

Rock Creek Mine Revised Closure Cost Estimate

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1.0 INTRODUCTION

Tetra Tech has been retained by NovaGold to revise the closure cost estimates for the Rock Creek Mine located near Nome, Alaska. Closure costs are calculated based on actual site-specific conditions and revised closure plans. The cost estimates contained in this report are based on the assumption that third-party contractors would perform the closure work at Rock Creek with contract administration and oversight by the State of Alaska.

This report briefly summarizes the October 24, 2011 Rock Creek Mine Reclamation and Closure Plan (Closure Plan) for the existing disturbance at the Rock Creek Mine (see Section 2.0) and subsequent modifications to the Closure Plan submitted to the State on December 5, 2011. The volumes and quantities used to develop this cost estimate reflect the Closure Plan and are divided into two implementation phases. Important material quantities, grading, and soil cover volumes and dimensions are also included in this report (see Section 3.0). Major costing assumptions used to estimate closure costs are described in Table 1 (see Section 3.0).

Based on the closure plans and assumptions described below the estimated cost to close and reclaim existing disturbance at the Rock Creek Mine is approximately US \$20.3 million. The spreadsheets used to generate this closure cost estimate for the Rock Creek Mine are included with this submittal in electronic form (RC Closure Cost Estimate 1-5-12.xlsm). Printouts of the spreadsheets are included as Appendix B. Closure activities will be completed over a 12-month period as shown in the activity planning schedule (Figure 1), with most activities occurring during summer and fall. Due to seasonal limitations on mobilizing and demobilizing large equipment to Nome, this cost estimate includes 12 months of equipment rental with one mobilization and demobilization of equipment.

2.0 CLOSURE PLAN SUMMARY

Closure of the Rock Creek Mine is scheduled in two phases. Phase I focuses on dewatering the tailings storage facility (TSF) to the maximum extent practicable; covering the paste tailings with an impermeable cover; breaching the TSF dam to eliminate the accumulation of runoff behind the dam; and closing the recycle water pond (RWP). Phase II addresses the remaining site activities, including backfilling the Main Pit with tailings and waste rock; demolition and disposal of all site buildings; and grading and revegetating the site to near pre-mining conditions. This multi-phase approach to closure mitigates the seasonal constraints that limited the timeframe during which certain activities could occur.

This section summarizes the key points of the Closure Plan for each planning area (Figure 4). Figures included with this cost estimate are from the Closure Plan; gaps in numbering reflect the inclusion of only certain figures with this report.

2.1 Phase I

Area 1—RWP

- The RWP will be dewatered and backfilled with excess development rock and loose fill, and covered with topsoil.

Area 2—Main Pit

- 10,000 m³ of riprap will be quarried from the Main Pit. Waste rock material generated during quarrying will be used to construct temporary stormwater controls in the TSF area.

Area 3—TSF

- The TSF pond will be dewatered to the maximum extent practicable.
- A temporary hypalon cover will be installed over the tailings, and a temporary diversion channel constructed to direct water away from the tailings. Installation costs described in the spreadsheet are inclusive of labor and equipment usage, and are based on manufacturer's guidelines for cold weather installation.¹
- The TSF dam will be breached and a permanent stormwater channel constructed to direct runoff to the lower portion of Diversion Channel #3. Riprap will be placed within the permanent channel to prevent scour (Figure 10).
- The TSF sumps (Main and South) will be backfilled with excess fill material from the breach.

2.2 Phase II

Area 1—Main Plant, Monofill, and Development Rock/Ore Stockpile

- A monofill for inert demolition debris will be constructed north of the main plant area (Figure 6) to accommodate approximately 60 percent of the debris expected to be generated during demolition of site buildings. Excess development rock from temporary stockpiles will be used to construct a 1-meter (m) thick pad on which debris will be placed and a temporary access road from the main plant area. The temporary road will be removed upon closure of the monofill.

¹ In the December 5, 2011 supplemental memorandum, NovaGold notified ADNR that it intends to use 60-mil HDPE liner (welded) to construct the temporary tailings cover since this material is already available on site and is suitable for the application. Under a future State-managed closure, however, the on-site inventory of HDPE would not likely be available. Hypalon, as the preferred cover material, would need to be shipped to the site.

- All buildings will be demolished. Stem walls will be knocked down and buried in place. Concrete pads will be buried in place.
- Inert demolition debris will be placed in the on-site monofill for final disposal or hauled to the City of Nome monofill. Demolition costs were estimated based on general information regarding construction materials and building dimensions, and are presented as bulk costs in the spreadsheet. Costs are inclusive of labor and equipment usage.
- The water treatment plant will remain on site until it is proven that there are no post-closure water treatment needs.
- All remaining development rock and low grade ore will be removed to the Main Pit for use as backfill.
- The entire disturbed area will be covered with a minimum 0.3-m thick layer of topsoil and revegetated.

Area 1 - Water Treatment Plant

- The existing water treatment plant (WTP) will remain in continuous operation at up to 450 gallons per minute (gpm) until contained water sources have been reclaimed and no longer require treatment.
- After contained water sources are reclaimed, the WTP will be retained to batch treat other water volumes as necessary; continuous operation is not anticipated for the duration of closure activities.
- During continuous operation, the treatment plant operators will work 12 hours per day, 7 days per week, in two shifts. After continuous operation ceases, work will be reduced to a one 12-hour shift per day, 7 days per week.

Area 2 –Main and Walsh Pits

- Based on the design shown on figures 8 and 9, the Main Pit will be backfilled to approximately 90 m above mean sea level (amsl) on the west side of the Main Rock Creek Pit and to approximately 120 m amsl on the east side.
- The floor of the Main Pit will be backfilled with tailings, ore and development rock, and excess fill from the TSF and causeway. The Walsh Pit will be backfilled with excess fill and topsoil to achieve final grade.
- The fill material will be graded to drain as shown in Figure 8 and 9, covered with a minimum 0.6 m of topsoil, and revegetated.
- No exposed highwall will be left after closure. The final grade of the pit area will not create any surface water pool.

Area 3 – TSF

- Tailings will be excavated and used to backfill the Main Pit. Removal to the Main Pit is planned for summer.
- The following items will be cut up and placed in the on-site monofill:
 - Temporary tailings cover
 - Pump intake PVC pipes (2)
 - HDPE tailings distribution pipes
 - HDPE liner from the inside face of the TSF dam
- Reclaim pump intake corrugated metal pipe (CMP) (2) will be hauled to the monofill for disposal.

- The tailings reclaim pumps (2) will be hauled to the monofill for disposal.
- The TSF area will generally be graded as shown in Figure 11. Excess fill material will be placed in the Main Pit. Final grading plans will be developed during reclamation but the area will be free draining with no ponding of surface water.
- The entire area will be covered with a minimum 0.3 m of topsoil and revegetated.

Area 3 - Tailings Thickener Tank

- The tailings thickener tank will be hauled to the City of Nome monofill.

Area 3 – Diversion Channel #3 (DC #3)

- The channel will be backfilled with materials sidecast along its margins.
- Soil cover will be placed over the backfilled DC #3 to a minimum depth of 0.3 m and revegetated.

Area 4 - Injection Wells

- The area surrounding the wellheads will be excavated.
- Well casing will be cut approximately 0.6 m below the existing soil surface.
- Wells will be filled with bentonite.
- The area excavated around the wellhead will be filled.
- Pipe removal length (3,600 m).
- The area will be covered with a minimum of 0.3 m of topsoil from Stockpile #1 and revegetated.
- The currently revegetated windrows will left as is. For cost estimating purposes, the total area requiring grading and revegetation was estimated to be 60 percent of the total initial disturbance.
- Cost for closing and abandoning site monitoring wells are included under Area 4 in the cost spreadsheet since their cost will be identical to the injection wells.

Area 4 – Diversion Channel #2 (DC #2)

- DC #2 will be side cast graded and covered with 0.3 m of topsoil from Stockpile #1.
- DC #2 will remain in place until Area #1 is covered with topsoil and revegetated.

Area 5 – Explosive Storage Area

- The explosive storage containers (Conex) will be removed to Nome and offered for future use.
- The pads will be graded, topsoil will be placed to a minimum thickness of 0.3 m from Stockpile #1, and the area will be revegetated.

Area 6 – Diversion Channel #1 (DC #1)

- DC #1 will be reclaimed in two segments, the northern section and the southern section. The southern section of DC #1 will be retained until the Main Rock Creek Pit has been backfilled and revegetated.

Area 7 - Causeway

- Based on the design shown on Figure 19 the causeway fill will be excavated. The material will be used to backfill the main pit.
- The culvert CMP (D = 1.2 m) will be cut up and hauled to the monofill for disposal.

- The entire area will be covered with a minimum 0.3 m of topsoil and revegetated.

Area 7 - Roads

- As shown on Figure 22 and 23, the following roads and road segments will be reclaimed
 - Main Road – two segments (643 m);
 - DC Road – (994 m);
 - Pit Road 1 – one segment (36 m);
 - Pit Road 2 (358 m);
 - TSF 1 Road (1,179 m);
 - TSF 2 Road (231 m); and
 - Power corridor and access (200 m).
- A small spur road (98 m) from the TSF 2 Road to the Glacier Creek Road will be constructed and maintained.

Miscellaneous Disturbed Areas

- The limited, disturbed area between the Walsh Pit and Rock Creek channel will be finish graded, scarified, and revegetated.
- Following the removal of soil from all organic stockpiles the areas will be scarified and revegetated.

3.0 MAJOR COSTING ASSUMPTIONS AND CLOSURE QUANTITIES AND DIMENSIONS

The major costing assumptions used to estimate closure costs at Rock Creek are summarized below in Table 1. Table 2 shows the estimated equipment productivities for each major earth moving task. Table 3 includes a summary of important closure quantities and dimensions.

All base topography, facility layouts, and general arrangements were supplied by NovaGold. The Civil 3-D CAD program was used to develop and estimate grading plans, volumes, distances, areas, etc. Area estimates are based on 3-dimensional surfaces and grading volumes are based on the composite method of comparing the existing topography and proposed topography. Equipment mobilization and demobilization costs and equipment rental rates, including stand by time, are based on recent price quotes from local vendors and suppliers. As appropriate, price quotes are referenced in Table 1 below and in the spreadsheet model.

TABLES

Table 1: Summary of Major Costing Assumptions

Closure Component	Costing Assumption
Water Treatment	Water treatment plant remains operational for one year, with continuous operation for 6 months. During continuous operation, WTP operates on 2 12-hour shifts per day, 7 days per week. After continuous operation, work reduced to one 12-hour shift per day. Total 12-month labor hours = 6,480. Water treatment chemical costs annualized for 12-month cycle based on Tetra Tech's experience with NovaGold procurement at Rock Creek. Calcium hypochlorite used for oxidation.
Main Plant (Area 1)	Cost estimate for demolition based on RS Means costs for bulk demolition of buildings with general characteristics similar to Rock Creek. Inert demolition debris to be disposed in on-site monofill estimated to be 60% of total debris volume. Excess volume hauled to City of Nome monofill.
Main Rock Creek Pit & Rock Creek Causeway Breach	Tailings density 115,755 tonnes at 1.36 tonnes/m ³ = 85,100 m ³ . Development rock backfill – 405,856 tonnes at 1.76 tonnes/m ³ = 230,600 m ³ . Benches constructed on 2H:1V slopes every 15 vertical meters. Excess fill required to achieve final grade from TSF. Rock Creek breach quantities based on <i>Rock Creek Channel Design</i> (See Appendix A). Appendix A based on English units. Spreadsheet costing model includes metric conversions.
Tailings Storage Facility & Dam Breach	Cover size based on areal extend of tailings surface as surveyed September 2011. Slope factor (~1.05) insignificant. Total material quantity (13,400 m ²) assumes 3-m overlap between sections. Hypalon material cost (12 USD/m ²) based on Tetra Tech experience with similar projects, and includes shipping and transportation cost to site. Installation cost (7.50 USD/m ²) includes labor and equipment for non-welded installation adjusted to reflect a cold weather installation. Riprap material for breach channel quarried from Main Pit. Tailings excavation – 85,100 m ³ . Excess fill from TSF grading placed in Main Pit – 25,200 m ³ . Thickener tank removed. Tailings reclaim pumps – 2 centrifuge pumps and one Conex Container. Reclaim pump intake – Two perforated CMP (D= 0.9 m); two PVC pipes (D = 0.2 m).
Diversion Channels #1 through #3	DC #1 backfill volume based on the surface needed for sheet flow drainage. DC #2 backfill volume was estimated. DC #3: cut/fill balanced at 2m ³ /linear meter. Bulking (swell) factor = 1.25 was also added to volume. Average slope = 15 percent.
Injection Well Field (Area 4)	60% of initial disturbed area will require grading/revegetation.
Explosive Storage Area	Conex containers empty. 10 Conex containers per pad with 9 pads = 90 Conex containers. 5 Conex containers/day loaded and hauled to Nome and unloaded with crane or CAT 988H. Conex containers transported to Nome on flatbed trucks. Loaded and unloaded with crane or CAT 988H located at mine and in Nome. Conex containers offered for future use.
Reagents, Explosive, Consumables, Small Volume Materials	Cost to remove these products from the site is estimated at \$500,000.
Labor, Equipment, and Material Cost	
General Costing Assumption	From State of Alaska Department of Labor and Workforce Development - Laborers' & Mechanics' Minimum Rates of Pay; Title 36. Public Contracts AS 36.05 & AS 36.10; Wage & Hour Administration Pamphlet No. 600. April, 2011.
Labor Cost	Two working shifts and one administrative shift per 24-hour day. Each Shift = 12 hours per 24 hour day and 10 hours productivity with two hours of breaks and lunch per shift. Work schedule = 20 days on 10 days off. Workers Pay = Base rate x (1+overtime factor) x (1+burden factor) + benefits Admin (indirect) hours coupled to project duration. Workers Compensation = 1.6% of total compensation; Employer Cost for Employee Compensation-December 2009, Table 5. Bureau of Labor Statistics March 10, 2010; Ref: USDL-10-0283.
Equipment Cost	Equipment operating cost based on EquipmentWatch estimate provided by ADNR. Cost equates to average cost for equipment used in financial assurance estimates for Pogo and Red Dog mines. Standby equipment cost based on 12-month rental and minimum charge per month from NC Machinery. Total equipment hours compared to hours required to meet minimum charge. If hours exceed minimum, no additional cost is included. If hours are less than minimum, the difference is multiplied by the hourly rate and added as a standby cost. Entire CAT 966H cost is included as "standby" because it is not assigned to a particular activity. Operator shift = 10 hours of equipment operation. Road maintenance activities based on haul truck operation.
Materials Cost	Seed cost provided by Alaska Plant Materials Center and is based on proposed seed mixture and current \$/lbm seed price for coastal Alaska. Diesel fuel cost based on actual cost incurred by NovaGold under contract with Bonanza Fuel (Nome) for delivery in September 2011.
Equipment Productivity	Average productivities estimated based on material/task specifics and limitations. Average productivities from <i>Caterpillar Performance Handbook</i> , Edition 35. CAT® Publication by Caterpillar Inc., Peoria, Illinois. October 2004

*Volumes rounded to the nearest 100 cubic meters

Table 2: Summary of Equipment Productivities Assumptions

Activity Code*	Activity	Loose (Lm3/hr)	Justification
R.001	Excavation, load and haul tailings from TSF to Main Rock Creek Pit	192	Cat 988 loading thawed tails from the TSF and 3@ 24.3m3 haul trucks hauling to the Main Rock Creek Pit. These trucks may need to be partially loaded or have temporary tailgates installed to prevent spillage of tails during the haul to the Main Rock Creek Pit. There are 3 trucks with an estimated load factor of 66% due to partial loading and significant carry back for this activity. The assumed load time of 5 min will allow for the loader to tram to the tailing pile and then back to the truck to prevent the trucks from tracking the tails out of the TSF. The total cycle time is estimated at 15 min. The overall productivity is 192 Lm3/hr.
R.002	Load and haul Development Rock from Development Rock Stockpile located in Area 1 to the Main Rock Creek Pit.	364.5	Cat 345 loading development rock from the development rock stockpile located in the facility area and 3@ 24.3m3 haul trucks hauling to the Main Rock Creek Pit. The excavator can load the trucks in 8 passes in 3 min the haul and dump time is 6min and 3 min respectively for a total cycle time of 12 min. The haul distance round trip is 2.8km and an average travel speed of 30km/h. The overall productivity is 364.5 Lm3/hr.
R.003	Load, haul, topsoil from the stockpile # 2 and cover the Main Rock Creek Pit	364.5	Cat 988 loading topsoil located in Stockpile #2 and 3@ 24.3m3 haul trucks hauling to the Main Rock Creek Pit. The load time is estimated at 3 min and the haul and dump time is 6 min and 3 min respectively. The overall cycle time is 12 min and the overall productivity is 364.5 Lm3/hr.
R.005	Excavate and dump excess fill from the TSF	364.5	Cat 988 loading excess fill from the TSF and 3@ 24.3m3 haul trucks hauling to the Main Rock Creek Pit. The load time is estimated at 3 min the haul and dump time is 6min and 3 min respectively for a total cycle time of 12 min. The haul distance round trip is 2.8km and an average travel speed of 30km/h. The overall productivity is 364.5 Lm3/hr. Grading of this material is addressed in R.029.
R.011	Grading the TSF and Dam Breach	786	Cat 345 loading TSF dam material and 3@ 24.3m3 haul trucks hauling within Area 3. This material may be partially frozen and a loader may have difficulty breaking up the material and loading at the same rate of an excavator. The excavator can load the trucks in 8 passes in 3 minutes. The haul and dump time is 2 min and 3 min respectively. The excavator can only load 3 trucks in 9 min so the overall cycle time is 9 min. The productivity is 486 Lm3/hr. The dozer will be working with the excavator and truck fleet on the short push areas which has a 300 Lm3/hr production.
R.013	Place topsoil over the TSF from Stockpiles #2 and #3.	586	Cat 988 loading topsoil located southeast of the TSF and 3@ 24.3m3 haul trucks hauling to the TSF. The load time is estimated at 3 min and the haul and dump time is 3 min and 3 min respectively. The overall cycle time is 9 min and the overall productivity is 486.0 Lm3/hr. In addition to the truck haul the D-8 will be able to push some of the topsoil to its final location during topsoil grading adding an additional 100 Lm3/hr.
R.014	Place topsoil over Area 1 from Stockpiles #2 and #3.	486	Cat 345 loading topsoil located southwest of Area 1 and 3@ 24.3m3 haul trucks hauling to Area 1. The load time is estimated at 3 min and the haul and dump time is 3 min and 3 min respectively. The overall cycle time is 9 min and the overall productivity is 486.0 Lm3/hr.
R.015	Place topsoil in the East Injection Well Field from the Stockpile #1	364.5	Cat 988 loading topsoil located in the facility area and 3@ 32 yd (24.3m3) haul trucks hauling to the East Injection Field. The load time is estimated at 3 min and the haul and dump time is 6 min and 3 min respectively. The overall cycle time is 12 min and the overall productivity is 364.5 Lm3/hr.
R.016	Place topsoil in the West Injection Well Field from the Stockpile #1	364.5	Cat 988 loading topsoil located in the facility area and 3@ 24.3m3 haul trucks hauling to the East Injection Field. The load time is estimated at 3 min and the haul and dump time is 6 min and 3 min respectively. The overall cycle time is 12 min and the overall productivity is 364.5 Lm3/hr.
R.017	Place topsoil in the Explosive Magazine Pad from the Stockpile #1	364.5	Cat 988 loading topsoil located in the facility area and 3@ 24.3m3 haul trucks hauling to the explosive magazine pad. The load time is estimated at 3 min and the haul and dump time is 6 min and 3 min respectively. The overall cycle time is 12 min and the overall productivity is 364.5 Lm3/hr.
R.018	Backfill of DC#1	400	The D8 dozer will backfill DC #1 and with no other equipment required for the backfill of the Diversion Channel the overall productivity is 400 L M3/hr.
R.020	Backfill of DC#2	400	The D8 dozer will backfill DC #2 and with no other equipment required for the backfill of the Diversion Channel the overall productivity is 400 L M3/hr.
R.021	Load haul and place topsoil on DC #2 from Stockpile #1	194.4	Cat 988 loading topsoil and 2@ 24.3m3 haul trucks hauling to DC #2. The loader can load the trucks in 3 minutes the haul is estimated at 6 min. Since it is a small area and there is a limited amount of fill required the dump time is estimated at 6 min per load. The overall cycle time will be of 15 min. The overall productivity is 194.4 Lm3/hr.
R.022	Dozer and Excavator backfill of DC#3	941.3	The excavator is able to cycle every 0.35 min with a 3.0 m3 bucket with a D8 dozing and with no other equipment required for the backfill of the Diversion Channel #3. The productivity is 541.3 L M3/hr for the loader and 400 L M3/hr for an overall productivity of 941.3 L M3/hr.
R.023	Load haul and place topsoil on DC #3 from Stockpile #2	194.4	Cat 988 loading topsoil and 2@ 24.3m3 haul trucks. Topsoiling DC #3 is incorporated into the topsoil placement of the entire Area #3
R.026	Excavate the causeway and haul to the Main Rock Creek Pit	291.6	Cat 988 loading causeway material from the access road and 3@32 24.3m3 haul trucks hauling to the main pit. The loader can load the trucks in 3 minutes but since the loading area is small the load time is expected to be 4 min. The haul and dump time is 8 minutes and 3 minutes respectively for a total cycle time of 15 minutes. The overall productivity is 291.6 Lm3/hr.
R.027	Load haul and placement of the demolition debris in the on-site monofill.	121.5	Cat 988 loading the debris into the 2@24.3m3 haul truck with a short haul to the on-site monofill. The cycle time is estimated to be 7 min and an overall productivity of 121.5 Lm3/hr.
R.028	Load haul and place topsoil on DC #1 from Stockpile #2	194.4	Cat 988 loading topsoil and 2@24.3m3 haul trucks hauling to the DC #1. The loader can load the trucks in 3 minutes the haul is estimated at 6 min. Since it is a small area and there is a limited amount of fill required the dump time is estimated at 6 min per load. The overall cycle time will be of 15 minutes. The overall productivity is 194.4 Lm3/hr.
R.029	Grading the backfill dumps within the Main Rock Creek Pit	300	Productivity came from cat handbook for D8 @ 80m downhill push, 300Lm3/hr.
R.030	Haul to City of Nome monofill	122.32	Productivity based on 4@15.4m3 side dump trucks hauling to the city monofill. Round trip distance is 11.4 miles at an average speed of 35 mph (19.5 minutes). Total load and dump time is estimated at 10.5 minutes for a total cycle time of 30 minutes.

*Used activity codes only. Gaps in numbering reflect activities no longer applicable to current Closure Plan.

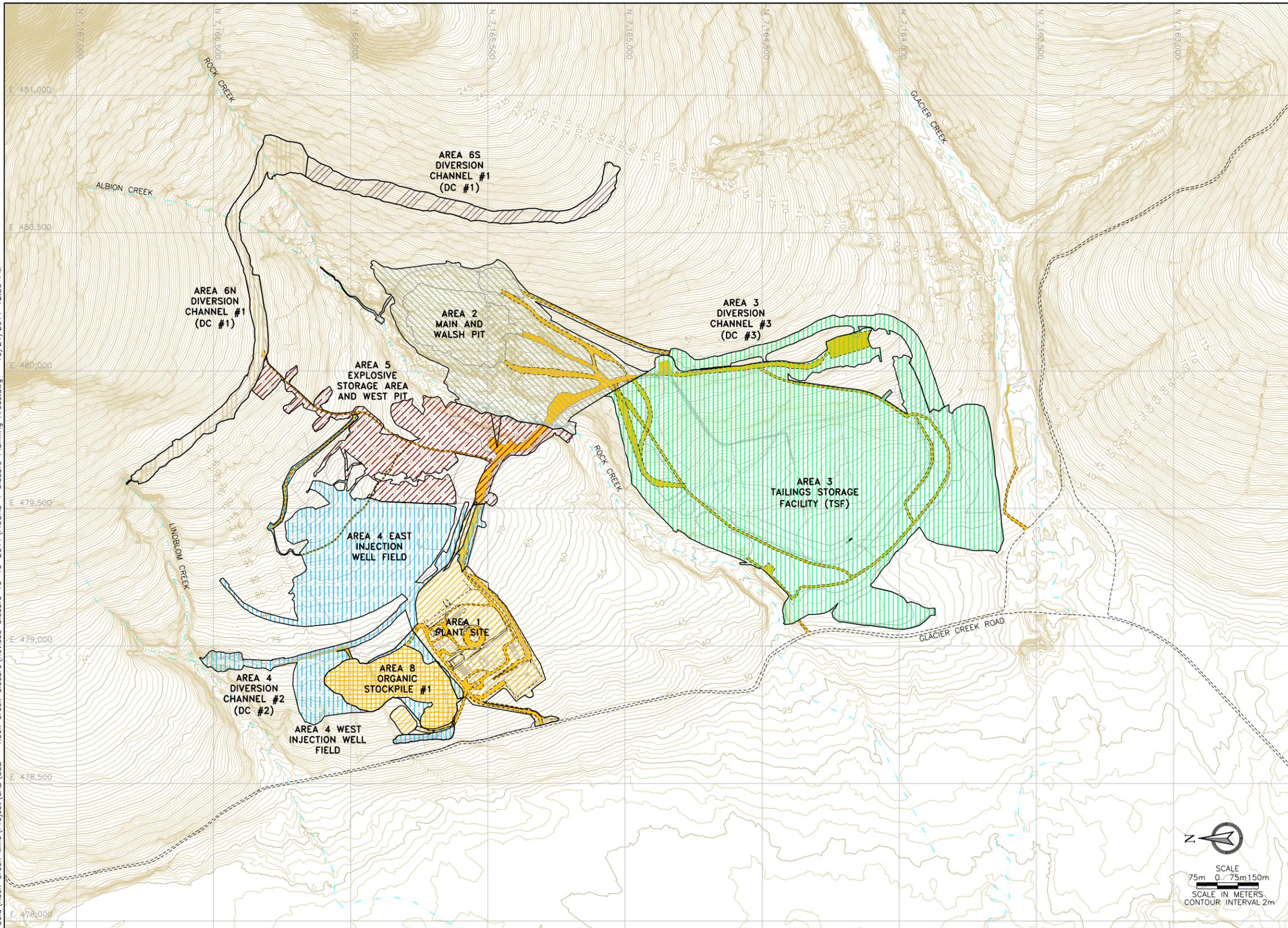
Table 3: Summary of Important Closure Quantities, Volumes, and Dimensions

Facility/Closure Component	Backfill Volume (m ³)	Excavation Volume (m ³)	Cover Volume (m ³)	One-Way Haul Distance (Km)	Rip Rap (m ³)	Quantity	Dimensions									
							Disturbed Area (hectares)	Soil Cover Depth (m)	Length (m)	Width (m)	Area (m ²)	Height/Depth (m)	Bottom Width (m)	Slope (H:V)	Side Slope (H:V)	Diameter (m)
Main Rock Creek Pit	Tailings = 85,100 Dev. Rock = 230,600	-	52,500	1.4	-	-	8.5	0.6	-	-	-	-	-	-	-	-
Tailing Removal	-	85,100		1.4	-	-	94	0.3	-	-	-	-	-	-	-	-
TSF Breach and Grading	324,200	25,200	291,700	0.4	-	-	-	-		30	7,947	19	30	3:1	-	-
HDPE Tailing Pipeline	-	-	-	-	-	-	-	-	8,569	-	-	-	-	-	-	0.25
Thickener Tank	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	6
Diversion Channel #1	92,200		45,400		no											
Diversion Channel # 2	20,000	-	18,000	0.5	no		2	0.3	590	-	4	1	2	-	2:1	-
Roads	-	24,680	66,900	varies	-	-	-	-	9,608	varies	4	varies	-	-	-	-
Culvert	-	-	-	-	-	-	-	-	2-109.74	-	-	-	-	-	-	2-0.91
Causeway Breach	-	79,600	7,800	0.9	-	-	-	-	-	-	4,049	8	30	3:1	-	-
Explosive Storage	-	-	66,900	-	-	-	22	0.3	-	-	-	-	-	-	-	-
Trailers	-	-	-	10.0	-	90	-	-	-	-	-	-	-	-	-	-
Injection Wells	1	1	117,000	0.8	-	31	38	0.3	-	-	-	-	-	-	-	-
Bentonite Fill	23	-	-	-	-	31	-	-	-	-	-	-	-	-	-	-
Power Line Poles	-	-	-	-	-	47	-	-	-	-	-	10.6-13.7	-	-	-	-

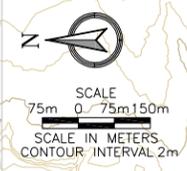
*Volumes rounded to the nearest 100 cubic meters

FIGURES

Ellis, Ryan - T:\Clients\Nova Gold\Rock Creek Mine\Project\CAD\C3D - Rock Creek Closure\Revised Closure 10-19-2011\FIGURE 4 Closure Planning Areas.dwg - 10/21/2011 12:30 PM



- LEGEND:**
- EXISTING CONTOURS
 - EXISTING ROADS
 - EXISTING DRAINAGE
 - AREA 1 - PLANT SITE, MONOFILL, AND DEVELOPMENT ROCK/ORE STOCKPILE
 - AREA 2 - MAIN AND WALSH PIT
 - AREA 3 - TSF AND DC #3
 - AREA 4 - INJECTION WELL FIELD AND DC #2
 - AREA 5 - EXPLOSIVE STORAGE AREA AND WEST PIT
 - AREA 6N - DC#1 NORTH
 - AREA 6S - DC#1 SOUTH
 - AREA 7 - ROADS AND CAUSEWAY
 - AREA 8 - ORGANIC STOCKPILE #1 AREA
 - AREA 9 - STAGING AREA (TO BE DETERMINED)



REFERENCE	ENGINEER'S SEAL	REVISIONS	Scale: As Shown	Designed by: RJE	Drawn by: RJE	Checked by: DH	Approved by: DH

Rev	Description	BY	Date

Scale: As Shown

Designed by: RJE
 Drawn by: RJE
 Checked by: DH
 Approved by: DH

Alaska Gold Company
 A subsidiary of NovaGold Resources Inc.

Issued by:

TETRA TECH

350 Indiana Street, Suite 500
 Golden, Colorado 80401
 (303) 217-5700 (303) 217-5705 fax

Title: **CLOSURE PLANNING AREAS**

Project: **ROCK CREEK MINE CLOSURE**

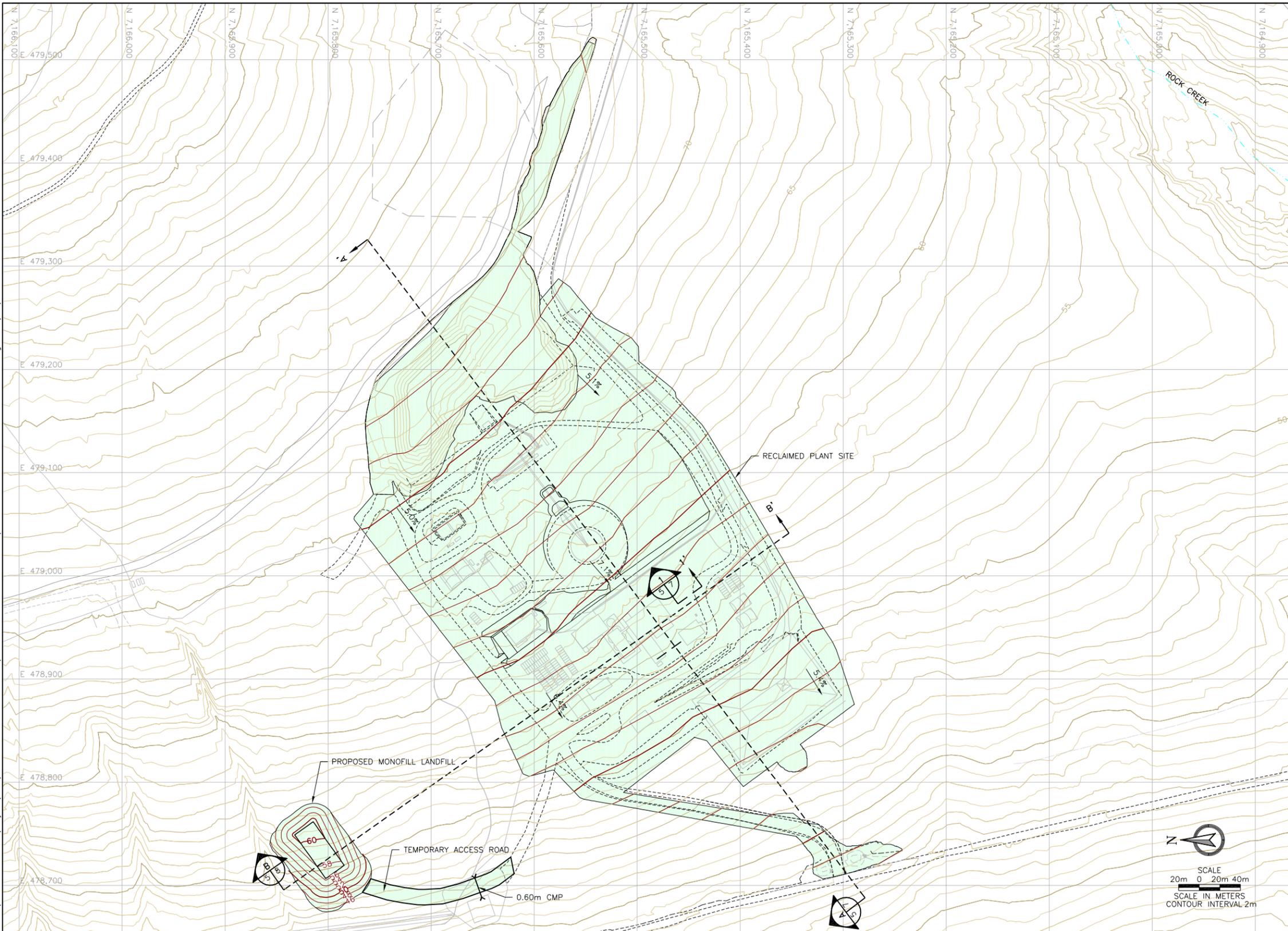
Project no.: **114-311141**

Location: **NOME, ALASKA**

Date: **10/11**

FIGURE 4

Ellis, Ryan - T:\Clients\Nova Gold\Rock Creek Closure\Revised Closure 10-19-2011\FIGURE 6 AREA 1 PLANT SITE PROPOSED.dwg - 10/21/2011 1:02 PM



LEGEND:

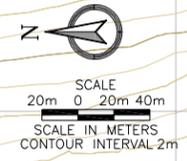
- 135 EXISTING CONTOURS
- 140 PROPOSED CONTOURS
- EXISTING ROADS
- EXISTING DRAINAGE
- DISTURBED AREA BOUNDARY
- █ RECLAIMED AREA BOUNDARY

APPROXIMATE VOLUMES - PLANT SITE CLOSURE			
MATERIAL	CUT (m ³)	FILL (m ³)	NET (m ³)
GRADING	7,500	15,500	8,000 (FILL)
RWP	0	12,600	12,600 (FILL)
TOPSOIL	0	48,300	48,300 (FILL)
DEVELOPMENT ROCK	237,000	0	237,000 (CUT)
INERT DEBRIS	20,000	0	20,000 (CUT)

APPROXIMATE VOLUMES - MONOFILL LANDFILL			
MATERIAL	CUT (m ³)	FILL (m ³)	NET (m ³)
INERT DEBRIS	0	20,000	20,000 (FILL)
DEVELOPMENT ROCK MONOFILL PAD	0	6,400	6,400 (FILL)
DEVELOPMENT ROCK TEMPORARY ACCESS ROAD	0	3,800	3,800 (FILL)
TOPSOIL	0	4,200	4,200 (FILL)

NOTES:

1. GRADING VOLUME IS BASED ON FINAL GRADING SURFACE.
2. TOPSOIL VOLUME IS BASED ON GRADED PLANT SITE AREA MULTIPLIED BY 0.30m AND GRADED LANDFILL AREA MULTIPLIED BY 0.60m.
3. DEVELOPMENT ROCK USED IN TEMPORARY ACCESS ROAD CONSTRUCTED WILL BE REMOVED WHEN ROAD IS DECOMMISSIONED.



Rev	Description	BY	Date

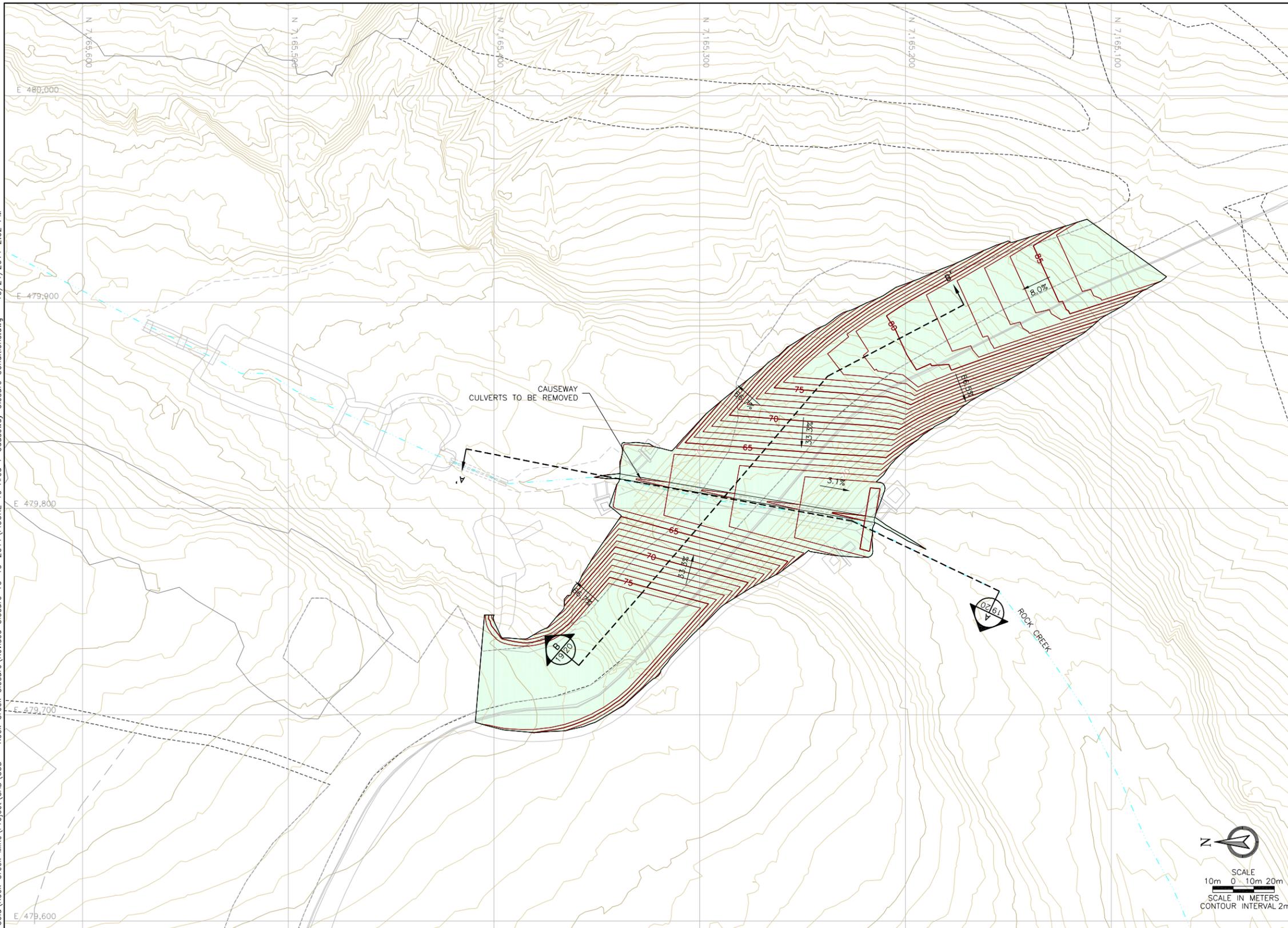
Rev	Description	BY	Date

Scale: As Shown
 Designed by: RJE
 Drawn by: RJE
 Checked by: DH
 Approved by: DH



AREA 1 PLANT SITE PROPOSED CLOSURE CONDITIONS		FIGURE 6
Project: ROCK CREEK MINE CLOSURE	Project no.: 114-311141	REVISION B
Location: NOME, ALASKA	Date: 10/11	

Ellis, Ryan - T:\Clients\Nova Gold\Rock Creek Mine\Project\CAD\C3D - Rock Creek Closure\Revised Closure 10-19-2011\FIGURE 19 Area 7 Causeway Closure Conditions.dwg - 10/21/2011 2:02 PM



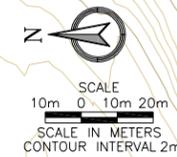
LEGEND:

- 135 — EXISTING CONTOURS
- 140 — PROPOSED CONTOURS
- EXISTING ROADS
- EXISTING DRAINAGE
- EXISTING PIPE
- █ RECLAIMED AREAS

NOTE:

1. EXISTING ROAD GRADING IS APPROXIMATE FROM PROVIDED INFORMATION.
2. EXISTING STRUCTURES IN THE GENERAL AREA ARE TO BE REMOVED. THE AREA SHALL BE GRADED AND REVEGETATED AS NECESSARY.

APPROXIMATE VOLUMES - CAUSEWAY CLOSURE			
MATERIAL	CUT (m ³)	FILL (m ³)	NET (m ³)
GRADING	79,600	0	79,600 (CUT)
TOPSOIL	0	7,800	7,800 (FILL)
RIPRAP	0	100	100 (FILL)



Rev	Description	BY	Date

Rev	Description	BY	Date

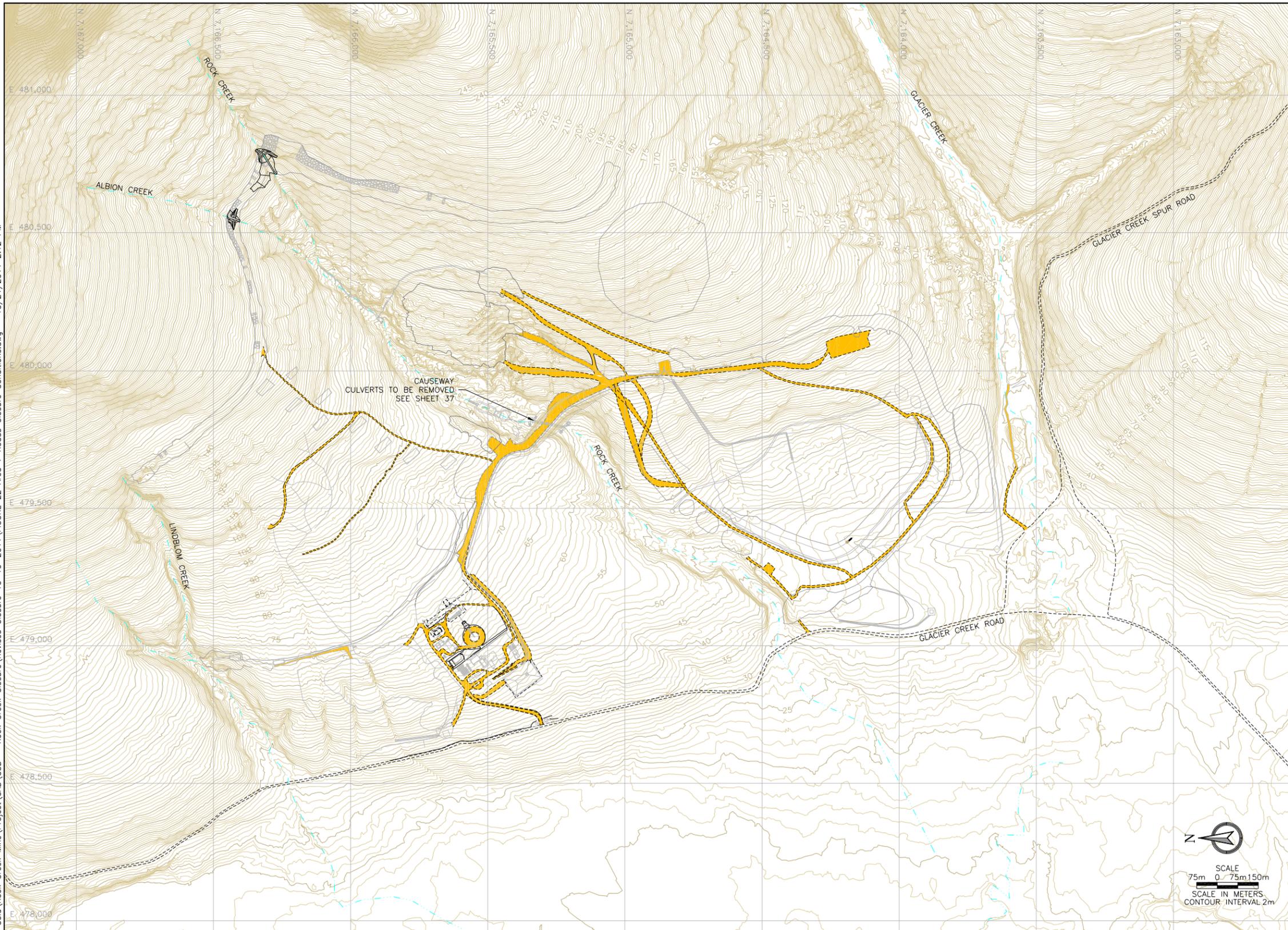
Scale: As Shown
 Designed by: RJE
 Drawn by: RJE
 Checked by: DH
 Approved by: DH



Project: ROCK CREEK MINE CLOSURE		Project no.: 114-311141		FIGURE 19
Location: NOME, ALASKA		Date: 10/11		

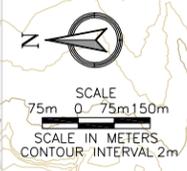


Ellis, Ryan - T:\Clients\Nova Gold\Rock Creek Mine\Project\CAD\C3D - Rock Creek Closure\Revised Closure 10-19-2011\FIGURE 22 Area 7 Roads Closure Conditions.dwg - 10/21/2011 2:12 PM



- LEGEND:**
- 135 — EXISTING CONTOURS
 - EXISTING ROADS
 - EXISTING DRAINAGE
 - AREA 7 - ROADS TO BE REMOVED

- NOTE:**
1. ROADS CONDITION MAY VARY SEE FIGURE 23 FOR TYPICAL ROAD RECLAMATION DETAILS.



Rev	Description	BY	Date

ENGINEER'S SEAL			
Rev	Description	BY	Date

Scale: As Shown
 Designed by: RJE
 Drawn by: RJE
 Checked by: DH
 Approved by: DH



Project:		Project no.:		FIGURE 22
ROCK CREEK MINE CLOSURE		114-311141		
Location: NOME, ALASKA		Date: 10/11		



APPENDIX A

ROCK CREEK CHANNEL DESIGN

ROCK CREEK CHANNEL DESIGN

The majority of the Rock Creek drainage is diverted above the mine site via Diversion Channel 1 (DC1), which flows to Lindblom Creek. As part of the mine closure plan, the Rock Creek channel would be restored by breaching DC1 near the junction of the original creek channel. Tetra Tech conducted hydrologic analyses to provide cost estimates for restoring the Rock Creek channel.

Ecological Resource Consultants, Inc. (ERC) originally used a HEC-HMS rainfall runoff model, developed by the U.S. Army Corps of Engineers (Corps, 2008), to design water management control structures at the Rock Creek mine, including DC1 (Corps, 2008). Tetra Tech used information provided by the ERC model to estimate design flows within DC1 and through a breach near the channel junction. TR-55, a model developed by the Natural Resource Conservation Service (NRCS, 1986), was then used to estimate runoff in the mine area below DC1 and to design the Rock Creek channel.

Channel Design Criteria

The Rock Creek channel was designed to convey runoff generated from a 5-year, 24-hour precipitation event plus a 1 foot freeboard. Most natural channels have a bank full capacity that can convey an approximate 2-year annual peak flood (i.e., the 50th percentile annual peak flow). The 5-year, 24-hour design flow was chosen so that the designed channel would be sized similar to a natural channel. Larger constructed channels, (e.g., using a 100-year flood frequency) often do not allow natural flooding and development of a flood plain and a corresponding riparian zone over time. The DC1 channel was originally designed to convey runoff from a 100-year, 24-hour precipitation event. For this reason, the breach in DC1 to redirect flows to the new Rock Creek channel was also designed to pass a 100-year event. This is so that flows from large events are not constricted by this breach causing water to backup in the DC1 channel, possibly causing a failure through its lower bank.

Channel Design Detail

The assumed channel alignment primarily follows the original path of the Rock Creek drainage. However, the breach in DC1 and the upper portion of the design channel are offset to the north of the original channel path. The average basin slope of the upper section of the watershed immediately below the DC1 breach is much steeper, (i.e., 13%) than the lower section of the watershed which has an average basin slope of 5%. For this reason, the watershed was separated into two areas. This allowed for separate channel designs to be developed for the upper steeper area of the watershed and the lower area of the watershed. Figure 1 shows the channel alignment and the upper and lower watershed sections, depicted as Section A and Section B, respectively. The channel length of Section A is 1,310 feet and the channel length of Section B is 3,746 for a total restored channel length of 5,056 feet. The watershed area for Section A is 29 acres and the watershed area of Section B is 182 acres.

The designed channels are trapezoidal with a 2:1 Horizontal to Vertical (H:V) side slope. It was assumed that the channel substrate and side slopes will be unlined but covered with rip rap. Channel design details and calculations are provided in Tables A-1 through A-3. Table A-1 shows channel design calculations for Section A. Table A-2 shows channel design calculations for Section B and the DC1 Breach is shown in Table A-3. Design criteria were structured so that design flow velocities were less than 10 feet per second (fps). A Manning's roughness coefficient of 0.038 was used for channel flow modeling, corresponding to jagged and irregular

rock cut channels (van Haveren, 1986). Figures 2 through 4 graphically depict designed channel cross sections.

Table A-4 summarizes the total volume of channel to be excavated for each channel section and the total volume of rip rap that will be required to line the channel and side slopes.

REFERENCES

U.S. Army Corps of Engineers (Corps). 2008. Hydrologic Modeling System HEC-HMS. Version 3.3. September 2008.

Natural Resource Conservation Service (NRCS). Urban Hydrology for Small Watersheds TR-55. Technical Release 55. June, 1986.

Van Haveren, B.P. 1986. Water Resource Measurements a Handbook for Hydrologists and Engineers. American Water Works Association.

Table A-1. Channel Design for the Upper Restored Channel. Section A - From DC1 Breach to 1,310 feet of Restored Channel (29 acres).

Input Data	
Design Flow	5-year, 24-hour
Precipitation Depth (in)	2.0
SCS Storm Distribution	Type I
TR-55 Peak Flow (cfs)	1.69
Peak Flow from DC1 ¹ (cfs)	26

Assumptions	
Assume Trapezoidal Channel with 2:1 H:V side slopes	
Channel Length (ft) =	1,310
Average Channel Slope (%) =	13%
Total Peak Flow (cfs) =	27.7

Channel Design Details		
Manning's n	0.038	--
Channel Slope	0.13	ft/ft
Flow depth (d)	0.50	ft
Free Board	1.0	ft
Channel Depth with free board (D)	1.5	ft
Channel bottom width (b)	6.0	ft
Side Slopes (z)	2.0	ft/ft
Flow width	8.0	ft
Channel Width with free board	12.0	ft
Hydraulic Radius [R]	0.4	ft
Velocity	8.0	ft/sec
Flow X-Sectional Area	3.5	ft ²
X-Sectional Area w/ free board	13.5	ft ²
Discharge	28.0	cfs
Channel Perimeter	12.7	ft
Total Channel Area	16,648	ft ²
Total Channel Volume	17,685	ft ³
Total Channel Volume	654	yd ³

Rip Rap Size (D50) ²	10	in
Rip Rap Weight ²	47	lbs
Rip Rap Volume ³	13,878	ft ³
Rip Rap Volume	513	yd ³

Footnotes:

¹ Supplied by Ecological Resource Consultants, Inc. HEC-HMS model² D50 based on predicted flow velocity; weight assumes 165 lbs/ft³³ Assumes D50 x channel area

Table A-2. Channel design detail for the lower restored channel. Section B - From Section A @ 1,310 feet of restored channel to reconnection with Rock Creek at 5,056 feet of restored channel (182 acres)

Input Data	
Design Flow	5-year, 24-hour
Precipitation Depth (in)	2.0
SCS Storm Distribution	Type I
TR-55 Peak Flow (cfs) Section A	1.69
TR-55 Peak Flow (cfs) Section B	111
Peak Flow from DC1 ¹ (cfs)	26

Assumptions	
Assume Trapezoidal Channel with 2:1 H:V side slopes	
Channel Length (ft) =	3,746
Average Channel Slope (%) =	5%
Total Peak Flow (cfs) =	137.0

Channel Design Details		
Manning's n	0.038	--
Channel Slope	0.05	ft/ft
Flow depth (d)	1.01	ft
Free Board	1.0	ft
Channel Depth with free board (D)	2.0	ft
Channel bottom width (b)	15	ft
Side Slopes (z)	2.0	ft/ft
Flow width	19.0	ft
Channel Width with free board	23.0	ft
Hydraulic Radius [R]	0.9	ft
Velocity	8.1	ft/sec
Flow X-Sectional Area	17.2	ft ²
X-Sectional Area w/ free board	38.2	ft ²
Discharge	138	cfs
Channel Perimeter	24.0	ft
Channel Area	89,863	ft ²
Total Channel Volume	143,210	ft ³
Total Channel Volume	5,299	yd ³

Rip Rap Size (D50) ²	10	in
Rip Rap Weight ²	47	lbs
Rip Rap Volume ³	74,886	ft ³
Rip Rap Volume	2,771	yd ³

Footnotes:

¹ Supplied by Ecological Resource Consultants, Inc. HEC-HMS model

² D50 based on predicted flow velocity; weight assumes 165 lbs/ft³

³ Assumes D50 x channel area

Table A-3. Channel design detail for the DC1 berm breach.

Input Data	
Design Flow	100-year, 24-hour
Precipitation Depth (in)	3.5
SCS Storm Distribution	Type I
Peak Flow from DC1 ¹ (cfs)	164

Assumptions	
Assume Trapezoidal Channel with 2:1 H:V side slopes	
Channel Length (ft) =	40
Average Channel Slope (%) =	7%
Total Peak Flow (cfs) =	164

Channel Design Details		
Manning's n	0.038	--
Channel Slope	0.07	ft/ft
Flow depth (d)	0.98	ft
Free Board	1.0	ft
Channel Depth with free board (D)	1.5	ft
Channel bottom width (b)	16	ft
Side Slopes (z)	2.0	ft/ft
Flow width	19.9	ft
Channel Width with free board	22.0	ft
Hydraulic Radius [R]	0.9	ft
Velocity	9.4	ft/sec
Flow X-Sectional Area	17.5	ft ²
X-Sectional Area w/ free board	28.5	ft ²
Discharge	164	cfs
Channel Perimeter	22.7	ft
Total Channel Area	908	ft ²
Total Channel Volume	1,140	ft ³
Total Channel Volume	42	yd ³

Rip Rap Size (D50) ²	12	in
Rip Rap Weight ²	81	lbs
Rip Rap Volume ³	908	ft ³
Rip Rap Volume	34	yd ³

Footnotes:

¹ Supplied by Ecological Resource Consultants, Inc. HEC-HMS model

² D50 based on predicted flow velocity; weight assumes 165 lbs/ft³

³ Assumes D50 x channel area

Table A-4. Summary of excavation volumes and rip rap requirements.			
Channel Section	Excavation Volume (yd ³)	Rip Rap Volume (yd ³)	Rip Rap Size D50 - inches
Section A	654	513	10
Section B	5,299	2,771	10
DC1 Breach	42	34	12
Total	5,995	3,318	--

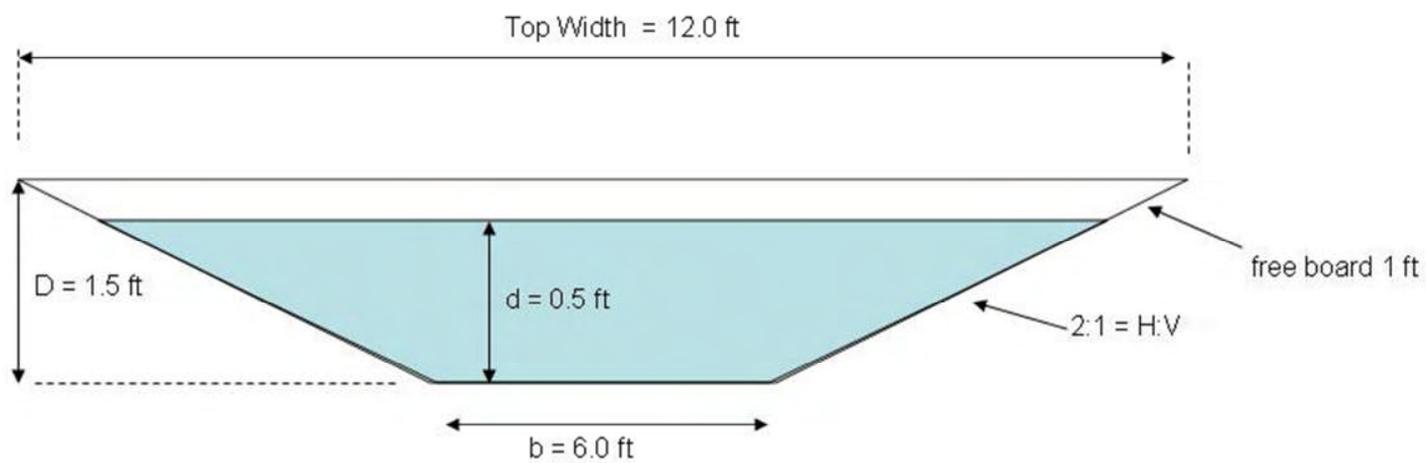


Figure 2. Rock Creek Upper Channel (Section A) Cross Section (Not to Scale)

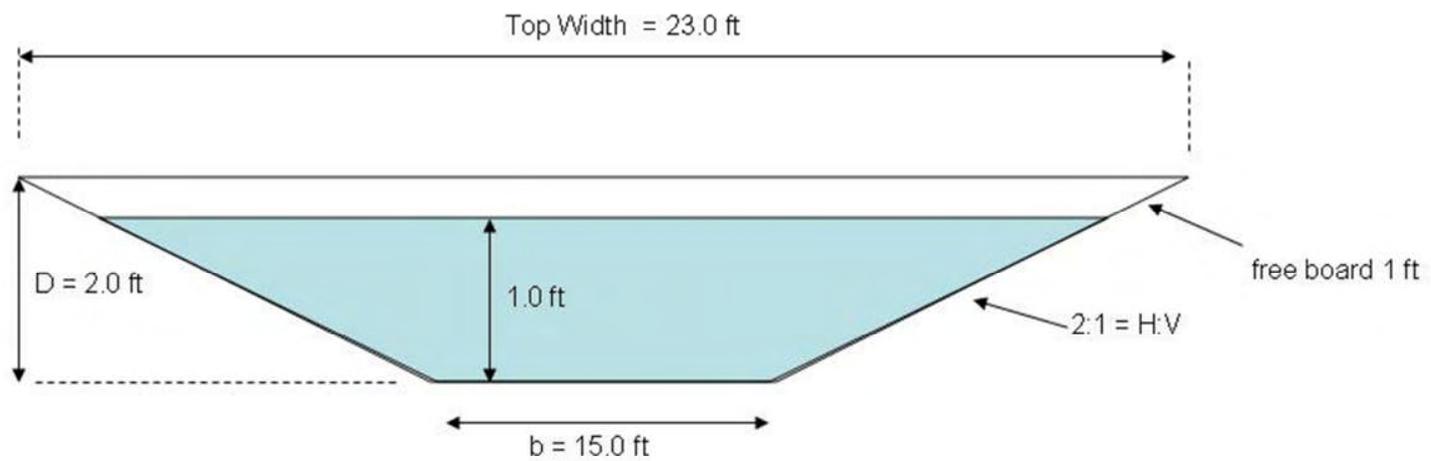


Figure 3. Rock Creek Lower Channel (Section B) Cross Section (Not to Scale)

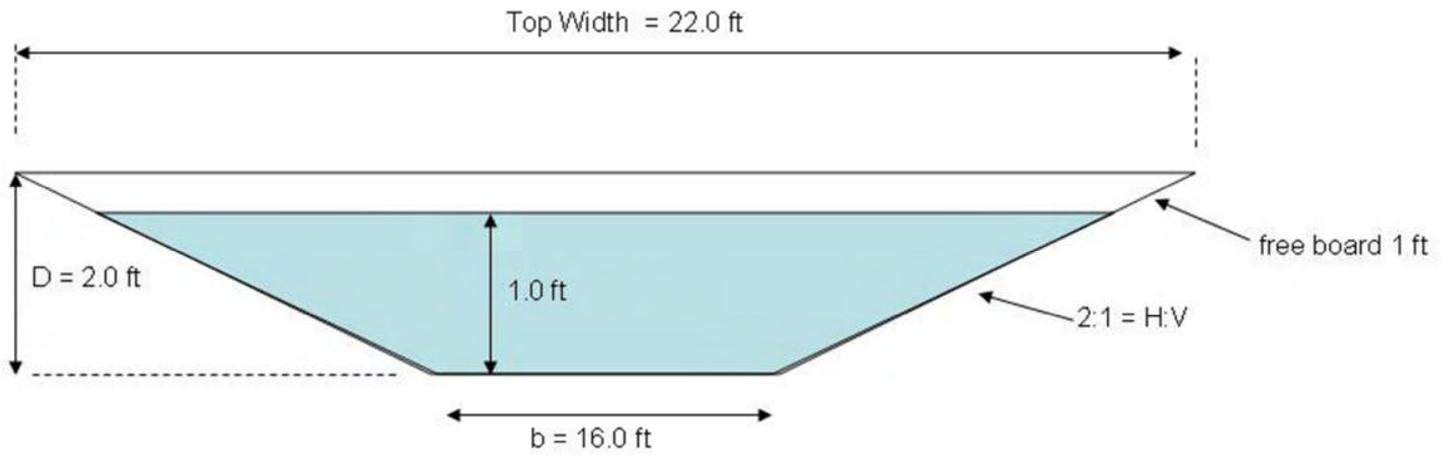


Figure 4. Rock Creek Channel (DC1 Breach) Cross Section (Not to Scale)

APPENDIX B

VENDOR QUOTES

NC MACHINERY



Jim Hollowood

6450 Arctic Blvd.
Anchorage, AK 99518
Phone: (907) 786-7500
Fax: (907) 786-7580
jhollowood@ncmachinery.com

Quotation

Prepared for: Tetra Tech
Nome Alaska



Description	Week	MONTH (200 hrs)	OVERTIME	Mobe/ Demobe
D6T XL Tractor	\$3,100	\$8,370	\$42	
D8T Tractor	\$6,000	\$18,000	\$90	
D9T Tractor	\$9,250	\$27,000	\$135	
345CL Excavator	\$5,250	\$12,500	\$63	
966H Wheel Loader	\$3,600	\$10,500	\$53	
988H Wheel Loader	\$7,000	\$21,000	\$105	
740 Articulated Truck	\$5,650	\$14,500	\$73	
14M Motor Grader	\$4,400	\$13,295	\$66	
Water Truck, 4000 gallon	\$1,800	\$5,400	\$27	
CS683E Compactor	\$2,400	\$7,200	\$36	

Machines subject to availability

THANK YOU FOR YOUR BUSINESS!

APPENDIX C

SPREADSHEETS

Rock Creek Closure Bond Estimate Index to Spreadsheet Printouts

Page 1	Rock Creek Reclamation and Bond Estimate Summary
Page 2	Field Support Labor; Administrative
Page 3	Equipment Usage Summary
Page 4	Area 1 Direct Costs: Main Plant & RWP
Page 5	Area 2 Direct Costs: Main & Walsk Pit Areas
Page 6	Area 3 Direct Costs: Tailings Storage Facility
Page 7	Area 4 Direct Costs: Injection Wellfield
Page 8	Area 5 Direct costs: Explosive Magazine Pads
Page 9	Area 6 Direct Costs: Diversion Channel #1
Page 10	Area 7 Direct Costs: Roads & Causeway
Page 11	Water Treatment Plant Direct Costs
Page 12	Area 1 Quantities: Main Plant & RWP
Page 13	Area 1 Quantities: Main & Walsh Pits
Page 14	Area 3 Quantities: Tailings Storage Facility
Page 15	Area 4 Quantities: Injection Wellfield
Page 16	Area 5 Quantities: Diversion Channel #1
Page 17	Area 7 Quantities: Roads & Causeway
Page 18	Rock Creek Building Demo Estimate
Page 19	Cut/Fill Balance; Topsoil
Page 20	Unit Cost Inputs; Fuel Consumption Factors
Page 21	Relocation Unit Costs
Page 22	Task Unit Costs
Page 23	Labor Rates
Page 24	Mobilization/Demobilization Cost Estimate
Page 25	Material Costs; Material Properties
Page 26	Standby Equipment Cost
Page 27	Road Maintenance; Indirect Cost Inputs
Page 28	Direct Cost Summary
Page 29	Demolition Cost Codes

NOTE: You can request and receive an MS Excel version of the closure bond estimate by contacting:

**Steve McGroarty PE, ADNR/Mining Land and Water
(907) 451-2795 email: steve.mcgroarty@alaska.gov**

Rock Creek Closure Bond Estimate

Rock Creek Reclamation and Bond Estimate Summary

Cost Element	Total
Direct Costs	
Area 1: Plant Site	\$ 725,883
Area 2: Main & Walsh Pits	\$ 2,827,036
Area 3: Tailings Storage Facility & DC #3	\$ 2,960,237
Area 4: Injection Well Fields & DC #2	\$ 455,273
Area 5: Explosive Storage Area & West Pit	\$ 503,310
Area 6: Diversion Channel #1	\$ 362,760
Area 7 Roads & Rock Creek Causeway	\$ 621,159
Standby Adjustment	\$ 542,625
Long Term Monitoring	\$ 92,000
Water Treatment	\$ 1,546,828
Mobilization	\$ 449,968
Demobilization	\$ 299,979
Freight costs (12% of material cost)	\$ 154,111
Haul Road Maintenance	\$ 234,472
Man Camp @ 152.40/man-day	\$ 945,337
Field Support Labor	\$ 2,175,848
Administrative Cost	\$ 148,459
Direct Subtotal	\$ 15,045,285
Indirect Costs	
Insurance (1.6% of equipment cost)	\$ 69,817
Contractor overhead and profit (15%)	\$ 2,125,465
Engineering Re-Design (3%)	\$ 488,857
Performance & Payment Bond (3%)	\$ 517,217
State Management and Oversight (1%)	\$ 182,466
Indirect Subtotal	\$ 3,383,822
Contingency (Direct + Indirect)*10%	\$ 1,842,911
PROJECT TOTAL	\$ 20,272,018

Rock Creek Closure Bond Estimate

Field Support Labor

Title	Field?	Rate	Project Days	Workdays	Days/Override	Calculation Days	hrs/shift	Wage Cost	Worker's compe	Turnarounds	Turnaround Cd	Total	Camp Days
Superintendent	Yes	\$153.71	366	254		254	12	\$468,517	\$7,496	12	\$7,376	\$483,390	254
Site Clerk / Medic	Yes	\$115.78	366	254		254	12	\$352,909	\$5,647	12	\$7,376	\$365,932	254
Foreman	Yes	\$85.84	366	254		254	12	\$261,640	\$4,186	12	\$7,376	\$273,202	254
Mechanic (Truck Drivers/Surveyors Group 2)	Yes	\$70.70	366	254		254	12	\$215,485	\$3,448	12	\$7,376	\$226,309	254
Survey Field Manager	Yes	\$79.67	366	254	189	189	12	\$180,694	\$2,891	9	\$5,532	\$189,118	189
Survey Crew (Surveyor and Helper)	Yes	\$141.91	366	254	189	189	12	\$321,860	\$5,150	9	\$11,064	\$338,074	378
Engineer	No	\$129.76	366	254	189	189	12	\$294,291	\$0	9	\$5,532	\$299,823	189
Total												\$2,175,848	1772

Administrative

Element	Quantity	Units	Unit Cost	Total Cost
Office Supplies	12	Month	\$101.60	\$1,219
Communications	12	Month	\$508.00	\$6,096
Misc. Admin Supplies	12	Month	\$254.00	\$3,048
Laboratory/Material Testing	12	Month	\$508.00	\$6,096
Fleet Vehicle (4)	12	Month	\$6,000.00	\$72,000
Heating/Electricity	12	Month	\$5,000.00	\$60,000
Total				\$148,459

Rock Creek Closure Bond Estimate

Equipment Usage Summary

Equipment	Task																				
	R.001	R.002	R.003	R.005	R.011	R.013	R.014	R.015	R.016	R.017	R.018	R.020	R.021	R.022	R.026	R.027	R.028	R.029	R.030	C3.01	C2.19
man hours	2,128	2,531	1,272	207	2,659	2,489	432	578	915	1,135	288	63	868	504	1,092	510	390	28	845	235	287
# of Operators	4	4	5	3	5	5	4	3	3	4	1	1	4	2	4	2	3	1	1	1	1
Task Hours	532	633	254	69	532	498	108	193	305	284	288	63	217	252	273	255	130	28	845	235	287
Task Days 20 hr working	27	32	13	3	27	25	5	10	15	14	14	3	11	13	14	13	7	1			
Weeks	5.8	6.8	2.8	0.7	5.8	5.4	1.2	2.1	3.3	3.1	3.1	0.7	2.3	2.7	3.0	2.8	1.4	0.3			
CAT 988H		1	1	1		1		1	1	1			1		1	1			1		
CAT 345 CL	1				1		1							1			1				
Articulated Truck (32-cy)	3	3	3	2	3	3	2	2	2	2			2		3	1	2				
CAT D8 T			1		1	1	1			1	1	1	1	1				1			
Water Truck																				1	
14M																					1
CAT 988H	0	633	254	69	0	498	0	193	305	284	0	0	217	0	273	255	0	0	845	0	0
CAT 345 CL	532	0	0	0	532	0	108	0	0	0	0	0	0	252	0	0	130	0	0	0	0
Articulated Truck (32-cy)	1,596	1,898	763	138	1,596	1,493	216	385	610	567	0	0	434	0	819	255	260	0	0	0	0
CAT D8 T	0	0	254	0	532	498	108	0	0	284	288	63	217	252	0	0	0	28	0	0	0
Water Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235	0
14M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	287

Rock Creek Closure Bond Estimate

Area 1 Direct Costs: Main Plant & RWP

Code	Activity	Quantity	Unit	Cost Code	Unit Mhrs	Total Mhrs	Labor Rate (\$/unit)	Total Labor Cost (\$)	Unit Matl (\$/unit)	Total Material Cost (\$)	Unit Equip. (\$/unit)	Total Equip. Cost (\$)	Unit Fuel (\$/unit)	Fuel Consumed (gal)	Fuel Cost (\$)	Total Unit Cost (\$/unit)	Total Activity Cost (\$)	Subtotal (\$)	Source / Comments
Building Demolition																		\$120,021	
	Mill building	1	bulk	D.001														\$ 26,404	Bulk demolition estimate, including labor and equipment
	Electrical building	1	bulk	D.002														\$ 21,136	Bulk demolition estimate, including labor and equipment
	Refinery	1	bulk	D.003														\$ 10,166	Bulk demolition estimate, including labor and equipment
	Reagent building	1	bulk	D.004														\$ 19,856	Bulk demolition estimate, including labor and equipment
	Truck shop	1	bulk	D.005														\$ 11,430	Bulk demolition estimate, including labor and equipment
	Pumphouse	1	bulk	D.006														\$ 573	Bulk demolition estimate, including labor and equipment
	Water treatment plant	1	bulk	D.007														\$ 15,642	Bulk demolition estimate, including labor and equipment
	Administration building	1	bulk	D.008														\$ 3,855	Bulk demolition estimate, including labor and equipment
	Electrical substation	1	bulk	D.009														\$ 9,630	Bulk demolition estimate, including labor and equipment
	Assay lab	1	bulk	D.010														\$ 1,330	Bulk demolition estimate, including labor and equipment
Material Hauling & Placement																		\$ 380,962	
A1Q.001	Mill building	11,793	m3	R.027	0.016	194.1	\$ 1.22	\$ 14,334	\$ -	\$ -	\$ 1.71	\$ 20,222	\$ 0.96	2,114	\$ 11,312	\$ 3.89	\$ 45,867		Volume = 60% of total from demolition estimate
A1Q.002	Electrical building	862	m3	R.027	0.016	14.2	\$ 1.22	\$ 1,047	\$ -	\$ -	\$ 1.71	\$ 1,478	\$ 0.96	154	\$ 827	\$ 3.89	\$ 3,352		Volume = 60% of total from demolition estimate
A1Q.003	Refinery	2,474	m3	R.027	0.016	40.7	\$ 1.22	\$ 3,007	\$ -	\$ -	\$ 1.71	\$ 4,242	\$ 0.96	444	\$ 2,373	\$ 3.89	\$ 9,622		Volume = 60% of total from demolition estimate
A1Q.004	Reagent building	4,058	m3	R.027	0.016	66.8	\$ 1.22	\$ 4,932	\$ -	\$ -	\$ 1.71	\$ 6,958	\$ 0.96	728	\$ 3,892	\$ 3.89	\$ 15,783		Volume = 60% of total from demolition estimate
A1Q.005	Truck shop	50	m3	R.027	0.016	0.8	\$ 1.22	\$ 60	\$ -	\$ -	\$ 1.71	\$ 85	\$ 0.96	9	\$ 48	\$ 3.89	\$ 193		Volume = 60% of total from demolition estimate
A1Q.006	Pumphouse	7,329	m3	R.027	0.016	120.6	\$ 1.22	\$ 8,908	\$ -	\$ -	\$ 1.71	\$ 12,567	\$ 0.96	1,314	\$ 7,030	\$ 3.89	\$ 28,504		Volume = 60% of total from demolition estimate
A1Q.007	Water treatment plant	3,078	m3	R.027	0.016	50.7	\$ 1.22	\$ 3,741	\$ -	\$ -	\$ 1.71	\$ 5,278	\$ 0.96	552	\$ 2,953	\$ 3.89	\$ 11,972		Volume = 60% of total from demolition estimate
A1Q.008	Administration building	585	m3	R.027	0.016	9.6	\$ 1.22	\$ 711	\$ -	\$ -	\$ 1.71	\$ 1,002	\$ 0.96	105	\$ 561	\$ 3.89	\$ 2,274		Volume = 60% of total from demolition estimate
A1Q.009	Electrical substation	127	m3	R.027	0.016	2.1	\$ 1.22	\$ 155	\$ -	\$ -	\$ 1.71	\$ 218	\$ 0.96	23	\$ 122	\$ 3.89	\$ 495		Volume = 60% of total from demolition estimate
A1Q.010	Assay lab	640	m3	R.027	0.016	10.5	\$ 1.22	\$ 778	\$ -	\$ -	\$ 1.71	\$ 1,098	\$ 0.96	115	\$ 614	\$ 3.89	\$ 2,491		Volume = 60% of total from demolition estimate
AQ1.012	Grading	15,500	m3	C2.19	0.003	38.8	\$ 0.19	\$ 2,879	\$ -	\$ -	\$ 0.20	\$ 3,039	\$ 0.11	315	\$ 1,686	\$ 0.49	\$ 7,603		Volume = 60% of total from demolition estimate
AQ1.013	RWP	12,600	m3	R.005	0.008	103.7	\$ 0.75	\$ 9,436	\$ -	\$ -	\$ 1.56	\$ 19,707	\$ 0.84	1,984	\$ 10,617	\$ 3.16	\$ 39,759		Volume = 60% of total from demolition estimate
A1Q.014	Monofill pad & temporary access road	10,200	m3	R.007	0.021	209.9	\$ 1.64	\$ 16,736	\$ -	\$ -	\$ 2.98	\$ 30,407	\$ 1.64	3,131	\$ 16,753	\$ 6.26	\$ 63,896		Excess development rock from temporary stockpiles
A1Q.015	Excess debris haul to city monofill	20,664	m3	R.030	0.041	844.7	\$ 0.61	\$ 12,549	\$ -	\$ -	\$ 6.28	\$ 129,817	\$ 0.33	1,268	\$ 6,784	\$ 7.22	\$ 149,151		Estimated balance of debris from demolition
Revegetation																		\$224,901	
T.001	Topsoil placement	52,500	m3	R.014	0.008	432.1	\$ 0.72	\$ 37,937	\$ -	\$ -	\$ 1.39	\$ 72,957	\$ 0.75	7,385	\$ 39,512	\$ 2.86	\$ 150,406		Placement of minimum 0.3 m topsoil cover and needed fill to reach grading plan elevations
	Revegetation-Seeding and Fertilizing	16	ha	C4.01	1.250	20.1	\$ 86.54	\$ 1,393	\$ 2,899.29	\$ 46,679	\$ 76.07	\$ 1,225	\$ 6.56	20	\$ 106	\$ 3,068.46	\$ 49,402		
Dust Control	Material and Application	161,000	m2	C3.01	0.001	161.0	\$ 0.07	\$ 11,038	\$ 0.03	\$ 4,838	\$ 0.03	\$ 4,782	\$ 0.03	829	\$ 4,435	\$ 0.16	\$ 25,093		
Subtotal: Area 1						2320		\$ 129,641		\$ 51,517		\$ 315,082			\$ 109,623			\$725,883	

Rock Creek Closure Bond Estimate

Area 2 Direct Costs: Main & Walsk Pit Areas

Code	Activity	Quantity	Unit	Cost Code	Unit Mhrs	Total Mhrs	Labor Rate (\$/unit)	Total Labor Cost (\$)	Unit Matl (\$/unit)	Total Material Cost (\$)	Unit Equip. (\$/unit)	Total Equip. Cost (\$)	Unit Fuel (\$/unit)	Fuel Consumed (gal)	Fuel Cost (\$)	Total Unit Cost (\$/unit)	Total Activity Cost (\$)	Subtotal (\$)	Source / Comments	
Material Hauling & Placement																			\$2,047,328	
	Tailings: excavate, load, haul, place	85100	m3	R.001	0.025	2127.5	\$ 1.79	\$ 152,317	\$ -	\$ -	\$ 5.21	\$ 443,052	\$ 2.79	44,381	\$ 237,439	\$ 9.79	\$ 832,808			
	Waste rock: load, haul, and place	230600	m3	R.002	0.011	2530.6	\$ 0.87	\$ 201,164	\$ -	\$ -	\$ 2.62	\$ 604,727	\$ 1.39	59,961	\$ 320,790	\$ 4.89	\$ 1,126,681			
	TSF excess fill: load, haul, place	25200	m3	R.005	0.008	207.4	\$ 0.75	\$ 18,871	\$ -	\$ -	\$ 1.56	\$ 39,413	\$ 0.84	3,969	\$ 21,233	\$ 3.16	\$ 79,518			
	Grading: push, place	8316	m3	R.029	0.003	27.7	\$ 0.31	\$ 2,574	\$ -	\$ -	\$ 0.44	\$ 3,699	\$ 0.25	383	\$ 2,048	\$ 1.00	\$ 8,321			
Riprap quarrying																				
		10000	m3	Estimated												\$ 38.00	\$ 380,000	\$380,000		
Revegetation of Pit Area																			\$399,708	
	Topsoil placement	51300	m3	R.004	0.025	1271.9	\$ 1.80	\$ 92,202	\$ -	\$ -	\$ 3.27	\$ 167,522	\$ 1.80	17,252	\$ 92,297	\$ 6.86	\$ 352,021			
	Revegetation-Seeding and Fertilizing	10	ha	C4.01	1.250	12.1	\$ 86.54	\$ 839	\$ 2,899.29	\$ 28,123	\$ 76.07	\$ 738	\$ 6.56	12	\$ 64	\$ 3,068.46	\$ 29,764			
	Material and Application	115000	m2	C3.01	0.001	115.0	\$ 0.07	\$ 7,884	\$ 0.03	\$ 3,456	\$ 0.03	\$ 3,416	\$ 0.03	592	\$ 3,168	\$ 0.16	\$ 17,924			
Subtotal: Area 2						6292		\$ 475,852		\$ 31,579		\$ 1,262,566			\$ 677,039			\$2,827,036		

Rock Creek Closure Bond Estimate

Area 3 Direct Costs: Tailings Storage Facility

Code	Activity	Quantity	Unit	Cost Code	Unit Mhrs	Total Mhrs	Labor Rate (\$/unit)	Total Labor Cost (\$)	Unit Matl (\$/unit)	Total Material Cost (\$)	Unit Equip. (\$/unit)	Total Equip. Cost (\$)	Unit Fuel (\$/unit)	Fuel Consumed (gal)	Fuel Cost (\$)	Total Unit Cost (\$/unit)	Total Activity Cost (\$)	Subtotal (\$)	Source / Comments
Phase I																		\$407,520	
	Temporary cover installation	13,400	m2						\$ 12.00	\$ 160,800	\$ 7.50	\$ 100,500				\$ 19.50	\$ 261,300		
	TSF Breach	31,700	m3	R.011	0.008	252.1	\$ 0.57	\$ 18,182	\$ -	\$ -	\$ 1.49	\$ 47,376	\$ 0.80	18,075	\$ 25,485	\$ 2.87	\$ 91,043		
	Breach channel riprap	3,600	m3	C2.25	0.040	144.0	\$ 3.03	\$ 10,891	\$ 5.00	\$ 18,000	\$ 4.65	\$ 16,739	\$ 2.65	6,771	\$ 9,547	\$ 15.33	\$ 55,177		
Phase II																		\$ 1,152,380	
	TSF grading	292,500	m3	R.016	0.008	2407.4	\$ 0.72	\$ 210,280	\$ -	\$ -	\$ 1.50	\$ 439,179	\$ 0.81	167,800	\$ 236,598	\$ 3.03	\$ 886,056		Excludes Phase I volume
A3Q.018	DC #3 backfill and grading	189,700	m3	R.022	0.003	504.0	\$ 0.20	\$ 37,439	\$ -	\$ -	\$ 0.26	\$ 49,522	\$ 0.16	21,098	\$ 29,748	\$ 0.62	\$ 116,708		
	Tailings distribution pipe removal	8,569	m			40.0	\$ 9.68	\$ 82,917.71								\$ 14.92	\$ 127,890		
	Pump Removal	2	pumps			10.0										\$ 172.51	\$ 1,725		
	Tailings Thickener Tank Removal	1															\$ 20,000		
Revegetation																		\$1,400,337	
	Topsoil placement	291,700	m3	R.013	0.009	2488.9	\$ 0.74	\$ 217,043	\$ -	\$ -	\$ 2.00	\$ 582,829	\$ 1.06	220,326	\$ 310,660	\$ 3.81	\$ 1,110,532		
	Revegetation-Seeding and Fertilizing	94	ha	C4.01	1.250	118.1	\$ 86.54	\$ 8,173	\$ 2,899.29	\$ 273,828	\$ 76.07	\$ 7,184	\$ 6.56	439	\$ 619	\$ 3,068.46	\$ 289,805		
	Material and Application	1,583,000	m2	C3.01	0.001	1583.0	\$ 0.07	\$ 108,530	\$ 0.03	\$ 47,571	\$ 0.03	\$ 47,015	\$ 0.03	8,151	\$ 43,607	\$ 0.16	\$ 246,722		
Subtotal: Area 3						4190		\$ 333,746		\$ 321,399		\$ 637,028			\$ 354,886			\$2,960,237	

Rock Creek Closure Bond Estimate

Area 5 Direct Costs: Explosive Magazing Pads

Code	Activity	Quantity	Unit	Cost Code	Unit Mhrs	Total Mhrs	Labor Rate (\$/unit)	Total Labor Cost (\$)	Unit Matl (\$/unit)	Total Material Cost (\$)	Unit Equip. (\$/unit)	Total Equip. Cost (\$)	Unit Fuel (\$/unit)	Fuel Consumed (gal)	Fuel Cost (\$)	Total Unit Cost (\$/unit)	Total Activity Cost (\$)	Subtotal (\$)	Source / Comments	
Explosive Magazine Pads																			\$503,310	
	Container Removal	18	days			216.0	\$ 1,310.10	\$ 23,582			\$ 901.20	\$ 16,222				\$ 901.20	\$ 16,221.60		90 containers transported for 20 km rounq trip to Nome.	
	Top Soil Placement	103,400	m3	R.017	0.011	1134.7	\$ 0.96	\$ 99,623	\$ -	\$ -	\$ 1.85	\$ 191,587	\$ 1.00	73,589	\$ 103,760	\$ 3.82	\$ 394,970		Based on total area, currently revegetated windrows will not be	
	Revegetation-Seeding and Fertilizing	22	ha	C4.01	1.250	27.9	\$ 86.54	\$ 1,930	\$ 2,899.29	\$ 64,654	\$ 76.07	\$ 1,696	\$ 6.56	104	\$ 146	\$ 3,068.46	\$ 68,427			
	Grading	48,300	m3	C2.19	0.003	120.8	\$ 0.19	\$ 8,970	\$ -	\$ -	\$ 0.20	\$ 9,469	\$ 0.11	3,726	\$ 5,253	\$ 0.49	\$ 23,692			
Subtotal: Area 5						1499		\$ 134,104		\$ 64,654		\$ 218,974			\$ 109,160			\$ 503,310		

Rock Creek Closure Bond Estimate

Area 6 Direct Costs: Diversion Channel #1

Code	Activity	Quantity	Unit	Cost Code	Unit Mhrs	Total Mhrs	Labor Rate (\$/unit)	Total Labor Cost (\$)	Unit Matl (\$/unit)	Total Material Cost (\$)	Unit Equip. (\$/unit)	Total Equip. Cost (\$)	Unit Fuel (\$/unit)	Fuel Consumed (gal)	Fuel Cost (\$)	Total Unit Cost (\$/unit)	Total Activity Cost (\$)	Subtotal (\$)	Source / Comments	
Diversion Channel #1 - North Section																			\$207,536	
A6Q.001	Channel Backfill Grading	62,200	m3	R.018	0.003	194.4	\$ 0.23	\$ 14,439	\$ -	\$ -	\$ 0.33	\$ 20,748	\$ 0.18	8,149	\$ 11,490	\$ 0.75	\$ 46,677			
T.006	Top Soil Placement	25,300	m3	R.028	0.015	390.4	\$ 1.33	\$ 33,683	\$ -	\$ -	\$ 2.59	\$ 65,608	\$ 1.43	25,603	\$ 36,100	\$ 5.35	\$ 135,391			
	Revegetation-Seeding and Fertilizing	8	ha	C4.01	1.250	10.4	\$ 86.54	\$ 718	\$ 2,899.29	\$ 24,064	\$ 76.07	\$ 631	\$ 6.56	39	\$ 54	\$ 3,068.46	\$ 25,468			
Diversion Channel #1 - South Section																			\$155,223	
A6Q.002	Channel Backfill Grading	30,000		R.018	0.003	93.8	\$ 0.23	\$ 6,964	\$ -	\$ -	\$ 0.33	\$ 10,007	\$ 0.18	3,930	\$ 5,542	\$ 0.75	\$ 22,513			
T.007	Top Soil Placement	20,900		R.028	0.015	322.5	\$ 1.33	\$ 27,825	\$ -	\$ -	\$ 2.59	\$ 54,198	\$ 1.43	21,150	\$ 29,822	\$ 5.35	\$ 111,845			
	Revegetation-Seeding and Fertilizing	7	ha	C4.01	1.250	8.5	\$ 86.54	\$ 588	\$ 2,899.29	\$ 19,715	\$ 76.07	\$ 517	\$ 6.56	32	\$ 45	\$ 3,068.46	\$ 20,865			
Subtotal: Area 6						1020		\$ 84,219		\$ 43,779		\$ 151,709			\$ 83,052			\$362,760		

Rock Creek Closure Bond Estimate

Area 7 Direct Costs: Roads & Causeway

Code	Activity	Quantity	Unit	Cost Code	Unit Mhrs	Total Mhrs	Labor Rate (\$/unit)	Total Labor Cost (\$)	Unit Matl (\$/unit)	Total Material Cost (\$)	Unit Equip. (\$/unit)	Total Equip. Cost (\$)	Unit Fuel (\$/unit)	Fuel Consumed (gal)	Fuel Cost (\$)	Total Unit Cost (\$/unit)	Total Activity Cost (\$)	Subtotal (\$)	Source / Comments	
Roads																			\$17,465	All roads revegetation is included in all other areas.
	Main Mine Road	5266	m3	C2.19	0.003	13.2	\$ 0.19	\$ 978	\$ -	\$ -	\$ 0.20	\$ 1,032	\$ 0.11	406	\$ 573	\$ 0.49	\$ 2,583		See Figure 1-Disturbed Areas Boundaries	
	Injection Field Road #1	2248	m3	C2.19	0.003	5.6	\$ 0.19	\$ 418	\$ -	\$ -	\$ 0.20	\$ 441	\$ 0.11	173	\$ 245	\$ 0.49	\$ 1,103			
	Injection Field Road #2	2359	m3	C2.19	0.003	5.9	\$ 0.19	\$ 438	\$ -	\$ -	\$ 0.20	\$ 462	\$ 0.11	182	\$ 257	\$ 0.49	\$ 1,157			
	Pit Road #1	459	m3	C2.19	0.003	1.1	\$ 0.19	\$ 85	\$ -	\$ -	\$ 0.20	\$ 90	\$ 0.11	35	\$ 50	\$ 0.49	\$ 225			
	Pit Road #3	1187	m3	C2.19	0.003	3.0	\$ 0.19	\$ 220	\$ -	\$ -	\$ 0.20	\$ 233	\$ 0.11	92	\$ 129	\$ 0.49	\$ 582			
	Pit Road #4	2280	m3	C2.19	0.003	5.7	\$ 0.19	\$ 423	\$ -	\$ -	\$ 0.20	\$ 447	\$ 0.11	176	\$ 248	\$ 0.49	\$ 1,118			
	Pit Road #5	2350	m3	C2.19	0.003	5.9	\$ 0.19	\$ 436	\$ -	\$ -	\$ 0.20	\$ 461	\$ 0.11	181	\$ 256	\$ 0.49	\$ 1,153			
	TSF Road #2	6732	m3	C2.19	0.003	16.8	\$ 0.19	\$ 1,250	\$ -	\$ -	\$ 0.20	\$ 1,320	\$ 0.11	519	\$ 732	\$ 0.49	\$ 3,302			
	TSF Road #3	1801	m3	C2.19	0.003	4.5	\$ 0.19	\$ 334	\$ -	\$ -	\$ 0.20	\$ 353	\$ 0.11	139	\$ 196	\$ 0.49	\$ 883			
	Rip-Rap Bottom of Channel	100	m3	C2.25	0.040	4.0	\$ 3.03	\$ 303	\$ 5.00	\$ 500	\$ 4.65	\$ 465	\$ 2.65	188	\$ 265	\$ 15.33	\$ 1,533			
	Topsoil Placement	7800	m3	C2.19	0.003	19.5	\$ 0.19	\$ 1,449	\$ -	\$ -	\$ 0.20	\$ 1,529	\$ 0.11	602	\$ 848	\$ 0.49	\$ 3,826			
Power Line Removal																			\$15,040	
	Power Line	47	poles			24.0	\$ 193.00	\$ 9,071.00			\$ 27.50	\$ 1,293				\$ 320.00	\$ 15,040			
Causeway Culvert Removal																			\$552,027	
	Excavation	79,600	m3	R.026	0.014	1091.9	\$ 1.23	\$ 97,718	\$ -	\$ -	\$ 3.57	\$ 284,237	\$ 1.91	108,034	\$ 152,327	\$ 6.71	\$ 534,282			
	Culvert Removal	15,707	kg			36.0	\$ 23.00	\$ 6,582.65			\$ 21.50	\$ 6,153				\$ 62.00	\$ 17,745			
Dust Control																			\$36,627	
	Material and Application	235000		C3.01	0.001	235.0	\$ 0.07	\$ 16,112	\$ 0.03	\$ 7,062	\$ 0.03	\$ 6,980	\$ 0.03	1,210	\$ 6,474	\$ 0.16	\$ 36,627			
Subtotal: Area 7						1472		\$ 135,818		\$ 7,562		\$ 305,495			\$ 162,599			\$ 621,159		

Rock Creek Closure Bond Estimate

Water Treatment Plant Direct Costs

Item	Quantity	Unit	Unit Cost	Total Item Cost	Subtotal
LABOR					
Water Treatment Technician	6,480	HR	\$87.02	\$563,916	
Subtotal					\$563,916
CHEMICALS⁽¹⁾					
Calcium Hypochlorite	23,153	Gal	\$2.25	\$52,051	
Ferric Chloride (39% Liquid)	22,500	Gal	\$2.90	\$65,268	
Sodium Hydroxide	82,500	Lbs	\$0.52	\$42,735	
Citric Acid	1,350	Lbs	\$1.14	\$1,538	
Polymer	1,650	Lbs	\$5.70	\$9,402	
Subtotal					\$170,994
ANNUAL PUMPING COST / POWER CONSUMPTION					
TSF Pump	2	EA	\$146,236.72	\$292,473	
Raw Water Feed Pump	2	EA	\$30,465.98	\$60,932	
MF Feed Pump	1	EA	\$22,849.49	\$22,849	
PALL Feed Pump	2	EA	\$60,931.97	\$121,864	
Finished Water Pump	3	EA	\$76,164.96	\$228,495	
Injection Booster Pump	1	EA	\$76,164.96	\$76,165	
House Water Pump	1	EA	\$9,139.59	\$9,140	
Subtotal					\$811,918
SUMMARY					
Total					\$1,546,828

OPERATING PARAMETERS

Plant operates 12 months per year at 450 gpm

Calcium Hypochlorite injection

Ferric Chloride 65 mg/l

Polymer (1 mg/l)

Citric Acid (EFM Daily 50 lbs)

Notes:

1) Cost of chemicals based on Tetra Tech's experience with NovaGold Procurement.

Rock Creek Closure Bond Estimate

Area 1 Quantities: Main Plant & RWP

Code	Area	Option	Item	Task	Qty	Measurement	Length (m)	Width (m)	Height (m)	Side Slope	Area (m2)	Bulk (m3)	Volume (m3)	Source / Comments
A1Q.001	Main Plant		Mill building	Debris haul, placement		m3	39.6	21.3	22.9		843	340	19,656	Estimate based on approximate building dimensions
A1Q.002	Main Plant		Electrical building	Debris haul, placement		m3	10.4	21.3	6.1		222	85	1,436	Estimate based on approximate building dimensions
A1Q.003	Main Plant		Refinery	Debris haul, placement		m3	30.5	12.2	10.7		372	142	4,123	Estimate based on approximate building dimensions
A1Q.004	Main Plant		Reagent building	Debris haul, placement		m3	18.3	33.5	10.7		613	204	6,764	Estimate based on approximate building dimensions
A1Q.005	Main Plant		Truck shop	Debris haul, placement		m3	6.1	3	3		18	28	83	Estimate based on approximate building dimensions
A1Q.006	Main Plant		Pumphouse	Debris haul, placement		m3	19.8	39.6	15.2		784	297	12,215	Estimate based on approximate building dimensions
A1Q.007	Main Plant		Water treatment plant	Debris haul, placement		m3	30.5	15.2	10.7		464	170	5,131	Estimate based on approximate building dimensions
A1Q.008	Main Plant		Administration building	Debris haul, placement		m3	21.3	13.7	3		292	99	974	Estimate based on approximate building dimensions
A1Q.009	Main Plant		Electrical substation	Debris haul, placement		m3	12.2	13.7	1		167	45	212	Estimate based on approximate building dimensions
A1Q.010	Main Plant		Assay lab	Debris haul, placement		m3	21.3	15.2	3		324	96	1,067	Estimate based on approximate building dimensions
A1Q.011	Main Plant		Recycle Water Pond	Fill, cover		m3					-	12,625	12,625	Value from Figure 5
A1Q.012	Main Plant		Grading	Move, place		m3					-	23,000	23,000	
A1Q.014	Main Plant		Monofill pad & road	Haul, place		m3					-	10,200	10,200	6,400 m3 for monofill pad; 3,800 for temporary road
A1Q.015	Main Plant		Debris Haul City Monofill	Haul, dump		m3					-	20,664	20,664	

Rock Creek Closure Bond Estimate

Area 1 Quantities: Main & Walsh Pits

Item	Option	Area	Task	Qty	unit	Length (m)	Width (m)	Height (m)	Side Slope	Area (m2)	Volume (m3)	Source / Comments
Tailings Placement	Pit Area	TSF	Haul and place Tailings								85,100	
Fill	Pit Area	Development Rock-from ore stockpile	Haul Development Rock								230,600	
		Causeway	Placement								79,600	
		Dam Grading Excess Fill	Placement								25,200	
		Top Soil	Top Soil Placement								48,778	
Walsh Pit	Pit Area	Walsh Pit	Top Soil Placement							12,406	3,722	
Riprap Quarring											10,000	
Total Fill in Main and Walsh Pits											473,000	

Rock Creek Closure Bond Estimate

Area 3 Quantities: Tailings Storage Facility

Code	Area	Option	Item	Task	Qty	unit	Length (m)	Width (m)	Height (m)	Side Slope	Area (m2)	Volume (m3)	Source / Comments
A3Q.001	Main Dam		Breach excavation	Excavate & haul								31,700	
A3Q.003			Sumps	Backfill, compaction and grading								41,998	Figure 4-Surfaces-2
A3Q.004	Tailings	Tailings Area	Cut Removal	Excavation, Haul								25,200	TSF grading plan
A3Q.005			Grading	Final Grade							944,465	324,200	TSF grading plan
			DC3 Grading									189,700	TSF grading plan
A3Q.006			Temporary Diversion Channel	Backfill, compaction			954						Figure 5-Facilities
A3Q.007			Pipe 1				1,633						Figure 5-Facilities
A3Q.008			Pipe 2				1,583						Figure 5-Facilities
A3Q.009			Pipe 3				1,556						Figure 5-Facilities
A3Q.010			Pipe 4				1,058						Figure 5-Facilities
A3Q.011			Pipe 5				285						Figure 5-Facilities
A3Q.012			Pipe 6				54						Figure 5-Facilities
A3Q.013			Pipe 7				299						Figure 5-Facilities
A3Q.014			Pipe 8				298						Figure 5-Facilities
A3Q.015			Tailings Pipe				1,383						Figure 5-Facilities
A3Q.016			NTSF-ELine				420						Figure 5-Facilities
A3Q.017			Total Pipe Length				8569						

Rock Creek Closure Bond Estimate

Area 4 Quantities: Injection Wellfield

Code	Area	Option	Item	Task	Qty	Units	Length (m)	Width (m)	Height (m)	Side Slope	Area (m2)	Bulk (m3)	Volume (m3)	Source / Comments
A4Q.001	IWF		Pipes	Pipe removal		lm	3600				-		-	
A4Q.002	IWF		Fill	Grading		m3					-	30,900	30,900	
A4Q.003	DC2		Fill	Grading		m3					-	20,000	20,000	Estimate; Data unavailable
A4Q.004	Area 4 Total		Cover	Placement		m3					-		117,000	

Rock Creek Closure Bond Estimate

Area 5 Quantities: Diversion Channel #1

Code	Area	Option	Item	Task	Qty	Measurement	Length (m)	Width (m)	Height (m)	Side Slope	Area (m2)	Bulk (m3)	Volume (m3)	Source / Comments
A6Q.001	DC1		DC1 North	Channel backfill		m3					-	62,200	62,200	Figure 13
A6Q.002	DC1		DC1 South	Channel backfill		m3					-	30,000	30,000	Figure 14

Rock Creek Closure Bond Estimate

Area 7 Quantities: Roads & Causeway

Task	Measurement	Quantity	Units	Cut/Fill (m3)	Source
Main Mine Road	Length	1,317	lm	5,266	Volume based on a general area of 4m2 time the road length.
Injection Field Road #1	Length	562	lm	2,248	Volume based on a general area of 4m2 time the road length.
Injection Field Road #2	Length	590	lm	2,359	Volume based on a general area of 4m2 time the road length.
Pit Road #1	Length	115	lm	459	Volume based on a general area of 4m2 time the road length.
Pit Road #3	Length	297	lm	1,187	Volume based on a general area of 4m2 time the road length.
Pit Road #4	Length	570	lm	2,280	Volume based on a general area of 4m2 time the road length.
Pit Road #5	Length	588	lm	2,350	Volume based on a general area of 4m2 time the road length.
TSF Road #2	Length	1,683	lm	6,732	Volume based on a general area of 4m2 time the road length.
TSF Road #3	Length	450	lm	1,801	Volume based on a general area of 4m2 time the road length.
Causeway	Volume		m3	79,600	Figure 17 Surfaces

Rock Creek Closure Bond Estimate

Rock Creek Building Demo Estimate

Structure	Activity	Rate (\$/unit)	Unit	# Units	Totals
Mill Building					
<i>Building size: 39.6m x 21.3m (130 ft x 70 ft). Pre-engineered,</i>					
	PRE-Engineered building demolition	1.90	sf	9,100	\$17,290.00
	Building Stem Walls rubblized	14.14	lf	400	\$5,656.00
	Building Floor perforation every 5 ft	0.38	sf	9,100	\$3,458.00
					\$26,404.00
Electrical Building					
<i>Building size: 10.4m x 21.3m (34 ft x 70 ft). Unknown building</i>					
	PRE-Engineered building demolition	1.90	sf	9,100	\$17,290.00
	Building Stem Walls rubblized	14.14	lf	208	\$2,941.12
	Building Floor perforation every 5 ft	0.38	sf	2,380	\$904.40
					\$21,135.52
Refinery					
<i>Building size: 30.5m x 12.2m (100 ft x 40 ft). Pre-engineered,</i>					
	PRE-Engineered building demolition	1.90	sf	4,000	\$7,600.00
	Building Stem Walls rubblized	14.14	cy	74	\$1,046.36
	Building Floor perforation every 5 ft	0.38	lf	4,000	\$1,520.00
					\$10,166.36
Reagent Building					
<i>Building size: 18.3m x 33.5m (60 ft x 110 ft). Pre-engineered,</i>					
	PRE-Engineered building demolition	1.90	sf	6,600	\$12,540.00
	Building Stem Walls rubblized	14.14	lf	340	\$4,807.60
	Building Floor perforation every 5 ft	0.38	sf	6,600	\$2,508.00
					\$19,855.60
Truck Shop					
<i>Building size: 19.8m x 39.6m (65 ft x 130 ft)</i>					
	Wood Structure Demo	0.32	sf	8,450	\$2,704.00
	Building Stem Walls rubblized	14.14	lf	390	\$5,514.60
	Building Floor perforation every 5 ft	0.38	sf	8,450	\$3,211.00
					\$11,429.60
Pumphouse					
<i>Building size: 6.1m x 3m (20 ft x 10 ft)</i>					
	Wood Structure Demo	0.32	sf	200.00	\$64.00
	Rubblize concrete for haul to Main Pit	137.50	sf	3.70	\$508.75
					\$572.75
WTP					
<i>Building size: 30.5m x 15.2m (100 ft x 50 ft) Pre-engineered,</i>					
	PRE-Engineered building demolition	1.90	sf	5,000	\$9,500.00
	Building Stem Walls rubblized	14.14	lf	300	\$4,242.00
	Building Floor perforation every 5 ft	0.38	sf	5,000	\$1,900.00
					\$15,642.00
Administration Building					
<i>Building size: 21.3m x 13.7m (70 ft x 45 ft) Wood Structure.</i>					
	Knock down building	0.32	sf	3,150	\$1,008.00
	Building Stem Walls rubblized	137.50	cy	12	\$1,650.00
	Building Floor perforation every 5 ft	0.38	sf	3,150	\$1,197.00
					\$3,855.00
Assay Lab					
<i>Building size: 30.5m x 15.2m (70 ft x 50 ft) Pre-engineered,</i>					
	PRE-Engineered building demolition	1.90	sf	3,500	\$6,650.00
	Building Stem Walls rubblized	137.50	cy	12	\$1,650.00
	Building Floor perforation every 5 ft	0.38	sf	3,500	\$1,330.00
					\$9,630.00
Electrical Substation					
<i>Pad: 12.2m x 13.7m (40 ft x 45 ft). Perforate concrete</i>					
	Building Floor perforation every 5 ft	0.38	sf	3,500	\$1,330.00
					\$1,330.00
Building Demolition Total					\$120,020.83

Rock Creek Closure Bond Estimate

CUT/FILL BALANCE

Area	Area m2	Activity	Cut	Fill	Net	Cut/Fill
Area 1		Grading (Main Plant)	7,500	15,500	8,000	Fill
Area 1		RWP	0	12,600	12,600	Fill
Area 1		Development Rock	237,000	6,400	230,600	Cut
Area 1		Demolition Debris	20,000	20,000	0	Cut
Area 1		Topsoil Handling	358,400	52,500	305,900	Cut
Area 2		Rip Rap Quarrying	10,000	0	10,000	Cut
Area 2		Tailings Placement	0	85,100	85,100	Fill
Area 2		Topsoil Placement	0	51,300	51,300	Fill
Area 2		Dam Grading Fill	0	25,200	25,200	Fill
Area 2		Causeway Fill	0	79,600	79,600	Fill
Area 2		Development Rock	0	230,600	230,600	Fill
Area 3		Tailings Removal	85,100	0	85,100	Cut
Area 3		Topsoil Handling	363,900	291,700	72,200	Cut
Area 3		TSF Grading	349,400	324,200	25,200	Cut
Area 3		DC3 Grading	189,700	189,700	0	Cut
Area 3		Channel Riprap		3,600	3,600	Fill
Area 4		GRADING	50,900	50,900	0	Cut
Area 4		Topsoil Placement	0	117,000	117,000	Fill
Area 5		GRADING	16,500	48,300	31,800	Fill
Area 5		Topsoil Placement	0	103,400	103,400	Fill
Area 6		DC1 North Backfill	62,200	62,200	0	Cut
Area 6		Topsoil Placement	0	25,300	25,300	Fill
Area 6		DC1 South Backfill	30,000	30,000	0	Cut
Area 6		Topsoil Placement	0	20,900	20,900	Fill
Area 7		RC Causeway Exc.	79,600	0	79,600	Cut
Area 7		Topsoil/ Rip Rap	0	7,900	7,900	Fill
			1,860,200	1,853,900	6,300	Cut

TOPSOIL

Code	Area	Area m2	Required topsoil m3	CUT	FILL	NET
T.001	Area 1	141,830	52,500	0	52,500	52,500
T.002	Area 2	85,482	51,289	0	51,300	51,300
T.003	Area 3	968,702	291,700	0	291,700	291,700
T.004	Area 4	452,173	117,000	0	117,000	117,000
T.005	Area 5	221,096	103,400	0	103,400	103,400
T.006	Area 6N	82,892	25,300	0	25,300	25,300
T.007	Area 6S	68,436	20,900	0	20,900	20,900
T.008	Area 7	26,717	7,800	0	7,800	7,800
Total						669,900

Rock Creek Closure Bond Estimate

Unit Cost Inputs

Model	HP	Operator Details			Rates Used in Estimate		
		# of Operators	Operator Type	Operator Rate (US \$/hr)	Equipment Rate (US \$/hr)	Fuel Rate (US \$/hr)	Equipment Rate Source
Dozer							
CAT D6 XL	200	1	Power Equipment Operator - Group 1	\$74.29	\$90.17	\$38.13	ADNR: Red Dog and Pogo average
CAT D8 T	310	1	Power Equipment Operator - Group 1	\$74.29	\$106.74	\$59.11	ADNR: Red Dog and Pogo average
Excavator							
CAT 345 CL	321	1	Power Equipment Operator - Group 1	\$74.29	\$89.78	\$58.94	ADNR: Red Dog and Pogo average
Grader							
CAT 14H	220	1	Power Equipment Operator - Group 1	\$74.29	\$78.42	\$43.50	ADNR: Red Dog and Pogo average
Loader							
CAT 966H	235	1	Power Equipment Operator - Group 1	\$74.29	\$68.45	\$40.16	ADNR: Red Dog and Pogo average
CAT 988H	430	1	Power Equipment Operator - Group 1A	\$76.97	\$125.75	\$73.48	ADNR: Red Dog and Pogo average
Truck							
Light Truck (3/4T) 4x2	200	0	Truck Drivers - Group 5		\$12.65	\$18.36	Alaska Pacific Leasing verbal quote to Tim Havey 12/12/2011
Articulated Truck (32-cy)	469	1	Truck Drivers - Group 2	\$70.70	\$82.58	\$43.05	ADNR: Red Dog and Pogo average
Water Truck	300	1	Truck Drivers - Group 4	\$68.56	\$29.70	\$27.55	ADNR: Red Dog and Pogo average
Side Dump					\$175.00		Vendor Quote inclusive of labor, fuel, maintenance

Fuel Consumption Factors

Equipment	\$/hr/hp	Source
Backhoe	0.11	CAT Handbook
Excavator	0.130	CAT Handbook
Lifting	0.100	Estimated
Loader	0.121	CAT Handbook
Dozer	0.135	CAT Handbook
Grader	0.14	CAT Handbook
Truck	0.065	CAT Handbook
Compactor	0.13	CAT Handbook
Drill	0.13	Estimated

Fuel (USD/g)	
\$	5.35

Rock Creek Closure Bond Estimate

Task Unit Costs				Rates							Manhour Details				Equipment Details					Material Details					Task						
Cost Code	Item	Unit	Productivity (unit/hr)	Total Unit Cost	Manhours per Unit (hrs/Unit)	Labor Cost Per Unit (\$/Unit)	Material Cost Per Unit (\$/Unit)	Equipment Cost Per Unit (\$/Unit)	Fuel Cost Per Unit (\$/Unit)	Power Cost Per Unit	Qty	Description	Rate (USD/hr)	Qty	Description	Rate (USD/hr)	Equipment Type	Equipment Model	# of Equipment	Equipment Rate (\$/hr)	Fuel Cost (\$/hr)	Cost Code	Item	Unit Rate	Unit	Multiplier	Multiplier Comments	Comments/Productivity Sources			
Earthworks																															
C2.19	Grading: roads, ramps, etc.	m2	400	\$ 0.49	0.003	\$ 0.19	\$ -	\$ 0.20	\$ 0.11					1.0	Power Equipment Operator - Group 1	\$74.29	Grader	CAT 14H	1	\$78.42	\$43.50										
C2.25	Rip-Rap (rounded, low quality): Screen and Stockpile	m3	50	\$ 15.33	0.040	\$ 3.03	\$ 5.00	\$ 4.65	\$ 2.65					1.0	Power Equipment Operator - Group 1A	\$76.97	Loader	CAT 988H	1	\$125.75	\$73.48										
														1.0	Power Equipment Operator - Group 1	\$74.29	Dozer	CAT D8 T	1	\$106.74	\$59.11										
Materials																															
C3.01	Dust Suppressant - Supply and Apply	m2	1000	\$ 0.16	0.001	\$ 0.07	\$ 0.03	\$ 0.03	\$ 0.03					1.0	Truck Drivers - Group 4	\$68.56	Truck	Water Truck	1	\$29.70	\$27.55	M.02	Dust Suppressant	\$0.03	\$0.03	1		estimated			
Revegetation																															
C4.01	Seeding/Fertilizing	ha	2.8	\$ 3,068.46	1.250	\$ 86.54	\$ 2,899.29	\$ 76.07	\$ 6.56		1.5	Labourers - Group 1	\$62.49	2.0	Power Equipment Operator - Group 1	\$74.29	Other	Hydro Seeding	1.0	\$200.34	\$0.00	M.28	Native seed	\$18.17	\$18.17	132	132 lbm per hectare	Estimated			
																	Truck	Light Truck (3/4T) 4x2	1.0	\$12.65	\$18.36	M.08	Fertilizer	\$1.00	\$1.00	500	500kg per hectare				
Relocations																															
C5.01	See Unit Cost Relocations Worksheet																														

Rock Creek Closure Bond Estimate

Labor Rates

Cost Code	Category	Rate Used in Estimate	Unit	Base Hourly Rate	OT Factor	Burdened Rate	H&W	PEN	TRN	L&M	LEG	SAF	Benefits (DOL)	Benefits%	DOL Full Rate	Fully Loaded Rate	Source
P.01	Asbestos Workers (Laborer Group 1)	\$62.49	USD/hr	\$29.00	0.261904762	\$44.28	\$5.41	\$11.25	\$1.20	\$0.20	\$0.15		\$18.21	\$11.60	\$62.49	\$55.88	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.02	Carpenter	\$73.17	USD/hr	\$35.49	0.261904762	\$54.19	\$7.15	\$10.78	\$0.80	\$0.10		\$0.15	\$18.98	\$14.20	\$73.17	\$68.39	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.03	Electrician (Journeyman Lineman)	\$96.70	USD/hr	\$47.15	0.261904762	\$71.99	\$9.15	\$14.56	\$0.65	\$0.20	\$0.15		\$24.71	\$18.86	\$96.70	\$90.85	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.04	Engineer	\$129.76	USD/hr	\$67.34	0.261904762	\$102.82							\$0.00	\$26.94	\$102.82	\$129.76	Estimated based on Tetra Tech Experience
P.05	Engineering Technician	\$89.83	USD/hr	\$46.62	0.261904762	\$71.18							\$0.00	\$18.65	\$71.18	\$89.83	Estimated based on Tetra Tech Experience
P.06	Foreman	\$85.84	USD/hr	\$44.55	0.261904762	\$68.02							\$0.00	\$17.82	\$68.02	\$85.84	Estimated based on Tetra Tech Experience
P.07	Hazardous Material Handler (Painter Group 2)	\$62.49	USD/hr	\$29.00	0.261904762	\$44.28	\$5.41	\$11.25	\$1.20	\$0.20	\$0.15		\$18.21	\$11.60	\$62.49	\$55.88	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.08	Health and Safety	\$89.83	USD/hr	\$46.62	0.261904762	\$71.18							\$0.00	\$18.65	\$71.18	\$89.83	Estimated based on Tetra Tech Experience
P.09	Labourers - Group 1	\$62.49	USD/hr	\$29.00	0.261904762	\$44.28	\$5.41	\$11.25	\$1.20	\$0.20	\$0.15		\$18.21	\$11.60	\$62.49	\$55.88	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.10	Labourers - Group 2	\$63.96	USD/hr	\$29.96	0.261904762	\$45.75	\$5.41	\$11.25	\$1.20	\$0.20	\$0.15		\$18.21	\$11.98	\$63.96	\$57.73	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.11	Labourers - Group 3	\$65.28	USD/hr	\$30.83	0.261904762	\$47.07	\$5.41	\$11.25	\$1.20	\$0.20	\$0.15		\$18.21	\$12.33	\$65.28	\$59.41	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.12	Labourers - Group 3A	\$70.08	USD/hr	\$33.97	0.261904762	\$51.87	\$5.41	\$11.25	\$1.20	\$0.20	\$0.15		\$18.21	\$13.59	\$70.08	\$65.46	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.13	Labourers - Group 4	\$47.22	USD/hr	\$19.00	0.261904762	\$29.01	\$5.41	\$11.25	\$1.20	\$0.20	\$0.15		\$18.21	\$7.60	\$47.22	\$36.61	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.14	Mechanic (Truck Drivers/Surveyors Group 2)	\$70.70	USD/hr	\$36.51	0.261904762	\$55.75	\$6.75	\$7.00	\$1.10	\$0.10			\$14.95	\$14.60	\$70.70	\$70.35	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.15	Millwright	\$68.73	USD/hr	\$33.89	0.261904762	\$51.75	\$7.15	\$8.43	\$1.00	\$0.25	\$0.15		\$16.98	\$13.56	\$68.73	\$65.30	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.16	Power Equipment Operator - Group 1	\$74.29	USD/hr	\$36.83	0.261904762	\$56.24	\$8.70	\$8.25	\$1.00	\$0.10			\$18.05	\$14.73	\$74.29	\$70.97	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.17	Power Equipment Operator - Group 1A	\$76.97	USD/hr	\$38.59	0.261904762	\$58.92	\$8.70	\$8.25	\$1.00	\$0.10			\$18.05	\$15.44	\$76.97	\$74.36	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.18	Power Equipment Operator - Group 2	\$73.11	USD/hr	\$36.06	0.261904762	\$55.06	\$8.70	\$8.25	\$1.00	\$0.10			\$18.05	\$14.42	\$73.11	\$69.48	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.19	Power Equipment Operator - Group 3	\$72.01	USD/hr	\$35.34	0.261904762	\$53.96	\$8.70	\$8.25	\$1.00	\$0.10			\$18.05	\$14.14	\$72.01	\$68.10	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.20	Power Equipment Operator - Group 4	\$62.53	USD/hr	\$29.13	0.261904762	\$44.48	\$8.70	\$8.25	\$1.00	\$0.10			\$18.05	\$11.65	\$62.53	\$56.13	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.21	Site Clerk / Medic	\$115.78	USD/hr	\$60.09	0.261904762	\$91.75							\$0.00	\$24.04	\$91.75	\$115.78	Estimated based on Tetra Tech Experience
P.22	Superintendent	\$153.71	USD/hr	\$79.77	0.261904762	\$121.80							\$0.00	\$31.91	\$121.80	\$153.71	Estimated based on Tetra Tech Experience
P.23	Survey Field Manager	\$79.67	USD/hr	\$41.35	0.261904762	\$63.13							\$0.00	\$16.54	\$63.13	\$79.67	Estimated based on Tetra Tech Experience
P.24	Survey Crew (Surveyor and Helper)	\$141.91	USD/hr	\$73.36	0.261904762	\$112.01	\$13.50	\$14.00	\$2.20	\$0.20			\$29.90	\$29.34	\$141.91	\$141.36	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.25	Truck Drivers - Group 1A	\$74.56	USD/hr	\$39.04	0.261904762	\$59.61	\$6.75	\$7.00	\$1.10	\$0.10			\$14.95	\$15.62	\$74.56	\$75.23	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.26	Truck Drivers - Group 1	\$72.62	USD/hr	\$37.77	0.261904762	\$57.67	\$6.75	\$7.00	\$1.10	\$0.10			\$14.95	\$15.11	\$72.62	\$72.78	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.27	Truck Drivers - Group 2	\$70.70	USD/hr	\$36.51	0.261904762	\$55.75	\$6.75	\$7.00	\$1.10	\$0.10			\$14.95	\$14.60	\$70.70	\$70.35	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.28	Truck Drivers - Group 3	\$69.45	USD/hr	\$35.69	0.261904762	\$54.50	\$6.75	\$7.00	\$1.10	\$0.10			\$14.95	\$14.28	\$69.45	\$68.77	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.29	Truck Drivers - Group 4	\$68.56	USD/hr	\$35.11	0.261904762	\$53.61	\$6.75	\$7.00	\$1.10	\$0.10			\$14.95	\$14.04	\$68.56	\$67.65	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.30	Truck Drivers - Group 5	\$67.40	USD/hr	\$34.35	0.261904762	\$52.45	\$6.75	\$7.00	\$1.10	\$0.10			\$14.95	\$13.74	\$67.40	\$66.19	Alaska Dep. Of Labor - Laborers' & Mechanics Min. Rate of Pay (April 1, 2011)
P.31	Water Treatment Technician	\$83.84	USD/hr	\$43.51	0.261904762	\$66.44							\$0.00	\$17.40	\$66.44	\$83.84	Estimated based on Tetra Tech Experience

Hrs/Shift	OT Factor	Benefits %
12	0.2619048	40%

Rock Creek Closure Bond Estimate

Mobilization/Demobilization Cost Estimate

Model	Notes	\$/Ft^2	length	width	ft^2	Cube Rate	Fuel Surchage	Barge to Nome	Barge to Seattle	WA Trucking (roundtrip)	Total Roundtrip	Extended Cost
D6T XL	6 way blade, ripper	\$ 73	22.25	12.75	284	\$ 20,573.02	\$ 4,114.60	\$ 24,687.62	\$ 19,750.10	\$ 1,036.00	\$ 45,473.72	\$ -
D8T	u blade, ripper	\$ 73	26.8	14	375	\$ 27,209.50	\$ 5,441.90	\$ 32,651.40	\$ 26,121.12	\$ 1,657.60	\$ 60,430.13	\$ 60,430.13
D9T	u blade, ripper	\$ 73	28	14.25	399	\$ 28,935.48	\$ 5,787.10	\$ 34,722.58	\$ 27,778.06	\$ 3,729.60	\$ 66,230.24	\$ -
345CL	no extra bucket	\$ 73	39.25	12	471	\$ 34,156.92	\$ 6,831.38	\$ 40,988.30	\$ 32,790.64	\$ 2,279.20	\$ 76,058.15	\$ 76,058.15
966H	bucket forks	\$ 73	30	10.5	315	\$ 22,843.80	\$ 4,568.76	\$ 27,412.56	\$ 21,930.05	\$ 1,036.00	\$ 50,378.61	\$ 50,378.61
988H	4.88M boom, rock bkt	\$ 73	41.5	12.5	519	\$ 37,619.75	\$ 7,523.95	\$ 45,143.70	\$ 36,114.96	\$ 2,279.20	\$ 83,537.86	\$ 83,537.86
740 dump	non-ejector	\$ 73	35.6	11.2	399	\$ 28,915.17	\$ 5,783.03	\$ 34,698.21	\$ 27,758.57	\$ 1,450.40	\$ 63,907.18	\$ 383,443.06
14M	ripper	\$ 73	35.75	9.2	329	\$ 23,851.83	\$ 4,770.37	\$ 28,622.19	\$ 22,897.75	\$ 1,243.20	\$ 52,763.15	\$ 52,763.15
4000 gallon water truck		\$ 52	29	8.5	247	\$ 12,768.70	\$ 2,553.74	\$ 15,322.44	\$ 12,257.95	\$ 828.80	\$ 28,409.19	\$ 28,409.19
345 shear/h	Hydraulic hamper/shears	\$ 52	21	6	126	\$ 6,526.80	\$ 1,305.36	\$ 7,832.16	\$ 6,265.73	\$ 828.80	\$ 14,926.69	\$ 14,926.69
Total											\$ 542,114.90	\$ 749,946.83

Fuel Markup	20%
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Rock Creek Closure Bond Estimate

Material Costs

Cost Code	Item	Unit Cost (\$)	Unit	Source
M.02	Dust Suppressant	\$0.03	m2	Red Dog financial assurance estimate adjusted to \$2011
M.08	Fertilizer	\$1.00	lbm	Red Dog financial assurance estimate adjusted to \$2012
M.28	Native seed	\$18.17	lbm	Alaska Native Plant Center (Dec. 2011)

Price increase of 12.1% based on inflation from 2006 to 2011.

Material Properties

Assumed Material Properties	Bulk density Mg/m3	Bulking Factor	Excavated Density Mg/m3	Shrinkage Factor	Compacted Density Mg/m3
Clay - Natural	2.02	1.20	1.68	0.90	2.24
Earth	1.90	1.25	1.52	0.95	2.00
Gravels	2.17	1.10	1.97	0.97	2.24
Misc.	2.00	1.00	2.00	1.00	2.00
Rip-Rap	3.00	1.20	2.50	1.00	3.00
Rock	1.76	1.10	1.60	1.00	1.76
Sands	1.90	1.10	1.73	0.90	2.11
Sand & Gravel	2.23	1.10	2.02	1.00	2.23
Shale	2.00	1.20	1.67	0.90	2.22
Top Soil	1.37	1.40	0.98	1.10	1.25
Tailings	1.36	1.20	1.13	0.90	1.51
Waste Rock (Development Rock)	1.76	1.10	1.60	1.00	1.76

Rock Creek Closure Bond Estimate

Standby Equipment Cost

Equipment	# in Fleet	Hourly/Unit	Monthly/Unit	Minimum Hours	Total Hours	Hours Adjustment	Cost Adjustment
CAT 988H	1	\$ 105.00	\$ 21,000	2,400	3,825	0.0	\$ -
CAT 345 CL	1	\$ 62.50	\$ 12,500	2,400	1,554	846.1	\$ 52,879
Articulated Truck (32-cy)	6	\$ 72.50	\$ 14,500	14,400	11,031	3369.2	\$ 244,265
CAT D8 T	1	\$ 93.24	\$ 18,648	2,400	2,523	0.0	\$ -
Water Truck	1	\$ 27.00	\$ 5,400	2,400	235	2165.0	\$ 58,455
CAT 14H	1	\$ 66.48	\$ 13,296	2,400	1,482	917.9	\$ 61,025
CAT 966H	1	\$ 52.50	\$ 10,500	2,400	0	2400.0	\$ 126,000
						Standby Estimate	\$ 542,625

Rental Month Basis (hours) 200

Rock Creek Closure Bond Estimate

Road Maintenance

Haul Truck Hours	1838
Adjustment (%)	65%
Maintenance Hours	1195.0
Operator Rate (\$/hour)	\$ 74.29
Equip Rate (\$/hour)	\$ 78.42
Fuel Rate (\$/hour)	\$ 43.50
Total Hourly Rate	\$ 196.21
Road Maintenance Cost	\$ 234,471.92

Indirect Cost Inputs

Project Start	11/1/2011
Project End	11/1/2012
# days	366
# workdays	254
# months	12
hrs/shift	12
Shifts/day	2

Rock Creek Closure Bond Estimate

Direct Cost Summary

	Project Total	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Standby Adjustment	Water Treatment	Long Term Monitoring
Direct Cost	\$ 10,637,111	\$ 725,883	\$ 2,827,036	\$ 2,960,237	\$ 455,273	\$ 503,310	\$ 362,760	\$ 621,159	\$ 542,625	\$ 1,546,828	\$ 92,000
Mhours	24,189	2320	6292	4190	915	1499	1020	1472		6,480	
Crew Size		10	10	10	10	10	10	10			
Material	\$ 1,284,262	\$51,517	\$31,579	\$321,399	\$92,777	\$64,654	\$43,779	\$7,562		\$ 670,994	
Equipment	\$ 4,363,540	\$315,082	\$1,262,566	\$637,028	\$118,143	\$218,974	\$151,709	\$305,495	\$ 542,625	\$ 811,918	
Duration (days)		9.7	26.2	17.5	3.8	6.2	4.2	6.1			
Camp Man-Days	4431.0	581.0	1574.0	1048.0	229.0	375.0	255.0	369.0			

Rock Creek Closure Bond Estimate

Demolition Cost Codes

Code	Name	Unit	Cost
D.001	Mill Building	bulk	\$ 26,404
D.002	Electrical Building	bulk	\$ 21,136
D.003	Refinery	bulk	\$ 10,166
D.004	Reagent Building	bulk	\$ 19,856
D.005	Truck Shop	bulk	\$ 11,430
D.006	Pumphouse	bulk	\$ 573
D.007	WTP	bulk	\$ 15,642
D.008	Administration Building	bulk	\$ 3,855
D.009	Assay Lab	bulk	\$ 9,630
D.010	Electrical Substation	bulk	\$ 1,330
Total			\$ 120,021