Project Memo

H349001

March 25, 2015

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Mary River Project

Final Environmental Impact Statement (FEIS) Closure and Reclamation - Financial Security Estimate Addendum

1. Objective

The objective of this document is to provide a revised ultimate reclamation security estimate of the entire currently envisioned Mary River Project upon project completion as described in the Final Environmental Impact Statement (FEIS) (FEIS 2012 and FEIS Addendum 2013). This estimate has been revised from the originally presented version provided in original FEIS, Appendix 10G - Preliminary Mine Closure and Reclamation Plan (H337697-0000-07-126-0014, Rev. D) to capture Early Revenue Phase (ERP) components.

2. Context

The Mary River Project is an advanced iron ore Project (the Project) located on north Baffin Island, in the Qikiqtani Region of Nunavut. The basis of the Project is production and shipment of high grade iron ore from Deposit No.1 located on North Baffin Island in the Qikiqtani Region of Nunavut. There are three (3) main project locations consisting of the Mine Site, Milne Port located north of the Mine Site, and, Steensby Port located south of the Mine Site. The Mine Site is located approximately 160 km south of Pond Inlet (Mittimatalik) and approximately 1,000 km northwest of Iqaluit. Milne Port is connected to the Mine Site by a 115 km Tote Road. A 149 km railway will eventually be constructed to connect Steensby Port to the Mine Site.

In February, 2012, Baffinland Iron Mines Corporation (Baffinland) submitted the FEIS for the originally envisioned project. Accompanying this original FEIS submission was a Preliminary Mine Closure and Reclamation Plan (H337697-0000-07-126-0014, Rev. D) which presented an estimated closure and reclamation costs based on the Project Description available at the time of submission (estimated as $518,711,208 CAD). The Nunavut Impact Review Board (NIRB) issued the Project Certificate, Project Certificate No. 005, for this Project on December 28, 2012. After the receipt of the Project Certificate the Nunavut Water Board (NWB) granted Type A Water Licence 2AM-MRY1325 for the Project in June 2013.

Based on the Terms and Conditions of Type A Water Licence 2AM-MRY1325 (Part C and Schedule C) and as also required under Section 9.2 of the Commercial Lease, No. Q13C301, agreed to between Baffinland and the Qikiqtani Inuit Association (QIA) an annual adjustment to reclamation security, or 'Annual Security Review (ASR)', was established to determine Project Security required to be posted on an annual basis moving forward. The amount of security required to be posted following the ASR is based on both an estimate of the highest reclamation liability in the upcoming year and the activities planned for in the annual Work Plan. This ASR process became the overriding mechanism to establish security for the Project in an effort to avoid 'over bonding' by ensuring the security required to be posted for the Project reflected the reclamation liability in the upcoming year only.

On January 13, 2013 Baffinland informed the NIRB that, due to various business drivers, Baffinland was proposing to make changes to the schedule and specific activities in the initial stages of the development associated with the Mary River Project. The revised Project plan calls for a phased development approach. Initially, Milne Port will be developed and the Tote Road will be upgraded to enable the Company to mine and ship a nominal 3.5 Mtpa of ore via Milne Port. This initial phase is termed the 'Early Revenue Phase' (ERP). At a later stage, the Railway will be constructed that will connect the Mine Site at Mary River to a newly constructed Port in Steensby Inlet on the southwestern coast of Baffin Island. The ERP introduces the following additional infrastructures that were not part of the original approved Project:

1. Milne Port:
    i) Ore stockpiling, reclaiming and loading equipment.
    ii) Ore dock.
2. Mine Site
    i) Truck haulage fleet.

The NIRB issued an amended Project certificate on May 28, 2014 to allow Baffinland to proceed with the ERP. An application to amend the Type A Water Licence to account for activities approved for the Early Revenue Phase was submitted to the NWB on July 16, 2014, and is currently under review. Technical meetings and Pre-Hearing Conference for this amendment application were held and January 28-29, 2015 and during these meetings the NWB requested Baffinland to submit a revised estimate of the ultimate reclamation security for the entire project as part of its updated Interim Abandonment and Reclamation Plan. As stated in Section 1, that is the aim of this document. It is noted however that the ASR process is the overriding mechanism to establish security for the Project on an annual basis.

3. Approach

The closure cost estimate presented herein is based on the closure cost estimate presented in the original FEIS Appendix 10G - Preliminary Mine Closure and Reclamation Plan (H337697-0000-07-126-0014, Rev. D). This closure cost estimate was estimated using The Mining RECLAIM spreadsheet – version 6, provided by Aboriginal Affairs and Northern Development Canada (AANDC). In order to capture Early Revenue Phase (ERP) components that were not considered in the original estimate, a hybrid system of RECLAIM and a Hatch developed Project-specific security estimate methodology was used. The Hatch developed Project-specific security estimate methodology (herin referred to as 'the Hatch Assessment Methodology') was developed for the Mary River Project in 2014[1] for the purpose of the ASR process to address stakeholder concerns of increasing transparency and understanding in the security estimate process while maintaining an estimate approach that is consistent with AANDC expectations.

The Hatch Assessment Methodology is made up of a detailed direct cost estimate for each of the reclamation activities identified for each project component (e.g. site development, mobile equipment, stockpiles, site utilities, etc.). A cost is developed based on the number of person-days, equipment hours and fuel consumption estimated to complete each reclamation activity required for each project component. Thus, the cost of each reclamation activity is estimated on the basis of the product of the quantity of functional unit costs and the estimate of an individual unit cost. Quantification of functional units for each reclamation activity was completed based on Hatch's estimate breakdown structure (EBS). The EBS is a numeric code of accounts for the logical division and sub-division of the work in a hierarchical manner. The EBS covers the complete scope of work for the Project. The project is divided into geographically based areas with each area further subdivided into facilities and systems. This approach was chosen to remain consistent with RECLAIM approach while incorporating unit cost that were developed based on Project specific information. For more information please refer to the 2014 Complete Project Financial Security Assessment (H349000-1000-07-126-0018, Rev. 1), and 2015 Marginal Closure and Reclamation Financial Security Estimate (H349000-1000-07-126-0019, Rev. 0).

RECLAIM methodology considers each project component as well and reclamation cost is based on a functional unit for that project component (e.g. m2 for building foot print, m3 for earthworks, etc.). Then based on experience/data available to the developers or the users a unit cost is assigned for reclaiming that functional unit. Unit cost is inclusive of fuel/labour/equipment. A global contingency is applied based on user experience (e.g. Hatch) and the level of confidence the user has in the accuracy the representative costs for reclamation of the project. In this case, a contingency of 10% for all activities was chosen by Hatch based on the type of activities being carried out to meet reclamation objectives.

[1] As described in the 2014 Complete Project Financial Security Assessment (H349000-1000-07-126-0018, Rev. 1), and 2015 Marginal Closure and Reclamation Financial Security Estimate (H349000-1000-07-126-0019, Rev. 0)

A hybrid method of these two (2) approaches was used by taking the total man-hour and equipment hour cost (in dollars) developed in the Hatch Assessment Methodology for each activity and/or component related to Milne Port and the Tote Road and then carrying that cost over into RECLAIM at identical values. For example, if the cost to reclaim a quarry on the Tote Road was estimated as $20,000 in the Hatch Assessment Methodology, then it was assigned 20,000 units @ $1 in the RECLAIM model. This hybrid approach was only used for Milne Port and Tote Road project components. The estimated security required for Projects components at the Mine Site, Railway and Steensby Port and activities associated with Chemicals And Soil Management, Water Management, Post-Closure Monitoring and Maintenance, and Mobilization/Demobilization remain consistent with the Preliminary Mine Closure and Reclamation Plan (H337697-0000-07-126-0014, Rev. D) submitted with the original FEIS.

In addition to the 10% global contingency applied to all closure estimates using the RECLAIM model, Hatch also included a 5% of capital costs allowance for Project Management in this FEIS Closure and Reclamation Financial Security Estimate update. This was deemed to be sufficient to cover anticipated Project Management costs. Hatch also included a 1% of capital cost allowance for bonding, a 1% of capital costs allowance for insurance and a 5% of capital cost allowance for engineering. Hatch is in the position that these total additional allowances area reasonable allocation of costs based on the level of required work. Based on calculations of the RECLAIM Model, the cost of reclamation of the Mary River Project is presented in Table 4-1.

3.1 Closure Scenario

FEIS Closure and Reclamation Financial Security Estimate update is based on a scenario that assumes all planned activities described in the FEIS (FEIS 2012 and FEIS Addendum 2013) have taken place on site. For the purpose of the cost estimate, the FEIS Closure and Reclamation Financial Security Estimate update assumes all activities as described in the Mary River Project Interim Closure and Reclamation Plan (BAF-PH1-830-P16-0012, Rev. 3) have been conducted as described.

4. Closure Cost Summary

Table 4-1 represents a summary of the closure cost estimate for the Mary River Project to meet the reclamation objectives outlined in the Mary River Project Interim Closure and Reclamation Plan (BAF-PH1-830-P16-0012, Rev. 3) upon completion of the Project as described in the FEIS (FEIS 2012 and FEIS Addendum 2013).

The estimated closure and reclamation cost required project wide is calculated by using the hybrid approach described in Section 3. Land and water liability for the purpose of the costs developed using the Hatch Assessment Methodology approach was assumed to be consistent with the overall allocation land and water liability in the most recent the ASR submissions on a percentage basis[2] (90% land, 10% water).

[2] 2014 Complete Project Financial Security Assessment (H349000-1000-07-126-0018, Rev. 1), and 2015 Marginal Closure and Reclamation Financial Security Estimate (H349000-1000-07-126-0019, Rev. 0)

Table 4-1: Closure and Reclamation Cost Total Summary

COMPONENT TYPE	COMPONENT NAME	TOTAL COST	LAND LIABILITY	WATER LIABILITY
OPEN PIT	Mary River Mine Pit	$1,455,765	$1,449,650	$6,116
UNDERGROUND MINE	-	$0	$0	$0
TAILINGS	-	$0	$0	$0
ROCK PILE	Mary River Stockpile	$192,957	$16,667	$176,290
BUILDINGS AND EQUIPMENT	Milne Port	$10,690,000	$9,621,000	$1,069,000
	Tote Road	$4,120,000	$3,708,000	$412,000
	Mary River Mine	$23,488,970	$23,244,356	$244,614
	Railway	$14,345,812	$12,756,932	$1,588,880
	Steensby Port	$10,506,669	$10,289,403	$217,266
CHEMICALS AND SOIL MANAGEMENT		$144,940,175	$145,126,575	$0
WATER MANAGEMENT		$239,772	$0	$239,772
POST-CLOSUREMONITORING AND MAINTENANCE		$52,295,597	$51,782,771	$512,826
	SUBTOTAL	**$262,275,717**	**$257,995,353**	**$4,466,764**
		PERCENTAGES	**98%**	**2%**
MOBILIZATION/DEMOBILIZATION		$206,549,913	203,178,999	3,517,709
PROJECT MANAGEMENT	5%	$13,113,786	$12,899,768	$223,338
Bonding	1%	$2,622,757	$2,579,954	$44,668
Taxes (GST on supplies) - est.	allowance	$0	$0	$0
Insurance	1%	$2,622,757	$2,579,954	$44,668
ENGINEERING	5%	$13,113,786	$12,899,768	$223,338
CONTINGENCY	10%	$26,227,572	$25,799,535	$446,676
Market Price Factor Adjustment	0%	$0	$0	$0
GRAND TOTAL - CAPITAL COSTS		**$526,526,287**	**$517,933,329**	**$8,967,162**

5. Supporting Documents

In addition to information presented within this document, please refer to the following for supporting information:

- Refer to Attachment A of this document for Mining RECLAIM screenshots of the FEIS Closure and Reclamation Financial Security Estimate update to consider ERP.
- Refer to Preliminary Mine Closure and Reclamation Plan (H337697-0000-07-126-0014, Rev. D) submitted with the original FEIS for the assumptions used to establish the cost allocations for the purpose of the FEIS Closure and Reclamation Financial Security Estimate update in respect to the Mary River Mine Site, the Railway, and Steensby Port and activities associated with Chemicals And Soil Management, Water Management, Post-Closure Monitoring and Maintenance, and Mobilization/Demobilization.
- Refer to the 2014 Complete Project Financial Security Assessment (H349000-1000-07-126-0018, Rev. 1) and 2015 Marginal Closure and Reclamation Financial Security Estimate (H349000-1000-07-126-0019, Rev. 0) for the assumptions used to establish the direct cost allocations for the purpose of the FEIS Closure and Reclamation Financial Security Estimate update in respect to the Mary River Mine Site, the Railway, and Steensby Port.
- Refer to Mary River Project Interim Closure and Reclamation Plan (BAF-PH1-830-P16-0012, Rev. 3) for a description of the closure strategy, activities, goals, principles, objectives and criteria used as a basis to establish the FEIS Closure and Reclamation Financial Security Estimate.

A. Grzegorczyk

AG:cb
Attachment(s)/Enclosure :

Attachment A: Mining RECLAIM Screenshots of FEIS Closure and Reclamation Financial Security Estimate

Attachment A: Mining RECLAIM Screenshots of FEIS Closure and Reclamation Financial Security Estimate

Open Pit Name: ***Mary River Mine Pit*** **Pit #** ***1***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: CONTROL ACCESS								
Fence	m		#N/A	0.00	$0	100%	$0	$0
Signs	each	9	SH	35.64	$321	100%	$321	$0
Berm at crest	m	4300	RBS	29.53	$126,969	100%	$126,969	$0
Block roads	m3		#N/A	0.00	$0		$0	$0
Other			#N/A		$0		$0	$0
OBJECTIVE: STABILIZE SLOPES								
Off-load crest, soil A	m3		#N/A	0	$0		$0	$0
Off-load crest, soil B	m3		#N/A	0	$0		$0	$0
Doze/trimoverburden at crest	m3		#N/A	0	$0		$0	$0
Drill & blast pit crest	m3		#N/A	0	$0		$0	$0
buttress slope	m3		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: COVER/CONTOUR SLOPES								
Dump demolition materials (pit or landfill or qı	m3	3724.3566	SC1H	8.262	$30,771	100%	$30,771	$0
Place overburden over demolition material	m3	124145.22	RB1L	10.098	$1,253,618	100%	$1,253,618	$0
Rip rap	m3		#N/A	0	$0		$0	$0
Vegetate slopes	ha		#N/A	0	$0		$0	$0
Vegetate pit floor	ha		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: SPILLWAY								
Excavate channel, soil A	m3	375	RC2H	16.308	$6,116		$0	$6,116
Excavate channel, soil B	m3		#N/A	0	$0		$0	$0
Concrete	m3		#N/A	0	$0		$0	$0
Rip rap	m3		#N/A	0	$0		$0	$0
Other	each		#N/A	0	$0		$0	$0
OBJECTIVE: FLOOD PIT								
remove stationary equipment (sump pump)	each		#N/A	0	$0		$0	$0
remove power lines	each		#N/A	0	$0		$0	$0
Embankment/dam - Soil A	m3		#N/A	0	$0		$0	$0
Embankment/dam - Soil B	m3		#N/A	0	$0		$0	$0
supply/install pump & piping system	each		#N/A	0	$0		$0	$0
operate pumps to flood pit	each		#N/A	0	$0		$0	$0
Llme addition, _____ kg/m3 of water	tonne		#N/A	0	$0		$0	$0
Lime, purchase and shipping	tonne		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
RECLAIM QUARRIES								
Contour slopes	m3	3238.09524	DSH	3.3588	$10,876	100%	$10,876	$0
Berm at crest	m3		#N/A	0	$0		$0	$0
Place overburder	m3	809.52381	SBCL	3	$2,429	100%	$2,429	$0
Vegetate	m3		#N/A	0	$0		$0	$0
OTHER ITEMS								
Stability inspection		1	sis	16667	$16,667	100%	$16,667	$0
Reclaim road to primary crusher (scarification)		8	scs	1000	$8,000	100%	$8,000	$0
				Subtotal	$1,455,765	100%	$1,449,650	$6,116
						Pct Land	Total Land	Total Water

Figure A-1: Mine Closure and Reclamation Cost – Open pit

Rock Pile Name: *Mary River Stockpile* **Rock Pile #: *1***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: STABILIZE SLOPES								
Flatten slopes with dozer	m3		#N/A	0	$0		$0	$0
Flatten "bubble dump" areas	m3		#N/A		$0		$0	$0
Divert runon, ditch mat'l A	m3		#N/A	0	$0		$0	$0
, ditch mat'l B	m3		#N/A	0	$0		$0	$0
Toe buttress, drain mat'l	m3		#N/A	0	$0		$0	$0
, fill mat'l A	m3		#N/A	0	$0		$0	$0
, fill mat'l B	m3		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: COVER DUMP								
Mat'l A	m3		#N/A		$0		$0	$0
Mat'l B	m3		#N/A	0	$0		$0	$0
Rip rap	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Other (scarify)	m2	176.29	SCS	1000	$176,290		$0	$176,290
VERY LOW PERMEABILITY COVER								
supply geomembrame, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
upper and lower bedding layers	m3		#N/A	0	$0		$0	$0
install geomembrane, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
erosion protection layer	m3		#N/A	0	$0		$0	$0
vegetate	ha		#N/A	0	$0		$0	$0
install infiltration/seepage instrumentation	allow		#N/A	0	$0		$0	$0
OBJECTIVE: RELOCATE DUMPS								
Load, haul, dump or doze	m3		#N/A	0	$0		$0	$0
Add lime	tonne		#N/A	0	$0		$0	$0
Contour reclaimed area	ha		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
SPECIALIZED ITEMS								
Stability inspection		1	sis	16667	$16,667	100%	$16,667	$0
install permanent instrumentation, drilling			#N/A		$0		$0	$0
				Subtotal	$192,957	9%	$16,667	$176,290
						% Land	Total Land	Total Water

Figure A-2: Mine Closure and Reclamation Cost – Mary River Mine Site Stockpiles

Building / Equip Name: *Milne Port* **Bldg / Equip #: *1***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
Other (sealift for equipmt)	each		#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE CONTAMINATED BUILDINGS								
Decontaminate crushing plant	each		#N/A	0	$0		$0	$0
Decontaminate tanks & plumbing	each		#N/A	0	$0		$0	$0
Decontaminate thickeners	each		#N/A	0	$0		$0	$0
Decontaminate water treatment plant	each		#N/A	0	$0		$0	$0
Decontaminate maintenance shop	each		#N/A	0	$0		$0	$0
Decontaminate power plant	each		#N/A	0	$0		$0	$0
Decontaminate bulk fuel storage	each		#N/A	0	$0		$0	$0
Decontaminate ANFO plant	each		#N/A	0	$0		$0	$0
Deontaminate offices/warehouse/accom	each		#N/A	0	$0		$0	$0
Removal of asbestos siding on buildings	each		#N/A	0	$0		$0	$0
Removal of friable asbestos on equipment	each		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE NON-CONTAMINATED BUILDINGS								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
consolidate & dump boneyard debris	m3		#N/A	0	$0		$0	$0
other			#N/A	0	$0		$0	$0
OBJECTIVE: BREAK BASEMENT SLABS								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
Other	m2		#N/A	0	$0		$0	$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
OBJECTIVE: GRADE AND CONTOUR MILL & PLANT SITE								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
other	m2		#N/A	0	$0		$0	$0
OBJECTIVE: RECLAIM ROADS								
Remove culverts	each		#N/A	0	$0		$0	$0
Remove bridges	each		#N/A	0	$0		$0	$0
Scarify and install water breaks	ha		#N/A	0	$0		$0	$0
remove/doze down berms	m3		#N/A	0	$0		$0	$0
create wildilfe passage ramps	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
other			#N/A	0	$0		$0	$0
SPECIALIZED ITEMS								
	each	0	#N/A	0	$0		$0	$0
HATCH ASSESMENT METHODOLOGY RESULT FROM ASR	each	10690000		1	$10,690,000	90%	$9,621,000	$1,069,000
				Subtotal	$10,690,000	90%	$9,621,000	$1,069,000
						Pct Land	Total Land	Total Water

Figure A-3: Mine Closure and Reclamation Cost – Milne Port

Building / Equip Name: *Tote Road* **Bldg / Equip #: *2***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
Other	each		#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE CONTAMINATED BUILDINGS								
Decontaminate crushing plant	each		#N/A	0	$0	100%	$0	$0
Decontaminate tanks & plumbing	each		#N/A	0	$0	100%	$0	$0
Decontaminate thickeners	each		#N/A	0	$0	100%	$0	$0
Decontaminate water treatment plant	each		#N/A	0	$0	100%	$0	$0
Decontaminate maintenance shop	each		#N/A	0	$0	100%	$0	$0
Decontaminate power plant	each		#N/A	0	$0	100%	$0	$0
Decontaminate bulk fuel storage	each		#N/A	0	$0	100%	$0	$0
Decontaminate ANFO plant	each		#N/A	0	$0	100%	$0	$0
Deontaminate offices/warehouse/accom	each		#N/A	0	$0	100%	$0	$0
Removal of asbestos siding on buildings	each		#N/A	0	$0	100%	$0	$0
Removal of friable asbestos on equipment	each		#N/A	0	$0	100%	$0	$0
Other			#N/A	0	$0	100%	$0	$0
OBJECTIVE: REMOVE NON-CONTAMINATED BUILDINGS								
crushing plant	m2		#N/A	0	$0	100%	$0	$0
conveyors & transfer towers	m2		#N/A	0	$0	100%	$0	$0
tanks & plumbing	m2		#N/A	0	$0	100%	$0	$0
thickeners	m2		#N/A	0	$0	100%	$0	$0
water treatment plant	m2		#N/A	0	$0	100%	$0	$0
maintenance shop	m2		#N/A	0	$0	100%	$0	$0
power plant	m2		#N/A	0	$0	100%	$0	$0
bulk fuel storage	m2		#N/A	0	$0	100%	$0	$0
ANFO plant	m2		#N/A	0	$0	100%	$0	$0
offices/warehouse/accom	m2		#N/A	0	$0	100%	$0	$0
consolidate & dump boneyard debris	m3		#N/A	0	$0	100%	$0	$0
other	m2		#N/A	0	$0	100%	$0	$0
OBJECTIVE: BREAK BASEMENT SLABS								
crushing plant	m2		#N/A	0	$0	100%	$0	$0
conveyors & transfer towers	m2		#N/A	0	$0	100%	$0	$0
tanks & plumbing	m2		#N/A	0	$0	100%	$0	$0
thickeners	m2		#N/A	0	$0	100%	$0	$0
water treatment plant	m2		#N/A	0	$0	100%	$0	$0
maintenance shop	m2		#N/A	0	$0	100%	$0	$0
power plant	m2		#N/A	0	$0	100%	$0	$0
bulk fuel storage	m2		#N/A	0	$0	100%	$0	$0
ANFO plant	m2		#N/A	0	$0	100%	$0	$0
offices/warehouse/accom	m2		#N/A	0	$0	100%	$0	$0
Other	m2		#N/A	0	$0	100%	$0	$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
OBJECTIVE: GRADE AND CONTOUR MILL & PLANT SITE								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
other	m2		#N/A	0	$0		$0	$0
OBJECTIVE: RECLAIM ROADS								
Remove box culverts & stabilize slopes	each		#N/A	0	$0		$0	$0
Remove round culverts & stabilize slopes	each		#N/A	0	$0		$0	$0
Install water breaks	ha		#N/A	0	$0		$0	$0
remove/doze down berms	m3		#N/A	0	$0		$0	$0
create wildlife passage ramps	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
other			#N/A	0	$0		$0	$0
SPECIALIZED ITEMS								
HATCH ASSESMENT METHODOLOGY RESULT FROM AS	each	4120000		1	$4,120,000	90%	$3,708,000	$412,000
				Subtotal	$4,120,000		$3,708,000	$412,000
						Pct Land	Total Land	Total Water

Figure A-4: Mine Closure and Reclamation Cost – Tote Road

Building / Equip Name: ***Mary River Mine*** **Bldg / Equip #:** ***3***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site	each		#N/A	0	$0	100%	$0	$0
Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
Other (remove airstrip lightning)	each	1	RALS	10099	$10,099	100%	$10,099	$0
OBJECTIVE: REMOVE CONTAMINATED BUILDINGS								
Decontaminate crushing plant	each		#N/A	0	$0	100%	$0	$0
Decontaminate tanks & plumbing	each		#N/A	0	$0		$0	$0
Decontaminate thickeners	each		#N/A	0	$0		$0	$0
Decontaminate water treatment plant	each		#N/A	0	$0		$0	$0
Decontaminate maintenance shop	each	1900	BRCdS	200	$380,000	100%	$380,000	$0
Decontaminate power plant	each	6804	BRCdS	200	$1,360,800	100%	$1,360,800	$0
Decontaminate bulk fuel storage	each	9847.5	BRCdS	200	$1,969,500	100%	$1,969,500	$0
Decontaminate ANFO plant	each	930.25	BRCdS	200	$186,050	100%	$186,050	$0
Deontaminate offices/warehouse/accom	each		#N/A	0	$0		$0	$0
Removal of asbestos siding on buildings	each		#N/A	0	$0		$0	$0
Removal of friable asbestos on equipment	each		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE NON-CONTAMINATED BUILDINGS								
crushing plant	m2	1350	BRS	100	$135,000	100%	$135,000	$0
conveyors & transfer towers	m2	869	BRS	100	$86,900	100%	$86,900	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1930.2	BRS	100	$193,020		$0	$193,020
maintenance shop	m2		#N/A	0	$0	100%	$0	$0
power plant	m2		#N/A	0	$0	100%	$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0	100%	$0	$0
offices/warehouse/accom	m2	18061.76	BRS	100	$1,806,176	100%	$1,806,176	$0
consolidate & dump boneyard debris	m3	1200	BRS	100	$120,000	100%	$120,000	$0
other	m2	4439.94	BRS	100	$443,994	100%	$443,994	$0
OBJECTIVE: BREAK BASEMENT SLABS								
crushing plant	m2	1350.0	BRCH	53.46	$72,171	100%	$72,171	$0
conveyors & transfer towers	m2	869	BRCS	26.73	$23,228	100%	$23,228	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1930.2	BRCS	26.73	$51,594		$0	$51,594
maintenance shop	m2	1900	BRCS	26.73	$50,787	100%	$50,787	$0
power plant	m2	6804	BRCS	26.73	$181,871	100%	$181,871	$0
bulk fuel storage	m2	13130	BRCS	26.73	$350,965	100%	$350,965	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	14979.0	BRCS	26.73	$400,388	100%	$400,388	$0
Other	m2	4439.9	BRCS	26.73	$118,680	100%	$118,680	$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover	m3	114450	SBTH	3.27	$374,252	100%	$374,252	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
OBJECTIVE: GRADE AND CONTOUR MILL & PLANT SITE								
crushing plant	m2	1350.0	SB4H	9.666	$13,049	100%	$13,049	$0
conveyors & transfer towers	m2	869	SB4H	9.666	$8,400	100%	$8,400	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1930.2	SB4H	9.666	$18,657	100%	$18,657	$0
maintenance shop	m2	1900	SB4H	9.666	$18,365	100%	$18,365	$0
power plant	m2	6804	SB4H	9.666	$65,767	100%	$65,767	$0
bulk fuel storage	m2	13130	SB4H	9.666	$126,915	100%	$126,915	$0
ANFO plant	m2	930.25	SB4H	9.666	$8,992	100%	$8,992	$0
offices/warehouse/accom	m2	14979.0	SB4H	9.666	$144,787	100%	$144,787	$0
other	m2	4439.9	SB4H	9.666	$42,916	100%	$42,916	$0
OBJECTIVE: RECLAIM ROADS								
Remove culverts	each		#N/A	0	$0		$0	$0
Remove bridges	each		#N/A	0	$0		$0	$0
Scarify and install water breaks	ha		#N/A	0	$0		$0	$0
Grade and contour road and ditch	m2	200000	DSH	3.3588	$671,760	100%	$671,760	$0
create wildilfe passage ramps	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
other	m3	600	DSH	3.3588	$2,015	100%	$2,015	$0
SPECIALIZED ITEMS								
Conveyors		1	cons	12036506	$12,036,506	100%	$12,036,506	
Stacker reclaimers	each	0.5	sts	2417431.8	$1,208,716	100%	$1,208,716	$0
Rail load out		1	tlos	806650	$806,650	100%	$806,650	
				Subtotal	$23,488,970		$23,244,356	$244,614
						Pct Land	Total Land	Total Water

Figure A-5: Mine Closure and Reclamation Cost – Mary River Mine Site

Building / Equip Name: *Railway* **Bldg / Equip #: *4***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
Other	each		#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE CONTAMINATED BUILDINGS								
Decontaminate crushing plant	each		#N/A	0	$0		$0	$0
Decontaminate tanks & plumbing	each		#N/A	0	$0		$0	$0
Decontaminate thickeners	each		#N/A	0	$0		$0	$0
Decontaminate water treatment plant	each		#N/A	0	$0		$0	$0
Decontaminate maintenance shop	each		#N/A	0	$0		$0	$0
Decontaminate power plant	each		#N/A	0	$0		$0	$0
Decontaminate bulk fuel storage	each		#N/A	0	$0		$0	$0
Decontaminate ANFO plant	each		#N/A	0	$0		$0	$0
Deontaminate offices/warehouse/accom	each		#N/A	0	$0		$0	$0
Removal of asbestos siding on buildings	each		#N/A	0	$0		$0	$0
Removal of friable asbestos on equipment	each		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE NON-CONTAMINATED BUILDINGS								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
consolidate & dump boneyard debris	m3		#N/A	0	$0		$0	$0
other	m2	351	BRS	100	$35,100	100%	$35,100	$0
OBJECTIVE: BREAK BASEMENT SLABS								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
Other	m2		#N/A	0	$0		$0	$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
OBJECTIVE: GRADE AND CONTOUR MILL & PLANT SITE								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
other	m2	351	SB4H	9.666	$3,393	100%	$3,393	$0
OBJECTIVE: RECLAIM RAILWAY								
Remove culverts	each	200	PPLH	194.4	$38,880		$0	$38,880
Remove bridges	each	31	RBRIS	50000	$1,550,000		$0	$1,550,000
Remove tracks and ties	eallow	1	TTRS	1.3E+07	$12,686,168	100%	$12,686,168	$0
recontour/doze access road	m3		#N/A	0	$0		$0	$0
create wildilfe passage ramps	m3		#N/A	0	$0		$0	$0
other (plug tunnels)		37.12	CSH	642.6	$23,853	100%	$23,853	$0
other (plug tunnels)		556.8	RB1H	15.12	$8,419	100%	$8,419	$0
SPECIALIZED ITEMS								
Dispose of misc. debris and laydown area refuse	m3		#N/A	0	$0		$0	$0
				Subtotal	$14,345,812		$12,756,932	$1,588,880
						Pct Land	Total Land	Total Water

Figure A-6: Mine Closure and Reclamation Cost – Railway

Building / Equip Name: *Steensby Port* **Bldg / Equip #: *5***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
Other (remove airstrip lightning)	each	1	RALS	10099	$10,099	100%	$10,099	$0
OBJECTIVE: REMOVE CONTAMINATED BUILDINGS								
Decontaminate crushing plant	each		#N/A	0	$0		$0	$0
Decontaminate tanks & plumbing	each		#N/A	0	$0		$0	$0
Decontaminate thickeners	each		#N/A	0	$0		$0	$0
Decontaminate water treatment plant	each		#N/A	0	$0		$0	$0
Decontaminate maintenance shop	each	11641.3	BRCdS	200	$2,328,260	100%	$2,328,260	$0
Decontaminate power plant	each	7704	BRCdS	200	$1,540,800	100%	$1,540,800	$0
Decontaminate bulk fuel storage	each	600	BRCdS	200	$120,000	100%	$120,000	$0
Decontaminate ANFO plant	each		#N/A	0	$0		$0	$0
Deontaminate offices/warehouse/accom	each		#N/A	0	$0		$0	$0
Removal of asbestos siding on buildings	each		#N/A	0	$0		$0	$0
Removal of friable asbestos on equipment	each		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE NON-CONTAMINATED BUILDINGS								
crushing plant	m2	1728	BRS	100	$172,800	100%	$172,800	$0
conveyors & transfer towers	m2	1473	BRS	100	$147,300	100%	$147,300	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1641	BRS	100	$164,100		$0	$164,100
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	6603.65	BRS	100	$660,365	100%	$660,365	$0
consolidate & dump boneyard debris	m3	1200	BRS	100	$120,000	100%	$120,000	$0
other	m2	12193.12	BRS	100	$1,219,312	100%	$1,219,312	$0
OBJECTIVE: BREAK BASEMENT SLABS								
crushing plant	m2	1728	BRCH	53.46	$92,379	100%	$92,379	$0
conveyors & transfer towers	m2	1473	BRCS	26.73	$39,373	100%	$39,373	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1389	BRCS	26.73	$37,128		$0	$37,128
maintenance shop	m2	9091.3	BRCS	26.73	$243,010	100%	$243,010	$0
power plant	m2	7704	BRCS	26.73	$205,928	100%	$205,928	$0
bulk fuel storage	m2	600	BRCS	26.73	$16,038		$0	$16,038
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	12447.8	BRCS	26.73	$332,730	100%	$332,730	$0
Other	m2	8453.1	BRCS	26.73	$225,951	100%	$225,951	$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover	m3	15000	SBTH	3.27	$49,050	100%	$49,050	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
OBJECTIVE: GRADE AND CONTOUR MILL & PLANT SITE								
crushing plant	m2	1728	SB4H	9.666	$16,703	100%	$16,703	$0
conveyors & transfer towers	m2	1473	SB4H	9.666	$14,238	100%	$14,238	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1641	SB4H	9.666	$15,862	100%	$15,862	$0
maintenance shop	m2	11641.3	SB4H	9.666	$112,525	100%	$112,525	$0
power plant	m2	7704	SB4H	9.666	$74,467	100%	$74,467	$0
bulk fuel storage	m2	600	SB4H	9.666	$5,800	100%	$5,800	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	6603.65	SB4H	9.666	$63,831	100%	$63,831	$0
other	m2	12193.12	SB4H	9.666	$117,859	100%	$117,859	$0
OBJECTIVE: RECLAIM ROADS								
Remove culverts	each		#N/A	0	$0		$0	$0
Remove bridges	each		#N/A	0	$0		$0	$0
Scarify and install water breaks	ha		#N/A	0	$0		$0	$0
remove/doze down berms	m3		#N/A	0	$0		$0	$0
create wildilfe passage ramps	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
other			#N/A	0	$0		$0	$0
SPECIALIZED ITEMS								
Car dumper		1	cds	180044	$180,044	100%	$180,044	
Stacker reclaimers	each	0.5	sts	2417432	$1,208,716	100%	$1,208,716	$0
Ship loaders		1	slos	972003	$972,003	100%	$972,003	
				Subtotal	$10,506,669		$10,289,403	$217,266
						Pct Land	Total Land	Total Water

Figure A-7: Mine Closure and Reclamation Cost – Steensby Port

Chemicals and Soil Contamination:

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.								
HAZARDOUS MATERIALS AUDIT								
Phase 1 audit	each	72	P1AS	1200	$86,400	100%	$86,400	$0
Phase 2 audit	each	1	#N/A	100000	$100,000	100%	$100,000	$0
HAZARDOUS MATERIALS TO BE CONSOLIDATED FOR REMOVAL								
Waste oils	litre	34816000	PCRH	2.214	$77,082,624	100%	$77,082,624	$0
Fuel - Type 1, eg diesel dregs	litre	49816000	FRH	1.1016	$54,877,306	100%	$54,877,306	$0
Fuel - Type 1, eg gasoline dregs	litre	1800000	FRH	1.1016	$1,982,880	100%	$1,982,880	$0
waste batteries	kg	3418000	PCRH	2.214	$7,567,452	100%	$7,567,452	$0
assay & environmental lab reagents	litre		#N/A	0	$0	100%	$0	$0
machine shop, paints, solvents etc	litre		#N/A	0	$0	100%	$0	$0
contaminated soils - hydrocarbon	m3		#N/A	0	$0	100%	$0	$0
metal contam. soil at conc. load-out	m3		#N/A	0	$0	100%	$0	$0
HAZARDOUS MATERIALS								
Transportation to disposal facility	T		#N/A	0	$0		$0	$0
Disposal fees	allow		#N/A		$0		$0	$0
other			#N/A	0	$0		$0	$0
CONTAMINATED SOILS								
Contam. soil investigation - technical	each	1	#N/A	34957	$34,957	100%	$34,957	$0
Contam. soil investigation - drilling & sampling	each	1	#N/A	34957	$34,957	100%	$34,957	$0
CONTAMINATED SOIL REMOVAL	m3				$0		$0	$0
contaminated soils - hydrocarbon	m3	33600	remss	100	$3,360,000	100%	$3,360,000	$0
metal contam. soil at conc. load-out	m3		#N/A	0	$0		$0	$0
Load, haul, dump or doze	m3		#N/A	0	$0		$0	$0
Reagents/stabilizing agent	m2		#N/A	0	$0		$0	$0
Contour reclaimed area	m3		#N/A	0	$0		$0	$0
other	m2		#N/A	0	$0		$0	$0
CONTAMIANTED SOIL VERY LOW PERMEABILITY COVER								
supply geomembrame, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
upper and lower bedding layers	m3		#N/A	0	$0		$0	$0
install geomembrane, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
erosion protection layer	m3		#N/A	0	$0		$0	$0
vegetate	m2		#N/A	0	$0		$0	$0
install infiltration/seepage instrumentation	allow		#N/A	0	$0		$0	$0
other			#N/A	0	$0		$0	$0
OTHER								
Explosives	kg	3002650	#N/A	0	$0		$0	$0
			Subtotal		$144,940,175	100%	$145,126,575	$0
						Pct Land	Total Land	Total Water

Figure A-8: Mine Closure and Reclamation Cost – Chemicals

Water Management :

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: WATER SUPPLY EMBANKMENT								
Toe buttress, drain mat'l	m3		#N/A	0	$0		$0	$0
, fill mat'l A	m3		#N/A	0	$0		$0	$0
, fill mat'l B	m3		#N/A	0	$0		$0	$0
Rip rap	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Breach dam	m3		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: UPGRADE SPILLWAY								
Excavate channel, mat'l A	m3		#N/A	0	$0		$0	$0
, mat'l B	m3		#N/A	0	$0		$0	$0
Concrete	m3		#N/A	0	$0		$0	$0
Rip rap	m3		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: STABILIZE &/OR UPGRADE DIVERSION DITCHES								
Excavate channel	m3		#N/A	0	$0		$0	$0
doze & spread excavated material	m3		#N/A	0	$0		$0	$0
Vegetate, spread material	ha		#N/A	0	$0		$0	$0
Rip rap in channel base	each		#N/A		$0		$0	$0
OBJECTIVE: BREACH DITCHES								
Excavate breaches	m3		#N/A	0	$0		$0	$0
install rip rap	m3		#N/A	0	$0		$0	$0
install flow dissipation	m3		#N/A	0	$0		$0	$0
vegetate remainder of ditch	m2		#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE PIPELINES								
Remove pipes	m	44402.3	PPSH	5.4	$239,772		$0	$239,772
Concrete plug deep pipes	m3		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
Groundwater Collection - Long-term Collection System								
excavate/install sumps	m2		#N/A	0	$0		$0	$0
install pumping wells	m3		#N/A	0	$0		$0	$0
install pumps/pipelines/power supply			#N/A	0	$0		$0	$0
OBJECTIVE: COLLECT DRAINAGE FOR TREATMENT								
Excavate channel	m3		#N/A	0	$0		$0	$0
doze & spread excavated material	m3		#N/A	0	$0		$0	$0
Vegetate, spread material	ha		#N/A	0	$0		$0	$0
Rip rap in channel base	each		#N/A	0	$0		$0	$0
Construct contaminated water storage pond								
Excavation	m3		#N/A	0	$0		$0	$0
supply geomembrame, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
upper and lower bedding layers	m3		#N/A	0	$0		$0	$0
install geomembrane, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
erosion protection layer	m3		#N/A	0	$0		$0	$0
OBJECTIVE: TREAT DRAINAGE (see "ONGOING TREATMENT" for operating costs)								
Build treatment plant	LS		#N/A	0	$0		$0	$0
build sludge containment facility	LS		#N/A	0	$0		$0	$0
				Subtotal	$239,772	0%	$0	$239,772
						Pct Land	Total Land	Total Water

Figure A-9: Mine Closure and Reclamation Cost – Water Management

Mobilization:

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	MOBILIZE HEAVY EQUIPMENT								
	Equipment to regional centre								
.	Excavators	km	100	MHERH	9.0936	$909	100%	$909	$0
.	Dump trucks	km	300	MHERH	9.0936	$2,728	100%	$2,728	$0
	Dozers	km	100	MHERH	9.0936	$909	100%	$909	$0
	Demolition shears	km	700	MHERH	9.0936	$6,366	100%	$6,366	$0
	Crane	km	200	MHERH	9.0936	$1,819	100%	$1,819	$0
	Light duty vehicles	km	3900	MHERH	9.0936	$35,465	100%	$35,465	$0
.	Other (loaders)	km	1100	MHERH	9.0936	$10,003	100%	$10,003	$0
.	Other	km	7500	MHERH	9.0936	$68,202	100%	$68,202	$0
	Equipment, regional centre to site								
.	Excavators	km		#N/A	0	$0		$0	$0
.	Dump trucks	km		#N/A	0	$0		$0	$0
	Dozers	km		#N/A	0	$0		$0	$0
	Demolition shears	km		#N/A	0	$0		$0	$0
	Crane	km		#N/A	0	$0		$0	$0
	Light duty vehicles	km		#N/A	0	$0		$0	$0
.	Other	km		#N/A	0	$0		$0	$0
.	Other	km		#N/A	0	$0		$0	$0
B	MOBILIZE CAMP								
.		allow		#N/A		$0		$0	$0
C	MOBILIZE WORKERS								
	crew travel time	manday		#N/A	0	$0	100%	$0	$0
.	crew transportation	each	210	flightS	88876	$18,663,859	100%	$18,663,859	$0
D	MOBILIZE MISC. SUPPLIES								
.	Fuel	litre	47,076,055	fss	0.95	$44,722,252	100%	$44,722,252	$0
.	Sealift per season	allow	2	sls	8E+06	$16,045,000	100%	$16,045,000	$0
.	Sealift manpower per season	allow	2	plss	5E+07	$95,690,400	100%	$95,690,400	$0
	Manpower for the season w/o sealift		1	slnss	1E+07	$9,642,000	100%	$9,642,000	$0
E	WORKER ACCOMODATIONS								
.		$	2000	cos	10800	$21,600,000	100%	$21,600,000	$0
F	WINTER ROAD							$0	$0
.	Full winter use	km		#N/A	0	$0		$0	$0
.	Limited winter use	km		#N/A	0	$0		$0	$0
.	other			#N/A	0	$0		$0	$0
G	INTERIM CARE & MAINTENANCE								
	on-site caretaker	annual		#N/A	0	$0			
	fuel and misc. supplies	annual		#N/A	0	$0			
	electrician	days		#N/A	0	$0			
	mechnaic	days		#N/A	0	$0			
	pick-up truck	yr		#N/A	0	$0			
	small dozer	allow		#N/A	0	$0			
	small excavator	allow		#N/A	0	$0			
	snow machine	allow		#N/A	0	$0			
	communications	allow		#N/A	0	$0			
	Water licence sampling & reporting	each		#N/A	0	$0			
	Geotechnical assessment	each		#N/A	0	$0			
	Other	each	1	#N/A	20000	$20,000			
				sub-total annual C&M cost		$20,000			
	Total C&M cost	years	3	#N/A	20000	$60,000	100%	$60,000	$0
					Subtotal	$206,549,913	100%	$206,549,913	$0
							Pct Land	Total Land	Total Water

Figure A-10: Mine Closure and Reclamation Cost – Mobilization

Post-Closure Monitoring & Maintenance:

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: MONITORING & INSPECTIONS								
	Annual geotechnical insp.	each		#N/A	$0	$0		$0	$0
.	Survey inspection	each	1	SIS	$16,667	$16,667	100%	$16,667	$0
.	Surface water sampling	each	0	WSS	$200	$0		$0	$0
	Groundwater Sampling	each	0	WSS	$200	$0		$0	$0
	Receiving/downstream water sampling	each	0	WSS	$200	$0		$0	$0
	Reporting	each	1	RPTH	$11,880	$11,880	100%	$11,880	$0
.	on-site transportation	each		#N/A	$0	$0		$0	$0
	transporation to site	each	1	#N/A	$4,918	$4,918	100%	$4,918	$0
.	Other (sea lift at the end of post closure)		1	slpcs	$11,173,540	$11,173,540	100%	$11,173,540	$0
B	OBJECTIVE: COVER MAINTENANCE								
.	Repair erosion - infill gullies	allow		#N/A	$0	$0		$0	$0
.	Repair erosion - upgrade diversion ditches	allow		#N/A	$0	$0		$0	$0
.	Remove problem vegetation	allow		#N/A	$0	$0		$0	$0
.	Repair animal damage	allow		#N/A	$0	$0		$0	$0
.	Repair/upgrade access controls	allow		#N/A	$0	$0		$0	$0
	Other		1	#N/A	$100,000	$100,000	100%	$100,000	$0
C	SPILLWAY MAINTENANCE								
	Repair erosion	m3		#N/A	$0	$0		$0	$0
	Clear spillway	each	1	CSWH	$5,702	$5,702		$0	$5,702
	Other			#N/A	$0	$0		$0	$0
D	POST-CLOSURE WATER TREATMENT								
	Annual water treatment cost, from Ongoing water		1	#N/A	$106,276	$106,276		$0	$106,276
	Subtotal, Annual post-closure costs					$11,418,983		$11,307,005	$111,978
	Discount rate for calculation of net present value of post-closure			3.00%					
	Number of years of post-closure activity			5 years					
	Present Value of payment stream					$52,295,597	$1	$51,782,771	$512,826
							Pct Land	Total Land	Total Water

Figure A-11: Mine Closure and Reclamation Cost – Post Closure

WATER TREATMENT COSTS

ANNUAL VOLUME OF WATER (m3) _____

Reagent addition rates

Reagent	kg reagent/m3 water		cost in $/kg, FOB site	Annual reagent cost
H2O2		kg/m3		$0
lime		kg/m3		$0
ferric sulphate		kg/m3		$0
ferrous sulphate		kg/m3		$0
flocculents		kg/m3		$0
			TOTAL	$0

Supplies and Labour

power, kW-hr	0	rate, $/kW-hr	$0
misc. supplies, hoses, tools			$0
sampling equip.			$4,200
equip. maintenance and parts			$5,000
water analysis			$6,400
reporting			$0
truck rental			$0
annual mileage			$0
road maintenace & snow plowing			$0
electrician/mechanic for treatment plant & power supply			$0
		Annual cost	$15,600
labor, hourly rate	$75.00		
men per day for water treatment work			3
on site, days per year			1
spring/fall maintenance, extra work			0
hours worked per year			24
annual labor cost			$1,800
		Total, labour and supplies	$17,400
TOTAL ANNUAL COSTS, reagents + labour + supplies + site access			$106,276
Average treatment cost, $/m3			$0.00

Water analyses	
samples per month	0
analysis cost/sample	0
shipping	0
Total Water Sampling	0

Site Access	
road	$0
air	$88,876
winter road	$0
annual site access cost	$88,876

Figure A-12: Mine Closure and Reclamation Cost – Water Treatment