2017 RECLAMATION COST ESTIMATE REPORT
FORMER CULLATON LAKE MINE

Submitted to:

Water Resources Regional Coordinator, Nunavut Region
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

March 2017

TV154012

March 16, 2017

TV154012

Indigenous and Northern Affairs Canada / Government of Canada
Bldg 918, P.O. Box 100
Iqaluit, NU X0A 0H0

Mr. Ian Parsons B.Sc., Regional Coordinator
Indigenous and Northern Affairs Canada (INAC)
Nunavut Region

Re: 2017 Reclamation Cost Estimate Report
Former Cullaton Lake Gold Mine, Nunavut

Amec Foster Wheeler is submitting this report describing the 2017 reclamation cost estimate for the former Cullaton Lake Mine Site in Nunavut. The cost estimate is based on a review of the remediation activities, past reports and revised unit rates and, as instructed by Indigenous and Northern Affairs Canada (INAC), as a worst case scenario. It has been developed to assist INAC in determining what financial security would be appropriate to remediate the former mine site.

The capital costs for the 2017 reclamation cost estimate are $4,931,375, with associated indirect costs of $10,692,457, for a total estimated reclamation cost of $15,623,832. In accordance with the Terms of Reference, this Reclamation costs estimate assumes an 18 month period of Interim Care and Maintenance (ICM). It is anticipated that there will be proportional increases associated with a longer ICM period.

Sincerely,

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

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EXECUTIVE SUMMARY

Amec Foster Wheeler Environment & Infrastructure, a division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler), has prepared a 2017 reclamation cost estimate for the former Cullaton Lake Mine Site in Nunavut. It is an update to the 2015 reclamation cost estimate. It has been developed to assist INAC in determining what financial security would be appropriate to remediate the former mine site. This work was carried out under Standing Offer Agreement 46-0000-1035, Call-up No. 2.

The Cullaton Lake Gold Mine operated from 1981 to 1985, and has not operated since. A revised *Final Abandonment and Restoration Plan* (AR Plan) was originally prepared and accepted by the Northwest Territories Water Board in 1996. Decommissioning and closure activities were carried out between 1996 and 2005.

Since then, the site has been monitored by the present Owner (Barrick Gold Inc. (Barrick)), under a post-closure surveillance program as required by water licenses issued by the Nunavut Water Board.

For the development of the 2015 and 2017 reclamation cost estimates, it has been assumed that site has been abandoned and that Barrick would no longer be involved with the management of the site.

The significant differences between the 2015 and 2017 reclamation activities and associated costs are as follows:

- The remediation activities are now assumed to be carried out over one summer season, rather than two as assumed in 2015, and would require more equipment and personnel be mobilized to site.
- Standby costs for the equipment and camp facilities were not considered in the 2015 reclamation cost estimate, but are included in the 2017 cost estimate.
- As per direction from INAC, the interim care and maintenance period was reduced from 5 years to 18 months.
- Consolidation of the Tailings Pond #1 tailings and waste rock (within the dam) with the beach tailings and cover with 2 m of till.
- Post closure monitoring was increased from 20 years to 25 years as directed by INAC.

As summarized below, the capital costs for the 2017 reclamation cost estimate are $4,931,375, with associated indirect costs of $10,692,457, for a total estimated reclamation cost of $15,623,832.

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CAPITAL COSTS			COST
AIR STRIP - NORTH END - ACCESS ROAD			$0
SHEAR LAKE WASTE ROCK			$146,863
ZONE B AREA			$3,123
TAILINGS IMPOUNDMENT			$4,725,575
BUILDINGS AND EQUIPMENT			$0
SURFACE AND GROUNDWATER MANAGEMENT			$0
INTERIM CARE AND MAINTENANCE			$55,814
	SUBTOTAL: Capital Costs		**$4,931,375**
	PERCENT OF SUBTOTAL		
INDIRECT COSTS			**COST**
MOBILIZATION/DEMOBILIZATION			$6,293,971
EQUIPMENT STANDBY COSTS			$2,807,280
POST-CLOSURE MONITORING AND MAINTENANCE			$506,303
ENGINEERING	5%		$246,569
PROJECT MANAGEMENT	4%		$197,255
HEALTH AND SAFETY PLANS/MONITORING & QA/C	2%		$98,628
BONDING/INSURANCE	1%		$49,314
CONTINGENCY	10%		$493,138
MARKET PRICE FACTOR ADJUSTMENT	0%		$0
	SUBTOTAL: Indirect Costs		**$10,692,457**
TOTAL COSTS			**$15,623,832**

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1.0 INTRODUCTION AND PROJECT BACKGROUND

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) to review the 2015 reclamation cost estimate for the former Cullaton Lake Mine site (Cullaton site), and prepare a 2017 reclamation cost estimate.

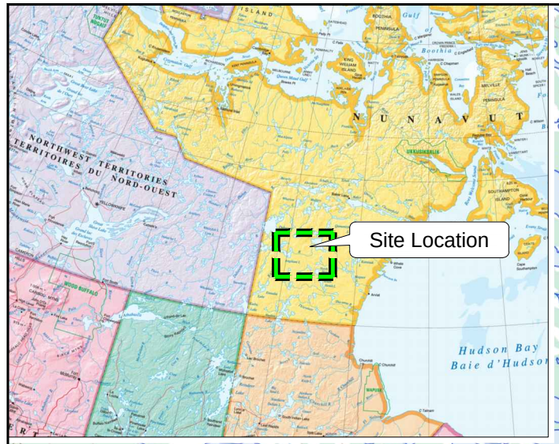
The Cullaton site is a closed gold mine located in the south central part of the Kivalliq Region of the Nunavut Territory. It is located approximately 230 km west of Arviat, and approximately 650 km north of Thompson Manitoba, as shown on Figure 1 the Key Plan and General Site Features.

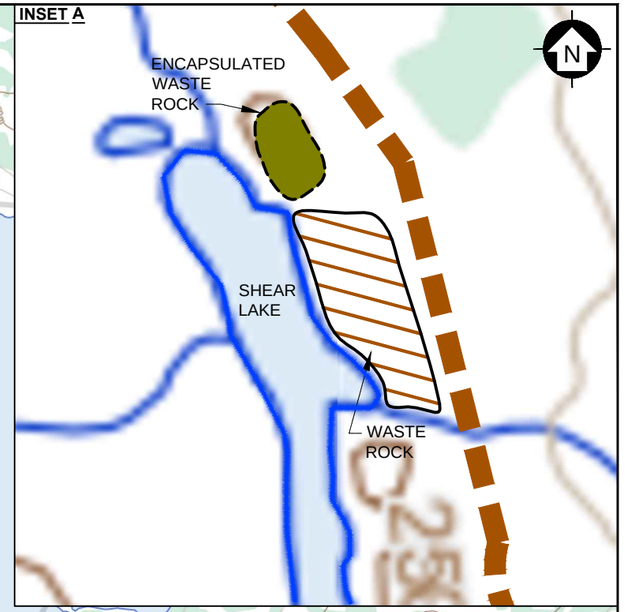
The Cullaton Lake Gold Mine operated from 1981 to 1985, and has not operated since. A revised *Abandonment and Restoration Plan* (AR Plan) was originally prepared and accepted by the Northwest Territories Water Board in 1996. Decommissioning and closure activities were carried out between 1996 and 2005. Since then, the site has been monitored by the present Owner (Barrick Gold Inc. (Barrick)), under a post-closure surveillance program as required by water licenses issued by the Nunavut Water Board.

Management of the Cullaton site is pursuant to Water License 1BR-CUL1118. It was issued in 2011 to Barrick by the Nunavut Water Board (NWB) and is valid to 31 January 2018. Barrick intends to continue holding and monitoring the Cullaton Lake property until an appropriate time after post closure monitoring indicates that the site is chemically and physically stable and can be safely relinquished.

Following decommissioning and closure activities, a site review was undertaken by INAC that identified a number of outstanding liabilities, including the long-term geochemical stability of the waste rock and tailings. As a result of the review, INAC has requested Barrick to submit an updated Abandonment and Reclamation plan to address concerns with the stability of the mine site. INAC has also initiated an assessment of the mine site closure components to determine additional work required to address the outstanding concerns. This included an assessment of the financial security required to adequately complete the additional work in accordance with the guidelines set out in the *Mine Site Reclamation Policy for Nunavut* (INAC) 2002.

To support the review carried out by INAC, Amec Foster Wheeler prepared an independent reclamation cost estimate in 2015, using the RECLAIM MODEL (Version 7). INAC has subsequently retained Amec Foster Wheeler to review and update this estimate, which is provided in this letter and referred to as the 2017 reclamation cost estimate.





TITLE:
General Site Features

PROJECT:
2015 Geotechnical Site Inspection
Former Cullaton Lake Gold Mine
Nunavut

CLIENT
Aboriginal Affairs and Northern Development Canada / Government of Canada, Nunavut Region

APPROX. LOCATION
Latitude 61°15' 37"
Longitude 98°28'13"-

DATE:
October 2015

DATUM & PROJECTION:
NAD83 UTM Zone 14

PROJECT NO:
TV154012

DWN BY:	CHK'D BY:	FIGURE NO:
EJM	JD	1

LEGEND:

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2.0 DESCRIPTION OF RECLAMATION ACTIVITES

2.1 Activities Contributing to Direct Costs

The following sections provide a description of the anticipated reclamation activities for each area of the Cullaton site, on which the 2017 direct reclamation cost has been developed. As directed by INAC, the "worst-case scenario" was to be assumed for the development of site reclamation requirements, which includes the assumption that the acid generating and metal leaching potentials of the tailings, waste rock and low grade ore, are now, or would become, detrimental to the environment.

The reclamation activities assumed in the 2015 reclamation cost estimate were reviewed and some adjustments were made as shown in Table 2-1. These adjustments are described further in Section 6.0.

2.1.1 North Site Area

The features located at the north end of the site include:

- Airstrip
- Boneyard / Airstrip landfill
- Quartzite stone stockpile
- Pallets / fuel drums

2.1.1.1 Airstrip and Site Road

The airstrip requires maintenance and vegetation clearing to provide on-going site access by fixed wing aircraft, until approximately 25 years after the completion of the reclamation activities.

No additional reclamation activities are anticipated to be carried out on the airstrip and access road.

2.1.1.2 Boneyard / Airstrip landfill

It has been assumed the material stored within the airstrip landfill is inert, and all waste oils and hydraulic fluids, as well as tires and batteries were removed from equipment prior to burial, as per the AR Plan (1996) and subsequent revisions.

2.1.1.3 Quartzite Stone Stockpile

No reclamation activities are anticipated to be required for the quartzite stone, as it is not considered to be potentially acid generating (PAG) material. It is expected that the stockpiled quartzite would be used during remediation activities.

2.1.1.4 Pallets / Fuel Drums

The wooden pallets, all unauthorized third party fuel drums cached at the airstrip, and scattered wood debris would be removed from site.

2.1.2 Shear Lake Area

The features remaining in the Shear Lake Area include the infilled Shear Lake decline and vent raise, the encapsulated waste rock (EWR) dump, an area of exposed waste rock / low grade ore, a stripped waste rock holding area, and the Shear Creek diversion.

2.1.2.1 Encapsulated Waste Rock (EWR) Dump

The EWR dump is located on the west side of the mine access road. It abuts the south limit of a rock outcrop through which the Shear Lake decline was placed. It contains approximately 1,000 m^3 of PAG rock covering an area of roughly 5,000 m^2. The dump forms a low broad feature with a gently rounded top. The north, east and west limits of the EWR are estimated to lie at between 2 and 3 horizontal (H):1 Vertical (V). It is reported that the PAG rock was placed on a 1 m thick compacted till pad and covered with 2 m of compacted till. The cover was designed to reduce infiltration into the waste rock, not specifically to act as a thermal cover. A surface runoff collection berm was constructed along the toe of the west, north and east slopes of the EWR dump.

No additional reclamation activities are anticipated to be carried out on the EWR cover.

Post-remediation activities would include continued monitoring for erosion and vegetation establishment for a period of 25 years.

2.1.2.2 Remaining Waste / Low Grade Ore

The exposed waste rock and low-grade ore contain visible sulphides (pyrite) and are identified as being PAG. There is also a low pH (~2.0) pond of standing water located adjacent to the waste rock/low grade ore piles. Therefore, these piles will be consolidated into an area of approximately 100 m x 50 m. It will be underlain with a 1 m thick fine till pad and covered with 1 m of fine till to reduce oxygen and water infiltration into the rock piles. A final 1 m thick layer of coarser till will complete the cover, which will be left to revegetate naturally.

Post-remediation activities will include monitoring for erosion and vegetation for a period of 25 years.

2.1.2.3 Shear Zone Decline and Vent Raise

The Shear Zone decline was cleaned of debris to the ice level of approximately 2.5 m below surface then infilled with waste rock. The vent raise was also cleaned of debris to the ice level of approximately 2.5 m below surface then infilled with layer of waste rock, then covered with concrete slabs (demolition debris). The EWR dump was then constructed over the vent raise, with the vent raise located centrally under the EWR dump (BGC Engineering Inc. 2006).

The remediation measures for the Shear Zone decline and vent raise have been in accordance with the accepted *Final Abandonment and Restoration Plan* (March 1996) and subsequent revisions. As a result, no additional remediation measures are anticipated to be carried out, except covering the exposed waste rock with a minimum 1 m of till. Nevertheless, based on the

remediation description provided, the openings are not filled to the bottom. There is potential for thawing of the frozen subgrade material and/or ice plug that may result in subsidence, particularly within the vertical raise area. Therefore, on-going monitoring would continue (BGC Engineering Inc. 2006).

2.1.2.4 Shear Creek Diversion Dam

The Shear Lake diversion dam material is located at the north end of Shear Lake, it is approximately 160 m in length and between 2.0 to 2.5 m in height with a crest width ranging between 3 and 5 m. It had been previously breached to re-establish flow into Shear Lake, although it was constructed of PAG waste rock (BGC Engineering Inc, 2012). It should be excavated and consolidated with the low-grade ore and exposed waste rock and covered with till.

2.1.2.5 EWR Cover Borrow Area

The EWR cover borrow area had been stripped of topsoil during the initial site reclamation activities, and based on the latitude and natural environment of the area vegetation establishment can be limiting. No new risks have been identified within this area, and therefore, no additional reclamation activities are anticipated to be carried out in this area.

Although, post-remediation activities would include monitoring for erosion and vegetation for a period of 25 years.

2.1.3 B-Zone Area

The B-Zone Mine Area includes the B-Zone portal and vent raise area and former plant site.

2.1.3.1 B Zone Portal and Vent Raise

The B Zone portal and vent raise area is located north of the former plant site. The portal was cleaned of debris to the ice level approximately 2.5 m below surface, the culvert covering the opening was cut up and pushed into the portal above the ice level and then the portal was backfilled to surface with waste rock mound (BGC Engineering Inc. 2006).

The vent raise was also cleaned of debris to the ice level approximately 2.5 m below surface, backfilled to surface with waste rock then concrete slabs (demolition debris) and finally covered under a waste rock mound (BGC Engineering Inc. 2006).

The small backfill mounds rise roughly 1 to 1.5 m above the surrounding grade, and small shrubs have begun to grow across the waste rock. No obvious settlement or sinkholes were observed within the backfill mounds.

The remediation measures to date have been in accordance with the accepted *Final Abandonment and Restoration Plan* (March 1996) and subsequent revisions. As a result, no additional remediation measures are anticipated to be carried out, with the exception of covering the exposed waste rock with a minimum 1 m thick layer of till. This is to isolate the waste rock which is considered to be PAG material.

Based on the remediation description provided, the openings were not filled to the bottom and there is potential for thawing of the frozen subgrade material and/or ice plug that may result in subsidence. Therefore, on-going monitoring would continue (BGC Engineering Inc. 2006).

2.1.3.2 B Zone Plant Site

Reclamation activities of the B Zone plan site were completed in accordance with the accepted *Final Abandonment and Restoration Plan* (March 1996) and subsequent revisions, and there are no obvious issues. As a result, no additional remediation measures are anticipated to be carried out.

2.1.4 Tailings Impoundment Area

The tailings impoundment area includes the covered tailings, Tailings Pond #1 Dam, the quarry landfill, the borrow area near Tailings Pond #1, Tailings Pond #2 and the diversion ditch.

2.1.4.1 Covered Tailings Area

Restoration activities in 1991 included placement of a dry cover over the tailings beach, consisting of till. The till cover was intended to reduce infiltration into the tailings by forming a low permeability layer, and to act as a thermal cover to promote aggradation of the permafrost into the tailings. The covered tailings area has a low slope, in the order of 1%. A central swale runs through the covered tailings are to promote surface drainage across the cover and to collect water from upslope of the covered tailings (former mill area). There are several small areas of standing water on the cover indicating areas of settlement.

It is understood that the till tailings cover was designed to provide frozen containment, and is presently not performing adequately. Four thermistor strings are installed across the dry covered tailings area, and have been determined to be non-functional. Test pits excavated through the covered tailings indicated the cover does not meet the design thickness of 1.4 m in several locations and is as minimal as 0.6 m (BGC Engineering Inc.2011).

The effect of standing water on the cover or having too little cover over the tailings is to increase the thickness of the active permafrost zone and heat and depress the continuous permafrost level that could otherwise develop, and the expected frozen tailings containment may not develop. Without reliable temperature data in the tailings below the cover, the effectiveness of the cover design cannot be evaluated.

It has been assumed that the covered tailings will require an additional minimum 1 m thick layer of till cover to meet the 1.4 m required to achieve frozen containment (BGC Engineering Inc.2011). Thermistors that were installed are no longer working, or provide inaccurate readings, and should be replaced with functional ones.

Post-remediation activities would include monitoring the ground temperature to evaluate cover performance, and monitoring for erosion and vegetation for 25 years.

2.1.4.2 Tailings Pond #1 and Dam

During mine operations, the purpose of the Tailings Pond #1 Dam was to retain tailings and water that was discharged upstream of the dam, from the tailings beach. As part of the closure activities, Pond #1 Dam has since provided a water cover for the PAG tailings. Water is retained by tailings Pond #1 Dam on the north east and south limits of the pond, and is contained by higher natural ground along the west limits.

Erosion along the inside perimeter of Tailings Pond #1 has been observed where there is minimal water cover, and wave action has disturbed the underlying tailings. Considering the lack of information available about the water cover, the remoteness of the site, potential long term impacts from climate change that may affect the water cover, and the long term environmental and geotechnical requirements for inspections and maintenance of a dam, Tailings Pond #1 should be eliminated.

It has been assumed that for reclamation, the water in Tailings Pond #1 would be drained and released to the environment. Based on water quality testing results from the pond in 2014 and 2015, it is assumed that no treatment would be required.

The tailings across the east portion of the pond would be consolidated on the west side. The waste rock and till that comprise the Tailings Pond #1 Dam would be consolidated with the tailings, and covered with 2 m of till to obtain a dry cover.

Post-remediation activities would include monitoring for erosion and vegetation for a period of 25 years.

2.1.4.3 Tailings Pond #2 Dam

Tailings Pond #2 Dam was originally a polishing pond for water decanted from Tailings Pond #1. It was not used to store tailings and it has not received water from the upper pond since closure of operations in 1985. As part of the decommissioning activities carried out over the period 1991 to 1993, the water level in Tailings Pond #2 Dam was lowered and the dam was partially removed. Although a low structure remains in place, the crest was breached to allow free, natural flow of water from the wetland upstream of the dam to the downstream side.

Reclamation activities of the Tailings Pond #2 Dam were completed in accordance with the accepted Final Abandonment and Restoration Plan (March 1996) and subsequent revisions. As a result, no additional remediation measures are anticipated to be carried out.

2.1.5 Quarry Area

The features included in the quarry area are the quarry landfill, the till borrow area south east of the quarry landfill, the quarry pond (or pit), and a drainage channel between the quarry pond and Tailings Pond #1.

2.1.5.1 Quarry Landfill Cover

The till cover over the quarry landfill has developed sinkholes, exposing the landfilled debris at some locations. It has been assumed that additional remediation measures would require compaction and extra till to fill voids, then additional till would be placed on top, as required, to maintain a minimum 2 m thick layer of till across the landfill area.

Post-remediation activities would include monitoring for erosion and vegetation for a period of 25 years.

2.1.5.2 Quarry Pit / Pond

Reclamation activities of the quarry pit/pond were completed in accordance with the accepted Final Abandonment and Restoration Plan (March 1996) and subsequent revisions. As a result, no additional remediation measures are anticipated to be carried out.

2.1.5.3 Borrow Area Southeast of Quarry Landfill

Reclamation activities of the borrow area were completed in accordance with the accepted Final Abandonment and Restoration Plan (March 1996) and subsequent revisions. As a result, no additional remediation measures are anticipated to be carried out.

2.1.6 Diversion Ditch around Tailings Pond #1 and #2

The purpose of the diversion ditch was to divert non-contact water around the tailings area. As Tailings Pond #1 is to be eliminated as part of the remediation, there is no requirement to maintain the diversion ditch. The ditch has revegetated naturally and reclamation activities would result in disturbance that is considered unnecessary. As a result, no reclamation measures will be carried out.

Table 2-1 Comparison of Reclamation Activities from 2015 Reclamation Cost Estimate with 2017 Reclamation Cost Estimate

Area	2015 Reclamation Cost Estimate	2017 Reclamation Cost Estimate
Airstrip / North End / Access Road	No reclamation activities	No reclamation activities
Underground Workings	No reclamation activities	No reclamation activities
Shear Lake Encapsulated Waste Rock (EWR)	Establish vegetation	Allow to naturally revegetate
Low-grade Ore and Exposed Waster Rock	Consolidate, place on till pad, cover with till and vegetate	Consolidate, place on till pad, cover with till and allow to naturally revegetate
Shear Lake Diversion Dam	Excavate and consolidate with low-grade ore and exposed waste rock	Excavate and consolidate with low-grade ore and exposed waste rock
EWR Cover Borrow Area	No reclamation activities	No reclamation activities
B Zone Portal and Vent Raise	No reclamation activities	Re-evaluated - Provide with 1 m of till cover, to isolate PAG waste rock used to backfill the portal and vent raises
B Zone Plant Site	No reclamation activities	No reclamation activities
Tailings Pond #1	Drain, treat and release water to the environment	Drain and release water to the environment
	Provide a 2 m thick till cover and vegetate	Consolidate tailings at west side of pond; provide a 2 m thick cover and allow to revegetate naturally
	-	Install thermistors
Tailings Pond #1 Dam	Cut dam height and grade to transition to surrounding environment	Excavate dam material and consolidate with tailings in Pond #1
Covered Tailings Area	Provide an additional 1 m of till cover and vegetate	Provide an additional 1 m of till cover and allow to revegetate naturally
	Install thermistors	Install thermistors
Tailings Pond #2	No reclamation activities	No reclamation activities
Quarry Landfill Cover	No reclamation activities	Compact surface, and place till to maintain a minimum 2 m thick cover
Quarry Pit / Pond	No reclamation activities	No reclamation activities
Borrow Area South East of Quarry Landfill	No reclamation activities	No reclamation activities
Diversion Ditch around Tailings Pond #1 and #2	No reclamation activities	No reclamation activities
Interim Care and Maintenance	5 years	18 months
Duration of Remediation Activities	2 seasons (summer)	1 season (summer)
Size of Camp	10 persons	30 persons
Standby Costs for Camp and Heavy Construction Equipment	Not included	Included
Engineering Costs	8% of direct costs	5% of direct costs
Project Management Costs	7% of direct costs	4% of direct costs
Post Remediation Monitoring	20 years	25 years

2.2 Activities Contributing to Indirect Costs

The following section provides a description of activities that will contribute to the indirect costs for the Cullaton Lake site.

- All equipment, required to carry out the remediation activities will need to be mobilized to the site, and demobilized upon completion of remediation activities. Equipment would be mobilized by sealift to Arviat. Heavy equipment and the camp structures would be mobilized to the Cullaton Site during the winter month via winter road or CAT train. The heavy equipment and camp would be demobilized from the site at the earliest convenience the following winter, again via winter road or CAT train.

- A 30-person camp facility will be supplied and operated by a third party. The camp is sized to accommodate 4 excavator operators, 2 dozer operators, 14 truck drivers, 1 fuel truck driver to refuel the equipment, 2 site supervisors, 1 mechanic, 4 camp operations personnel, 1 security / first aid person, and one QA/QC monitor.

- Standby rates will be charged for all pieces of equipment, when not in operation. The standby rate was selected as 30% of the standard operating rate.

- Post reclamation monitoring and surveillance will continue for 25 years. Post remediation monitoring would consist of:
    - Geotechnical inspections every 2 years in years 1 through 8, then every fourth to year 25;
    - Vegetation inspections and cover inspections would be carried out (on average) every 4 years until year 25;
    - Water quality sampling would be carried out annually in years 1 through 8, then re-assessed for on-going monitoring. For the purposes of this cost estimate however, it has been assumed that water quality sampling would be carried out annually until year 25.

- A trip to site for maintenance activities to the airstrip, access road, and till covers should be required every 4 years.

- Engineering costs are estimated to be 5% of the direct costs. Engineering support will include design of the thermal cover on top of the tailings inside the former Tailings Pond #1, a borrow source investigation, and the preparation of tender ready drawings and documents.

- Project management costs would be 4% of the estimated direct costs.

- Health and safety planning and implementation, and quality assurance monitoring would be 2% of the estimated direct costs.

3.0 GENERAL ASSUMPTIONS FOR THE 2017 RECLAMATION COST ESTIMATE

The following information and assumptions were used as a basis for the 2017 reclamation costs at the former Cullaton Lake mine site. These assumptions may or may not change as additional information becomes available.

- The "worst-case" assumes the tailings, waste rock and low grade ore would become acidic and metal leaching, such that the surface runoff and/or seepage water will negatively impact the surrounding environment.

- Equipment mobilization/demobilization to the site would take place during the winter months, via a winter road or CAT train. A number of construction companies had been contacted to request cost estimates for the construction and maintenance of a winter road, and mobilization from Arviat to the site. Due to the remoteness of the Cullaton site and effort required to prepare an estimate, the requests were declined. As a result, these costs were developed using the rates in the 2014 RECLAIM Model, escalated by 2.5% annually in accordance with the Consumer Price Index (CPI) for Nunavut.

- It is assumed the water quality in Tailings Pond #1 meets the Water License conditions and can be released to the environment without treatment.

- The equipment would be stored on site through the spring, with reclamation activities to take place over a 90-day period starting in late spring/early summer. The daily operations would consist of 2 – 12 shifts. Equipment will remain on site until the following winter when it can be demobilized from site via a winter road or CAT train.

- Suitable till borrow can be sourced within 5 km of the placement location. If sufficient quantities of till are not available, an alternative cover design may need to be considered.

- All waste oils and hydraulic fluids, as well as tires and batteries were removed from equipment prior to burial in the landfills and subsequently airlifted from the site for proper disposal.

- Constructed till covers will be left to revegetate naturally.

- Post remediation monitoring and surveillance will continue for 25 years, or until the site conditions have been deemed to be geochemically and physically stable, and inspection and maintenance are no longer required. The site will be abandoned with no further remedial measures (i.e. roads and airstrip would be left as is).

- A mass loading analysis was completed in 2016, but the report and results have not been provided. Therefore, the implications from that analysis are not included in this remediation cost estimate.

- Until the Proponent submits an updated closure and reclamation plan that identifies the direction in which they want to proceed, there are a number of variables that need to be considered until such time that an updated plan is in place.

4.0 SPECIFIC ASSUMPTIONS FOR 2017 RECLAMATION ACTIVITIES

Specific assumptions with respect to the 2017 reclamation activities are outlined below:

4.1 Direct Costs

The following information and assumptions were used to develop the direct costs.

- In accordance with direction from INAC, there would be an 18-month period of interim care and maintenance (ICM) prior to the initiation of the reclamation activities. This would involve general maintenance activities to maintain site access, annual geotechnical inspection, and water quality sampling and testing.
- ICM activities are expected to be carried out during an annual site visit.
- Quantities were estimated from available drawings, photographs and previous site visits.
- Skilled and unskilled labour would be contracted as per the Article 23 of the Nunavut Agreement and potentially mobilized from several locations including Arviat (Nunavut) and Churchill or Thompson (Manitoba).
- Labor rates were selected based on rates used in similar projects in the Nunavut.
- Equipment rates were selected based on rates used in similar projects in the Nunavut.
- Where recent rates were not obtained, the rates provided in the 2014 RECLAIM Model were used, escalated by 2.5% annually in accordance with the Consumer Price Index (CPI) for Nunavut.

4.2 Duration and Equipment Requirements for Reclamation Activities

The reclamation activities consist largely of earth moving activities. The following methodology was used to determine the time and equipment required to complete the reclamation cost estimate.

- The quantity of material required to be excavated, transported and placed was determined using proposed cover thicknesses, estimated tailings thickness and the aerial extents shown on available plans.
- A borrow source for till was assumed to be available within 5 kilometres of the site.
- Equipment size was selected to meet practical expectations for closure activities.

- Using Estimator Sheets in the RECLAIM Model and Caterpillar Performance Handbook 45, the hourly productivity of the selected pieces of equipment were determined.
    - The calculated excavator hourly productivity was determined based on anticipated excavation conditions for the various activities, bucket capacity, and estimates for the fill factor, cycle time, operator skill and machine availability.
    - The calculated truck hourly productivity for each reclamation activity was determined based on estimated load time, haul distance, average velocity, wait time, dump time and machine availability.
    - The calculated dozer hourly productivity for each reclamation activity was determined using dozer production curves based on average dozing distance, and application of job condition correction factors for operator experience, type of material, visibility and job efficiency.
- It was assumed that a 2-shift, 24 hour per day work schedule would be implemented, with the exception of the dozer operations which would operate 12 hours/day.
- Based on the estimated production rate, the number of pieces of equipment was selected that tried to optimize the use of each piece of equipment and complete the works within the summer period.
    - It was determined that 7 trucks could haul the required material over a period of 90 days.
    - It was determined that between 90 and 100 days would be required for the dozing activities using two crawler tractors.
    - It was determined that approximately 70 days would be required for the excavators to carry out the required till excavation, consolidation of the low grade ore and waste rock, and excavation of the Shear Lake Diversion Dam material. Additional time can be spent with fill placement activities at the Tailings Pond #1.

4.3 Indirect Costs

The following information and assumptions were used to develop the indirect costs. As noted above the costs were developed based on the assumption that the heavy equipment and the camp structures would be mobilized to the Cullaton Site during the winter month via winter road or CAT train. Site remediation activities would take place during the following summer, working for 24 hours per day over a 90-day work period. The heavy equipment and camp would be demobilized from the site at the earliest convenience the following winter, again via winter road or CAT train.

- There is a detailed, approved remediation plan that can be readily translated into tender ready documents and drawings.

- A 30-person camp facility will be supplied and operated by a third party. The camp is sized to accommodate 4 excavator operators, 2 dozer operators, 14 truck drivers, 1 fuel truck driver to refuel the equipment, 2 site supervisors, 1 mechanic, 4 camp operations personnel, 1 security / first aid person, and one QA/QC monitor.

- The camp would be mobilized by sealift from Montreal to Arviat, and then by winter road/CAT train to Cullaton Lake. Standby rates would apply for all camp components when not in operation.

- Standby rates would apply for all pieces of equipment, when not in operation. Hence, between the mobilization, work period and demobilization off site.

- Site remediation activities would be carried out over a single 3-month construction season (i.e. June to August).

- All equipment, required to carry out the remediation activities would need to be mobilized to the site, and demobilized upon completion of remediation activities. Equipment would be mobilized by sealift to Arviat. A winter road, or CAT Train would be constructed to mobilize equipment to site in one winter period, and constructed again to demobilize the following winter season.

- Post remediation monitoring and surveillance would continue for 25 years. Post remediation monitoring would consist of:
    - Geotechnical inspections every 2 years in years 1 through 8, then every fourth to year 25;
    - Vegetation inspections and cover inspections would be carried out (on average) every 4 years until year 25;
    - Water quality sampling would be carried out annually in years 1 through 8, then re-assessed for on-going monitoring. For the purposes of this cost estimate however, it has been assumed that water quality sampling would be carried out annually until year 25.

- A trip to site for maintenance activities to the airstrip, access road, and till covers would be required every 4 years.

- Engineering costs to advance the reclamation plan to a detailed construction work scope and drawings would be 5% of the estimated direct costs.

- Project management costs would be 4% of the estimated direct costs.

- Health and safety planning and implementation, and quality assurance monitoring would be 2% of the estimated direct costs.

- A contingency of 10% of the capital reclamation costs has been applied to the estimate. It was selected from Table 2 - ‘Selection of Appropriate Contingency for Security Estimate’, in the Reclaim 7.0 User Manual (DRAFT). It was selected because a considerable amount of the reclamation work has been completed. What remains to be done is almost entirely earthworks, with low engineering requirements.

5.0 RECLAMATION COSTING

Table 5.1 provides a summary of the 2017 reclamation cost estimate developed for the remediation measures at the former Cullaton Lake Mine site, based on the assumptions outlined in Sections 3.0 and 4.0. Detailed costing sheets are included in Appendix A.

6.0 COMPARISON OF 2015 RECLAMATION COST ESTIMATE WITH 2017 RECLAMATION COST ESTIMATE

A comparison of the activities proposed in the 2015 and 2017 reclamation cost estimates is presented in Table 2-1. A comparison of the 2015 and 2017 reclamation costs is summarized in Table 6-1.

In general, the reclamation activities are not significantly different between the 2015 and 2017 cost estimates. The main differences between the reclamation activities and associated costs are as follows:

- The remediation activities are now assumed to be carried out over one summer season, rather than two as assumed in 2015. This would require more equipment and personnel be mobilized to site.
- Standby costs for the equipment and camp facilities were not considered in the 2015 reclamation cost estimate, but are included in the 2017 cost estimate.
- As per direction from INAC, the interim care and maintenance period was reduced from 5 years to 18 months.
- Consolidation of the Tailings Pond #1 tailings and waste rock (within the dam) with the beach tailings and cover with 2 m of till.
- Post closure monitoring was increased from 20 years to 25 years as per direction from INAC.

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Table 6-1 Summary of Reclamation Costs for Completion of Remediation Activities

CAPITAL COSTS			COST
AIR STRIP - NORTH END - ACCESS ROAD			$0
SHEAR LAKE WASTE ROCK			$146,863
ZONE B AREA			$3,123
TAILINGS IMPOUNDMENT			$4,725,575
BUILDINGS AND EQUIPMENT			$0
SURFACE AND GROUNDWATER MANAGEMENT			$0
INTERIM CARE AND MAINTENANCE			$55,814
	SUBTOTAL: Capital Costs		**$4,931,375**
	PERCENT OF SUBTOTAL		
INDIRECT COSTS			**COST**
MOBILIZATION/DEMOBILIZATION			$6,293,971
EQUIPMENT STANDBY COSTS			$2,807,280
POST-CLOSURE MONITORING AND MAINTENANCE			$506,303
ENGINEERING	5%		$246,569
PROJECT MANAGEMENT	4%		$197,255
HEALTH AND SAFETY PLANS/MONITORING & QA/C	2%		$98,628
BONDING/INSURANCE	1%		$49,314
CONTINGENCY	10%		$493,138
MARKET PRICE FACTOR ADJUSTMENT	0%		$0
	SUBTOTAL: Indirect Costs		**$10,692,457**
TOTAL COSTS			**$15,623,832**

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Table 6-2 Comparison of 2015 Reclamation Cost Estimate and 2017 Reclamation Cost Estimate

2015 RECLAMATION COST ESTIMATE			2017 RECLAMATION COST ESTIMATE		
CAPITAL COSTS		**COST**	**CAPITAL COSTS**		**COST**
OPEN PIT (AirStrip/North End/Access Road)		$0	AIR STRIP - NORTH END - ACCESS ROAD	0	$0
UNDERGROUND MINE	0	$0	UNDERGROUND MINE		$0
TAILINGS FACILITY		$9,309,000	TAILINGS IMPOUNDMENT		$4,725,575
ROCK PILE (Shear Lake and Zone B Area)		$1,487,360	SHEAR LAKE WASTE ROCK	0	$146,863
			ZONE B AREA	0	$3,123
BUILDINGS AND EQUIPMENT	0	$0	BUILDINGS AND EQUIPMENT	0	$0
SURFACE AND GROUNDWATER MANAGEMENT		$500,000	SURFACE AND GROUNDWATER MANAGEMENT		$0
INTERIM CARE AND MAINTENANCE	**0**	$472,779	INTERIM CARE AND MAINTENANCE	**0**	$55,814
SUBTOTAL: Capital Costs		**$11,769,000**	**SUBTOTAL: Capital Costs**		**$4,931,375**
INDIRECT COSTS		**COST**	**INDIRECT COSTS**		**COST**
MOBILIZATION/DEMOBILIZATION	0	$2,169,695	MOBILIZATION/DEMOBILIZATION	0	$6,293,971
			EQUIPMENT STANDBY COSTS	0	$2,807,280
POST-CLOSURE MONITORING AND MAINTENANCE	0	$711,976	POST-CLOSURE MONITORING AND MAINTENANCE	0	$506,303
ENGINEERING	5%	$941,531	ENGINEERING	5%	$246,568.73
PROJECT MANAGEMENT	4%	$823,840	PROJECT MANAGEMENT	4%	$197,254.98
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	2%	$235,383	HEALTH AND SAFETY PLANS/MONITORING & QA/QC	2%	$98,627.49
BONDING/INSURANCE	1%	$117,691	BONDING/INSURANCE	1%	$49,313.75
CONTINGENCY	20%	$2,353,828	CONTINGENCY	10%	$493,137.45
MARKET PRICE FACTOR ADJUSTMENT	0%	$0	MARKET PRICE FACTOR ADJUSTMENT	0%	$0
SUBTOTAL: Indirect Costs		**$7,354,000**	**SUBTOTAL: Indirect Costs**		**$10,692,456**
TOTAL COSTS		**$19,123,000**	**TOTAL COSTS**		**$15,623,830**

7.0 SUMMARY

For the development of the 2015 and 2017 reclamation cost estimates, it has been assumed that site has been abandoned and that Barrick would no longer be involved with the management of the site.

The significant differences between the 2015 and 2017 reclamation activities and associated costs are as follows:

- The remediation activities are now assumed to be carried out over one summer season, rather than two as assumed in 2015, and would require more equipment and personnel be mobilized to site.
- Standby costs for the equipment and camp facilities were not considered in the 2015 reclamation cost estimate, but are included in the 2017 cost estimate.
- As per direction from INAC, the interim care and maintenance period was reduced from 5 years to 18 months.
- Consolidation of the Tailings Pond #1 tailings and waste rock (within the dam) with the beach tailings and cover with 2 m of till.
- Post closure monitoring was increased from 20 years to 25 years as directed by INAC.

As summarized below, the capital costs for the 2017 reclamation cost estimate are $4,931,375, with associated indirect costs of $10,692,457, for a total estimated reclamation cost of $15,623,832.

8.0 CLOSING REMARKS

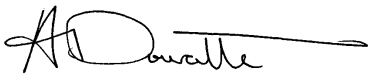
This report has been prepared by Ms. Jane Doucette, P.Eng., and reviewed by Tracy Cochrane, P.Geo. of Amec Foster Wheeler.

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

Prepared by:



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APPENDIX A
Detailed Cost Estimate Sheets*

*Costs are calculated based on the unit costs determined to be appropriate for the site and calculated in the RECLAIM Model.

Air Strip - North End- Access Road

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
CONTROL ACCESS						
Fence		m		#N/A	$0.00	$0
Signs		each		#N/A	$0.00	$0
Berm at crest		m3		#N/A	$0.00	$0
Block roads		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
AIRSTRIP						
no final remediation requirement		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
BONEYARD - AIRPORT LANDFILL						
not required		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
WOODEN PALLETS - FUEL BARRELS						
remove from site		m3		#N/A	$0.00	$0
Other		m3		#N/A	$0.00	$0
QUARTZITE STONE						
not required		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
SITE ROAD						
no final remediation requirement		m3		#N/A	$0.00	$0
Other		m3		#N/A	$0.00	$0
					Total	$0
					% of Total	

Shear Lake Waste Rock Area

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
ENCAPSULATED WASTE ROCK						
none required		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
FORMER WASTE ROCK STOCKPILE - TILL BORROW AREA						
none required		ha		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
REMAINING WASTE ROCK - LOW GRADE ORE						
Haul / dump till cover				#N/A	$0.00	$0
haul and dump till pad and cover		hr	447.8	truck-sL	$225.00	$100,755
Excavate Till pad and cover				#N/A	$0.00	$0
excavate till for pad and cover		hr	92	exc-sH	$210.00	$19,320
consolidate low grade ore and waste rock				#N/A	$0.00	$0
consolidate material		hr	21.5	dozerlL	$395.00	$8,493
place till pad and cover		hr	21.5	dozerlL	$395.00	$8,493
Other		allow		#N/A	$0.00	$0
SHEAR CREEK DIVERSION DAM						
remove dam material and consolidate with low grade ore / waste rock				#N/A	$0.00	$0
excavate Shear Lake dam material		hr	21.5	exc-sH	$210.00	$4,515
haul and dump Shear Lake dam material		hr	23.5	truck-sL	$225.00	$5,288
Other		m3		#N/A	$0.00	$0
SHEAR CREEK DECLINE AND VENT RAISE						
cover waste rock backfill with 1 m of till	incl in consolidation and cover of low grade (	m3		#N/A	$0.00	$0
Other		m3		#N/A	$0.00	$0
					Total	$146,863
					% of Total	

Zone B Area

ACTIVITY/MATERIAL	Notes	Unit	Qty	Cost Code	Unit Cost	Cost
B ZONE PLANT AREA						
none required		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
B ZONE PORTAL AND VENT RAISE						
cover waste rock backfill with 1 m of till				#N/A	$0.00	$0
excavate till cover material		hr	2	exc-sH	$210.00	$420
haul and dump till cover material		hr	8.5	truck-sL	$225.00	$1,913
Place 1 m till cover		hr	2	dozerlL	$395.00	$790
Other				#N/A	$0.00	$0
					Total	$3,123
					% of Total	

TAILINGS IMPOUNDMENT AREA

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
CONTROL ACCESS						
Fence		m		#N/A	$0.00	$0
Signs		each		#N/A	$0.00	$0
Berm		m3		#N/A	$0.00	$0
Block roads		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
TAILINGS POND #1 and DAM						
Pump Capital cost		each	2	PCL	$12,000.00	$24,000
Pump water in pond	150,000 m3	hrly	1008	POCH	$1.20	$1,210
consolidate tailings inside east side of pond		hrly	670	dozerlL	$395.00	$264,650
consolidate dam materials		m3	707	dozerlL	$395.00	$279,265
excavate till cover material		hrly	919	exc-sH	$210.00	$192,990
haul and dump till cover material		each	4478	truck-sL	$225.00	$1,007,550
place 2 m of cover		hrly	1071	dozerlL	$395.00	$423,045
install thermistors		each	3	therL	$10,000.00	$30,000
Other				#N/A	$0.00	$0
COVERED TAILINGS						
place 1 m of till		m3		#N/A	$0.00	$0
excavate till cover material		hrly	1045	exc-sH	$210.00	$219,450
haul and dump till cover material		each	5094	truck-sL	$225.00	$1,146,150
place 1 m of cover		hrly	1071	dozerlL	$395.00	$423,045
install thermistors		each	3	therL	$10,000.00	$30,000
Other				#N/A	$0.00	$0
QUARRY LANDFILL						
compact		hrly	5	dozerlL	$395.00	$1,975
excavate till cover material		m3	386	exc-sH	$210.00	$81,060
haul and dump till cover material		hrly	1881	truck-sL	$225.00	$423,225
place 2m of till material		m2	450	dozerlL	$395.00	$177,750
Other				#N/A	$0.00	$0
QUARRY PIT						
not required		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
BORROW AREA SOUTHEAST OF QUARRY LANDFILL						
not required		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
TAILINGS POND #2 and DAM						
not required		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
DIVERSION DITCH around TAILINGS POND #1 and #2						
not required		m3		#N/A	$0.00	$0
Other		m3		#N/A	$0.00	$0
					Total	$4,725,575
					% of Total	

EQUIPMENT STANDBY COSTS

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
EQUIPMENT STANDBY						
Excavator		months	21	exmthL	$10,080.00	$211,680
Excavator		months	21	exmthL	$10,080.00	$211,680
Off-Highway Articulated Dump Truck		months	21	trmthL	$10,800.00	$226,800
Off-Highway Articulated Dump Truck		months	21	trmthL	$10,800.00	$226,800
Off-Highway Articulated Dump Truck		months	21	trmthL	$10,800.00	$226,800
Off-Highway Articulated Dump Truck		months	21	trmthL	$10,800.00	$226,800
Off-Highway Articulated Dump Truck		months	21	trmthL	$10,800.00	$226,800
Off-Highway Articulated Dump Truck		months	21	trmthL	$10,800.00	$226,800
Off-Highway Articulated Dump Truck		months	21	trmthL	$10,800.00	$226,800
Tractor Crawler		months	21	domthL	$18,960.00	$398,160
Tractor Crawler		months	21	domthL	$18,960.00	$398,160
Other				#N/A	$0.00	$0
OTHER						
				#N/A	$0.00	$0
					Total	$2,807,280
					% of Total	

Interim Care and Maintenance

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
INTERIM CARE & MAINTENANCE						
Geotechnical Inspection						
Technician for water sampling		hrs	16	envtechL	85	$1,360
-Registered Engineer Snr		hrs	30	engH	220	$6,600
-Registered Engineer Int		hrs	30	engL	145	$4,350
- work supervisor		hrs	16	lab-sH	65	$1,040
-unskilled laborer		hrs	16	lab-usL	40	$640
travel costs per person (TO to Thompson)		each	2	travL	2137	$4,274
travel from Thompson to Cullaton (Kississing quote)		each	1	flt-icmL	8685	$8,685
misc. supplies (1 day trip)		allow	1	dlytrpL	500	$500
ATV rental (incl fuel)		each	1	atvH	100	$100
Maintenance for Airstrip / Access Road / Cover				#N/A	0	$0
- work supervisor	prep and site time	hrs	24	lab-sH	65	$1,560
'-unskilled laborer (2)	prep and site time	hrs	48	lab-usL	40	$1,920
travel from Thompson to Cullaton (Kississing quote)		each	1	flt-icmL	8685	$8,685
ATV rental (incl fuel)		each	2	atvH	100	$200
misc. supplies (1 day trip)		allow	1	dlytrpL	500	$500
pick-up truck		each		#N/A	0	$0
small dozer		allow		#N/A	0	$0
small excavator		allow		#N/A	0	$0
snow machine		allow		#N/A	0	$0
communications		allow		#N/A	0	$0
SNP/AEMP water sampling & reporting		each	1	WSL	5400	$5,400
geotechnical assessment report		each	1	RPTL	10000	$10,000
interim water treatment				#N/A		$0
other		each		#N/A	0	$0
			Annual	Interim C&M Cost		$55,814
Number of years of ICM		years	1		**Total**	$55,814

Assume 1 trip to site for inspection and water qualit sampling during 18 month ICM
Assume an additional trip to site during ICM for airstrip and road maintenance

Post-Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MONITORING & INSPECTIONS						
Annual geotechnical inspection	developed for ICM site visit (less the water qu	each	0.32	AGIL	$34,809.00	$11,139
Survey inspection		each		#N/A	$0.00	$0
Regulatory costs*		each		#N/A	$0.00	$0
Site water monitoring (AEMP and SNP)	internal afw costs	each	1	WSL	$5,400.00	$5,400
- Active closure and flooding		each		#N/A	$0.00	$0
- Post pit flooding		each		#N/A	$0.00	$0
Expense for extra 17 visits not covered uder geotech inspections		eaach	0.68	fly-expL	$9,285.00	$6,314
Air Quality Monitoring Program (AQMP)		each		#N/A	$0.00	$0
Wildlife Effects Monitoring Program (WEMP)		each		#N/A	$0.00	$0
Vegetation Monitoring	incl with annual geotech inspec	each		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
COVER / AIRSTRIP / ACCESS ROAD MAINTENANCE						
Trip to site (2 days) to carry out maintenance activities every 4 years	developed for ICM site visit x 2	allow	0.24	mainL	$25,930.00	$6,223
Other				#N/A	$0.00	$0
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
POST-CLOSURE WATER TREATMENT						
Annual water treatment cost, from "Water Treatment"						$0
Subtotal, Annual post-closure costs						$29,076
Discount rate for calculation of net present value of post-closure cost, %				3.00%		
Number of years of post-closure activity				25	years	
Present Value of payment stream						$506,303

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

Frequency of Inspections / water quality monitoring events were determined by dividing the total # of events by 25 years

Mobilization/Demobilization:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MOBILIZE HEAVY EQUIPMENT - MONTREAL TO ARVIAT - SEALIFT						
Excavators		each	2	excaL	18908	$37,816
Dump trucks		each	7	arttL	13470	$94,290
Dozers		each	2	dozeL	9943	$19,866
Fuel		pallet	858	fuseaL	330	$283,140
Light duty vehicles		each	5	putrL	3369	$16,845
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
20' shipping container - Montreal to Arviat - Sealift		each	5	seacL	8232	$41,160
flights from Thompson to site for resupply during construction season		each	4	flt-icmL	8685	$34,740
CAMP COSTS						
Modular Units (30 person camp x 90 day)		allow	1	accomL	1E+06	$1,377,820
Transportation - sealift to Arviat		allow	5	seacL	8232	$41,160
Install and dismantle		allow	1	tranL	636732	$636,732
Camp operations		allow	1	opsL	465191	$465,191
Other (security, communications)		allow	1	cmpscL	161230	$161,230
MOBILIZE WORKERS						
Reclamation activities - transport		each		#N/A	0	$0
Reclamation activities - travel time		manhours		#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						
Reclamation activities		manmonths		#N/A	0	$0
Long term reclamation activities (eg pump flooding)		manmonths		#N/A	0	$0
FUEL COST						
Fuel - reclamation activities		litre	700000	FCDH	1.5	$1,050,000
MOBILIZE FUEL						
Fuel freight - reclamation activities		litre	700000	FCMH	0.49	$343,000
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	300	WRCL	2200	$660,000
Usage		kmtonne	193200	WRUL	0.31	$59,892
Winter road tariff		km		#N/A	0	$0
DEMOBILIZE HEAVY EQUIPMENT						
Excavators		each	2	excaL	18908	$37,816
Dump trucks		each	7	arttL	13470	$94,290
Dozers		each	3	dozeL	9943	$29,829
Demolition shears		km		#N/A	0	$0
Crane		km		#N/A	0	$0
Loader		km		#N/A	0	$0
Compactor		each		#N/A	0	$0
Light duty vehicles		each	5	putrL	3369	$16,845
20' shipping container - Arviat to Montreal - Sealift		each	5	seacL	8232	$41,160
DEMOBILIZE CAMP						
Transportation - sealift Arviat to Montreal		allow	5	seacL	8232	$41,160
DEMOBILIZE WORKERS						
crew travel time		mandays		#N/A	0	$0
crew transportation		each		#N/A	0	$0
WINTER ROAD						
Construction and operation		km	300	WRCL	2200	$660,000
Usage		kmtonne	193200	WRUL	0.31	$59,892
Winter road tariff		km		#N/A	0	$0
					Total	$6,293,971

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

Filter by unit

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	COMMENTS
Thermistors						
		ther	each	10000.00		
Maintenance for Airstrip/Road/Till Cover						
	2 day trip -	main	each	25930.00		
	daily misc expense	dlytrp	each	500.00		
Fuel and Electricity						
	Fuel cost - gas	FCG	litre	1.05	1.40	
	Fuel cost - diesel	FCD	litre		1.50	first week of February 2017
	Fuel mobilization - sealift	fusea	litre	330.00		2016 neas freight cost +20% markup
	Fuel mobilization	FCM	litre	0.24	0.49	(Used 2014 rates and escalated 2.5% per annum)
	Electricity	FCE	kW-h	0.17	0.19	
Labour & Equipment Rates						
	Site manager	sman	$/hr	125.00	152.00	
	Supervisor	super	$/hr	52.00	91.84	
	Registered engineer	eng	$/hr	145.00	220.00	
	travel costs (TO to Thompson)	trav	each	2137.00		
	Environmental coordinator	envco	$/hr	74.16	130.00	
	Evironmental technologist	envtech	$/hr	85.00		
	Electrician	elec	$/hr	74.00	95.00	
	Journeyman - various	journey	$/hr	44.00	71.79	
	Labour - skilled	lab-s	$/hr	50.00	65.00	
	Labour - unskilled	lab-us	$/hr	40.00	55.00	
	Equipment operator	oper	$/hr	41.00	80.00	
	truck driver	trdr	$/hr			
	Equipment rates include operator and fuel					
	Loader - 4 cu.yd (3.06m3)	load-s	$/hr	175.00		
	Loader - 7 cu.yd (5.35m3)	load-l	$/hr	315.00		
	Excavator - 26.76-30.84 tonnes	exc-s	$/hr	180.00	210.00	recent rates from AFW estimator
	Excavator - 68.95+tonnes	exc-l	$/hr	420.00		
	Grader	grad	$/hr	190.00		
	Dump truck off hwy 30-50 tonnes	truck-s	$/hr	225.00		recent rates from AFW estimator
	Dump truck off hwy 55-75 tonnes	truck-l	$/hr	300.00		
	dozer, small	dozers	$/hr	205.00		
	dozer, large	dozerl	$/hr	395.00		recent rates from AFW estimator
	smooth drum compactor	comp	$/hr	155.00		
	scooptram, 6 yd3 bucket	scoop	$/hr	170.00		
	flat bed truck with hiab	hiab	$/hr	155.00		
	fuel truck	ftruck	$/hr	150.00		
	water truck	wtruck	$/hr	58.00	150.00	
	ATV rental (incl fuel)	atv	day		100.00	
Mobilize Camp						
	Modular Units (34 person camp)	accom	each	1377820.00		discussions with Outlander and similar project
	Transportation. Install and dismantle	tran	each	636732.00		discussions with Outlander and similar project
	Camp operations	ops	each	465191.00		discussions with Outlander and similar project
	Camp operations	cmpsc	each	161230.00		
Equipment Standby						
	Excavator	exmth	month	10080.00	13400.00	Discussion with Sigfusson Northern. Typical standby rate for equipment on isolated sites is 30 to 40% of the normal operating rate
	Off-highway Articulate Dump Truck	trmth	month	10800.00	14400.00	
	Tractor Crawler	domth	month	18960.00	25280	
Mobilize Workers						
	flight	MW	each	4500.00	9100.00	
	flight for ICM activities and during Reclamation	flt-icm	each	8685.00		quote from Kississing
	flight and expense for extra water sampling trips not included under the geotechnical inspections	fly-exp	each	9285.00		see cell G13+G14 + G15 from ICM tab
Pumps						
	Pump capital cost	PC	each	12000.00		
	Pump shipping	PS	each	2500.00		
	Pump operating cost	POC	m3	0.60	1.20	pump operating costs should be calculated based on pump capacity, fuel costs, etc. from afw estimator
	Pump maintenance	PM	allow	25000.00		
Site Inspection Report						
		RPT	each	10000.00	20000.00	
	Annual Geotech Inspection	AGI		34809.00		ICM cost without the water quality sampling
SEALIFT COSTS						
	excavator	exca	lump sum	18908		$343 per revenue Tonne / quote from NEAS
	trucks	artt	lump sum	13470		$343 per revenue Tonne / quote from NEAS
	dozer	doze	lump sum	9943		$343 per revenue Tonne / quote from NEAS
	pu truck	putr	lump sum	3369		$343 per revenue Tonne / quote from NEAS
	20 ft Std container	seac	each	8232		$343 per revenue Tonne / quote from NEAS
Water Sampling/Analysis/Reporting						
		WS	each	5400.00		internal afw quote
Winter Road						
	Construction	WRC	km	2200.00	12500.00	used original rates supplied in 2014 plus 2.5% annual escalation as per CPI
	Usage	WRU	kmtonne	0.31		same