

Appendix B  
Reclamation Plans and Cost Estimates

Palmer Advanced Exploration Project  
Haines, Alaska

Underground Exploration Upland Mining  
Lease No. 9100759



Prepared for:  
Alaska Mental Health Trust Land Office  
Alaska Department of Natural Resources  
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## 1.0 INTRODUCTION

This document describes plans for both Temporary Closure and Permanent Closure of the Palmer Exploration Project. The Palmer Exploration Project is being executed to evaluate the technical and economic merits of developing a mine to exploit mineral deposits on the Palmer Property.

The Alaska Department of Natural Resources (ADNR) has requirements for an approved Reclamation Plan prior to initiating exploration project like the Palmer Project.

A significant ADNR requirement of regulation 11 AAC 86.800 is for “statements, maps and drawings setting out the reclamation that will be carried out, including a timetable for each step in the reclamation, an estimate of the cost and a description of the measures to ensure that the debris is disposed of in a sound manner.” Additionally, ADNR also regulates project reclamation and closure planning and the requirement for financial assurances (reclamation bonding) under statute AS 27.19 and regulation 11 AAC 97. Specifically, 11AAC 97.200 sets certain performance standards for reclamation that require a site to be reclaimed to a stable condition relative to erosion (after one year) and to naturally revegetate after 5 years, requires segregation of native topsoils for reclamation and other requirements. Regulation 11AAC 97.210 addresses the removal of buildings, debris and structures on state land, including the option of leaving buildings and structures if the surface owner or land manager approves it. 11 AAC 97.220 requires that openings of all shafts, adits, tunnels and air vents to underground mine workings shall be stabilized and properly sealed to protect the public, wildlife, and the environment. 11AAC 97.240 requires that a miner shall reclaim a mined area that has potential to generate acid rock drainage (acid mine drainage) in a manner that prevents the generation of acid rock drainage or prevents the offsite discharge of acid rock drainage. Additional requirements for the Reclamation Plan are prescribed in regulation 11 AAC 97.300. Reclamation bonding is regulated under 11 AAC 97.400 and requires posting a personal bond accompanied by a letter of credit, deposit of gold or cash under 11 AAC 97.410.

The following Reclamation Plan meets the State of Alaska regulatory requirements for a reclamation plan. Constantine has prepared reclamation plans for both temporary closure and permanent closure scenarios which are described below. This reclamation plan and reclamation cost estimate supersede the plan and cost estimate included in Constantine’s Phase II Plan of Operations and approved under by ADNR Reclamation Plan Approval #J20185690RPA. This updated reclamation plan and cost estimate has been updated to reflect inflationary increases to costs since the 2019 cost estimate was generated and some design changes in the project including a slightly longer access road. The updated cost estimate is also supported by new independent confirmation about the assumptions for the portal plug design and the amount of funding included in the cost estimate to develop the final design of the portal plug (Langston & Associates, 2022).

Constantine has calculated estimated costs for both the care and maintenance under the temporary closure scenario and reclamation for permanent closure. Constantine intends to post a financial assurance in a form acceptable to the State regulatory agencies prior to initiating any work under this Plan of Operations once the Plan of Operations is approved by the MHT and the reclamation plan is approved by ADNR.

Constantine's estimated cost for the temporary closure scenario is: 1) \$34,974 to stabilize the site and make it ready for Care and Maintenance and install an access road gate, plus 2) \$15,969/year for twice-monthly inspections and monthly reporting for each year that it remains in Care and Maintenance status. Assuming a 3-year duration on Care and Maintenance status, the total cost is estimated to be \$110,937 including indirect costs per ADNR guidance. At the end of 3 years Constantine must either request an extension of the Care and Maintenance status from ADNR or permanently close the site in accordance with the reclamation plan for permanent closure.

Constantine's estimated reclamation cost for the permanent closure of the site is \$1,073,970. This includes \$549,334 to design and construct a hydraulic portal plug in the development ramp to reduce flows from the portal to de minimis levels. The cost estimate includes indirect costs in accordance with ADNR guidance.

The closure cost estimates include indirect costs in accordance with ADNR guidance. In determining the Indirect rate for each of the 7 categories of Indirect Costs, we referred to the DOWL (2015) report for the discussion of factors affecting the range of indirect costs in each category. In general owing to the low risk (no PAG, predicted good water quality, low project uncertainty, good access, the lack of project complexity, fact that equipment rates already include contractor profit, history of civil contractor experience on site, and the low overall direct cost of the reclamation), and manageable climate the guidance suggests using the lower range of indirect costs, with some exceptions. The following is a discussion of the factors Constantine considered in selecting the indirect costs.

Contractor Profit – ADNR guidelines (DOWL, 2015) recommend a range of 6-10% of direct costs. Most of the reclamation costs for the project are civil works costs and the cost estimate is based on quotes from a local contractor who has performed years of civil work on the project. Contractor profit is already included in the contractor's hourly equipment rates used for the cost estimate. As a result, Constantine feels that the low end (6%) of the indirect range is appropriate for contractor profit.

Contractor Overhead – ADNR guidelines (DOWL, 2015) recommend a range of 4-8% of direct costs. As with contractor profit, contractor overhead is already built into the contractor's hourly rates for equipment, including the equipment operator, fuel, and repairs. While the guidelines point out that there are often higher overhead costs for smaller projects, our use of local contractor rates negates this idea for the Palmer project. Therefore, Constantine did not choose the lowest value but used 5% for contractor overhead in the cost estimate.

Performance and Payment Bonds - ADNR guidelines (DOWL, 2015) recommend a range of 2.5-3.5% of direct costs. Constantine concluded that the low end of the range was appropriate for the Palmer project owing to the low overall cost of reclamation, the simplicity of the project, past performance of local contractors and the relatively few contractors/subcontractors required to perform the reclamation.

Liability Insurance - ADNR guidelines (DOWL, 2015) recommend 1.5% of labor costs. This is a fixed percentage according to the guidelines.

Contract Administration - ADNR guidelines (DOWL, 2015) recommend a range of 5-9% of direct costs. According to the guidelines this category of indirect costs is to cover the cost of hiring a project management firm to inspect and supervise the reclamation work. The guidelines go on to state that the contract administration amount accepted by the state will be based on size of the bond, project closure complexity and duration of the active reclamation phase. The guidelines also describe factors like access, climate, and mine maturity. On one hand the guidelines say that in general larger projects may require a lower percentage of contract administration costs compared to small or mid-size projects. But on the other hand, the guidelines offer that while scale may warrant lower contract administration costs, project complexity may push these costs to the top of the range. In addition, Constantine already has a project lead (supervisor) built into each of the tasks that comprise the entire reclamation project, including meals and accommodations for the lead. Constantine also included engineering supervision costs in the direct costs for the portal plug. Arguably this is the single component of the reclamation activities that requires engineering support and inspecting. Constantine considered all these factors and concluded that the inclusion of supervision (including support costs) in the cost estimate, lack of project complexity, ease of access, moderate weather, and the general lack of the requirement for inspections of engineered facilities (lack of engineered covers, engineered water management components) all justify using a contract administration value in the lower half of the range (5-9%). Constantine used 6% in the cost estimate.

Engineering Redesign - ADNR guidelines (DOWL, 2015) recommend a range of 3-7% of direct costs. Engineering redesign costs are meant to bring conceptual closure plan designs to ready-for construction designs. The guidelines use scale to mean that bigger mines often have performed more closure design work by the time closure occurs. This is true for more mature mines but not necessarily for immature, complex mines. Reclamation at Palmer is mostly simplistic recontouring operations and removal of pipe. The only required complicated engineering design is for the portal plug and the direct cost estimate includes \$113,000 specifically for geotechnical studies, engineering design (conceptual to final) and professional engineering management/oversight during entire construction of the portal plug. Owing to the inclusion of geotechnical work, engineering design and professional engineering supervision costs in the direct cost for the portal plug and the otherwise simplistic nature of the reclamation itself, Constantine concluded that 3% is sufficient for engineering redesign component of indirect costs.

Scope Contingency - ADNR guidelines (DOWL, 2015) recommend a range of 6-11% of direct costs. Owing to the narrow scope and simplicity of the reclamation work, and familiarity that local contractors have with the site, Constantine chose 6% for scope contingency.

Bid Contingency - ADNR guidelines (DOWL, 2015) recommend a range of 4-9% of direct costs. The guidelines offer that this contingency might be lower for larger projects where there would be project efficiencies realized over the life of the reclamation project. Constantine believes that the years of experience gained at the site by the few civil contractors in Haines essentially has the same effect. Namely that any of those contractors know how to bid any work at Palmer and make it cost effective for them. Constantine chose 4% for bid contingency.

## **2.0 CARE AND MAINTENANCE FOR TEMPORARY CLOSURE**

There are some situations where Constantine may elect to suspend its activities proposed under this Plan of Operations for periods longer than the seasonal interruptions that are common to mineral exploration. Under any situation where activities at the site will cease for more than 1 year and for up to 3 years Constantine would take the steps necessary to put the site on a Care and Maintenance status and continue to perform all maintenance, monitoring and reporting tasks that are necessary to protect public health and the environment during the temporary closure. Should Constantine decide to suspend activities for more than 1 year it will notify ADNR with 45 days of making that decision. The Care and Maintenance Plan for the temporary closure scenario includes the following key components:

- Continuation of baseline water quality monitoring at select sites,
- Continuation of seasonal underground seepage water quality monitoring at the monitoring point down-gradient of the LAD diffuser as long as water is being discharged through the LAD diffuser,
- Continuation of discharge of underground seepage water through the LAD disposal system,
- Compliance with the SWPPP, including visual inspections and maintenance of storm water BMP's during the ice-free months,
- Installing a barrier at the portal to restrict public access to the underground development ramp,
- Compliance with the SPCC Plan including visual monitoring and management of fuel storage facilities including maintenance of secondary containment vessels when fuel is being stored in site,

- Monthly visual monitoring of site roads, laydown areas and portal pad area during ice- free months for any conditions that warrant repair or other response.

Estimated Temporary Closure costs are described below.

**Table 1. Temporary Closure - Cost Summary**

2022 Temporary Closure - Cost Estimate Summary						
Direct Costs						
One Time Activities	Recurring Activities	Unit Costs	Year 1 Cost	Year 2 Cost	Year 3 Cost	Cumulative 3-Yr. Cost
Direct Costs						
Site Clean-up, Preparation			\$19,909			\$19,909
Construct Access Road Barrier			\$15,065			\$15,065
	Biweekly Site Inspection	\$1,094	\$13,129	\$13,129	\$13,129	\$39,387
	Monthly Reporting	\$237	\$2,840	\$2,840	\$2,840	\$8,521
Direct Cost Subtotal (3-Years)			\$50,943	\$15,969	\$15,969	\$82,882
Indirect Costs						
	Contractor Profit (6% of Direct Costs)					\$4,973
	Contractor Overhead (5% of Direct Costs)					\$4,144
	Performance and Payment Bonds (2.5% of Direct Costs)					\$2,072
	Liability Insurance (1.5% of Labor Costs)					\$290
	Contract Administration (6% of Direct Costs)					\$4,973
	Engineering Redesign (3% of Direct Costs)					\$2,486
	Scope Contingency (6% of Direct Costs)					\$4,973
	Bid Contingency (5% of Direct Costs)					\$4,144
Indirect Costs Subtotal (3-Years)						\$28,055
Total Temporary Closure Costs	Duration 3 Years					\$110,937

**Table 2. Site Cleanup Costs**

Site Cleanup and Preparation Costs							
Item	# people	\$/day	# days	\$/unit	#units	2019 total	2022 total
Field Lead	1	\$ 450.00	5			\$2,250	\$2,367
local labor	1	\$ 375.00	3			\$1,125	\$1,184
Incidentals		\$ 50.00	5			\$250	\$263
Equipment Rental (loaders) to stabilize area			3	\$ 1,925.00	1	\$5,775	\$6,075
Mobilization				\$ 3,080.00	1	\$3,080	\$3,240
Pickup Rental + fuel			5	\$ 165.00	1	\$825	\$868
Contingency Road BMP maintenance						\$5,620	\$5,912
		TOTAL				\$18,925	\$19,909

**Table 3. Biweekly Inspection Costs**

Biweekly Site Inspection Costs						
	\$/day	# days	\$/unit	#units	2019 total	2022 total
rental truck +fuel	\$ 165.00	1			\$ 165.00	\$ 173.58
per diem	\$ 100.00	1			\$ 100.00	\$ 105.20
misc. (radio - light batteries, gloves, etc.)			\$ 25.00	1	\$ 25.00	\$ 26.30
Labor costs	\$ 375.00	2			\$ 750.00	\$ 789.00
	TOTAL PER TRIP				\$ 1,040.00	\$ 1,094.08
	TOTAL FOR TWELVE TRIPS (1-Yr.)				\$ 12,480.00	\$ 13,128.96

**Table 4. Road Barrier Construction Costs**

Road Barrier Construction Costs							
Item	# people	\$/day	# days	\$/unit	#units	2019 total	2022 total
Operators	1	\$ 340.00	2			\$680	\$715
local assistant (assume 0.5 day for safety & prep)	1	\$ 375.00	2			\$750	\$789
Equipment Rental (Cat, loaders, welder, etc.)			2	\$ 1,200.00	1	\$2,400	\$2,525
Pickup Rental + fuel			2	\$ 165.00	1	\$330	\$347
Miscellaneous material, rebar, cement, plate steel						\$3,000	\$3,156
Same costs for constructing Portal Barrier						\$7,160	\$7,532
		TOTAL				\$14,320	\$15,065

Main activity is fabricating and installing a gate at the BLM/MHT boundary to keep vehicles out of the MHT lands. There is an option of trenching the road instead but Constantine has successfully installed a gate at the State/BLM boundary and a gate allows MHT to continue to have access to the land while discouraging others to enter.



**Table 5. Monthly Reporting Costs**

Monthly Reporting Costs						
	\$/day	# days	/unit	#units	2019 total	2022 total
professional fees(consultant)						
lead	\$ 375.00	0.5			\$ 187.50	\$ 197.25
assistant	\$ 375.00	0.1			\$ 37.50	\$ 39.45
	TOTAL PER REPORT				\$ 225.00	\$ 236.70
	TOTAL FOR TWELVE REPORTS (1 yr)				\$ 2,700.00	\$ 2,840.40

### 3.0 RECLAMATION PLAN FOR PERMANENT CLOSURE

If Constantine ceases activities at the site permanently, it will perform the following:

- Update its Water Management Plan incorporating underground seepage water quality and quantity data and confirm the need for installation of a hydraulic portal plug in the development ramp to stem the flow of underground seepage water to the surface at the portal. Constantine's base assumption is that it will install a hydraulic portal plug in the development ramp at closure. Constantine has included the estimated costs for the portal plug design and installation in the reclamation cost estimate. In the absence of a need to install a hydraulic plug, Constantine will install a barricade on the portal that will provide a barrier to public and large mammal access.
- Consult with the Mental Health Trust to identify any surface infrastructure that the Trust wants left in place at final closure. Presently Constantine understands the Trust prefers that the access road up to the portal pad remain in place for the long-term. Accordingly, costs for reclaiming the access road on MHT lands are not included in the reclamation cost estimate.
- Remove all surface facilities and appurtenances (buildings, exposed piping, fuel storage facilities, etc.) and materials (supplies, fuel, tanks, debris, explosives, chemicals, etc.), except those that the landowner requests to be left in-place or that are required for long-term monitoring and maintenance.
- Reclaim the disturbed areas (roads, ponds) by recontouring, placing any salvaged soil and reseeded, to provide short-term stability from erosion and encourage long-term re-establishment of native plant species. Constantine will consult with the Alaska Plant Materials Research Center to develop a strategy for revegetation including identifying the appropriate seed mix to use for revegetation disturbed areas. There will not be an effort to reseed the waste rock storage areas owing to the coarse nature of the material. As a practical matter, the glaciofluvial material that overlies bedrock in most of upper Glacier Creek is too immature to have developed an organic topsoil horizon. As a result, little topsoil has been salvaged and Constantine anticipates that it will be reseeding directly onto this glaciofluvial material during reclamation. Undisturbed glaciofluvial material currently supports alder- and devils club -dominated plant communities.
- Leave any facilities that are required for long-term water management in-place, and the ongoing operation and maintenance costs associated with them will be included in an updated financial assurance for the site. Presently Constantine anticipates installing the portal plug to stem the flow of underground seepage water onto the surface and that there will not be any facilities required for long-term water

management. Therefore, we have not included any costs associated with operating or maintaining any water management facilities following reclamation and closure.

- Haul any PAG development rock (none is anticipated) back underground prior to installing the hydraulic portal plug.
- Perform monthly site inspections and reporting during the snow-free months for a two-year period following final closure. The principal purpose of the monitoring is to inspect the portal area and monitor seepage from the portal as a measure of the efficacy of the portal plug in eliminating seepage to de-minimis levels.

Permanent closure costs are described in the following tables:

**Table 6. Permanent Closure - Schedule**

Activity	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13
Equipment Mobe and Demobe	X											X	
PAG Haulage to U/G		X											
Portal Closure			X	X	X								
Site Clean-up, Preparation, Reseed						X					X		
Portal Facility Removal						X							
Reclaim Ponds									X				
Fuel Facility Deconstruct					X								
Construct Road Barrier											X		
Surface Pipe Removal									X				
Final Closure Report													X
Post Closure Monitoring*													X
* Ongoing for next two snow free seasons													

**Table 7. Permanent Closure - Cost Summary**

<b>Permanent Closure - 2022 Reclamation Cost Estimate Summary</b>		
<b>Activity</b>		<b>Cost</b>
<b>Direct costs</b>		
	Fuel Facility Deconstruct	\$21,755
	PAG Haulage to U/G	\$44,689
	Portal Closure	\$549,334
	Site Clean-up, Preparation, Reseed	\$31,870
	Portal Pad Facility Removal	\$20,935
	Surface Pipe Removal	\$42,054
	Reclaim Ponds	\$46,356
	Construct Road Barrier	\$7,532
	Equipment Move and Demobe	\$13,066
	Final Closure Report	\$10,441
	Post Closure Monitoring	\$14,739
<b>Direct Costs Subtotal</b>		<b>\$802,772</b>
<b>Indirect Costs</b>		
	Contractor Profit (6%)	\$48,166
	Contractor Overhead (5%)	\$40,139
	Performance and Payment Bonds (2.5%)	\$20,069
	Liability Insurance (1.5% labor)	\$2,270
	Contract Administration (6%)	\$48,166
	Engineering Redesign (3%)	\$24,083
	Scope Contingency (6%)	\$48,166
	Bid Contingency (5%)	\$40,139
<b>Indirect Costs Subtotal</b>		<b>\$271,198</b>
<b>Total Permanent Closure Reclamation Costs</b>		<b>\$1,073,970</b>

**Table 8. Cost to Deconstruct Fuel Facilities**

Fuel Facility Deconstruct							
Item	# people	\$/day	# days	\$/unit	#units	2019 total	2022 total
lead (assume 1 day for prep / mobe)	1	\$1,100	3			\$3,300	\$3,472
local labor	2	\$375	4			\$3,000	\$3,156
meals and accomodations for Lead	1	\$300	3			\$900	\$947
meals	2	\$20	4			\$160	\$168
Low boy truck to haul empty tanks/liner to town			1	\$1,650	1	\$1,650	\$1,736
Fuel Transfer Truck - charge for defueling tanks			2	\$500	1	\$1,000	\$1,052
Equipment Rental (CAT 312 excavator)			2	\$1,925	1	\$3,850	\$4,050
Pickup Rental + fuel			4	\$165	2	\$1,320	\$1,389
landfill fees for liner disposal				\$500	1	\$500	\$526
Contingency for contaminated soil mitigation				\$5,000	1	\$5,000	\$5,260
<b>TOTAL</b>						<b>\$20,680</b>	<b>\$21,755</b>

Main activity is pumping tanks dry, removing bulk tanks, removing containment liner and demolishing the containment. Excavator to lift tanks onto low boy and remove berms, smooth ground

**Table 9. Cost to Haul PAG Underground**

PAG Haulage to U/G								
Item	# people	\$/day	# days	\$/unit	#units	2019 total	2022 total	comments
Meals and Accommodations - Proj. Mgr	2	\$300	7			\$4,200	\$4,418	
Equipment Rental (CAT 312 excavator)			7	\$1,925	1	\$13,475	\$14,176	load haul truck
Truck - articulated			7	\$1,450	1	\$10,150	\$10,678	haul to portal
Contract Miner Equipment						\$10,000	\$10,520	contract miner
Contract Miner Labor			7	\$500	1	\$3,500	\$3,682	
Pickup Rental + fuel			7	\$165	1	\$1,155	\$1,215	
<b>TOTAL</b>						<b>\$42,480</b>	<b>\$44,689</b>	

General Plan here is to use Southeast road builders equipment to haul material to portal and contract miners LHD (3 cy) to haul material underground. Assume 4 rounds or 1,000 tons of material or 400 cubic yards (15x15x10=2,250 cubic feet, x 4 rounds=10,000 cubic feet, converts to 400 cubic yards). Assumes contract miner moes to site one week early (for portal plug construction) to make LHD available. Assumes Haul truck can haul 8 yards for 50 loads to portal.

**Table 10. Cost to Construct Portal Plug**

Portal Closure									
Item	# people	\$/day	# days	\$/unit	#units	2019 total	2022 total	comments	
Project Manager, engineering and construction	1	\$1,600	30	\$ -		\$48,000	\$50,496		
Local labor	2	\$375	21			\$15,750	\$16,569		
Plug Design Criteria Studies (hydrology, geochem, geotech, rock mechanics)						\$25,000	\$26,300		
Conceptual Plug Design						\$20,000	\$21,040		
Final Plug Design						\$20,000	\$21,040		
Meals and Accommodations - contract mine crew	4	\$200	21			\$16,800	\$17,674		
Meals and Accommodations - Project Manager	1	\$300	21			\$6,300	\$6,628		
Contract Miner Portal Plug Construction (prep, steel, grouting, shotcrete, bulkheads)						\$172,300	\$181,260	contract miner	
Concrete (yd <sup>3</sup> ) - delivered to portal and pumped				\$493	315	\$155,358	\$163,437	10 yd <sup>3</sup> trucks	
Plug Construction consumable materials (bulkhead lumber, rebar, piping, valves)						\$39,208	\$41,247		
Pickup Rental + fuel			21	\$165	1	\$3,465	\$3,645		
<b>TOTAL</b>						<b>\$522,181</b>	<b>\$549,334</b>		

Assumption is that contract miner would mobilize to site and provide all U/G equipment and miners to prepare and install the hydraulic portal plug. Based on best engineering practices we estimate head pressures of ~232 psi at the portal requiring a portal plug approximately 30 feet long. Concrete volumes are thus calculated. Concrete costs were provided by Southeast Road Builders (non-bid) and assume 5% product loss and truck transportation from batch plant in Haines. All consumable materials to construct the bulkheads etc are included in line 13. Assumes the power generator at the portal pad is available.

**Table 11. Cost Site Cleanup and Seeding**

Site Prep, Cleanup and Reseed Costs							
Item	# people	\$/day	# days	\$/unit	#units	2019 total	2022 total
lead (assume 1 day for prep / demob / la	1	\$1,100	3			\$3,300	\$3,472
local labor	2	\$375	14			\$10,500	\$11,046
Lead meals and accomodations	1	\$300	3			\$900	
meals	2	\$20	14			\$560	\$589
seed mix (hand cast)				\$10	200	\$2,000	\$2,104
Fuel Transfer Truck			3	\$165	1	\$495	\$521
Equipment Rental (CAT 312 excavator)			6	\$1,925	1	\$11,550	\$12,151
Pickup Rental + fuel			3	\$165	2	\$990	\$1,041
<b>TOTAL</b>						<b>\$30,295</b>	<b>\$31,870</b>

Main activity is excavator for 3 days to dress road, stabilize ditches prior to leaving the site. Two local laborers are available for 13 days to pickup trash and reseed the pond and LAD areas after they are reclaimed.

**Table 12. Cost for Facility Removal at Portal**

Portal Pad Facility Removal								
Item	# people	\$/day	# days 2019	# days 2022	\$/unit	#units	2019 total	2022 total
lead (assume 1 day for prep / mobe)	1	\$1,100	3	4			\$3,300	4,629
local labor	2	\$375	3	4			\$2,250	3,156
Labor - Demolition snow sheds, steel sets	2	\$375	2	3			\$1,500	2,367
Meals and accomodations for Lead	1	\$300	3	4			\$900	1,262
meals	3	\$20	5	6			\$300	379
Fuel Transfer Truck			3	4	\$165	1	\$495	694
Equipment Rental (CAT 312 excavator) - load truck			1	2	\$1,925	1	\$1,925	4,050
Articulated truck haul demolition debris to staging			1	2	\$1,595	1	\$1,595	3,356
Pickup Rental + fuel			2	3	\$165	2	\$660	1,041
<b>TOTAL</b>							<b>\$12,925</b>	<b>20,935</b>

Main activity is removal of all improvements from the Portal Pad - including generators, connexes, fuel tanks, air compressors and buildings - snow sheds, steel sets, etc. leaving a "naked" portal pad. Stabilization and reseed covered under Site Cleanup tab. Assumes mine contractor removes all of their equipment at their expense - connex, equipment, parts

**Table 13. Cost for Removal of Surface Pipe**

Surface Pipe Removal							
Item	# people	\$/day	# days	\$/unit	#units	2019 total	2022 total
lead (assume 1 day for prep / mobe)	1	\$1,100	6			\$6,600	\$6,943
local labor	4	\$375	7			\$10,500	\$11,046
Meals and accomodations for Lead	1	\$300	6			\$1,800	\$1,894
Meals (lunch daily for crew of 4)	4	\$20	7			\$560	\$589
Low Boy haul pipe to town				\$1,540	1	\$1,540	\$1,620
Articulated truck haul pipe sections to staging			2	\$1,595	1	\$3,190	\$3,356
Equipment Rental (CAT 312 excavator)			7	\$1,925	1	\$13,475	\$14,176
Pickup Rental + fuel			7	\$165	2	\$2,310	\$2,430
<b>TOTAL</b>						<b>\$39,975</b>	<b>\$42,054</b>

Main activity is dismantling and removing approx 700 meters of pipe from portal to settling ponds, and from settling ponds to LAD diffuser, plus 300 meters of pipe from portal to percolation trench. Activities include small excavator for 7 days to pull, stack pipe, 4 laborers and 2 pickup trucks, plus haulage to town on a low boy for the pipe. Assumes pipe broken into 10 meter pieces comprising 100 pieces.

**Table 14. Cost for Removing Settling Ponds**

Pond Reclamation Costs							
Item	# people	\$/day	# days	\$/unit	#units	2019 total	2021 total
Team Lead	1	\$1,100	7			\$7,700	\$8,100
meals and accomodation	1	\$300	7			\$2,100	\$2,209
CAT D6			7	\$1,980	1	\$13,860	\$14,581
Excavator CAT 312			3	\$1,925	1	\$5,775	\$6,075
Fuel Transfer Truck			7	\$165	1	\$1,155	\$1,215
Truck - articulated			7	\$1,595	1	\$11,165	\$11,746
Pickup Rental			7	\$165	2	\$2,310	\$2,430
		TOTAL				\$44,065	\$46,356

Main activity is pushing liners into center of ponds, then burying them with clean fill and recontouring the surface to discourage ponding. Truck to haul fill to pond sites included, plus then spreading with the cat. Excavator in estimate primarily to pull liner away from margins into the center of the pond. Final reseed is included on the Site prep, cleanup and reseed sheet. Two pickups are rented for 13-day duration for laborers and lead to use as needed.

**Table 15. Cost for Constructing Road Barrier**

Road Barrier Construction Costs							
Item	# people	\$/day	# days	\$/unit	#units	2019 total	2022 total
Operators	1	\$340	2			\$680	\$715
local assistant (assume 0.5 day for safety & prep)	1	\$375	2			\$750	\$789
Equipment Rental (Cat, loaders, welder, etc.)			2	\$1,200	1	\$2,400	\$2,525
Pickup Rental + fuel			2	\$165	1	\$330	\$347
Miscellaneous material, rebar, cement, plate steel						\$3,000	\$3,156
		TOTAL				\$7,160	\$7,532

Main activity is fabricating and installing a gate at the BLM/MHT boundary to keep vehicles out of the MHT lands. There is an option of trenching the road instead but Constantine has successfully installed a gate at the State/BLM boundary and a gate allows MHT to continue to have access to the land while discouraging others to enter.

**Table 16. Cost for Equipment Mobilization and Demobilization**

Equipment Mobe and Demobe Costs		
	2019 RT mobe/demobe	2022 RT mobe/demobe
Dozer CAT D6	\$3,300	\$3,472
Excavator CAT 320	\$3,300	\$3,472
Loader 980C	\$1,540	\$1,620
Truck 25 ton (articulated)	\$3,080	\$3,240
Invasive Species washdown	\$1,200	\$1,262
Total costs	\$12,420	\$13,066

Main activity is mobilizing equipment from Haines (by road) for the 13 days to complete the site reclamation. Mobe costs come from Southeast Road Builders bid from 2017. Contract miner equipment mobe covered under portal closure costs.

**Table 17. Cost for Post Closure Monitoring and Reporting**

Post Closure Inspection and Reporting Costs						
	\$/day	# days	\$/unit	#units	2019 total	2022 total
rental truck +fuel	\$165	1			\$165	\$174
per diem	\$40	1			\$40	\$42
misc. (radio - light batteries, gloves, etc.)			\$25	1	\$25	\$26
Labor costs	\$375	2			\$750	\$789
Reporting (to ADNR and MHT)	\$375	0.5			\$188	\$197
	TOTAL PER TRIP				\$1,168	\$1,228
	TOTAL FOR TWELVE TRIPS (2-Yr.)				\$14,010	\$14,739

Assumes team of two from Haines, 1X month during 6 snow free months and when access road is passable for 2 years to inspect portal seepage

**Table 18. Cost for Final Reclamation Report**

Final Reclamation Report Costs				
	\$/day	# days	2019 total	2021 total
lead author	\$1,100	8	\$8,800	\$9,258
graphical assistant	\$375	3	\$1,125	\$1,184
	TOTAL		\$9,925	\$10,441

Main activity is developing a final report that describes the final reclamation activities with photos and documentation to show the final site configuration and the steps that were taken to get it there.



**Table 19. 2022 Equipment Costs**

2017 Equipment Quote from Local Hanies Contractor			
Add 10% for 2019 Rates			
Multiply 2019 Rates X 1.052 for 2022 Rates			
<b>Mobilization Rates:</b>		<b>unit cost (one way)</b>	
Excavator	320 Size - Cat	\$1,500 /each	(from existing location)
	335 Size - Cat	\$1,700 each	
	345 Size - Cat	\$2,200 each	
Loader		\$1,400 /each	"
Dozer	D-6	\$1,500 /each	"
Dozer	D-8T	\$2,000 /each	"
Truck	Off-Highway	\$1,400 /each	"
Truck	Other	\$300 /each	"
563 Cat Roller/Compactor		\$1,250 /each	"
12M Cat Grader		\$850 /each	"
Drill		\$1,200 /each	"
on-site vehicle - Dedicated		\$250 /each	"
hydroseeder		\$450 /each	"
SWPPP Container and Storage Container		\$500 /each	"
Mobilization stops at point where invasive species clear limits begin			
<b>Equipment Rates:</b>			
Excavator	Model Caterpillar 335	\$1,950 /day-\$175*	Incl operator/fuel/preventative maintenance
Excavator	Model Caterpillar 320	\$1,850 /day-\$175*	Incl operator/fuel/preventative maintenance
Excavator	Model Caterpillar 312	\$1,750 /day-\$175*	Incl operator/fuel/preventative maintenance
Loader	Model Caterpillar 980 C	\$1,800 /day-\$150*	Incl operator/fuel/preventative maintenance
Dozer	Caterpillar D8T	\$2,450 /day-\$200*	Incl operator/fuel/preventative maintenance
Dozer	Caterpillar D6	\$1,800 /day-\$125*	Incl operator/fuel/preventative maintenance
Truck	25/30 ton (Articulated)	\$1,450 /day-\$125	Incl operator/fuel/preventative maintenance
Compactor	Caterpillar 563	\$1,800 /day-\$125	Incl operator/fuel/preventative maintenance
Grader	Caterpillar 12 M	\$1,950 /day-\$150	Incl operator/fuel/preventative maintenance
Drill	Komatsu - John Henry	\$1,600 /day-\$100*	Does not include drill steel/bits/strikers/couplers /caps/powder/primers/powderman
Fuel transfers/Truck use for fueling		\$150 /day	
CrewTransport Vehicles		\$150 /day	Dedicated to Project (Staged @ Camp)
Truck/Tractor with lowboy:		\$200 /hr.-\$150*	Incidental moves
Invasive Specie - washdown/control (#2 Wash)		\$350 /unit	(owner provided system) - SRI can provide
Invasive Specie - Initial Wash-down prior to mob. (HNS)		\$300 /unit	SRI Provided system - HNS
Service/Maintenance Truck - Dedicated (invasive)		\$200 /day	
Hydroseeder		\$500 /load-\$50*	1100 gallon - 10,000 Sq ft. of coverage - + material cost per below

## **4.0 REFERENCES**

DOWL, 2015. Mine Closure and Reclamation Cost Estimation Guidelines: Indirect Cost Categories, Prepared for ADNR and ADEC, DOWL Report. 38 p.

Langston & Associates, 2022. Technical Memorandum Re: Decline Bulkhead Analysis, Prepared for Roughstock Mining Services. 12 p.