



7th Floor - 4922 48th Street,
P.O. Box 2130, Yellowknife NT X1A 2P6

Tel: 867-669-0506 Fax: 867-873-6610
www.mvlwb.com

Staff Report

Applicant: NWT Rare Earths Ltd.	
Location: Thor Lake Area, NT	File Number: MV2014D0001 MV2014L2-0001
Date Prepared: September 8, 2020	Date of Board Meeting: September 17, 2020
Subject: Closure and Reclamation Plan	

1. Purpose

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) a Closure and Reclamation Plan (Plan) submitted by NWT Rare Earths Ltd (NWTREL) to satisfy Part I, condition 4 of Water Licence (Licence) MV2014L2-0001 and condition 68 of Land Use Permit (Permit) MV2014D0001.

2. Background

- April 24, 2014 – Issuance of Permit MV2014D0001;
- May 22, 2014 – Issuance of Licence MV2014L2-0001;
- January 7, 2020 – Assignment from Avalon Advanced Materials Inc. to NWT Rare Earths Ltd. approved;
- April 2, 2020 – Amendment approved by the Board;
- July 3, 2020 – Closure and Reclamation Plan submitted;
- July 7, 2020 – Plan distributed and review commenced;
- July 30, 2020 – Reviewer comments and recommendations due and received;
- September 4, 2020 – Responses submitted; and
- **September 17, 2020 – Plan presented to the Board for decision;**
- April 23, 2021– Expiration of Permit; and
- May 21, 2021 – Expiration of Licence

3. Discussion

History

In 2014, a Permit and Licence were issued to Avalon for early works associated with the larger mining applications (waiting additional information from Avalon). On January 7, 2020 both of the authorizations were assigned to NWT Rare Earths Ltd. and then amended April 2, 2020 for the inclusion of a demonstration project.

On July 3, 2020, NWTREL submitted the Closure and Reclamation Plan for both authorizations.

The Closure and Reclamation Plan is required under Part I, condition 4 of Licence MV2014L2-0001 and condition 68 of Permit MV2014D0001 which states:

The Licensee shall, one year prior to the expiration of this Licence, submit a revised Closure and Reclamation Plan to the Board for approval, developed in accordance with the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development's *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*, or subsequent editions.

The Permittee shall, prior to a year of the expiration of this Permit, submit a Closure and Reclamation Plan to the Board for approval, developed in accordance with the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development's *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*.

Description of Plan

The Plan is divided into two phases:

- 1) The Nechalacho Rare Earths Demonstration Project, which consists of a small scale open-cast surface bulk sample operation, stockpiles, plant, and equipment storage area in the T-Zone deposit.
- 2) The Preliminary Site Preparation and Construction Phase for the Underground Mine, Concentrator, Camp, Tailings Management Facility, and Supporting Infrastructure. This phase includes only preliminary preparation and construction activities in advance of full scale mining activities at the Basal Zone deposit.

In the Licence and the Permit, there is no specific schedule for NWTREL to follow or to adhere to based on the size of the project, however as noted in the condition adherence to the *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories* is required. The Plan consisted of the following elements:

- 1) Introduction
- 2) Project Description
- 3) Project Environment
- 4) Permanent Closure and Reclamation
 - a. Goals
 - b. Objectives
 - c. Reclamation Strategies
 - i. Demonstration Project
 - ii. Open-cast Excavation
 - iii. Waste and Ore Stockpiles
 - iv. Surface Water Management Infrastructure
 - v. Supporting Infrastructure
 - vi. Oil and Fuel Storage
- 5) Progressive Reclamation
 - a. Contingencies
- 6) Temporary Closure
- 7) Post Closure Monitoring
 - a. Demonstration Project

- b. Preliminary Site Preparation and Construction Phases for the Underground Mine, Concentrator, Camp, TMF, and Supporting Infrastructure
- 8) Financial Security

4. Comments

n/a

5. Public Review

By July 30, 2020 comments and recommendations on the Plan were received from the Government of the Northwest Territories – Environment and Natural Resources (Environmental Assessment and Monitoring).

NWT Rare Earths Ltd. responded by September 4, 2020. Review Summary and Attachments (attached) presents the concerns identified through this review.

Main areas where additional information was requested during the review”

The following summarizes the main areas where additional information was requested during the review:

- Post closure monitoring (frequency for each component)
- Clarification on process and purpose for the vegetation over on waste piles
- Outline scenarios where equipment would be left of onsite
- Revised measurement for water quality to reference the quality that the results will be measured against
- Additional information on actions for instances where water is not found to meet the criteria
- Define “priority” areas, and how the areas were selected
- Provide risk based criteria
- Clarification on the use of a landfarm
- Details on monitoring groundwater
- Options if ground water doesn’t meet the closure criteria
- Details on covers for waste piles and ore stockpiles.

6. Security

The status of security for this Project will not be affected by the Board’s decisions related to the Plan.

7. Conclusion

NWT Rare Earths Ltd. provided responses as well as a commitment to work with the Government of the Northwest Territories – Environment and Natural Resources to further refine the Plan within one year of the start of operations and that the outcome will result in an updated version of the Plan.

8. Recommendation

Board staff recommend the Board:

- a) **Make a motion to approve the Closure and Reclamation Plan** as required by Land Use Permit MV2014D0001 and Water Licence MV2014L2-0001.

A draft decision letter is attached.

9. Attachments

- [Closure and Reclamation Plan](#)
- Review Summary and Attachments
- Draft Decision Letter from the Board

Respectfully submitted,

A handwritten signature in blue ink that reads "Tyree Mullaney". The signature is written in a cursive style and is placed on a light yellow rectangular background.

Tyree Mullaney
Regulatory Specialist

Review Comment Table

Board:	MVLWB
Review Item:	Nechalacho - Closure and Reclamation Plan - MV2014L2-0001 MV2014D0001
File(s):	MV2014D0001 MV2014L2-0001
Proponent:	NWT Rare Earths Ltd
Document(s):	Closure and Reclamation Plan (3 MB)
Item For Review Distributed On:	July 7 at 08:27 Distribution List
Reviewer Comments Due By:	July 30, 2020
Proponent Responses Due By:	Aug 6, 2020
Item Description:	<p>NWT Rare Earth Ltd submitted their Closure and Reclamation Plan on July 3, 2020. This Report is required by Water Licence MV2014L2-0001 (Part I, condition 2) and Land Use Permit MV2014D0001 (condition 68).</p> <p>Using the Online Review System (ORS), reviewers are invited to submit comments and recommendations on the documents linked below by the review comment deadline specified. Reviewers may also wish to consider providing an overarching recommendation regarding whether the Board should approve the submission, to provide context for the comments and recommendations and assist the Board with its decision. If reviewers seek clarification on the submission, they are encouraged to correspond directly with the Applicant prior to submitting comments and recommendations.</p> <p>All documents that have been uploaded to this review are also available on our public Registry. If you have any questions or comments about the ORS or this review, please contact Board staff identified below.</p>
Contact Information:	Jen Potten 867-766-7468 Tyree Mullaney 867-766-7464

Comment Summary

GNWT - ENR - EAM (Environmental Assessment and Monitoring): Central Email GNWT				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Response
18	General File	Comment (doc) ENR Letter with Comments and Recommendations Recommendation		

1	Topic 1: Temporal Period for Post-closure Monitoring	<p>Comment Section 4.3 of the Plan (Closure and Reclamation Objectives) states: "Post-closure environmental maintenance and monitoring may be carried out if required for revegetation and surface stabilization efforts, surface water quality and other required environmental components to verify achievement of closure criteria". Regarding the temporal period of post-closure monitoring, Section 7.2 (Post-Closure Monitoring) does not provide any details on the frequency or period of monitoring that is expected to commence post-closure. Due to the potential impacts to the local environment from the project (i.e., waste rock, water retention ponds), ENR expects that the proponent should clarify their expected frequency and timeframe for post-closure monitoring. ENR notes that at least five years of post-closure monitoring will be expected if the project is completed as described in the Plan.</p> <p>Recommendation 1) ENR recommends that the proponent provide additional information on the expected frequency and duration of post-closure monitoring for the project (e.g., one inspection every year for five years). This should include all components of post-closure monitoring (i.e., water quality, vegetation, site stability, etc.).</p>	<p>Sep 4: NWTREL proposes to determine details of post-closure monitoring by conducting a Closure Risk Assessment within one year of the start of operations, within an updated version of the CRP. NWTREL will carry out progressive reclamation and monitoring during the two-year planned project life; post-closure monitoring may not be required if closure criteria have been met through progressive reclamation activities by the end of operations. More information will be available to support the CRP at the conclusion of ongoing long-term geochemical testing.</p>	The response provided is adequate.
2	Topic 2: Vegetation Cover	<p>Comment Section 4.3 of the Plan states: "Use of agronomic species will be</p>	<p>Sep 4: NWTREL proposes to add to the next version of the CRP that the vegetation cover</p>	The response provided is adequate.

		<p>limited and will likely only occur in instances where the establishment of a rapid cover". ENR is seeking clarity on the ultimate objective of the vegetation cover, namely is the cover only to provide an aesthetics cover or is there a structural integrity component (i.e., reduction of erosion potential). If the latter, this would require different monitoring and criteria.</p> <p>Recommendation 1) ENR recommends the proponent comment on the ultimate purpose of the vegetation cover for the waste piles.</p>	<p>on the waste pile is strictly for aesthetics, there are no erosion or safety concerns</p>	
3	Topic 3: Deserted Waste	<p>Comment Section 4.3 states: "Infrastructure not required beyond closure will be decontaminated, dismantled, and removed from site where economic to do so (emphasis added)." Without additional information on the types of situations when these activities may not be economical, it isn't clear how this clause may be applied.</p> <p>Recommendation 1) ENR recommends the proponent provide an outline of probable scenarios where it wouldn't be economical and infrastructure may not require remediation, including examples of the types of waste that may be deserted.</p>	<p>Sep 4: NWTREL proposes to add examples of infrastructure that may be left in the next version of the CRP. Examples of infrastructure that may not be removed are roads used by local outfitters and for fighting forest fires. Infrastructure of value to local communities could be left behind after consultation with Affected Parties.</p>	<p>The response provided is adequate.</p>
4	Topic 4: Table 1 Closure Objectives - Water Quality Criteria	<p>Comment The proposed closure criteria for water quality criteria in Table 1 states: "Closure water quality criteria will be developed using generic guidelines and site-specific risk based criteria and for the protection of</p>	<p>Sep 4: Closure water quality criteria will be developed following engagement with GNWT-ENR, and using the effluent quality requirements in Water Licence MV2014L2-0001 Part G Item 14 as a starting point. NWTREL notes</p>	<p>The response provided is adequate.</p>

		<p>aquatic life that includes operations experience and preconstruction background conditions". ENR notes that the closure criteria are vague and should be better defined prior to operations.</p> <p>Recommendation 1) ENR recommends the proponent provide an update on when closure water quality criteria will be developed for public review. This should include a discussion on the guidelines to be selected, and how site-specific risk based criteria will be developed and selected.</p>	<p>that blasting is not planned after the first year of operations, so ammonia and nitrate concentrations are not expected to be a concern post-closure.</p>	
5	None	<p>Comment None</p> <p>Recommendation 2) ENR recommends the proponent clarify how operations experience will be used in the development of closure water quality criteria.</p>	<p>Sep 4: NWTREL proposes to add clarification that operations experience; includes collecting historical water analysis from operations and demonstrating that the water quality discharged meets set criteria.</p>	<p>The response provided is adequate.</p>
6	Topic 5: Table 1 " Closure Objectives - Water Quality Actions	<p>Comment Regarding water quality actions/measurements, Table 1 of the Plan (closure objectives and criteria) states that actions will include "Post-closure monitoring of lakes, streams, site runoff and seepage at appropriate on site locations." ENR notes that these actions are too general to be effectively measurable. Monitoring in itself should not be set as a measure; rather, the action for water quality should include some reference to meeting closure criteria. Further discussion in the Plan is also required for instances where water is found not to meet these criteria (i.e., unsafe for discharge). This should</p>	<p>Sep 4: NWTREL proposes to propose details of post-closure monitoring through discussions with GNWT-ENR and through a Closure Risk Assessment within one year of the start of operations. The outcome of these processes will be included in the next version of the CRP.</p>	<p>The response provided is adequate.</p>

		include whether water will be treated to meet the requirements. Recommendation 1) ENR recommends that the measurement for water quality be revised to reference the quality that results will be measure against (i.e. closure criteria).		
7	None	Comment None Recommendation 2) ENR recommends that the proponent update the Plan with greater detail on actions for instances where water is found not to meet these criteria.	Sep 4: NWTREL proposes to propose details of post-closure monitoring through discussions with GNWT-ENR and through a Closure Risk Assessment within one year of the start of operations. The outcome of these processes will be included in the next version of the CRP.	The response provided is adequate.
8	Topic 6: Revegetation Areas	Comment Table 1 of the Plan states for the revegetation closure objective that the criteria and measurement are: "Revegetation targeted to priority areas. Revegetation activities have been completed at priority areas; acceptable vegetation biodiversity has been reached. Inspection and submission of a summary report by a qualified person". ENR is uncertain on what is defined as "priority" areas or "qualified person" by the proponent. Recommendation 1) ENR recommends that the proponent define what priority areas are in the Plan and refer to this information in the measurement/action part of Table 1 (e.g., a separate table of locations that need to be revegetated and diversity/density amounts that would be acceptable). The proponent	Sep 4: NWTREL proposes to determine details of post-closure monitoring by conducting a Closure Risk Assessment within one year of the start of operations, within an updated version of the CRP.	The response provided is adequate.

		should also include a discussion on how these areas are selected.		
9	None	Comment None Recommendation 2) ENR recommends that the qualified person include a Professional Biologist for the vegetation assessment.	Sep 4: NWTREL notes that qualified person; will be based on experience conducting similar vegetation assessments, and that biologist is not a regulated profession in NWT.	The response provided is adequate.
10	Topic 7: Contaminated Soils and Waste Closure Disposal Objective	Comment For the contaminated soils and waste closure disposal objective, Table 1 states that the criterion is: "The mine site is remediated to site specific risk-based criteria. Potential contaminant sources are remediated on site or removed from site." The Plan provides no specific details on the risk-based criteria or how this may look at final closure. Additionally, it isn't clear how contaminated soil will be remediated on site if the proponent has not requested a landfarm to be included in the scope of work. Recommendation 1) ENR recommends that the proponent provide the risk-based criteria that will be used for the mine site at closure, or discuss how these will be selected in future.	Sep 4: NWTREL will propose details of post-closure monitoring through a meeting with GNWT-ENR and completing a Closure Risk Assessment within one year of the start of operations, within an updated version of the CRP.	The response provided is adequate.
11	None	Comment None Recommendation 2) ENR recommends that the proponent clarify if a landfarm is required on-site. If the proponent does not intend to remediated waste soil on-site via landfarming, ENR recommends the proponent update the objective to the following: The mine site is remediated to site specific risk-based	Sep 4: NWTREL will consider this suggestion and provide further detail in the next version of the CRP.	The response provided is adequate.

		criteria. Potential contaminant sources are removed from site.		
12	Topic 8: Portal Closure Water Quality Criteria	<p>Comment For the portal closure water quality objective, Table 1 states that: "Underground mine should not contribute to the contamination of ground or surface water. Closure water quality criteria to be developed using generic guidelines and site-specific risk based criteria. Post-closure monitoring of groundwater and surface water." As discussed previously for the surface water quality, ENR notes that the closure criteria are vague and should be better defined prior to construction. For example, greater details on how the proponent will be monitoring groundwater conditions should be included as well as a discussion on the mitigation options that are available if the groundwater quality that may report to the surface is not meeting the criteria.</p> <p>Recommendation 1) ENR recommends that the proponent provide additional information on timelines for when the closure water quality criteria will be developed for public review. This should include a discussion on what guidelines will be selected, and how site-specific risk based criteria will be developed and selected.</p>	Sep 4: See the response to Comment ID #4.	The response provided is adequate.
13	None	<p>Comment None</p> <p>Recommendation 2) ENR recommends the proponent provide details on how the proponent will be monitoring</p>	Sep 4: NWTREL agrees with the recommendation to provide details on groundwater monitoring and mitigation options and notes	The response provided is adequate.

		<p>groundwater conditions and outline mitigation options that are available if the water quality is not meeting the criteria.</p>	<p>that these details will likely include the following: As the portal and adit is developed, groundwater (water inflows) will be pumped to settling ponds and monitored for the water quality as per the response above (Comment ID 12). (Note that water for drilling will be recycled from the settling ponds.) Given that this pumping will create a zone of depression, and the elevated location of the portal relative to the surrounding land, and given the low permeability of the granite, limited local groundwater will flow toward the portal/adit and be captured by the pump; As such, monitoring of the settling pond is equivalent to monitoring the groundwater; Once drilling is stopped and the portal and adit begins to flood, inflows as they flood will very accurately represent the groundwater quality as impacted by the portal/adit. Treatment options will depend on the parameter of concern. Mitigation of elevated nitrate or ammonium that is the result of blasting agents will utilize Best Management Practice to mitigate this problem. (See Explosives Management Plan). Suspended solids can be reduced by increasing pond retention time, additional sumps in the adit for pre-treatment or with the use of flocculent and/or coagulants to improve settling. Should the pH be too low, limestone can be added. If the pH is too high, there are several options ranging from bubbling air in the effluent to</p>	
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			<p>dissolve CO2 into it will decrease the pH, or bubbling CO2 in the effluent if more rapid pH depression is required to adding sulfuric acid. Treatment for arsenic, thorium, copper, nickel, zinc and lead can be done using standard lime treatment technology. A variety of alternate arsenic removal techniques can also be used, and depend on the form and oxidation state of the arsenic which would be determined in the unlikely event it is found. Similarly, alternate methods are available for Thorium removal. However, to date, no historical or ongoing leachate or humidity cell testing has shown any of these parameters anywhere near the concentrations in the effluent criteria in leachates or humidity cell testing in ores, concentrates and waste rock and thus is very unlikely to be required. Post closure, the effluent from the portal/adit can be monitored and would be representative of shallow groundwater inflow, especially if the adit is not very deep. Should deeper groundwater monitoring be required, an existing downgradient diamond drill hole can be adapted to sample groundwater annually using a piezometer. Note that holes that are in the ore body are not suitable as this is not a comparison of the ground water in the granite of the adit. The need for additional groundwater monitoring will be evaluated on a risk based approach in discussion with the Land Use</p>	
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			Inspector and MVLWB experts, and include an evaluation of the pre-construction background surface and groundwater data, groundwater data from the adit during development, rate of groundwater inflow/rock permeability and sampling of the adit water quality during closure and flooding that will occur during other closure activities and demobilization. Should mitigation be required, pumping the water from the portal/adit will maintain the cone of depression above and permit treatment as discussed above.	
14	Topic 9: Open Pit Water Quality	<p>Comment Section 4.4.1.1 of the Plan states: "Upon completion of operations, it is expected that the open-cast excavation will be allowed to fill with groundwater and surface run off to create a lake." However, ENR is uncertain the predicted groundwater quality that will report to this lake and the expected water quality of the lake will be at closure. This information is necessary as the surface water of the pit lake will report to the local environment, as described in Section 4.4.1.3.</p> <p>Recommendation 1) ENR recommends that the proponent commit to providing details on predicted groundwater quality that will report to the lake, and the expected water quality of the lake at closure.</p>	<p>Sep 4: NWTREL proposes to propose details of post-closure monitoring through discussions with GNWT-ENR and through a Closure Risk Assessment within one year of the start of operations. The outcome of these processes will be included in the next version of the CRP.</p>	The response provided is adequate.
15	None	<p>Comment None</p> <p>Recommendation 2) ENR recommends that the</p>	<p>Sep 4: NWTREL proposes to propose details of post-closure monitoring through</p>	The response provided is adequate.

		proponent comment on the migration options that will be implemented if water fails to meet the closure criteria.	discussions with GNWT-ENR and through a Closure Risk Assessment within one year of the start of operations. The outcome of these processes will be included in the next version of the CRP.	
16	Topic 10: Waste and Ore Stockpiles	<p>Comment Section 4.4.1.2 of the Plan notes in relation to Waste and Ore Stockpiles that "The waste and ore stockpile area will be progressively reclaimed, where practical, by loosening exposed, compacted soils, applying a cover of available organic material, and allowing for the surface to revegetate naturally". Additional information is required regarding these piles.</p> <p>Recommendation 1) ENR recommends that the proponent provide the additional information: a. How much of the pile is expected to be covered and how thick? b. Is the only purpose of cover for revegetation? c. What are the anticipated slope ratios?</p>	<p>Sep 4: NWTREL proposes to add to the next version of the CRP that: a: the thickness of the pile cover is dependent on the amount of material salvaged prior to development of the stockpile areas b: the purpose of the cover is for aesthetics only, there are no erosion concerns or geochemical concerns (to be confirmed by the Geochemical Characterization and Management Plan, and Waste Rock Management Plan) c: anticipated slope angles will be at or less than the waste rock angle of repose to reduce stability risk. Details will be provided in the Waste Rock Management Plan</p>	The response provided is adequate.
17	Topic 11: Financial Security	<p>Comment As part of the initial Water Licence application process, ENR submitted a comment and recommendation on the financial security of the project. ENR notes that the proponent has accepted the estimate amount and has included the memorandum submitted by ENR's retained expert (ARKTIS Solutions Inc.) in their plan. While ENR appreciates the proponent's acceptance of the estimate, ENR feels that the proponent should further describe within the Plan the process</p>	<p>Sep 4: NWTREL will accept the security set by the MVLWB.</p>	The response provided is adequate.

		<p>associated with the MVLWB security determination. This process included a proponent derived security that was submitted with the Water Licence amendment application subject to ENR review, the provision of an ENR security estimate and the MVLWB's evaluation of both securities prior to making a ruling. A clear statement from the proponent that the security presented in the Plan is ENR's estimate that has been agreed to would be ideal.</p> <p>Recommendation 1) ENR recommends that the Plan be updated to include further details on the security process and identify that the estimate provide in the Plan was proposed and produced by ENR and is supported by the proponent.</p>		
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July 30, 2020

Jen Potten
Regulatory Coordinator
Mackenzie Valley Land and Water Board
7th Floor – 4910 50th Avenue
P.O. Box 2130
Yellowknife, NT
X1A 2P6

Dear Ms. Potten,

**Re: NWT Rare Earths Ltd.
Water Licence - MV2014L2-0001
Land Use Permit - MV2014D0001
Closure and Reclamation Plan (the Plan)
Request for Comment**

The Department of Environment and Natural Resources (ENR), Government of the Northwest Territories has reviewed the Plan at reference based on its mandated responsibilities under the *Environmental Protection Act*, the *Forest Management Act*, the *Forest Protection Act*, the *Species at Risk (NWT) Act*, the *Waters Act* and the *Wildlife Act* and provides the following comments and recommendations for the consideration of the Board.

Topic 1: Temporal Period for Post-closure Monitoring

Comment(s):

Section 4.3 of the Plan (Closure and Reclamation Objectives) states: “Post-closure environmental maintenance and monitoring may be carried out if required for revegetation and surface stabilization efforts, surface water quality and other required environmental components to verify achievement of closure criteria”. Regarding the temporal period of post-closure monitoring, Section 7.2 (Post-Closure Monitoring) does not provide any details on the frequency or period of monitoring that is expected to commence post-closure. Due to the potential impacts to the local environment from the project (i.e., waste rock, water retention ponds), ENR expects that the proponent should clarify their expected frequency and timeframe for post-

closure monitoring. ENR notes that at least five years of post-closure monitoring will be expected if the project is completed as described in the Plan.

Recommendation(s):

- 1) ENR recommends that the proponent provide additional information on the expected frequency and duration of post-closure monitoring for the project (e.g., one inspection every year for five years). This should include all components of post-closure monitoring (i.e., water quality, vegetation, site stability, etc.).

Topic 2: Vegetation Cover

Comment(s):

Section 4.3 of the Plan states: “Use of agronomic species will be limited and will likely only occur in instances where the establishment of a rapid cover”. ENR is seeking clarity on the ultimate objective of the vegetation cover, namely is the cover only to provide an aesthetics cover or is there a structural integrity component (i.e., reduction of erosion potential). If the latter, this would require different monitoring and criteria.

Recommendation(s):

- 1) ENR recommends the proponent comment on the ultimate purpose of the vegetation cover for the waste piles.

Topic 3: Deserted Waste

Comment(s):

Section 4.3 states: “Infrastructure not required beyond closure will be decontaminated, dismantled, and removed from site *where economic to do so* (emphasis added).” Without additional information on the types of situations when these activities may not be economical, it isn’t clear how this clause may be applied.

Recommendation(s):

- 1) ENR recommends the proponent provide an outline of probable scenarios where it wouldn’t be economical and infrastructure may not require remediation, including examples of the types of waste that may be deserted.

Topic 4: Table 1 – Closure Objectives - Water Quality Criteria

Comment(s):

The proposed closure criteria for water quality criteria in Table 1 states: “Closure water quality criteria will be developed using generic guidelines and site-specific risk based criteria and for the protection of aquatic life that includes operations experience and preconstruction background conditions”. ENR notes that the closure criteria are vague and should be better defined prior to operations.

Recommendation(s):

- 1) ENR recommends the proponent provide an update on when closure water quality criteria will be developed for public review. This should include a discussion on the guidelines to be selected, and how site-specific risk based criteria will be developed and selected.
- 2) ENR recommends the proponent clarify how “operations experience” will be used in the development of closure water quality criteria.

Topic 5: Table 1 – Closure Objectives - Water Quality Actions

Comment(s):

Regarding water quality actions/measurements, Table 1 of the Plan (closure objectives and criteria) states that actions will include “Post-closure monitoring of lakes, streams, site runoff and seepage at appropriate on site locations.” ENR notes that these actions are too general to be effectively measureable. Monitoring in itself should not be set as a measure; rather, the action for water quality should include some reference to meeting closure criteria. Further discussion in the Plan is also required for instances where water is found not to meet these criteria (i.e., unsafe for discharge). This should include whether water will be treated to meet the requirements.

Recommendation(s):

- 1) ENR recommends that the measurement for water quality be revised to reference the quality that results will be measure against (i.e. closure criteria).
- 2) ENR recommends that the proponent update the Plan with greater detail on actions for instances where water is found not to meet these criteria.

Topic 6: Revegetation Areas

Comment(s):

Table 1 of the Plan states for the revegetation closure objective that the criteria and measurement are: “Revegetation targeted to priority areas. Revegetation activities have been completed at priority areas; acceptable vegetation biodiversity has been reached. Inspection and submission of a summary report by a qualified person”. ENR is uncertain on what is defined as “priority” areas or “qualified person” by the proponent.

Recommendation(s):

- 1) ENR recommends that the proponent define what “priority” areas are in the Plan and refer to this information in the measurement/action part of Table 1 (e.g., a separate table of locations that need to be revegetated and diversity/density amounts that would be acceptable). The proponent should also include a discussion on how these areas are selected.
- 2) ENR recommends that the “qualified person” include a Professional Biologist for the vegetation assessment.

Topic 7: Contaminated Soils and Waste Closure Disposal Objective

Comment(s):

For the contaminated soils and waste closure disposal objective, Table 1 states that the criterion is: “The mine site is remediated to site specific risk-based criteria. Potential contaminant sources are remediated on site or removed from site.” The Plan provides no specific details on the risk-based criteria or how this may look at final closure. Additionally, it isn’t clear how contaminated soil will be remediated on site if the proponent has not requested a landfarm to be included in the scope of work.

Recommendation(s):

- 1) ENR recommends that the proponent provide the risk-based criteria that will be used for the mine site at closure, or discuss how these will be selected in future.
- 2) ENR recommends that the proponent clarify if a landfarm is required on-site. If the proponent does not intend to remediate waste soil on-site via landfarming, ENR recommends the proponent update the objective to the following: “The mine site is remediated to site specific risk-based criteria. Potential contaminant sources are removed from site.”

Topic 8: Portal Closure Water Quality Criteria

Comment(s):

For the portal closure water quality objective, Table 1 states that: “Underground mine should not contribute to the contamination of ground or surface water. Closure water quality criteria to be developed using generic guidelines and site-specific risk based criteria. Post-closure monitoring of groundwater and surface water.” As discussed previously for the surface water quality, ENR notes that the closure criteria are vague and should be better defined prior to construction. For example, greater details on how the proponent will be monitoring groundwater conditions should be included as well as a discussion on the mitigation options that are available if the groundwater quality that may report to the surface is not meeting the criteria.

Recommendation(s):

- 1) ENR recommends that the proponent provide additional information on timelines for when the closure water quality criteria will be developed for public review. This should include a discussion on what guidelines will be selected, and how site-specific risk based criteria will be developed and selected.
- 2) ENR recommends the proponent provide details on how the proponent will be monitoring groundwater conditions and outline mitigation options that are available if the water quality is not meeting the criteria.

Topic 9: Open Pit Water Quality

Comment(s):

Section 4.4.1.1 of the Plan states: “Upon completion of operations, it is expected that the open-cast excavation will be allowed to fill with groundwater and surface run off to create a lake.” However, ENR is uncertain the predicted groundwater quality that will report to this lake and the expected water quality of the lake will be at closure. This information is necessary as the surface water of the pit lake will report to the local environment, as described in Section 4.4.1.3.

Recommendation(s):

- 1) ENR recommends that the proponent commit to providing details on predicted groundwater quality that will report to the lake, and the expected water quality of the lake at closure.
- 2) ENR recommends that the proponent comment on the migration options that will implemented if water fails to meet the closure criteria.

Topic 10: Waste and Ore Stockpiles

Comment(s):

Section 4.4.1.2 of the Plan notes in relation to Waste and Ore Stockpiles that “The waste and ore stockpile area will be progressively reclaimed, where practical, by loosening exposed, compacted soils, applying a cover of available organic material, and allowing for the surface to revegetate naturally”.

Additional information is required regarding these piles.

Recommendation(s):

- 1) ENR recommends that the proponent provide the additional information:
 - a. How much of the pile is expected to be covered and how thick?
 - b. Is the only purpose of cover for revegetation?
 - c. What are the anticipated slope ratios?

Topic 11: Financial Security

Comment(s):

As part of the initial Water Licence application process, ENR submitted a comment and recommendation on the financial security of the project. ENR notes that the proponent has accepted the estimate amount and has included the memorandum submitted by ENR’s retained expert (ARKTIS Solutions Inc.) in their plan. While ENR appreciates the proponent’s acceptance of the estimate, ENR feels that the proponent should further describe within the Plan the process associated with the MVLWB security determination. This process included a proponent derived security that was submitted with the Water Licence amendment application subject to ENR review, the provision of an ENR security estimate and the MVLWB’s evaluation of both securities prior to making a ruling. A clear statement from the proponent that the security presented in the Plan is ENR’s estimate that has been agreed to would be ideal.

Recommendation(s):

- 1) ENR recommends that the Plan be updated to include further details on the security process and identify that the estimate provide in the Plan was proposed and produced by ENR and is supported by the proponent.

Comments and recommendations were provided by ENR technical experts in the Water Management and Monitoring Division and the North Slave Region and were coordinated and collated by the Environmental Assessment and Monitoring Section (EAM), Environmental Stewardship and Climate Change Division.

Should you have any questions or concerns, please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst at email: patrick_clancy@gov.nt.ca.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Clancy', written in a cursive style.

Patrick Clancy
Environmental Regulatory Analyst
Environmental Assessment and Monitoring Section
Environmental Stewardship and Climate Change Division
Department of Environment and Natural Resources
Government of the Northwest Territories