



May 4, 2021

BY ONLINE REVIEW SYSTEM

Ms. Jacqueline Ho, Regulatory Specialist
Ms. Jen Potten, A/Regulatory Coordinator
Ms. Kim Murray/ Regulatory Specialist
Mackenzie Valley Land and Water Board
7th Floor YK Centre Mall
4922 – 48th Street
PO BOX 2130
YELLOWKNIFE NT X1A 2P6

Dear Ms. Ho, Ms. Potten, and Ms. Murray:

The Government of the Northwest Territories' Technical Intervention in relation to Pine Point Mining Limited's Confirmation and Exploration Project Type A Water Licence Application (W2020L8-0012).

Attached is the Government of the Northwest Territories' (GNWT's) technical intervention for Pine Point Mining Limited's Confirmation and Exploration Project (CEP) Type A Water Licence application (W2020L8-0012) for the Mackenzie Valley Land and Water Board's consideration. I confirm that all GNWT departments with interests in PPML's CEP Type A Water Licence application had the opportunity to review the developer's plans, proposed monitoring programs, and submissions provided during the regulatory process up to April 21, 2021.

If the Mackenzie Valley Land and Water Board has any questions or concerns or requires additional information, please contact Mr. Horatio Sam-Aggrey, Project Assessment Analyst, at Horatio_Sam-Aggrey@gov.nt.ca or (867) 767-9180 ext. 24023 or me at Lorraine_Seale@gov.nt.ca or (867) 767-9180 ext. 24020.

Sincerely,

Lorraine Seale
Director
Securities and Project Assessment
Lands

Attachments

GOVERNMENT OF THE NORTHWEST TERRITORIES

TECHNICAL INTERVENTION

FOR

**PINE POINT MINING LIMITED
CONFIRMATION AND EXPLORATION PROGRAM
TYPE A WATER LICENCE APPLICATION
W2020L8-0012**

Submitted to:

Mackenzie Valley Land and Water Board
P.O Box 2130
4922 48th Street
7th Floor YK Centre Mall
Yellowknife, NT X1A 2P6

May 4, 2021

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Appendix A: Government of the Northwest Territories' Security Estimate Review

List of Acronyms

Brodie Consulting Limited	BCL
Carbonaceous Biochemical Oxygen Demand	CBOD
Canadian Council of Ministers of the Environment	CCME
Closure and Reclamation Plan	CRP
Coliform Forming Units	CFU
Department of Environment and Natural Resources	ENR
Effluent Quality Criteria	EQC
Government of the Northwest Territories	GNWT
Groundwater Management Plan	GMP
Information Request	IR
Mackenzie Valley Land and Water Board	MVLWB
Pine Point Mining Limited	PPML
Surveillance Network Program	SNP
Total Dissolved Solids	TDS
Wildlife Management and Monitoring Plan	WMMP

1.0 Introduction

The following concerns and issues have resulted from the Government of the Northwest Territories' (GNWT) and their retained experts' review of plans, proposed monitoring programs and submissions as part of the Pine Point Mining Limited's (PPML) Confirmation and Exploration Project Type A Water Licence Application W2020L8-0012. This technical intervention explains GNWT's concerns and provides recommendations for the Mackenzie Valley Land and Water Board (MVLWB)'s consideration. Of note, this submission takes into consideration all of the documents provided during the process up to April 21, 2021.

GNWT appreciates the opportunity to express its concerns and provide recommendations and suggestions to the MVLWB. GNWT intends to provide technical input at the public hearing on June 15-17, 2021 to assist the MVLWB in making a decision related to the Water Licence Application.

1.1 Report Outline

This technical intervention is structured to discuss components included within the Water Licence Application and supporting documents. The intervention is divided into the following sections:

Section 1 – Introduction to the technical intervention, and GNWT's involvement in the regulatory review;

Section 2 – Discussion of GNWT recommendations related to the Annual Water Licence Annual Report;

Section 3 – Discussion of GNWT recommendations related to the Groundwater Management Plan (GMP);

Section 4 - Discussion of GNWT recommendations related to fish presence in pits;

Section 5 – Discussion of GNWT recommendations on water quality compatibility criteria;

Section 6 – Discussion of GNWT recommendations related to wastewater treatment;

Section 7 – Discussion of GNWT recommendations related to offsite waste disposal;

Section 8 - Discussion of GNWT recommendations related to a Surveillance Network Program (SNP);

Section 9 - Discussion of GNWT recommendations related to reclamation securities;

Section 10 – Discussion of GNWT-Environment and Natural Resources’ requirement for a Wildlife Management and Monitoring Plan (WMMP).

1.2 Information Requests

Following the Technical Session, held February 24 and 25, 2021, ten Information Requests (IR)s were issued to PPML. Reviewers were then provided an opportunity to review and comment on PPML’s IR responses, with comments due March 26, 2021. PPML then responded to these reviewer comments on March 30, 2021. PPML indicated in their response to comments that they would be submitting a more detailed analysis in response to comments in an additional memo. This memorandum was circulated to reviewers on April 21, 2021. GNWT held a meeting with PPML on April 13, 2021 to discuss the contents of the April memorandum in advance of that April 21, 2021 submission.

2.0 Annual Water Licence

GNWT comment 13 on PPML’s responses to IRs identified select pump test information that warrants reporting by PPML. PPML noted that the annual water licence report would be used to document the pump test information.

Recommendation:

1. GNWT recommends that the following items are reported by PPML within the Annual Water Licence report:

- a) Location of testing (GPS and map);**
- b) Dates and duration of testing;**
- c) Quantity of water removed from source and location of source;**
- d) Quantity of water discharged and location of discharge;**
- e) Water quality sampling results for source and discharge locations;**
- f) Result of monitoring conducted during testing and description of any adaptive management actions triggered; and**
- g) Demonstration that water transfer criteria were achieved for each test.**

3.0 Groundwater Management Plan

3.1 Submit Groundwater Management Plan for Approval

PPML provided a framework Groundwater Management Plan (GMP) as a component of their water licence application. In their response to review comments, additional information was provided by PPML that will need to be included into a GMP for this project. The GMP will need to include descriptions and locations of the proposed activities, methodology for monitoring to execute the monitoring program, reporting requirements, and the water quality compatibility protocol.

Recommendation:

2. GNWT recommends that a Groundwater Management Plan be submitted for review and Board approval 90 days prior to commencing any hydrogeological investigations.

3.2 Groundwater Management Plan Uncertainties

Prior to making specific recommendations on PPML's proposed compatibility criteria, GNWT will discuss the various project uncertainties that remain at this stage of the project. This discussion will provide additional context for GNWT's recommendations on the proposed water quality compatibility criteria.

Information regarding the groundwater quality at the project site is described in qualitative terms only. Given the limited understanding of pit and groundwater quality and spatial variability across the project site, it is recommended that a precautionary approach to waters discharged to a pit or well is considered necessary to limit the potential for environmental impacts. The need for a precautionary approach is further supported by the fact the pit and well locations for testing have not been defined by PPML at this time.

GNWT comments ID 1 to 4 on PPML's responses to IRs recommended additional information to understand the plans for water transfer. On March 30, 2021, PPML committed to providing the information within a memorandum that was circulated by the MVLWB on April 21, 2021 (the April memorandum). As was noted in GNWT comment ID 3, there was uncertainty regarding the number of water samples that were associated with pits or groundwater within PPML's water quality database. The April memorandum summarized data from 22 surface water quality samples associated with 13 different pits. No groundwater quality data was presented in the April memorandum and therefore the groundwater at the project site has not been characterized to address GNWT comment ID 3.

In addition, there is an inherent uncertainty associated with implementation of the GMP since it has not been developed to an executable level. Efforts to understand the key decision pathways to permit a water transfer were sought during the water licence application review process; however, uncertainty remains regarding several items which significantly impacts confidence in the proposed compatibility assessment and therefore the proposed water transfer criteria. For example:

- The compatibility assessment did not include some factors that were discussed within the main body of the April memorandum, including:
 - Influence of a pit chemocline on water quality sampling and how this is considered in evaluating the water transfer criteria;
 - How the depth-average Total Dissolved Solids (TDS) concentration and specific conductivity TDS relationship is being developed and if these items

are considered in evaluating the water transfer criteria. Note, GNWT comment 6 and 8 on PPML's responses to IRs sought information about how the depth-average TDS was calculated and if the specific conductivity TDS relationship is apparent and suitable for this project site. PPML's responses did not adequately address the GNWT comments and therefore this uncertainty remains.

- Figure B1 in the April memorandum presents a pit to pit compatibility assessment which references an evaluation of source pit water to "guidelines"; however, the guideline values used for the evaluation have not been referenced. There are many guidelines that exist but they all provide a differing degree of protection.
- The compatibility assessments (Figures B1, B2 and B3) each use the phrase "upper bound" as part of the source and receptor water quality comparisons. The term "upper bound" is not defined within the April memorandum. Based on an e-mail exchange between the GNWT and PPML on April 26, 2021, it is GNWT's understanding that the "upper bound" is a calculated value based on any available water quality data for the receptor. The calculation used to determine this value was not presented and therefore cannot be assessed. A temporal assessment of the water quality for receptor locations is also not presented. Without this information GNWT cannot assess if the approach to calculate an "upper bound" would be influenced by changes in the water quality that may have occurred over time. As noted above, only data from 13 pits has been provided by PPML, and no groundwater quality summaries have been provided.
- The well to well and pit to well compatibility assessment (Figures B2 and B3) do not consider an evaluation against guidelines that are protective of the receiving environment (e.g. CCME Protection of Aquatic Life). This is a concern as PPML has noted a strong interconnectedness between the groundwater and surface water systems; therefore, any water pumped to pits or into injection wells has the potential to reach the surface in the vicinity of the pits.
- Based on the e-mail exchange between the GNWT and PPML on April 26, 2021, it was confirmed that Figure B3 has an error where the Yes/No responses should be switched.
- The compatibility assessments compare source and receptor water quality; however, it is not clear if the source and receptor water samples are those collected prior to testing or if this comparison also includes the water quality database presented in the April memorandum.

Recommendation:

3. GNWT recommends that the Groundwater Management Plan be updated to clarify and resolve the uncertainties noted in the bullets listed above, and summarized here:

- **Inclusion of pit chemocline influence on the compatibility assessment.**
- **Description of methodology for the development of the depth-average TDS concentration and specific conductivity-TDS relationship.**

- **Clarification on which guidelines are being referenced in Figure B1 of the April memorandum.**
- **Clarification on methodology for the calculation of the “upper bound”.**
- **The well to well and pit to well scenarios should consider an evaluation against appropriate guidelines that are protective of the receiving environment.**
- **The compatibility assessments should be made between samples collected prior to groundwater testing, and not in relation to the database presented in the April memorandum.**

4.0 Fish Presence in Pits

GNWT is concerned that PPML has not sufficiently assessed the receiving water quality, and potential fish presence in the existing pits on site. This is necessary to ensure that appropriate water quality objectives are in place prior to the potential transfer of relatively poor water quality discharge into a potentially fish-bearing environment. However, it is unclear if PPML still intends to use pits that contain fish. As noted in GNWT comments 11 and 12 on PPML’s responses to IRs, the framework GMP described different groundwater testing methods for pits where fish are not present, and those that may have fish. During the Technical Session, and in response to GNWT comment 11, PPML noted that transferring water into fish bearing pits will be avoided. In the April 21, 2021 Memorandum, PPML provided an updated decision tree for water transfers to determine if a pit can accept water from another pit. The updated decision tree does not address the presence of fish.

The potential for fish presence in the pits raises concerns regarding the methods used for determining their presence and the overall assessment of water quality conditions in the pits. GNWT asked a series of questions at the Technical Session to clarify the assessments that had been done to better understand the conditions of the receiving environment prior to conducting the groundwater testing. GNWT also noted the challenge of being able to make recommendations on discharge quality, and for the MVLWB to set conditions in the Water Licence without a thorough understanding of the receiving environment and therefore the level of protection that would be required by the water quality objectives (Technical Session Transcript, Day 1, p.97).

In response to questioning, PPML clarified that “the details of what Pine Point plans on doing in terms of water transfers still has yet to be determined” and PPML “would be looking at what that would mean in terms of the water transfers and the compatibility of the water.” (Technical Session Transcript, Day 1, p. 108 lines 23-25, p. 109, lines 1-3). PPML did reiterate multiple times that they would not transfer water into pits with a known presence of fish:

- “We wouldn’t be pumping water where we know we’ve got fish.” (Technical Session Transcript, Day 1, p. 101 lines 7-9).
- “In the short term, when talking about the CEP Program, the plan is that we would be looking at selecting pits that do not have fish in them to take that sort of challenge out of the program.” (Technical Session Transcript, Day 1, p. 100, lines 1-5)
- “At this point the plan would be looking at pits...that would be non-fish bearing.” “Where possible, is based on the fact that we haven’t actually selected the pits yet” (Technical Session Transcript, Day 1, p. 100, lines 8-13).
- “There are some pits that do have fish...stickleback” (Technical Session Transcript, Day 1, page 99, lines 14-16).
- “...Try to make it happen in non-fish bearing pits to not disturb the area.” (Technical Session Transcript, Day 1, p. 89 lines 12-15).

Further, in response to GNWT comment on PPML’s response to IR #3, PPML described methods used to determine fish presence which would include “minnow trapping and seine netting around the shoreline, supplemented by backpack electrofishing and small mesh multi-panel gill nets where conditions are suitable.”

GNWT notes that if fish presence is confirmed in a pit receiving discharge, PPML should ensure concentrations of each parameter in the discharge should be equal to or lower than concentrations in the receiving pit or below CCME Guidelines for the Protection of Aquatic Life.

Further, statements in the memo provided by PPML on April 21, 2021, suggest there has been a change in PPML’s plans regarding the protection of fish and the general environmental conditions of the pits. PPML states that the existing “system of pits and drainage channels is human-made and is not a natural environment. It is therefore PPML’s opinion that this system should not be considered the receiving environment. The receiving environment that should be protected is the natural aquatic environment that sits outside of the project area boundary, such as the Paulette Creek, Little Buffalo River, Twin Creek, and Great Slave Lake.” GNWT notes that this statement suggests that PPML no longer intends to protect the environment within existing pits, and disregards the evidence that suggests a strong interconnectedness between groundwater and surface water in the region. Further, this change calls into question whether PPML’s intention to only discharge into pits with no fish presence, still applies.

It is the GNWT’s position that whether a receiving environment is natural or historically “human-made” does not allow for any less protection of the existing condition (i.e. aquatic species).

Recommendation:

- 4. GNWT recommends the Water Licence include a condition that requires fish presence determinations in a pit prior to water being discharged into it.**
- 5. GNWT recommends that source water for discharge to pits confirmed to have fish present must have parameter concentrations equal to, or lower than the concentrations in the receiving pit or parameter concentrations that are below CCME Guidelines for the Protection of Aquatic Life.**
- 6. GNWT recommends that existing pits be considered the receiving environment, and that PPML be responsible for protecting the environment within and surrounding these pits (aquatic and otherwise).**

5.0 Water Quality Compatibility Criteria

With consideration given to PPML's water compatibility assessment outlined in the April memorandum, it is recommended the water transfer criteria be adjusted to achieve conditions that are protective of the receiving environment and aim to not degrade the receptor water quality. A 30% difference between source and receptor water quality was proposed by PPML as a criterion for TDS and individual parameters. Although the basis for the 30% selection is not defined, it was considered acceptable by GNWT for the specific tests proposed for this project subject to the additional criteria presented in recommendations below. Additional precautionary elements in these recommendations for water transfer are to account for the uncertainties identified in Section 3.2, the potential for water quality to change during pumping as groundwater recharges, and the objective of protecting the receiving environment. To provide flexibility, a condition is included that allows PPML to seek approval for a water transfer if the water quality criteria are not met.

Recommendation:

- 7. GNWT recommends that water transfers from pit to pit, well to well and pit to well, be conducted in accordance with the Groundwater Management Plan and subject to the following additional conditions:**
 - a) Not occur in pits containing fish unless source water concentrations are equal to, or lower than, parameter concentrations in the receiving pit or source water concentrations that are below CCME Guidelines for the Protection of Aquatic Life.**
 - b) Water transfers shall not result in temporary flooding or drying up of nearby waterbodies as confirmed through visual monitoring;**
 - c) There is a less than 30% difference in Total Dissolved Solids concentration between the source and receiving water locations, and**

- d) Source water quality for individual parameters have less than 30% difference in source water and receptor water quality concentrations (for all parameters that have a CCME Water Quality Guidelines for the Protection of Aquatic Life guideline value).**

8. GNWT recommends that if condition b), c) and d) cannot be achieved, PPML may submit a request, for review and Board approval, that describes with supporting analysis, how the water transfer will be conducted in a manner that mitigates against potential impacts to surface water.

9. GNWT recommends that PPML describe how water quality will be monitored during testing to ensure that poor quality water is not discharged as a result of changing water conditions during recharge of the source water pit.

6.0 Wastewater Treatment

At the Technical Session held on February 24 and 25, 2021, Board staff questioned PPML on details for a possible water treatment plant (Technical Session Transcript, Day 2, page 46, lines 1-3). PPML indicated that they had not determined the type of treatment plant that would be used, and that this would take some time to develop (Technical Session Transcript, Day 2, page 46, lines 8-10). Board staff reiterated the importance of this information for drafting of Water Licence conditions and setting relevant Effluent Quality Criteria (EQC) (Technical Session Transcript Day 2, page 47, lines 13 to 15). As a result, IR #4 was issued for “PPML to provide details on the proposed options for the management of sewage (all toilet wastes and greywater).” In this section, GNWT will discuss each of the proposed wastewater treatment options and make a recommendation based on the information available.

6.1 Near-term Wastewater Treatment

PPML’s response to IR #4 outlines several options. It was noted that:

“In the near term...the camp would continue with the incinerating toilets and trucking of the ash to Hay River for disposal. As the camp expands to meet the program needs, a holding tank may be installed for sewage waste and this waste would be trucked to the Hay River Solid Waste Facility. Greywater would either continue to be directed to the sump near the camp or captured with the sewage and shipped to the Hay River facility.”

GNWT notes that it remains unclear when the holding tank will be required and used. Further, for this option, please note that the sewage disposal should occur at the lagoon and not the Solid Waste Facility and that approval from the Town of Hay River is required before implementing this option.

PPML goes on to note that as the camp population expands, there are three options under consideration. They are discussed in Sections 6.2 to 6.4 below with recommendations in Section 6.4.

6.2 Sewage Lagoon

PPML notes that if a sewage lagoon were selected, discharge would be through a wetland, from which the water would migrate naturally through the local drainage. GNWT notes that PPML has not provided details regarding the size, or location of this facility. Without these details, it is not possible to assess the feasibility and potential environmental impacts of a sewage lagoon. It is also not possible to establish Surveillance Network Program (SNP) stations and compliance points for such a system.

6.3 Septic Tank and Absorption Field System

PPML provided the Bluefish Hydroelectric facility as an example of a septic tank and absorption field system that could be utilized. It is important to note that the Bluefish facility has an 8 person camp, which is significantly smaller than the 249 person camp proposed by PPML. PPML also states that it is “acceptable option in the NWT where soil conditions allow”. GNWT notes that PPML has not provided an assessment of whether there is a location on site where soil conditions are appropriate for a septic tank and absorption field system sufficient for a 249 person camp. Further, this option needs to consider the strong interconnectedness between groundwater and surface water in the region.

6.4 Modular Water Treatment Plant

PPML states in their response to IR #4 that another option would be a modular wastewater treatment plant that would consist of “a modular container-based system and installed in the vicinity of the camp. The effluent would be discharged to the same area as the greywater is currently discharged”.

GNWT notes that the location of effluent discharge is not clear in the application. PPML referenced the EQC for the Nechalacho Water Licence (MV2020L2-0010) which includes provisions for a modular sewage treatment plant for a 100-person camp. The EQC are presented in Table 1 of PPML’s response to IR #4. GNWT notes that the EQC from the referenced water licence are considered appropriate for the Pine Point exploration camp. However, PPML has not yet discussed the achievability of the proposed EQC.

GNWT notes that the modular wastewater treatment plant is the best option proposed by PPML at this time, due to the lack of details provided regarding the sewage lagoon and septic tank with absorption field system.

Recommendation:

10. GNWT recommends that the Water Licence include conditions for a modular wastewater treatment plant for the treatment of camp sewage.

11. GNWT recommends that the EQC for the discharge from the wastewater treatment plant be set as follows:

Parameter	Maximum Grab Concentration
Fecal Coliforms	20 CFU/100 mL
Carbonaceous Biological Oxygen Demand (CBODs)	25 mg/L
Total Suspended Solids	25 mg/L
pH	6 to 9

7.0 Offsite Waste Disposal

7.1 Landfarm and Associated Contact Water

During Day 2 of the Technical Session, Board staff asked PPML to confirm whether a landfarm would be constructed to treat hydrocarbon-contaminated soil. Board staff noted that “if there is contact water that needs to be managed, and that contact water needs to be discharged, then EQC would need to be set in the licence.” (Technical Session Transcripts, Day 2, page 57, lines 23-25).

PPML responded that “this was a contingency option” (Technical Session Transcript, Day 2, page 58, lines 16-17). Regarding potential contact water, PPML explained that “that water would be treated onsite probably through an oil-water separator. The water would then be tested. Then we would transfer that water to an approved site that could receive contaminated water, or... we would have to seek and develop EQCs for the release of that water.” (Technical Session Transcript, Day 2, page 58, lines 22-25, and page 59 lines 1-3).

Finally, PPML notes that if they were to build a landfarm, they would go through the process, including, “if necessary, amending the licence to include EQCs for that water.” (Technical Session Transcripts, Day 2, page 59, lines 11-13).

GNWT notes that PPML has not provided any additional information on the management of hydrocarbon-contaminated soil, or associated contact water since the Technical Session. It remains unclear how these wastes will be handled on site, and therefore GNWT suggests they be shipped offsite for disposal at an appropriate facility.

Recommendation:

12. GNWT recommends that the MVLWB not include authorization for a landfarm in the Water Licence at this time.

13. GNWT recommends that the Water Licence should require submission of a revised Waste Management Plan 30 days after issuance. PPML revise the Plan to specify that hydrocarbon-impacted material and its associated contact water will be shipped to an offsite facility for appropriate disposal.

7.2 Vehicle Wash Station

During Day 2 of the Technical Session, GNWT asked PPML about how they would manage runoff water from the vehicle wash station. This water is expected to contain hydrocarbons as well as ammonium nitrate residues. PPML responded that “the first option would be to send it offsite to an approved facility that could receive that water.” (Technical Session Transcript, Day 2, page 60, lines 24-25).

GNWT notes that this is not consistent with Section 4.4 of the Waste Management Plan that was submitted with the application which states the following:

- a) Capture wash water at the point of production by means such as a lined pad.
- b) As necessary, treat water with an oil/water separator.
- c) Discharge water to an appropriate sump.

GNWT notes that in order for vehicle wash station runoff to be discharged to a sump, EQC would need to be set in the licence, and PPML has not proposed EQC for this discharge.

Based on the information provided by PPML at the Technical Session, and the lack of proposed EQC, GNWT suggests that this waste be shipped offsite to an appropriate disposal facility.

Recommendation:

14. GNWT recommends that the Water Licence should require submission of a revised Waste Management Plan 30 days after issuance. PPML revise the Plan to state that the runoff water from the vehicle wash station will be shipped offsite to an appropriate disposal facility.

8.0 Surveillance Network Program

In review comments on the initial application, GNWT recommended that the applicability of an SNP be considered for monitoring water quality in pits, and other nearby waterbodies. PPML responded that this monitoring would be better described in the Groundwater Management Plan. However, the trigger for this Type A Water Licence was

the volume of water being used for groundwater testing. It is therefore GNWT's position that key operational monitoring should be required as a condition of the licence which typically occurs as part of an SNP. To be clear, this would not negate the need for a Groundwater Management Plan.

During the Technical Session, PPML indicated that they're "still collecting information on what the groundwater looks like, what the water quality is like in the pits, what the fish situation and connectivity is like in the pits (Technical Session Transcript, Day 1, p. 119 lines 8-12). Due to these uncertainties, and the fact that PPML has not yet selected the specific locations for groundwater testing, it is not possible to recommend specific locations for water quality monitoring at this time. However, it is GNWT's opinion that compliance monitoring for water quality in nearby waterbodies should be conducted to monitor for any increases in toxicity of the aquatic environment during groundwater testing. GNWT believes that key monitoring locations should be determined, and included in the SNP section of the Water Licence. For example, water quality of pumped water from an injection well should require a SNP station, water quality in the pits to be used to discharge pumped water should include a SNP station, local water quality monitoring at surface waterbodies should be listed as part of the SNP, and discharge criteria for any waste disposal should also be included in the SNP (e.g. treated sewage). Regarding sampling frequency, PPML stated during their presentation at the Technical Session that "During the pump test all the parameters, all metals will be monitored every 24 hours (Technical Session Transcript, Day 1, p. 94-95 lines 23-25, 1-2 respectively). "We're going to make sure ...there is no major changes in the water quality" (lines 8-10). GNWT notes that this sampling frequency should be outlined in the SNP for ensuring that the water being transferred from the source pit or well remains compatible with the receiving water source during testing.

Recommendation:

15. GNWT recommends that the list of proposed locations for groundwater testing be provided for review and approval to the Board 90 days before testing begins.

16. GNWT recommends that PPML provide a SNP containing water quality monitoring locations, sampling parameters and sampling frequency for review and approval for inclusion in the Water Licence. The SNP should include both the source and receiving water bodies involved in groundwater testing, as well as nearby water bodies that could be hydrologically connected.

9.0 Reclamation Security

GNWT and its retained consultant, Brodie Consulting Limited (BCL) have reviewed the Closure and Reclamation Plan V1.0 (CRP) and RECLAIM estimate that was prepared by PPML to support the application. Based on the February 24, 2021 workshop and an

updated Security Estimate submitted as part of PPML's Response to IR #5 (March 12, 2021), GNWT has included a security estimate for the project (see Appendix A).

In general, GNWT and BCL found the PPML security estimate reasonable for the proposed scope of exploration work. The estimate included acceptable closure costs for the current stage of the project, including:

- Removal of buildings, equipment and project infrastructure, and shipping off-site,
- Mobilization of a small equipment fleet for reclamation and closure,
- Allowance for 10 workers and an estimated 60 days of closure work,
- 20% contingency.

GNWT does have some areas of adjustment to the PPML estimate based on the review by BCL, which are included in the attached memorandum and RECLAIM estimate. Most notably are an adjustment to PPML's inflation adjustment, updated total waste fuel volumes, inclusion of a temporary water pipeline, adjustment of revegetation based on PPML's IR #8 response, and updated costs to grade previously undisturbed areas.

As such, GNWT recommends that the security estimate for the project be set to \$1,124,699, a 21% increase to the PPML security estimate of \$926,578. This estimate should be separated into land and water liability, as recommend below.

Recommendation:

17. GNWT that the total security estimate for the project be set to \$1,124,699 with a land and water liability set at \$735,377 and \$389,322, respectively.

10.0 Wildlife Management and Monitoring Plan

GNWT has notified PPML of the Minister of Environment and Natural Resources' (ENR) determination that an approved Tier 1 Wildlife Management and Monitoring Plan will be required for the Confirmation and Exploration Program. The determination of the need for a WMMP largely reflects the potential impacts of the project on boreal woodland caribou, which are listed as a threatened species under both the federal *Species at Risk Act* and the *Species at Risk (NWT) Act*. A key factor in concluding that the potential impacts of the Confirmation and Exploration Program on boreal caribou are of sufficient importance to warrant an approved WMMP is that GNWT data indicate that boreal caribou in the Pine Point area may represent a small local population with little chance for rescue from adjacent local populations if their numbers decline. GNWT recognizes PPML's commitments to include additional mitigation and monitoring approaches to minimize impacts to boreal caribou from sensory disturbance during sensitive periods and habitat loss, and an approved WMMP will allow ENR to ensure that PPML implements those commitments. It is expected that the WMMP submitted by PPML for approval by the

Minister of ENR will address comments made on the Wildlife Protection Plan – Ver. 1.0 posted to the ORS during the MVLWB’s public review phase, comments made by participants in the technical sessions as well as the measures identified in PPML’s March 12 Memo to ENR, subject to required revisions outlined in the WMMP determination letter provided to PPML.

11.0 References

MVLWB/AANDC. 2013. Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories. November, 2013.

Technical Session Transcript, Day 1. Pine Point Mining Limited (PPML) – Confirmation and Exploration program (CEP) MV2020L8-0012 and MV2020C0017.

Technical Session Transcript, Day 2. Pine Point Mining Limited (PPML) – Confirmation and Exploration program (CEP) MV2020L8-0012 and MV2020C0017.



MEMORANDUM

DATE: April 20, 2021

TO: Bill Pain, GNWT, Laura Malone, GNWT

CC:

FROM: Henry Wong, P.Eng., John Brodie, P. Eng.

SUBJECT: BCL Security Estimate Review

Pine Point Project – Confirmation and Exploration Project (CEP)

Pine Point Mining Limited (PPML) submitted a Closure and Reclamation Plan V1.0 (CRP) for the Pine Point Project Confirmation and Exploration Project (CEP) in November 2020. An estimate of financial security was included in the CRP and a RECLAIM cost file issued as part of the submission. GNWT has requested BCL to provide an estimate of the financial security for closure of the project site.

BCL's initial review of the CRP and accompanying PPML security estimate included a submission of technical questions to PPML (via the GNWT-ENR team), as a part of the online review process. The questions were sent to PPML in advance of their technical workshop, held on February 24 and 25, 2021. The workshop addressed various stakeholder comments, and outstanding items formed the basis of several Information Requests (IR). The PPML Response to IR submission included an updated Security Estimate (Response to IR5, March 12, 2021).

Information used to support the BCL security estimate included the following:

- CRP V1.0 (November 2020)
- information from the technical workshop held by PPML on February 24 and 25 (2021)
- PPML's Response to Information Requests from the workshop (March 2021)

- Including an updated security estimate (RECLAIM file dated March 12, 2021)

Review of PPML Security Estimate (March 2021)

In general, BCL found the PPML security estimate reasonable for the proposed scope of exploration work. The estimate included acceptable closure costs for the current stage of the project, including:

- Removal of buildings, equipment and project infrastructure, and shipping off-site,
- Mobilization of a small equipment fleet for reclamation and closure,
- Allowance for 10 workers and an estimated 60 days of closure work,
- 20% contingency.

Inflation was included in the PPML estimate to adjust RECLAIM v7.0 – 2014 unit costs to 2020 dollars.

No on-going and/ or long-term monitoring would be expected for the exploration work planned. The closure costs included two interim care and maintenance inspections, a geotechnical inspection and a site visit for licence compliance. No additional monitoring or inspection events were described in the RCP, nor are they expected to be required.

Minimal closure work has been proposed to manage the drill pads and access roads. The PPML closure costs addressed only a small cleanup footprint based on ‘undisturbed’ areas. BCL notes that regulatory requirements are not prescriptive for the reclamation of drill pads and requirements for road reclamation can vary project site to project site, and as such, it is difficult to comment on the appropriateness of the proposed closure measure. In this case which involves reclamation of previously disturbed sites that were reclaimed to the standard of the day, the proposed level of effort seems tolerable.

Engineering and Project Management closure costs were included at 3%, which is acceptable for the scope of closure work stated.

PPML has proposed a 20% contingency for the work. Typically, on reclamation cost estimates for mines, where there is doubt as to the scope, effectiveness and cost of the proposed reclamation work, a 25% contingency is applied. In this case, where all of the reclamation tasks are relatively well defined, likely to be effective, and lacking complexity that may influence the unit costs, BCL’s opinion is that the 20% contingency is tolerable.

BCL security estimate

A security estimate has been prepared by BCL using the PPML March 12 submission as its base. A summary of the BCL changes to the PPML submission is shown in Table 1.

Table 1 – Changed Quantities

Closure Activity	PPML Quantity	BCL Quantity	Rationale
Chemicals worksheet - Hazardous Material Removal <ul style="list-style-type: none"> Total Waste fuel 	1,683 L	33,100 L	Quantity changed to reflect 10% of ‘maximum fuel volumes’, as described in Project Description.
Buildings & Equipment worksheet – Remove buildings item added <ul style="list-style-type: none"> Temporary Water Pipeline 	No value	3 km	Temporary Water Pipeline for conveying groundwater to the re-injection wells or to the nearest historical open pit, as described in Project Description.
Buildings & Equipment worksheet – Grade and Contour Pads <ul style="list-style-type: none"> Vegetate 	10 ha	36 ha	RCP states plan to promote natural revegetation of previously undisturbed areas. Quantity revised to reflect PPML IR #8 (Mar2021) Drilling Footprint of undisturbed areas.
Buildings & Equipment worksheet – Grade and Contour Pads <ul style="list-style-type: none"> Grade overburden over 36 ha @ 0.15 m thick soil 	No value	54,000 cu.m	Costs to grade undisturbed areas. RCP states that overburden will be used to cover the area to be reclaimed when drilling is completed. Area reflects PPML IR #8 (Mar2021) Drilling Footprint of undisturbed areas.
Inflation (2014 to 2020)	8%	8.2%	Ratio of Yellowknife CPI: <ul style="list-style-type: none"> 2014 Yellowknife CPI @ \$128.40 2020 Yellowknife CPI @ \$138.90

In summary, the BCL security estimate reflects:

- corrections of cost items quantities (total waste fuel estimate and undisturbed drill footprint area),
- addition of scope of work for re-covering the undisturbed drill footprint areas (as noted in CRP),
- application of CPI inflation formula (vs. 8% set rate),
 - 2020 to 2014, applied to
 - all Capital Costs items, and
 - two Indirect Costs items– Mobilization/ Demobilization and Post-Closure.

The total BCL security estimate is \$1,124,699, a 21% increase to the PPML security estimate of \$926,578.

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	LAND LIABILITY	WATER LIABILITY
OPEN PIT	Test Pit Restoration	\$120	\$60	\$60
UNDERGROUND MINE		\$0	\$0	\$0
TAILINGS FACILITY		\$0	\$0	\$0
ROCK PILE		\$0	\$0	\$0
BUILDINGS AND EQUIPMENT		\$568,205	\$394,953	\$173,253
CHEMICALS AND CONTAMINATED SOIL MANAGEMENT		\$109,712	\$54,856	\$54,856
SURFACE AND GROUNDWATER MANAGEMENT		\$0	\$0	\$0
INTERIM CARE AND MAINTENANCE		\$10,000	\$0	\$10,000
INFLATION (2014 to 2020) applied to Capital Costs	8.2%	\$56,419	\$36,889	\$19,530
SUBTOTAL: Capital Costs		\$744,456	\$486,758	\$257,698
PERCENT OF SUBTOTAL			65%	35%

INDIRECT COSTS	COST	LAND LIABILITY	WATER LIABILITY
MOBILIZATION/DEMOBILIZATION	\$148,776	\$97,276	\$51,500
POST-CLOSURE MONITORING AND MAINTENANCE	\$10,000	\$6,538	\$3,462
INFLATION (2014 to 2020) applied to Mobilization and Post-Closure Indirect Costs	8.2%	\$13,020	\$8,513
ENGINEERING	3%	\$22,334	\$14,603
PROJECT MANAGEMENT	3%	\$22,334	\$14,603
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1%	\$7,445	\$4,868
BONDING/INSURANCE	1%	\$7,445	\$4,868
CONTINGENCY	20%	\$148,891	\$97,352
MARKET PRICE FACTOR ADJUSTMENT	0%	\$0	\$0
SUBTOTAL: Indirect Costs		\$380,243	\$248,620

TOTAL COSTS	\$1,124,699	\$735,377	\$389,322
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Note: Inflation is applied separately to Capital Costs, and two Indirect Cost Items - Mobilization/ Demobilization and Post-Closure costs. The other Indirect Costs are inflated as a function of being %'s of the total Capital Costs.

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Open Pit Name: Test Pit Restoration

Pit # 1

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
CONTROL ACCESS									
Fence		m		#N/A	\$0.00	\$0		\$0	\$0
Signs		each		#N/A	\$0.00	\$0		\$0	\$0
Berm at crest		m3		#N/A	\$0.00	\$0		\$0	\$0
Block roads		m3		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
STABILITY STUDY									
Conduct stability and setback study		allow		#N/A	\$0.00	\$0		\$0	\$0
STABILIZE SLOPES									
Off-load crest, soil A		m3		#N/A	\$0.00	\$0		\$0	\$0
Off-load crest, soil B		m3		#N/A	\$0.00	\$0		\$0	\$0
Doze/trim overburden at crest		m3		#N/A	\$0.00	\$0		\$0	\$0
Drill & blast pit crest		m3		#N/A	\$0.00	\$0		\$0	\$0
Buttress slope		m3		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
COVER/CONTOUR SLOPES									
Place fill, soil A		m3		#N/A	\$0.00	\$0		\$0	\$0
Place fill, soil B		m3		#N/A	\$0.00	\$0		\$0	\$0
Rip rap		m3		#N/A	\$0.00	\$0		\$0	\$0
Vegetate slopes		ha		#N/A	\$0.00	\$0		\$0	\$0
Vegetate pit floor		ha		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
CONSTRUCT DIVERSION									
DITCHES									
Excavate ditches -soil		m3		#N/A	\$0.00	\$0		\$0	\$0
Excavate ditches -rock		m3		#N/A	\$0.00	\$0		\$0	\$0
Rip rap in channel base		m3		#N/A	\$0.00	\$0		\$0	\$0
CONSTRUCT SPILLWAY									
Excavate channel		m3		#N/A	\$0.00	\$0		\$0	\$0
Concrete		m3		#N/A	\$0.00	\$0		\$0	\$0
Rip rap		m3		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
RECLAIM QUARRIES									
Contour slopes	5 test pits @ 20 tonnes each requiring re-grading following removal of 1-2 tonne sample	m3	50.	DRH	\$2.40	\$120	50%	\$60	\$60
Place overburden		m3		#N/A	\$0.00	\$0		\$0	\$0
Vegetate		m3		#N/A	\$0.00	\$0		\$0	\$0
FLOOD PIT-Captital									
Remove stationary equipment (sumo pumps)		each		#N/A	\$0.00	\$0		\$0	\$0
Remove dewatering pipeline		m		#N/A	\$0.00	\$0		\$0	\$0
Remove power lines		each		#N/A	\$0.00	\$0		\$0	\$0
Construct diversion ditches		m3		#N/A	\$0.00	\$0		\$0	\$0
-Ditch, mat'l A		m3		#N/A	\$0.00	\$0		\$0	\$0
-Ditch, mat'l B		m3		#N/A	\$0.00	\$0		\$0	\$0
Construct embankment/dam		m3		#N/A	\$0.00	\$0		\$0	\$0
Supply/install pump station		each		#N/A	\$0.00	\$0		\$0	\$0
Supply/install piping system		m		#N/A	\$0.00	\$0		\$0	\$0
Remove pump post-closure		each		#N/A	\$0.00	\$0		\$0	\$0
Remove pipeline post-closure		m		#N/A	\$0.00	\$0		\$0	\$0
FLOOD PIT-Annual Cost									
Operate pumps (power)		m3		#N/A	\$0.00	\$0		\$0	\$0
Maintain pump/pipeline		allow		#N/A	\$0.00	\$0		\$0	\$0
Labour:fuel management, comissioning/decom		\$/h		#N/A	\$0.00	\$0		\$0	\$0
Chemical addition, _____ kg/m3 of water		tonne		#N/A	\$0.00	\$0		\$0	\$0
Chemicals, purchase and shipping		tonne		#N/A	\$0.00	\$0		\$0	\$0
Passive/biological additives		\$/ha		#N/A	\$0.00	\$0		\$0	\$0
Passive additives purchase and shipping		tonne		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
Annual pumping costs						\$0			
Number of years of pump flooding						years			
Total pumping costs						\$0		\$0	\$0
Total						\$120		\$60	\$60
% of Total								50%	50%

1 Chemicals/Soil Area Name:

Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly									
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
HAZARDOUS MATERIALS AUDIT									
Hazardous materials audit		mandays		#N/A	\$0.00	\$0		\$0	\$0
BUILDING DECONTAMINATION & CONSOLIDATION OF HAZARDOUS MATERIALS									
Environmental technician/coordinator		mandays		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate: oil, fuel		mandays		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate maintenance shop		mandays		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate power plant		mandays		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate bulk fuel storage		mandays		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate ANFO plant		mandays		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate offices/warehouse/accom		mandays		#N/A	\$0.00	\$0		\$0	\$0
Removal of asbestos siding on buildings		m2		#N/A	\$0.00	\$0		\$0	\$0
Removal of friable asbestos on equipment		m2		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
HAZARDOUS MATERIALS REMOVAL									
Waste oils	10% of total volume 500 (+90 from previous permits)	litre	590.	ORL	\$0.43	\$254	50%	\$127	\$127
Waste fuel	10% of total volume. From Project Description: → 275,000 L diesel → 28,000 L gasoline → 28,000 L aviation fuel = 331,000L 10% = 33,100 L	litre	33,100.	ORH	\$1.20	\$39,720	50%	\$19,860	\$19,860
Waste batteries		kg		#N/A	\$0.00	\$0		\$0	\$0
Assay & environmental lab reagents		kg		#N/A	\$0.00	\$0		\$0	\$0
Machine shop paints, solvents etc		litre		#N/A	\$0.00	\$0		\$0	\$0
Glycol		litre		#N/A	\$0.00	\$0		\$0	\$0
Process reagents	500 from previous permit	kg	500.	PCRH	\$2.50	\$1,250	50%	\$625	\$625
Nuclear sources		allow		#N/A	\$0.00	\$0		\$0	\$0
Other hazardous materials	180+360 from previous plus 500l	L	1,040.	ORH	\$1.20	\$1,248	50%	\$624	\$624
HAZARDOUS MATERIALS									
Transportation to disposal facility		allow	1.	PSC1S	\$1,000.00	\$1,000	50%	\$500	\$500
Disposal fees		allow	1.	PSC2S	\$1,000.00	\$1,000	50%	\$500	\$500
Other				#N/A	\$0.00	\$0		\$0	\$0
CONTAMINATED SOILS									
Contam. soil investigation - Phase 1	Increased based on GNWT-ID54 comment	each	1.	PSC3S	\$50,000.00	\$50,000	50%	\$25,000	\$25,000
Contam. soil investigation - Phase 2		each		#N/A	\$0.00	\$0		\$0	\$0
CONTAMINATED SOIL REMOVAL									
Excavate and transport to onsite facility		m3	0.	#N/A	\$0.00	\$0		\$0	\$0
Manage hydrocarbon remediation at facility		m3		#N/A	\$0.00	\$0		\$0	\$0
Reagents/stabilizing agent		m2		#N/A	\$0.00	\$0		\$0	\$0
Excavate and transport to offsite facility	previously 100 increase to 300 due to increased activities	m3	300.	CSRSL	\$47.00	\$14,100	50%	\$7,050	\$7,050
Contour decontaminated area	previously 100 increase to 300 due to increased activities	m3	300.	DSH	\$3.80	\$1,140	50%	\$570	\$570
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER									
Supply geomembrane, HDPE, ES3, GCL		m2		#N/A	\$0.00	\$0		\$0	\$0
Upper and lower bedding layers		m3		#N/A	\$0.00	\$0		\$0	\$0
Install geomembrane, HDPE, ES3, GCL		m2		#N/A	\$0.00	\$0		\$0	\$0
Erosion protection layer		m3		#N/A	\$0.00	\$0		\$0	\$0
Vegetate		m2		#N/A	\$0.00	\$0		\$0	\$0
Install infiltration/seepage instrumentation		allow		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
OTHER									
				#N/A	\$0.00	\$0		\$0	\$0
Total						\$109,712		\$54,856	\$54,856
% of Total								50%	50%

1 Building / Equip Name:		Bldg / Equip #: 1								
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost	
DISPOSE MOBILE EQUIPMENT										
Decontaminate and ship off-site	includes heavy equipment, drill units, and large vehicles; 46 previously plus 25	allow	72.	PSBE1S	\$2,000.00	\$144,000	100%	\$144,000	\$0	
Decontaminate and dispose on-site		allow		#N/A	\$0.00	\$0		\$0	\$0	
Other	light vehicles - trucks, quads, argos, skidoos, kabota's, etc. 33+42 previously; reduce unit cost to 400		75.	PSBE2S	\$400.00	\$30,000	100%	\$30,000	\$0	
REMOVE BUILDINGS - see note below										
Accommodation Complex	249 person camp (5250m2) + 532m2 (from previous LUP)	m2	5,782.	BRWL	\$27.50	\$159,005	50%	\$79,503	\$79,503	
Process Facilities	equipment/pump shacks; add	ea	10.	BRS1L	\$45.00	\$450	100%	\$450	\$0	
Offices, Repair, Lab, Warehouse	Coreshacks etc	m2	120.	BRWL	\$27.50	\$3,300	100%	\$3,300	\$0	
Storage Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0	
Water and Wastewater Treatment Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0	
U/G Heating Plant		m2		#N/A	\$0.00	\$0		\$0	\$0	
Emulsion Plant		m2		#N/A	\$0.00	\$0		\$0	\$0	
AN Storage Facility	AN facility	m2	500.	BRWL	\$27.50	\$13,750	100%	\$13,750	\$0	
Warehouse, Shops and Other	A geological core shed, mechanical shop, cold storage tent, dewatering shacks	m2	1,000.	BRWL	\$27.50	\$27,500	100%	\$27,500	\$0	
Storage Facility at Laydown/Airstrip		m2		#N/A	\$0.00	\$0		\$0	\$0	
Fuel tanks	Multiple fuel tanks at various pads; previously 9 units; increase to 15	ea	15.	PSBE3S	\$1,000.00	\$15,000	100%	\$15,000	\$0	
Fuel Tanks	Assume multiple large tanks	ea	3.	PSBE4S	\$6,000.00	\$18,000	100%	\$18,000	\$0	
Freshwater intake	13 km pipeline	m	13,000.	PSRL	\$1.00	\$13,000	100%	\$13,000	\$0	
Temporary Water Pipeline for conveying groundwater to the re-injection wells or to the nearest historical open pit	3 km	m	3,000.	PSRL	\$1.00	\$3,000	100%	\$3,000	\$0	
Reclaim pumps		m2		#N/A	\$0.00	\$0		\$0	\$0	
Outfall & Diffuser		m2		#N/A	\$0.00	\$0		\$0	\$0	
Airstrip lighting, navigation, electrician		mandays		#N/A	\$0.00	\$0		\$0	\$0	
Airstrip lighting, navigation, mechanical		mandays		#N/A	\$0.00	\$0		\$0	\$0	
Break foundation slabs	total of all buildings	m2		#N/A	\$0.00	\$0		\$0	\$0	
Consolidate & dump boneyard debris		m3		#N/A	\$0.00	\$0		\$0	\$0	
Other	removal generators and pumps - 1 haul truck picking up multiple locations previously 1; double to 2	allow	2.	PSBE5S	\$2,500.00	\$5,000	100%	\$5,000	\$0	
LANDFILL FOR DEMOLITION										
WASTE										
Place rock cover	Blast rock fill	m3		#N/A	\$0.00	\$0		\$0	\$0	
Place soil cover	Soil Cap - Landfill and Septic Field	m3		#N/A	\$0.00	\$0		\$0	\$0	
Vegetate		ha		#N/A	\$0.00	\$0		\$0	\$0	
GRADE AND CONTOUR PADS										
Accommodation Complex		ha		#N/A	\$0.00	\$0		\$0	\$0	
Process Facilities		ha		#N/A	\$0.00	\$0		\$0	\$0	
Offices, Repair, Lab, Warehouse		ha		#N/A	\$0.00	\$0		\$0	\$0	
Storage Facilities		ha		#N/A	\$0.00	\$0		\$0	\$0	
Water and Wastewater Treatment Facilities		ha		#N/A	\$0.00	\$0		\$0	\$0	
U/G Heating Plant		ha		#N/A	\$0.00	\$0		\$0	\$0	
Emulsion Plant		ha		#N/A	\$0.00	\$0		\$0	\$0	
Warehouse, Shops and Other		ha		#N/A	\$0.00	\$0		\$0	\$0	
Place rock cover		m3		#N/A	\$0.00	\$0		\$0	\$0	
Vegetate	It is anticipated that approximately 10% of the new drill holes will be in undisturbed areas (36 hectares [ha]), minimizing disturbance to greenfield areas.	ha	36.	PSBE6S	\$2,000.00	\$72,000	50%	\$36,000	\$36,000	
Other	Soil will be spread over the cap as closely as possible to the same level as the immediate surrounding grade: --- Spread 36 ha @ 0.15 m thick soil	m3	54,000.	DSL	\$0.95	\$51,300		\$0	\$51,300	
PUNCTURE LINED SUMPS										
Puncture liner and place soil cover		m3		#N/A	\$0.00	\$0		\$0	\$0	
RECLAIM ROADS										
Remove culverts		each		#N/A	\$0.00	\$0		\$0	\$0	
Remove bridges		each		#N/A	\$0.00	\$0		\$0	\$0	
Scarify and install water breaks		ha		#N/A	\$0.00	\$0		\$0	\$0	
Scarify airstrip		ha		#N/A	\$0.00	\$0		\$0	\$0	
Scarify laydown areas	Previous estimate was 3; double to 6	ha	6.	SCFYS	\$2,150.00	\$12,900	50%	\$6,450	\$6,450	
Vegetate		ha		#N/A	\$0.00	\$0		\$0	\$0	
Other				#N/A	\$0.00	\$0		\$0	\$0	
SPECIALIZED ITEMS										
Dispose of misc. debris and laydown area refuse				#N/A	\$0.00	\$0		\$0	\$0	
						Total		\$568,205	\$394,953	\$173,253
						% of Total			70%	30%

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

1 Post-Closure Monitoring & Maintenance

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MONITORING & INSPECTIONS						
Annual geotechnical inspection		each	1.	PSPC1S	\$10,000.00	\$10,000
Survey inspection		each		#N/A	\$0.00	\$0
Regulatory costs*		each		#N/A	\$0.00	\$0
Site water monitoring (AEMP and SNP)		each		#N/A	\$0.00	\$0
- Active closure and flooding		each		#N/A	\$0.00	\$0
- Post pit flooding		each		#N/A	\$0.00	\$0
Air Quality Monitoring Program (AQMP)		each		#N/A	\$0.00	\$0
Wildlife Effects Monitoring Program (WEMP)		each		#N/A	\$0.00	\$0
Vegetation Monitoring		each		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	\$0.00	\$0
Repair erosion - upgrade diversion ditches		allow		#N/A	\$0.00	\$0
Remove problem vegetation		allow		#N/A	\$0.00	\$0
Repair animal damage		allow		#N/A	\$0.00	\$0
Repair/upgrade access controls		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	\$0.00	\$0
Clear spillway		each		#N/A	\$0.00	\$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	\$0.00	\$0
POST-CLOSURE WATER TREATMENT**						
Annual water treatment cost, from "Water Treatment"						\$0
Subtotal, Annual post-closure costs						\$10,000
Discount rate for calculation of net present value of post-closure cost, %				0.00%		
Number of years of post-closure activity				1	years	
Present Value of payment stream						\$10,000

*Regulatory costs - annual reporting, management plans, progress reports etc.
 Include water treatment cost from "Water Treatment" worksheet if treatment is considered long term, such as ARD/ML.

1 Interim Care and Maintenance

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
INTERIM CARE & MAINTENANCE						
on-site caretaker		manmonths		#N/A	\$0.00	\$0
extra personnel		manmonths		#N/A	\$0.00	\$0
-electrician		manmonths		#N/A	\$0.00	\$0
-mechanic		manmonths		#N/A	\$0.00	\$0
annual fuel		litre		#N/A	\$0.00	\$0
misc. supplies		allow		#N/A	\$0.00	\$0
pick-up truck		each		#N/A	\$0.00	\$0
small dozer		allow		#N/A	\$0.00	\$0
small excavator		allow		#N/A	\$0.00	\$0
snow machine		allow		#N/A	\$0.00	\$0
communications		allow		#N/A	\$0.00	\$0
SNP/AEMP water sampling & reporting		each		#N/A	\$0.00	\$0
geotechnical assessment		each		#N/A	\$0.00	\$0
interim water treatment				#N/A		\$0
other	site visits to inspect, report and maintain licence compliance	each	1.	PSICM1S	\$10,000.00	\$10,000
					Annual Interim C&M Cost	\$10,000
Number of years of ICM		years	1.	Total		\$10,000

1 Mobilization/Demobilization:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MOBILIZE HEAVY EQUIPMENT						
Excavators	13T x 90km	kmtonne	1,170.	MHERL	\$3.40	\$3,978
Dump trucks	20T x 90km	kmtonne	1,800.	MHERL	\$3.40	\$6,120
Dozers	20T x 90km	kmtonne	1,800.	MHERL	\$3.40	\$6,120
Demolition shears		each		#N/A	\$0.00	\$0
Crane	26T x 90km	kmtonne	2,340.	MHERL	\$3.40	\$7,956
Loader	8T x 90km	each	720.	MHERL	\$3.40	\$2,448
Compactor		each		#N/A	\$0.00	\$0
Light duty vehicles	3T x 4 x 90km	kmtonne	1,080.	MHERL	\$3.40	\$3,672
MOBILIZE MISC. EQUIPMENT						
Pump shipping		each		#N/A	\$0.00	\$0
Pipe shipping		m		#N/A	\$0.00	\$0
Minor tools and equipment		allow		#N/A	\$0.00	\$0
Truck tires		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
MOBILIZE CAMP						
Reclamation activities		allow		#N/A	\$0.00	\$0
Long term reclamation activities (eg pump flooding)		allow		#N/A	\$0.00	\$0
MOBILIZE WORKERS						
Reclamation activities - transport	estimated number of days - 30 days; increase to 60	each	60.	PSMob1S	\$200.00	\$12,000
Reclamation activities - travel time		manhours		#N/A	\$0.00	\$0
Long term reclamation activities (eg pump flooding) - transport		each		#N/A	\$0.00	\$0
Long term reclamation activities (eg pump flooding) - travel time		each		#N/A	\$0.00	\$0
Monitoring Airfare		each		#N/A	\$0.00	\$0
WORKER ACCOMODATIONS						
Reclamation activities		manmonths		#N/A	\$0.00	\$0
Long term reclamation activities (eg pump flooding)		manmonths		#N/A	\$0.00	\$0
Food	no camp but food will be provided - 10 staff/60 days	allow	600.	PSMob2S	\$30.00	\$18,000
Labourer salaries	10 laborers for 60 days	allow	600.	LAB-USH	\$43.98	\$26,388
MOBILIZE FUEL						
Fuel freight - reclamation activities	20000 liters	litre	20,000.	FCDL	\$0.99	\$19,800
Fuel freight - long term reclamation activities		litre		#N/A	\$0.00	\$0
Fuel freight accomodations		litre		#N/A	\$0.00	\$0
WINTER ROAD						
Construction and operation		km		#N/A	\$0.00	\$0
Limited winter use		WRU		#N/A	\$0.00	\$0
Winter road tarriff		km		#N/A	\$0.00	\$0
DEMOBILIZE HEAVY EQUIPMENT						
Excavators	13T x 90km	kmtonne	1,170.	MHERL	\$3.40	\$3,978
Dump trucks	20T x 90km	kmtonne	1,800.	MHERL	\$3.40	\$6,120
Dozers	20T x 90km	kmtonne	1,800.	MHERL	\$3.40	\$6,120
Demolition shears		km		#N/A	\$0.00	\$0
Crane	26T x 90km	kmtonne	2,340.	MHERL	\$3.40	\$7,956
Loader	8T x 90km	kmtonne	720.	MHERL	\$3.40	\$2,448
Compactor		each		#N/A	\$0.00	\$0
Light duty vehicles	3T x 4 x 90km	kmtonne	1,080.	MHERL	\$3.40	\$3,672
Other		km		#N/A	\$0.00	\$0
DEMOBILIZE CAMP						
		allow		#N/A	\$0.00	\$0
DEMOBILIZE WORKERS						
crew travel time		mandays		#N/A	\$0.00	\$0
crew transportation	estimated number of days 60	each	60.	PSMob1S	\$200.00	\$12,000
WINTER ROAD						
Construction and operation		km		#N/A	\$0.00	\$0
Limited winter use		km		#N/A	\$0.00	\$0
Winter road tarriff		km		#N/A	\$0.00	\$0
					Total	\$148,776

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

Filter by unit

ITEM	Detail	COST CODE	UNITS	LOW \$	HIGH \$	SPECIFIED \$	COMMENTS
Accommodation							
		ACCM	manday	\$100.00	\$175.00		
Buildings - Decontaminate							
	Asbestos	BDA	m2	\$25.60	\$51.20		Low: removal of asbestos siding & flooring; High: removal of insulated pipes, friable asbestos Unit costs are based on 3m high, single storey building. Scale areas accordingly.
Buildings - Remove							
	Wood	BRW	m2	\$27.50	\$41.00		
	Concrete	BRC	m2	\$40.00	\$65.00	\$6.00	Specified: puncture concrete foundation slabs
	Steel - teardown	BRS1	m2	\$45.00	\$65.00		
	Steel - for salvage	BRS2	m2	\$67.00	\$100.00		
Concrete work							
	Small pour	CSF	m3	\$426.50	\$639.75		Low: YK; High=1.5xLow
	Large pour	CLF	m3	\$353.50	\$530.25	\$2,130.00	Specified: concrete crown pillar
Contaminated Soils							
	ESA Phase 1	CS1	each	\$7,500.00			Low: small, "clean" site
	ESA Phase 1	CS2	each	\$50,000.00			Low: small, "clean" site
	Remediate on site	CSR	m3	\$47.00	\$146.00		
Dozing							
	doze rock piles	DR	m3	\$1.05	\$2.40		Low cost: doze crest off dump
	doze overburden/soil piles	DS	m3	\$0.95	\$3.80		High cost: push up to 300 m
Excavate Rock; Low Spec's and QA/QC							
	drill/blast/load/short haul	RB1	m3	\$11.40	\$17.05		Low:quarry operations for bulk fill
	drill/blast/load/long haul	RB2	m3	\$12.05	\$17.80		
	RB1 + spread and compact	RB3	m3	\$12.05	\$17.80		
	RB2 + spread and compact	RB4	m3	\$12.50	\$30.75		
	Specified activity	RBS	m3				
Excavate Rock; High Spec's and QA/QC							
	drill/blast/load/short haul	RC1	m3	\$12.05	\$17.80		(e.g. ditch/spillway excavation) Low: foundation excavation;High:spillway excavation
	drill/blast/load/long haul	RC2	m3	\$12.70	\$18.40		
	RC1 + spread and compact	RC3	m3	\$12.70	\$18.40		e.g. cover construction
	RC2 + spread and compact	RC4	m3	\$13.50	\$19.20		e.g. cover construction
	Specified activity	RCS	m3			\$175.00	Specified-drift excavation
Excavate Rip Rap							
	drill/blast/load/short haul/place	RR1	m3	\$13.50	\$17.75		High: quarry & place rip rap in channel
	drill/blast/load/long haul/place	RR2	m3	\$14.20	\$20.65		
	source is waste dump/short haul	RR3	m3	\$7.00			cost includes sorting
	source is waste dump/long haul	RR4	m3	\$7.60			
	Specified activity	RRS	m3				
Excavate Soil; Low Spec's and QA/QC							
	clear & grub	SBC	m2	\$3.40	\$5.00		
	excavate/load/short haul	SB1	m3	\$4.30	\$5.90		Low: non-engineered; High:engineered
	excavate/load/long haul	SB2	m3	\$4.60	\$7.30		Low: non-engineered; High:engineered
	SB1 + spread and compact	SB3	m3	\$5.10	\$8.90		Low: rehandle waste rock dump by dozing; High:rehandle waste rock by hauling
	SB2 + spread and compact	SB4	m3	\$5.50	\$11.00		High:contour surface - wet or frozen; Specified:haul/place wet infill
	Specified activity	SBS	m3	\$3.20	\$6.30		
	Tailings	SBT	m3	\$1.35	\$3.70	\$15.50	
Excavate Soil, High Spec's and QA/QC							
	excavate/load/short haul	SC1	m3	\$6.80	\$9.30		Low: non-engineered; High:engineered
	excavate/load/long haul	SC2	m3	\$7.10	\$11.75		Low: non-engineered; High:engineered (e.g. complex covers, low volume dam construction)
	SC1 + spread and compact	SC3	m3	\$8.90	\$14.20		Backfill adit with waste rock
	SC2 + spread and compact	SC4	m3	\$9.30	\$23.20		
	Specified activity	SCS	m3			\$18.80	
Fence							
		FNC	m	\$13.55	\$203.00		
Fuel and Electricity							
	Fuel cost - gas	FCG	litre	\$1.05	\$1.40		High: winter road usage
	Fuel cost - diesel	FCD	litre	\$0.99	\$1.39		Low and High:Yellowknife; Specified:diesel generator
	Fuel mobilization	FCM	litre	\$0.22	\$0.42		
	Electricity	FCE	kW-h	\$0.17	\$0.19	\$0.49	
Geo-Synthetics							
	geotextile	GST	m2	\$3.44			Supply and install
	geogrid	GSG	m2	\$5.75			
	liner, HDPE	GSHDPE	m2	\$7.95			Supply and install; large quantity

2020 Dollars

Unit Cost Inflater	100.0%
Yellowknife - July 2020	\$138.90
Yellowknife - 2014 Inflation	\$128.40
	8.2%

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

Filter by unit

2020 Dollars

liner, ES3	GSES3	m2	\$20.20		
geosynthetic installation	GSI	m2	\$3.16	\$14.00	
bentonite soil amendment	GSBA	tonne	\$308.30	\$348.50	
Grouting (/m3 of rock grouted)					
	grout	m3	\$236.55	\$286.75	
Labour & Equipment Rates					
Site manager	sman	\$/hr	\$125.00	\$152.00	
Supervisor	super	\$/hr	\$52.00	\$91.84	
Registered engineer	eng	\$/hr	\$95.00	\$220.00	
Environmental coordinator	envco	\$/hr	\$74.16	\$130.00	
Environmental technologist	envtech	\$/hr	\$36.00		
Electrician	elec	\$/hr	\$74.00	\$95.00	
Journeyman - various	journey	\$/hr	\$44.00	\$71.79	
Labour - skilled	lab-s	\$/hr	\$41.00	\$49.60	
Labour - unskilled	lab-us	\$/hr	\$31.00	\$43.98	
Equipment operator	oper	\$/hr	\$41.00	\$65.00	
Heavy duty mechanic	mech	\$/hr	\$49.00	\$72.85	
Water treatment plant operator	oper-wt	\$/hr	\$41.00	\$59.86	
Security / first aid	safety	\$/hr	\$36.00	\$66.97	
Administrative staff	admin	\$/hr	\$38.00	\$57.89	
Equipment rates include operator and fuel					
Loader - 4 cu.yd (3.06m3)	load-s	\$/hr	\$175.00		
Loader - 7 cu.yd (5.35m3)	load-l	\$/hr	\$315.00		
Excavator - 26.76-30.84 tonnes	exc-s	\$/hr	\$190.00		
Excavator - 68.95+tonnes	exc-l	\$/hr	\$420.00		
Grader	grad	\$/hr	\$190.00		
Dump truck off hwy 30-50 tonnes	truck-s	\$/hr	\$225.00		
Dump truck off hwy 55-75 tonnes	truck-l	\$/hr	\$300.00		
dozer, small	dozers	\$/hr	\$205.00	\$260.00	
dozer, large	dozerl	\$/hr	\$490.00	\$565.00	
smooth drum compactor	comp	\$/hr	\$155.00		
scooptram, 6 yd3 bucket	scoop	\$/hr	\$170.00		
flat bed truck with hiab	hiab	\$/hr	\$155.00		
fuel truck	ftruck	\$/hr	\$150.00		
water truck	wtruck	\$/hr	\$58.00	\$150.00	
Mobilize Heavy Equipment					
Road access	MHER	kmtonne	\$3.40	\$10.25	
Air access	MHEA	kmtonne	\$12.00		cargo rate>500lb
Mobilize Camp					
Road access	MCR	each	\$50,000.00		refurbish existing camp
Mobilize Workers					
flight	MW	each	\$4,500.00	\$9,100.00	Low:e.g. 8 passenger; High: Dash 7
Oil Removal					
oil removal	OR	litre	\$0.43	\$1.20	Low:waste oil heater; High: ship offsite
PCB Removal					
Remove from site	PCBR	litre	\$40.20	\$46.90	Low: shipping, handling & disposal from Yellowknife
Pipes, small (<6in dia.)					
remove/dispose on site	PSR	m	\$1.00	\$24.00	Low: remove/dispose on site; High: remove/re-use
supply	PSS	m	\$6.10	\$11.10	Low:supply; High:supply and ship
install	PSI	m	\$25.00		
Pipes, large (>6in dia.)					
remove/dispose on site	PLR	m	\$22.00	\$72.00	Low: remove/dispose on site; High: remove/re-use
supply	PLS	m	\$129.00	\$143.00	Low:supply; High:supply and ship
install	PLI	m	\$50.00		
Power Lines					
remove/dispose on site	POWR	m	\$25.50		
Process Chemicals					
Remove from site	PCR	kg	\$0.45	\$2.50	Low: shipping, handling & disposal from Yellowknife
Pumps					
Pump capital cost	PC	each	\$195,000.00		
Pump shipping	PS	each	\$2,500.00		
Pump operating cost	POC	m3	\$0.12		pump operating costs should be calculated based on pump capacity, fuel costs, etc.
Pump maintenance	PM	allow	\$25,000.00		
Pump sand BackFill					
	PBF	m3	\$85.00	\$300.00	
Scarify - road/mine site					
	SCFY	ha	\$4,300.00	\$6,030.00	\$2,150.00
Shaft, Raise & Portal Closures					
Shaft & Raises	SR	m2	\$645.00	\$2,132.00	Low:pre-cast concrete slabs, little site prep. Area=shaft->1m all around

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

Filter by unit

2020 Dollars

Portals	POR	m3	\$18.80	\$250.00	\$1,200.00	Low:unit cost code SCS;High:excavate & backfill collapsed portal;Spec: installed pressure plug
Site Inspection Report						
	RPT	each	\$10,000.00	\$20,000.00		
SpillWay - Clear						
	SW	each	\$3,000.00	\$7,000.00		
Survey/Instrumentation						
	SI	each	\$1,800.00	\$3,600.00		2 person crew
Treatment Plant - Construct						
Small (< 1000 m3/d)	TPS	lump sum	\$9,000,000.00	\$15,000,000.00		
Large (> 1000 m3/d)	TPL	lump sum	\$15,000,000.00	\$46,000,000.00		
Constructed Wetland	CWTS	ha	\$200,000.00	\$300,000.00		
Treatment Plant - Operate						
	TPO	m3	\$0.35	\$2.00		
Treatment Chemicals						
ferric sulphate	ferric	kg	\$1.19			
ferrous sulphate	ferrous	kg	\$1.32			
lime	lime	kg	\$0.56			
hydrogen peroxide, 35%	hperox	kg	\$1.50			
Sodium Metabisulfate	Nametab	kg	\$1.18			
Caustic soda, 50%	caustic	kg	\$0.74			
Sulfuric acid, 93%	sulfuric	kg	\$0.31			
flocculant	flocc	kg	\$6.00			
copper sulphate	copper	kg				
shipping	shipping	kg	\$0.20			
Vegetation						
Hydroseed, Flat	VHF	ha	\$4,000.00			
Hydroseed, Sloped	VHS	ha	\$4,500.00			
Veg. blanket/erosion mat	VB	ha	\$13,000.00			
Tree planting	VT	ha	\$2,600.00	\$6,000.00		
Wetland species	VW	ha			\$47.72	Specified= /m3, Wetland Growth Media Substrate mixed and installed (sand, biochar and fertilizer, woodchips)
Water Sampling/Analysis/Reporting						
	WS	each	\$7,000.00	\$10,000.00		
Winter Road						
Construction	WRC	km	\$2,000.00	\$11,500.00		
Usage	WRU	kmtonne	\$0.29			
Project Specific Unit Costs - PPML 2020 proposed costs						
Chemicals						
Transportation to disposal facility	PSC1	allow		\$1,000.00		Okay, based on expected limited amounts of hazmat and close highway access
Disposal fees	PSC2	allow		\$1,000.00		Okay, based on expected limited amounts of hazmat and close highway access
Contam. soil investigation - Phase 1	PSC3	allow		\$50,000.00		Okay
Bldgs&Equip						
Decontaminate and ship off-site	PSBE1	ea		\$2,000.00		Reasonable for decon and trailer removal of heavy equipment - highway access
Decontaminate and ship off-site	PSBE2	ea		\$400.00		Reasonable for decon and trailer removal of light equipment - highway access
Fuel Tanks	PSBE3	ea		\$1,000.00		Okay
Fuel Tanks	PSBE4	ea		\$6,000.00		Okay
removal generators and pumps	PSBE5	ea		\$2,500.00		Okay
vegetate - grade and contour pads	PSBE6	ha		\$2,000.00		Reduced vegetate costs - okay based on stated closure objectives and understood regulatory requirements
PostClosure						
Annual geotechnical inspection	PSPC1	allow		\$10,000.00		Okay, based on expected limited geotechnical disturbances and close highway access
ICM						
site visits to inspect, report and maintain licence compliance	PSICM1	allow		\$10,000.00		Okay, based on expected limited geotechnical disturbances and close highway access
Mob						
Reclamation activities - transport	PSMob1	ea		\$200.00		Okay
Food	PSMob2	persons		\$30.00		Okay

INFLATION	#DIV/0!
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Closure and Reclamation Plan for the Confirmation and Exploration Program
November 23, 2020

ID	Sect.	Sub-Sect.	Column n1	Activity	Quantity	Unit	Detail	Notes	BCL Review
1	1	Open Pit							
2		RECLAIM QUARRIES							
3				Contour slopes	50.	m3	5 test pits @ 20 tonnes each requiring re-grading following removal of 1-2 tonne sample	PPML Mar2020 → following IR	No change
4	2	Chemicals							
5		HAZARDOUS MATERIALS REMOVAL							
6				Waste oils	590.	L	10% of total volume 500 (+90 from previous permits)		No change
7				Waste fuel	33,100.	L	Old: 10% of total volume (16000) use 1683 from previous permit New: 10% of total volume. From Project Description: → 275,000 L diesel → 28,000 L gasoline → 28,000 L aviation fuel = 331,000L 10% = 33,100 L	From 2020 Project Description, Maximum Fuel Volumes	Changed from PPML CE: → 1683 L
8				Process reagents	500.	kg	500 from previous permit		No change
9				Other hazardous materials	1,040.	L	180+360 from previous plus 500l		No change
10		HAZARDOUS MATERIALS							
11				Transportation to disposal facility	1,000.	\$ allowance			No change
12				Disposal fees	1,000.	\$ allowance			No change
13		CONTAMINATED SOILS							
14				Contam. soil investigation - Phase 1	50,000.	\$ allowance	Increased based on GNWT-ID54 comment		No change
15	3	Bldgs&Equip							
16		DISPOSE MOBILE EQUIPMENT							
17				Decontaminate and ship off-site	72.	ea	includes heavy equipment, drill units, and large vehicles; 46 previously plus 25		No change
18				Other	75.	ea	light vehicles - trucks, quads, argos, skidoos, kabota's, etc. 33+42 previously; reduce unit cost to 400		No change
19		REMOVE BUILDINGS - see note below							
20				Accommodation Complex	5,782.	m2	249 person camp (5250m2) + 532m2 (from previous LUP)		No change
21				Process Facilities	10.	ea	equipment/pump shacks; add		No change
22				Offices, Repair, Lab, Warehouse	120.	m2	Coreshacks etc		No change
23				AN Storage Facility	500.	m2	AN facility		No change
24				Warehouse, Shops and Other	1,000.	m2	A geological core shed, mechanical shop, cold storage tent, dewatering shacks		No change
25				Fuel tanks	15.	ea	Multiple fuel tanks at various pads; previously 9 units; increase to 15		No change
26				Fuel Tanks	3.	ea	Assume multiple large tanks		No change
27				Freshwater intake	13,000.	m	13 km pipeline		No change
28				Temporary Water Pipeline for conveying groundwater to the re-injection wells or to the nearest historical open pit	3,000.	m	3 km	From 2020 Project Description, for Groundwater Tests	Added
29				Other	2.	allow	removal generators and pumps - 1 haul truck picking up multiple locations previously 1; double to 2		No change
30		GRADE AND CONTOUR PADS							
31				Vegetate	36.	ha	Old: Previous estimate was 4.28; increase due to additional pads New: It is anticipated that approximately 10% of the new drill holes will be in undisturbed areas (36 hectares [ha]), minimizing disturbance to greenfield areas. Soil will be spread over the cap as closely as possible to the same level as the immediate surrounding grade: → Spread 36 ha @ 0.15 m thick soil	From PPML Technical Session Response, #8 Drilling Footprint	Changed from PPML CE: → 10 ha
32				Other	54,000.	m3			Added
33		RECLAIM ROADS							
34				Scarify laydown areas	6.	ha	Previous estimate was 3; double to 6		No change
35	4	PostClosure							

ID	Sect.	Sub-Sect.	Column 1	Activity	Quantity	Unit	Detail	Notes	BCL Review
36				MONITORING & INSPECTIONS					
37				Annual geotechnical inspection	10,000.	\$ allowance			No change
38	5	ICM							
39				INTERIM CARE & MAINTENANCE					
40				other	10,000.	\$ allowance	site visits to inspect, report and maintain licence compliance		No change
41	6	Mob							
42				MOBILIZE HEAVY EQUIPMENT					
43				Excavators	1,170.	kmtonne	13T x 90km		No change
44				Dump trucks	1,800.	kmtonne	20T x 90km		No change
45				Dozers	1,800.	kmtonne	20T x 90km		No change
46				Crane	2,340.	kmtonne	26T x 90km		No change
47				Loader	720.	each	8T x 90km		No change
48				Light duty vehicles	1,080.	kmtonne	3T x 4 x 90km		No change
49				MOBILIZE WORKERS					
50				Reclamation activities - transport	60.	ea	estimated number of days - 30 days; increase to 60		No change
51				WORKER ACCOMODATIONS					
52				Food	600.	ea	no camp but food will be provided - 10 staff/60 days		No change
53				Labourer salaries	600.	ea	10 laborers for 60 days		No change
54				MOBILIZE FUEL					
55				Fuel freight - reclamation activities	20,000.	L			No change
56				DEMobilize HEAVY EQUIPMENT					
57				Excavators	1,170.	kmtonne	13T x 90km		No change
58				Dump trucks	1,800.	kmtonne	20T x 90km		No change
59				Dozers	1,800.	kmtonne	20T x 90km		No change
60				Crane	2,340.	kmtonne	26T x 90km		No change
61				Loader	720.	kmtonne	8T x 90km		No change
62				Light duty vehicles	1,080.	kmtonne	3T x 4 x 90km		No change
63				DEMobilize WORKERS					
64				crew transportation	60.	ea	estimated number of days 60		No change