Roberts Bay laydown area.

Since the bedrock zone was completely exposed (with the exception of a few isolated pockets of overburden), a geotechnical investigation was not required to confirm bedrock conditions.

4.4 Tank Farm Secondary Containment

Secondary containment from the tank farm will be provided by constructing a fill berm using Run of Quarry material (ROQ) on a levelled bedrock foundation. A 60-mil HDPE liner sandwiched between two 12-oz non-woven geotextiles will be draped over the bedrock floor and up over the berms. The liner will subsequently be covered with a 600 mm layer of protective crush material. The berm will be constructed using ROQ excavated from the pad footprint. Downstream and upstream slopes of containment berm will be at least 1.5H:1V. The overall berm height is variable; however, its upper elevation is constant. The berm crest width is 3 m. The steel fuel tanks will be constructed on sloped crush pedestals within the confines of this area as illustrated in Attachment A.

4.5 Pipeline Secondary Containment

The dedicated fuel pipeline will run from the jetty to the two existing tanks farms, the new tank farm and the existing Roberts Bay tank farm. The pipeline will be placed within a lined containment berm to provide secondary containment as per NMC's 5-star standards. This containment berm will be constructed from select ROQ. The secondary containment will be provided with a 60-mil HDPE liner sandwiched between two 12-oz non-woven geotextiles. This liner system will receive a final crush protective layer as illustrated in Attachment A.

4.6 Safety Catch Bench

Due to the height of the high-wall along the south-west side of the facility, a 6 m wide safety catch bench will be constructed in accordance with best practice guidelines. This high-wall will also be inspected by a rock mechanics expert when exposed, and if deemed necessary, additional protection measures will be implemented such as scaling, rock bolting, meshing and/or shotcreted.

4.7 Protection Berm

A 1 m high protection berm with 1.5H:1V side slopes will be constructed 3 m from the crest of the high-wall in accordance with best practice guidelines to prevent inadvertent access over the high-wall by people and larger terrestrial animals.

4.8 Access Road and Ramps

The tank farm will be accessed through a road with ramps entering and exiting the facility. This access road will double as the fuel transfer station and will be located within the lined secondary containment areas. To ensure adequate protection of the liner in this high traffic zone, the 6.7 m wide access road is to have a minimum 0.9 m cover over the liner.

Since the tank farm is elevated over the surrounding Roberts Bay laydown areas, two access ramps will be required to enter the facility. These access ramps, graded at about 10%, fall outside of the lined secondary containment area.

4.9 Sump

A sump will be constructed within the secondary containment area. The area will be graded to have positive drainage towards the sump for collection of surface water and/or fuel spills. When the sump contains liquid, it will be tested. If it meets the discharge criteria, it will be pumped out and spread out on the tundra or used as dust suppressant on the roads. If the liquid contains hydrocarbons it will be pumped through an on-site oil/water separator, tested again and then is disposed of as previously mentioned. Alternatively, liquid that does not meet the discharge criteria will be pumped out (using a vacuum truck) and disposed of in the contaminated water cell of the landfarm located at Doris Camp.

5 Construction Methodology

The tank farm will be constructed in the floor of a rock quarry specifically developed for that purpose. A drill program was completed to collect samples and confirm the geochemical suitability of this rock (see Attachment B).

Prior to developing the rock quarry, overburden soils will be stripped from the quarry using dozers with ripper attachments or drill-and-blast methods. This overburden will be disposed of on the existing overburden dump immediately east of the existing fuel tank farm at Roberts Bay. To ensure proper sediment control from this overburden dump, a sedimentation control berm will be constructed along the downstream edge of the dump as illustrated in Attachment A. This berm will be about 2 m high, have 2H:1V side slopes, and a 6 m crest width, and will be constructed from select ROQ material.

Once the overburden has been stripped, the quarry will be developed using conventional drill-and-blast techniques. Development will follow the best practice methods and will result in high-walls about 8 m high with near vertical overall slope angles of at least 80º. The total amount of rock to be developed is about 68,000 m^3. The bulk of this material will be used for construction of the airstrip bypass road (about 50,000 m^3). The remainder of the material will be used for construction of the sedimentation berm, the tank farm secondary containment, access road and ramps as well as the expansion of the Roberts Bay laydown areas to accommodate functional use of this new tank farm.

Crush material for use in these elements will be sourced from the existing crusher plant, which uses material developed from Quarry #2.

Complete quantities are presented in Attachment A.

6 References

SRK (2009), Hope Bay Gold Project: Stage 2, Overburden Characterization Report, 1CH008.002, September 2009.

SRK (2010), Roberts Bay Tank Farm Design Memo, 1CH008.27, April 2009.

Attachment A

Drawings

Engineering Drawings for the Roberts Bay Fuel Tank Farm, Doris North Project, Nunavut, Canada

ACTIVE DRAWING STATUS

DWG NUMBER	NEWMONT DWG NUMBER	DRAWING TITLE	REVISION	DATE	STATUS
RBTF-00	HB+R-CIV-CIV-OND-0027	Engineering Drawings for the Roberts Bay Fuel Tank Farm	B	September 27, 2010	Issued for Comment
RBTF-01	HB+R-CIV-CIV-OND-0028	Fuel Tank Farm General Arrangement	B	September 27, 2010	Issued for Comment
RBTF-02	HB+R-CIV-CIV-OND-0029	Fuel Tank Farm Plan Layout	B	September 27, 2010	Issued for Comment
RBTF-03	HB+R-CIV-CIV-OND-0030	Fuel Tank Farm Sections	B	September 27, 2010	Issued for Comment
RBTF-04	HB+R-CIV-CIV-OND-0031	Fuel Tank Farm Details	B	September 27, 2010	Issued for Comment
RBTF-05	HB+R-CIV-CIV-OND-0039	Roberts Bay Overburden Storage Area and Sedimentation Berm	A	September 27, 2010	Issued for Comment
RBTF-06	HB+R-CIV-CIV-OND-0040	Pipe Bench Sections	A	September 27, 2010	Issued for Comment
RBTF-07	HB+R-CIV-CIV-OND-0041	Pipe Bench Section and Details	A	September 27, 2010	Issued for Comment

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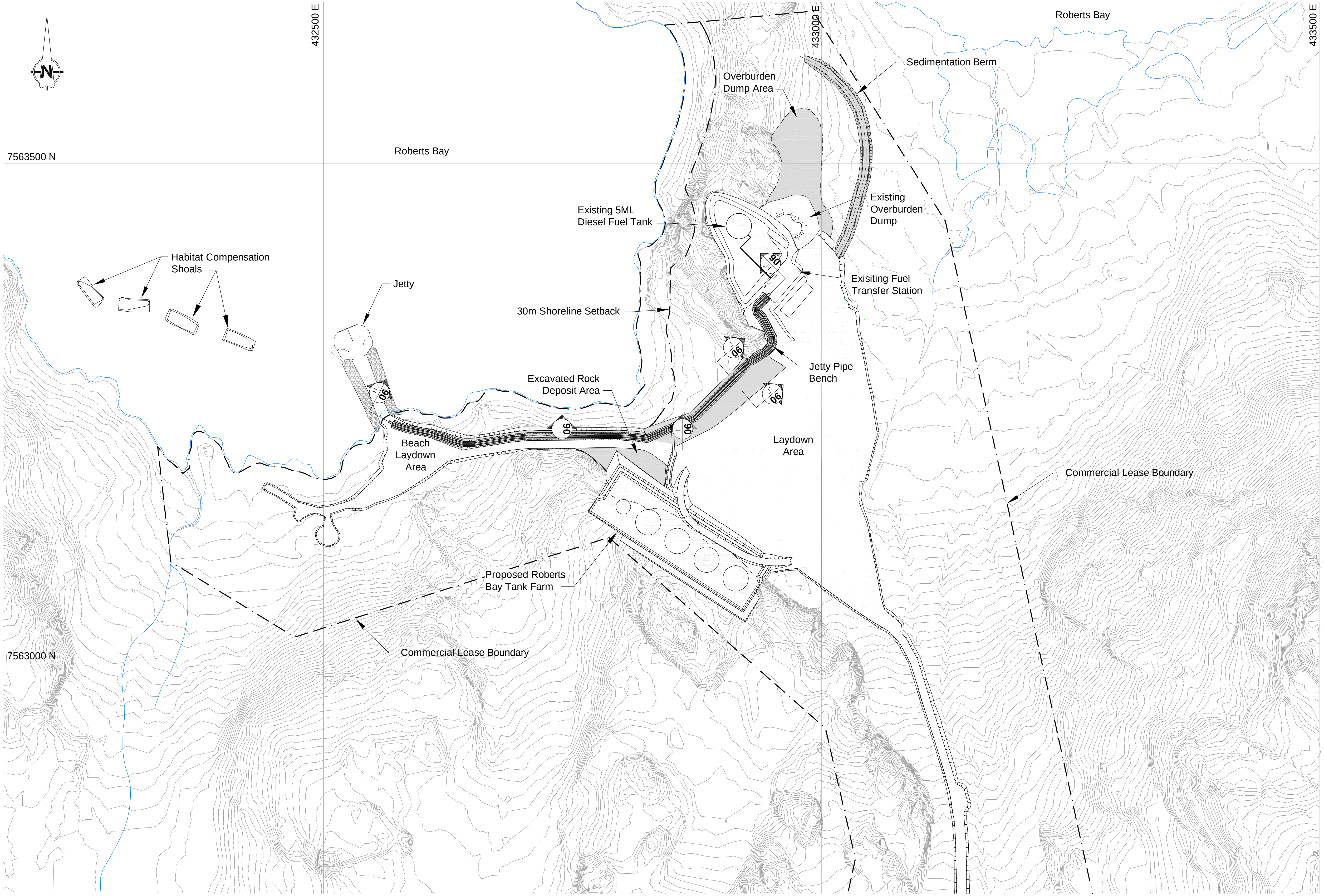
PROJECT NO: 1CH008.027
ISSUED FOR COMMENT
Revision B
September 27, 2010
RBTF-00 / HB+R-CIV-CIV-OND-0027



NOTES:

1. The Contractor shall ensure that appropriate best management policies are followed at the overburden dump.
2. Rock from the tank farm area will be used to construct the laydown expansive areas. Excess rock will be used at other areas of the site.
3. The Contractor is not responsible to obtain all necessary permits and approvals for the works; however, the Contractor must confirm that such approvals have been obtained from the Owner prior to proceeding with any construction.
4. Regional topographic contour data for the terrain model was provided by the Owner, and is based on 2007 Aerial Photography. Contour intervals are 1m.
5. The co-ordinate system is UTM NAD 83, Zone 13.
6. All drawings are scaled appropriately for D-size construction drawings. Scales may not be correct if these drawings are reproduced and presented in any other size format.
7. Notes and specifications on any drawings in this set apply equally to all drawings in the set.
8. If an Engineer's representative is on site, the Contractor shall notify the Engineer at least 12 hours in advance if an inspection is required for acceptance of works at any stage. If the Engineer's representative is not on site this notification period will be at least 5 days.
9. Blast rock from the pad excavation shall be placed in the designated areas shown on the drawing. These areas have been carefully selected so as not to block any natural drainage on the site.

0 20 40 60 80 100
Scale in Metres

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REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE
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REVISIONS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	Issued for comment	AT	EMR	27Sep.10
A	Issued for comment	AT	EMR	27Apr.10

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FILE NAME: RB–TankFarm.dwg

NEWMONT NORTH AMERICA

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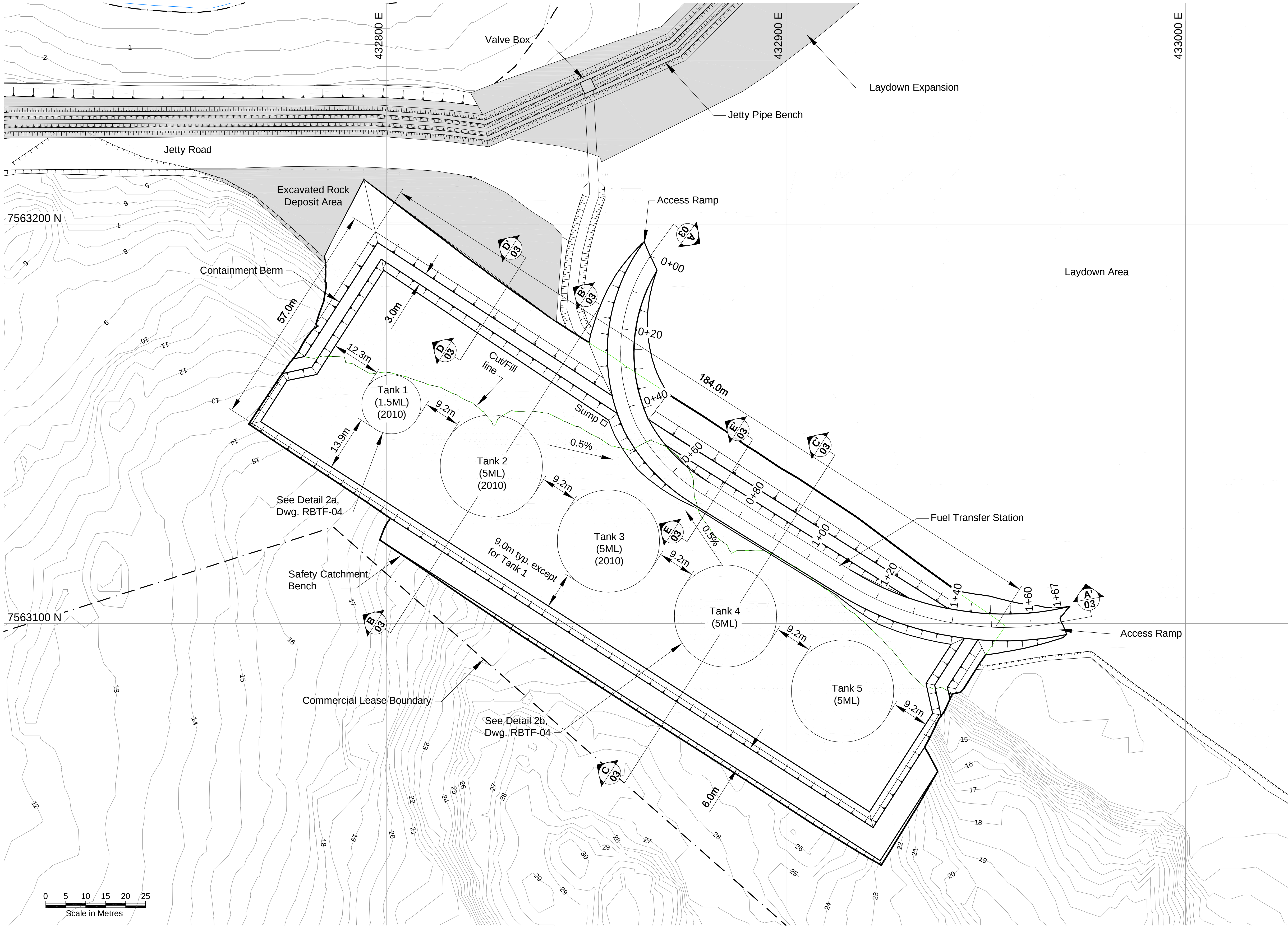
SRK JOB NO.: 1CH008 027 | SRK DWG NO.: RBTF-01

Doris North Project

DRAWING TITLE:

Fuel Tank Farm
General Arrangement

NEWMONT DRAWING NO.: HB+R-CIV-CIV-OND-0028 | SHEET: 2 OF 6 | REVISION NO.: B



NOTES:

1. The Contractor is not responsible to obtain all necessary permits and approvals for the works; however, the Contractor must confirm that such approvals have been obtained from the Owner prior to proceeding with any construction.
2. Regional topographic contour data for the terrain model was provided by the Owner, and is based on 2007 Aerial Photography. Contour intervals are 1m.
3. The co-ordinate system is UTM NAD 83, Zone 13.
4. All work is to be set out prior to the start of any construction. Should there be any difference between the co-ordinates provided and the field locations, the Engineer is to be informed immediately.
5. All dimensions are metric units, unless specifically mentioned.
6. All drawings are scaled appropriately for D-size construction drawings. Scales may not be correct if these drawings are reproduced and presented in any other size format.
7. Typical details are Not to Scale (NTS) unless specifically mentioned.
8. Notes and specifications on any drawings in this set apply equally to all drawings in the set.
9. The Roberts Bay Tank Farm is to be constructed on a leveled engineered fill pad over an intact bedrock surface. The bedrock surface shall be drill and blasted to specified elevation. The finished grade of the blasted bedrock surface has a maximum tolerance of 0.3m. The Contractor shall ensure the blasted floor have natural drainage and minimize ponding water. All blasted material shall be excavated to expose intact rock surface for survey and approval from the EPCM team and the Engineer.
10. If an Engineer's representative is on site, the Contractor shall notify the Engineer at least 12 hours in advance if an inspection is required for acceptance of works at any stage. If the Engineer's representative is not on site this notification period will be at least 5 days.
11. The Contractor will inform the Owner and Engineer in advance of any specialist contractor and/or technicians that will be sub-contracted to carry out specialized works. The Owner must approve all such sub-contractors.
12. The Contractor will at all times make his Surveyor available to the Engineer at a mutually agreed upon time, should the Engineer need surveying services to complete Quality Control/Quality Assurance of the Works.
13. The scope of work described herein specifically excludes all electrical and mechanical elements.
14. Tanks 1, 2, and 3 will be constructed and put in use in 2010. Tanks 4 and 5 will be constructed and put in once the appropriate regulatory approvals have been obtained.

REFERENCE DRAWINGS

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NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	Issued for comment	MK	EMR	27Sep.10
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FILE NAME: RB–TankFarm.dwg

NEWMONT NORTH AMERICA

HOPE BAY MINING LTD.

SRK JOB NO.: 1CH008.027 SRK DWG NO.: RBTF-02

Doris North Project

DRAWING TITLE:

Fuel Tank Farm
Plan Layout

NEWMONT DRAWING NO.: HB+R-CIV-CIV-OND-0029

SHEET 3 OF 6

REVISION NO. B

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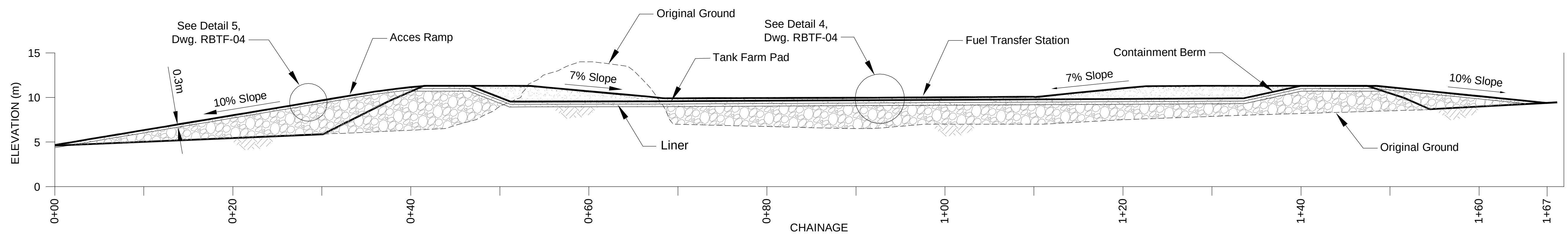

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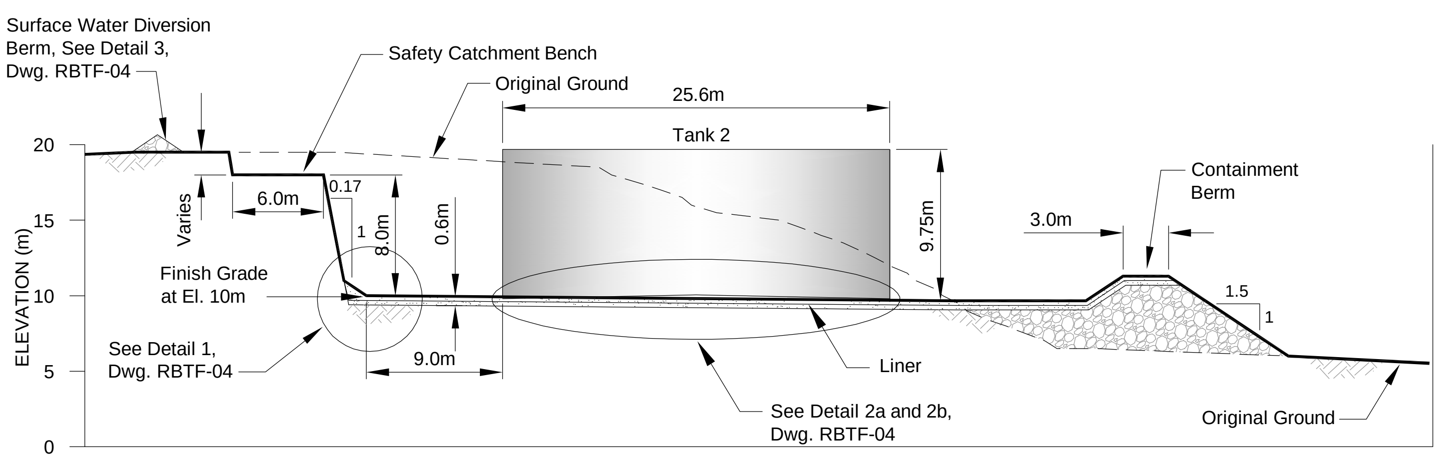

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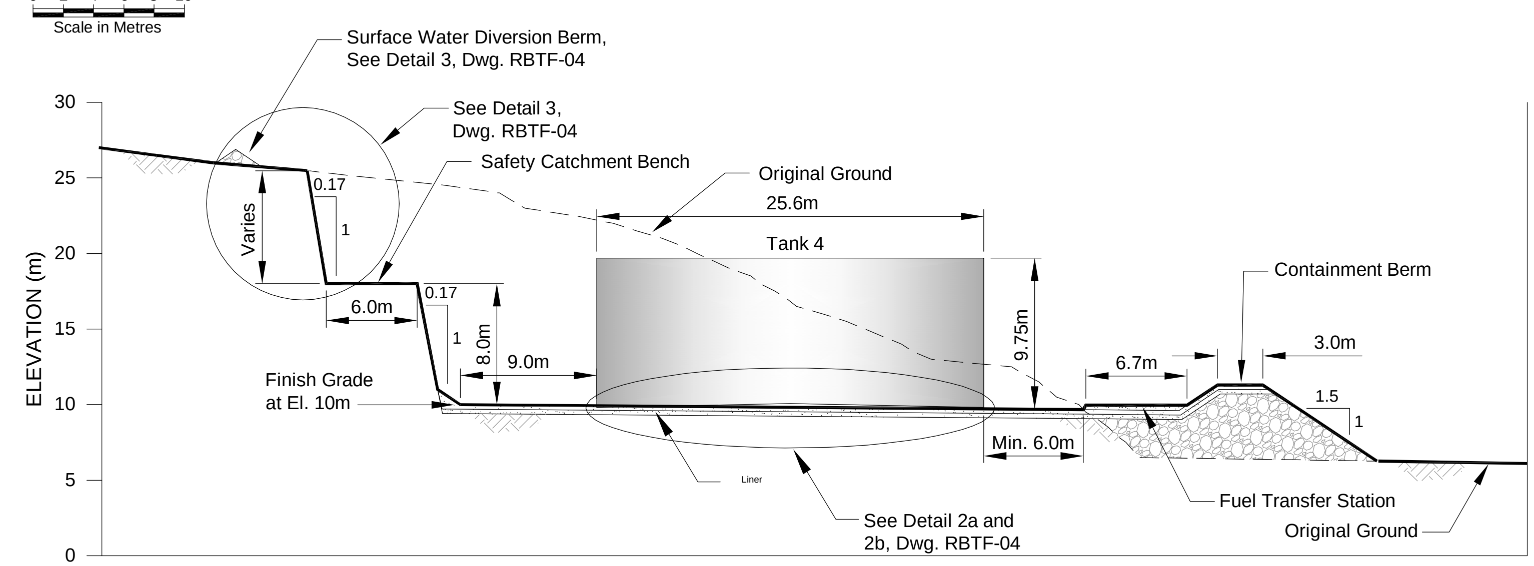

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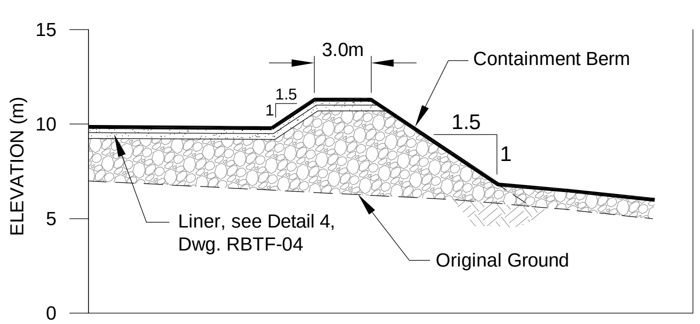

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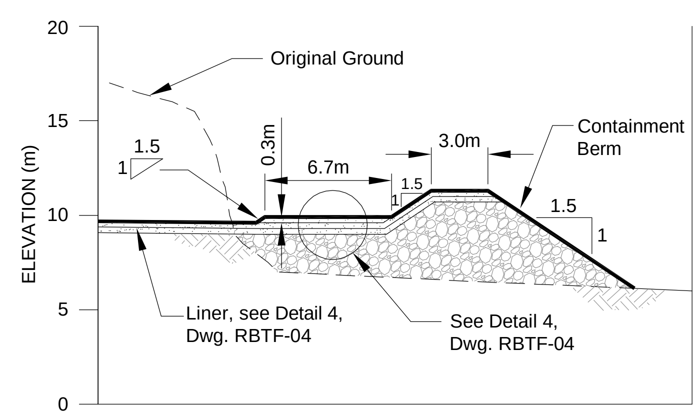

SECTION E/02

0 2 4 6 8 10
Scale in Metres

NOTES:

1. Overburden, snow and ice shall be excavated and hauled to designated stockpile for disposal.
2. The blasted foundation shall be inspected and approved by the EPCM team and the Engineer prior to furthermore work. Additional small scale rock breaking or blasting might be required to ensure natural drainage in the intact rock foundation.
3. Prior to placement of any construction material, the receiving surface must be free of snow and ice.
4. The EPCM team and Engineer must approve all surfaces prior to placement of any construction material.
5. Snow and ice on construction material stockpile must be removed prior to loading it for construction use.
6. The construction material shall be made and procure according to or equivalent to the specification below.
7. The quantities provided are neat line quantities and the Contractor needs to apply the appropriate bulking/shrinkage factors on fill as well as waste/overlap on geosynthetics.
8. An appropriately qualified sub-contractor must install the liner in accordance with standard procedures. The liner sub-contractor must supply the Engineer with a Quality Assurance protocol.
9. Geotextile overlaps shall be at least 500mm if not sewed or heat bonded. If swing or heat bonding is used, the overlap can be reduced to 200mm.
10. The Contractor will be responsible to store and handle on site liner and geotextile in accordance with manufacturers specifications.
11. If overburden is expose from the excavation of the tank farm footprint, standard procedures of thermal insulation shall be constructed to protect the permafrost.

Legend:

Run of quarry

Surface Material

Description	Material Specification	Estimated Quantities (See Note 7)
Surface Material	¾" crushed rock compacted to 95% Modified Proctor	3,300 m^3
General Fill	Run of Quarry material	14,100 m^3
Geotextile	12 oz non-woven Geotextile	20,600 m^2
Geomembrane	60 mil 1-side textured HDPE	10,300 m^2

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	Issued for comment	MK	EMR	27Sep.10
A	Issued for comment	AT	EMR	27Apr.10

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FILE NAME: RB–TankFarm.dwg

NEWMONT NORTH AMERICA

HOPE BAY MINING LTD.

SRK JOB NO.: 1CH008.027
SRK DWG NO.: RBTF-03

Doris North Project

DRAWING TITLE:
Fuel Tank Farm
Sections

NEWMONT DRAWING NO.: HB+R-CIV-CIV-OND-0030
SHEET 4 OF 6
REVISION NO. B

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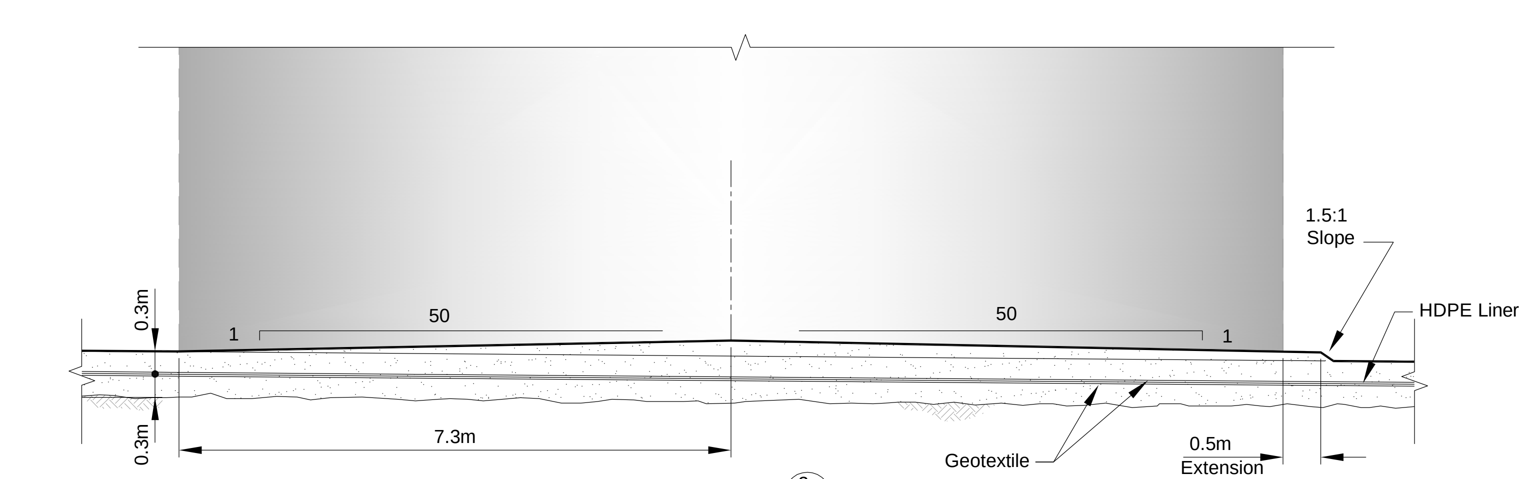

DETAIL 2a/03

PEDESTAL FOR 1.5M LITRE TANK

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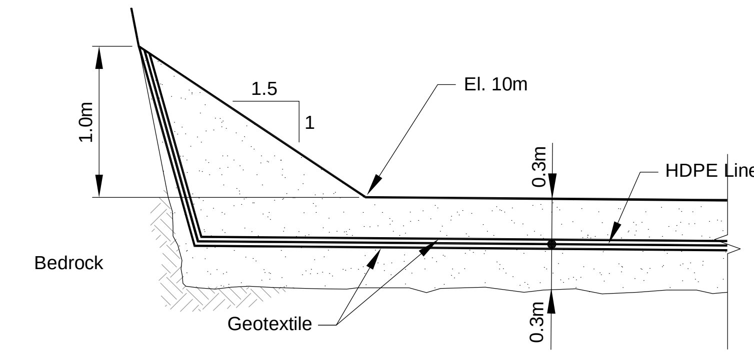

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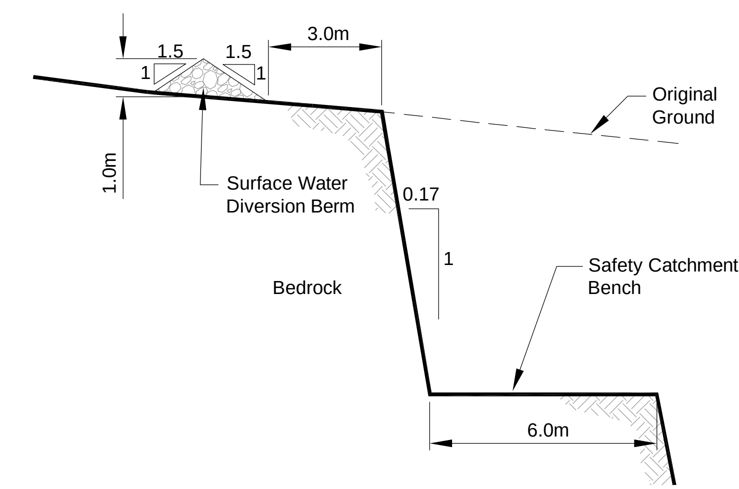

DETAIL 3/03

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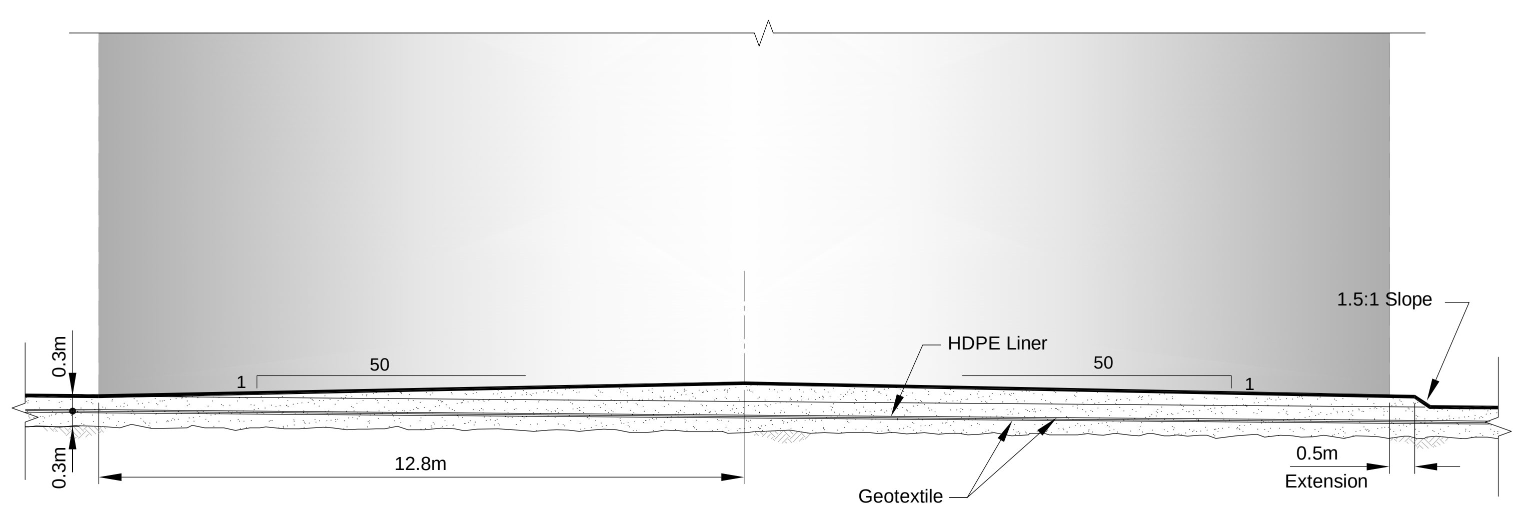
Scale in Metres



DETAIL 2b/03

TYPICAL PEDESTAL FOR 5M LITRE TANK

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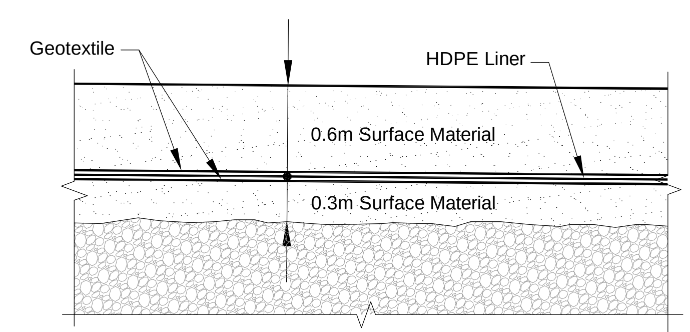
Scale in Metres



DETAIL 4/03

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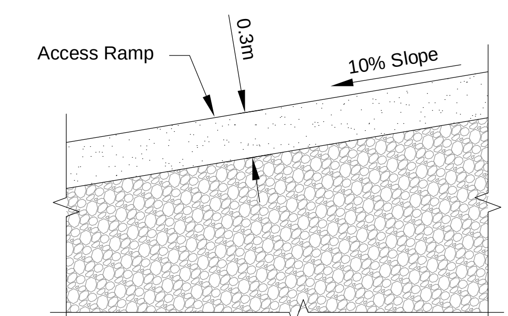
Scale in Metres



DETAIL 5/03

0 1 2 3 4 5
Scale in Metres

LEGEND:

Run of quarry

Surface Material

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A	Issued for comment	AT	EMR	27Apr.10

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FILE NAME: RB-TankFarm.dwg

NEWMONT
NORTH AMERICA

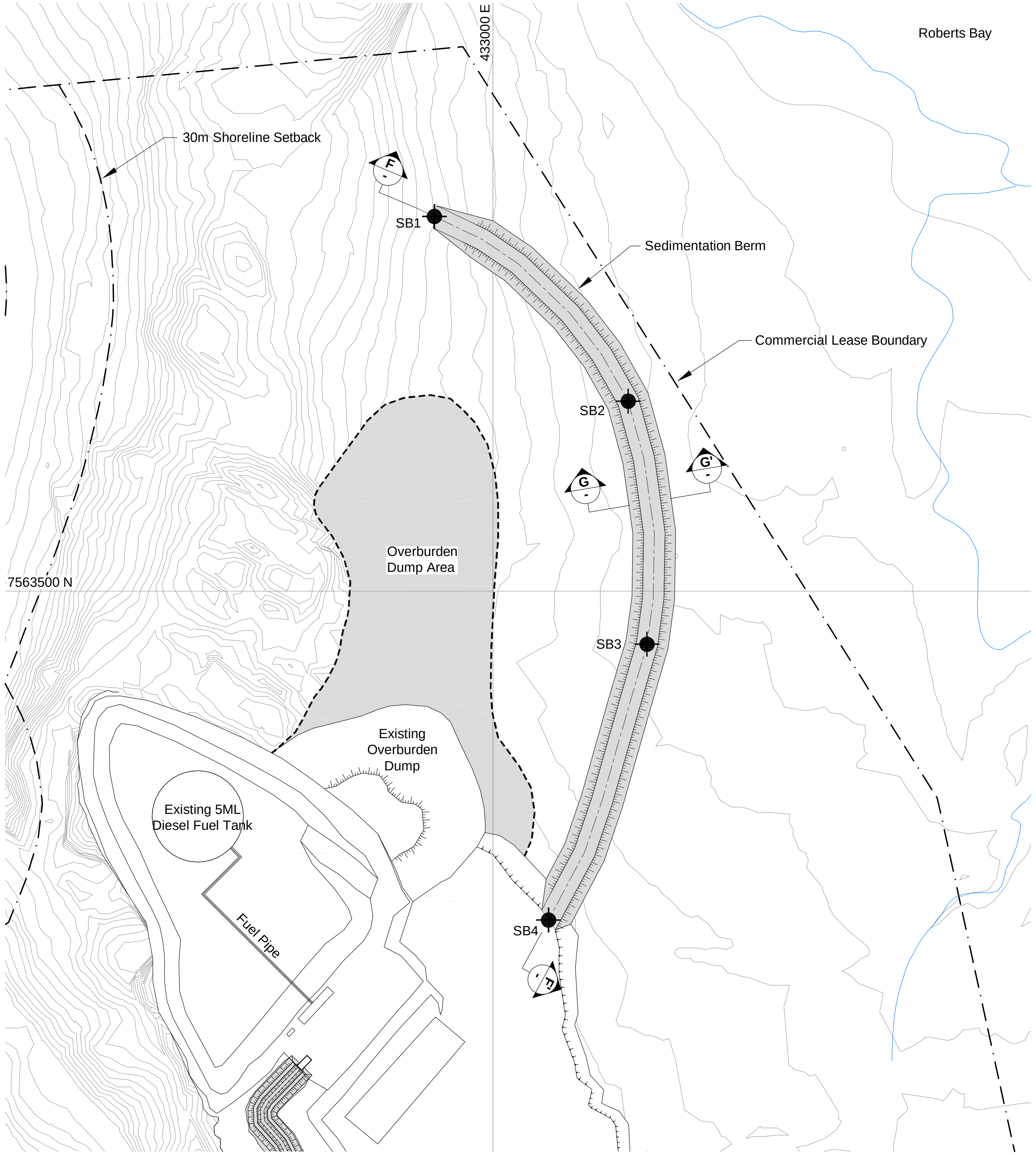
HOPE BAY MINING LTD.

SRK JOB NO.: 1CH008.027 | SRK DWG NO.: RBTF-04

Doris North Project

DRAWING TITLE:
Fuel Tank Farm
Details

NEWMONT DRAWING NO.: HB+R-CIV-CIV-OND-0031 | SHEET: 5 OF 6 | REVISION NO.: B



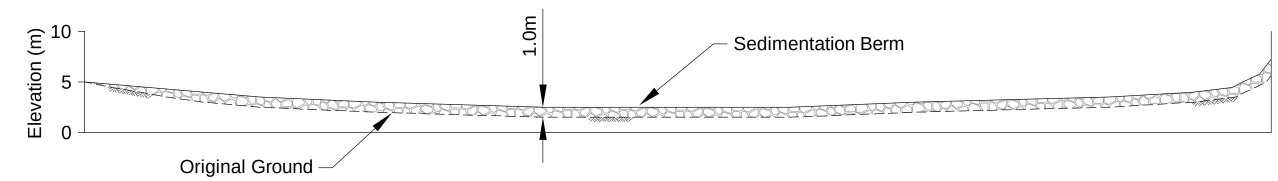
PLAN

0 10 20 30
Scale in Metres

SEDIMENTATION BERM STAKE OUT POINTS		
ID	Easting	Northing
SB1	432983.61	7563605.10
SB2	433037.97	7563553.31
SB3	433043.24	7563485.15
SB4	433015.62	7563407.80

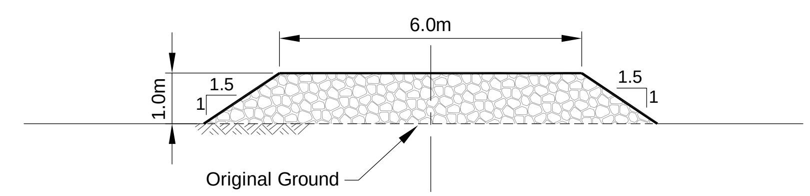
Materials List and Quantities

Description	Material Specifications	Estimated Quantities (See Note 8)
General Fill	Run of Quarry Material	1,800 m³



SECTION F

0 10 20 30
Scale in Metres
2X Vertical Exaggeration



SECTION G

0 1.0 2.0 3.0
Scale in Metres

LEGEND:

Run of quarry

Notes:

1. Contour intervals are 1m.
2. The co-ordinate system is UTM NAD 83, Zone 13.
3. Construction rock material shall be from approved rock quarries, shall be non-acid generating, shall be free of overburden soil, organic material or similar impurities, as well as snow and ice.
4. The Contractor shall employ best management practices to ensure sediment control and to prevent erosion from the overburden stockpile.
5. Run of Quarry (ROQ) shall be well-graded, containing sufficient quantities of gravel, sand, and silt sized material. For fill thickness <0.85m the maximum boulder size shall not exceed 500mm. For fill thickness >0.85m the maximum boulder size shall not exceed 900mm.
6. Prior to placement of any construction fill material, the receiving surface must be free of snow and ice. The Engineer must approve all surfaces prior to placement of any construction material.
7. Overburden material should be placed in lifts not exceeding 1.5m thick. The overall final slope of the overburden pile should not exceed 3:1.
8. Quantities provided are neat line quantities and the contractor needs to apply the appropriate bulking/shrinkage factors.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE	NO.	DESCRIPTION	CHK'D	APP'D	DATE
–	–			A	Issued for comment	MK	EMR	27Sep.10

REFERENCE DRAWINGS | REVISIONS | PROFESSIONAL ENGINEER'S STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN: MK | DRAWN: VY | REVIEWED: MK
CHECKED: MK | APPROVED: EMR | DATE: Sep. 27, 2010
FILE NAME: RB-TankFarm.dwg

NEWMONT NORTH AMERICA
HOPE BAY MINING LTD.
SRK JOB NO.: 1CH008 027 | SRK DWG NO.: RBTF-05

Doris North Project
DRAWING TITLE:
Roberts Bay Overburden Storage Area and Sedimentation Control Berm

NEWMONT DRAWING NO.: HB+R-CIV-CIV-OND-0039 | SHEET: 6 OF 6 | REVISION NO.: A

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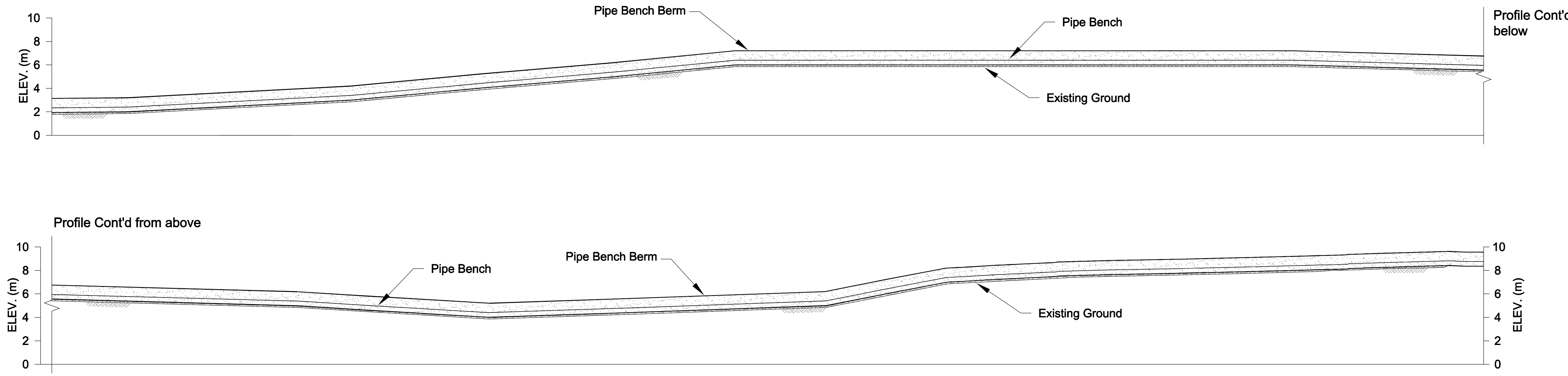
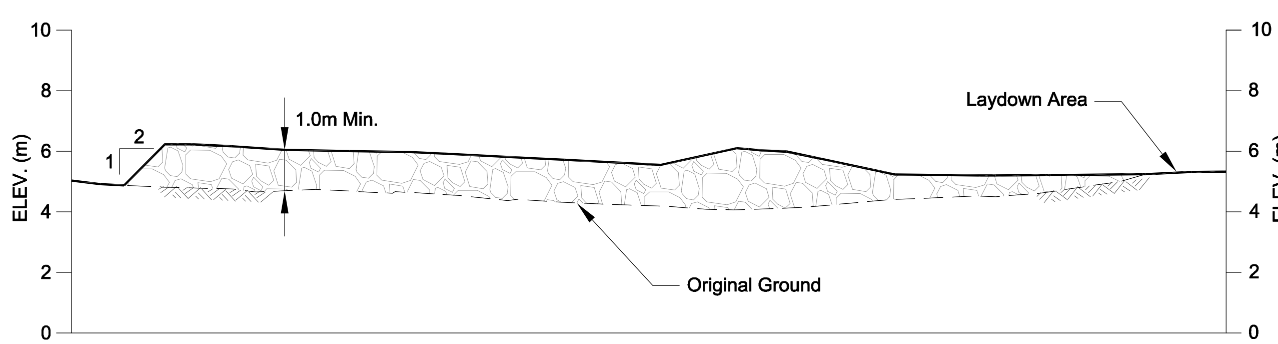


SECTION H-H'

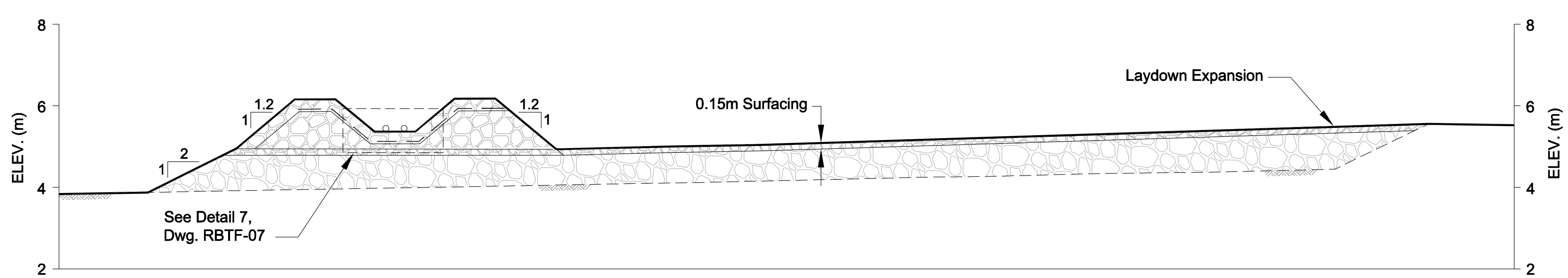
Scale in Metres

2X Vertical Exaggeration



SECTION I-I'

Scale in Metres



SECTION J-J'

Scale in Metres

LEGEND

- Surface Material
- 1 ¾" Crushed Material
- ROQ
- Liner system

NO.	DESCRIPTION	CHK'D	APP'D	DATE
A	Issued for Comment	–	EMR	27SEP10

REFERENCE DRAWINGS: DRAWING NO. | DRAWING TITLE | DRAWING NO. | DRAWING TITLE

REVISIONS

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Engineers and Scientists
Vancouver

DESIGN: MK | DRAWN: VY/MDDS | REVIEWED: EMR
CHECKED: MK | APPROVED: EMR | DATE: Sep. 27, 2010

FILE NAME: RBTF-06-07_Pipe Bench.dwg

NEWMONT NORTH AMERICA

HOPE BAY MINING LTD.

SRK JOB NO.: 1CH008.027 | SRK DWG NO.: RBTF-06

Doris North Project

DRAWING TITLE:
Pipe Bench
Sections

NEWMONT DRAWING NO.: HB+R-CIV-CIV-OND-0040 | SHEET 6 OF 8 | REVISION NO. A

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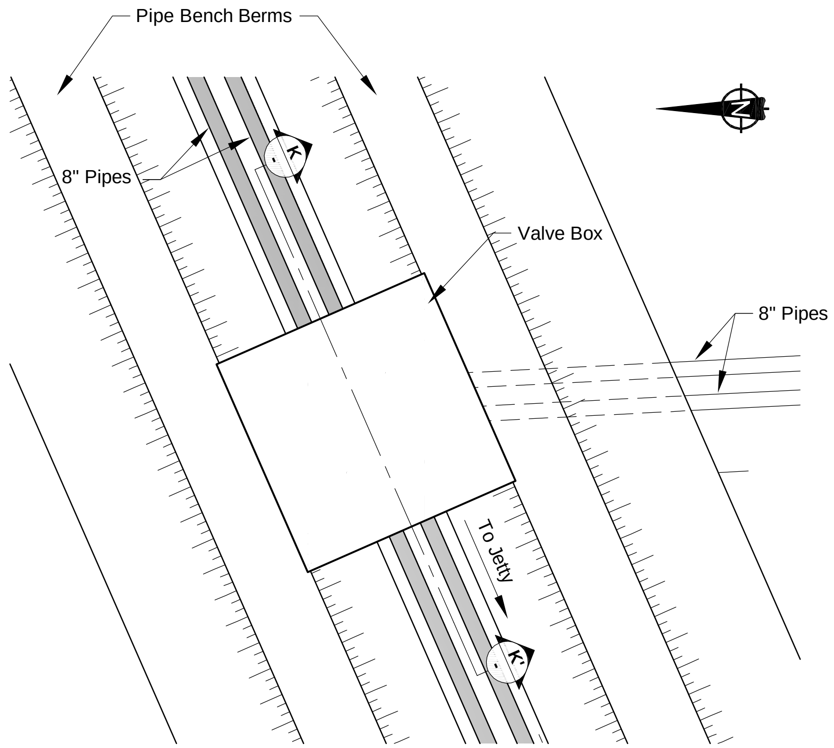
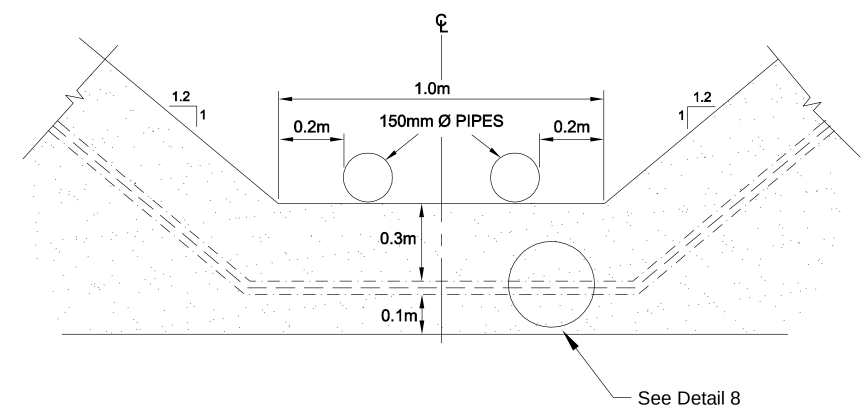


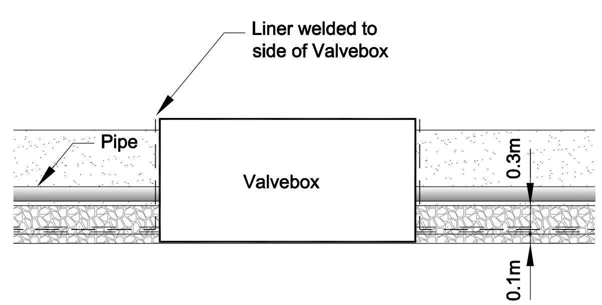
DETAIL 6 -
VALVE BOX AT JUNCTION
0 0.5 1 1.5 2 2.5
Scale in Metres



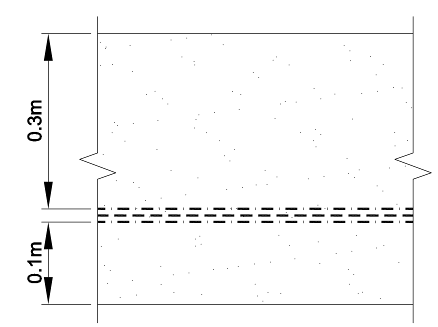
DETAIL 7 06
TYPICAL PIPE BENCH SECTION
NTS

Materials List and Quantities

Description	Material Specifications	Estimated Quantities
Surface Material	¾" Crushed Rock Compacted to 95% Modified Proctor	3,000 m^3
Geotextile	12 oz. Non-woven Geotextile	3,000 m²
Geomembrane	60 mil Textured HDPE	6,000 m²



SECTION K -
0 0.4 0.8 1.2 1.6 2
Scale in Metres



DETAIL 8 -
TYPICAL LINER DETAILS
NTS

LEGEND

- Surface Material
- 1 ¼" Crushed Material
- ROQ
- HDPE Liner
- Geotextile

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DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE	NO.	DESCRIPTION	CHK'D	APP'D	DATE
				A	Issued for Comment	LW	EMR	27SEP10
REFERENCE DRAWINGS				REVISIONS				

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Vancouver

DESIGN: MK	DRAWN: VY/MDDS	REVIEWED: EMR
CHECKED: MK	APPROVED: EMR	DATE: Sep. 27, 2010
FILE NAME: RBTF-06-07_Pipe Bench.dwg		

NEWMONT NORTH AMERICA

HOPE BAY MINING LTD.

SRK JOB NO.: 1CH008.027 SRK DWG NO.: RBTF-07

Doris North Project

DRAWING TITLE:
Pipe Bench
Section and Details

NEWMONT DRAWING NO.: HB+R-CIV-CIV-OND-0041 SHEET 8 OF 8 REVISION NO. A

Attachment B
Geochemical Characterization and Recommendations Memo (SRK, April 2010)

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Fax: 604.687.5532

Memo

To:	Chris Hanks, Newmont	**Date:**	April 23, 2010
cc:	Lea-Marie Bowes-Lyon, Newmont	**From:**	Lisa Barazzuol Kelly Sexsmith
Subject:	Geochemical Characterization and Recommendations for Roberts Bay Fuel Tank Farm, Doris North, Hope Bay Project	**Project #:**	1CH008.029.3600

1 Introduction

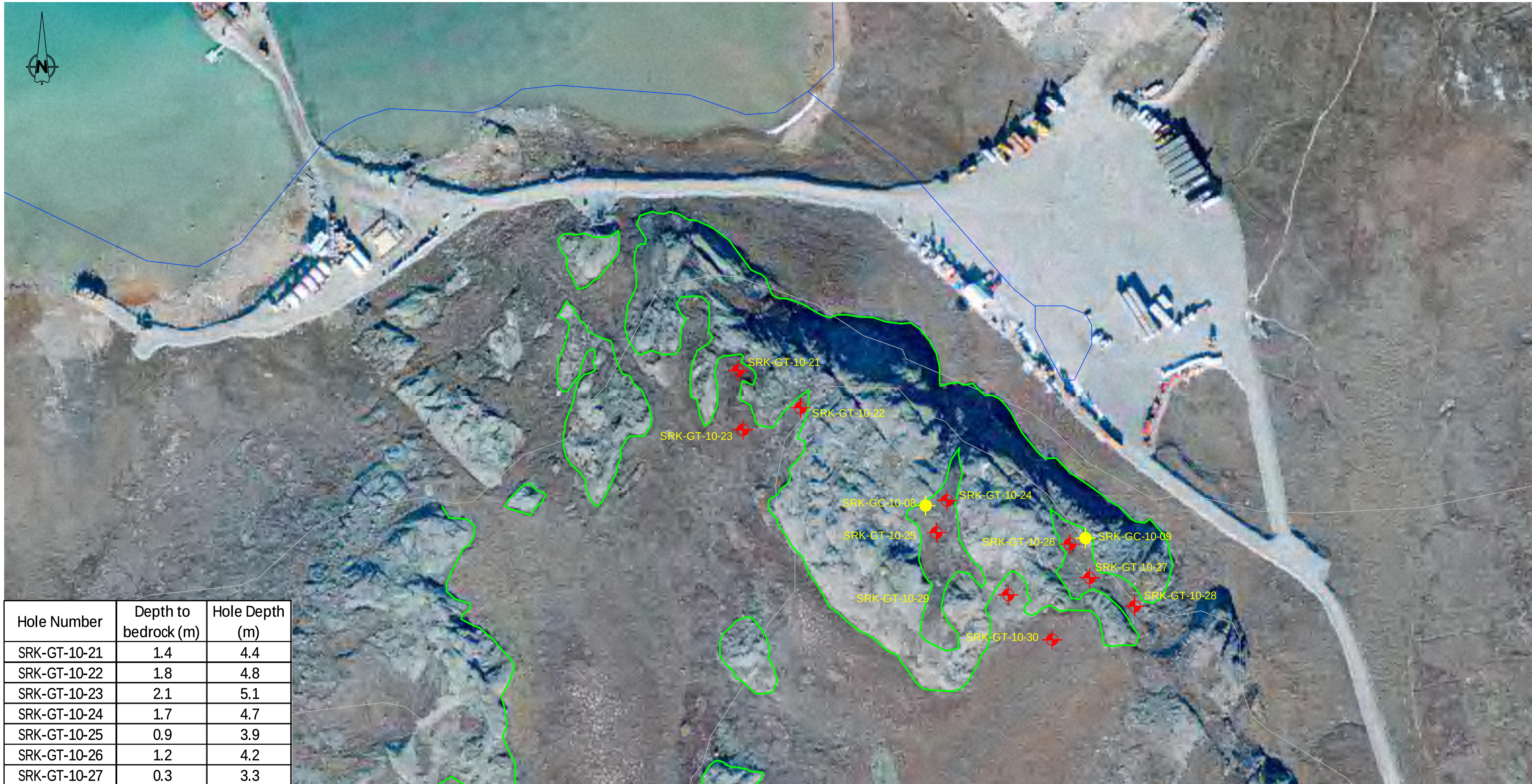
Hope Bay Mining Ltd. (HBML) is seeking permission for the Nunavut Water Board (NWB) to build an additional fuel tank farm, fuel transfer station and secondary containment facility on a bedrock outcrop south of the Roberts Bay laydown area (Figure 1). Construction of this facility would require blasting and removal of rock to create a level working surface. The blasted rock would be used for other previously approved infrastructure development associated with the Doris North project.

SRK were asked to characterize the potential for metal leaching and/or acid rock drainage (ML/ARD) of the rock that will be exposed or removed from this area. Samples were obtained and characterized both geologically and geochemically. This memorandum presents results of the testing program and provides recommendations for management and monitoring of this material.

2 Methods

Two geochemical and ten geotechnical drillholes were drilled within the proposed Roberts Bay fuel tank farm footprint in February 2010 to confirm the sub-surface geology of the development area (Figure 1). All holes were drilled using an Atlas Copco D9 ROC drill. The geochemical holes were drilled to the projected depth of development. Samples were also obtained from a series of geotechnical holes, which were terminated once 3 m of bedrock was intersected. Rock chip samples weighing approximately 2 kg each were collected by an SRK engineer. A total of 43 samples were collected, each sample representing approximately 1 m of drill core. The rock chips were logged by a Newmont geologist using standardized Newmont lithology codes (Attachment 1).

Samples were submitted to CANTEST Ltd., in Burnaby BC for testing. A total of 20 samples were analyzed for total sulphur. Eleven of these samples were geochemically analyzed for trace metals analysis by aqua regia digestion and ICP-MS finish, and complete ABA analysis including: paste pH, total inorganic carbon (TIC), sulphate sulphur and Modified Sobek neutralization potential (NP). The samples selected for testing were intended to provide adequate spatial distribution and to represent the range of geological characteristics described in the geology logs. QA/QC of the data set was performed by SRK.



Hole Number	Depth to bedrock (m)	Hole Depth (m)
SRK-GT-10-21	1.4	4.4
SRK-GT-10-22	1.8	4.8
SRK-GT-10-23	2.1	5.1
SRK-GT-10-24	1.7	4.7
SRK-GT-10-25	0.9	3.9
SRK-GT-10-26	1.2	4.2
SRK-GT-10-27	0.3	3.3
SRK-GT-10-28	0.9	3.9
SRK-GT-10-29	0.9	3.9
SRK-GT-10-30	4.0	7.0

LEGEND

- Geotechnical Drill Hole
- Geochemical Drill Hole

0 20 40 60 80 100
Scale in Metres

SRK Consulting
Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CH008.027.0200
FILE NAME: Doris–RobertsB Camp Drill Sites.dwg

NEWMONT
The Gold Company

HOPE BAY MINING LTD.

Doris North Phase 1 Infrastructure

Roberts Bay Tank Farm Expansion
Drill Hole Locations

DATE: Feb 2010 | APPROVED: MK | FIGURE: 1

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3 Results

ABA and trace metal data are presented in Attachments 2 and 3.

The majority (41/43) of the samples were logged as metavolcanic (1), suggesting that the fuel tank farm development area is lithologically consistent. The two other samples were also logged as metavolcanic, but were mixed with with either quartz vein (12q) or granitoid (9).

Total sulphur concentrations for the 20 samples were very low, ranging from below detection (0.02%) to 0.1% (median 0.07%). Pyrite concentrations of up to 3% were noted by the geologist, however total sulphur concentrations for these samples were 0.04% and 0.1%, respectively.

Table 1 presents data for the 11 samples submitted for full ABA analysis. NPs were relatively low in comparison to other metavolcanic samples in the area, ranging from 16.1 to 119.5 kg $CaCO_3$/tonne (median 27.6 kg $CaCO_3$/tonne). TICs were uniformly less than NP, ranging from 6.6 to 98.4 kg $CaCO_3$/tonne (median 11.4 kg $CaCO_3$/tonne).

The data indicate that all of the samples are classified[1] as not potentially acid generating (not-PAG) on the basis of NP/AP and TIC/AP ratios, with one exception. Sample ID 540470 was classified as uncertain on the basis of TIC/AP, however, the low sulphur content (0.1%) suggests the potential for acid generation is limited.

Table 1: ABA Data, 11 Samples from the Roberts Bay Fuel Tank Farm Expansion

Sample ID	Paste pH	Total Sulphur	Sulphate Sulphur	AP	Modified NP	TIC	NNP	NP/AP	TIC/AP
	s.u.	%	%	Kg $CaCO_3$/tonne				ratio	ratio
540477	9.01	<0.02	<0.01	0.6	64.8	50.0	64.1	103.6	80.0
540481	9.23	0.04	<0.01	1.3	94.0	74.5	92.8	75.2	59.6
540484	9.3	0.05	<0.01	1.6	119.5	98.4	117.9	76.5	63.0
540485	9.22	0.06	<0.01	1.9	23.0	9.3	21.1	12.3	5.0
540487	9.43	0.05	<0.01	1.6	16.1	6.6	14.6	10.3	4.2
540489	9.6	0.03	<0.01	0.9	28.5	15.0	27.6	30.4	16.0
540448	9.57	0.08	<0.01	2.5	83.8	76.4	81.3	33.5	30.5
540450	8.99	0.04	<0.01	1.3	37.4	23.2	36.1	29.9	18.5
540468	8.84	0.08	0.01	2.2	27.6	11.4	25.4	12.6	5.2
540470	9.49	0.1	<0.01	3.1	22.8	8.2	19.6	7.3	2.6
540474	8.91	0.09	<0.01	2.8	25.3	11.1	22.4	9.0	4.0

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[1] ARD classifications as follows: not-PAG defined as NP/AP or TIC/AP > 3; uncertain defined as NP/AP or TIC/AP between 1 and 3; PAG defined as NP/AP or TIC/AP ≤ 1

The apparent discrepancy in the ARD classifications for sample 540470 is due to the low levels of carbonate minerals, as indicated by the TIC content, and the more appreciable amounts of non-carbonate buffering minerals, as indicated by the higher levels of NP. Given the low sulphide content of these samples, these differences are not considered to be important, and buffering by silicate minerals is likely to be adequate for maintaining neutral pH conditions.

Of the 11 samples analyzed for trace metals, none had a trace metal content greater than ten times the average crustal abundance for basaltic rocks (Price 1997).

4 Discussion

Material from the proposed Roberts Bay fuel tank farm is geologically consistent with Quarry 1, which has already been developed and is located north of the Roberts Bay laydown area. This section compares data for metavolcanic samples from the fuel tank area with existing data for Quarry 1.

Existing geochemical data from Quarry 1 includes:

- ABA data for seven surface samples (AMEC 2005), 23 drill core samples from two drill holes (SRK 2007), and 33 samples obtained by Golder Consultants (Golder) during the 2007 construction season (SRK 2009). An additional 55 samples taken by Golder were analyzed for total sulphur only (SRK 2009).
- Trace element data (aqua regia digestion with ICP finish) for the AMEC (2005) and SRK (2007) samples.
- One humidity cell (AMEC 2005),Results from the 2007 seepage survey by Golder and 2009 by SRK (SRK 2009).

These data and reports have been submitted to the NWB.

Total sulphur levels for the 104 samples from AMEC (2005), SRK (2007) and SRK (2009) ranged from 0.03 to 0.22% with median values of 0.08%. NP and TIC analyzed on 55 of these samples ranged from 3.7 to 281.3 kg CaCO3/tonne (median 115.8 kg CaCO3/tonne) and 0.5 to 265.8 kg CaCO3/tonne (median 78.0 kg CaCO3/tonne), respectively. All of the samples from Quarry 1 were classified as non-PAG except one sample from AMEC (2005). This sample was a grab sample classified as uncertain and PAG on the basis of NP/AP and TIC/AP, respectively (AMEC 2005). The geology of the sample was not recorded, however this sample is considered not representative of bulk quarry material because it was obtained from a localized area. Trace element median levels were typically comparable to the fuel tank farm expansion samples, with a few exceptions. Copper levels in the fuel tank farm expansion samples were an order of magnitude lower than Quarry 1 and arsenic and lead were higher, however levels were lower than ten times the average crustal abundance for basaltic rocks.

ABA and trace element results were comparable to samples from the Roberts Bay fuel tank farm area. For this reason, seepage and runoff associated with the proposed development and any rock excavated from this area are expected to exhibit similar characteristics.

The humidity cell (HC) test of Quarry 1 material indicated sulphide depletion rates were extremely low (<1 mg/kg/week) and that the leachates were projected to remain pH neutral (AMEC 2005). Seepage monitoring results indicated that all seep samples were near neutral with metal concentrations generally low with the exception of copper, which was also elevated in reference sites outside of the area of interest.

5 Summary and Recommendations

The geology of the Roberts Bay fuel tank area expansion was consistently logged as mafic volcanic, which is the same rock type as Quarry 1. ABA data (total sulphur and ARD classifications) for 11 samples from the fuel tank expansion area are comparable to the 104 samples from Quarry 1, with all sample containing low sulphur (<0.2%) and moderate levels of NP.

All fuel tank farm expansion samples except one were classified as not-PAG on the basis of NP/AP and TIC/AP ratios. The one sample classified as uncertain on the basis of TIC/AP had a low sulphur content (0.1%), which suggests a limited potential for acid generation. Results from kinetic testing (HC test) and seepage monitoring in 2009 for Quarry 1 materials further support the not-PAG classifications of the fuel tank farm expansion materials.

Special management plans are not require to prevent acidic drainage from developing in this material. SRK recommends a monitoring program to verify the characteristics of these materials following construction. The program would include visual inspection and sampling of both solid materials and seepage flowing from infrastructure, as has already been conducted for the existing Doris North camp, airstrip and roads (SRK 2009).

6 References

AMEC 2005. ARD and Metal Leaching Characterization Studies in 2003 – 2005, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Mining Ltd. by AMEC Earth & Environmental, October 2005.

Price 1997. Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia, DRAFT. British Columbia Ministry of Employment and Investment, April 1997.

SRK 2007. Geochemical Characterization of Quarry Materials, Doris North Project, Hope Bay, Nunavut, Canada (Revised March 2007). Report prepard for Miramar Hope Bay Ltd. by SRK Consulting, March 2007.

SRK 2009. Hope Bay Project Quarry Monitoring. Report prepared for Hope Bay Mining Ltd. by SRK Consulting, November 2009.

Attachment 1
Geology Logs for Roberts Bay Fuel Tank Farm Expansion Drill Holes

Attachment 1: Geology Logs for Roberts Bay Fuel Tank Farm Expansion Drill Holes

Hole	From (m)	To (m)	Sample ID	Lithology Code	Sulphides	C-type or A-type?	Geological Description
SRK-GC-10-08	0.0	1.0	540477	1a	trace pyrite	--	(1a) Fine to medium grained dark greyish green basalt. Hematite stain on cracks, trace fine pyrite disseminated; fizz in cracks & hairline calcite vlets, but rock is unaltered.
SRK-GC-10-08	1.0	2.0	540478	1a	trace pyrite	--	Fine to medium grained dark greyish green basalt. Hematite stain on cracks, trace fine pyrite disseminated; fizz in cracks & hairline calcite vlets, but rock is unaltered. Local mm scale epidote vlets.
SRK-GC-10-08	2.0	3.0	540479	1a	trace pyrite	--	Fine to medium grained dark greyish green basalt. Hematite stain on cracks, trace fine pyrite disseminated; fizz in cracks & hairline calcite vlets, but rock is unaltered. No epidote
SRK-GC-10-08	3.0	4.0	540480	1a	trace pyrite	--	Fine to medium dark greyish basalt. Hematite stain on cracks, trace fine pyrite, disseminated; No epidote, no fizz except for hairline cc vlets.
SRK-GC-10-08	4.0	5.0	540481	1a	3% pyrite	--	(1a) Mix: 50% Fine to medium grained dark greyish green basalt with mm scale quartz-calcite veinelts; 50% fine, possibly weakly sericite-altered basalt with 3% blebbly, discoloured pyrite. Neither fizz, except minor calcite in vlets.
SRK-GC-10-08	5.0	6.0	540482	1a	2% pyrite	--	(1a) Mix: 25%Fine to medium grained dark greyish green basalt, trace pyrite. 75% fine weakly sericitic basalt with 2% pyrite. No fizz.
SRK-GC-10-08	6.0	7.0	540483	1a	1% pyrite	--	Medium grained green basalt with moderate foliation & 1% very fine pyrite. Hairline calcite-hematite vlets. Rock mass = no fizz.
SRK-GC-10-08	7.0	8.0	540484	1a	0.5-1% pyrite	--	Medium to fine grained dark green basalt with moderate foliation and 0.5-1% very fine pyrite; hairline to 2mm scale quartz-calcite vlts with pyrite in rims/edges. No fizz.
SRK-GC-10-09	0.0	1.0	540485	1a	0	--	Medium grained dark greyish-green basalt, weakly foliated, with calcite-hematite hairline vlets; rock mass does not fizz. No pyrite.
SRK-GC-10-09	1.0	2.0	540486	1a	0.5% pyrite	--	Medium grained dark greyish-green basalt, weakly foliated, with calcite-hematite hairline vlets; rock mass does not fizz. 0.5% pyrite.
SRK-GC-10-09	2.0	3.0	540487	1a	0.5% pyrite	--	Medium grained dark greyish-green basalt, weakly foliated, hematite vlets/crack stains, with no calcite. 0.5% pyrite, fine, disseminated; no fizz.
SRK-GC-10-09	3.0	4.0	540488	1a	trace pyrite	--	Mix: 50% medium grained dark green, weakly foliated basalt, trace pyrite. 50% chips same texture, same composition, but a dark reddish brownish green, No fizz either.
SRK-GC-10-09	4.0	5.0	540489	1a	trace pyrite	--	Mix: 50% medium grained dark green, weakly foliated basalt, trace pyrite. 50% chips same texture, same composition, but a dark reddish brownish green, No fizz either.

Hole	From (m)	To (m)	Sample ID	Lithology Code	Sulphides	C-type or A-type?	Geological Description
SRK-GT-10-21	1.4	2.4	540447	1a	2% pyrite	C-type	Mix of 90% fine to medium grained basalt, haematite-filled/coated cracks, 10% very fine yellowish green basalt, C-type, minor sericite + 2% py
SRK-GT-10-21	2.4	3.4	540448	1a/12q/1a	trace pyrite	--	Mix of 80% fine to medium grained basalt with trace py, 10% white quartz with epidote vein material, 10% brick red, fine grained rock, probably a haematite altered fine grained basalt
SRK-GT-10-21	3.4	4.4	540449	1a	--	--	Dark grey to reddish black, fine grained gabbro or very coarse grained basalt with abundant haematite spots.
SRK-GT-10-22	1.8	2.8	540450	1a/9	--	C-type	Mix of 90% foliated fine grained, light to medium gren basalt (C-type) + 10% granite / monzogranite chips.
SRK-GT-10-22	2.8	3.8	540451	1a	trace pyrite	--	Foliated, fine to medium grained, light green basalt with mm scale epidote veinlets and trace anhedral py.
SRK-GT-10-22	3.8	4.8	540452	1a	trace pyrite	--	Foliated, fine to medium grained, light green basalt with mm scale epidote veinlets and trace anhedral py with haematite-faced fractures.
SRK-GT-10-23	2.1	3.1	540453	1a	2% pyrite	--	Fine grained, light green basalt, foliation, 2% anhedral py in quartz and epidote hairline to mm scale cracks. Pervasive epidote and haematite lined cracks.
SRK-GT-10-23	3.1	4.1	540454	1a	1% pyrite	--	Fine grained, light green basalt, foliation, 1% anhedral py in quartz and epidote hairline to mm scale cracks. Pervasive epidote and haematite lined cracks.
SRK-GT-10-23	4.1	5.1	540455	1aa	0.5-1% pyrite	--	Fine grained, light green basalt, foliation, 0.5 to 1% anhedral py in quartz and epidote hairline to mm scale cracks. Pervasive epidote and haematite lined cracks.
SRK-GT-10-24	1.7	2.7	540456	1a	0.5% pyrite	--	Grey with green chlorite blotches, fine grained basalt, weak possible sericite alteration, 0.5% ultrafine pyrite, minor quartz-dolomite veinlets.
SRK-GT-10-24	2.7	3.7	540457	1a	--	C-type	Medium green (C-type) fine grained basalt, with sericite alteration, 10% minor quartz-dolomite veinlets, haematite blobs and stains.
SRK-GT-10-24	3.7	4.7	540458	1a	--	C-type	Medium green (C-type) fine grained basalt, with sericite alteration, 10% minor quartz-dolomite veinlets, haematite blobs and stains.
SRK-GT-10-25	0.9	1.9	540459	1a	1% Pyrite	C-type	Fine light green basalt, possible C-type, 1% very fine disseminated Pyrite. Very weak fizz.
SRK-GT-10-25	1.9	2.9	540460	1a	1% pyrite, 0.5% chalcopyrite	--	Mix: 60% fine weakly sericitized basalt with 1% pyrite; 40% medium grained, dark green, well foliated basalt with 1% pyrite + 0.5% chalcopyrite. No fizz.
SRK-GT-10-25	2.9	3.9	540461	1a	1% pyrite, 0.5% chalcopyrite	--	Mix: 60% fine weakly sericitized basalt with 1% pyrite; 40% medium grained, dark green, well foliated basalt with 1% pyrite + 0.5% chalcopyrite. No fizz.
SRK-GT-10-26	1.2	2.2	540462	1a	0.5% pyrite	--	Dark grey medium-grained basalt with hematite staining & 0.5% fine pyrite. No fizz.
SRK-GT-10-26	2.2	3.2	540463	1a	0.5% pyrite	--	Mix: 50% dark grey fine grained basalt with hematite staining & 0.5% pyrite; 50% coarse dark green basalt. No fizz.
SRK-GT-10-26	3.2	4.2	540464	1a	0	--	Coarse dark green basalt; no pyrite or fizz.
SRK-GT-10-27	0.3	1.3	540465	1a	--	--	Medium grained chl.altered basalt with 10% mm scale calcite vlets (no pervasive chl.alt.) Minor epidote present.
SRK-GT-10-27	1.3	2.3	540466	1a	--	--	Medium grained chl.altered basalt with 10% mm scale calcite vlets (no pervasive chl.alt.) Minor epidote present.
SRK-GT-10-27	2.3	3.3	540467	1a	--	--	Medium grained chl.altered basalt with 10% mm scale calcite vlets (no pervasive chl.alt.) Minor epidote present.
SRK-GT-10-28	0.9	1.9	540468	1a	--	--	Dark maroon-grey, medium-grained Basalt. No fizz.
SRK-GT-10-28	1.9	2.9	540469	1a	Trace Pyrite	--	Mix: 80% Dark maroon-grey, medium-grained Basalt; 20% Dark maroon-grey, medium-grained basalt with orange quartz & trace fine pyrite. No fizz.
SRK-GT-10-28	2.9	3.9	540470	1a	1-3% Pyrite	--	Mix: 90% dark maroon, medium to coarse grained basalt; 10% syenogranite chips bearing ca. 1-3% medium-grained pyrite. no fizz.
SRK-GT-10-29	0.0	1.0	540471	1a	Trace Pyrite	--	Fine grained, medium green basalt with trace pyrite. No fizz.
SRK-GT-10-29	1.9	2.9	540472	1a	Trace Pyrite	--	Fine grained, medium green basalt with trace pyrite, accessory epidote, hematite on joint faces. No fizz.
SRK-GT-10-29	2.9	3.9	540473	1a	Trace Pyrite	--	Fine grained, medium green basalt with trace pyrite, accessory epidote, hematite on joint faces. No fizz.
SRK-GT-10-30	4.0	5.0	540474	1a	Trace Pyrite	--	Fine to medium grain, dark greenish grey basalt. Trace pyrite. No fizz.
SRK-GT-10-30	5.0	6.0	540475	1a	--	--	Fine to medium grain, dark greenish grey basalt + 10% orange, mm scale quartz vlets. No fizz.
SRK-GT-10-30	6.0	7.0	540476	1a	--	--	Fine to medium grain, dark greenish grey basalt+ 20% orange quartz vlets. No fizz.

Attachment 2

Total Sulphur and ABA Data for
Roberts Bay Fuel Tank Farm Expansion Area Samples

Attachment 2: Total Sulphur and ABA Data for Roberts Bay Fuel Tank Farm Expansion Area Samples

CANTEST
A Maxxam Company

SRK Consulting Inc. - Hopebay, 3-Mar-10

CANTEST Ltd. 4606 Canada Way, Burnaby, BC Canada V5G 1K5 Tel: 604 734 7276 Fax: 604 731 2386 www.cantest.com

Table 1: ABA Test Results for 41 and Total Sulphur Results for 126 (of 172) SRK-Hopebay (Doris Camp samples) Pulp Samples - March 2010

			Acme		Acme				Mod. ABA NP		
S. No.	Sample ID	Paste pH	CO2 (Wt.%)	CaCO3 Equiv.* (Kg CaCO3/Tonne)	Total Sulphur (Wt.%)	Sulphate Sulphur (Wt.%)	Sulphide Sulphur** (Wt.%)	Maximum Potential Acidity*** (Kg CaCO3/Tonne)	Neutralization Potential (Kg CaCO3/Tonne)	Net Neutralization Potential**** (Kg CaCO3/Tonne)	Fizz Rating
62	540477	9.0	2.20	50.0	<0.02	<0.01	<0.02	<0.6	64.8	64.8	Strong
63	540479				0.06						
64	540481	9.2	3.28	74.5	0.04	<0.01	0.04	1.3	94.0	92.8	Strong
65	540482				0.07						
66	540483				0.07						
67	540484	9.3	4.33	98.4	0.05	<0.01	0.05	1.6	119.5	117.9	Strong
68	540485	9.2	0.41	9.3	0.06	<0.01	0.06	1.9	23.0	21.1	Moderate
69	540486				0.06						
70	540487	9.4	0.29	6.6	0.05	<0.01	0.05	1.6	16.1	14.6	Slight
71	540488				0.03						
72	540489	9.6	0.66	15.0	0.03	<0.01	0.03	0.9	28.5	27.6	Moderate
107	540448	9.6	3.36	76.4	0.08	<0.01	0.08	2.5	83.8	81.3	Strong
108	540449				0.04						
109	540450	9.0	1.02	23.2	0.04	<0.01	0.04	1.3	37.4	36.1	Moderate
110	540452				0.03						
111	540453				0.09						
112	540455				0.07						
113	540456				0.07						
114	540458				0.06						
115	540460				0.06						
116	540461				0.07						
117	540463				0.07						
118	540464				0.03						
119	540466				0.05						
120	540467				0.06						
121	540468	8.8	0.50	11.4	0.08	0.01	0.07	2.2	27.6	25.4	Slight
122	540470	9.5	0.36	8.2	0.10	<0.01	0.10	3.1	22.8	19.6	Slight
123	540471				0.04						
124	540473				0.04						
125	540474	8.9	0.49	11.1	0.09	<0.01	0.09	2.8	25.3	22.4	Moderate
126	540476				0.10						

Notes:

Total sulphur and carbonate carbon (CO_2; HCl direct method) by Leco done at Acme Labs.

CO_2 Analysis: 0.2g of pulp sample is digested with 6 ml of 1.8N HCl in a hot water bath of 70 ˚C for 30 minutes. The CO_2 that evolves is trapped in a gas chamber that is controlied with a stopcock, once the stopcock is opened the CO_2 gas is swept into the Leco analyser with an oxygen carrier gas. Leco then determines the CO_2 as total-carbon which is calculated to total CO_2.

Calculations:

*CaCO3 equivalents is based on carbonate carbon.

**Sulphide sulphur is based on difference between total sulphur and sulphate sulphur.

***MPA (Maximum Potential Acidity) is based on sulphide sulphur .

**** NNP (Net Neutralization Potential) is based on difference between Neutralization Potential (NP) and MPA.

References:

Reference for Mod ABA NP method (SOP No. 7150): MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Attachment 3

Trace Metal Data for
Roberts Bay Fuel Tank Farm Expansion Area Samples

Attachment 3: Trace Metal Data for Roberts Bay Fuel Tank Farm Expansion Area Samples

CANTEST
A Maxxam Company

SRK Consulting Inc. - Hopebay, 3-Mar-10

CANTEST Ltd. 4606 Canada Way, Burnaby, BC Canada V5G 1K5 Tel: 604 734 7276 Fax: 604 731 2386 www.cantest.com

Table 3: Trace Metals Using Aqua Regia Digestion with ICP-MS Finish for 41 (of 172) SRK-Hopebay (Doris Camp samples) Pulp Samples - March 2010

S. No.	Sample ID	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Hg ppm	Sc ppm	Tl ppm	S %	Ga ppm	Se ppm	Te ppm
62	540477	0.20	118.9	0.8	61	<0.1	80.4	32.9	873	4.7	1.1	<0.1	0.9	0.1	21	<0.1	<0.1	<0.1	119	2.56	0.023	1	255	2.89	1	0.398	<20	3.17	0.024	0.03	<0.1	<0.01	5.5	<0.1	<0.05	6	<0.5	<0.2
63	540479																																					
64	540481	0.20	104.4	1.2	53	<0.1	82.8	32.2	868	4.5	1.4	<0.1	2.2	0.1	22	<0.1	<0.1	<0.1	111	3.46	0.022	1	261	2.58	2	0.38	<20	3.07	0.038	0.03	<0.1	<0.01	4.8	<0.1	<0.05	6	1	<0.2
65	540482																																					
66	540483																																					
67	540484	0.20	85.3	9	62	<0.1	87	36.2	934	4.8	1.7	<0.1	2.3	0.1	21	<0.1	<0.1	<0.1	131	4.23	0.022	1	282	2.97	3	0.354	<20	3.37	0.042	0.03	<0.1	<0.01	5.9	<0.1	<0.05	7	0.7	<0.2
68	540485	0.20	143	1.6	51	<0.1	47.9	35.2	639	3.59	0.7	<0.1	1.7	0.1	17	<0.1	<0.1	<0.1	83	1.15	0.026	2	76	1.92	3	0.289	<20	2.23	0.043	0.03	<0.1	<0.01	2.8	<0.1	<0.05	5	0.9	<0.2
69	540486																																					
70	540487	0.60	130.3	1.1	41	<0.1	42.4	22.4	465	3.06	<0.5	<0.1	2.3	<0.1	24	<0.1	<0.1	<0.1	68	0.98	0.023	1	78	1.58	2	0.269	<20	1.79	0.043	0.03	0.2	<0.01	2.6	<0.1	<0.05	4	0.6	<0.2
71	540488																																					
72	540489	0.70	96.8	1.5	64	<0.1	51.3	34.4	827	5.82	0.9	0.1	2.4	0.6	25	<0.1	<0.1	<0.1	132	1.31	0.058	8	59	2.31	8	0.429	<20	2.51	0.074	0.05	<0.1	<0.01	6.3	<0.1	<0.05	10	<0.5	<0.2
107	540448	0.80	157.9	3.5	52	<0.1	60.5	36.8	843	5.31	0.6	<0.1	3	0.2	25	<0.1	<0.1	<0.1	157	3.31	0.027	2	182	2.74	4	0.357	<20	2.85	0.083	0.05	<0.1	<0.01	5.1	<0.1	0.08	7	0.6	<0.2
108	540449																																					
109	540450	1.70	82.9	1	48	0.4	141.4	37.6	714	4.21	5.8	<0.1	<0.5	0.5	7	<0.1	<0.1	<0.1	87	1.16	0.027	4	480	3.34	9	0.204	<20	2.84	0.031	0.05	<0.1	<0.01	2.8	<0.1	<0.05	7	<0.5	<0.2
110	540452																																					
111	540453																																					
112	540455																																					
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115	540460																																					
116	540461																																					
117	540463																																					
118	540464																																					
119	540466																																					
120	540467																																					
121	540468	0.90	74.8	2	59	<0.1	59.6	54.8	981	7.42	1.1	0.2	0.7	1.3	38	<0.1	<0.1	<0.1	138	1.32	0.114	16	27	2.21	26	0.365	<20	2.79	0.132	0.17	<0.1	<0.01	7.1	0.2	0.07	10	<0.5	<0.2
122	540470	0.80	63.2	3.5	70	<0.1	55.6	50.8	1051	7.3	1	0.1	<0.5	1.2	32	<0.1	<0.1	<0.1	123	1.14	0.114	14	23	2.31	17	0.379	<20	2.94	0.114	0.1	0.1	<0.01	6.4	<0.1	0.09	11	<0.5	<0.2
123	540471																																					
124	540473																																					
125	540474	0.30	89.7	7.3	55	<0.1	51	26.4	673	3.68	1.5	0.1	1.2	0.9	14	<0.1	<0.1	<0.1	83	1.06	0.028	4	88	2.17	10	0.252	<20	2.25	0.085	0.06	0.1	<0.01	2.5	<0.1	0.08	5	0.6	<0.2
126	540476																																					

Note:
Analysis done at Acme Labs.