2015 RECLAMATION COST ESTIMATE
(2016 UPDATE)
AMENDMENT No. 1 to NUNAVUT WATER BOARD LICENCE No. 2AM-DOH1323
DORIS NORTH PROJECT
KITIKMEOT REGION, NUNAVUT

Submitted to:

David Abernethy, Water Resources Regional Coordinator, Resource Management Directorate,
Indigenous and Northern Affairs Canada / Government of Canada, Nunavut Region

Submitted by:

Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited
Dartmouth, Nova Scotia

July 2016

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David Abernethy
Regional Coordinator
Water Resources Division
Resource Management Directorate
Indigenous and Northern Affairs Canada / Government of Canada, Nunavut Region
IQALUIT, NU X0A 0H0

Re: 2015 Independent Reclamation Cost Estimate (2016 Update)
Nunavut Water Board Licence No. 2AM-DOH1323
Doris North Project
Kitikmeot Region, Nunavut

We are submitting this updated report describing the development of a reclamation cost estimate for the Doris North Project, situated in Nunavut's Kitikmeot Region. It has been developed to assist Indigenous and Northern Affairs Canada (INAC) in the Technical Review of TMAC Resources Inc.'s (TMAC) application amendment No. 1 to Nunavut Water Board Licence No. 2AM-DOH1323. The original 2015 reclamation cost estimate was submitted in December 2015, and has subsequently been updated based on discussions with INAC and TMAC.

The following costs have been estimated using the RECLAIM 7.0 Model for Reclamation and Closure Security Estimate (RECLAIM Model):

Land related liabilities under the Water Licence -	$19,705,946.00
Water related liabilities under the Water Licence -	$23,715,459.00
Reclamation Cost Estimate related to the Water Licence -	$43,421,405.00
Crown land liabilities (Roberts Bay jetty and marine outfall) -	$701,129.00
Inuit-owned land liabilities -	$43,421,404.00
Total Reclamation Cost Estimate for Doris North -	$44,122,533.00

The amount of security that should be held under the amended water licence should be $43,421,405.00 as compared to that estimated in the TMAC model (revised December 2015) which is $28,938,129.00.

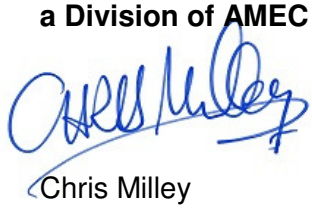
The direct costs developed in the RECLAIM Model are approximately 4% lower than the direct costs developed in the TMAC Estimate, stemming mostly from costs developed for reclamation of the tailings impoundment area, mill / processing facilities, interim care and maintenance, and water management activities. The indirect costs developed in the RECLAIM Model are almost 175% higher than the indirect costs developed in the TMAC Estimate, primarily due to costs associated with mobilization / demobilization, engineering and project management.

This reclamation cost estimate is based on a review of the activities outlined in the TMAC interim closure plan. It is also based on the quantities from the TMAC closure cost estimate as there was insufficient site time to carry out an on-site inventory of all structures and infrastructure.

We trust that this report meets your requirements. If you have any questions or comments, please contact the undersigned.

Sincerely,

AMEC Foster Wheeler Environment & Infrastructure,
a Division of AMEC Foster Wheeler Americas Limited



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EXECUTIVE SUMMARY

This report provides an estimate of reclamation costs for the Doris North Project, situated in Nunavut's Kitikmeot Region. It has been developed to assist Indigenous and Northern Affairs Canada (INAC) in the Technical Review of TMAC Resources Inc.'s (TMAC) application amendment No. 1 to Nunavut Water Board Licence No. 2AM-DOH1323.

The total costs estimated in the RECLAIM 7.0 Model for Reclamation and Closure Security for the Doris North Project (RECLAIM Model) are $44,122,533.00, compared to $28,938,129.00 estimated in the TMAC Model (revised Dec 2015), approximately 52% higher. Inuit owned land liability was determined to be $43,421,404.00, and Crown land liabilities were determined to be $701,129.00.

The amount of security recommended to be held under the amended water licence is $44,122,533.00. Land related liabilities have been determined to total $19,705,946.00 (45.4% of the Reclamation Cost Estimate related to the Water Licence. Water related liabilities make up $23,715,459.00, or 54.6%.

The reclamation and closure cost estimate was developed based on rates provided in the RECLAIM Model spreadsheet, the TMAC reclamation cost estimate, internet research and comparison with rates used in similar projects in the Yukon and Northwest Territories. The reclamation and closure cost estimate also incorporates the results of discussions with INAC, TMAC and their Consultant (SRK Consulting Canada Inc.), during the technical meetings held in Cambridge Bay, NU on January 26 to 29, 2016.

The direct costs developed in the RECLAIM Model are approximately 4% lower than the direct costs developed in the TMAC Estimate, stemming mostly from costs developed for reclamation of the tailings impoundment area, mill / processing facilities, interim care and maintenance, and water management activities. The indirect costs developed in the RECLAIM Model are almost 175% higher than the indirect costs developed in the TMAC Estimate, primarily due to costs associated with mobilization / demobilization, fuel, engineering and project management.

Costs for Engineering, Project Management, Health and Safety, Monitoring (QA/QC) were applied at between 2 and 11% of the capital or direct costs. These percentages reflect the situation where a Consultant is selected to lead the reclamation process, who may have relatively little experience with the site.

A contingency of 20% of the direct costs was included.

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INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler) was retained by Indigenous and Northern Affairs Canada (INAC or the Department) to carry out an independent reclamation cost estimate for the Doris North Project. This work was carried out under Standing Offer Agreement 46-0000-1035, Call-up No. 1.

The Doris North Project is a gold mine located in the Kitikmeot Region of Nunavut, approximately 125 km southwest of Cambridge Bay. The mine is situated primarily on Inuit Owned Land administered by the Kitikmeot Inuit Association, and partly on a Crown land lease.

The mine is owned by TMAC Resources Inc. (TMAC). TMAC is applying to amend its Nunavut Water Board (NWB) Type A Water Licence No. 2AM-DOH1323 and the Nunavut Impact Review Board Project Certificate No. 003. The amendment applications will allow increased production rates, an increased mine size, changes to the management of tailings, the discharge of effluent reporting from the tailings impoundment area to the marine environment rather than to an approved creek, and other associated project changes.

TMAC's water licence amendment application includes a revised reclamation cost estimate based on the proposed project changes. The Department's 2002 *Mine Site Reclamation Policy for Nunavut* requires that adequate security be provided to ensure the entire cost of reclamation, including shutdown, closure, and post-closure, is born by the operator of the mine rather than the Crown. Reclamation security is required for the full reclamation of the mine site should TMAC abandon its project and not be able to carry out this responsibility.

The purpose of this work is to provide technical support for INAC's review of the NWB water licence amendment application, by the completion of an independent reclamation financial security cost estimate for the closure of the Doris North Project using the RECLAIM 7.0 Model for Reclamation and Closure Security Estimate (RECLAIM Model). This estimate is based on the following:

- a review of documentation included in TMAC's application amendment No. 1 to Nunavut Water Board Licence No. 2AM-DOH1323;
- a site visit carried out from August 25th to 28th, 2015;
- discussion with INAC, TMAC and their Consultant (SRK Consulting Canada Inc.), during the technical meetings held in Cambridge Bay, NU on January 26 to 29, 2016, and
- discussion with INAC personnel (Ms. Sarah Forte) during a conference call on June 30, 2016.

In accordance with direction given by INAC, this report has been organized in the following manner:

- Section 2 provides information the basis for development of the INAC 2015 reclamation cost estimate (2016 update) (RECLAIM Model);

- Section 3 provides a general comparison of the INAC reclamation cost estimate (RECLAIM Model) and TMAC reclamation cost estimate (revised 2015), (hereinafter referred to as the TMAC estimate or TMAC reclamation cost estimate), with respect to organization of the costs for the various mine components;
- Section 4 provides an overview of the INAC 2015 reclamation cost estimate (2016 update), including the separation of costs with respect to land and water related liabilities, as well as Inuit Owned and Crown Liabilities;
- Section 5 provides a comparison of the 2015 INAC reclamation cost estimate originally submitted in December 2015, with the 2015 INAC reclamation cost estimate (2016 Update); and
- Section 6 provides a comparison of the INAC 2015 reclamation cost estimate (2016 update) (RECLAIM Model), with the TMAC reclamation cost estimate (revised 2015).

1.0 BASIS OF ESTIMATE

Direct Costs

The development of the direct closure costs were based on the following assumptions:

- There will be an 18 month period where the site will be managed under interim care and maintenance. This will involve general maintenance activities to keep clear access to the site, water management activities, annual inspections and maintenance as recommended by the on-site inspections. Water quality sampling and testing will also continue to be carried out, as also indicated in the TMAC model.

- Site closure activities will be carried out over a period of three years. Closure activities would be carried out during 7 months of the year, using a 25 man crew. During off-months, a 2 person crew would be resident in the camp.

- Water management activities will be carried out for a period of 5 years, beginning with the commencement of closure activities, and continuing for two years after completion of closure activities.

- Generally, the quantities and structures outlined in the document *TMAC Interim Closure and Reclamation Plan, July 2015 – Detailed Cost Estimate*, were assumed to be correct. Previous reports and scaled drawings were used to confirm some quantities where possible (e.g. pad sizes, tanks, pipeline lengths).

- Labor rates were selected based on rates provided in the RECLAIM Model spreadsheet, the TMAC reclamation cost estimate, and comparison with rates used in similar projects in the Yukon and NWT. Enquiries were also made with the existing site Contractor, Nuna Logistics.

- Equipment rates were determined considering rates provided in the RECLAIM Model spreadsheet, the TMAC reclamation cost estimate, and rates used in similar projects in the Yukon and NWT. Enquiries were also made with the existing site Contractor, Nuna Logistics.

- The task unit costs and relocation unit rates developed in the TMAC reclamation cost estimate were reviewed to confirm that the assumptions were reasonable, and if considered necessary, revised.

Indirect Costs

The development of indirect closure costs included the following assumptions:

- There is a detailed, approved closure plan that has been updated as required to be current with site operations and infrastructure. It has been assumed that tender documents and construction drawings will need to be developed based on the existing closure plan.

- All equipment, personnel and camp facilities required to carry out the required activities during interim care and maintenance and closure activities, will need to be mobilized to the site, and demobilized upon completion of closure activities.

- Equipment for the completion of reclamation activities will be mobilized out of Edmonton, AB, hauled by truck to Hay River, NT, and then shipped by barge to Roberts Bay, NU.

- Post closure monitoring and surveillance will continue for 10 years or until a lesser frequency is appropriate. Annual geotechnical inspections will be carried out in Years 1, 2, 3, 6 and 10, and cover inspections in Years 1, 3, 5, 7 and 10. Water quality sampling will be carried out in Years 1, 2, 3, 5, 7 and 10.

- Engineering costs to advance the approved closure plan to a detailed construction work scope and drawings will be 8% of the estimated direct costs.

- Project management costs will be 11% of the estimated direct costs.

- Health and Safety planning and implementation, and quality assurance monitoring will be 2% of the estimated direct costs, assuming that established standard operating procedures, and safety, health and the environment (SHE) plans are available.

- A contingency of 20% of the estimated closure costs has been assumed. The RECLAIM 7.0 Guidance suggests that for a 'feasibility or advanced conceptual' estimate type, a contingency of ±20% is appropriate. The guidance also says that virtually all reclamation plans and associated cost estimates are in the 'feasibility or advanced conceptual' stage until possibly the last few years of the mine life.

2.0 GENERAL COMPARISON OF INAC 2015 RECLAMATION COST ESTIMATE (2016 UPDATE) (RECLAIM MODEL) AND TMAC ESTIMATE

The TMAC reclamation cost estimate model separates the direct closure costs by location or facility, following the interim closure plan. The specific tasks related to each location or facility are grouped together, making it straightforward to track that all of the required closure activities have been incorporated into the plan. The indirect costs cover mobilization / demobilization, contingency, general and administration costs, field support, hydrocarbon decontamination and post-closure monitoring.

The RECLAIM Model cost estimation breaks down the reclamation costs into three broad operations - the underground, tailings, and rockpile operations. There are also additional categories for Chemicals, Buildings/Equipment and Water Management, which introduces some

crossover between spreadsheets for a particular mine component. The indirect costs cover mobilization / demobilization, contingency, post-closure monitoring and maintenance, engineering, project management, health and safety plans/monitoring and Qa/Qc, bonding/insurance, contingency and market price factor adjustment. An 18 month period of Interim Care and Maintenance is also included in the direct costs.

The costs within the RECLAIM Model are organized similar to the TMAC Model (by facility). There was some difficulty with being able to edit spreadsheet tab names or adding new tabs without changing some of the functionality. As a result, the reclamation costs for some mine components / locations do not correspond to the name of the RECLAIM Model spreadsheet tab. A concordance table has been prepared as a comparison of the organization of the two models.

Although the organization for the reclamation costs differ, in general, the methods used by both models to estimate costs are similar. The TMAC model however, is considerably more detailed with respect to how task unit costs and relocation unit rates are developed.

Table 3.1 Table of Concordance for the RECLAIM 7.0 Reclamation and Closure Security Estimate and TMAC Reclamation Cost Estimates

RECLAIM VERSION 7	TMAC Cost Model
Direct Costs	
Open Pit	Roberts Bay Area Airstrip
Underground Mine	Underground Workings Reagent Pads
Tailings	Tailings Facility
Rockpile	Quarry A, B, D and Explosives Secondary Rd
Chemicals	Quarry #2 Quarry #3 Doris Mountain Doris Waste Area Ocean Discharge System Off-site Shipping for Disposal Off-Site Disposal Fees
Buildings and Equipment	Doris Camp
Water Management	Closure Water Management
Water Treatment	not used
Interim Care and Maintenance	not used
Indirect Costs	
Mobilization/Demobilization	Mobilization/Demobilization
Post-Closure Monitoring And Maintenance	Post Closure Monitoring Field Support
Engineering	not used
Project Management	General and Administrative Costs
Health And Safety Plans/Monitoring & QA/QC	not used
Bonding/Insurance	not used
Contingency	Contingency
Market Price Factor Adjustment	not used
	Hydrocarbon Decontamination

3.0 INAC 2015 RECLAMATION COST ESTIMATE (2016 UPDATE)

3.1 General

Table 4.1 provides a summary of the reclamation costs developed for the closure measures for the Doris North Project using the RECLAIM Model (2016 Update). Detailed costing sheets are included in Appendix A.

The reclamation costs have been separated with respect to land and water related liabilities, as well as Crown Land and Inuit Owned Land Liabilities. Portions of the reclamation costs not included under the Water Licence (i.e. for Roberts Bay Jetty and the Roberts Bay Marine Outfall) have also been listed separately.

3.2 Total Reclamation Costs

The total costs estimated in the RECLAIM 7.0 Model for Reclamation and Closure Security for the Doris North Project (RECLAIM Model) are $44,122,533.00, compared to $28,938,129.00 estimated in the TMAC Estimate, approximately 52% higher. In general, the unit rates, task unit costs and relocation unit rates used in the TMAC Model are considered reasonable.

The direct costs developed in the RECLAIM Model are approximately 4% lower than the direct costs developed in the TMAC Estimate, stemming mostly from costs developed for interim care and maintenance, water management activities, and mobilization. The indirect costs developed in the RECLAIM Model are almost 175% higher than the indirect costs developed in the TMAC Estimate, having chiefly to do with mobilization / demobilizations costs, fuel, engineering and project management.

The scope of work for this assignment required that the total reclamation costs be separated with respect to Inuit owned Land liabilities and Crown liabilities. Inuit owned land liability has been determined to be $43,421,404.00, and includes the majority of the Doris North Project site reclamation costs. The balance of the reclamation costs of $701,129.00 is assigned as Crown liability, related to the reclamation costs associated with the Roberts Bay Jetty and the ocean outfall.

3.3 Reclamation Costs Related to the Water Licence

The reclamation costs related to the water licence have been determined to be $43,421,405.00. This is the recommended amount of security that should be held under the amended water licence,

The scope of work for this assignment required that the reclamation costs related to the water licence be separated with respect to land and water related liabilities.

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Table 4.1 Summary of Reclamation Costs for Completion of Closure Activities (2016 Update)

DIRECT COSTS	COMPONENT NAME	PRINCIPLE ESTIMATE	WATER LICENCE	WATER LICENCE (LAND LIABILITY)	WATER LICENCE (WATER LIABILITY)	ROBERTS BAY JETTY	MARINE OUTFALL	
							(LAND LIABILITY)	(WATER LIABILITY)
OPEN PIT	Roberts Bay Area / Airstrip	$457,188	$446,479	$345,989	$100,489	$10,709		
UG MINE	U/G Workings and Reagent Pads	$248,726	$248,726	$205,499	$43,227			
TAILINGS	North and South Dams / Interim Dyke	$7,312,645	$7,312,645	$4,162,301	$3,150,344			
ROCK PILE	Doris Windy Road / Secondary Road	$379,285	$379,285	$183,665	$195,620			
DORIS CAMP	Doris Camp	$3,876,329	$3,876,329	$3,363,412	$512,917			
CHEMICALS	Quarry #2 / Doris Mtn / Doris Waste Area / Ocean Discharge System . Off-Site Disposal	$632,071	$340,231	$242,594	$97,637		$97,586	$194,254
SURFACE AND GROUNDWATER MANAGEMENT		$3,027,500	$3,027,500	-	$3,027,500			
INTERIM CARE AND MAINTENANCE (18 months)		$3,105,900	$3,105,900	-	$3,105,900			
	SUBTOTAL: Direct Costs	**$19,039,644**	**$18,737,095**	**$8,503,460**	**$10,233,635**	**$10,709**	**$97,586**	**$194,254**
	PERCENT OF SUBTOTAL		**100.00%**	**45.4%**	**54.6%**			
INDIRECT COSTS		**PRINCIPLE ESTIMATE**	**WATER LICENCE**	**WATER LICENCE (LAND LIABILITY)**	**WATER LICENCE (WATER LIABILITY)**	**ROBERTS BAY JETTY**	**MARINE OUTFALL**	
MOBILIZATION/DEMOBILIZATION		$15,766,239	$15,515,705	$7,041,496	$8,474,209	$8,868	$80,809	$160,857
POST-CLOSURE MONITORING AND MAINTENANC		$1,320,000	$1,299,025	$589,537	$709,488	$742	$6,766	$13,467
ENGINEERING	8%	$1,523,171.52	$1,498,968	$680,277	$818,691	$857	$7,807	$15,540
PROJECT MANAGEMENT	11%	$2,094,360.84	$2,061,080	$935,381	$1,125,700	$1,178	$10,734	$21,368
HEALTH AND SAFETY PLANS/MONITORING & QA	2%	$380,792.88	$374,742	$170,069	$204,673	$214	$1,952	$3,885
BONDING/INSURANCE	1%	$190,396.44	$187,371	$85,035	$102,336	$107	$976	$1,943
CONTINGENCY	20%	$3,807,928.80	$3,747,419	$1,700,692	$2,046,727	$2,142	$19,517	$38,851
MARKET PRICE FACTOR ADJUSTMENT	0%	$0	$0	$0	$0	$0	$0	$0
	SUBTOTAL: Indirect Costs	**$25,082,889**	**$24,684,310**	**$11,202,486**	**$13,481,824**	**$14,109**	**$128,561**	**$255,911**
TOTAL COSTS		**$44,122,533**	**$43,421,404**	**$19,705,946**	**$23,715,459**	**$24,818**	**$226,147**	**$450,164**

The breakdown between land and water related liabilities is shown in Table 4.1. In general, any work in and around water crossings or bodies of water was assigned a water liability of between 80 to 100%. Regrading or earthmoving activities, and production of run of quarry (ROQ) or other materials was assigned a water liability of between 20 and 50%. Removal of structures was assigned 90% to land liability.

Under the water licence, land related liabilities total $19,705,946.00, and water related liabilities $23,715,459.00.

4.0 COMPARISON OF INAC 2015 RECLAMATION COST ESTIMATE WITH 2016 UPDATE

A summary of the major cost differences between the original submission of the 2015 INAC Reclamation Cost Estimate and the 2016 Update is included in Appendix B, and is listed below.

INAC 2015 Reclamation Cost Estimate (Original Submission) -	$47,818,382.00
INAC 2015 Reclamation Cost Estimate (2016 Update) -	$44,122,533.00

In general, the major cost differences arise from:

- incorrect assumption that the camp operations rate did not include mobilization of workers to and from the site (-$7.2 M);
- incorrect assumption that a winter road was required to move equipment (-$4M);
- assumptions for short term water treatment / management requirements (+$1.7M);
- an error in the low and high camp operations rates (+$5.7M);
- the addition of fuel costs for reclamation activities (+$1.8M); and
- an increase in project management costs from 7 to 11%, based on Senior Review (+$900k).

The remaining cost differences were largely due to errors in the number of units, and a number of unit rates that were too high for the level of effort required.

5.0 COMPARISON OF INAC 2015 RECLAMATION COST ESTIMATE (2016 UPDATE) WITH TMAC ESTIMATE

A summary of the major cost differences between the 2015 INAC Reclamation Cost Estimate (2016 Update) and the TMAC Estimate is included in Appendix C.

In general, the major cost differences arise from:

- the assumption that the INAC 2015 Reclamation Cost Estimate assumes no existing camp facilities will be available for use, and that camp facilities will be required during interim care and maintenance, closure and for water management activities for 2 years beyond closure. The TMAC estimate assumes camp facilities will be required for 2.5 years. (+$9M).

- fuel for reclamation activities has been included in the INAC estimate at the request of INAC (+$1.8);
- higher cost in the INAC estimate for dismantling of the ore processing and milling complex (approx. +$1M); and
- higher costs for engineering and project management, and health and safety and QA/QC, assigned as percentages of the direct costs (+$4.7M).

The remaining cost differences were largely due to differences in derivation of unit rates, and assumptions in the level of effort required to complete various tasks.

6.0 CONCLUSION

The reclamation and closure cost estimate was developed based on rates provided in the RECLAIM Model spreadsheet, the TMAC reclamation cost estimate, internet research and comparison with rates used in similar projects in the Yukon and NWT. It also incorporates the results of discussions with INAC, TMAC and their Consultant (SRK Consulting Canada Inc.), during the technical meetings held in Cambridge Bay, NU on January 26 to 29, 2016.

6.1 Total Reclamation Cost Estimate

The costs estimated in the RECLAIM 7.0 Model for Reclamation and Closure Security for the Doris North Project (RECLAIM Model), are $44,122,533.00, compared to $28,938,129.00 estimated in the TMAC Model (revised December 2015). The direct costs developed in the RECLAIM Model are approximately 4% lower than the direct costs developed in the TMAC Estimate, stemming mostly from costs developed for reclamation of the tailings impoundment area, mill / processing facilities, interim care and maintenance, and water management activities. The indirect costs developed in the RECLAIM Model are almost 175% higher than the indirect costs developed in the TMAC Estimate, having chiefly to do with mobilization / demobilization costs, engineering and project management.

Inuit owned land liability has been determined to be $43,421,404.00, and includes the majority of the Doris North Project site reclamation costs. The balance of the reclamation costs of $701,129.00 is assigned as Crown liability, related to the reclamation costs associated with the Roberts Bay Jetty and the ocean outfall.

6.2 Reclamation Cost Estimate Related to the Water Licence

The reclamation costs related to the water licence have been determined to be $43,421,405.00. This is the recommended amount of security that should be held under the amended water licence.

The land related liabilities total $19,705,946.00, and water related liabilities $23,715,459.00.

7.0 CLOSING REMARKS

This report has been prepared by Ms. Jane Doucette, P.Eng, of Amec Foster Wheeler.

This report is for the exclusive use of the INAC, for specific application to the area within this report. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. Amec Foster Wheeler accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. It has been prepared in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made.

Respectfully submitted,

Amec Foster Wheeler Environnent & Infrastructure,
a Division of Amec Foster Wheeler Americas Limited

Prepared by:

REGISTERED PROFESSIONAL ENGINEER
J.A.G. DOUCETTE
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Geotechnical Engineer (NAPEG)

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Appendix A
Doris North Project
INAC 2015 Reclamation Cost Estimate (2016 Update)

DORIS NORTH PROJECT - 2015 RECLAMATION COST ESTIMATE (2016 UPDATE)

DIRECT COSTS	COMPONENT NAME	PRINCIPLE ESTIMATE	WATER LICENCE	WATER LICENCE (LAND LIABILITY)	WATER LICENCE (WATER LIABILITY)	ROBERTS BAY JETTY	MARINE OUTFALL	
							(LAND LIABILITY)	(WATER LIABILITY)
OPEN PIT	Roberts Bay Area / Airstrip	$457,188	$446,479	$345,989	$100,489	$10,709		
UG MINE	U/G Workings and Reagent Pads	$248,726	$248,726	$205,499	$43,227			
TAILINGS	North and South Dams / Interim Dyke	$7,312,645	$7,312,645	$4,162,301	$3,150,344			
ROCK PILE	Doris Windy Road / Secondary Road	$379,285	$379,285	$183,665	$195,620			
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SURFACE AND GROUNDWATER MANAGEMENT		$3,027,500	$3,027,500	-	$3,027,500			
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	SUBTOTAL: Direct Costs	**$19,039,644**	**$18,737,095**	**$8,503,460**	**$10,233,635**	**$10,709**	**$97,586**	**$194,254**
	PERCENT OF SUBTOTAL		**100.00%**	**45.4%**	**54.6%**			
INDIRECT COSTS		**PRINCIPLE ESTIMATE**	**WATER LICENCE**	**WATER LICENCE (LAND LIABILITY)**	**WATER LICENCE (WATER LIABILITY)**	**ROBERTS BAY JETTY**	**MARINE OUTFALL**	
MOBILIZATION/DEMOBILIZATION		$15,766,239	$15,515,705	$7,041,496	$8,474,209	$8,868	$80,809	$160,857
POST-CLOSURE MONITORING AND MAINTENAN		$1,320,000	$1,299,025	$589,537	$709,488	$742	$6,766	$13,467
ENGINEERING	8%	$1,523,171.52	$1,498,968	$680,277	$818,691	$857	$7,807	$15,540
PROJECT MANAGEMENT	11%	$2,094,360.84	$2,061,080	$935,381	$1,125,700	$1,178	$10,734	$21,368
HEALTH AND SAFETY PLANS/MONITORING & Q	2%	$380,792.88	$374,742	$170,069	$204,673	$214	$1,952	$3,885
BONDING/INSURANCE	1%	$190,396.44	$187,371	$85,035	$102,336	$107	$976	$1,943
CONTINGENCY	20%	$3,807,928.80	$3,747,419	$1,700,692	$2,046,727	$2,142	$19,517	$38,851
MARKET PRICE FACTOR ADJUSTMENT	0%	$0	$0	$0	$0	$0	$0	$0
	SUBTOTAL: Indirect Costs	**$25,082,889**	**$24,684,310**	**$11,202,486**	**$13,481,824**	**$14,109**	**$128,561**	**$255,911**
TOTAL COSTS		**$44,122,533**	**$43,421,404**	**$19,705,946**	**$23,715,459**	**$24,818**	**$226,147**	**$450,164**

Open Pit Name: **Roberts Bay Area / Airstrip**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Vegetate pit floor		ha		#N/A	$0.00	$0		$0	$0
JETTY									
Remove rock fill to 0.3 m below LLWL, place in surrounding water		m3	1013.8	SB1H	$5.90	$5,981			
Remove on-shore mooring points		LS	1	OSHRL	$1,500.00	$1,500			
Remove mooring buoy		LS	1	FSHRL	$3,000.00	$3,000			
Crown jetty for positive drainage		m2	1900	c518l	$0.12	$228			
ROBERTS BAY TANK FARM - 20ML									
Drain tanks into portable fuel storage (EnviroTanks)		each	4	C203L	$10,000.00	$40,000	50%	$20,000	$20,000
Decommission fuel transfer facilities		each	4	C102L	$550.00	$2,200	90%	$1,980	$220
Wash tanks		each	4	C204L	$1,420.00	$5,680	50%	$2,840	$2,840
Operate oil/water separator		m3	50	C208L	$30.00	$1,500	50%	$750	$750
Disconnect piping and controls		each	4	C102L	$550.00	$2,200	50%	$1,100	$1,100
Dismantle tanks and cut into manageable pieces		each	4	CUT5L	$15,000.00	$60,000	80%	$48,000	$12,000
Load pieces for transportation		m3	43.5	C401L	$13.13	$571	90%	$514	$57
Haul cut metal to Landfill		m3	51.4	C415L	$6.34	$326	90%	$293	$33
Remove and stockpile liner protection cover		m3	5455	SB1L	$4.30	$23,457	90%	$21,111	$2,346
load contained contaminated soils into megabags for shipping off-site		m3	50	C412L	$100.25	$5,013	90%	$4,511	$501
haul contaminated material to Roberts Bay laydown		m3	56.8	C404L	$6.34	$360	90%	$324	$36
Clean liner		m2	10300	C210L	$0.39	$4,017	50%	$2,009	$2,009
Remove and cut liner into manageable pieces		m2	10300	C302L	$0.56	$5,768	90%	$5,191	$577
Load Debris into Waste Trucks		m3	92.7	C401L	$13.13	$1,217	90%	$1,095	$122
Haul containers to Quarry 3 Landfill		m3	92.7	C415L	$6.34	$588	90%	$529	$59
Level containment berms		m2	231.3	C505L	$1.58	$365	50%	$183	$183
Regrade area for positive drainage		m2	11530	C518L	$0.12	$1,384	50%	$692	$692
QUARRY 1 TANK FARM									
5ML Drain tanks into portable fuel storage (EnviroTanks)		each	1	C203L	$10,000.00	$10,000	50%	$5,000	$5,000
1ML Drain tanks into portable fuel storage (EnviroTanks)		each	1	C203L	$10,000.00	$10,000	50%	$5,000	$5,000
Decommission fuel transfer facilities		each	2	C102L	$550.00	$1,100	90%	$990	$110
Wash tanks		each	2	C204L	$1,420.00	$2,840	50%	$1,420	$1,420
Operate oil/water separator		m3	220	C208L	$30.00	$6,600	50%	$3,300	$3,300
Disconnect piping and controls		each	2	C102L	$550.00	$1,100	90%	$990	$110
Dismantle 5ML diesel fuel tank and cut into manageable pieces		each	1	CUT5L	$15,000.00	$15,000	90%	$13,500	$1,500
Dismantle 1ML jet fuel tank and cut into manageable pieces		each	1	CUT1L	$15,000.00	$15,000	90%	$13,500	$1,500
Prepare pieces for transportation		m3	174	C401L	$13.13	$2,285	90%	$2,056	$228
Haul cut metal to Landfill		m3	174	C415L	$6.34	$1,103	90%	$993	$110

Open Pit Name: **Roberts Bay Area / Airstrip**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Remove and stockpile liner protection cover		m3	2190	SB1L	$4.30	$9,417	90%	$8,475	$942
load contained contaminated soils into megabags for shipping off-site		m3	50	C412L	$100.25	$5,013	90%	$4,511	$501
haul megabags to Roberts Bay laydown		m3	53.4	C404L	$6.34	$339	90%	$305	$34
Clean liner		m2	6521	C210L	$0.39	$2,543	50%	$1,272	$1,272
Remove and cut liner into manageable pieces		m2	6521	C302L	$0.56	$3,652	90%	$3,287	$365
Drain and wash empty fuel drums		each	150	C205L	$60.00	$9,000	50%	$4,500	$4,500
Crush empty fuel drums		each	150	C301L	$35.00	$5,250	90%	$4,725	$525
Load debris for transport to landfill		m3	68.2	C401L	$13.13	$895	90%	$806	$90
Haul waste to Landfill		m3	68.2	C415L	$6.34	$432	90%	$389	$43
Level containment berms		m2	279.3	C505L	$1.58	$441	90%	$397	$44
Regrade area for positive drainage		m2	3650	C518L	$0.12	$438	50%	$219	$219
MECHANICAL SHOP COMPLEX									
Decommission electrical, mechanical, heating (including connections to generator house & t		each	7	C105L	$640.00	$4,480	90%	$4,032	$448
Demolish (steel modular structure)		m3	2204.4	C305L	$19.00	$41,884	90%	$37,695	$4,188
Demolish wood structures (warehouse roof, crew lounge)		m3	283.2	C305L	$19.00	$5,381	90%	$4,843	$538
Demolish tent structure (light vehicle shop)		m3	460.3	C305L	$19.00	$8,746	90%	$7,871	$875
Collect Debris		m2	685.8	C310L	$0.18	$123	90%	$111	$12
Load debris for transport to landfill		m3	867.1	C401L	$13.13	$11,385	90%	$10,247	$1,139
Haul debris to Landfill		m3	867.1	C415L	$6.34	$5,497	90%	$4,948	$550
WASTE MANAGEMENT FACILITY									
Collect ashes and place in containers		m3	0.5	C207L	$13.13	$7	75%	$5	$2
Dismantle (welding crew)		each	2	C308L	$1,500.00	$3,000	95%	$2,850	$150
Demolish wood structures (roof, entryway, etc.)		m3	76.2	C305L	$19.00	$1,448	90%	$1,303	$145
Disconnect containers and prep for shipping off-site		each	11	C108L	$1,325.00	$14,575	90%	$13,118	$1,458
Collect all debris		m2	128.7	C310L	$0.18	$23	90%	$21	$2
Load debris for transport to landfill		m3	152.5	C401L	$13.13	$2,002	90%	$1,802	$200
Haul debris to Landfill		m3	152.5	C415L	$6.34	$967	90%	$870	$97
LAYDOWN AREA									
Decommission vehicle plug system		each	1	C105L	$640.00	$640	90%	$576	$64
Remove cables and posts		each	8	C314L	$150.00	$1,200	90%	$1,080	$120
Collect all debris		m2	24491.6	C310L	$0.18	$4,408	90%	$3,968	$441
Load debris for transport to landfill		m3	10	C401L	$13.13	$131	90%	$118	$13
Haul debris to Landfill		m3	10	C415L	$6.34	$63	90%	$57	$6
Regrade area for positive drainage		m2	24491.6	C518L	$0.12	$2,939	90%	$2,645	$294
Laydown Area Expansion Collect all debris		m2	38800	C310L	$0.18	$6,984	90%	$6,286	$698

Open Pit Name: **Roberts Bay Area / Airstrip**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Load waste into containers for shipping off-site		m3	10	C401L	$13.13	$131	90%	$118	$13
Haul debris to Landfill		m3	10	C415L	$6.34	$63	90%	$57	$6
Breach safety berms and Regrade area for positive drainage		m2	38800	C518L	$0.12	$4,656	50%	$2,328	$2,328

Open Pit Name: **Roberts Bay Area / Airstrip**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OVERBURDEN DUMP									
Collect all debris		m2	10448	C310L	$0.18	$1,881	90%	$1,693	$188
Load waste into containers for shipping off-site		m3	10	C401L	$13.13	$131	90%	$118	$13
Haul debris to Landfill		m3	10	C415L	$6.34	$63	90%	$57	$6
Grade for positive drainage		m2	10448	C505L	$1.58	$16,508	50%	$8,254	$8,254
Breach the berm to original ground in several locations (4 locations) to restore natural flow p		m2	378	C505L	$1.58	$597	50%	$299	$299
ROBERTS BAY ACCESS ROAD									
Crown road for positive drainage		m2	3378	C518L	$0.12	$405	50%	$203	$203
COMMUNICATIONS TOWER									
Decommission Tower		each	1	C105L	$640.00	$640	90%	$576	$64
Remove communication equipment		each	4	C107L	$350.00	$1,400	90%	$1,260	$140
Dismantle towers		each	1	C311L	$15,500.00	$15,500	90%	$13,950	$1,550
Prep tower sections for shipping off-site		m	8	C312L	$1,500.00	$12,000	90%	$10,800	$1,200
Collect all debris		m2	1.4	C310L	$0.18	$0	90%	$0	$0
Load waste into containers for shipping off-site		m3	10.5	C401L	$13.13	$138	90%	$124	$14
Haul hazardous waste to Roberts Bay		m3	5	C404L	$6.34	$32	90%	$29	$3
Haul debris to Landfill		m2	5.5	C415L	$6.34	$35	90%	$31	$3
ALL WEATHER AIRSTRIP									
Decommission Airstrip		each	1	C109L	$1,500.00	$1,500	90%	$1,350	$150
Remove lighting fixtures (airstrip lighting, approach lights)		each	70	C110L	$50.00	$3,500	90%	$3,150	$350
collect all debris		m2	2850	C310L	$0.18	$513	90%	$462	$51
load waste for transport to landfill		m3	1.2	C401L	$13.13	$16	90%	$14	$2
Haul debris to Landfill		m3	1.2	C416L	$6.34	$8	90%	$7	$1
crown airstrip and airstrip expansion for positive drainage		m2	42000	C518L	$0.12	$5,040	50%	$2,520	$2,520
Other				#N/A	$0.00	$0		$0	$0
SOUTH APRON									
crown for positive drainage		m2	4500	C518L	$0.12	$540	50%	$270	$270
Other				#N/A	$0.00	$0		$0	$0

Open Pit Name: **Roberts Bay Area / Airstrip**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
NORTH APRON									
Decommission electrical, and heating from traffic control tower		each	1	C107L	$350.00	$350	90%	$315	$35
demolish control tower structure (wood shack)		m3	11.7	C305L	$19.00	$222	90%	$200	$22
disconnect containers and prep for shipping off-site		each	5	C108L	$1,325.00	$6,625	90%	$5,963	$663
collect all debris		m2	12.2	C310L	$0.18	$2	90%	$2	$0
load waste for transport to landfill		m3	17.6	C401L	$13.13	$231	90%	$208	$23
haul debris to landfill		m3	17.6	C416L	$6.34	$112	90%	$100	$11
crown for positive drainage		m2	5517.2	C518L	$0.12	$662	50%	$331	$331
Other				#N/A	$0.00	$0		$0	$0
					Annual pumping costs	$0			
Number of years of pump flooding		years							
					Total pumping costs	$0		$0	$0
					Total	$457,188		$345,989	$100,489
					% of Total			76%	22%

Underground Mine Name **U/G Workings and Reagent Pads** **UG Mine # *1***

ACTIVITY/MATERIAL	Notes	Unit	Qty	Code	Unit Cost	Cost	Land	Land Cost	Water Cost
Remove misc. haz. mat & explosives		kg		#N/A	$0.00	$0		$0	$0
DORIS NORTH DECLINE PORTAL									
remove ducts, pipes, electrical cables		lm	100	C316L	$113.00	$11,300	90%	$10,170	$1,130
construct portal plug		m3	707	C503L	$24.53	$17,343	90%	$15,608	$1,734
regrade area for positive drainage		m2	1446	C518L	$0.12	$174	50%	$87	$87
DORIS NORTH VENT RAISE									
Remove ducts, pipes, and cables		lm	100	C316L	$113.00	$11,300	90%	$10,170	$1,130
Construct a concrete cap (0.5 m thick reinforced concrete) to seal the top		each	1	C603L	$40,000.00	$40,000	90%	$36,000	$4,000
Decommission and dismantle all ventilation and heating facilities		each	4	C105L	$640.00	$2,560	90%	$2,304	$256
Prepare units for shipping off-site		each	1	C108L	$1,325.00	$1,325	90%	$1,192.50	$133
Haul units to Roberts Bay		hrs	3	C404AL	$155.00	$465	90%	$419	$47
Regrade pads for positive drainage		m2	4150	C518L	$0.12	$498	50%	$249	$249
Drain and decommission Enviro Tank		each	1	C203L	$10,000.00	$10,000	50%	$5,000	$5,000
Haul Enviro Tank to Roberts Bay		hrs	1.5	C404AL	$155.00	$233	90%	$209	$23
Remove liner and cut into manageable pieces		m2	1230	C302L	$0.56	$689	90%	$620	$69
Load waste for transport to landfill		m3	11	C401L	$13.13	$144	90%	$130	$14
Haul waste to landfill		m3	11	C414L	$6.34	$70	90%	$63	$7
Backfill area to prevent permanent ponding		m2	4150	C505L	$1.58	$6,557	90%	$5,901	$656
DORIS CONNECTOR VENT RAISE									
Remove ducts, pipes, and cables		lm	100	C316L	$113.00	$11,300	90%	$10,170	$1,130
Decommission and dismantle all ventilation facilities		each	2	C105L	$640.00	$1,280	90%	$1,152	$128
Prepare units for shipping off-site		each	1	C108L	$1,325.00	$1,325	90%	$1,192.50	$133
Haul units to Roberts Bay		hrs	1.5	C404L	$6.34	$10	90%	$9	$1
Construct a concrete cap (0.5 m thick reinforced concrete) to seal the top		each	1	C603L	$40,000.00	$40,000	80%	$32,000	$8,000
Remove culvert		each	1	RCULL	$2,625.00	$2,625	90%	$2,363	$263
Crown road for positive drainage		km	0.2	CRWNL	$1,190.00	$238	50%	$119	$119
DORIS CENTRAL VENT RAISE									
Remove ducts, pipes, and cables		lm	100	C316L	$113.00	$11,300	90%	$10,170	$1,130
Decommission and dismantle all ventilation facilities		each	2	C105L	$640.00	$1,280	90%	$1,152	$128
Prepare units for shipping off-site		each	1	C108L	$1,325.00	$1,325	90%	$1,192.50	$133
Haul units to Roberts Bay		hrs	1.5	C404L	$6.34	$10	90%	$9	$1
Construct a concrete cap (0.5 m thick reinforced concrete) to seal the top		each	1	C603L	$40,000.00	$40,000	80%	$32,000	$8,000
Remove culvert		each	1	RCULL	$2,625.00	$2,625	0%	$0	$2,625
Crown road for positive drainage		km	0.7	CRWNL	$1,190.00	$833	50%	$417	$417
Other				#N/A	$0.00	$0		$0	$0

Underground Mine Name **U/G Workings and Reagent Pads** **UG Mine # *1***

ACTIVITY/MATERIAL	Notes	Unit	Qty	Code	Unit Cost	Cost	Land	Land Cost	Water Cost
EQUIPMENT LAYDOWN AREA									
collect all debris		m2	21870	C310L	$0.18	$3,937	90%	$3,543	$394
load waste for transport to landfill		m3	20	C401L	$13.13	$263	90%	$236	$26
regrade area for positive drainage		m2	21870	C518L	$0.12	$2,624	50%	$1,312	$1,312
haul waste to Landfill		m3	20	C417L	$6.34	$127	90%	$114	$13
Other				#N/A	$0.00	$0		$0	$0
MATERIALS LAYDOWN AREA									
collect all debris		m2	33399	C310L	$0.18	$6,012	90%	$5,411	$601
load waste to ship to Landfill		m3	20	C401L	$13.13	$263	90%	$236	$26
regrade area for positive drainage		m2	33399	C518L	$0.12	$4,008	50%	$2,004	$2,004
haul waste to Landfill		m3	20	C417L	$6.34	$127	90%	$114	$13
Other				#N/A	$0.00	$0		$0	$0
AMMONIUM NITARATE STORAGE BUILDING									
remove and stockpile liner protection cover		m3	1505	SB1L	$4.30	$6,472	90%	$5,824	$647
clean liner		m2	2800	C210L	$0.39	$1,092	50%	$546	$546
remove and cut liner into manageable pieces		m2	2800	C302L	$0.56	$1,568	90%	$1,411	$157
load waste for transport to landfill		m3	25.2	C401L	$13.13	$331	90%	$298	$33
Haul waste to Landfill		m3	25.2	C417L	$6.34	$160	90%	$144	$16
level containment berms		m2	32	C505L	$1.58	$51	50%	$25	$25
regrade area for positive drainage		m2	3858	C518L	$0.12	$463	50%	$231	$231
Other				#N/A	$0.00	$0		$0	$0
EXPLORATION DRILLING SUPPORT BUILDING									
Decommission electrical, mechanical, heating		each	2	C105L	$640.00	$1,280	90%	$1,152	$128
demolish building (tent structure)		m3	149.6	C305L	$19.00	$2,842	90%	$2,558	$284
collect all debris		m2	335	C310L	$0.18	$60	90%	$54	$6
load waste for transport to landfill		m3	12.4	C401L	$13.13	$163	90%	$147	$16
haul waste to Landfill		m3	12.4	C417L	$6.34	$79	90%	$71	$8
					Total	$248,726		$205,499	$43,227
					% of Total			83%	17%

Tailings Impoundment Name: **North and South Dams / Interim Dyke**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Crown Access Roads		km	0.2	CRWNL	$1,190.00	$238	50%	$119	$119
STABILIZE EMBANKMENT(S)									
Breach North dam by cutting a 20 m slot down to original ground (drill and blast)		m3	7028	RB1H	$31.99	$224,826	50%	$112,413	$112,413
Load and haul material		m3	31021.1	SB3H	$8.90	$276,088	50%	$138,044	$138,044
Clad the cut core faces for thermal protection		m3	614.2	RR2H	$20.65	$12,683	50%	$6,342	$6,342
SHORELINE PROTECTION									
Install separation geotextile		m2	54340	GSTH	$18.00	$978,120	95%	$929,214	$48,906
Haul and place riprap to prevent erosion		m3	24,700	SBSH	$6.30	$155,610	95%	$147,830	$7,781
Recontour Interim Dyke Crest		m3	2000	DRH	$2.40	$4,800	50%	$2,400	$2,400
COVER TAILINGS									
Grade/shape tailings surface		m2	440000	SBTL	$1.35	$594,000	50%	$297,000	$297,000
Produce ROQ (quarry drill and blast		m3	132000	RB1H	$31.99	$4,222,680	50%	$2,111,340	$2,111,340
LHDP ROQ (0.3m thick cover)		m3	132000	SBSH	$6.30	$831,600	50%	$415,800	$415,800
SPECIALIZED ITEMS									
Remove thermosyphons radiators and towers		each	12	THRL	$1,000.00	$12,000	15%	$1,800	$10,200

Tailings Impoundment Name: **North and South Dams / Interim Dyke**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
					Total	$7,312,645		$4,162,301	$3,150,344
					% of Total			57%	43%

Rock Pile Name: **Doris Windy Road / Secondary Road**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Install geomembrane		m2		#N/A	$0.00	$0		$0	$0
ALL WEATHER ROAD									
NOT PART OF DORIS RECLAMATION COSTS									
QUARRY A									
No decomm required				#N/A	$0.00	$0		$0	$0
QUARRY B									
No decomm required				#N/A	$0.00	$0		$0	$0
QUARRY D									
Scale vertical walls				#N/A	$0.00	$0		$0	$0
EXPLOSIVES STORAGE FACILITY									
Remove all explosive magazines		m3	66.4	C305L	$19.00	$1,262	90%	$1,135	$126
Demolish entry gates		m3	0.5	C305L	$19.00	$10	90%	$9	$1
Load all debris for transport to landfill		m3	25.4	C401L	$13.13	$334	90%	$300	$33
Haul waste to the landfill		m3	25.4	C414L	$6.34	$161	90%	$145	$16
Regrade area for positive drainage		m3	2805.8	DSL	$0.95	$2,666	50%	$1,333	$1,333
Secondary Road									
Remove Doris Creek bridge		ls	1	RBRGL	$50,000.00	$50,000	0%	$0	$50,000
Cut tailings line running alongside the road into manageable pieces		m	5750	PLDL	$11.50	$66,125	50%	$33,063	$33,063
Strap together or load pipe sections in containers for transport to landfill		m3	2760	C401L	$13.13	$36,239	90%	$32,615	$3,624
Haul waste to the landfill		m3	2760	C404L	$6.34	$17,498	90%	$15,749	$1,750
Remove pipe culvert east of the bridge		lm	18.8	RCULL	$2,625.00	$49,350	0%	$0	$49,350
Tailings Discharge And Reclaim Water Pipelines									
Cut pipelines into manageable pieces		lm	8125	PLDL	$11.50	$93,438	50%	$46,719	$46,719
decommission electrical (heat tracing)		each	4	C105L	$640.00	$2,560	90%	$2,304	$256
collect electrical cables and controllers and prep for shipping off-site		m2	4062.5	C310L	$0.18	$731	90%	$658	$73
Load debris for transport to landfill		m3	306.3	C401L	$13.13	$4,022	90%	$3,620	$402
Haul waste to the landfill		m3	306.3	C404L	$6.34	$1,942	90%	$1,748	$194
TIA Access Road (Chainage 0+725)									
Crown road for positive drainage		km	0.29	CRWNL	$1,190.00	$345	50%	$173	$173
Remove floating dock and bridge		m3	132	C401L	$13.13	$1,733	0%	$0	$1,733
Load all debris to haul to Landfill		m3	132	C401L	$13.13	$1,733	90%	$1,560	$173
Haul waste to the landfill		m3	132	C404L	$6.34	$837	90%	$753	$84

Rock Pile Name: **Doris Windy Road / Secondary Road**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Explosives Facility									
Remove all explosive magazines		m3	265.6	C305L	$19.00	$5,046	90%	$4,542	$505
Demolish entry gates		m3	0.5	C305L	$19.00	$10	90%	$9	$1
remove and stockpile liner protection cover		m3	3031	SB1L	$4.30	$13,033	90%	$11,730	$1,303
clean liner		m2	4442	C210L	$0.39	$1,732	50%	$866	$866
remove and cut liner into manageable pieces		m2	4442	C302L	$0.56	$2,488	90%	$2,239	$249
load waste into containers for shipping off-site		m3	200	C401L	$13.13	$2,626	90%	$2,363	$263
Decommission electrical and heating from facilities		each	2	C105L	$640.00	$1,280	90%	$1,152	$128
Demolish building (tent structure)		m3	430	C305L	$19.00	$8,170	90%	$7,353	$817
disconnect containers and prep for shipping off-site		each	2	C108L	$1,325.00	$2,650	90%	$2,385	$265
load waste into containers for shipping off-site		m3	41.5	C401L	$13.13	$545	90%	$490	$54
collect all debris		m2	18558	C310L	$0.18	$3,340	90%	$3,006	$334
Load all waste and debris and waste into containers		m2	18558	C310L	$0.18	$3,340	90%	$3,006	$334
Haul waste to landfill		m3	245	C404L	$6.34	$1,553	90%	$1,398	$155
Regrade pad area for positive drainage		m2	18558	C518L	$0.12	$2,227	50%	$1,113	$1,113
Recontour berms to blend in with topography		m2	2166	C518L	$0.12	$260	50%	$130	$130
					Total	$379,285		$183,665	$195,620
					% of Total			48%	52%

Chemicals/Soil Area Name: **Quarry #2 / Doris Mtn / Doris Waste Area / Ocean Discharge System . Off-Site Disposal**

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.

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Glycol		litre		#N/A	$0.00	$0		$0	$0
QUARRY #2			60						
No decomm required			60	#N/A	$0.00	$0		$0	$0
OVERBURDEN DUMP									
reslope to 3H:1V		m3	8781.3	SC1L	$6.80	$59,713	50%	$29,856	$29,856
grade top for positive drainage		m2	18441	C505L	$1.58	$29,137	50%	$14,568	$14,568
install erosion protection measures (coconut matting)		m2	2634	GSTH	$18.00	$47,412	90%	$42,671	$4,741
Remove culvert		ls	1	RCULL	$2,625.00	$2,625	0%	$0	$2,625
Other				#N/A	$0.00	$0		$0	$0
TREATED SEWAGE DISCHARGE AREAS									
Fill in low-lying areas (assumed sourced within 0.5km)		m3	69.1	SB4H	$11.00	$760	50%	$380	$380
erosion protection: Supply and place cocoa matting		m2	53.2	GSTH	$18.00	$958	90%	$862	$96
Other				#N/A	$0.00	$0		$0	$0
Quarry #3 -									
No decomm required				#N/A	$0.00	$0		$0	$0
Q#3 Access Road									
crown road for positive drainage		km	0.2	CRWNL	$1,190.00	$238	50%	$119	$119
Quarry #3 Landfill									
LHDP ROQ to construct 1m landfill cap[1]		m3	19520	DRH	$2.40	$46,848	80%	$37,478.40	$9,370
COMMUNICATIONS TOWER									
Remove communications equipment		each	12	C107L	$350.00	$4,200	90%	$3,780	$420
Dismantle the communications towers and prepare for shipping off-site		each	2	C311L	$15,500.00	$31,000	90%	$27,900	$3,100
Demolish equipment housing shack		m3	9	C305L	$19.00	$171	90%	$154	$17
Remove electrical and fiber optics cables		each	12	C105L	$640.00	$7,680	90%	$6,912	$768
Remove all equipment, material, and waste from Doris Mountain (helicopter)		m3	11	DEB1L	$2,500.00	$27,500	90%	$24,750	$2,750
load waste into trucks for transport to landfill		m3	11	C401L	$13.13	$144	90%	$130	$14
Transport Waste to Landfill		m3	11	C415L	$6.34	$70	90%	$63	$7
Transport Communications tower equipment to Roberts Bay		m3	33.2	C404L	$6.34	$210	90%	$189	$21
Land FARM									
load contained contaminated soils into megabags for shipping off-site		m3	100	C412L	$100.25	$10,025	90%	$9,023	$1,003
haul megabags to Roberts Bay laydown		m3	100	C404L	$6.34	$634	90%	$571	$63
treat contained water and discharge		ls	1	TRTL	$6,500.00	$6,500	0%	$0	$6,500
remove and stockpile liner protection cover		m3	2591	SB1L	$4.30	$11,141	90%	$10,027	$1,114
clean liner		m2	4384	C210L	$0.39	$1,710	50%	$855	$855
remove and cut liner into manageable pieces		m2	13152	C302L	$0.56	$7,365	90%	$6,629	$737

Chemicals/Soil Area Name: **Quarry #2 / Doris Mtn / Doris Waste Area / Ocean Discharge System . Off-Site Disposal**

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.

load waste for transport to landfill	m3	118.4	C401L	$13.13	$1,555	90%	$1,399	$155
Haul Material to Landfill	m3	118.4	C414L	$6.34	$751	90%	$676	$75
level containment berms	m2	3134.8	C505L	$1.58	$4,953	90%	$4,458	$495
regrade area for positive drainage	m2	4384	C518L	$0.12	$526	50%	$263	$263
Other			#N/A	$0.00	$0		$0	$0
BATCH PLANT PAD								
collect all debris	m2	740.3	C310L	$0.18	$133	90%	$120	$13
load waste for transport to landfill	m3	3	C401L	$13.13	$39	90%	$35	$4
haul waste to Landfill	m3	3	C414L	$6.34	$19	90%	$17	$2
regrade area for positive drainage	m2	740.3	C518L	$0.12	$89	50%	$44	$44
Other			#N/A	$0.00	$0		$0	$0
BURN PAD								
Collect ashes and place in containers	m3	0.1	C207L	$13.13	$1	90%	$1	$0
Dismantle (welding crew)	each	1	C308L	$1,500.00	$1,500	90%	$1,350	$150
load waste into containers for shipping off-site	m3	0.2	C401L	$13.13	$3	90%	$2	$0
haul containers to Roberts Bay laydown	m3	0.2	C404L	$6.34	$1	90%	$1	$0
regrade area for positive drainage	m2	400	C518L	$0.12	$48	50%	$24	$24
Other			#N/A	$0.00	$0		$0	$0
OFF-SITE SHIPPING BY BARGE								
hazardous waste	m3	120	hz1l	$218.81	$26,257	50%	$13,129	$13,129
hazardous solid waste	m3	38	hz2l	$218.81	$8,315	50%	$4,157	$4,157
hydrocarbon contaminated soils	m3	0	hy1l	$1,082.00	$0	50%	$0	$0
ROBERTS BAY DISCHARGE SYSTEM (MARINE BASED)								
Retrieve Pipeline; cut pipelines into manageable pieces	lm	2461	PLRH	$72.00	$177,192			
Load debris for transport to landfill	m3	525	C401L	$13.13	$6,893			
haul debris to landfill	m3	525	C404L	$6.34	$3,329			
Retrieve and dismantle diffuser	lm	95	PLRH	$72.00	$6,840			

Chemicals/Soil Area Name: **Quarry #2 / Doris Mtn / Doris Waste Area / Ocean Discharge System . Off-Site Disposal**

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.

ROBERTS BAY DISCHARGE SYSTEM (LAND BASED)							
Cut pipelines into manageable pieces	lm	5470	PLDL	$11.50	$62,905		
Decommission electrical (heat tracing)	each	11	C106L	$750.00	$8,250		
Collect electrical cables and controllers and prep for shipping off-site	m2	5470	C310L	$0.18	$985		
Load debris for transport to landfill	m3	1160	C401L	$13.13	$15,231		
haul debris to landfill	m3	1160	C404L	$6.34	$7,354		
Remove rock fill to 0.3 m below LLWL	m3	485	SB1H	$5.90	$2,862		
				Total	$632,071	$242,594	$97,637
				% of Total		38%	15%

1. The landfill cap will be 1 m thick; therefore no processing to produce a specific gradation will be required. Assumed rock will be present in the Quarry for use as it is landfilled; therefore no loading / transport required.

Building / Equip Name: **Doris Camp**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Airstrip lighting, navigation, electrician		mandays		#N/A	$0.00	$0		$0	$0
ACCOMODATION COMPLEX									
Decommission (electrical, mechanical, plumbing)		each	103	C105L	$640.00	$65,920	90%	$59,328	$6,592
disconnect trailers and prep for moving (remove boards/piping, etc.; wrap in plastic)		each	83	C108L	$1,325.00	$109,975	90%	$98,978	$10,998
haul trailers to Roberts Bay for shipping off-site		m3	2756	C404L	$6.34	$17,473	90%	$15,726	$1,747
demolish cabins		m3	319.1	C305L	$19.00	$6,063	90%	$5,457	$606
demolish cribbing, stairs, entryways, etc.		m3	250.3	C305L	$19.00	$4,756	90%	$4,280	$476
demolish arctic corridor		m3	132.5	C305L	$19.00	$2,518	90%	$2,266	$252
collect all debris		m2	380.9	C310L	$0.18	$69	90%	$62	$7
load waste for transport to Landfill		m3	623.1	C401L	$13.13	$8,181	90%	$7,363	$818
Haul waste to Landfill		m3	623.1	C414L	$6.34	$3,950	90%	$3,555	$395
regrade area for positive drainage		m2	21050	C518L	$0.12	$2,526	90%	$2,273	$253
regrade pad transitions to blend in with topography		m2	15200	C505L	$1.58	$24,016	50%	$12,008	$12,008
regrade surface to prevent ponding		m2	152000	C518L	$0.12	$18,240	50%	$9,120	$9,120
TANK FARM									
Drain tanks into portable fuel storage (EnviroTanks)		each	5	C203L	$10,000.00	$50,000	10%	$5,000	$45,000
Decommission Fuel Transfer Facilities		each	5	C102L	$550.00	$2,750	90%	$2,475	$275
Wash tanks		each	5	C204L	$1,420.00	$7,100	10%	$710	$6,390
Operate oil/water separator		m3	10	C208L	$30.00	$300	10%	$30	$270
Disconnect piping and controls		each	5	C102L	$550.00	$2,750	90%	$2,475	$275
Dismantle tanks and cut into manageable pieces		each	5	CUT1L	$15,000.00	$75,000	90%	$67,500	$7,500
prepare pieces for transportation		m3	22.8	C401L	$13.13	$299	90%	$269	$30
haul cut metal to landfill		m3	22.8	C414L	$6.34	$145	90%	$130	$14
remove and stockpile liner protection cover		m3	3360	SB1L	$4.30	$14,448	90%	$13,003	$1,445
load contaminated soils into megabags for shipping off-site (assumed worst case)		m3	50	C412L	$100.25	$5,013	90%	$4,511	$501
haul contaminated material to Roberts Bay laydown		m3	62	C404L	$6.34	$393	90%	$354	$39
clean liner		m2	5500	C210L	$0.39	$2,145	50%	$1,073	$1,073
remove and cut geosynthetics into manageable pieces		m2	5500	C302L	$0.56	$3,080	90%	$2,772	$308
load waste into containers for transport to landfill		m3	176.6	C401L	$13.13	$2,319	90%	$2,087	$232
haul waste to landfill		m3	176.6	C414L	$6.34	$1,120	90%	$1,008	$112
level containment berms		m2	962	C505L	$1.58	$1,520	50%	$760	$760
regrade area for positive drainage		m2	4927.7	C518L	$0.12	$591	50%	$296	$296
PERMANAENT POWER GENERATOR									
Decommission (electrical)		each	8	C106L	$750.00	$6,000	90%	$5,400	$600
Disconnect containers and prep for shipping off-site		each	8	C108L	$1,325.00	$10,600	90%	$9,540	$1,060

Building / Equip Name: **Doris Camp**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
haul containers to Roberts Bay laydown		m3	265.66	C404L	$6.34	$1,684	90%	$1,516	$168
dismantle stacks		each	2	C313L	$20,000.00	$40,000	90%	$36,000	$4,000
prep stacks for shipping off-site		each	2	C312L	$1,500.00	$3,000	90%	$2,700	$300
haul stack sections to Roberts Bay laydown		m3	166	C404L	$6.34	$1,052	90%	$947	$105
collect all debris		m2	2103	C310L	$0.18	$379	90%	$341	$38
load waste for shipping to landfill		m3	2	C401L	$13.13	$26	90%	$24	$3
haul waste to landfill		m3	2	C414L	$6.34	$13	90%	$11	$1
BACKUP POWER GENERATOR									
Decommission (electrical)		each	4	c105l	$640.00	$2,560	90%	$2,304	$256
Disconnect generator units and prep for shipping off-site		each	2	c106l	$750.00	$1,500	90%	$1,350	$150
haul units to Roberts Bay laydown		m3	67.6	C404L	$6.34	$429	90%	$386	$43
demolish tent housing structure		m3	94.1	C305L	$19.00	$1,788	90%	$1,609	$179
collect all debris		m2	259.3	C310L	$0.18	$47	90%	$42	$5
load waste for shipping to landfill		m3	122.4	C401L	$13.13	$1,607	90%	$1,446	$161
haul waste to landfill		m3	122.4	C414L	$6.34	$776	90%	$698	$78
SEWAGE TREATMENT PLANT									
Flush & remove sewage plumbing, collect sewage sludge/waste water in 55 gallon drums		each	9	C206L	$657.86	$5,921	0%	$0	$5,921
Decommission (electrical) 9.0 each		each	9	C105L	$640.00	$5,760	90%	$5,184	$576
Disconnect containers and prep for shipping off-site		each	9	C108L	$1,325.00	$11,925	90%	$10,733	$1,193
haul containers to Roberts Bay laydown		m3	597.6	C404L	$6.34	$3,789	90%	$3,410	$379
Collect Debris		m2	29.8	C310L	$0.18	$5	90%	$5	$1
Load debris into containers for transport (to Roberts Bay)		m3	23.8	C401L	$13.13	$312	90%	$281	$31
Haul debris to Roberts Bay		m3	23.8	C414L	$6.34	$151	90%	$136	$15
FIRE WATER STORAGE TANK									
decommission and disconnect electrical and plumbing		each	3	C105L	$640.00	$1,920	90%	$1,728	$192
disconnect & remove container housing pumps & controls; prep for shipping		each	1	C108L	$1,325.00	$1,325	90%	$1,193	$133
haul container to Roberts Bay laydown		m3	33.2	C404L	$6.34	$210	90%	$189	$21
remove tank insulation		m3	53	C315L	$720.00	$38,160	90%	$34,344	$3,816
Dismantle tanks and cut into manageable pieces		m3	2	C307L	$19.00	$38	90%	$34	$4
prepare pieces for transportation		m3	3.4	C401L	$13.13	$45	90%	$40	$4
haul cut metal to Roberts Bay laydown		m3	3.4	C404L	$6.34	$22	90%	$19	$2
Collect Debris		m3	73.2	C310L	$0.18	$13	90%	$12	$1
Load debris for transport Landfill		m2	29.7	C401L	$13.13	$390	90%	$351	$39
Haul debris to landfill		m3	29.7	C404L	$6.34	$188	90%	$169	$19

Building / Equip Name: **Doris Camp**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Muster Station									
demolish tent structure		m3	227.3	C305L	$19.00	$4,319	90%	$3,887	$432
dismantle wood flooring		m3	27.3	C305L	$19.00	$519	90%	$467	$52
Collect Debris		m2	90.9	C310L	$0.18	$16	90%	$15	$2
Load debris for transport to landfill		m3	42.7	C404L	$6.34	$271	90%	$244	$27
Haul Debris to landfill		m3	42.7	C414L	$6.34	$271	90%	$244	$27
WAREHOUSE / CORE SHACK									
demolish tent structure		m3	269.5	C305L	$19.00	$5,121	90%	$4,608	$512
dismantle wood flooring, shelving, and lofts		m3	186.2	C305L	$19.00	$3,538	90%	$3,184	$354
Collect Debris		m2	720.1	C310L	$0.18	$130	90%	$117	$13
Load debris for transport to landfill		m3	350.3	C401L	$13.13	$4,599	90%	$4,139	$460
Haul debris to landfill		m3	350.3	C414L	$6.34	$2,221	90%	$1,999	$222
haul all warehouse containers to Roberts Bay		m3	796.8	C404L	$6.34	$5,052	90%	$4,547	$505
OFFICE & MINE DRY COMPLEX									
Decommission (electrical, mechanical, plumbing)		each	3	C105L	$640.00	$1,920	90%	$1,728	$192
disconnect trailers and prep for moving (remove boards, cladding, etc.; wrap in plastic)		each	17	C108L	$1,325.00	$22,525	90%	$20,273	$2,253
haul trailers to Roberts Bay for shipping off-site		m3	564.4	C404L	$6.34	$3,578	90%	$3,220	$358
demolish arctic corridor		m3	219.5	C305L	$19.00	$4,171	90%	$3,753	$417
demolish cribbing, stairs, entryways, etc.		m3	998.2	C305L	$19.00	$18,966	90%	$17,069	$1,897
collect all debris		m3	998.2	C310L	$0.18	$180	90%	$162	$18
Load debris for transport to landfill		m3	2325.6	C401L	$13.13	$30,535	90%	$27,482	$3,054
haul debris to landfill		m3	2325.6	C414L	$6.34	$14,744	90%	$13,270	$1,474
regrade area for positive drainage		m2	6910	C518L	$0.12	$829	70%	$580	$249
CRUSHING, MILLING & PROCESSING PLANT									
decommission crusher, milling, and process plants		each	1	PLNT1L	$150,000.00	$150,000	90%	$135,000	$15,000
Drain chemicals and reagents into containers for shipping off site		m3	8.3	c208al	$100.00	$830	0%	$0	$830
disassemble equipment		each	1	PLNT2L	$200,000.00	$200,000	90%	$180,000	$20,000
prepare equipment for shipping off-site		each	1	PLNT3L	$50,000.00	$50,000	90%	$45,000	$5,000
demolish / dismantle mill building		m3	123515	C305L	$19.00	$2,346,785	90%	$2,112,107	$234,679
Collect Debris		m2	8700	C310L	$0.18	$1,566	90%	$1,409	$157
load waste for transport to Landfill		m3	4381.8	C401L	$13.13	$57,533	90%	$51,780	$5,753
Haul debris to landfill		m3	4381.8	C414L	$6.34	$27,781	90%	$25,003	$2,778
transport drums to Roberts Bay		m3	8.3	C404L	$6.34	$53	90%	$47	$5

Building / Equip Name: **Doris Camp**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
UNDERGROUND WASHBAY				0.74					
demolish tent structure		m3	776.9	C305L	$19.00	$14,761	90%	$13,285	$1,476
Collect Debris		m2	155.4	C310L	$0.18	$28	90%	$25	$3
Load debris for transport to landfill		m3	15.5	C401L	$13.13	$204	90%	$183	$20
Haul debris to landfill		m3	15.5	C414L	$6.34	$98	90%	$88	$10
UNDERGROUND DRILLING SUPPORT SHOP									
demolish tent structure		m3	859.2	C305L	$19.00	$16,325	90%	$14,692	$1,632
Collect Debris		m2	229.1	C310L	$0.18	$41	90%	$37	$4
Load debris for transport to landfill		m3	17.7	C401L	$13.13	$232	90%	$209	$23
Haul debris to landfill		m3	17.7	C414L	$6.34	$112	90%	$101	$11
WATER INTAKE STRUCTURE AND PUMPING FACILITY									
remove water intake line from Doris Lake		lm	25	PLRL	$22.00	$550	0%	$0	$550
decommission pumping facility (remove electrical)		each	2	C105L	$640.00	$1,280	90%	$1,152	$128
prep containers for shipping off-site		each	2	C108L	$1,325.00	$2,650	90%	$2,385	$265
disconnect and remove generator fuel tank (place in Doris tank farm for cleaning)		each	1	C105L	$640.00	$640	0%	$0	$640
clean TidyTank and prep for shipping off-site		each	1	C204L	$1,420.00	$1,420	0%	$0	$1,420
run oil-water separator		m3	3	C208L	$30.00	$90	0%	$0	$90
prep generator container for shipping off-site		each	1	C108L	$1,325.00	$1,325	90%	$1,193	$133
haul containers to Roberts Bay laydown		m3	66.4	C404L	$6.34	$421	90%	$379	$42
Collect Debris		m2	2226.2	C310L	$0.18	$401	90%	$361	$40
Load debris for transport to landfill		m3	20	C401L	$13.13	$263	90%	$236	$26
Haul debris to landfill		m3	20	C414L	$6.34	$127	90%	$114	$13
SEDIMENTATION / POLLUTION CONTROL POND									
disconnect piping and electrical wiring, remove sump pumps		each	2	C105L	$640.00	$1,280	90%	$1,152	$128
remove and cut liner into manageable pieces (Sedimentation Pond only)		m2	14110	C302L	$0.56	$7,902	50%	$3,951	$3,951
load waste for transport to Landfill		m3	42.3	C401L	$13.13	$555	90%	$500	$56
Haul Debris to landfill		m3	42.3	C414L	$6.34	$268	90%	$241	$27
breach Pollution Control pond and Sedimentation Pond containment berms		m3	2608.2	SB1L	$4.30	$11,215	70%	$7,851	$3,365
rip-rap breach for erosion protection		m3	13.8	RR1L	$13.50	$186	70%	$130	$56
UNDERGROUND SUPPORT MECHANICAL SHOP									
Decommission electrical, mechanical (including connections to generator house & transform		each	3	C105L	$640.00	$1,920	90%	$1,728	$192
demolish building		m3	2281.6	C305L	$19.00	$43,350	90%	$39,015	$4,335
Collect Debris		m2	456.3	C310L	$0.18	$82	90%	$74	$8
load waste for transport to Landfill		m3	504.5	C401L	$13.13	$6,624	90%	$5,962	$662
haul debris to landfill		m3	504.5	C414L	$6.34	$3,199	90%	$2,879	$320
Load hazardous waste into container for transport off site		m3	33.2	C401L	$13.13	$436	90%	$392	$44
Haul Waste container to Roberts Bay		m3	33.2	C414L	$6.34	$210	90%	$189	$21

Building / Equip Name: **Doris Camp**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
FRESH WATER PIPELINES									
Cut pipelines into manageable pieces		lm	830	PLDL	$11.50	$9,545	50%	$4,773	$4,773
decommission electrical (heat tracing)		each	4	C105L	$640.00	$2,560	90%	$2,304	$256
collect electrical cables and controllers and prep for shipping off-site		m2	1600	C310L	$0.18	$288	90%	$259	$29
Load debris for transport to landfill		m3	28.2	C404L	$6.34	$179	90%	$161	$18
haul debris to landfill		m3	28.2	C414L	$6.34	$179	90%	$161	$18
HELECOPTER SUPPORT FACILITIES									
dismantle helicopter pads and walkway		m3	15	C305L	$19.00	$285	90%	$257	$29
demolish Heli shack		m3	27.9	C305L	$19.00	$530	90%	$477	$53
demolish washcar and other facilities		m3	81.8	C305L	$19.00	$1,554	90%	$1,399	$155
Collect Debris		m2	154.2	C310L	$0.18	$28	90%	$25	$3
Load debris for transport to landfill		m3	234.4	C401L	$13.13	$3,078	90%	$2,770	$308
Haul debris to landfill		m3	234.4	C414L	$6.34	$1,486	90%	$1,337	$149
Regrade surface for positive drainage		m2	1582.4	C518L	$0.12	$190	50%	$95	$95
WASTE ROCK PAD									
no decomm required		m2	11500	#N/A	$0.00	$0		$0	$0
RUN-OFF DIVERSION BERM									
Breach the berm to original ground in several locations (4 locations) to restore natural flow p		m3	378	SB1L	$4.30	$1,625	70%	$1,138	$488
Remove cut liners and load for transport to landfill		m3	0.3	C302L	$0.56	$0	90%	$0	$0
Haul debris to landfill		m3	0.3	C414L	$6.34	$2	90%	$2	$0

Building / Equip Name: **Doris Camp**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
SEWAGE DISCHARGE LINE									
Flush pipeline prior to decommissioning		each	1	SEWL	$770.00	$770	0%	$0	$770
Cut pipelines into manageable pieces and place in containers for shipping off-site		lm	1190	PLDL	$11.50	$13,685	50%	$6,843	$6,843
Remove electrical cables and controllers		each	1	C105L	$640.00	$640	90%	$576	$64
Load debris into containers for shipping off-site		m3	90.8	C412L	$100.25	$9,103	90%	$8,192	$910
Haul debris to landfill		m3	90.8	C414L	$6.34	$576	90%	$518	$58
SEDIMENTATION BERM									
Breach the berm to restore a free drainage path		m2	24	SB1L	$4.30	$103	70%	$72	$31
rip-rap breach for erosion protection		m3	3.6	RR1L	$13.50	$49	10%	$5	$44
SUMPS									
decommission sumps		each	2	C102L	$550.00	$1,100	90%	$990	$110
remove pumps, pipes, cables, culverts		ls	2	RPPCL	$2,000.00	$4,000	0%	$0	$4,000
backfill sump excavation		m3	28.3	SBSL	$3.20	$91	0%	$0	$91
EXPANDED WASTE ROCK STORAGE (PAD T)									
Regrade Stockpile		m2	50400	SBSL	$3.20	$161,280	70%	$112,896	$48,384
Load waste for transport to landfill		m3	10	C401L	$13.13	$131	90%	$118	$13
Haul debris to landfill		m3	10	C404L	$6.34	$63	90%	$57	$6
EXPANDED LAYDOWN AREA (PAD U)									
remove pumps, pipes, cables, culverts		ls	1						
breach Sedimentation Pond containment berms		m3	120	SB1L	$4.30	$516	50%	$258	$258
collect all debris		m2	35200						
LHD remaining ore to TIA		m3	1760	SBSH	$6.30	$11,088	90%	$9,979	$1,109
load waste into containers for shipping off-site		m3	10	C412L	$100.25	$1,003	90%	$902	$100
haul containers to landfill		m3	10	C414L	$6.34	$63		$0	$63
					Total	$3,876,329		$3,363,412	$512,917
					% of Total			87%	13%

Note: Unit costs are based on 3m high, single storey building. Scale larger building areas accordingly. E.g. 10m high building multiply area by 3.3 (10/3)

Capital Expenditures and Short Term Water Treatment identified in 'Instructions' worksheet

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
PUMPS						
Pump capital cost		LS	5	pcl	$25,000.00	$125,000
Pump shipping		LS	5	psl	$2,500.00	$12,500
Pump maintenance		allow	5	pml	$25,000.00	$125,000
Install pumping system		LS		#N/A	$0.00	$0
Remove pumping system		LS		#N/A	$0.00	$0
INSPECT AND MAINTAIN WATER MANAGEMENT STRUCTURES						
Inspect and maintain water management structures[2]		ls	5	WTR3L	$70,000.00	$350,000

Capital Expenditures and Short Term Water Treatment identified in 'Instructions' worksheet

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
OPERATE / MAINTAIN WATER MANAGEMENT SYSTEM						
technician (camp rental / operations incl under Mob)		month	40	WTR1L	$34,200.00	$1,368,000
site support, consumables		month	40	WTR2L	$5,800.00	$232,000
WATER TESTING & REPORTING DURING CLOSUREACTIVITES (3 YEARS)						
Annual geotechnical inspection (during closure activites)[3]		each	3	GEOIL	$25,000.00	$75,000
Regulatory costs[4]	EACH YEAR	each	3	RPTL	$20,000.00	$60,000
Water sampling and testing[5]	EACH YEAR	each	3	WTR4L	$60,000.00	$180,000
Build treatment plant		LS		#N/A	$0.00	$0
Build sludge containment facility		LS		#N/A	$0.00	$0
DECOMMISSION WATER MANAGEMENT STRUCTURES (after year 5)						
Decommission water management structures		LS	1	DITCL	$500,000.00	$500,000
					Total	$3,027,500

2. Water management will be carried out for 5 years (3 years closure activities and 2 years afterwards). Inspections and oversite of maintenance activites carried out by Consultants.

3, 4 and 5. Regulatory and Water sampling /testing costs beyond Year 3 are included in Post-Closure

Interim Care and Maintenance **18 MONTHS**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
INTERIM CARE & MAINTENANCE						
on-site caretaker / pump technician		manmonths	8	MM1L	$17,550.00	$140,400
extra personnel		manmonths				$0
-electrician		manmonths	8	MM2L	$25,650.00	$205,200
-mechanic		manmonths	8	MM3L	$20,250.00	$162,000
flights (yellowknife - cambridge bay)				#N/A	$0.00	$0
mobile camp rental		year	1	camrl	$425,000.00	$425,000
camp operation (<10 persons) - 3 persons		days	240	CPOPAL	$2,000.00	$480,000
annual fuel		litre	35000	FCGH	$1.40	$49,000
misc. supplies		allow		#N/A	$0.00	$0
pick-up truck		month	24	EQP1L	$2,000.00	$48,000
small dozer		month	12	EQP2L	$8,000.00	$96,000
small excavator		month	12	EQP3L	$10,000.00	$120,000
snow machine		month	12	EQP4L	$10,000.00	$120,000
articulated dump truck		month	12	EQP5L	$10,000.00	$120,000
communications		month		#N/A	$0.00	$0
SNP/AEMP water sampling & reporting		each	1	WSH	$10,000.00	$10,000
geotechnical assessment[3]		each	1	GEOIL	$25,000.00	$25,000
Water Management						
Inspect and maintain water management structures		ls	1	WTR3L	$70,000.00	$70,000
Operate / maintain pumping system						
technician (camp rental /operations incl under Mob)		month	0	WTR1L	$34,200.00	$0
site support, consumables		month	0	WTR2L	$5,800.00	$0
				Annual	Interim C&M Cost	$2,070,600
Number of years of ICM		years	1.5		**Total**	$3,105,900.00

3. Geotechnical inspection is to assess the stability of the dams, thermal pads, look for obvious permafrost degredation, assess stability of road embankments.

Post-Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MONITORING & INSPECTIONS						
Annual geotechnical inspection	(years 1, 2, 3, 6 and 10 after closure activitie	each	0.5	GEOI2L	$70,000.00	$35,000
Cover monitoring	(years 1, 3, 5, 7, 10)	each	0.5	GEOI2L	$70,000.00	$35,000
Survey inspection		each		#N/A	$0.00	$0
Regulatory costs*	every year	each	1	RPTL	$20,000.00	$20,000
Water sampling and testing	(years 1, 2, 3, 4, 5, 7 and 10)	each	0.7	WTR4L	$60,000.00	$42,000
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	$0.00	$0
Clear spillway		each		#N/A	$0.00	$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	$0.00	$0

Subtotal, Annual post-closure costs			$132,000
Discount rate for calculation of net present value of post-closure cost, %			
Number of years of post-closure activity	10	years	
Present Value of payment stream			$1,320,000

*Regulatory costs - annual reporting, management plans, progress reports etc.

Mobilization/Demobilization:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MOBILIZE HEAVY EQUIPMENT						
Excavators						
Edmonton to Hay River	(2 x 36.1 tonnes)	tonne	108.3	MOB1L	$443.00	$47,977
Hay River to Roberts Bay	(2 x 36.1 tonnes)	tonne	108.3	MOB1L	$443.00	$47,977
Dump trucks						
Edmonton to Hay River	(3 x 34.4 tonnes)	tonne	137.6	MOB1L	$443.00	$60,957
Hay River to Roberts Bay	(3 x 34.4 tonnes)	tonne	137.6	MOB1L	$443.00	$60,957
Dozers						
Edmonton to Hay River	(2 x 33.5 tonnes)	tonne	67	MOB1L	$443.00	$29,681
Hay River to Roberts Bay	(2 x 33.5 tonnes)	tonne	67	MOB1L	$443.00	$29,681
Loaders						
Edmonton to Hay River	(2 x 30 tonnes)	tonne	90	MOB1L	$443.00	$39,870
Hay River to Roberts Bay	(2 x 30 tonnes)	tonne	90	MOB1L	$443.00	$39,870
Light duty vehicles						
Edmonton to Hay River		each	8	MOB3L	$5,050.00	$40,400
Hay River to Roberts Bay		each	8	MOB3L	$5,050.00	$40,400
Standard 20' containers						
Edmonton to Hay River		each	12	MOB2L	$13,400.00	$160,800
Hay River to Roberts Bay		each	12	MOB2L	$13,400.00	$160,800
MOBILIZE MISC. EQUIPMENT						
Pump shipping		each		#N/A	0	$0
Pipe shipping		m		#N/A	0	$0
Minor tools and equipment		allow		#N/A	0	$0
Truck tires		allow		#N/A	0	$0
Other				#N/A	0	$0
MOBILIZE CAMP						
ICM activities		year	1.5	CPRTL	425000	$637,500
Reclamation / Closure activities		year	5	CPRTL	425000	$2,125,000

Mobilization/Demobilization:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
Long term reclamation activities (eg pump flooding)		allow		#N/A	0	$0
MOBILIZE WORKERS						
flights from Yellowknife to Cambridge Bay in summer months		month	0	#N/A	0	$0
flights from Yellowknife to Cambridge Bay in winter months		month	0	#N/A	0	$0
Long term reclamation activities (eg pump flooding) - transport		each		#N/A	0	$0
Long term reclamation activities (eg pump flooding) - travel time		each		#N/A	0	$0
Monitoring Airfare		each		#N/A	0	$0
WORKER ACCOMODATIONS						
Closure Activities - camp operations (winter months , <10 persons, incl food, maintenance, air travel)		day	450	CPOPAL	2000	$900,000
Closure Activities - camp operations (non-winter months , 25 persons, incl food, maintenance, air travel)		person/day	15750	CPOPL	500	$7,875,000
Water Managemnt (2 years after closure) - camp operations (<10 persons, incl food, maintenance, air travel)	(8 months per year)	day	480	CPOPAL	2000	$960,000
MOBILIZE FUEL						
Fuel freight - reclamation activities		litre	1250000	FCGH	1.4	$1,750,000
Fuel freight - long term reclamation activities		litre		#N/A	0	$0
Fuel freight accommodations		litre		#N/A	0	$0
WINTER ROAD						
Construction and operation		km	0	#N/A	0	$0
Limited winter use		km	0	#N/A	0	$0
Winter road tariff		km		#N/A	0	$0
DEMOBILIZE HEAVY EQUIPMENT			60			
Excavators			60			
Edmonton to Hay River	(3 x 36.1 tonnes)	tonne	108.3	MOB1L	$443.00	$47,977

Mobilization/Demobilization:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
Hay River to Roberts Bay	(3 x 36.1 tonnes)	tonne	108.3	MOB1L	$443.00	$47,977
Dump trucks						
Edmonton to Hay River	(4 x 34.4 tonnes)	tonne	137.6	MOB1L	$443.00	$60,957
Hay River to Roberts Bay	(4 x 34.4 tonnes)	tonne	137.6	MOB1L	$443.00	$60,957
Dozers						
Edmonton to Hay River	(2 x 33.5 tonnes)	tonne	67	MOB1L	$443.00	$29,681
Hay River to Roberts Bay	(2 x 33.5 tonnes)	tonne	67	MOB1L	$443.00	$29,681
Loaders						
Edmonton to Hay River	(3 x 30 tonnes)	tonne	90	MOB1L	$443.00	$39,870
Hay River to Roberts Bay	(3 x 30 tonnes)	tonne	90	MOB1L	$443.00	$39,870
Light duty vehicles						
Edmonton to Hay River		each	8	MOB3L	$5,050.00	$40,400
Hay River to Roberts Bay		each	8	MOB3L	$5,050.00	$40,400
Standard 20' containers						
Edmonton to Hay River		each	12	MOB2L	$13,400.00	$160,800
Hay River to Roberts Bay		each	12	MOB2L	$13,400.00	$160,800
DEMOBILIZE CAMP						
		allow		#N/A	$0.00	$0
DEMOBILIZE WORKERS						
flights from Yellowknife to Cambridge Bay in summer months		month	0	#N/A	$0.00	$0
flights from Yellowknife to Cambridge Bay in winter months		month	0	#N/A	$0.00	$0
WINTER ROAD						
Construction and operation		km	0	#N/A	$0.00	$0
Limited winter use		km	0	#N/A	$0.00	$0
Winter road tariff		km		#N/A	$0.00	$0
					Total	**$15,766,239**

Appendix B
Doris North Project
Comparison of INAC 2015 Reclamation Cost Estimate with INAC Updated Estimate (2016)

COMPARISON OF INAC 2015 RECLAMATION COST ESTIMATE AND UPDATED ESTIMATE (2016)

Activity / Material	2015 Reclamation Cost Estimate	Updated 2016 Reclamation Cost Estimate	Difference	Reason for Difference	Comments
CAPITAL COSTS					
ROBERTS BAY AREA					
20 ML Tank Farm - Wash tanks	$1,420	$5,680	$4,260		wrong number of tanks
20 ML Tank Farm - Disconnect piping and controls	$550	$2,200	$1,650		wrong number of tanks
20 ML Tank Farm - Dismantle tanks and cut into manageable pie	$100,000	$60,000	-$40,000		wrong number of tanks, and unit rate too high
Quarry 1 - Drain tanks into portable fuel storage (EnviroTanks)	$40,000	$10,000	-$30,000		wrong number of tanks
Quarry 1 -Disconnect piping and controls	$2,750	$1,100	-$1,650		wrong number of tanks
Quarry 1 -dismantle 5ML tank and cut into manageable pieces	$400,000	$15,000	-$385,000		wrong number of tanks, and unit rate too high
TAILINGS IMPOUNDMENT AREA					
Shoreline Protection - Install separation geotextile	$326,040	$978,120	$652,080	unit rate	unit rate increased from $6.00/m2 to $18.00/m2 based on project experience in YT
Shoreline Protection - Haul and place rip rap	$510,055	$155,610	-$354,445	unit rate	unit rate decreased - haul and place only.
Cover Tailings - LHDP ROQ (0.3 m thick cover). Source from Quarry #3, adjacent to the TIA.	$2,158,200	$831,600	-$1,326,600	unit rate	unit rate decreased for haul and place only instead of produce, haul and place..
QUARRY A, B, D AND EXPLOSIVES STORAGE FACILITIES					
Doris Windy Road	$261,900	$0	-$261,900		Doris Windy Road not part of Water Licence
SECONDARY ROAD					
cut tailings line running along the road	$126,500	$66,125	-$60,375	unit rate	revised to $11.50/m from $22.00/m (reflects appropriate production rate)
cut pipeline into manageable pieces	$178,750	$93,438	-$85,312	unit rate	revised to $11.50/m from $22.00/m (reflects appropriate production rate)
QUARRY #2 AND #3					
Overburden Dump - install erosion protection measures (coconut matting)	$15,804	$47,412	$31,608	unit rate	unit rate increased from $6.00/m2 to $18.00/m2 based on project experience in YT
ROBERTS BAY DISCHARGE SYSTEM (LAND BASED)					
Cut pipelines into manageable pieces	$393,840	$62,905	-$330,935	unit rate	revised to $11.50/m from $72.00/m. Original unit rate changed from underwater removal / dismantling to land based.
ROBERTS BAY DISCHARGE SYSTEM (MARINE BASED)					
Retrieve Pipeline; cut pipelines into manageable pieces	$0	$177,192			was not included (missed) in original estimate
Load debris for transport to landfill	$0	$6,893			was not included (missed) in original estimate
haul debris to landfill	$0	$3,329			was not included (missed) in original estimate
Retrieve and dismantle diffuser	$0	$6,840			was not included (missed) in original estimate
DORIS CAMP					
Accommodation Complex - disconnect trailers and prep for removal (remove boards/piping, etc.; wrap in plastic)	$374,975	$109,975	-$265,000	# of units	# of units corrected (revised to 83 trailers from 283 trailers)
Cut pipelines into manageable pieces	$18,260	$9,545	-$8,715	unit rate	revised to $11.50/m from $22.00/m (reflects appropriate production rate)
Fire Storage tank - prepare pieces for transportation (includes water tank for Boston)	$38	$58	$20	# of units	revised to 2.9 m3 from 4.4 m3 (removal of Boston tank from scope)
Fire Storage tank - collect debris	$1	$13	$12	# of units	revised to 73.2 m3 from 4.4 m3 (removal of Boston tank from scope)
remove water intake line from Doris lake	$1,800	$550	-$1,250	unit rate	revised to $11.50/m from $22.00/m (reflects appropriate production rate)
Cut pipelines into manageable pieces and place in containers for shipping off-site	$26,180	$9,545	-$16,635	unit rate	revised to $11.50/m from $22.00/m (reflects appropriate production rate)
WATER MANAGEMENT					
Pumps - Capital costs	$0	$125,000	$125,000	# of units	Assumed no pumps available on-site. This was not included (missed) in original estimate
Pumps - shipping	$0	$12,500	$12,500	# of units	
Pumps- maintenance	$0	$125,000	$125,000	# of units	

COMPARISON OF INAC 2015 RECLAMATION COST ESTIMATE AND UPDATED ESTIMATE (2016)

Activity / Material	2015 Reclamation Cost Estimate	Updated 2016 Reclamation Cost Estimate	Difference	Reason for Difference	Comments
Inspect and maintain water management structures	$100,000	$350,000	$250,000	# of units	Was included in 2015 estimate under water management. Rate revised to reflect 12 hrs/day for 30days at $95/hr, 8 months/yr.
Operate / maintain H2O Mgmt structures - technician	$567,000	$1,368,000	$801,000	# of units	
Operate / maintain H2O Mgmt structures - support/consumables	$348,000	$232,000	-$116,000	# of units	
H20 testing/reporting during closure (3 yrs)- annual geotech insp	$0	$75,000	$75,000	# of units	was not included (missed) in original estimate
H20 testing/reporting during closure (3 yrs)- regulatory costs	$0	$60,000	$60,000	# of units	was not included (missed) in original estimate
H20 testing/reporting during closure (3 yrs)-samples and lab	$0	$180,000	$180,000	# of units	was not included (missed) in original estimate
INTERIM CARE AND MAINTENANCE (18 MONTHS)					
caretaker*	$87,750	$140,400	$52,650	# of units	revised to 8 manmonths (reflects overlap, training)
electrician*	$128,250	$205,200	$76,950	# of units	revised to 8 manmonths (reflects overlap, training)
mechanic*	$101,250	$162,000	$60,750	# of units	revised to 8 manmonths (reflects overlap, training)
camp operation (<10 persons)*	$540,000	$480,000	-$60,000	# of units	revised for 18 months (12 manmonths), using daily camp operation rate per person
annual fuel*	$47,250	$49,000	$1,750	# of units	revised units from 22,500 L to 35,000L
pick-up truck*	$72,000	$48,000	-$24,000	# of units	revised units from 48 months to 24 months, from 1 unit to 2 units
geotechnical assessment*	$56,250	$25,000	-$31,250	# of units	revised units from 2 years to 1 year x 1.5 yrs
Inspect and maintain water management structures	$30,000	$70,000	$40,000	unit rate	revised unit rate from $20k per inspection to $70k/inspection x 1.5 yrs. Assumed this will require equipment / operator and laborer for maintenance.
technician (camp support incl under Mob)	$85,050	$0	-$85,050	# of units	Included under 5 year Water Management plan
site support, consumables	$52,200	$0	-$52,200	# of units	Included under 5 year Water Management plan
Winter Road - construct and operate	$1,334,000	$0	-$1,334,000		winter road not required
Winter - road - limited winter use	34	0	-34		winter road not required
OFF SITE SHIPPING BY BARGE					
hazardous waste	$0	$26,257	$26,257		was not included (missed) in original estimate
hazardous solid waste	$0	$8,316	$8,316		was not included (missed) in original estimate

COMPARISON OF INAC 2015 RECLAMATION COST ESTIMATE AND UPDATED ESTIMATE (2016)

Activity / Material	2015 Reclamation Cost Estimate	Updated 2016 Reclamation Cost Estimate	Difference	Reason for Difference	Comments
INDIRECT COSTS					
MOBILIZATION					
Mobilize workers - flights from Yellowknife to Cambridge Bay in summer months	$3,060,000	$0	-$3,060,000		removed rom 2016 estimate b/c they are included in camp rental costs
Mobilize workers - flights from Yellowknife to Cambridge Bay in winter months	$612,000	$0	-$612,000		removed rom 2016 estimate b/c they are included in camp rental costs
camp operations (winter months , <10 persons, incl food, maintenance, air travel) - 2 full years for water management activities (before camp closure)	$3,600,000	$1,860,000	-$1,740,000		changed from 60 mos to 36 months; Used TMAC daily unit rate per person.
camp operations (winter months , >25 persons, incl food, maintenance, air travel) - 2 full years for water management activities (before camp closure)	$270,000	$7,875,000	$7,605,000		Revised units to reflect 21 months (over 3 years) for a 25 person camp. Per person perday rate of $500.
Winter Road - construction and operation (DURING CLOSURE)	$1,334,000	$0	-$1,334,000		Winter road not required.
Demobilize workers - flights from Yellowknife to Cambridge Bay in summer months	$3,060,000	$0	-$3,060,000		not required - these costs included in Camp operations
Demobilize workers - flights from Yellowknife to Cambridge Bay in winter months	$612,000	$0	-$612,000		not required - these costs included in Camp operations
Winter Road - construction and operation	$1,334,000	$0	-$1,334,000		Winter road not required.
Fuel costs for closure activites	$0	$1,750,000	$1,750,000		Included as per diection by INAC.
POST CLOSURE MONITORING AND MAINTENANCE					
Water sampling and testing (years 1, 2, 3, 4, 5, 7 and 10)	$60,000	$42,000	-$18,000	# of units	revised water sampling schedule (years 1, 2, 3,5 ,7 and 10)
Vegetation Monitoring	$35,000	$0	-$35,000	# of units	removed from 2016 estimate - no revegetation measures
ENGINEERING	$1,408,063	$1,523,171	$115,108		difference results from changes in direct costs
PROJECT MANAGEMENT	$1,173,386	$2,094,361	$920,975		increased from 7% to 11% of direct costs, based on senior review
H&S PLANS / MONITORING & QA/QC	$469,354	$380,793	-$88,561		difference results from changes in direct costs
BONDING INSURANCE	$234,677	$190,396	-$44,281		difference results from changes in direct costs
CONTINGENCY[1], 20%	$4,693,545	$3,807,928	-$885,617		difference results from changes in direct costs
MARKET PRICE FACTOR ADJUSTMENT	$0	$0	$0		not applicable

1. A contingency of 20% of the direct costs was included. The RECLAIM 7.0 Guidance suggests that for a 'feasibility or advanced conceptual' estimate type, a contingency of ±20% is appropriate. The guidance also says that virtually all reclamation plans and associated cost estimates are in the 'feasibility or advanced conceptual' stage until possibly the last few years of the mine life.

* - These are costs/year and need to be multiplied by 1.5 for 18 months.

Appendix C
Doris North Project
Comparison of INAC 2015 Reclamation Cost Estimate (2016 Update)
and TMAC 2016 Reclamation Cost Estimate

Appendix C
Doris North Project
Comparison of INAC 2015 Reclamation Costs (2016 Update) and TMAC Reclamation Costs (revised 2015)

	INAC Estimate	TMAC Estimate		Difference	Basis for Significant Differences
DIRECT					
Roberts Bay Area	$446,458	$758,903		-$312,446	Cost to dismantle tanks in tank farms. TMAC rate @$100k for 5ML tanks compared to $15k rate used for INAC estimate based on unit rate obtained form Amec Foster Wheeler Estimators Group. Accounts for -$460k. Draining Large fuel Tanks - assume need 6 portable enviro tanks (20,000 L each) per tank - rental and operations to transfer fuel. Accounts for +$20k.
Airstrip	$19,321	$11,520		$7,801	Unit rate of $0.12/m2 calculated for INAC estimate to regrade /crown areas for positive drainage, compared to TMAC unit rate of $0.01/m2. Accounts for +$5.6k
Underground Infrastructure	$209,904	$124,161		$85,743	INAC estimate uses a unit rate of $40k to engineer and construct reinforced concrete vent raise caps vs. TMAC rate @ $14k. Accounts for +$78k.
Reagent pads	$31,618	$20,141		$11,476	Unit rate of $0.12/m2 calculated for INAC estimate to regrade /crown areas for positive drainage, compared to TMAC unit rate of $0.01/m2. Accounts for +$6.5kk
Tailings	$7,312,645	$8,655,951		-$1,343,306	INAC Estimate assumes regrading of tailings surface will be required (+$400k) INAC estimate uses lower unit rates as follows: - separation geotextile ($18.00 vs. $28.37) - accounts for -$560k - haul & place rip rap ($6.30 vs. $8.82) - accounts for -$62k - LHDP ROQ ($6.30 vs. $16.35) - accounts for -$1.3M (Assumed rip rap and ROQ from Quarry #3, adjacent to Tailings area).
Secondary Road	$374,854	$288,573		$86,281	varying unit rates
Doris Windy Road	$4,431	$259,353		-$254,922	Doris Windy Road not included in Doris North reclamation cost.
Quarry #2 and #3	$187,690	$190,109		-$2,419	varying unit rates
Doris Mountain	$70,975	$65,592		$5,383	varying unit rates
Doris Waste Managemnt Area	$46,993	$29,700		$17,293	varying unit rates
Roberts Bay Discharge	$291,841	$87,521		$204,319	TMAC estimate only included costs to dismantle / dispose of land pipeline - did not include costs for retrieving and dismantling marine portion of pioeline and diffuser. Accounts for +$204k
Off-Site Disposal for Shipping	$34,572	$303,487		-$268,915	Hydrocarbon contaminated soil to be disposed of underground.
Doris Camp	$3,884,665	$2,996,445		$888,220	Cost to dismantle tanks in tank farms. TMAC rate @$100k for 5ML tanks compared to $15k rate used for INAC estimate based on unit rate obtained form Amec Foster Wheeler Estimators Group. Accounts for -$275k. Regrading of pad areas - Unit rate of $0.12/m2 calculated for INAC estimate to regrade /crown areas for positive drainage, compared to TMAC unit rate of $0.01/m2. Accounts for +$166k. Demolition of Mill Building - Used a higher rate of $19/m3 (vs $12.90/m3) for dismantling and demolition. Accounts for +$800k. Draining Large fuel Tanks - assume need 6 portable enviro tanks (20,000 L each) per tank - rental and operations to transfer fuel. Accounts for +$50k.

	INAC Estimate	TMAC Estimate		Difference	Basis for Significant Differences
Water Management	$3,027,500	$3,361,200		-$333,700	TMAC estimate uses a monthly rate of $5.8k over 40 months for consumables to support the operation / maintenance of the water management activites. INAC estimate uses $60k over 22 months. Accounts for -$1.1M. INAC estimate assumes pupms will need to be purchased and maintained. Accounts for +$250k. INAC estimate allows for annual geotechnical and water sampling events during closure activites (3 years). Accounts for +$315k.
Interim Care and Maintenance	$3,268,743	$2,408,390		$860,353	TMAC estimate assumes camp facilities available for ICM. Accounts for $640k
Total Direct Cost Differences	$19,212,209	$19,561,047		-$348,839	
INDIRECT					
Post Closure Monitoring and Maintenan	$1,320,000	$1,320,000		$0	
Mobilization / Demobilization	$15,549,796	$2,865,058		$12,684,738	Camp Rental - INAC estimate asumes 5 years camp rental vs. TMAc estimate of 2.5 years. Accounts for +$1.1M Camp operation costs - INAC estimate assumes closure activities will be carried out over 3 years (21 months at a high camp costs (25 persons) and 5 months at a lower camp cost (<10 persons). Accounts for +$7.6M. Camp Operation Costs - INAC estimate assumes camp costs (less than 10 persons) for 2 years after closure activites to complete water managemnt plan. Accounts for +$960k. Equipment - INAC estimate allows for 2 dozers, 3 excavators, 3 loaders @$443/tonne; 6 light duty vehicles @ $5k each and 12 x 20' containers #13K each for mob. Same rates for demob. Accounts for +$800k. Fuel for Reclamation activites included in INAC Estimate. Accounts for +$1.75M
Engineering	$1,523,171	$197,475		$1,325,696	INAC estimate uses 8% of direct costs for engineering vs. TMAC estimate at 1%
Project Management	$2,094,360	$394,950		$1,699,410	INAC estimate uses 11% of direct costs for engineering vs. TMAC estimate at 2%
Bonding / Insurance	$190,396	$0		$190,396	Not included in TMAC estimate
Contingency	$3,807,929	$3,851,111		-$43,182	Both estimates used 20% of direct costs for contingency
Market Price Factor Adjustment	$0	$0		$0	
Total Indirect Cost Differences	$26,580,012	$9,023,544		$17,556,468	

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
ROBERTS BAY AREA			
JETTY			
Remove rock fill to 0.3 m below LLWL, place in surrounding water	$5,981	$1,244	TMAC unit rate @ $1.23/m2 for dozer / operator. INAC model used $5.90/m3, to excavate and haul.
Remove on-shore mooring points	$1,500	$1,200	same # of units; RECLAIM unit rate for equipment; TMAC rate for laborer
Remove mooring buoy	$3,000	$2,500	same # of units; RECLAIM unit rate for equipment; TMAC rate for laborer plus barge
Crown jetty for positive drainage	$228	$2,332	Calculated a unit rate of $0.12/m2 compared to TMAc model of $1.23/m2.
ROBERTS BAY TANK FARM - 20ML			
Drain tanks into portable fuel storage (EnviroTanks)	$40,000	$1,027	80,000L needed to drain, $1,500 annual tank rental per 20,000 L tank + labour
Decommission fuel transfer facilities	$2,200	$1,288	same # of units; TMAC rates for laborers and electrician
Wash tanks	$5,680	$4,493	same # of units; TMAC rates for laborers
Operate oil/water separator	$1,500	$139	Different unit rate, different # of units
Disconnect piping and controls	$2,200	$1,549	same # of units; TMAC rates for laborers and electrician
Dismantle tanks and cut into manageable pieces	$60,000	$400,000	revised unit rate of $15k per tank from AFW demolition group
Load pieces for transportation	$571	$465	same # of units; RECLAIM unit rate for excavator / operator
Haul cut metal to Landfill	$326	$308	same # of units; TMAC rates for tractor trailer / operator; time varies
Remove and stockpile liner protection cover	$23,457	$14,994	calculated $4.40/m3, compared to $2.75 for TMAC
load contaminated soils into megabags for shipping off-site	$5,013	$3,537	same # of units; rates from both RECLAIM and TMAC
haul contaminated material to Roberts Bay laydown	$360	$143	same # of units; TMAC rates for tractor trailer / operator; time varies
Clean liner	$4,017	$4,017	
Remove and cut liner into manageable pieces	$5,768	$1,653	calculated $0.56/m2, compared to $2.75 for TMAC
Load Debris into Waste Trucks	$1,217	$948	same # of units; RECLAIM unit rate for excavator / operator
Haul containers to Quarry 3 Landfill	$588	$556	same # of units; TMAC rates for tractor trailer / operator; time varies
Regrade area for positive drainage	$1,384	$114	Calculated a unit rate of $0.12/m2 compared to TMAc model of $1.23/m2.
QUARRY 1 TANK FARM			
5ML Drain tanks into portable fuel storage (EnviroTanks)	$10,000	$ 257.00	80,000L needed to drain, $1,500 annual tank rental per 20,000 L tank + labour
1ML Drain tanks into portable fuel storage (EnviroTanks)	$10,000	$257	80,000L needed to drain, $1,500 annual tank rental per 20,000 L tank + labour
Decommission fuel transfer facilities	$1,100	$ 448.37	higher lump sum cost
Wash tanks	$2,840	$ 2,246.57	same # of units; TMAC rates for laborers
Operate oil/water separator	$6,600	$ 6,819.95	same unit rate, different # of units
Disconnect piping and controls	$1,100	$ 448.37	same # of units; Tam rates for laborers and electrician
Dismantle 5ML diesel fuel tank and cut into manageable pieces	$15,000	$ 100,000.00	revised unit rate of $15k per tank from AFW demolition group
Dismantle 1ML jet fuel tank and cut into manageable pieces	$15,000	$ 50,000.00	revised unit rate of $15k per tank from AFW demolition group
Prepare pieces for transportation	$2,285	$ 1,779.66	same # of units; RECLAIM unit rate for excavator / operator
Haul cut metal to Landfill	$1,103	$ 1,042.84	same # of units; TMAC rates for tractor trailer / operator; time varies
Remove and stockpile liner protection cover	$9,417	$ 6,019.64	calculated $0.56/m2, compared to $2.75 for TMAC
load contaminated soils into megabags for shipping off-site	$5,013	$ 3,537.45	calculated $0.56/m2, compared to $2.75 for TMAC
haul megabags to Roberts Bay laydown	$339	$ 134.52	calculated $0.56/m2, compared to $2.75 for TMAC
Clean liner	$2,543	$ 2,543.38	calculated $0.56/m2, compared to $2.75 for TMAC
Remove and cut liner into manageable pieces	$3,652	$ 1,046.42	calculated $0.56/m2, compared to $2.75 for TMAC
Drain and wash empty fuel drums	$9,000	$ 2,661.01	same # of units; RECLAIM unit rate for equipment/operator; TMAC rate for laborer
Crush empty fuel drums	$5,250	$ 3,095.96	same # of units; RECLAIM unit rate for loader; TMAC rate for laborer
Load debris for transport to landfill	$895	$ 697.54	same # of units; RECLAIM unit rate for excavator / operator

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
Haul waste to Landfill	$432	$ 408.74	same # of units; TMAC rates for tractor trailer / operator; time varies
Level containment berms	$441	$ 342.80	same # of units; RECLAIM unit rate for loader / operator
Regrade area for positive drainage	$438	$ 36.06	same # of units; RECLAIM unit rate for grader / operator

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
MECHANICAL SHOP COMPLEX			
Decommission electrical, mechanical, heating (including connections	$4,480	$4,480	
Demolish (steel modular structure)	$41,884	$30,983	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Demolish wood structures (warehouse roof, crew lounge)	$5,381	$3,652	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Demolish tent structure (light vehicle shop)	$8,746	$5,936	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Collect Debris	$123	$119	
Load debris for transport to landfill	$11,385	$8,868	same # of units; RECLAIM unit rate for excavator / operator
Haul debris to Landfill	$5,497	$5,197	same # of units; TMAC rates for tractor trailer / operator
WASTE MANAGEMENT FACILITY			
Collect ashes and place in containers	$7	$ 373.85	same # of units; RECLAIM unit rate for excavator / operator
Dismantle (welding crew)	$3,000	$ 1,022.00	
Demolish wood structures (roof, entryway, etc.)	$1,448	$ 983.29	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Disconnect containers and prep for shipping off-site	$14,575	$ 14,535.06	
Collect all debris	$23	$ 22.28	
Load debris for transport to landfill	$2,002	$ 1,559.67	same # of units; RECLAIM unit rate for excavator / operator
Haul debris to Landfill	$967	$ 913.93	same # of units; TMAC rates for tractor trailer / operator; time varies
LAYDOWN AREA			
Decommission vehicle plug system	$640	$ 639.99	
Remove cables and posts	$1,200	$ 3,225.96	
Collect all debris	$4,408	$ 4,242.05	
Load debris for transport to landfill	$131	$ 102.28	same # of units; RECLAIM unit rate for excavator / operator
Haul debris to Landfill	$63	$ 59.93	same # of units; TMAC rates for tractor trailer / operator; time varies
Regrade area for positive drainage	$2,939	$ 241.97	Calculated a unit rate of $0.12/m2 compared to TMAc model of $1.23/m2.
Laydown Area Expansion Collect all debris	$6,984	$ 6,720.33	
Load waste into containers for shipping off-site	$131	$ 102.28	same # of units; RECLAIM unit rate for excavator / operator
Haul debris to Landfill	$63	$ 59.93	same # of units; TMAC rates for tractor trailer / operator; time varies
Breach safety berms and Regrade area for positive drainage	$4,656	$ 383.33	Calculated a unit rate of $0.12/m2 compared to TMAc model of $1.23/m2.
OVERBURDEN DUMP	$8,795		
Collect all debris	$1,881	$ 1,809.64	
Load waste into containers for shipping off-site	$131	$ 102.28	same # of units; RECLAIM unit rate for excavator / operator
Haul debris to Landfill	$63	$ 59.93	same # of units; TMAC rates for tractor trailer / operator; time varies
Grade for positive drainage	$16,508	$ 12,823.35	Calculated a unit rate of $0.12/m2 compared to TMAc model of $1.23/m2.
Breach the berm to original ground to restore natural flow path	$597	$ 463.94	same # of units; RECLAIM unit rate for loader / operator
ROBERTS BAY ACCESS ROAD			
Crown road for positive drainage	$405	$ 33.37	same # of units; RECLAIM unit rate for grader / operator
COMMUNICATIONS TOWER			
Decommission Tower	$640	$ 639.99	
Remove communication equipment	$1,400	$ 1,410.25	
Dismantle towers	$15,500	$ 15,417.42	
Prep tower sections for shipping off-site	$12,000	$ 4,954.53	

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
AIRSTRIP			
ALL WEATHER AIRSTRIP			
Decommission Airstrip	$1,500	$306.75	same # of units; RECLAIM unit rate to excavate, load, short haul, place and compact
Remove lighting fixtures (airstrip lighting, approach lights	$3,500	$2,799.96	same # of units; RECLAIM rates for equipment; TMAC rates for laborers
collect all debris	$513	$493.63	
load waste for transport to landfill	$16	$12.27	same # of units; RECLAIM unit rate for grader
Haul debris to Landfill	$8	$6.43	same # of units; TMAC rates for tractor trailer / operator
crown airstrip and airstrip expansion for positive drainage	$5,040	$414.94	Calculated a unit rate of $0.12/m2 compared to TMAc model of $0.01/m2.
SOUTH APRON			
crown for positive drainage	$540	$44.46	Calculated a unit rate of $0.12/m2 compared to TMAc model of $0.01/m2.
NORTH APRON			
Decommission electrical, and heating from traffic control	$350	$352.56	
demolish control tower structure (wood shack)	$222	$150.89	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
disconnect containers and prep for shipping off-site	$6,625	$6,606.84	
collect all debris	$2	$2.11	
load waste for transport to landfill	$231	$180.01	same # of units; RECLAIM unit rate for excavator / operator
haul debris to landfill	$112	$94.33	same # of units; TMAC rates for tractor trailer / operator
crown for positive drainage	$662	$54.51	Calculated a unit rate of $0.12/m2 compared to TMAc model of $0.01/m2.

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
UNDERGROUND INFRASTRUCTURE			
DORIS NORTH DECLINE PORTAL			
remove ducts, pipes, electrical cables	$11,300	$11,209	same # of units; RECLAIM unit rate to excavate, load, short haul, place and compact
construct portal plug	$17,343	$17,342	
regrade area for positive drainage	$174	$14	Calculated a unit rate of $0.12/m2 compared to TMAc model of $0.01/m2.
DORIS NORTH VENT RAISE			same # of units; RECLAIM unit rate for grader
Remove ducts, pipes, and cables	$11,300	$11,209	
Construct a concrete cap (0.5 m thick reinforced concrete) to seal the top	$40,000	$14,007	same # of units; TMAC rates laborers/engineer; RECLAIM rates for equipment; concrete and steel
Decommission and dismantle all ventilation and hea	$2,560	$2,560	
Prepare units for shipping off-site	$5,300	$1,321	
Haul units to Roberts Bay	$465	$84	same # of units; TMAC rates for tractor trailer / operator; time varies
Regrade pads for positive drainage	$498	$41	same # of units; RECLAIM unit rate for grader / operator
Drain and decommission Enviro Tank	$10,000	$257	80,000L needed to drain, $1,500 annual tank rental per 20,000 L tank + labour
Haul Enviro Tank to Roberts Bay	$233	$84	same # of units; TMAC rates for tractor trailer / operator; time varies
Remove liner and cut into manageable pieces	$689	$197	same # of units; RECLAIM unit rate for excavator; TMAC rate for laborer
Load waste for transport to landfill	$144	$113	same # of units; RECLAIM unit rate for excavator / operator
Haul waste to landfill	$70	$46	same # of units; TMAC rates for tractor trailer / operator; time varies
Backfill area to prevent permanent ponding	$6,557	$5,094	same # of units; RECLAIM unit rate for loader / operator
DORIS CONNECTOR VENT RAISE			
Remove ducts, pipes, and cables	$11,300	$11,209	
Decommission and dismantle all ventilation facilities	$1,280	$1,280	
Prepare units for shipping off-site	$1,325	$1,321	
Construct a concrete cap (0.5 m thick reinforced concrete) to seal the top	$40,000	$14,007	same # of units; TMAC rates laborers/engineer; RECLAIM rates for equipment; concrete and steel
Remove culvert	$2,625	$2,000	same # of units; RECLAIM rates for excavator, trucking and laborers
Crown road for positive drainage	$833	$173	same # of units; RECLAIM unit rate for grader / operator
DORIS CENTRAL VENT RAISE			
Remove ducts, pipes, and cables	$113	$11,209	
Decommission and dismantle all ventilation facilities	$640	$1,280	
Prepare units for shipping off-site	$1,325	$1,321	
Haul units to Roberts Bay	$6	$84	same # of units; TMAC rates for tractor trailer / operator; time varies
Construct a concrete cap (0.5 m thick reinforced concrete) to seal the top	$40,000	$14,007	same # of units; TMAC rates laborers/engineer; RECLAIM rates for equipment; concrete and steel
Remove culvert	$2,625	$2,000	same # of units; RECLAIM rates for excavator, trucking and laborers
Crown road for positive drainage	$1,190	$606	Calculated a unit rate of $0.12/m2 compared to TMAc model of $0.01/m2.

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
REAGENT PADS			
EQUIPMENT LAYDOWN AREA			
collect all debris	$3,937	$3,788	same # of units; RECLAIM unit rate to excavate, load, short haul, place and compact
load waste for transport to landfill	$263	$205	same # of units; RECLAIM unit rate for excavator / operator
regrade area for positive drainage	$2,624	$216	Calculated a unit rate of $0.12/m2 compared to TMAc model of $0.01/m2.
haul waste to Landfill	$127	$120	same # of units; RECLAIM unit rate for grader
MATERIALS LAYDOWN AREA			
collect all debris	$6,012	$5,785	
load waste to ship to Landfill	$263	$205	same # of units; RECLAIM unit rate for excavator / operator
regrade area for positive drainage	$4,008	$330	Calculated a unit rate of $0.12/m2 compared to TMAc model of $0.01/m2.
haul waste to Landfill	$127	$120	same # of units; TMAC rates for tractor trailer / operator; time varies
AMMONIUM NITRATE STORAGE BUILDING			
remove and stockpile liner protection cover	$6,472	$4,137	same # of units; used RECLAIM to excavate/load/short haul
clean liner	$1,092	$1,092	
remove and cut liner into manageable pieces	$1,568	$449	same # of units; RECLAIM unit rate for excavator; TMAC rate for laborer
load waste for transport to landfill	$331	$258	same # of units; RECLAIM unit rate for excavator / operator
Haul waste to Landfill	$160	$151	same # of units; TMAC rates for tractor trailer / operator; time varies
level containment berms	$51	$39	same # of units; RECLAIM unit rate for loader / operator
regrade area for positive drainage	$463	$38	Calculated a unit rate of $0.12/m2 compared to TMAc model of $0.01/m2.
Decommission electrical, mechanical, heating	$1,280	$1,280	
demolish building (tent structure)	$2,842	$1,929	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
TAILINGS IMPOUNDMENT AREA			
CONTROL ACCESS			
Crown Access Roads	$238	$173	same # of units; RECLAIM unit rate to excavate, load, short haul, place and compact
STABILIZE EMBANKMENT(S)			
Breach North dam by cutting a 20 m slot down to original ground (drill and blast)	$224,826	$224,819	
Load and haul material	$276,088	$273,742	same # of units; RECLAIM unit rate for grader
Clad the cut core faces for thermal protection	$12,683	$10,044	same # of units; RECLAIM unit rate to drill/blast/load/long haul/place rip rap
SHORELINE PROTECTION			
Install separation geotextile	$978,120	$1,536,441	same # of units; rate based on previous projects in YT
Haul and place riprap to prevent erosion	$155,610	$217,962	same # of units; RECLAIM unit rate to drill/blast/load/long haul/place rip rap
Recontour Interim Dyke Crest	$4,800	$5,497	
COVER TAILINGS			
Grade/shape tailings surface	$594,000	$0	RECLAIM unit rate to excavate / recontor tailings
Produce ROQ (quarry drill and blast	$4,222,680	$4,222,560	
LHDP ROQ (0.3m thick cover)	$831,600	$2,158,580	RECLAIM unit rate to load/haul/ dump ROQ material to the TIA
SPECIALIZED ITEMS			
Remove thermosyphons radiators and towers	$12,000	$6,132	same # of units; RECLAIM unit rate for equipment; TMAC rates for laborer / plumbing

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
SECONDARY ROAD			
Secondary Road			
Remove Doris Creek bridge	$50,000	$ 50,000	same # of units; RECLAIM unit rate to excavate, load, short haul, place and compact
Cut tailings line running alongside the road into mai	$66,125	$ 63,973	same # of units; RECLAIM unit rate for loader / operator; TMAC rates for laborers/welder
Strap together or load pipe sections in containers fo	$36,239	$ 28,229	same # of units; RECLAIM unit rate for excavator / operator
Haul waste to the landfill	$17,498	$ 11,521	same # of units; RECLAIM unit rate for grader
Remove pipe culvert east of the bridge	$49,350	$ 1,786	same # of units; RECLAIM rates for excavator, trucking and laborers
Tailings Discharge And Reclaim Water Pipelines			
Cut pipelines into manageable pieces	$93,438	$ 90,396	same # of units; RECLAIM unit rate for loader / operator; TMAC rates for laborers/welder
decommission electrical (heat tracing)	$2,560	$ 2,560	
collect electrical cables and controllers and prep for	$731	$ 704	
Load debris for transport to landfill	$4,022	$ 3,133	same # of units; RECLAIM unit rate for excavator / operator
Haul waste to the landfill	$1,942	$ 2,457	same # of units; TMAC rates for tractor trailer / operator; time varies
TIA Access Road (Chainage 0+725)			
Crown road for positive drainage	$345	$ 251	same # of units; RECLAIM unit rate for grader / operator
Remove floating dock and bridge	$1,733	$ 545	same # of units; RECLAIM unit rate for excavator / operator
Load all debris to haul to Landfill	$1,733	$ 1,350	same # of units; RECLAIM unit rate for excavator / operator
Haul waste to the landfill	$837	$ 1,059	same # of units; TMAC rates for tractor trailer / operator; time varies
Explosives Facility			
Remove all explosive magazines	$5,046	$ 773	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Demolish entry gates	$10	$ 6	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
remove and stockpile liner protection cover	$13,033	$ 8,331	same # of units; used RECLAIM to excavate/load/short haul
remove and cut liner into manageable pieces	$2,488	$ 713	same # of units; RECLAIM unit rate for excavator; TMAC rate for laborer
load waste into containers for shipping off-site	$2,626	$ 2,046	same # of units; RECLAIM unit rate for excavator / operator
Decommission electrical and heating from facilities	$1,280	$ 1,280	
Demolish building (tent structure)	$8,170	$ 5,545	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
disconnect containers and prep for shipping off-site	$2,650	$ 2,643	
load waste into containers for shipping off-site	$545	$ 424	same # of units; RECLAIM unit rate for excavator / operator
collect all debris	$3,340	$ 3,214	
Load all waste and debris and waste into containers	$3,340	$ 38	same # of units; RECLAIM unit rate for loader / operator
Haul waste to landfill	$1,553	$ 1,023	same # of units; TMAC rates for tractor trailer / operator; time varies
Regrade pad area for positive drainage	$2,227	$ 183	same # of units; RECLAIM unit rate for grader / operator
Recontour berms to blend in with topography	$260	$ 2,658	same # of units; RECLAIM unit rate for grader / operator

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
DORIS WINDY ROAD			
ALL WEATHER ROAD			
Remove bridges	$0	150000	Removed - not part of the Doris North reclamtion costs
Remove Arched Culvert	$0	100000	
Crown road for positive drainage	$0	$8,662.20	
QUARRY A			
No decomm required	$0	$0.00	
QUARRY B			
No decomm required	$0	$0.00	
QUARRY D			
Scale vertical walls	$0	$0.00	
EXPLOSIVES STORAGE FACILITY			
Remove all explosive magazines	$1,262	$193	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Demolish entry gates	$10	$6	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Load all debris for transport to landfill	$334	$260	same # of units; RECLAIM unit rate for excavator / operator
Haul waste to the landfill	$161	$204	same # of units; TMAC rates for tractor trailer / operator; time varies
Regrade area for positive drainage	$2,666	$28	same # of units; RECLAIM rate for doze overburden/soil piles

	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
QUARRY #2 AND #3			
QUARRY #2			
No decomm required	$0	$0.00	same # of units; RECLAIM unit rate to excavate, load, short haul, place and compact
OVERBURDEN DUMP			
reslope to 3H:1V	$59,713	$28,740.61	same # of units; RECLAIM unit rate to excavate soil/ load/ short haul
grade top for positive drainage	$29,137	$22,633.56	same # of units; RECLAIM unit rate for grader
install erosion protection measures (coconut matting)	$47,412	$12,604.20	same # of units; rate based on previous projects in YT
Remove culvert	$2,625	$2,000.00	same # of units; RECLAIM rates for excavator, trucking and laborers
TREATED SEWAGE DISCHARGE AREAS			
Fill in low-lying areas (assumed sourced within 0.5km)	$760	$1,129.98	same # of units; RECLAIM unit rate to excavate soil/ load/ short haul/ spread and compact
erosion protection: Supply and place cocoa matting	$958	$254.57	same # of units; rate based on previous projects in YT
Quarry #3 -			
No decomm required	$0	$0.00	
Q#3 Access Road			
crown road for positive drainage	$238	$173.24	same # of units; RECLAIM unit rate for grader / operator
Quarry #3 Landfill			
LHDP ROQ to construct 1m landfill cap	$46,848	$122,573.28	same # of units; RECLAIM unit rate to drill / blast /load / haul spread and compact

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
DORIS MOUNTAIN			
COMMUNICATIONS TOWER			
Remove communications equipment	$4,200	$4,231	same # of units; RECLAIM unit rate to excavate, load, short haul, place and compact
Dismantle the communications towers and prepare for shipping o	$31,000	$30,835	
Demolish equipment housing shack	$171	$116	same # of units; RECLAIM unit rate for grader / operator
Remove electrical and fiber optics cables	$7,680	$7,680	same # of units; RECLAIM unit rate for grader
Remove all equipment, material, and waste from Doris Mountain	$27,500	$22,513	same unit rate; # of units varies slightly
load waste into trucks for transport to landfill	$144	$92	same # of units; RECLAIM unit rate for excavator / operator
Transport Waste to Landfill	$70	$42	same # of units; TMAC rates for tractor trailer / operator; time varies
Transport Communications tower equipment to Roberts Bay	$210	$84	same # of units; TMAC rates for tractor trailer / operator; time varies

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
DORIS WASTE MANAGEMENT AREA			
LAND FARM			
load contained contaminated soils into megabags f	$10,025	$7,074.89	same # of units; RECLAIM unit rate for loader; TMAC rate for laborer
haul megabags to Roberts Bay laydown	$634	$251.91	same # of units; TMAC rates for tractor trailer / operator
treat contained water and discharge	$6,500	$5,000.00	
remove and stockpile liner protection cover	$11,141	$7,121.87	same # of units; used RECLAIM to excavate/load/short haul
clean liner	$1,710	$1,709.89	
remove and cut liner into manageable pieces	$7,365	$2,110.50	same # of units; RECLAIM unit rate for excavator; TMAC rate for laborer
load waste for transport to landfill	$1,555	$1,210.99	same # of units; RECLAIM unit rate for excavator / operator
Haul Material to Landfill	$751	$556.44	same # of units; TMAC rates for tractor trailer / operator
level containment berms	$4,953	$3,847.50	same # of units; RECLAIM unit rate for loader / operator
regrade area for positive drainage	$526	$43.31	same # of units; RECLAIM unit rate for grader / operator
BATCH PLANT PAD			
collect all debris	$133	$128.22	
load waste for transport to landfill	$39	$30.68	same # of units; RECLAIM unit rate for excavator / operator
haul waste to Landfill	$19	$14.10	same # of units; TMAC rates for tractor trailer / operator
regrade area for positive drainage	$89	$7.31	same # of units; RECLAIM unit rate for grader / operator
BURN PAD			
Collect ashes and place in containers	$1	$74.77	same # of units; RECLAIM unit rate for excavator / operator
Dismantle (welding crew)	$1,500	$511.00	
haul containers to Roberts Bay laydown	$1	$0.50	same # of units; TMAC rates for tractor trailer / operator
regrade area for positive drainage	$48	$3.95	same # of units; RECLAIM unit rate for grader / operator

ACTIVITY/MATERIAL	Units	Cost Code	Unit Cost	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
OFF-SITE SHIPPING BY BARGE						
Off-Site Shipping by Barge						
hazardous waste	m3	hz1l	$218.81	$26,257	$25,893.83	
hazardous solid waste	m3	hz2l	$218.81	$8,315	$8,412.57	
hydrocarbon contaminated soils	m3	hy1l	$1,082.00	$0	$303,486.94	Hydrocarbon contaminated soils will be disposed of underground.

Comparison of INAC 2015 Reclamation Costs (2016 Update) and TMAC Reclamation Costs (revised 2015)

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
ROBERTS BAY DISCHARGE SYSTEM (LAND BASED)			
Cut pipelines into manageable pieces	$62,905	$60,857	same # of units; Unit rate first used considered removal / dismantling of pipe from underwater
Decommission electrical (heat tracing)	$8,250	$7,040	same # of units; RECLAIM unit rate to excavate, load, short haul, place and compact
Collect electrical cables and controllers and pr	$985	$947	
Load debris for transport to landfill	$15,231	$11,864	same # of units; RECLAIM unit rate for excavator / operator
haul debris to landfill	$7,354	$6,217	same # of units; RECLAIM unit rate for grader
Remove rock fill to 0.3 m below LLWL	$2,862	$595	same # of units; RECLAIM unit rate to excavate, load, short haul, place and compact
ROBERTS BAY DISCHARGE SYSTEM (MARINE BASED)			
Retrieve Pipeline; cut pipelines into manageable pieces	$177,192	$0	Not included in TMAC estimate
Load debris for transport to landfill	$6,893	$0	Not included in TMAC estimate
haul debris to landfill	$3,329	$0	Not included in TMAC estimate
Retrieve and dismantle diffuser	$6,840	$0	Not included in TMAC estimate

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
DORIS CAMP			
ACCOMODATION COMPLEX			
Decommission (electrical, mechanical, plumbing)	$65,920	$65,919	same # of units; RECLAIM unit rate to excavate, load, short haul, place and compact
disconnect trailers and prep for moving (remove boards/p	$109,975	$109,674	
haul trailers to Roberts Bay for shipping off-site	$17,473	$6,943	same # of units; TMAC rates for tractor trailer / operator
demolish cabins	$6,063	$4,115	same # of units; RECLAIM unit rate for grader
demolish cribbing, stairs, entryways, etc.	$4,756	$3,228	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
demolish arctic corridor	$2,518	$1,709	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
collect all debris	$69	$66	
load waste for transport to Landfill	$8,181	$6,373	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul waste to Landfill	$3,950	$2,928	same # of units; TMAC rates for tractor trailer / operator
regrade area for positive drainage	$2,526	$208	same # of units; RECLAIM unit rate for grader / operator
regrade pad transitions to blend in with topography	$24,016	$18,656	same # of units; RECLAIM unit rate for loader / operator
regrade surface to prevent ponding	$18,240	$1,502	same # of units; RECLAIM unit rate for grader / operator
TANK FARM			
Drain tanks into portable fuel storage (EnviroTanks)	$50,000	$1,284	different # of units; RECLAIM unit rate for equipment; TMAC rate for laborers / mechanic
Decommission Fuel Transfer Facilities	$2,750	$2,242	different # of units; Tam rates for laborers and electrician
Wash tanks	$7,100	$5,616	different # of units; TMAC rates for laborers
Operate oil/water separator	$300	$245	different # of units
Disconnect piping and controls	$2,750	$2,242	different # of units; Tam rates for laborers and electrician
Dismantle tanks and cut into manageable pieces	$75,000	$350,000	revised estimate from AFW Demolition group
prepare pieces for transportation	$299	$233	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
remove and stockpile liner protection cover	$14,448	$9,236	same # of units; used RECLAIM to excavate/load/short haul
load contained contaminated soils into megabags for ship	$5,013	$3,537	same # of units; RECLAIM unit rate for loader; TMAC rate for laborer
haul contaminated material to Roberts Bay laydown	$393	$156	same # of units; TMAC rates for tractor trailer / operator
clean liner	$2,145	$2,145	
remove and cut geosynthetics into manageable pieces	$3,080	$883	same # of units; RECLAIM unit rate for excavator; TMAC rate for laborer
load waste into containers for transport to landfill	$2,319	$1,806	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
haul waste to landfill	$1,120	$830	same # of units; TMAC rates for tractor trailer / operator
level containment berms	$1,520	$1,181	same # of units; RECLAIM unit rate for loader / operator
regrade area for positive drainage	$591	$49	same # of units; RECLAIM unit rate for grader / operator
PERMANAENT POWER GENERATOR			
Decommission (electrical)	$6,000	$6,033	
Disconnect containers and prep for shipping off-site	$10,600	$10,571	
haul containers to Roberts Bay laydown	$1,684	$669	
dismantle stacks	$40,000	$5,135	
prep stacks for shipping off-site	$3,000	$24,773	
haul stack sections to Roberts Bay laydown	$1,052	$418	
collect all debris	$379	$364	

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
load waste for shipping to landfill	$26	$20	
haul waste to landfill	$13	$9	
BACKUP POWER GENERATOR			
Decommission (electrical)	$2,560	$2,560	
Disconnect generator units and prep for shipping off-site	$1,500	$1,508	
haul units to Roberts Bay laydown	$429	$170	same # of units; TMAC rates for tractor trailer / operator
demolish tent housing structure	$1,788	$1,214	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
collect all debris	$47	$45	
load waste for shipping to landfill	$1,607	$1,252	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
haul waste to landfill	$776	$575	same # of units; TMAC rates for tractor trailer / operator
SEWAGE TREATMENT PLANT			
Flush and remove sewage plumbing, collect sewage slud	$5,921	$5,921	
Decommission (electrical) 9.0 each	$5,760	$5,760	
Disconnect containers and prep for shipping off-site	$11,925	$11,892	
haul containers to Roberts Bay laydown	$3,789	$1,505	same # of units; TMAC rates for tractor trailer / operator
Collect Debris	$5	$5	
Load debris into containers for transport (to Roberts Bay)	$312	$243	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul debris to Roberts Bay	$151	$112	same # of units; TMAC rates for tractor trailer / operator
FIRE WATER STORAGE TANK			
decommission and disconnect electrical and plumbing	$1,920	$3,865	
disconnect and remove container housing the pumps and	$1,325	$1,321	
haul container to Roberts Bay laydown	$210	$84	same # of units; TMAC rates for tractor trailer / operator
remove tank insulation	$38,160	$38,162	
Dismantle tanks and cut into manageable pieces (include	$38	$771	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
prepare pieces for transportation (includes water tank for	$45	$45	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
haul cut metal to Roberts Bay laydown (includes water tar	$22	$11	same # of units; TMAC rates for tractor trailer / operator
Collect Debris	$13	$13	
Load debris for transport Landfill	$390	$304	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul debris to landfill	$188	$140	same # of units; TMAC rates for tractor trailer / operator
Muster Station			
demolish tent structure	$4,319	$2,931	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
dismantle wood flooring	$519	$352	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Collect Debris	$16	$16	
Load debris for transport to landfill	$271	$437	same # of units; TMAC rates for tractor trailer / operator
Haul Debris to landfill	$271	$201	same # of units; TMAC rates for tractor trailer / operator
WAREHOUSE / CORE SHACK			
demolish tent structure	$5,121	$3,476	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
dismantle wood flooring, shelving, and lofts	$3,538	$2,401	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Collect Debris	$130	$125	

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
Load debris for transport to landfill	$4,599	$3,583	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul debris to landfill	$2,221	$1,646	same # of units; TMAC rates for tractor trailer / operator
haul all warehouse containers to Roberts Bay	$5,052	$2,007	same # of units; TMAC rates for tractor trailer / operator

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
OFFICE & MINE DRY COMPLEX			
Decommission (electrical, mechanical, plumbing)	$1,920	$1,920	
disconnect trailers and prep for moving (remove boards, c	$22,525	$22,463	
haul trailers to Roberts Bay for shipping off-site	$3,578	$1,422	same # of units; TMAC rates for tractor trailer / operator
demolish arctic corridor	$4,171	$2,831	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
demolish cribbing, stairs, entryways, etc.	$18,966	$12,873	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
collect all debris	$180	$343	
Load debris for transport to landfill	$30,535	$23,786	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
haul debris to landfill	$14,744	$10,930	same # of units; TMAC rates for tractor trailer / operator
regrade area for positive drainage	$829	$68	same # of units; RECLAIM unit rate for grader / operator
CRUSHING, MILLING & PROCESSING PLANT			
decommission crusher, milling, and process plants	$150,000	$100,000	
Drain chemicals and reagents into containers for shipping	$830	$21,814	
disassemble equipment	$200,000	$200,000	
prepare equipment for shipping off-site	$50,000	$50,000	
demolish / dismantle mill building	$2,346,785	$1,592,887	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Collect Debris	$1,566	$1,507	
load waste for transport to Landfill	$57,533	$44,817	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul debris to landfill	$27,781	$20,593	same # of units; TMAC rates for tractor trailer / operator
transport drums to Roberts Bay	$53	$21	same # of units; TMAC rates for tractor trailer / operator
UNDERGROUND WASHBAY			
demolish tent structure	$14,761	$10,019	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Collect Debris	$28	$27	
Load debris for transport to landfill	$204	$159	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul debris to landfill	$98	$73	same # of units; TMAC rates for tractor trailer / operator
UNDERGROUND DRILLING SUPPORT SHOP			
demolish tent structure	$16,325	$11,081	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Collect Debris	$41	$40	
Load debris for transport to landfill	$232	$181	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul debris to landfill	$112	$83	same # of units; TMAC rates for tractor trailer / operator
WATER INTAKE STRUCTURE AND PUMPING FACILITY			
remove water intake line from Doris Lake	$550	$278	same # of units; RECLAIM unit rate for removal / disposal (higher rate for removal from water)
decommission pumping facility (remove electrical)	$1,280	$2,576	
prep containers for shipping off-site	$2,650	$2,643	
disconnect and remove generator fuel tank (place in Doris	$640	$93	
clean TidyTank and prep for shipping off-site	$1,420	$23	same # of units; TMAC rates for laborers
run oil-water separator	$90	$93	
prep generator container for shipping off-site	$1,325	$1,321	
haul containers to Roberts Bay laydown	$421	$167	same # of units; TMAC rates for tractor trailer / operator

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
Collect Debris	$401	$386	
Load debris for transport to landfill	$263	$205	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul debris to landfill	$127	$94	same # of units; TMAC rates for tractor trailer / operator
SEDIMENTATION / POLLUTION CONTROL POND			
disconnect piping and electrical wiring, remove sump pum	$1,280	$1,280	
remove and cut liner into manageable pieces (Sedimenta	$7,902	$2,264	same # of units; RECLAIM unit rate for excavator; TMAC rate for laborer
load waste for transport to Landfill	$555	$433	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul Debris to landfill	$268	$199	same # of units; TMAC rates for tractor trailer / operator
breach Pollution Control pond and Sedimentation Pond c	$11,215	$3,201	same # of units; used RECLAIM to excavate/load/short haul
rip-rap breach for erosion protection	$186	$339	RECLAIM unit rate for drill/blast/load/short haul/place
UNDERGROUND SUPPORT MECHANICAL SHOP			
Decommission electrical, mechanical (including connectio	$1,920	$1,920	
demolish building	$43,350	$29,424	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Collect Debris	$82	$79	
load waste for transport to Landfill	$6,624	$5,160	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
haul debris to landfill	$3,199	$2,371	same # of units; TMAC rates for tractor trailer / operator
Load hazardous waste into container for transport off site	$436	$340	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul Waste container to Roberts Bay	$210	$84	same # of units; TMAC rates for tractor trailer / operator
FRESH WATER PIPELINES			
Cut pipelines into manageable pieces	$9,545	$9,234	
decommission electrical (heat tracing)	$2,560	$2,560	
collect electrical cables and controllers and prep for shipp	$288	$277	
Load debris for transport to landfill	$179	$288	same # of units; TMAC rates for tractor trailer / operator
haul debris to landfill	$179	$133	same # of units; TMAC rates for tractor trailer / operator
HELECOPTER SUPPORT FACILITIES			
dismantle helicopter pads and walkway	$285	$62	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
demolish helishack	$530	$360	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
demolish washcar and other facilities	$1,554	$1,055	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Collect Debris	$28	$27	
Load debris for transport to landfill	$3,078	$2,397	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
Haul debris to landfill	$1,486	$1,102	same # of units; TMAC rates for tractor trailer / operator
Regrade surface for positive drainage	$190	$16	same # of units; RECLAIM unit rate for grader / operator
WASTE ROCK PAD			
no decomm required	$0	$0	
RUN-OFF DIVERSION BERM			
Breach the berm to original ground in several locations (4	$1,625	$464	same # of units; used RECLAIM to excavate/load/short haul
Remove cut liners and load for transport to landfill	$0	$3	same # of units; RECLAIM unit rate for excavator; TMAC rate for laborer
Haul debris to landfill	$2	$1	same # of units; TMAC rates for tractor trailer / operator
SEWAGE DISCHARGE LINE			

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
Flush pipeline prior to decommissioning	$770	$658	
Cut pipelines into manageable pieces and place in contai	$13,685	$13,240	
Remove electrical cables and controllers	$640	$640	
Load debris into containers for shipping off-site	$9,103	$929	same # of units; RECLAIM unit rate for loader; TMAC rate for laborer
Haul debris to landfill	$576	$427	same # of units; TMAC rates for tractor trailer / operator

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
SEDIMENTATION BERM			
Breach the berm to restore a free drainage path	$103	$29	same # of units; used RECLAIM to excavate/load/short haul
rip-rap breach for erosion protection	$49	$88	RECLAIM unit rate for drill/blast/load/short haul/place
SUMPS			
decommission sumps	$1,100	$1,280	same # of units; Tam rates for laborers and electrician
remove pumps, pipes, cables, culverts	$4,000	$5,000	
backfill sump excavation	$91	$463	RECLAIM unit rate to Excavate Soil, LHD to TIA
EXPANDED WASTE ROCK STORAGE (PAD T)			
Regrade Stockpile	$161,280	$6,186	
Load waste for transport to landfill	$131	$102	
Haul debris to landfill	$63	$47	same # of units; RECLAIM unit rate for excavator and loader; TMAC unit rate for laborer
EXPANDED LAYDOWN AREA (PAD U)			
remove pumps, pipes, cables, culverts	$2,000	$2,000	
breach Sedimentation Pond containment berms	$516	$330	
Collect all debris	$6,336	$6,097	
LHD remaining ore to TIA	$11,088	$10,136	RECLAIM unit rate to load/haul/ dump ROQ material to the TIA
load waste into containers for shipping off-site	$1,003	$102	same # of units; RECLAIM unit rate for loader; TMAC rate for laborer
haul containers to landfill	$63	$47	same # of units; TMAC rates for tractor trailer / operator

ACTIVITY/MATERIAL	INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
WATER MANAGEMENT			
PUMPS			
Pump capital cost	$125,000	$0	assumed no pumps available on-site
Pump shipping	$12,500	$0	assumed no pumps available on-site
Pump maintenance	$125,000	$0	required maintenance
INSPECT AND MAINTAIN WATER MANAGEMENT STRUCTURES			
Inspect and maintain water management structures[2]	$350,000	$350,000	
OPERATE / MAINTAIN WATER MANAGEMENT SYSTEM			
technician (camp support incl under Mob)	$1,368,000	$1,663,200	Used RECLAIM unit rate
site support, consumables	$232,000	$1,348,000	Used RECLAIM unit rate
Decommisson Water Manangement Structures	$500,000	$500,000	

ACTIVITY/MATERIAL		INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
INTERIM CARE & MAINTENANCE				
on-site caretaker / pump technician		$140,400	$340,200	8 manmonths / year
extra personnel				
-electrician		$205,200	$103,475	8 manmonths / year
-mechanic		$162,000	$98,118	8 manmonths / year
flights (yellowknife - cambridge bay)		$0	$0	
mobile camp rental		$425,000	$0	TMAC estimate assumes camp facilities available
annual fuel		$49,000	$32,400	different # of units and unit rate
misc. supplies		$0	$0	
pick-up truck		$48,000	$88,512	different # of units and unit rate
small dozer		$96,000	$96,000	
small excavator		$120,000	$120,000	
snow machine		$120,000	$85,236	different # of units and unit rate
articulated dump truck		$120,000	$120,000	
communications		$0	$0	
camp operations (<10 persons)		$480,000	$366,000	Used RECLAIM daily unit rate
SNP/AEMP water sampling & reporting		$10,000	$10,000	
geotechnical assessment		$25,000	$25,000	
Water Management				
Inspect/maintain water management structures		$70,000	$20,000	various assumptions onunit rates, personnel, report preparation, maintenance required
Operate / maintain pumping system				
technician (camp support incl under Mob)		$0	$0	
interim water treatment		$0		
equipment mob / demob - see below		$0	$0	
EQUIPMENT MOBILIZATION				
Excavators				
Edmonton to Hay River	(1 x 36.1 tonnes)	$15,992	$8,860	different # of units
Hay River to Roberts Bay	(1 x 36.1 tonnes)	$15,992	$8,860	different # of units
Dump trucks				
Edmonton to Hay River	(1 x 34.4 tonnes)	$15,239	$15,239	
Hay River to Roberts Bay	(1 x 34.4 tonnes)	$15,239	$15,239	
Loaders				
Edmonton to Hay River	(1 x 30 tonnes)	$13,290	$13,290	
Hay River to Roberts Bay	(1 x 30 tonnes)	$13,290	$13,290	
Light duty vehicles				
Edmonton to Hay River		$10,100	$10,100	
Hay River to Roberts Bay		$10,100	$10,100	
Standard 20' containers				
Edmonton to Hay River		$26,800	$13,000	different unit rate for container shipping

ACTIVITY/MATERIAL		INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
Hay River to Roberts Bay		$26,800	$13,000	different unit rate for container shipping
WINTER ROAD				
Construction and operation		$0	$0	
Limited winter use		$0	$0	

Note - to obtain total costs, amounts for Interim Care and Maintenance and Water Management would be x 1.5

Comparison of INAC 2015 Reclamation Costs (2016 Update) and TMAC Reclamation Costs (revised 2015)

ACTIVITY/MATERIAL		INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
MONITORING & INSPECTIONS				
Annual geotechnical inspection	(years 1, 2, 3, 6 and 10 after closure a	$35,000	$35,000	
Cover monitoring	(years 1, 3, 5, 7, 10)	$35,000	$35,000	
Survey inspection		$0	$0	
Regulatory costs*	every year	$20,000	$20,000	
Site water monitoring (AEMP and SNP)		$0	$0	
- Active closure and flooding		$0	$0	
- Post pit flooding		$0	$0	
Water sampling and testing	(years 1, 2, 3, 4, 5, 7 and 10)	$42,000	$42,000	unit rate the same; # of units varies
Air Quality Monitoring Program (AQMP)		$0	$0	
Wildlife Effects Monitoring Program (WEMP)		$0	$0	
Vegetation Monitoring	every 2 years	$0	$0	assumed no vegetated cover placement

Note - to obtain total costs, amounts for Monitoring and Inspections (excluding decomm of water managemnt structures) would be x 10 years

ACTIVITY/MATERIAL		INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
MOBILIZE HEAVY EQUIPMENT				
Excavators				
Edmonton to Hay River	(2 x 36.1 tonnes)	$31,985	$15,992	difference in # of units to move
Hay River to Roberts Bay	(2 x 36.1 tonnes)	$31,985	$15,992	difference in # of units to move
Dump trucks				
Edmonton to Hay River	(3 x 34.4 tonnes)	$45,718	$45,718	
Hay River to Roberts Bay	(3 x 34.4 tonnes)	$45,718	$45,718	
Dozers				
Edmonton to Hay River	(2 x 33.5 tonnes)	$29,681	$0	difference in # of units to move
Hay River to Roberts Bay	(2 x 33.5 tonnes)	$29,681	$0	difference in # of units to move
Loaders				
Edmonton to Hay River	(2 x 30 tonnes)	$26,580	$13,290	difference in # of units to move
Hay River to Roberts Bay	(2 x 30 tonnes)	$26,580	$13,290	difference in # of units to move
Light duty vehicles				
Edmonton to Hay River		$30,300	$10,100	difference in # of units to move
Hay River to Roberts Bay		$30,300	$10,100	difference in # of units to move
Standard 20' containers				
Edmonton to Hay River		$134,000	$65,000	different unit rate
Hay River to Roberts Bay		$134,000	$65,000	different unit rate
MOBILIZE CAMP/RENTAL				
ICM Activities		$637,500		
Reclamation / closure activities		$2,125,000	$1,061,758	difference in # of units
Long term reclamation activities (eg pump flooding)		$0		
MOBILIZE WORKERS				
flights from Yellowknife to Cambridge Bay in summer months		$0		
flights from Yellowknife to Cambridge Bay in winter months		$0		
Long term reclamation activities (eg pump flooding) - transport		$0	$0	
Long term reclamation activities (eg pump flooding) - travel time		$0	$0	
Monitoring Airfare		$0	$0	
WORKER ACCOMODATIONS				

ACTIVITY/MATERIAL		INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
Closure Activities - camp operations (winter months , <10 persons, incl food, maintenance, air travel)		$900,000	$1,020,000	
Closure Activities - camp operations (non-winter months , 25 persons, incl food, maintenance, air travel)		$7,875,000	$180,000	
Water Managemnt (2 years after closure) - camp operations (<10 persons, incl food, maintenance, air travel)		$960,000		
MOBILIZE FUEL				
Fuel freight - reclamation activities		$1,750,000	$0	
Fuel freight - long term reclamation activities		$0	$0	
Fuel freight accommodations		$0	$0	
WINTER ROAD				
Construction and operation		$0		
Limited winter use		$0		
Winter road tariff		$0		
DEMOBILIZE HEAVY EQUIPMENT				
Excavators				
Edmonton to Hay River	(3 x 36.1 tonnes)	$47,977	$20,794	different unit rate; different # of units
Hay River to Roberts Bay	(3 x 36.1 tonnes)	$47,977	$20,794	different unit rate; different # of units
Dump trucks				
Edmonton to Hay River	(4 x 34.4 tonnes)	$60,957	$39,629	different unit rate; different # of units
Hay River to Roberts Bay	(4 x 34.4 tonnes)	$60,957	$39,629	different unit rate; different # of units
Dozers				
Edmonton to Hay River	(2 x 33.5 tonnes)	$29,681	$9,648	different unit rate; different # of units
Hay River to Roberts Bay	(2 x 33.5 tonnes)	$29,681	$9,648	different unit rate; different # of units
Loaders				
Edmonton to Hay River	(3 x 30 tonnes)	$39,870	$17,280	different unit rate; different # of units
Hay River to Roberts Bay	(3 x 30 tonnes)	$39,870	$17,280	different unit rate; different # of units
Light duty vehicles				
Edmonton to Hay River		$40,400	$13,200	different unit rate; different # of units
Hay River to Roberts Bay		$40,400	$13,200	different unit rate; different # of units
Standard 20' containers				

ACTIVITY/MATERIAL		INAC Updated (2016) Reclamation Cost Estimate	TMAC 2016 Reclamation Cost Estimate	Notes
Edmonton to Hay River		$134,000	$51,000	different unit rate; different # of units
Hay River to Roberts Bay		$134,000	$51,000	different unit rate; different # of units