LUPIN MINES INCORPORATED

2021 Post Closure Monitoring Plan

Technical Comment Responses

Submitted to:

Nunavut Water Board
PO Box 119
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Submitted by:

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On behalf of:
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Contents

1.0 INTRODUCTION

On February 28, 2020, the Nunavut Water Board (NWB or Board) issued the Type A Water Licence 2AM-LUP2032 (Licence), with approval of the Licence from the Minister of Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) on 9 April 2020. The Licence requires Lupin Mines Incorporated (LMI) in accordance with Part J, Item 13, The Licensee shall, within one (1) year following the approval of the Licence, submit to the Board for approval a Post Closure Monitoring Plan in accordance with requirements in Schedule J.

On February 26, 2021, LMI and their consultants reached out CIRNAC, Environment and Climate Change Canada (ECCC) and the Kitikmeot Inuit Association (KIA) to participate in a consultation process (see below) prior to submitting the draft PCMP to the NWB on April 9, 2021. The draft PCMP was emailed to the interested parties later that same day.

- **9 March:** Conference all 2-4pm ET
- **9 March :** Comments received from interested parties
- **16 March:** Feedback and comments incorporated and revised plan circulated for comment
- **25 March:** Second consultation session if needed to resolve final comments
- **9 April:** Submission of the PCMP to the Nunavut Water Board

The first consultation call/presentation, via Teams, was held on March 9, 2021 with CIRNAC, ECCC, the KIA and SteveJan Consultants Inc (SJCJ) on behalf of the KIA. Following the call, on the same date, LMI received comments from KIA/SJCJ.

On March 16, 2021, LMI emailed CIRNAC, ECCC and the KIA the updated draft PCMP, incorporating the relevant comments from the KIA/SJCJ, 2019 Annual Report, Water Quality Monitoring and QA/QC Plan August 2020, KIA/SJCJ Comments dated March 9, 2021 and LMI Response to KIA/SJCJ comments.

A second call was held on March 25, 2021 with CIRNAC, ECCC, the KIA/SJCJ. CIRNAC provided LMI with their written comments on the same date prior to the call, ECCC provided one verbal comment during the call and KIA/SJCJ provided their written comments after the call on March 26, 2021.

LMI did not provide a written response to the comments received on March 25/26, 2021 as all concerns were discussed during the call and relevant comments were incorporated into the draft PCMP prior to submission to the NWB for review and comment.

Due to COVID restrictions, LMI was not able to carry out in-person consultation with the community of Kugluktuk, but we hope that we will be able to provide an in-person update at some point in the near future. On April 8, 2021, LMI held a conference call with community of Kugluktuk which was attended by community member Wynter Kuliktana. A call with a community member, Ida, after the consultation session, noting she had no questions of concern. The Hunters and Trappers Association (HTO) advised that they were not available to attend the call but emailed a couple of questions. The following are the HTO questions including LMI's responses:

HTO Question:

First of is the concern for wastes that were used to bring out the gold from the ore deposits, do you have them all identified or aware of them? And how they are being approached or handled for clean up commitments.

LMI Response:

The wastes that were generated as part of the ore processing are contained in the tailings, which are stored in the Tailings Containment Area. The tailings are stored in isolated cells and covered with sand and water to

prevent the types of reactions that generate environmental problems. After closure, the cells will be inspected to ensure they are operating as designed.

HTO Comment:

The other is, the testing of the water in Contoyto Lake (preferably where the toxins might flow into the Lake by). As you must know the Contoyto Lake drains to Bathurst Inlet by Hood River.

LMI Response:

Water in the Tailings Containment Area is collected before it is released to test for toxicity to aquatic life in a laboratory. Two different types of tests are completed:

1. Short-term laboratory toxicity tests (two to four days in length) and are performed with a water flea and a fish (Rainbow Trout).

2. Long-term laboratory toxicity tests (three to eight days in length) and are performed with algae, an aquatic plant, a water flea, and a fish (Fathead Minnow).

The results from toxicity tests are used to assess the potential for negative effects related to release of treated effluent into Seep Creek and ultimately Contwoyto Lake. Results from 2020 were consistent or better than in previous years. There were no toxic effects to fish in the laboratory tests, which provides confidence that release of treated effluent from the Tailings Containment Area is not causing any toxic effects in Contwoyto Lake.

The HTO thanked LMI for their response.

LMI is scheduling a Q2 conference call after reviewing the comments from interested parties to provide an update on the new commitments and inquire if the community has any comments they would like the LMI to address. The HTO has advised LMI that they would make themselves available for this call.

LMI submitted the draft PCMP to the NWB on April 9, 2021. The NWB sent out the draft PCMP to interested parties on April 21, 2021 to provide comments by May 26, 2021.

Technical review submissions were received from ECCC on May 18, 2021, SteveJan Consultants Inc (SJCJ) on behalf of the Kitikmeot Inuit Association (KIA) on May 26, 2021 and from CIRNAC on June 1, 2021.

In response to the submissions, LMI has provided this document, which includes the response from LMI to each of the comments as presented including references and attachments where necessary.

2.0 ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC)

Interested Party:	ECCC	**Technical Comment No:**	1
Subject/Topic:	Phase 2 Passive Closure Monitoring		

Reference:

- Table 9 Water Quality Monitoring Requirements for Active and Passive Closure at Lupin Mine; Section 6.2.2 Tailings Containment Area

Detailed Review Comment by Party (May 18, 2021):

Table 9 presents the monitoring for discharges from Pond 2, which is currently the effluent final discharge point, designated LUP-10. After 2021, a spillway will be installed at Dam 1A and this will be designated Station LUP-10b. Passive monitoring will be done for the period 2022-2026, or until the global objectives for the mine site can be confirmed. During the passive monitoring in Phase 2, all downstream monitoring is proposed to be completely discontinued as discharge from the Tailings Containment Area (TCA) will have ceased in 2021. Given that there will still be outflows from Pond 2 via the spillway, testing of downstream water quality should not be dropped entirely; this could be triggered as a response to any unanticipated changes in water quality at LUP-10b.

Request or Recommendation by Party (May 18, 2021):

- Linking sampling downstream of LUP-10b to the Adaptive Monitoring described in Section 6.2.6.
- Identifying the data analysis method that will be used to demonstrate pH trends or stability. This could be included under Section 7.0 Data Storage, Analysis and Reporting Subsection 7.1 Tailings Containment Area.

LMI Response (June 15, 2021):

Trends in pH through the Phase 1 (active closure) and Phase 2 (passive closure) periods will be evaluated visually using time series plots to assess water quality against the proposed trigger outlined in Section 6.2.2 (i.e., if pH remains above 5.5 and is not actively decreasing, Pond 2 will passively discharge to the environment and the monitoring frequency will be reduced). If changes in pH are detected through visual analysis, further quantitative analysis will be conducted using Mann-Kendall tests to determine if there are significant trends in pH. A downward trend in pH would trigger adaptive monitoring in the Seep Creek and Inner Sun Bay receiving environments.

Data analysis methods will be included in Section 7.0 (Sub-section 7.1) of the next version of the PCMP.

Reference(s): Section 6.2.2

Attachment: **n/a**

Interested Party:	ECCC	**Technical Comment No:**	2
Subject/Topic:	Adaptive Monitoring		

Reference:

- Section 6.2.6 Adaptive Monitoring

Detailed Review Comment by Party (May 18, 2021):

The Proponent states that monitoring will be scaled back as verification monitoring confirms predictions of chemical and physical stability, based on evidence. Section 6.2.6 focuses on reducing monitoring, but notes that if there is a need for enhanced monitoring, such as deterioration in water quality,

> "A detailed monitoring plan will be developed for any areas of concern depending on the geographic extent of the observed concern and/or a source, pathway, and receptor analysis for potential contaminant release to the environment."

No discussion has been provided on what would trigger increases in monitoring or constitute an area of concern.

Request or Recommendation by Party (May 18, 2021):

ECCC recommends that further discussion be outlined in Section 6.2.6 on triggers for increased monitoring under the Adaptive Monitoring approach.

LMI Response (June 15, 2021):

There are many possible future conditions that may trigger the need for adaptive monitoring. For this reason, the adaptive monitoring framework must be flexible and allow for contingency monitoring as required, and as appropriate to the observed change or area of concern. The TCA has a clearly defined trigger for pH as outlined in Section 6.2.2. In this case, if TCA water quality begins to approach the minimum thresholds identified for the transition from active to passive closure monitoring, then increased monitoring will need to be employed. More general triggers are proposed for other Mine areas, and include, for example, an increase in a parameter concentration relative to pre-remediation conditions.

The area of concern is also dependent on the nature of the change that is observed in the monitoring dataset. This could be, for example, a change in seepage quality from the waste rock dome that indicates residual soils contamination that may be entering the receiving environment. The area of concern in this case, would be the seepage source, pathway, and receiving environment. LMI notes that the Water Licence requirements for the PCMP include a description of thresholds that may trigger a reduction in monitoring requirements in closure. There is no requirement in the Water Licence for a description of thresholds that may require an increase in monitoring.

Reference(s): Section 6.2.2

Attachment: **n/a**

3.0 CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA (CIRNAC)

Interested Party:	CIRNAC	**Technical Comment No:**	1
Subject/Topic:	Water Quality in TCA		

Reference:

- Section 6.2.2

Detailed Review Comment by Party (June 1, 2021):

In section 6.2.2, LMI proposes a pH trigger to help determine when desired water quality conditions are achieved in the Tailings Containment Area (TCA) (Cell 4, Pond 1, Pond 2) that would allow for the transition from active to passive discharge and reduced TCA monitoring. It is questionable to use a pH trigger (5.5) which is lower than the acceptable Metal and Diamond Mining Effluent Regulations (MDMER) range (6.0-9.5) as a reference point. It is also not clear why the trigger is based on pH only and not any total metals that have been a concern associated with the tailings.

Request or Recommendation by Party (June 1, 2021):

(R-01) CIRNAC recommends that, prior to transitioning from active to passive TCA discharge, the licensee justify why the trigger for the transition does not include criteria for concentrations of metals of concern.

LMI Response (June 15, 2021):

The trigger for the transition from active to passive closure does not include criteria for metals concentrations as the Lupin Mine site does not currently exceed metals criteria stipulated in the Water Licence. Further, discharge from Pond 2 has not previously required treatment for metals and has complied with MDMER limits for deleterious substances, including those established for arsenic, copper, lead, nickel, and zinc per Part 1 and Schedule 4 of the MDMER. There are no new sources for these metals in closure, and therefore no residual risk for metals contamination in the passive closure phase.

Reference(s): n/a

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	2
Subject/Topic:	Geotechnical Monitoring		

Reference:

- Section 6.1.1; Section 6.1.4; Section 6.2.1

Detailed Review Comment by Party (June 1, 2021):

Geotechnical monitoring is essential to check that structures are performing as planned and are physically stable. The executive summary speaks to "Inspections include seepage from the dams, water levels in ponds/cells, and general surface erosion, tension cracks, and/or anomalies on dams", however section 6.1.1 does not specify dams other than the TCA. During phase 1, structures still classified as dams should be inspected, including:

- Verifying slope stabilization and erosion control at the former "interior dams" (K,M,N) and L Dam Spillway;
- Monitoring potential exposed and covered tailings after water level is drawn down; and
- Monitoring of thermistors in the M and N dams.

Section 6.1.4 states "Some perimeters dams can be declassified as dam structure in Phase 2, as they will no longer contain water when the ponds are passively managed at a much lower post closure water levels", without specifying which dams are being referred to.

Additionally, section 6.2.1 states: "Any evidence of surficial settlement or erosion or settlement above the crown pillar or shafts will be documented with photographs and reported." The absence of settlement and erosion is also noteworthy. Photographic records of inspections over the years should be kept and reported to allow monitoring of any evolution.

Request or Recommendation by Party (June 1, 2021):

(R-02) CIRNAC recommends that licensee include in the PCMP:

- the list of structures to be inspected in phase 1;
- specific dams which they intend to declassify for phase 2; and
- instructions to report on phase 2 site inspections regardless of the findings.

LMI Response (June 15, 2021):

The Executive Summary states, "Phase 1 (Active Closure) monitoring includes bi-weekly inspections during freshet per **Part J, Item 11** of the Water Licence. Inspections include seepage from the dams, water levels in ponds/cells, and general surface erosion, tension cracks, and/or anomalies on dams….."

Section 6.1.1 also refers to inspections as **Part J, Item 11 and Item 12.** Part J, Item 11 and Item 12, both refer and require inspections at the Tailings Containment Area not other areas at the Lupin Mine site. During Phase 1 – Active Closure Phase, which we are currently actively in this stage, structures are inspected as required under Part J, Item 11 and Item 12, filed annual with NWB located on the NWB ftp under

ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-LUP2032%20LMI/3%20TECH/J%20MONITORING/J12%20Annual%20Geotechnical%20Inspection/

LMI can agree to list the structures at the TCA which are required for Phase 1 inspections under Part J, Item 12 which form the annual geotechnical Engineer's report. These dams are also listed in the approved FCRP – Table 11: Perimeter and Internal Dams. During Phase 1 these reports will continue as per Part J, Item 12.

Under Section 6.2.4 Geotechnical Monitoring (Temperature/Thermistor) LMI has provided the list of dams they would request to declassify.

These reports verify slope stabilization and surface water management to limit erosion at Dam K, Dam M, Dam N and once we are in the Closure Phase the Dam L outlet structure, it should be noted that this is not a spillway as stated above by CIRNAC.

The PCMP states the during the TCA inspections, the geotechnical engineer will also carry out visual inspections of the condition of the esker cover at the TCA. There are no thermistors planned in Dam M or Dam N.

The PCMP states, "Reporting for the Phase 1 and Phase 2 monitoring programs will consist of an annual monitoring report per the Water Licence (Part J Item 10) submitted by 31 March each year, a final MDMER report for 2021, Phase 1 and 2 geotechnical monitoring reports, and a final soils remediation report."

Reference(s): 2AM-LUP2032 – Part J, Item 11 and Item 12; Section 6.2.4; Executive Summary; Section 6.1.1

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	3
Subject/Topic:	Community Consultation		

Reference:

- Schedule J, Item1

Detailed Review Comment by Party (June 1, 2021):

Schedule J Item 1 requires the licensee to consult with the community of Kugluktuk during both development of PCMP and post closure monitoring, and the requirement remains outstanding.

In the executive summary, LMI states that consultation occurred via online calls and presentations on March 9 & 25, 2021. On March 9 and 25 2021, LMI held technical review sessions with government representatives, the Kitikmeot Inuit Association (KIA), and various hired consultants/technical representatives. The goal was to review the comments LMI received from these organizations about the PCMP. The nature of the calls were technical. It is recommended that LMI undertake additional measures to consult with the community of Kugluktuk.

In the executive summary, LMI references consultation that occurred with community members and organizations in the community of Kugluktuk in April 8, 2021. LMI stated during a call with CIRNAC on May 26, 2021 that the consultation was not well attended. CIRNAC would like to know details about how the community was notified of the event, engagement content, and a summary of dates, times, locations, attendees, concerns brought forward.

Schedule B, Item 1l describes information on public consultation to be included in annual reports. This should be reproduced in the PCMP to ensure required information is collected during consultation.

CIRNAC notes the submitted PCMP does not include a translated executive summary in Inuktitut or Inuinnaqtun. Translated material is essential so that consultations can include all potentially interested community members. Given the limited success of first consultation attempts, a more thorough plan must be developed and described in section 8 of the PCMP.

Request or Recommendation by Party (June 1, 2021):

(R-03) CIRNAC recommends section 8 of the PCMP include a detailed plan for proposed community consultations including how the community will be notified, how materials understandable by the general public will be prepared, what times of year will be prioritized for maximum participation, as well as information contained in Schedule B, Item 1l.

LMI Response (June 15, 2021):

LMI will provide the information on community consultation as required under the Water Licence Condition Part B, Item 2 (Annual Report) Schedule B, Item 1. Wherein, LMI is required under its water licence to provide a summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions and the consultation efforts of the Licensee required under Part B, Item 20. LMI is not required to provide this information as part of the overall PCMP but has included an overview. LMI believes they have met the water licence condition and will continue to consult with the community members and community organizations.

LMI will ensure that the translations are submitted as soon as possible.

Reference(s): 2AM-LUP2032, Part B, Item 2, Schedule B, Item 1. / **Attachment: n/a**

Interested Party:	CIRNAC	**Technical Comment No:**	4
Subject/Topic:	Visual Inspections of TCA Pond Perimeters		

Reference:

- n/a

Detailed Review Comment by Party (June 1, 2021):

Visual inspections along TCA pond perimeters looking for signs of active oxidation or seepage are currently included for phase 1, but not explicitly for phase 2. Absence of signs of active oxidation or seepage will be necessary to demonstrate long term chemical and physical stability, so these inspections should continue throughout phase 2.

Request or Recommendation by Party (June 1, 2021):

(R-04) CIRNAC recommends that visual inspections for signs of active oxidation or seepage be included in the phase 2 monitoring.

LMI Response (June 15, 2021):

Visual inspections for signs of active oxidation and seepage will continue during Phase 2 site visits.

Reference(s): n/a

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	5
Subject/Topic:	Schedule J Items Missing		

Reference:

- 2AM-LUP2032 - Schedule J, Item 2;

Detailed Review Comment by Party (June 1, 2021):

Schedule J, Item 2 of water licence 2AM-LUP2032 lists items that need to be included in PCMP. Certain items were not found in the plan submitted in April 2021, including:

a. A review of historical data and estimate of waste rock quantities use across the site for construction of dams and other permanent structures;
b. Thresholds for tailings cover performance that would trigger moving to reduced monitoring frequency or intensity;

CIRNAC notes that Item 2g, also includes the requirement for thresholds for water quality at the TCA, and these have been provided.

Request or Recommendation by Party (June 1, 2021):

(R-05) CIRNAC recommends the PCMP include all items prescribed in Schedule J, Item 2 of the water licence, including an estimate of waste rock quantities used across the site from historical data and thresholds for tailings cover performance.

LMI Response (June 15, 2021):

As stated in the FCRP, the estimated volume of waste rock brought up from underground and placed on surface is about 1,000,000 m3. Review of historical documents, including two environmental site assessments, has not determined a more precise number.

The historical data and estimate of waste rock quantities used across the site for construction of dams was carried out during the FCRP review process under PHC Commitments #3 and #4. There was an estimated 100,000 m3 of waste rock used to build the TCA dams.

LMI has previously explained the requirement for a saturated zone above the tailings contact within the cover, which will be monitored by the volumetric water content (VWC) probes. The VWC trends will be used to trigger a reduction or increase in monitoring frequency, as required.

Reference(s): FCRP, PHC Commitments #3 and #4

Attachment: **n/a**

Interested Party:	CIRNAC	**Technical Comment No:**	6
Subject/Topic:	Duration of Passive Monitoring		

Reference:

- Section 6.0

Detailed Review Comment by Party (June 1, 2021):

Section 6.0 states that "The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (i.e. 2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. Phase 2 monitoring programs will be carried out during site visits under the supervision and direction of DMS [Discovery Mining Services].

The Federal Contaminated Sites Action Plan Long-Term Monitoring Planning Guidance recommends 25 years of monitoring to verify equilibrium conditions at landfills in northern regions. This matches the post closure monitoring period used to generate the reclamation estimate used for site is 25 years.

Request or Recommendation by Party (June 1, 2021):

(R-06) CIRNAC recommends the PCMP support the proposed shorter passive monitoring period with evidence that permanent physical and chemical stability of the site could be determined in this timeframe.

LMI Response (June 15, 2021):

The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. The adaptive monitoring framework outlined in Section 6.2.6 allows for enhanced monitoring if closure objectives of physical stability, chemical stability, and future use and aesthetics are not met by the end of the passive closure period in 2026. In this case, an extended passive monitoring period would be considered depending on the magnitude and spatial extent of the concern. As per the response to KIA TC 2, 3, and 4 below, active monitoring will occur until the global closure objectives have been confirmed.

Reference(s): Section 6.2.6 Adaptive Monitoring; KIA TC 2, 3 and 4 below

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	7
Subject/Topic:	Demolition Landfill Monitoring Wells		

Reference:

- Schedule J, Table 1; Table 9

Detailed Review Comment by Party (June 1, 2021):

Schedule J, Table 1 of the water licence prescribes three monitoring wells at the demolition landfill facility; one up gradient (LUP-36) and two down gradient (LUP-37a & LUP-37b).

The licensee's comments on these stations in Table 9 are: "Demolition landfill is not planned for construction".

CIRNAC agrees that there no longer is a demolition landfill planned. The material that was originally planned to placed in this landfill will instead be buried in the Waste Rock Dome.

In order to monitor possible leachate, wells originally planned for the demolition landfill should be moved to up gradient and down gradient of the Dome.

Request or Recommendation by Party (June 1, 2021):

(R-07) CIRNAC recommends the licensee install monitoring wells upstream and downstream of the waste rock dome and include their monitoring in Table 9 of the PCMP.

LMI Response (June 15, 2021):

CIRNA's comment above in regard to material that was originally planned to be placed in this landfill will instead by buried in the Waste Rock Dome is an incorrect statement. Instead, the non-hazardous waste materials generated by demolition will be placed into the existing landfill facility, which has been raised to accommodate these materials. LMI has not stated and does not plan on placing anything other than waste rock into the Waste Rock Dome. As stated in the PCMP, per Water Licence requirements, seepage surveys and applicable sampling will be conducted twice yearly at the landfill facility (LUP-31 and LUP-35) and Waste Rock Dome (LUP-SP-01 to LUP-SP-XX) through the Phase 2 Passive Monitoring, as for Phase 1 Active Monitoring (Table 9). Surveys will be conducted once in late spring after complete melt and once in late summer (late August or September) before freeze-up. This monitoring requirement is consistent with response to CIRNAC TC No. 17 during the Water Licence review process, whereby LMI committed to monitor and sample seeps from the domed covered waste rock area.

Reference(s): CIRNAC TC No. 17 (water licence review process)

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	8
Subject/Topic:	Activity Schedule Unclear		

Reference:

- n/a

Detailed Review Comment by Party (June 1, 2021):

Much of the content of the document is dated, and in some instances, unclear. The document contains references made to events/activities to be done in future that have already been undertaken. In various cases, the document provides detailed descriptions of what has occurred in the past, without inclusion in discussions of what has happened to the end of 2020, and what if anything remains to be done. For example section 4.7.8 Fuel Storage, refers to 14 diesel tanks, 1 jet A tank and 9 individual tank, without mentioning that some have been removed and others are still standing.

The PCMP covers 2021, during which time it is important to have a clear schedule that illustrates the activities proposed to be carried out during the “active period” and the expected completion date for these activities. The schedule should include when the J and 1A dams will be breached and when final pond water elevations of 480 m for Pond 2 and 481 m for Pond 1 will be established.

Request or Recommendation by Party (June 1, 2021):

(R-08) CIRNAC recommends the PCMP be modified to include a schedule of activities with expected completion dates.

LMI Response (June 15, 2021):

Section 4.0 Summary of Final Closure provides an overview of the FCRP. Under Section 4.0 it states, “The approved FCRP has been prepared on the assumption that all facilities and installations that comprise the Lupin Mine Operations will ultimately be decommissioned, removed, or reclaimed under the terms of the land lease and in accordance with the reclamation requirements set out in the Water Licence (LMI 2020a).

For complete and comprehensive details associated with final remediation and closure refer to the FCRP.”

An updated schedule has been provided to CIRNAC and the schedule will also be provided with the FCRP addendum(s) as part of the Annual Report.

Reference(s): n/a

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	9
Subject/Topic:	Inadequate Figures		

Reference:

- Appendix A - Figure 4 and Figure 8

Detailed Review Comment by Party (June 1, 2021):

Figures presented in Appendix A do not illustrate the site as it is in 2021, or as it will be once closure activities are completed. As such, it is difficult to evaluate the location of sampling sites or to put the proposed monitoring in context. For example, Figure 4 shows the TCA pre-2020, but there is no illustration for after closure and no indication of where the spillway will be built and what the water levels will be.

Figure 8 shows 13 seepage surface water sampling locations, but it is not clear if these are LUP-SP-01 to LUP-SP-XX referred to in Table 9. There is also no figure for seeps from the TCA, identified as LUP-TCA-01 to LUP-TCA-XX in Table 9.

Request or Recommendation by Party (June 1, 2021):

(R-09) CIRNAC recommends the PCMP include figures that show site conditions after planned closure works are completed, and include all the sampling stations.

LMI Response (June 15, 2021):

LMI commits to updating the PCMP figures once the closure and reclamation is complete.

Seeps from the waste rock dome (LUP-SP-01 to LUP-SP-XX) and TCA (LUP-TCA-01 to LUP-TCA-XX) are not shown on figures, as they have not yet been sampled. Surveys will be conducted in spring freshet 2021 at the TCA and at the waste rock dome after construction (if flowing water is observed). The location of these seeps cannot therefore be documented until after the 2021 sampling programs.

As stated in the PCMP for LUP-TCA01 to LUP-TCA-XX, seep sampling locations will be added to the post closure monitoring program as new seeps are documented.

Reference(s): n/a

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	10
Subject/Topic:	Changes to General Monitoring		

Reference:

- Section 1.4

Detailed Review Comment by Party (June 1, 2021):

Section 1.4 of the PCMP states “General monitoring is subject to change, as directed by an Inspector or by the Licensee, and is also subject to approval by the NWB[Nunavut Water Board].”

CIRNAC would like to clarify that an Inspector has the authority to request additional monitoring or changes to monitoring without approval by the Board. Should the licensee want to change general monitoring conditions, approval from the Nunavut Water Board would have to be sought beforehand.

Request or Recommendation by Party (June 1, 2021):

(R-09) CIRNAC recommends the licensee clarify the text regarding changes to general monitoring in the next revision of the PCMP.

LMI Response (June 15, 2021):

LMI will update the wording to reflect the water licence wherein general monitoring is subject to change as per the water licence, Part J, Item 8, which states: Additional monitoring requirements may be requested by the Inspector (note: without approval of the Board); or Part J, Item 10, the Licensee shall submit to the Board for approval any requests for changes(s) to the Monitoring Program as outlined in Part J and Schedule J, including justification for the change(s). The NWB may modify the Monitoring Program under Schedule J without an Amendment to the Licence. Refer to Section 5.0 and Appendix D.

Reference(s): 2AM-LUP2032 – Part J, Item 8 and Schedule J; Section 5.0; Appendix D.

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	11
Subject/Topic:	Thermistor Repair		

Reference:

- Table 13

Detailed Review Comment by Party (June 1, 2021):

Table 13 reports one thermistor in Dam 1A and one thermistor in Dam 4 were damaged in 2020 and there will be an attempt to repair them. No plans or information on what the attempts will entail are provided.

Request or Recommendation by Party (June 1, 2021):

(R-09) CIRNAC recommends the licensee clarify the text regarding changes to general monitoring in the next revision of the PCMP.

LMI Response (June 15, 2021):

As noted in the approved FCRP and PCMP, a spillway will be constructed through Dam 1A after closure and Dam 4 will be declassified so while LMI will make an effort to repair the thermistors, they are not critical for post closure monitoring as they will no longer be water retaining structures. The results of any repairs will be included in the Annual Report.

Reference(s): FCRP

Attachment: **n/a**

4.0 KITIKMEOT INUIT ASSOCIATION (KIA)

Interested Party:	KIA	**Technical Comment No:**	1
Subject/Topic:	Duration of the Post-Closure (PC) Monitoring Phase		

Reference:

- Section 6.2.1

Detailed Review Comment By Party (May 20 & 26, 2021):

The final PCMP continues to refer to the PC phase as being 5 years long, i.e., from 2022 to 2026. A number of examples are present within the final version that acknowledge monitoring will continue beyond then, for as long as required, with the minimum being to February 27, 2032 when the current Water Licence is due to expire. However, not in all cases.

In Section 6.2.1-Site Inspections, is the first mention of a Phase 3 – Passive Closure Period. The next paragraph in the PCMP discusses components of the visual inspections, presumably referring to those to be undertaken during the Phase 3. It is unclear why this additional Phase has been included here and only here.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

LMI is required to carry out all monitoring as per the water licence until the licence expires (including any renewal of the licence); or until the closure objectives for the mine site can be confirmed by CIRNAC and the NWB. As stated in the PCMP, Section 1.1 Scope of Monitoring Plan, "Post closure monitoring of the Site will be conducted to meet the global objectives of Physical Stability, Chemical Stability, and Future Use and Aesthetics described in Section 1.2.

A high-level conceptual PCMP was developed and incorporated in the FCRP (refer to Section 5.0 of the FCRP). It is **anticipated** that active monitoring will occur for 2.5 years and passive monitoring will occur for **approximately** 5 years following completion of the reclamation work, **or until the global objectives for the Site can be confirmed.**"

LMI acknowledges that a typo was made and under Section 6.2.1 – Site Inspections it should say Phase 2 not Phase 3, we apologize for the error.

Reference(s): Section 1.1**;** FCRP Section 5.0

Attachment: n/a

Interested Party:	KIA	**Technical Comment No:**	2
Subject/Topic:	Focus on Including Text on How LMI can Reduce Monitoring Requirements		

Reference:

- Section 6.2.6

Detailed Review Comment by Party (May 20 & 26, 2021):

Although the text now has a section titled Adaptive Monitoring, only a brief mention is made of the possible need for enhanced monitoring while several subsections within the above titled section elaborate on how reductions in monitoring requirements at the site can be undertaken.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

The PCMP is living document. Under Schedule B, Item K, where applicable, revisions as Addendums with an indication of where changes have been made for plans reports and Manuals is required in the Annual Report. As LMI receives annual results of the monitoring program, updates to the PCMP may be required and submitted under the Annual Report. LMI will assess if reductions or further monitoring is required annually and provide as addendum to the plan in the Annual Report.

Reference(s): Schedule B, Item K

Attachment: n/a

Interested Party:	KIA	**Technical Comment No:**	3
Subject/Topic:	Lowering Discharge pH Limits to 5.5 from 6.0		

Reference:

- Section 6.2.3

Detailed Review Comment By Party (May 20 & 26, 2021):

The PCMP continues to promote the idea of a pH 5.5 lower site-specific trigger limit for the TCA and its discharge versus the federal and NWB Water Licence lower limit of 6.0. The PCMP lists several lower pHs measured at a number of water quality monitoring sites in the surrounding water bodies of the TCA as it did in the earlier versions of the PCMP. However, a pH at or near the proposed lower pH limit in the TCA could be an indication that the soil cover over the previously exposed tailings is not effective and that acid generation is occurring. A defensible case (with significantly more data than shown in the PCMP) would need to be made within an application to the NWB for a lowered pH trigger point for discharges from the site to be considered.

Text in Section 6.2.2-Tailings Containment Area PC Monitoring goes on to outline how monitoring could be reduced even when pHs are around the 5.5 value. And if pHs were found to be below 5.5 and dropping it proposes using the same monitoring frequency as in Phase 1, which for LUP-10 (Pond 2 Discharge at Dam 1A) is weekly during discharge versus twice yearly during Phase 2 at LUP-10b (new spillway). When pHs are around the lower limit, be it 6.0 or the suggested 5.5, monitoring frequency should be increased, with additional sampling within the TCA itself being required to help identify where the lower pH could be coming from to then enable remedial measures to be implemented.

The possible ramifications of allowing a lower pH lower limit at the TCA discharge and suggested adjustments to monitoring frequencies are unjustified, with the suggestion that downstream natural lake pHs are below 6.0 and therefore, the discharge limit from the TCA should be less than 6.0. A comprehensive defensible case should be required to enact such a change.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

As previously discussed with the interested parties and in LMI's written response to the KIA/SJCJ, LMI was advising the interested parties, in advance, that it would be looking at requesting consideration of a lower pH threshold during the active and passive phases of closure monitoring once the TCA cover is installed and there is no longer standing water in the TCA ponds. This proposal would need to be filed with the NWB as an amendment with the appropriate backup to justify the request.

The fundamental purpose of closure is to return the site to a state that is compatible with the natural environment. In the first PCMP draft, data were presented that demonstrate natural waters surrounding Lupin can seasonally drop below a pH of 6. This was confirmed as recently as 2019 based on EEM sampling conducted at the Fingers Lake reference area. Tundra landscapes in the Canadian north, such as the area around Lupin Mine, typically exhibit slightly acidic conditions related to lack of mineral soils and natural buffering capacity. Natural baseline conditions (i.e., low pH) should be considered when planning for the long-term chemical stability of the site. The reduced monitoring frequency was only proposed during the passive closure phase if TCA water quality meets

criteria during the active closure phase. The authors of the PMCP would argue that no comprehensive argument was provided to counter either request.

Reference(s): n/a

Attachment: n/a

Interested Party:	KIA	**Technical Comment No:**	4
Subject/Topic:	Lack of Contingency Plans or AMPS in the PCMP		

Reference:

- Section 6.2.6

Detailed Review Comment By Party (May 20 & 26, 2021):

The Mar. 16, 2021 LMI response memo to the SJCI draft comments on the first draft PCMP querying the lack of contingency plans mentions that they will need to be submitted to the NWB for their approval and do not fit in a PCMP type document. However, the PCMP should be comprehensive and include discussions on what contingency plans and adaptive management plans (for both better and worse monitoring results) or the frameworks for them as to what they may look like in a follow-up detailed procedures type manual. The LMI response to the SJCI draft comments claims the PCMP has an Adaptive Management framework included in it. The PCMP has no such framework, only several sections of text outlining how it can reduce monitoring requirements. The LMI response goes on to say that their inclusion of plans ("guiding principles" according to the PCMP text) on how LMI can reduce monitoring requirements with the body of the PCMP is acceptable.

The lack of Adaptive Management Plans or Contingency Plans continues to be the case in the final PCMP as is found in Section titled 6.2.6–Reductions in Adaptive Monitoring Requirements (previously Section 6.2.2 in earlier revisions of the PCMP). That is not an Adaptive Management Plan or framework, or a Contingency Plan. It is a plan on how to reduce monitoring requirements. As a minimum, the alternative scenarios and corresponding response plans should be described in the document.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

In LMI's response to KIA/SJCJ it was stated that, "The FCRP considers contingency plans and if they are required LMI would need to submit a revised FCRP to the NWB for approval. The adaptive management framework for closure is integrated into the approved FCRP.

The PCMP is a living working document that will be updated as new information and results are obtained. The PCMP would be updated in the same manner as any other Plan as per 2AM-LUP2032, Schedule B, Item K.

The purpose of the PCMP is to outline monitoring requirements for Phase 1 and Phase 2, and to present a suggested set of guiding principles whereby LMI may scale back or reduce monitoring requirements as the success of reclamation works is confirmed. This does not exclude the possibility that enhanced monitoring could be implemented, if required, under the adaptive management framework in the FCRP. In this case, changes in the monitoring requirements would be carried forward into an updated PCMP.

Reference(s): 2AM-LUP2032, Schedule B, Item K

Attachment: n/a

Interested Party:	KIA	**Technical Comment No:**	5
Subject/Topic:	Need For Consultation With Local Stakeholders During C&M and Active Closure Phases		

Reference:

- n/a

Detailed Review Comment By Party (May 20 & 26, 2021):

LMI led 2 teleconference calls with regulatory stakeholders in March of 2021 and some items of concern were considered in the final version of the PCMP.

A teleconference call with the community of Kugluktuk continued to be promoted to LMI in discussions and review comments to them. A last minute (i.e., 2 day) invitation to Kugluktuk was made in a single limited distribution website by LMI for an April 8, 2021 web-based teleconference. However, there were no respondents. A more concerted effort by LMI should be made in the future if the company wants to be able to claim they've included the community in their stakeholder interactions, albeit this being their first attempt and it being near the end of the implementation of the Lupin Mine's reclamation and closure plan and well beyond the planning stages when the input would have been most beneficial.

It is hoped that LMI will continue to engage with Kugluktuk and other area stakeholders as the Active Phase continues this year and rolls over into 2022 when major equipment demobilization is undertaken, and the site then heads into the Passive Monitoring Phase and there may be opportunities for the community to be involved.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

LMI would like to note that some of SJCJ information above is not correct.

- The invitation was emailed to parties that provided their email address on the last few in-person technical/public hearings held in Kugluktuk, the HTO, KIA and also posted on the Kugluktuk community facebook page.
- The radio station was called a number of times but there was no answer.
- To clarify the calls were an audio conference call, at the suggestion of the KIA, as this is best way to connect when internet connectivity is limited.
- There was acknowledgement on the Facebook page post, as stated above there was a community member on the call,
- An email from the HTO with two questions (see Introduction above for questions and responses) and
- A call with a community member after the teleconference.

It should be noted that the community member on the call did advise that members of the community were talking about the conference call and thought that more people would attend. In addition, LMI will be hosting a Q2 2021 community engagement session (via telecom) with community members. The HTO has advised LMI that they will make themselves available for the call.

LMI also recognizes that through the NWB regulatory review process for the PCMP once submitted to the Board for review, interested community members were also provided an opportunity to provide comments to the NWB.

The PCMP is a living working document until Post Closure Monitoring has been completed.

LMI has real regulatory obligations through implementation of the terms and conditions of the water licence issued by the NWB regardless of the fact that 2020 was a bizarre and exceptional year due to COVID-19 and the need to keep safe and healthy. LMI is the first to acknowledge that engagement and consultation while not ideal was affected by the Global pandemic and public health restriction. LMI will be continuing ongoing consultation with the community members and organizations in the future.

Reference(s): n/a

Attachment: n/a

Interested Party:	KIA	**Technical Comment No:**	6
Subject/Topic:	Continued Operation of the Site's Automated Weather Station		

Reference:

- n/a

Detailed Review Comment By Party (May 20 & 26, 2021):

Text concerning the automated site weather station is absent in the final PCMP. The second stakeholder teleconference raised the possibility that the automated station could continue to be utilized as it would generate useful information, although it would likely be up to ECCC as the owners of the station to do so and not LMI. The author has not heard any further updates on this possibility.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

As previously advised verbally and in writing, the weather station located at the Lupin Mine site is owned by ECCC and they determine the future of the weather station. LMI does not collect data or have any access to the workings of the weather station and therefore has not included the weather station in the PCMP or the FCRP. LMI agrees that having the weather station remain at the Lupin Mine site is a good idea. The weather station is located on a CIRNAC lease and therefore the determination if the weather station remains is to be decided between CIRNAC and ECCC.

LMI has advised CIRNA and ECCC during the FCRP approval process that LMI will not take on the responsibility or any reclamation work for the ECCC weather station if it remains.

If LMI is being asked to be responsible for the weather station or carry out the reclamation work for this area, it is a small box, then we will request that ECCC remove the weather station so that we can meet our closure and reclamation obligations but we would prefer that CIRNA and ECCC take responsibility and allow it to remain. This has been LMI's stance all throughout the FCRP and water licence renewal process. During our conference call ECCC advised they would be looking into this item.

LMI considered this item resolved.

Reference(s): n/a

Attachment: n/a

Interested Party:	KIA	**Technical Comment No:**	7
Subject/Topic:	Getting All Geo-Technical Instrumentation Installed and Operating		

Reference:

- Table 13, Section 6.2.5 and Section 7.4

Detailed Review Comment By Party (May 20 & 26, 2021):

With new instrumentation being planned for installation (as per Table 13) it is hoped that LMI will utilize the same equipment to replace the non-operational or problematic existing instruments on site. The final PCMP also mentions the possible plans to install volumetric water content probes within the TMA Cell Nos. 3, 5 and N (Sec. 6.2.5).

Section 7.4 also mentions the proposal to report on geotechnical data less frequently than every year during the P-C Monitoring Phase. The proposal is to drop it to every 3 years, then 5 and then every 10 years. This is in contravention to the schedule shown in Table 13 of the PCMP. Annual downloads of instrumentation and geotechnical inspections could be accommodated during scheduled annual site inspections and water quality sampling campaigns during the Post-Closure Phase as is specified in the Water License. Any adjustments to reporting requirements need to be negotiated with NWB and its stakeholders and will only be considered when a defensible case for that change can be made.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

In regard to non-operational equipment please response to CIRNA TC 11 above.

LMI thanks you for your comments on Section 7.4.

There is no mechanism for LMI to negotiate with the NWB and its stakeholders. LMI will follow their water licence conditions to adjust their reporting requirements, if required, under Part J, Item 10, The Licensee shall submit to the Board for approval any requests for change(s) to the Monitoring Program as outlined in Part J and Schedule J, including justification for the change(s). The NWB may modify the Monitoring Program under Schedule J without an Amendment to the Licence.

Reference(s): CIRNA TC 11 (above); 2AM-LUP2032 Part J, Item 10

Attachment: n/a

5.0 QA/QC - ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC)

Interested Party:	ECCC	**Technical Comment No:**	1
Subject/Topic:	Sampling Parameters - Cyanide		

Reference:

- Table 2.1: Sample Collection Requirements; Water Licence No. 2AM-LUP2032 -Schedule J: Conditions Applying to Monitoring, Item 3, Table 1

Detailed Review Comment by Party (April 9, 2021):

The water licence requires daily monitoring of discharge from Pond 2 for cyanide and metals, as reflected in Table 1. Acknowledging this monitoring is a licence requirement, ECCC notes the requirement for cyanide to be analysed daily is not demonstrated by the data. Cyanide concentrations were below detection limits in the analyzed 2018 discharge, and there is no ongoing source related to mining operations. The MDMER allows for quarterly testing:

13 (1) The owner or operator of a mine may reduce the frequency of conducting tests relating to the concentrations of arsenic, copper, cyanide, lead, nickel or zinc at a final discharge point to not less than once in each calendar quarter, each test being conducted at least one month apart, if that substance's monthly mean concentration at that final discharge point is less than 10% of the value set out in column 2 of Schedule 4 for 12 consecutive months. (Ammonia will be added to this section June 1, 2021)

The (MDMER) Schedule 4 limit for total cyanide is 1.0 mg/L MAC and 2.0 mg/L MGC. Monitoring results reported have been below the detection limit of 0.005 mg/L.

Request or Recommendation by Party (April 9, 2021):

ECCC recommends the NWB consider removing daily cyanide monitoring requirements, reducing them to quarterly monitoring during discharge as all of the 2018 monitoring results were below detection limits.

LMI Response (June 15, 2021):

LMI acknowledges that cyanide is not a parameter of concern at Pond 2 and has been below detection during 2018 and 2020 discharge seasons. LMI would support ECCC's recommendation that the NWB consider removing daily cyanide monitoring requirements, reducing them to quarterly monitoring during discharge under 2AM-LUP2032 – Schedule J, Table 1. LMI would update the PCMP to reflect this change if accepted by the NWB.

Reference(s): 2AM-LUP2032 – Schedule J, Table 1, LUP-10

Attachment: **n/a**

Interested Party:	ECCC	**Technical Comment No:**	2
Subject/Topic:	pH Discharge Standards		

Reference:

- Table 2.2: Sampling Event Schedule, Tailings Containment Facility

Detailed Review Comment by Party (April 9, 2021):

The requirement for results to meet discharge criteria includes the caveat “expect pH” [sic], which relates to the request of not having to meet licence criteria regarding low pH levels. Further discussion of this approach is warranted; as noted by ECCC previously, there is concern with tailings cover performance in preventing acid generation in the tailings that are approximately 1 metre below the surface cover. Lower pH values would be an indication the saturation/cover closure system is not performing as designed, and should be examined. Accordingly, pH values that are below the current regulatory criteria of 6.0 would be important to flag.

Request or Recommendation by Party (April 9, 2021):

ECCC recommends further discussion and rationale regarding the pH discharge criteria.

LMI Response (June 15, 2021):

The Water Licence and QA/QC Plan sampling requirements at LUP-10a are as follows:

1) Sample one month prior to discharge for analytical water quality at LUP-10a, then
2) Once results are reviewed and confirmed to be below discharge limits, collect field measurements and a sample for acute toxicity testing (bioassay)

For step 2 above, the caveat for pH is noted in the sampling requirements (except pH) because the pre-treatment toxicity test is run at three pH levels (i.e., 6.3, 7.5, and 8.5). Per the Lupin Mine Liquid Waste Management Plan (LWMP), the pH of the initial sample is adjusted using soda ash and so the initial sample must be collected when the pH is <6.3 so that it can be treated to simulate effluent treatment at the TCA. Procedures specified in the LWMP are:

- If the sample from Pond 2 meets the discharge criteria, except for pH, collect enough water for three static pass/fail bioassay tests for both Rainbow Trout and *Daphnia magna*.
- A sample of the lime (soda ash) utilized for the liming process should be sent to the laboratory along with the water samples. In order to obtain results for the range of potential discharge values the laboratory will adjust the pH of the samples between 6.0 and 9.5, i.e., 6.3, 7.5 and 8.5.

Reference(s): LMI Liquid Waste Management Plan, March 2016.

Attachment: n/a

Interested Party:	ECCC	**Technical Comment No:**	3
Subject/Topic:	QA/QC Sample Numbers		

Reference:

- Table 2.2: Sampling Event Schedule

Detailed Review Comment by Party (April 9, 2021):

QA/QC samples shown in Table 2.2 include field duplicates or field blanks. It is not clear whether the quantity of QA/QC samples will comprise the recommended minimum 10% of samples, as noted in Footnote 1. Travel blanks should also be included in the suite of QA/QC analyses listed here. ECCC notes that travel blanks are included in Section 3.1 of the plan.

Request or Recommendation by Party (April 9, 2021):

ECCC recommends clarification in Table 2.2, where QA/QC samples should be randomly selected for different analyses, and comprise 10% of the samples. In addition, travel (trip) blanks should be included in the table for QA/QC samples. The footnotes could reference Section 3 - Water Field Quality Control.

LMI Response (June 15, 2021):

Table 2.2 specifies field blanks and duplicates for specific stations but does not list travel blanks because these apply to all stations sampled on any given day (i.e., reflect the potential for contamination during sample handling and transport for all samples). A footnote can be added to the table to reference Section 3 during the next update to the QA/QC Plan.

The criteria for QC samples to comprise at least 10% of the total sample count is included in footnote (1) to Table 2.2 (i.e., Duplicate and Blank samples must be collected for approximately every ten (10) field samples collected across the range of parameters. At least one duplicate must be submitted per sample shipment) and in Section 6.1.3:

- QC samples will represent a minimum of 10% of the total sample count (field samples plus QC samples) for each program (Environment Canada 2012).

In addition, the requirement for the QC program to include travel blanks is in Section 3.1:

- Travel blanks are supplied and shipped by the laboratory to test for possible contamination that might arise during the handling, transport, or storage of the samples. The identity of these samples must be recorded in the Field Log Book. One travel blank must be submitted per sample shipment.

Reference(s): n/a

Attachment: n/a

Interested Party:	ECCC	**Technical Comment No:**	4
Subject/Topic:	Field Log Book Observations		

Reference:

- 2.1.2: Field Measurements and Field Log Book

Detailed Review Comment by Party (April 9, 2021):

Weather conditions and air temperature are listed as activities to be recorded in the Field Log Book; it may be useful to specify these conditions to include wind speed and direction, as well as precipitation (current, as well as the past 24 hours). These data can be useful in interpreting some of the results (e.g. TSS, turbidity).

Request or Recommendation by Party (April 9, 2021):

ECCC recommends specifying the recorded ambient conditions to include wind speed, wind direction and precipitation.

LMI Response (June 15, 2021):

In the next update of the QA/QC Plan, wind speed, wind direction, and precipitation will be noted as conditions that should be recorded in the Field Log Book.

Reference(s): n/a

Attachment: n/a

Interested Party:	ECCC	**Technical Comment No:**	5
Subject/Topic:	Detection Limits		

Reference:

- Water Quality Monitoring and QA/QC Plan – General; Appendix B – Scope of Accreditations

Detailed Review Comment by Party (April 9, 2021):

The Scope of Accreditations (Appendix B) provides the list of tests and measurement capabilities of the analytical laboratories for parameters that could be analyzed. However, the document does not mention detection limits. It would be important to maintain consistent detection limits over time, or specify where ultra-low detection limits may be warranted.

Request or Recommendation by Party (April 9, 2021):

ECCC recommends that the QA/QC plan include a list of detection limits, or instructions for the users of the plan on communicating what detection limits are to be requested.

LMI Response (June 15, 2021):

A table of project detection limits will be included in the next version of the QA/QC Plan.

Reference(s): n/a

Attachment: n/a

Interested Party:	ECCC	**Technical Comment No:**	6
Subject/Topic:	Soil Sample QA/QC		

Reference:

- Section 8: Duplicate Samples

Detailed Review Comment by Party (April 9, 2021):

Duplicate samples are proposed for soil sampling QA/QC, at a 10% frequency. Other methods could include spiked samples and split samples, to assess accuracy and precision for the soil analyses.

Request or Recommendation by Party (April 9, 2021):

ECCC recommends reviewing additional soil QA/QC methods to be incorporated in the sampling program.

LMI Response (June 15, 2021):

The collection of duplicate soil samples at a 10% frequency is consistent with industry standards (CCME Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Volume 1 Guidance Manual, 2016). In addition, ALS is a Canadian Association for Laboratory Accreditation (CALA) certified laboratory. As part of their QC procedures, ALS uses method blanks, spikes, and the analysis of certified reference materials.

Reference(s): n/a

Attachment: n/a

6.0 QA/QC - CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA (CIRNAC)

Interested Party:	CIRNAC	**Technical Comment No:**	1
Subject/Topic:	Monitoring Parameters Omission		

Reference:

- Table 2.1: Sample Collection Requirements; 2AM-LUP2032 - Part J, Schedule J, Table 1

Detailed Review Comment by Party (April 8, 2021):

In the Document Control section, Revision No. 3.0, LMI stated monitoring parameters as one of the major updates performed on the QA/QC plan. In Table 2.1: Sample Collection Requirements, there was an omission of the following monitoring parameters in the QA/QC plan:

- Station ID. No. LUP-01, No visible sheen of Oil and Grease (O&G) parameter was not included; and
- Station ID. No. LUP-14, Total Phosphorous (TP) parameter was not included.

These monitoring parameters are required according to the Type A Water Licence No. 2AM-LUP2032 terms and conditions part J, Schedule J, Table 1 – Monitoring Program Requirements.

Request or Recommendation by Party (April 8, 2021):

(R-01) CIRNAC recommends that LMI update the QA/QC Plan to include the No visible sheen of O&G and TP monitoring parameters to Stations LUP-01 and LUP-14 respectively or provide a rationale for omitting these parameters.

LMI Response (June 15, 2021):

Under water licence 2AM-LUP2032 – Part J, Schedule J, Table 1 – criteria for Station ID. No. LUP-01 does not have an Oil and Grease parameter and therefore was not included in Table 2.1.

LMI will update Table 2.1 to include Total Phosphorous for Station ID. No. LUP-14.

Reference(s): 2AM-LUP2032 – Part J, Schedule J, Table 1

Attachment: **n/a**

Interested Party:	CIRNAC	**Technical Comment No:**	2
Subject/Topic:	Field Blank Omission		

Reference:

- Section 3.0: Water Field Quality Control

Detailed Review Comment by Party (April 8, 2021):

Section 3.0 of the QA/QC plan, does not contain any information about the field blank as one of the components of field quality control. It appears LMI has no plan to perform a field blank prior to sending the samples to the laboratory. This exercise is an important component of water field quality control measure used to detect and identify any contaminant from the sampling site.

CIRNAC is of the view that LMI update the QA/QC plan to include the field blank as one of the components of field quality control.

Request or Recommendation by Party (April 8, 2021):

(R-02) CIRNAC recommends that LMI updates the QA/QC Plan to include filed blank and ensure that field blank is performed prior to sending the samples to the laboratory.

LMI Response (June 15, 2021):

The requirement for field blanks is listed by station is Table 2.2, and elsewhere in Sections 2.2 and 5. LMI includes field blanks, duplicates, and travel blanks routinely as part of the QC program for Lupin Mine. A section describing field blanks will be added to Section 3 of the next version of the QA/QC Plan.

Reference(s): Table 2.2, Sections 2.2 and Section 5

Attachment: **n/a**

Interested Party:	CIRNAC	**Technical Comment No:**	3
Subject/Topic:	Sampling Station Coordinates		

Reference:

- Table 2.4; 2AM-LUP2032 – Part J, Item 2

Detailed Review Comment by Party (April 8, 2021):

In Table 2.4, of the QA/QC Plan, LMI provided the summary list of the current active sampling stations with some of their Global Positioning System (GPS) coordinates. The coordinates of eight (8) sampling locations in the landfarm and Landfill facilities were not provided.

This will undermine the essence of the QA/QC Plan, which is to promote sampling integrity by ensuring that samples are always taken from the same location, within the same temporal scope.

The provided coordinates were all captured in Universal Transverse Mercator (UTM) coordinate system. During the March 25, 2021 teleconference, the inspector requested the GPS coordinates be provided in degrees, minutes and seconds which is consistent withType A Water Licence No. 2AM-LUP2031, Part J, Item 2, which states that:

"The Licensee shall provide the GPS co-ordinates, in degrees, minutes and seconds of latitude and longitude, of all locations where sources of Water are utilized for all purposes"

This appears to be contradictory to the water licence provision.

Request or Recommendation by Party (April 8, 2021):

(R-03) CIRNAC recommends that LMI:

- Provide the GPS coordinates of the missing eight (8) sample stations for the landfarm and landfill facilities; and,
- Represent the GPS coordinates of all the sampling stations in degrees, minutes and seconds of latitude and longitude as per the water licence.

LMI Response (June 15, 2021):

The monitoring wells for the landfarm are still included as part of the water licence but it should be noted that on August 17, 2017 the NWB issued Motion No. 2017-A1-013, Modification No. 1 to allow the Licensee to implement the proposed leak-detection and associated measure, instead of the monitoring wells required under the Licence, to monitor the Landfarm facility. LMI will change the plan to state the monitoring wells were not installed as per the modification issued by the NWB and therefore not in use.

LMI will update the GPS coordinates of the sampling stations in degrees, minutes and seconds of latitude and longitude.

Reference(s): Motion No. 2017-A1-013, Modification No. 1

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	4
Subject/Topic:	Sampling Stations Signage		

Reference:

- n/a

Detailed Review Comment by Party (April 8, 2021):

In August 5, 2018 inspection report, CIRNAC inspector expressed concerns about the signage at the sampling stations. The concerns include the signage is physically short, not clear enough to be read from a close distance, constructed with wood and not firmly planted to the ground. Reading signage correctly prevents an avoidable error, enhances sampling integrity, and promotes consistency by ensuring samples are taken from the same location. It will also ensure continuity during staff changes.

Part B, Item 4, of the Type A Water Licence No. 2AM-LUP2032 terms and condition states that:

"The Licensee shall maintain to the satisfaction of the Inspector, all the signs necessary to identify the stations of the "Monitoring Program", detailed in Schedule J"

Request or Recommendation by Party (April 8, 2021):

(R-04) CIRNAC recommends LMI ensure that all sample stations signage align with the following criteria:

- About six (6) feet tall above ground to ensure visibility above snow;
- Built with metal for durability;
- Clearly marked with four (4) inch reflective lettering indicating the sample station
  - (e.g. LUP-01) to ensure it is legible and visibility.

LMI Response (June 15, 2021):

In 2018, the Inspectors report, carried out on August 5, 2018 and filed on January 23, 2019, did list a concern with 2 sample station signs at the Lupin mine site. LMI took the initiative and replaced all sample station signs at site. The 2019 and 2020 inspection reports did not have any concerns with signage at site.

Reference(s): n/a

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	5
Subject/Topic:	Executive Summary Improvement		

Reference:

- Executive Summary

Detailed Review Comment by Party (April 8, 2021):

In the executive summary, LMI did not capture the overview of the QA/QC plan and did not provide the Inuktitut and Inuinnaqtun translation of the executive summary.

This information is vital as the executive summary intends to provide readers with the overview of the QA/QC plan. The essence of translating the executive summary is to provide interested parties including community members the opportunity to participate effectively in the review process.

It will be helpful if LMI expand the executive summary to capture the overview of the QA/QC Plan.

Request or Recommendation by Party (April 8, 2021):

(R-05) CIRNAC recommends that LMI:

- Further develop the executive summary of the QA/QC plan to present the overview of the plan.
- Translate the executive summary of the QA/QC plan to Inuktitut and Inuinnaqtun for the benefit of the interested parties including community members involve in the review process.

LMI Response (June 15, 2021):

LMI will further develop the executive summary and then have the further developed executive summary translated to Inuktitut and Inuinnaqtun.

Reference(s): n/a

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	6
Subject/Topic:	Title Page Project Status		

Reference:

- Title Page

Detailed Review Comment by Party (April 8, 2021):

In the title page of the QA/QC Plan, LMI indicated the current phase of the closure period as Care and Maintenance. In section 6.0, of the Post Closure Monitoring Plan (PCMP), LMI stated that the Active Closure Period (Phase 1 monitoring), began in the summer of 2019 and forecasted that reclamation will be completed in the summer of 2021. This statement shows the project has moved away from Care and Maintenance phase to an Active Closure status.

It will be helpful if LMI indicate the current status of the project reclamation to avoid confusion to the readers.

Request or Recommendation by Party (April 8, 2021):

(R-06) CIRNAC recommends that LMI updates the QA/QC Plan title page to reflect the current Active Closure period.

LMI Response (June 15, 2021):

LMI will change the cover page to state Active Closure and Reclamation Phase.

Reference(s): n/a

Attachment: n/a

LUPIN MINES INCORPORATED

2021 Post Closure Monitoring Plan

Technical Comment Responses

Submitted to:

Nunavut Water Board
PO Box 119
Gjoa Haven, NU X0B 1J0

Submitted by:

K. Lewis, Project Manager

On behalf of:
Lupin Mines Incorporated
c/o Mandalay Resources Corporation
Suite 330 – 76 Richmond Street
Toronto, ON M5C 1P1

July 5, 2021

Contents

1.0 INTRODUCTION

On February 28, 2020, the Nunavut Water Board (NWB or Board) issued the Type A Water Licence 2AM-LUP2032 (Licence), with approval of the Licence from the Minister of Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) on April 9, 2020. The Licence (Part J, Item 13) requires Lupin Mines Incorporated (LMI) to submit a Post Closure Monitoring Plan (PCMP) to the Board for approval within one (1) year following the approval of the Licence.

On February 26, 2021, LMI and their consultants reached out CIRNAC, Environment and Climate Change Canada (ECCC) and the Kitikmeot Inuit Association (KIA) to participate in a consultation process (see below) prior to submitting the draft PCMP to the NWB on April 9, 2021. The draft PCMP was emailed to the interested parties later that same day.

The timeline for consultation, receipt of comments, and PCMP submissions was as follows:

- **9 March:** Conference call 2-4 pm ET
- **9 March :** Comments received from interested parties
- **16 March:** Feedback and comments incorporated and revised plan circulated for comment
- **25 March:** Second consultation session if needed to resolve final comments
- **9 April:** Submission of the PCMP to the Nunavut Water Board

The first consultation call/presentation, via Teams, was held on March 9, 2021 with CIRNAC, ECCC, the KIA and SteveJan Consultants Inc (SJCJ) on behalf of the KIA. Following the call, on the same date, LMI received comments from KIA/SJCJ.

On March 16, 2021, LMI emailed CIRNAC, ECCC and the KIA the updated draft PCMP, incorporating the relevant comments from the KIA/SJCJ, 2019 Annual Report, Water Quality Monitoring and QA/QC Plan August 2020, KIA/SJCJ Comments dated March 9, 2021 and LMI Response to KIA/SJCJ comments.

A second call was held on March 25, 2021 with CIRNAC, ECCC, the KIA/SJCJ. CIRNAC provided LMI with their written comments on the same date prior to the call, ECCC provided one verbal comment during the call and KIA/SJCJ provided their written comments after the call on March 26, 2021.

LMI did not provide a written response to the comments received on March 25/26, 2021 as all concerns were discussed during the call and relevant comments were incorporated into the draft PCMP prior to submission to the NWB for review and comment.

Due to COVID restrictions, LMI was not able to carry out in-person consultation with the community of Kugluktuk, but we hope that we will be able to provide an in-person update at some point in the near future.

On April 8, 2021, LMI held a conference call with community of Kugluktuk which was attended by community member. A call with a community member, was also held after the consultation session, noting she had no questions of concern. The Hunters and Trappers Association (HTO) advised that they were not available to attend the call but emailed a couple of questions. The following are the HTO questions including LMI's responses:

HTO Question:

First of is the concern for wastes that were used to bring out the gold from the ore deposits, do you have them all identified or aware of them? And how they are being approached or handled for clean up commitments.

LMI Response:

The wastes that were generated as part of the ore processing are contained in the tailings, which are stored in the Tailings Containment Area. The tailings are stored in isolated cells and covered with sand and water to prevent the types of reactions that generate environmental problems. After closure, the cells will be inspected to ensure they are operating as designed.

HTO Comment:

The other is, the testing of the water in Contoyto Lake (preferably where the toxins might flow into the Lake by). As you must know the Contoyto Lake drains to Bathurst Inlet by Hood River.

LMI Response:

Water in the Tailings Containment Area is collected before it is released to test for toxicity to aquatic life in a laboratory. Two different types of tests are completed:

1. Short-term laboratory toxicity tests (two to four days in length) and are performed with a water flea and a fish (Rainbow Trout).

2. Long-term laboratory toxicity tests (three to eight days in length) and are performed with algae, an aquatic plant, a water flea, and a fish (Fathead Minnow).

The results from toxicity tests are used to assess the potential for negative effects related to release of treated effluent into Seep Creek and ultimately Contwoyto Lake. Results from 2020 were consistent or better than in previous years. There were no toxic effects to fish in the laboratory tests, which provides confidence that release of treated effluent from the Tailings Containment Area is not causing any toxic effects in Contwoyto Lake.

The HTO thanked LMI for their response.

LMI submitted the PCMP to the NWB on April 9, 2021. The NWB sent out the PCMP to interested parties on April 21, 2021 to provide comments by May 26, 2021.

Technical review submissions were received from ECCC on May 18, 2021, SteveJan Consultants Inc (SJCJ) on behalf of the Kitikmeot Inuit Association (KIA) on May 26, 2021 and from CIRNAC on June 1, 2021. In response to the submissions,

LMI has provided a response document (June 15, 2021), which included the responses from LMI to each of the comments as presented including references and attachments where necessary, as well as responses to the comments submitted by CIRNAC and ECCC on April 8-9, 2021, respectively, on the Water Quality Monitoring Plan and Water and Soil Quality Control and Quality Assurance Plan.

LMI held a second conference call with community organizations and community members on June 24, 2021. This conference call included an update on the closure and reclamation work program as well as an overview of the PCMP to inquire if the community has any comments they would like the LMI to address. The KIA, HTO, GN (Cambridge Bay), and two community members were on the conference call.

On June 23, 2021, CIRNAC, ECCC and KIA/SJCJ submitted comments, or advised they were satisfied with LMI's responses, to the NWB in response to LMI's June 15, 2021 submission of the PCMP. LMI responses to each of the final comments, as presented, are provided below.

2.0 ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC)

Interested Party:	ECCC	**Technical Comment No:**	1
Subject/Topic:	Phase 2 Passive Closure Monitoring		

Reference:

- Table 9 Water Quality Monitoring Requirements for Active and Passive Closure at Lupin Mine; Section 6.2.2 Tailings Containment Area

Detailed Review Comment by Party (May 18, 2021):

Table 9 presents the monitoring for discharges from Pond 2, which is currently the effluent final discharge point, designated LUP-10. After 2021, a spillway will be installed at Dam 1A and this will be designated Station LUP-10b. Passive monitoring will be done for the period 2022-2026, or until the global objectives for the mine site can be confirmed. During the passive monitoring in Phase 2, all downstream monitoring is proposed to be completely discontinued as discharge from the Tailings Containment Area (TCA) will have ceased in 2021. Given that there will still be outflows from Pond 2 via the spillway, testing of downstream water quality should not be dropped entirely; this could be triggered as a response to any unanticipated changes in water quality at LUP-10b.

Request or Recommendation by Party (May 18, 2021):

- Linking sampling downstream of LUP-10b to the Adaptive Monitoring described in Section 6.2.6.
- Identifying the data analysis method that will be used to demonstrate pH trends or stability. This could be included under Section 7.0 Data Storage, Analysis and Reporting Subsection 7.1 Tailings Containment Area.

LMI Response (June 15, 2021):

Trends in pH through the Phase 1 (active closure) and Phase 2 (passive closure) periods will be evaluated visually using time series plots to assess water quality against the proposed trigger outlined in Section 6.2.2 (i.e., if pH remains above 5.5 and is not actively decreasing, Pond 2 will passively discharge to the environment and the monitoring frequency will be reduced). If changes in pH are detected through visual analysis, further quantitative analysis will be conducted using Mann-Kendall tests to determine if there are significant trends in pH. A downward trend in pH would trigger adaptive monitoring in the Seep Creek and Inner Sun Bay receiving environments.

Data analysis methods will be included in Section 7.0 (Sub-section 7.1) of the next version of the PCMP.

Reference(s): Section 6.2.2

Attachment: **n/a**

Detailed Review Comment by Party (June 23, 2021):

ECCC has reviewed the responses to comments on the Lupin Mine Site Post Closure Monitoring plan and found that they are reasonable and address ECCC's concerns.

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (July 5, 2021):

Thank you, LMI confirms the data analysis methods will be included in Section 7.0 (Sub-section 7.1) of the next version of the PCMP.

LMI considers this item resolved.

Interested Party:	ECCC	**Technical Comment No:**	2
Subject/Topic:	Adaptive Monitoring		

Reference:

- Section 6.2.6 Adaptive Monitoring

Detailed Review Comment by Party (May 18, 2021):

The Proponent states that monitoring will be scaled back as verification monitoring confirms predictions of chemical and physical stability, based on evidence. Section 6.2.6 focuses on reducing monitoring, but notes that if there is a need for enhanced monitoring, such as deterioration in water quality,

> "A detailed monitoring plan will be developed for any areas of concern depending on the geographic extent of the observed concern and/or a source, pathway, and receptor analysis for potential contaminant release to the environment."

No discussion has been provided on what would trigger increases in monitoring or constitute an area of concern.

Request or Recommendation by Party (May 18, 2021):

ECCC recommends that further discussion be outlined in Section 6.2.6 on triggers for increased monitoring under the Adaptive Monitoring approach.

LMI Response (June 15, 2021):

There are many possible future conditions that may trigger the need for adaptive monitoring. For this reason, the adaptive monitoring framework must be flexible and allow for contingency monitoring as required, and as appropriate to the observed change or area of concern. The TCA has a clearly defined trigger for pH as outlined in Section 6.2.2. In this case, if TCA water quality begins to approach the minimum thresholds identified for the transition from active to passive closure monitoring, then increased monitoring will need to be employed. More general triggers are proposed for other Mine areas, and include, for example, an increase in a parameter concentration relative to pre-remediation conditions.

The area of concern is also dependent on the nature of the change that is observed in the monitoring dataset. This could be, for example, a change in seepage quality from the waste rock dome that indicates residual soils contamination that may be entering the receiving environment. The area of concern in this case, would be the seepage source, pathway, and receiving environment. LMI notes that the Water Licence requirements for the PCMP include a description of thresholds that may trigger a reduction in monitoring requirements in closure. There is no requirement in the Water Licence for a description of thresholds that may require an increase in monitoring.

Reference(s): Section 6.2.2

Attachment: **n/a**

Detailed Review Comment by Party (June 23, 2021):

ECCC has reviewed the responses to comments on the Lupin Mine Site Post Closure Monitoring plan and found that they are reasonable and address ECCC's concerns.

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (July 5, 2021):

Thank you.

LMI considers this time resolved.

3.0 CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA (CIRNAC)

Interested Party:	CIRNAC	**Technical Comment No:**	1
Subject/Topic:	Water Quality in TCA		

Reference:

- Section 6.2.2

Detailed Review Comment by Party (June 1, 2021):

In section 6.2.2, LMI proposes a pH trigger to help determine when desired water quality conditions are achieved in the Tailings Containment Area (TCA) (Cell 4, Pond 1, Pond 2) that would allow for the transition from active to passive discharge and reduced TCA monitoring. It is questionable to use a pH trigger (5.5) which is lower than the acceptable Metal and Diamond Mining Effluent Regulations (MDMER) range (6.0-9.5) as a reference point. It is also not clear why the trigger is based on pH only and not any total metals that have been a concern associated with the tailings.

Request or Recommendation by Party (June 1, 2021):

(R-01) CIRNAC recommends that, prior to transitioning from active to passive TCA discharge, the licensee justify why the trigger for the transition does not include criteria for concentrations of metals of concern.

LMI Response (June 15, 2021):

The trigger for the transition from active to passive closure does not include criteria for metals concentrations as the Lupin Mine site does not currently exceed metals criteria stipulated in the Water Licence. Further, discharge from Pond 2 has not previously required treatment for metals and has complied with MDMER limits for deleterious substances, including those established for arsenic, copper, lead, nickel, and zinc per Part 1 and Schedule 4 of the MDMER. There are no new sources for these metals in closure, and therefore no residual risk for metals contamination in the passive closure phase.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment by Party (June 23, 2021):

In comment R-01, CIRNAC recommended that prior to transitioning from active to passive TCA discharge, the licensee justify why the trigger for the transition does not include criteria for concentration of metals of concern.

In its response, the licensee stated that:

The trigger for the transition from active to passive closure does not include criteria for metals concentrations as the Lupin Mine site does not currently exceed metals criteria stipulated in the Water Licence. Further, discharge from Pond 2 has not previously required treatment for metals and has complied with MDMER limits for deleterious substances, including those established for arsenic, copper, lead, nickel, and zinc per Part 1 and Schedule 4 of the MDMER. There are no new sources for these metals in closure, and therefore no residual risk for metals contamination in the passive closure phase.

The licensee's response does not address CIRNAC's concern. The MDMER limits are for effluents from a mine, and according to the PCMP, the licensee hopes to achieve closed mine status in 2021. CCME protection of aquatic life water quality guidelines or site specific water quality objectives are more relevant for reclaimed sites that have reduced monitoring because there are no longer activities on site. CIRNAC continues to recommend the licensee justify why the trigger for the transition does not include criteria for concentration of metals of concern.

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (July 5, 2021):

LMI anticipates that MDMER closed mine status will be achieved in early 2022, any discharge from the TCA is still subject to the Water Licence requirements until such time that the Water Licence is amended. Discharge from the TCA has been consistently below the Water Licence effluent quality criteria for metals.

Reference(s): n/a

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	2
Subject/Topic:	Geotechnical Monitoring		

Reference:

- Section 6.1.1; Section 6.1.4; Section 6.2.1

Detailed Review Comment by Party (June 1, 2021):

Geotechnical monitoring is essential to check that structures are performing as planned and are physically stable. The executive summary speaks to "Inspections include seepage from the dams, water levels in ponds/cells, and general surface erosion, tension cracks, and/or anomalies on dams", however section 6.1.1 does not specify dams other than the TCA. During phase 1, structures still classified as dams should be inspected, including:

- Verifying slope stabilization and erosion control at the former "interior dams" (K,M,N) and L Dam Spillway;
- Monitoring potential exposed and covered tailings after water level is drawn down; and
- Monitoring of thermistors in the M and N dams.

Section 6.1.4 states "Some perimeters dams can be declassified as dam structure in Phase 2, as they will no longer contain water when the ponds are passively managed at a much lower post closure water levels", without specifying which dams are being referred to.

Additionally, section 6.2.1 states: "Any evidence of surficial settlement or erosion or settlement above the crown pillar or shafts will be documented with photographs and reported." The absence of settlement and erosion is also noteworthy. Photographic records of inspections over the years should be kept and reported to allow monitoring of any evolution.

Request or Recommendation by Party (June 1, 2021):

(R-02) CIRNAC recommends that licensee include in the PCMP:

- the list of structures to be inspected in phase 1;
- specific dams which they intend to declassify for phase 2; and
- instructions to report on phase 2 site inspections regardless of the findings.

LMI Response (June 15, 2021):

The Executive Summary states, "Phase 1 (Active Closure) monitoring includes bi-weekly inspections during freshet per **Part J, Item 11** of the Water Licence. Inspections include seepage from the dams, water levels in ponds/cells, and general surface erosion, tension cracks, and/or anomalies on dams….."

Section 6.1.1 also refers to inspections as **Part J, Item 11 and Item 12.** Part J, Item 11 and Item 12, both refer and require inspections at the Tailings Containment Area not other areas at the Lupin Mine site. During Phase 1 – Active Closure Phase, which we are currently actively in this stage, structures are inspected as required under Part J, Item 11 and Item 12, filed annual with NWB located on the NWB ftp under

ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-LUP2032%20LMI/3%20TECH/J%20MONITORING/J12%20Annual%20Geotechnical%20Inspection/

LMI can agree to list the structures at the TCA which are required for Phase 1 inspections under Part J, Item 12 which form the annual geotechnical Engineer's report. These dams are also listed in the approved FCRP – Table 11: Perimeter and Internal Dams. During Phase 1 these reports will continue as per Part J, Item 12.

Under Section 6.2.4 Geotechnical Monitoring (Temperature/Thermistor) LMI has provided the list of dams they would request to declassify.

These reports verify slope stabilization and surface water management to limit erosion at Dam K, Dam M, Dam N and once we are in the Closure Phase the Dam L outlet structure, it should be noted that this is not a spillway as stated above by CIRNAC.

The PCMP states the during the TCA inspections, the geotechnical engineer will also carry out visual inspections of the condition of the esker cover at the TCA. There are no thermistors planned in Dam M or Dam N.

The PCMP states, "Reporting for the Phase 1 and Phase 2 monitoring programs will consist of an annual monitoring report per the Water Licence (Part J Item 10) submitted by 31 March each year, a final MDMER report for 2021, Phase 1 and 2 geotechnical monitoring reports, and a final soils remediation report."

Reference(s): 2AM-LUP2032 – Part J, Item 11 and Item 12; Section 6.2.4; Executive Summary; Section 6.1.1

Attachment: n/a

Detailed Review Comment by Party (June 23, 2021):

CIRNAC concerns were addressed

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (June 15, 2021):

Thank you. As committed, LMI will provide a list of structures at the TCA required for Phase 1 inspections in a PCMP addendum.

LMI considers this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	3
Subject/Topic:	Community Consultation		

Reference:

- Schedule J, Item1

Detailed Review Comment by Party (June 1, 2021):

Schedule J Item 1 requires the licensee to consult with the community of Kugluktuk during both development of PCMP and post closure monitoring, and the requirement remains outstanding.

In the executive summary, LMI states that consultation occurred via online calls and presentations on March 9 & 25, 2021. On March 9 and 25 2021, LMI held technical review sessions with government representatives, the Kitikmeot Inuit Association (KIA), and various hired consultants/technical representatives. The goal was to review the comments LMI received from these organizations about the PCMP. The nature of the calls were technical. It is recommended that LMI undertake additional measures to consult with the community of Kugluktuk.

In the executive summary, LMI references consultation that occurred with community members and organizations in the community of Kugluktuk in April 8, 2021. LMI stated during a call with CIRNAC on May 26, 2021 that the consultation was not well attended. CIRNAC would like to know details about how the community was notified of the event, engagement content, and a summary of dates, times, locations, attendees, concerns brought forward.

Schedule B, Item 1l describes information on public consultation to be included in annual reports. This should be reproduced in the PCMP to ensure required information is collected during consultation.

CIRNAC notes the submitted PCMP does not include a translated executive summary in Inuktitut or Inuinnaqtun. Translated material is essential so that consultations can include all potentially interested community members. Given the limited success of first consultation attempts, a more thorough plan must be developed and described in section 8 of the PCMP.

Request or Recommendation by Party (June 1, 2021):

(R-03) CIRNAC recommends section 8 of the PCMP include a detailed plan for proposed community consultations including how the community will be notified, how materials understandable by the general public will be prepared, what times of year will be prioritized for maximum participation, as well as information contained in Schedule B, Item 1l.

LMI Response (June 15, 2021):

LMI will provide the information on community consultation as required under the Water Licence Condition Part B, Item 2 (Annual Report) Schedule B, Item 1. Wherein, LMI is required under its water licence to provide a summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions and the consultation efforts of the Licensee required under Part B, Item 20. LMI is not required to provide this information as part of the overall PCMP but has included an overview. LMI believes they have met the water licence condition and will continue to consult with the community members and community organizations.

Detailed Review Comment by Party (June 23, 2021):

In comment R-03, CIRNAC recommended that: Section 8 of the PCMP include a detailed plan for proposed community consultations including how the community will be notified, how materials understandable by the general public will be prepared, what times of year will be prioritized for maximum participation, as well as information contained in Schedule B, Item 1(i).

In its response, the licensee stated that they are not required to provide the summary of the consultation as part of the overall PCMP but has included an overview and believe they have met the water licence condition.

LMI has not yet provided the 2020 annual report, so CIRNAC is not able to determine if Part B, Item 20 of the water licence has been met. CIRNAC is expecting the following information as part of consultation summary referred in Schedule B, Item 1(i) and Schedule J, Item 1.

- List of community members and organizations in attendance;
- What concerns were raised by the community members;
- Which information was provided to the community members in attendance with regards to the status of reclamation and closure activities;
- How were the community notified about the meeting; and
- Schedule of upcoming events and information sessions.

CIRNAC's community consultation concern remains outstanding and CIRNAC recommends the consultation summary referred in the water licence be provided in the 2020 annual report.

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (July 5, 2021):

LMI provided a summary of community consultations as required under the Water Licence Condition Part B, Item 2 (2020 Annual Report), Schedule B, Item 1(l) filed with the NWB on June 26, 2021 (extension granted date). Under Schedule J, Item 1, development of the PCMP began in December 2020 and therefore community consultation took place in 2021 and has/will continue, with the outcomes to be summarized in future Annual Reports. To clarify, CIRNAC listed Schedule B, Item 1(i) above and we believe they meant to type Schedule B, Item 1(l).

For 2021, consultation with community members and community organizations was provided to the CIRNAC Manager of Land Operations on June 4, 2021. LMI held a second community conference call on June 24, 2021 with community members and community organizations providing an update and answer questions on the final closure and reclamation work program as well as provide information and answer questions on the PCMP. LMI will include a summary in the 2021 Annual Report as required under Part B, Item 2. Also see LMI Response to KIA TC 5 below.

LMI would like to advise that the translations were provided to the NWB on June 23, 2021.

LMI considers this item resolved.

Reference(s): 2AM-LUP2032, Part B, Item 2, Schedule B, Item 1(l); Schedule J, Item 1, LMI Response to KIA TC 5 below (July 5, 2021) / **Attachment: n/a**

Interested Party:	CIRNAC	**Technical Comment No:**	4
Subject/Topic:	Visual Inspections of TCA Pond Perimeters		

Reference:

- n/a

Detailed Review Comment by Party (June 1, 2021):

Visual inspections along TCA pond perimeters looking for signs of active oxidation or seepage are currently included for phase 1, but not explicitly for phase 2. Absence of signs of active oxidation or seepage will be necessary to demonstrate long term chemical and physical stability, so these inspections should continue throughout phase 2.

Request or Recommendation by Party (June 1, 2021):

(R-04) CIRNAC recommends that visual inspections for signs of active oxidation or seepage be included in the phase 2 monitoring.

LMI Response (June 15, 2021):

Visual inspections for signs of active oxidation and seepage will continue during Phase 2 site visits.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment by Party (June 23, 2021):

Licensee is committed to continue visual inspection for signs of active oxidation and seepage during phase 2 monitoring.

Request or Recommendation by Party (June 23, 2021):

This addresses CIRNAC's concern and we request this be added in a PCMP addendum.

LMI Response (July 5, 2021):

LMI will include this in a PCMP addendum.

LMI considers this item resolved.

Reference(s): n/a

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	5
Subject/Topic:	Schedule J Items Missing		

Reference:

- 2AM-LUP2032 - Schedule J, Item 2;

Detailed Review Comment by Party (June 1, 2021):

Schedule J, Item 2 of water licence 2AM-LUP2032 lists items that need to be included in PCMP. Certain items were not found in the plan submitted in April 2021, including:

a. A review of historical data and estimate of waste rock quantities use across the site for construction of dams and other permanent structures;
b. Thresholds for tailings cover performance that would trigger moving to reduced monitoring frequency or intensity;

CIRNAC notes that Item 2g, also includes the requirement for thresholds for water quality at the TCA, and these have been provided.

Request or Recommendation by Party (June 1, 2021):

(R-05) CIRNAC recommends the PCMP include all items prescribed in Schedule J, Item 2 of the water licence, including an estimate of waste rock quantities used across the site from historical data and thresholds for tailings cover performance.

LMI Response (June 15, 2021):

As stated in the FCRP, the estimated volume of waste rock brought up from underground and placed on surface is about 1,000,000 m3. Review of historical documents, including two environmental site assessments, has not determined a more precise number.

The historical data and estimate of waste rock quantities used across the site for construction of dams was carried out during the FCRP review process under PHC Commitments #3 and #4. There was an estimated 100,000 m3 of waste rock used to build the TCA dams.

LMI has previously explained the requirement for a saturated zone above the tailings contact within the cover, which will be monitored by the volumetric water content (VWC) probes. The VWC trends will be used to trigger a reduction or increase in monitoring frequency, as required.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment by Party (June 23, 2021):

CIRNAC concerns were addressed.

Request or Recommendation by Party (June 23, 2021):

LMI Response (July 5, 2021):

Thank you.

LMI considered this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	6
Subject/Topic:	Duration of Passive Monitoring		

Reference:

- Section 6.0

Detailed Review Comment by Party (June 1, 2021):

Section 6.0 states that "The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (i.e. 2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. Phase 2 monitoring programs will be carried out during site visits under the supervision and direction of DMS [Discovery Mining Services].

The Federal Contaminated Sites Action Plan Long-Term Monitoring Planning Guidance recommends 25 years of monitoring to verify equilibrium conditions at landfills in northern regions. This matches the post closure monitoring period used to generate the reclamation estimate used for site is 25 years.

Request or Recommendation by Party (June 1, 2021):

(R-06) CIRNAC recommends the PCMP support the proposed shorter passive monitoring period with evidence that permanent physical and chemical stability of the site could be determined in this timeframe.

LMI Response (June 15, 2021):

The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. The adaptive monitoring framework outlined in Section 6.2.6 allows for enhanced monitoring if closure objectives of physical stability, chemical stability, and future use and aesthetics are not met by the end of the passive closure period in 2026. In this case, an extended passive monitoring period would be considered depending on the magnitude and spatial extent of the concern. As per the response to KIA TC 2, 3, and 4 below, active monitoring will occur until the global closure objectives have been confirmed.

Reference(s): Section 6.2.6 Adaptive Monitoring; KIA TC 2, 3 and 4 below

Attachment: n/a

Detailed Review Comment by Party (June 23, 2021):

In comment R-06, CIRNAC recommended that: The PCMP support the proposed shorter passive monitoring period with evidence that permanent physical and chemical stability of the site could be determined in this timeframe.

In its response, stated that:

The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. The adaptive monitoring framework outlined in Section 6.2.6 allows for enhanced monitoring if closure objectives of physical stability, chemical stability, and future use and aesthetics are not met by the end of the passive closure period in 2026. In this case, an extended passive monitoring period would be considered depending on the magnitude and spatial extent of the concern. As per the response to KIA TC 2, 3, and 4 below, active monitoring will occur until the global closure objectives have been confirmed.

This response does not address CIRNAC concern as CIRNAC wanted the licensee to provide an evidence that permanent physical and chemical stability of the site could be achieved in 5 years. CIRNAC is of the opinion that permanent physical and chemical stability in the arctic cannot be demonstrated in such a short timeframe and requests the licensee provides evidence on how they intend to do so.

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (July 5, 2021):

Physical stability of the TCA will be achieved at the completion of active reclamation work and annual DSIs will confirm that physical stability. Historical testing of the Lupin tailings (Klohn Leanoff, 1992) concluded that exposed tailings could become acid-generating within 5-10 years of exposure to weathering; as such it is considered that 5 years is adequate to provide evidence of TCA chemical stability or provide evidence that a longer monitoring period is required.

Reference(s): n/a

Attachment: n/a

Interested Party:	CIRNAC	**Technical Comment No:**	7
Subject/Topic:	Demolition Landfill Monitoring Wells		

Reference:

- Schedule J, Table 1; Table 9

Detailed Review Comment by Party (June 1, 2021):

Schedule J, Table 1 of the water licence prescribes three monitoring wells at the demolition landfill facility; one up gradient (LUP-36) and two down gradient (LUP-37a & LUP-37b).

The licensee's comments on these stations in Table 9 are: "Demolition landfill is not planned for construction".

CIRNAC agrees that there no longer is a demolition landfill planned. The material that was originally planned to placed in this landfill will instead be buried in the Waste Rock Dome.

In order to monitor possible leachate, wells originally planned for the demolition landfill should be moved to up gradient and down gradient of the Dome.

Request or Recommendation by Party (June 1, 2021):

(R-07) CIRNAC recommends the licensee install monitoring wells upstream and downstream of the waste rock dome and include their monitoring in Table 9 of the PCMP.

LMI Response (June 15, 2021):

CIRNA's comment above in regard to material that was originally planned to be placed in this landfill will instead by buried in the Waste Rock Dome is an incorrect statement. Instead, the non-hazardous waste materials generated by demolition will be placed into the existing landfill facility, which has been raised to accommodate these materials. LMI has not stated and does not plan on placing anything other than waste rock into the Waste Rock Dome. As stated in the PCMP, per Water Licence requirements, seepage surveys and applicable sampling will be conducted twice yearly at the landfill facility (LUP-31 and LUP-35) and Waste Rock Dome (LUP-SP-01 to LUP-SP-XX) through the Phase 2 Passive Monitoring, as for Phase 1 Active Monitoring (Table 9). Surveys will be conducted once in late spring after complete melt and once in late summer (late August or September) before freeze-up. This monitoring requirement is consistent with response to CIRNAC TC No. 17 during the Water Licence review process, whereby LMI committed to monitor and sample seeps from the domed covered waste rock area.

Reference(s): CIRNAC TC No. 17 (water licence review process)

Attachment: n/a

Detailed Review Comment by Party (June 23, 2021):

CIRNAC concerns were addressed.

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (July 5, 2021):

Thank you.

LMI considers this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	8
Subject/Topic:	Activity Schedule Unclear		

Reference:

- n/a

Detailed Review Comment by Party (June 1, 2021):

Much of the content of the document is dated, and in some instances, unclear. The document contains references made to events/activities to be done in future that have already been undertaken. In various cases, the document provides detailed descriptions of what has occurred in the past, without inclusion in discussions of what has happened to the end of 2020, and what if anything remains to be done. For example section 4.7.8 Fuel Storage, refers to 14 diesel tanks, 1 jet A tank and 9 individual tank, without mentioning that some have been removed and others are still standing.

The PCMP covers 2021, during which time it is important to have a clear schedule that illustrates the activities proposed to be carried out during the "active period" and the expected completion date for these activities. The schedule should include when the J and 1A dams will be breached and when final pond water elevations of 480 m for Pond 2 and 481 m for Pond 1 will be established.

Request or Recommendation by Party (June 1, 2021):

(R-08) CIRNAC recommends the PCMP be modified to include a schedule of activities with expected completion dates.

LMI Response (June 15, 2021):

Section 4.0 Summary of Final Closure provides an overview of the FCRP. Under Section 4.0 it states, "The approved FCRP has been prepared on the assumption that all facilities and installations that comprise the Lupin Mine Operations will ultimately be decommissioned, removed, or reclaimed under the terms of the land lease and in accordance with the reclamation requirements set out in the Water Licence (LMI 2020a).

For complete and comprehensive details associated with final remediation and closure refer to the FCRP."

An updated schedule has been provided to CIRNAC and the schedule will also be provided with the FCRP addendum(s) as part of the Annual Report.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment by Party (June 23, 2021):

In comment R-08, CIRNAC recommended that:

The PCMP be modified to include a schedule of activities with expected completion dates.

In its response, the Licensee stated that an updated schedule has been provided to CIRNAC and the schedule will also be provided with the Final Closure and Reclamation Plan (FCRP) addendum (s) as part of the Annual Report.

The updated version of the schedule provided does not address CIRNAC's concern, as the following details are missing from the schedule:

- Extent or degree the items planned in the 2020 schedule have been completed;
- Details on the time lines of work planned for 2021; and
- Duration of each activities.

However, on June 21, 2021, the Licensee provided more detailed schedule for the 2021 earthworks reclamation activities to CIRNAC field inspectors. It will be helpful if the Licensee incorporate this amount of detail into the FCRP addendum that will be submitted alongside the annual report.

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (July 5, 2021):

As per LMI's original commitment above, LMI will provide an updated schedule (FCRP Table 14 – Summary of Measures for Final Closure) with the Rev 2 FCRP addendum as part of the Annual Report. The approved FCRP states, "Table 14 lists the measures that will need to be implemented to achieve permanent closure at both locations. The following subsections provide descriptions of the measures for each component." While there are years associated with each task, Table 14 was never intended to be a detailed schedule of activities but a summary of measures to achieve permanent closure.

To assist CIRNAC with planning for inspections/engineers to be on site and verify the work being carried out and completed, LMI provide a detailed schedule to CIRNAC in January 2020 for the 2020 work program. A revised schedule for 2021 was provided to the Inspector for the same purpose, to assist with inspection timelines etc and the Inspector was advised that this earthworks schedule would be fluid due for various factors. It would not be prudent to include an every evolving plan in the FCRP addendum as the FCRP Addendum's are revised and submitted with the Annual Report once a year. LMI is working with the Inspector and Manager of Field Operations to coordinate inspections and site visits for their consultant engineers (staying at site one to two weeks at a time) to ensure that the work is being carried out as planned and to timing of activities to ensure items are inspected for potential security requests.

LMI considers this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	9
Subject/Topic:	Inadequate Figures		

Reference:

- Appendix A - Figure 4 and Figure 8

Detailed Review Comment by Party (June 1, 2021):

Figures presented in Appendix A do not illustrate the site as it is in 2021, or as it will be once closure activities are completed. As such, it is difficult to evaluate the location of sampling sites or to put the proposed monitoring in context. For example, Figure 4 shows the TCA pre-2020, but there is no illustration for after closure and no indication of where the spillway will be built and what the water levels will be.

Figure 8 shows 13 seepage surface water sampling locations, but it is not clear if these are LUP-SP-01 to LUP-SP-XX referred to in Table 9. There is also no figure for seeps from the TCA, identified as LUP-TCA-01 to LUP-TCA-XX in Table 9.

Request or Recommendation by Party (June 1, 2021):

(R-09) CIRNAC recommends the PCMP include figures that show site conditions after planned closure works are completed, and include all the sampling stations.

LMI Response (June 15, 2021):

LMI commits to updating the PCMP figures once the closure and reclamation is complete.

Seeps from the waste rock dome (LUP-SP-01 to LUP-SP-XX) and TCA (LUP-TCA-01 to LUP-TCA-XX) are not shown on figures, as they have not yet been sampled. Surveys will be conducted in spring freshet 2021 at the TCA and at the waste rock dome after construction (if flowing water is observed). The location of these seeps cannot therefore be documented until after the 2021 sampling programs.

As stated in the PCMP for LUP-TCA01 to LUP-TCA-XX, seep sampling locations will be added to the post closure monitoring program as new seeps are documented.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment by Party (June 23, 2021):

Licensee is committed to updating the PCMP figures on completion of the closure and reclamation activities. CIRNAC will comment further once the drawings become available.

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (July 5, 2021):

Thank you. LMI considers this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	10
Subject/Topic:	Changes to General Monitoring		

Reference:

- Section 1.4

Detailed Review Comment by Party (June 1, 2021):

Section 1.4 of the PCMP states “General monitoring is subject to change, as directed by an Inspector or by the Licensee, and is also subject to approval by the NWB[Nunavut Water Board].”

CIRNAC would like to clarify that an Inspector has the authority to request additional monitoring or changes to monitoring without approval by the Board. Should the licensee want to change general monitoring conditions, approval from the Nunavut Water Board would have to be sought beforehand.

Request or Recommendation by Party (June 1, 2021):

(R-09) CIRNAC recommends the licensee clarify the text regarding changes to general monitoring in the next revision of the PCMP.

LMI Response (June 15, 2021):

LMI will update the wording to reflect the water licence wherein general monitoring is subject to change as per the water licence, Part J, Item 8, which states: Additional monitoring requirements may be requested by the Inspector (note: without approval of the Board); or Part J, Item 10, the Licensee shall submit to the Board for approval any requests for changes(s) to the Monitoring Program as outlined in Part J and Schedule J, including justification for the change(s). The NWB may modify the Monitoring Program under Schedule J without an Amendment to the Licence. Refer to Section 5.0 and Appendix D.

Reference(s): 2AM-LUP2032 – Part J, Item 8 and Schedule J; Section 5.0; Appendix D.

Attachment: n/a

Detailed Review Comment by Party (June 23, 2021):

Licensee is committed to updating the wording in section 1.4 of the PCMP to reflect the water licence thus:

Wherein general monitoring is subject to change as per the water licence, Part J, Item 8, which states: Additional monitoring requirements may be requested by the Inspector (note: without approval of the Board); or Part J, Item 10, the Licensee shall submit to the Board for approval any requests for changes(s) to the Monitoring Program as outlined in Part J and Schedule J, including justification for the change(s). The NWB may modify the Monitoring Program under Schedule J without an Amendment to the Licence.

This addresses CIRNAC’s concern and we request this be added in a PCMP addendum.

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (July 5, 2021):

LMI will update the wording in Section 1.4 as per above in a PCMP addendum.

LMI considers this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	11
Subject/Topic:	Thermistor Repair		

Reference:

- Table 13

Detailed Review Comment by Party (June 1, 2021):

Table 13 reports one thermistor in Dam 1A and one thermistor in Dam 4 were damaged in 2020 and there will be an attempt to repair them. No plans or information on what the attempts will entail are provided.

Request or Recommendation by Party (June 1, 2021):

(R-09) CIRNAC recommends the licensee clarify the text regarding changes to general monitoring in the next revision of the PCMP.

LMI Response (June 15, 2021):

As noted in the approved FCRP and PCMP, a spillway will be constructed through Dam 1A after closure and Dam 4 will be declassified so while LMI will make an effort to repair the thermistors, they are not critical for post closure monitoring as they will no longer be water retaining structures. The results of any repairs will be included in the Annual Report.

Reference(s): FCRP

Attachment: n/a

Detailed Review Comment by Party (June 23, 2021):

The licensee is committed to repairing the damaged thermistors and including the results of the repairs in the annual report.

This addresses CIRNAC's concern and we request this be added in a PCMP addendum.

Request or Recommendation by Party (June 23, 2021): n/a

LMI Response (July 5, 2021):

Thank you, to clarify LMI committed to make every effort to repair the thermistors and LMI will provide any repair updates in the Annual DSI Report.

LMI considers this item resolved.

4.0 KITIKMEOT INUIT ASSOCIATION (KIA)

Interested Party:	KIA	**Technical Comment No:**	1
Subject/Topic:	Duration of the Post-Closure (PC) Monitoring Phase		

Reference:

- Section 6.2.1

Detailed Review Comment By Party (May 20 & 26, 2021):

The final PCMP continues to refer to the PC phase as being 5 years long, i.e., from 2022 to 2026. A number of examples are present within the final version that acknowledge monitoring will continue beyond then, for as long as required, with the minimum being to February 27, 2032 when the current Water Licence is due to expire. However, not in all cases.

In Section 6.2.1-Site Inspections, is the first mention of a Phase 3 – Passive Closure Period. The next paragraph in the PCMP discusses components of the visual inspections, presumably referring to those to be undertaken during the Phase 3. It is unclear why this additional Phase has been included here and only here.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

LMI is required to carry out all monitoring as per the water licence until the licence expires (including any renewal of the licence); or until the closure objectives for the mine site can be confirmed by CIRNAC and the NWB. As stated in the PCMP, Section 1.1 Scope of Monitoring Plan, "Post closure monitoring of the Site will be conducted to meet the global objectives of Physical Stability, Chemical Stability, and Future Use and Aesthetics described in Section 1.2.

A high-level conceptual PCMP was developed and incorporated in the FCRP (refer to Section 5.0 of the FCRP). It is **anticipated** that active monitoring will occur for 2.5 years and passive monitoring will occur for **approximately** 5 years following completion of the reclamation work, **or until the global objectives for the Site can be confirmed.**"

LMI acknowledges that a typo was made and under Section 6.2.1 – Site Inspections it should say Phase 2 not Phase 3, we apologize for the error.

Reference(s): Section 1.1**;** FCRP Section 5.0

Attachment: n/a

Detailed Review Comment By Party (June 22 & 23, 2021):

Duration of post-closure monitoring: The document should be consistently stating the monitoring will continue for as long as required, and notably as specified in the Water Licence. This is not the case through the entire document.

The KIA accept the clarification there is no Phase 3 of closure monitoring, and only 2 Phases in total.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

Thank you. LMI confirms they will correct the typo under Section 6.2.1 – Site Inspections it should say Phase 2 not Phase 3 in a PCMP addendum.

LMI considers this item resolved.

Reference(s): n/a

Attachment: n/a

Interested Party:	KIA	**Technical Comment No:**	2
Subject/Topic:	Focus on Including Text on How LMI can Reduce Monitoring Requirements		

Reference:

- Section 6.2.6

Detailed Review Comment by Party (May 20 & 26, 2021):

Although the text now has a section titled Adaptive Monitoring, only a brief mention is made of the possible need for enhanced monitoring while several subsections within the above titled section elaborate on how reductions in monitoring requirements at the site can be undertaken.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

The PCMP is a living document. Under Schedule B, Item K, where applicable, revisions as Addendums with an indication of where changes have been made for plans reports and Manuals is required in the Annual Report. As LMI receives annual results of the monitoring program, updates to the PCMP may be required and submitted under the Annual Report. LMI will assess if reductions or further monitoring is required annually and provide as addendum to the plan in the Annual Report.

Reference(s): Schedule B, Item K

Attachment: n/a

Detailed Review Comment By Party (June 22 & 23, 2021):

LMI continues to downplay its focus within the PCMP document on discussing possible reductions in monitoring requirements versus presenting alternate changes (both more or less in scope) that may be required, including increases in monitoring that may be required for the most likely scenarios and attempting to track down the source(s) of the problem.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

While LMI's respects the KIA/SJCJ response, LMI respectfully disagrees that LMI is downplaying its focus within the PCMP document.

Please see LMI's response to ECCC TC 2 above, which LMI should have referenced in our original response to the KIA, which states: "There are many possible future conditions that may trigger the need for adaptive monitoring. For this reason, the adaptive monitoring framework must be flexible and allow for contingency monitoring as required, and as appropriate to the observed change or area of concern. The TCA has a clearly defined trigger for pH as outlined in Section 6.2.2. In this case, if TCA water quality begins to approach the

minimum thresholds identified for the transition from active to passive closure monitoring, then increased monitoring will need to be employed. More general triggers are proposed for other Mine areas, and include, for example, an increase in a parameter concentration relative to pre-remediation conditions.

The area of concern is also dependent on the nature of the change that is observed in the monitoring dataset. This could be, for example, a change in seepage quality from the waste rock dome that indicates residual soils contamination that may be entering the receiving environment. The area of concern in this case, would be the seepage source, pathway, and receiving environment. LMI notes that the Water Licence requirements for the PCMP include a description of thresholds that may trigger a reduction in monitoring requirements in closure. There is no requirement in the Water Licence for a description of thresholds that may require an increase in monitoring."

On June 23, 2021 (ECCC TC 2 above) ECCC advised the NWB that, "ECCC has reviewed the responses to comments on the Lupin Mine Site Post Closure Monitoring plan and found that they are reasonable and address ECCC's concerns."

Reference(s): Section 6.2.2; ECCC TC 2 above

Attachment: n/a

Interested Party:	KIA	**Technical Comment No:**	3
Subject/Topic:	Lowering Discharge pH Limits to 5.5 from 6.0		

Reference:

- Section 6.2.2

Detailed Review Comment By Party (May 20 & 26, 2021):

The PCMP continues to promote the idea of a pH 5.5 lower site-specific trigger limit for the TCA and its discharge versus the federal and NWB Water Licence lower limit of 6.0. The PCMP lists several lower pHs measured at a number of water quality monitoring sites in the surrounding water bodies of the TCA as it did in the earlier versions of the PCMP. However, a pH at or near the proposed lower pH limit in the TCA could be an indication that the soil cover over the previously exposed tailings is not effective and that acid generation is occurring. A defensible case (with significantly more data than shown in the PCMP) would need to be made within an application to the NWB for a lowered pH trigger point for discharges from the site to be considered.

Text in Section 6.2.2-Tailings Containment Area PC Monitoring goes on to outline how monitoring could be reduced even when pHs are around the 5.5 value. And if pHs were found to be below 5.5 and dropping it proposes using the same monitoring frequency as in Phase 1, which for LUP-10 (Pond 2 Discharge at Dam 1A) is weekly during discharge versus twice yearly during Phase 2 at LUP-10b (new spillway). When pHs are around the lower limit, be it 6.0 or the suggested 5.5, monitoring frequency should be increased, with additional sampling within the TCA itself being required to help identify where the lower pH could be coming from to then enable remedial measures to be implemented.

The possible ramifications of allowing a lower pH lower limit at the TCA discharge and suggested adjustments to monitoring frequencies are unjustified, with the suggestion that downstream natural lake pHs are below 6.0 and therefore, the discharge limit from the TCA should be less than 6.0. A comprehensive defensible case should be required to enact such a change.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

As previously discussed with the interested parties and in LMI's written response to the KIA/SJCJ, LMI was advising the interested parties, in advance, that it would be looking at requesting consideration of a lower pH threshold during the active and passive phases of closure monitoring once the TCA cover is installed and there is no longer standing water in the TCA ponds. This proposal would need to be filed with the NWB as an amendment with the appropriate backup to justify the request.

The fundamental purpose of closure is to return the site to a state that is compatible with the natural environment. In the first PCMP draft, data were presented that demonstrate natural waters surrounding Lupin can seasonally drop below a pH of 6. This was confirmed as recently as 2019 based on EEM sampling conducted at the Fingers Lake reference area. Tundra landscapes in the Canadian north, such as the area around Lupin Mine, typically exhibit slightly acidic conditions related to lack of mineral soils and natural buffering capacity. Natural baseline conditions (i.e., low pH) should be considered when planning for the long-term chemical stability of the site. The reduced monitoring frequency was only proposed during the passive closure phase if TCA water quality meets

criteria during the active closure phase. The authors of the PMCP would argue that no comprehensive argument was provided to counter either request.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment By Party (June 22 & 23, 2021):

Lowering of lower pH limit for TCA discharge: Significantly more historical and current downstream water quality data would need to be collected to justify a lower pH limit, including examples of other northern sites where such allowances have been made. Keeping the limit where it is (pH 6.0) and operating the TCA and discharge at a slightly higher pH will add a little buffering capacity and a cushion should any ML/ARD begin to develop within the basin. This is in LMI's best interest. As the pH is allowed to get lower metals solubility increases and this will overflow water from the TCA and enter the downstream environment.

This point was also raised in CIRNAC's TC 1.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

LMI thanks KIA/SJCJ for their comment. LMI would like to clarify that under 6.2.2. LMI was discussing the possibility of requesting a lower pH for passive discharge, not discharge as is currently undertaken under their water licence. As stated above, LMI was advising the interested parties in advance that it would be looking at possibly requesting consideration of a lower pH threshold during the active and passive phases of closure monitoring once the TCA cover is installed and there is no longer standing water in the TCA ponds. This proposal would need to be filed with the NWB as an amendment with the appropriate backup to justify the request.

LMI considers this item resolved.

Reference(s): Section 6.2.2

Attachment: n/a

Interested Party:	KIA	**Technical Comment No:**	4
Subject/Topic:	Lack of Contingency Plans or AMPS in the PCMP		

Reference:

- Section 6.2.6

Detailed Review Comment By Party (May 20 & 26, 2021):

The Mar. 16, 2021 LMI response memo to the SJCI draft comments on the first draft PCMP querying the lack of contingency plans mentions that they will need to be submitted to the NWB for their approval and do not fit in a PCMP type document. However, the PCMP should be comprehensive and include discussions on what contingency plans and adaptive management plans (for both better and worse monitoring results) or the frameworks for them as to what they may look like in a follow-up detailed procedures type manual. The LMI response to the SJCI draft comments claims the PCMP has an Adaptive Management framework included in it. The PCMP has no such framework, only several sections of text outlining how it can reduce monitoring requirements. The LMI response goes on to say that their inclusion of plans ("guiding principles" according to the PCMP text) on how LMI can reduce monitoring requirements with the body of the PCMP is acceptable.

The lack of Adaptive Management Plans or Contingency Plans continues to be the case in the final PCMP as is found in Section titled 6.2.6–Reductions in Adaptive Monitoring Requirements (previously Section 6.2.2 in earlier revisions of the PCMP). That is not an Adaptive Management Plan or framework, or a Contingency Plan. It is a plan on how to reduce monitoring requirements. As a minimum, the alternative scenarios and corresponding response plans should be described in the document.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

In LMI's response to KIA/SJCJ it was stated that, "The FCRP considers contingency plans and if they are required LMI would need to submit a revised FCRP to the NWB for approval. The adaptive management framework for closure is integrated into the approved FCRP.

The PCMP is a living working document that will be updated as new information and results are obtained. The PCMP would be updated in the same manner as any other Plan as per 2AM-LUP2032, Schedule B, Item K.

The purpose of the PCMP is to outline monitoring requirements for Phase 1 and Phase 2, and to present a suggested set of guiding principles whereby LMI may scale back or reduce monitoring requirements as the success of reclamation works is confirmed. This does not exclude the possibility that enhanced monitoring could be implemented, if required, under the adaptive management framework in the FCRP. In this case, changes in the monitoring requirements would be carried forward into an updated PCMP.

Reference(s): 2AM-LUP2032, Schedule B, Item K

Attachment: n/a

Detailed Review Comment By Party (June 22 & 23, 2021):

Range of scenarios considered in AMP: The LMI response continues to state that outlining a reduced monitoring program is an AMP. An Adaptive Management Plan needs to consider various possible scenarios including ones which may include additional monitoring. The text of the LMI memo acknowledges this to be the case, as an afterthought. But there is no presentation of alternative management plans in the PCMP. A range of scenarios should be presented in the final version of the PCMP.

Similar concerns were raised by ECCC in TC 2.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

See LMI July 5, 2021 response to KIA TC 2 above, LMI June 15, 2021 response to ECCC TC 2, and ECCC TC 2 comment on June 23, 2021 advising the NWB, “ECCC has reviewed the responses to comments on the Lupin Mine Site Post Closure Monitoring plan and found that they are reasonable and address ECCC’s concerns.

Reference(s): KIA TC 2 above; ECCC TC 2 above

Attachment: n/a

Interested Party:	KIA	**Technical Comment No:**	5
Subject/Topic:	Need For Consultation With Local Stakeholders During C&M and Active Closure Phases		

Reference:

- n/a

Detailed Review Comment By Party (May 20 & 26, 2021):

LMI led 2 teleconference calls with regulatory stakeholders in March of 2021 and some items of concern were considered in the final version of the PCMP.

A teleconference call with the community of Kugluktuk continued to be promoted to LMI in discussions and review comments to them. A last minute (i.e., 2 day) invitation to Kugluktuk was made in a single limited distribution website by LMI for an April 8, 2021 web-based teleconference. However, there were no respondents. A more concerted effort by LMI should be made in the future if the company wants to be able to claim they've included the community in their stakeholder interactions, albeit this being their first attempt and it being near the end of the implementation of the Lupin Mine's reclamation and closure plan and well beyond the planning stages when the input would have been most beneficial.

It is hoped that LMI will continue to engage with Kugluktuk and other area stakeholders as the Active Phase continues this year and rolls over into 2022 when major equipment demobilization is undertaken, and the site then heads into the Passive Monitoring Phase and there may be opportunities for the community to be involved.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

LMI would like to note that some of SJCJ information above is not correct.

- The invitation was emailed to parties that provided their email address on the last few in-person technical/public hearings held in Kugluktuk, the HTO, KIA and also posted on the Kugluktuk community Facebook page.
- The radio station was called a number of times but there was no answer.
- To clarify the calls were an audio conference call, at the suggestion of the KIA, as this is best way to connect when internet connectivity is limited.
- There was acknowledgement on the Facebook page post, as stated above there was a community member on the call,
- An email from the HTO with two questions (see Introduction above for questions and responses) and
- A call with a community member after the teleconference.

It should be noted that the community member on the call did advise that members of the community were talking about the conference call and thought that more people would attend. In addition, LMI will be hosting a Q2 2021 community engagement session (via telecom) with community members. The HTO has advised LMI that they will make themselves available for the call.

LMI also recognizes that through the NWB regulatory review process for the PCMP once submitted to the Board for review, interested community members were also provided an opportunity to provide comments to the NWB.

The PCMP is a living working document until Post Closure Monitoring has been completed.

LMI has real regulatory obligations through implementation of the terms and conditions of the water licence issued by the NWB regardless of the fact that 2020 was a bizarre and exceptional year due to COVID-19 and the need to keep safe and healthy. LMI is the first to acknowledge that engagement and consultation while not ideal was affected by the Global pandemic and public health restriction. LMI will be continuing ongoing consultation with the community members and organizations in the future.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment By Party (June 22 & 23, 2021):

Adequacy of community consultations: In the latest discussions SJCI provided comments on community consultations based on information provided by the KIA. An error may have been made concerning there not being any meetings or consultations some two months ago. These recent communications by LMI were pushed for by the KIA. However, this recent effort is well after there should have been meaningful dialogues with local stakeholders and in this case, the hamlet of Kugluktuk. These should have taken place before active reclamation work commenced and well before the Covid pandemic, which took effect in March\April last year. LMI should make every effort to involve the community in the future.

The CIRNAC had a similar comment in their TC 3.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

LMI respectfully disagrees that these communications took place because they were pushed by the KIA. With all due respect, while the KIA/SJCJ may view it that way, LMI has always had it in their plans/budgets to carry out community consultation and was looking forward to in-person community meeting(s) in 2020. LMI has also planned /budgeted to carry out a Lupin Mine site visit with various community organizations and a few community members to show them the closure and reclamation work while it was underway 2020 but due to COVID-19 this was not possible.

LMI would note that community consultation did take place prior to active reclamation during the final closure and reclamation plan approval process in 2019/2020. The KIA was in attendance as an observer at a technical meeting but advised they would not be participating in the conversation. The KIA, as a community organization, also advised the NWB that the KIA indicated they would be in attendance as an observer at the Public Hearing, but would not be participating as an Intervener in FCRP process. The KIA did not provide any comments during the FCRP review process and did not attend the public hearing. As noted in the TM/PHC decision, "The members

of the public in attendance did not express any concerns with respect to the Application generally, nor the Application proceeding to a Public Hearing."

LMI held a second conference call on June 24, 2021 to update the community members on the final closure and reclamation work program and to receive input on the PCMP currently under review. LMI always endeavours to do better, and will continue to engage with community members and community organizations, hopefully in-person in the near future.

With respect to the PCMP recognizing the ongoing changes to effective consultation during the global pandemic LMI did in fact reach out specifically to the KIA for support and advice on how best to achieve during this unprecedented time and appreciated the advice/support provided.

Interested Party:	KIA	**Technical Comment No:**	6
Subject/Topic:	Continued Operation of the Site's Automated Weather Station		

Reference:

- n/a

Detailed Review Comment By Party (May 20 & 26, 2021):

Text concerning the automated site weather station is absent in the final PCMP. The second stakeholder teleconference raised the possibility that the automated station could continue to be utilized as it would generate useful information, although it would likely be up to ECCC as the owners of the station to do so and not LMI. The author has not heard any further updates on this possibility.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

As previously advised verbally and in writing, the weather station located at the Lupin Mine site is owned by ECCC and they determine the future of the weather station. LMI does not collect data or have any access to the workings of the weather station and therefore has not included the weather station in the PCMP or the FCRP. LMI agrees that having the weather station remain at the Lupin Mine site is a good idea. The weather station is located on a CIRNAC lease and therefore the determination if the weather station remains is to be decided between CIRNAC and ECCC.

LMI has advised CIRNA and ECCC during the FCRP approval process that LMI will not take on the responsibility or any reclamation work for the ECCC weather station if it remains.

If LMI is being asked to be responsible for the weather station or carry out the reclamation work for this area, it is a small box, then we will request that ECCC remove the weather station so that we can meet our closure and reclamation obligations but we would prefer that CIRNA and ECCC take responsibility and allow it to remain. This has been LMI's stance all throughout the FCRP and water licence renewal process. During our conference call ECCC advised they would be looking into this item.

LMI considered this item resolved.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment By Party (June 22 & 23, 2021):

Site weather station: Concerning the fate of the automated weather station at the site, KIA has no further comment as it is between LMI and CIRNAC who own and operate the station on a small land lease at the site.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

Thank you. LMI would like to clarify that neither LMI nor CIRNAC own or operate the weather station. ECCC is the owner and the operator of the weather station. The ECCC weather station is located on LMI's mine site surface lease issued by CIRNAC. ECCC and CIRNAC should determine the final plan for the weather station and advise LMI.

LMI considers this item resolved.

Interested Party:	KIA	**Technical Comment No:**	7
Subject/Topic:	Getting All Geo-Technical Instrumentation Installed and Operating		

Reference:

- Table 13, Section 6.2.5 and Section 7.4

Detailed Review Comment By Party (May 20 & 26, 2021):

With new instrumentation being planned for installation (as per Table 13) it is hoped that LMI will utilize the same equipment to replace the non-operational or problematic existing instruments on site. The final PCMP also mentions the possible plans to install volumetric water content probes within the TMA Cell Nos. 3, 5 and N (Sec. 6.2.5).

Section 7.4 also mentions the proposal to report on geotechnical data less frequently than every year during the P-C Monitoring Phase. The proposal is to drop it to every 3 years, then 5 and then every 10 years. This is in contravention to the schedule shown in Table 13 of the PCMP. Annual downloads of instrumentation and geotechnical inspections could be accommodated during scheduled annual site inspections and water quality sampling campaigns during the Post-Closure Phase as is specified in the Water License. Any adjustments to reporting requirements need to be negotiated with NWB and its stakeholders and will only be considered when a defensible case for that change can be made.

Request or Recommendation by Party: n/a

LMI Response (June 15, 2021):

In regard to non-operational equipment please response to CIRNA TC 11 above.

LMI thanks you for your comments on Section 7.4.

There is no mechanism for LMI to negotiate with the NWB and its stakeholders. LMI will follow their water licence conditions to adjust their reporting requirements, if required, under Part J, Item 10, The Licensee shall submit to the Board for approval any requests for change(s) to the Monitoring Program as outlined in Part J and Schedule J, including justification for the change(s). The NWB may modify the Monitoring Program under Schedule J without an Amendment to the Licence.

Reference(s): CIRNA TC 11 (above); 2AM-LUP2032 Part J, Item 10

Attachment: n/a

Detailed Review Comment By Party (June 22 & 23, 2021):

Geo-technical instrumentation: Replacing exiting damaged geotechnical instrumentation (e.g., D1A-00-01S, D4-3 in Dams 1A and 4) is still considered a valid point especially as the units have significant historical data and could continue to be utilized and provide meaningful data and are to be sampled “if possible…” as is stated in the Water Licence.

This is similar to a comment made by CIRNAC in TC 11.

Additionally, on-site instrumentation should continue to be downloaded during routine annual geo-technical inspections and Water Quality sampling campaigns. Dropping the frequency to every 3, 5 or 10 years misses the opportunity to react in a timely manner should the data show there may be problems,

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

See LMI's June 15, 2021 response to CIRNAC TC 11 and CIRNAC TC 11 June 23, 2021 response to LMI advising they are satisfied with LMI's response.

LMI considers this item resolved.

Reference(s): CIRNAC TC 11 (above)

Attachment: n/a

5.0 QA/QC - ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC)

Interested Party:	ECCC	**Technical Comment No:**	1
Subject/Topic:	Sampling Parameters - Cyanide		

Reference:

- Table 2.1: Sample Collection Requirements; Water Licence No. 2AM-LUP2032 -Schedule J: Conditions Applying to Monitoring, Item 3, Table 1

Detailed Review Comment by Party (April 9, 2021):

The water licence requires daily monitoring of discharge from Pond 2 for cyanide and metals, as reflected in Table 1. Acknowledging this monitoring is a licence requirement, ECCC notes the requirement for cyanide to be analysed daily is not demonstrated by the data. Cyanide concentrations were below detection limits in the analyzed 2018 discharge, and there is no ongoing source related to mining operations. The MDMER allows for quarterly testing:

13 (1) The owner or operator of a mine may reduce the frequency of conducting tests relating to the concentrations of arsenic, copper, cyanide, lead, nickel or zinc at a final discharge point to not less than once in each calendar quarter, each test being conducted at least one month apart, if that substance's monthly mean concentration at that final discharge point is less than 10% of the value set out in column 2 of Schedule 4 for 12 consecutive months. (Ammonia will be added to this section June 1, 2021)

The (MDMER) Schedule 4 limit for total cyanide is 1.0 mg/L MAC and 2.0 mg/L MGC. Monitoring results reported have been below the detection limit of 0.005 mg/L.

Request or Recommendation by Party (April 9, 2021):

ECCC recommends the NWB consider removing daily cyanide monitoring requirements, reducing them to quarterly monitoring during discharge as all of the 2018 monitoring results were below detection limits.

LMI Response (June 15, 2021):

LMI acknowledges that cyanide is not a parameter of concern at Pond 2 and has been below detection during 2018 and 2020 discharge seasons. LMI would support ECCC's recommendation that the NWB consider removing daily cyanide monitoring requirements, reducing them to quarterly monitoring during discharge under 2AM-LUP2032 – Schedule J, Table 1. LMI would update the PCMP to reflect this change if accepted by the NWB.

Reference(s): 2AM-LUP2032 – Schedule J, Table 1, LUP-10

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

ECCC has reviewed the responses to comments on the Lupin Mine Site Post Closure Monitoring Plan and found that they are reasonable and address ECCC's comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

Thank you.

LMI considers this item resolved

Interested Party:	ECCC	**Technical Comment No:**	2
Subject/Topic:	pH Discharge Standards		

Reference:

- Table 2.2: Sampling Event Schedule, Tailings Containment Facility

Detailed Review Comment by Party (April 9, 2021):

The requirement for results to meet discharge criteria includes the caveat “expect pH” [sic], which relates to the request of not having to meet licence criteria regarding low pH levels. Further discussion of this approach is warranted; as noted by ECCC previously, there is concern with tailings cover performance in preventing acid generation in the tailings that are approximately 1 metre below the surface cover. Lower pH values would be an indication the saturation/cover closure system is not performing as designed, and should be examined. Accordingly, pH values that are below the current regulatory criteria of 6.0 would be important to flag.

Request or Recommendation by Party (April 9, 2021):

ECCC recommends further discussion and rationale regarding the pH discharge criteria.

LMI Response (June 15, 2021):

The Water Licence and QA/QC Plan sampling requirements at LUP-10a are as follows:

1) Sample one month prior to discharge for analytical water quality at LUP-10a, then
2) Once results are reviewed and confirmed to be below discharge limits, collect field measurements and a sample for acute toxicity testing (bioassay)

For step 2 above, the caveat for pH is noted in the sampling requirements (except pH) because the pre-treatment toxicity test is run at three pH levels (i.e., 6.3, 7.5, and 8.5). Per the Lupin Mine Liquid Waste Management Plan (LWMP), the pH of the initial sample is adjusted using soda ash and so the initial sample must be collected when the pH is <6.3 so that it can be treated to simulate effluent treatment at the TCA. Procedures specified in the LWMP are:

- If the sample from Pond 2 meets the discharge criteria, except for pH, collect enough water for three static pass/fail bioassay tests for both Rainbow Trout and *Daphnia magna*.
- A sample of the lime (soda ash) utilized for the liming process should be sent to the laboratory along with the water samples. In order to obtain results for the range of potential discharge values the laboratory will adjust the pH of the samples between 6.0 and 9.5, i.e., 6.3, 7.5 and 8.5.

Reference(s): LMI Liquid Waste Management Plan, March 2016.

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

ECCC has reviewed the responses to comments on the Lupin Mine Site Post Closure Monitoring Plan and found that they are reasonable and address ECCC's comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

Thank you.

LMI considers this item resolved

Interested Party:	ECCC	**Technical Comment No:**	3
Subject/Topic:	QA/QC Sample Numbers		

Reference:

- Table 2.2: Sampling Event Schedule

Detailed Review Comment by Party (April 9, 2021):

QA/QC samples shown in Table 2.2 include field duplicates or field blanks. It is not clear whether the quantity of QA/QC samples will comprise the recommended minimum 10% of samples, as noted in Footnote 1. Travel blanks should also be included in the suite of QA/QC analyses listed here. ECCC notes that travel blanks are included in Section 3.1 of the plan.

Request or Recommendation by Party (April 9, 2021):

ECCC recommends clarification in Table 2.2, where QA/QC samples should be randomly selected for different analyses, and comprise 10% of the samples. In addition, travel (trip) blanks should be included in the table for QA/QC samples. The footnotes could reference Section 3 - Water Field Quality Control.

LMI Response (June 15, 2021):

Table 2.2 specifies field blanks and duplicates for specific stations but does not list travel blanks because these apply to all stations sampled on any given day (i.e., reflect the potential for contamination during sample handling and transport for all samples). A footnote can be added to the table to reference Section 3 during the next update to the QA/QC Plan.

The criteria for QC samples to comprise at least 10% of the total sample count is included in footnote (1) to Table 2.2 (i.e., Duplicate and Blank samples must be collected for approximately every ten (10) field samples collected across the range of parameters. At least one duplicate must be submitted per sample shipment) and in Section 6.1.3:

- QC samples will represent a minimum of 10% of the total sample count (field samples plus QC samples) for each program (Environment Canada 2012).

In addition, the requirement for the QC program to include travel blanks is in Section 3.1:

- Travel blanks are supplied and shipped by the laboratory to test for possible contamination that might arise during the handling, transport, or storage of the samples. The identity of these samples must be recorded in the Field Log Book. One travel blank must be submitted per sample shipment.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

ECCC has reviewed the responses to comments on the Lupin Mine Site Post Closure Monitoring Plan and found that they are reasonable and address ECCC's comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

Thank you.

LMI consider this item resolved

Interested Party:	ECCC	**Technical Comment No:**	4
Subject/Topic:	Field Log Book Observations		

Reference:

- 2.1.2: Field Measurements and Field Log Book

Detailed Review Comment by Party (April 9, 2021):

Weather conditions and air temperature are listed as activities to be recorded in the Field Log Book; it may be useful to specify these conditions to include wind speed and direction, as well as precipitation (current, as well as the past 24 hours). These data can be useful in interpreting some of the results (e.g. TSS, turbidity).

Request or Recommendation by Party (April 9, 2021):

ECCC recommends specifying the recorded ambient conditions to include wind speed, wind direction and precipitation.

LMI Response (June 15, 2021):

In the next update of the QA/QC Plan, wind speed, wind direction, and precipitation will be noted as conditions that should be recorded in the Field Log Book.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

ECCC has reviewed the responses to comments on the Lupin Mine Site Post Closure Monitoring Plan and found that they are reasonable and address ECCC's comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

Thank you.

LMI considers this item resolved

Interested Party:	ECCC	**Technical Comment No:**	5
Subject/Topic:	Detection Limits		

Reference:

- Water Quality Monitoring and QA/QC Plan – General; Appendix B – Scope of Accreditations

Detailed Review Comment by Party (April 9, 2021):

The Scope of Accreditations (Appendix B) provides the list of tests and measurement capabilities of the analytical laboratories for parameters that could be analyzed. However, the document does not mention detection limits. It would be important to maintain consistent detection limits over time, or specify where ultra-low detection limits may be warranted.

Request or Recommendation by Party (April 9, 2021):

ECCC recommends that the QA/QC plan include a list of detection limits, or instructions for the users of the plan on communicating what detection limits are to be requested.

LMI Response (June 15, 2021):

A table of project detection limits will be included in the next version of the QA/QC Plan.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

ECCC has reviewed the responses to comments on the Lupin Mine Site Post Closure Monitoring Plan and found that they are reasonable and address ECCC's comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

Thank you.

LMI considers this item resolved

Interested Party:	ECCC	**Technical Comment No:**	6
Subject/Topic:	Soil Sample QA/QC		

Reference:

- Section 8: Duplicate Samples

Detailed Review Comment by Party (April 9, 2021):

Duplicate samples are proposed for soil sampling QA/QC, at a 10% frequency. Other methods could include spiked samples and split samples, to assess accuracy and precision for the soil analyses.

Request or Recommendation by Party (April 9, 2021):

ECCC recommends reviewing additional soil QA/QC methods to be incorporated in the sampling program.

LMI Response (June 15, 2021):

The collection of duplicate soil samples at a 10% frequency is consistent with industry standards (CCME Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Volume 1 Guidance Manual, 2016). In addition, ALS is a Canadian Association for Laboratory Accreditation (CALA) certified laboratory. As part of their QC procedures, ALS uses method blanks, spikes, and the analysis of certified reference materials.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

ECCC has reviewed the responses to comments on the Lupin Mine Site Post Closure Monitoring Plan and found that they are reasonable and address ECCC's comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

Thank you.

LMI considers this item resolved

6.0 QA/QC - CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA (CIRNAC)

Interested Party:	CIRNAC	**Technical Comment No:**	1
Subject/Topic:	Monitoring Parameters Omission		

Reference:

- Table 2.1: Sample Collection Requirements; 2AM-LUP2032 - Part J, Schedule J, Table 1

Detailed Review Comment by Party (April 8, 2021):

In the Document Control section, Revision No. 3.0, LMI stated monitoring parameters as one of the major updates performed on the QA/QC plan. In Table 2.1: Sample Collection Requirements, there was an omission of the following monitoring parameters in the QA/QC plan:

- Station ID. No. LUP-01, No visible sheen of Oil and Grease (O&G) parameter was not included; and
- Station ID. No. LUP-14, Total Phosphorous (TP) parameter was not included.

These monitoring parameters are required according to the Type A Water Licence No. 2AM-LUP2032 terms and conditions part J, Schedule J, Table 1 – Monitoring Program Requirements.

Request or Recommendation by Party (April 8, 2021):

(R-01) CIRNAC recommends that LMI update the QA/QC Plan to include the No visible sheen of O&G and TP monitoring parameters to Stations LUP-01 and LUP-14 respectively or provide a rationale for omitting these parameters.

LMI Response (June 15, 2021):

Under water licence 2AM-LUP2032 – Part J, Schedule J, Table 1 – criteria for Station ID. No. LUP-01 does not have an Oil and Grease parameter and therefore was not included in Table 2.1.

LMI will update Table 2.1 to include Total Phosphorous for Station ID. No. LUP-14.

Reference(s): 2AM-LUP2032 – Part J, Schedule J, Table 1

Attachment: **n/a**

Detailed Review Comment By Party (June 23, 2021):

CIRNAC did not provide any further comments.

Request or Recommendation by Party: **n/a**

LMI Response (July 5, 2021):

LMI considers this item resolved

Interested Party:	CIRNAC	**Technical Comment No:**	2
Subject/Topic:	Field Blank Omission		

Reference:

- Section 3.0: Water Field Quality Control

Detailed Review Comment by Party (April 8, 2021):

Section 3.0 of the QA/QC plan, does not contain any information about the field blank as one of the components of field quality control. It appears LMI has no plan to perform a field blank prior to sending the samples to the laboratory. This exercise is an important component of water field quality control measure used to detect and identify any contaminant from the sampling site.

CIRNAC is of the view that LMI update the QA/QC plan to include the field blank as one of the components of field quality control.

Request or Recommendation by Party (April 8, 2021):

(R-02) CIRNAC recommends that LMI updates the QA/QC Plan to include filed blank and ensure that field blank is performed prior to sending the samples to the laboratory.

LMI Response (June 15, 2021):

The requirement for field blanks is listed by station is Table 2.2, and elsewhere in Sections 2.2 and 5. LMI includes field blanks, duplicates, and travel blanks routinely as part of the QC program for Lupin Mine. A section describing field blanks will be added to Section 3 of the next version of the QA/QC Plan.

Reference(s): Table 2.2, Sections 2.2 and Section 5

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

CIRNAC did not provide any further comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

LMI considers this item resolved

Interested Party:	CIRNAC	**Technical Comment No:**	3
Subject/Topic:	Sampling Station Coordinates		

Reference:

- Table 2.4; 2AM-LUP2032 – Part J, Item 2

Detailed Review Comment by Party (April 8, 2021):

In Table 2.4, of the QA/QC Plan, LMI provided the summary list of the current active sampling stations with some of their Global Positioning System (GPS) coordinates. The coordinates of eight (8) sampling locations in the landfarm and Landfill facilities were not provided.

This will undermine the essence of the QA/QC Plan, which is to promote sampling integrity by ensuring that samples are always taken from the same location, within the same temporal scope.

The provided coordinates were all captured in Universal Transverse Mercator (UTM) coordinate system. During the March 25, 2021 teleconference, the inspector requested the GPS coordinates be provided in degrees, minutes and seconds which is consistent withType A Water Licence No. 2AM-LUP2031, Part J, Item 2, which states that:

"The Licensee shall provide the GPS co-ordinates, in degrees, minutes and seconds of latitude and longitude, of all locations where sources of Water are utilized for all purposes"

This appears to be contradictory to the water licence provision.

Request or Recommendation by Party (April 8, 2021):

(R-03) CIRNAC recommends that LMI:

- Provide the GPS coordinates of the missing eight (8) sample stations for the landfarm and landfill facilities; and,
- Represent the GPS coordinates of all the sampling stations in degrees, minutes and seconds of latitude and longitude as per the water licence.

LMI Response (June 15, 2021):

The monitoring wells for the landfarm are still included as part of the water licence but it should be noted that on August 17, 2017 the NWB issued Motion No. 2017-A1-013, Modification No. 1 to allow the Licensee to implement the proposed leak-detection and associated measure, instead of the monitoring wells required under the Licence, to monitor the Landfarm facility. LMI will change the plan to state the monitoring wells were not installed as per the modification issued by the NWB and therefore not in use.

LMI will update the GPS coordinates of the sampling stations in degrees, minutes and seconds of latitude and longitude.

Reference(s): Motion No. 2017-A1-013, Modification No. 1

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

CIRNAC did not provide any further comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

LMI considers this item resolved

Interested Party:	CIRNAC	**Technical Comment No:**	4
Subject/Topic:	Sampling Stations Signage		

Reference:

- n/a

Detailed Review Comment by Party (April 8, 2021):

In August 5, 2018 inspection report, CIRNAC inspector expressed concerns about the signage at the sampling stations. The concerns include the signage is physically short, not clear enough to be read from a close distance, constructed with wood and not firmly planted to the ground. Reading signage correctly prevents an avoidable error, enhances sampling integrity, and promotes consistency by ensuring samples are taken from the same location. It will also ensure continuity during staff changes.

Part B, Item 4, of the Type A Water Licence No. 2AM-LUP2032 terms and condition states that:

"The Licensee shall maintain to the satisfaction of the Inspector, all the signs necessary to identify the stations of the "Monitoring Program", detailed in Schedule J"

Request or Recommendation by Party (April 8, 2021):

(R-04) CIRNAC recommends LMI ensure that all sample stations signage align with the following criteria:

- About six (6) feet tall above ground to ensure visibility above snow;
- Built with metal for durability;
- Clearly marked with four (4) inch reflective lettering indicating the sample station
  - (e.g. LUP-01) to ensure it is legible and visibility.

LMI Response (June 15, 2021):

In 2018, the Inspectors report, carried out on August 5, 2018 and filed on January 23, 2019, did list a concern with 2 sample station signs at the Lupin mine site. LMI took the initiative and replaced all sample station signs at site 2018. The 2019 Inspection Report did not note any issues with signage. The July 2020 inspection report did note an issue with some signs, that had been moved for demo or closure work. In the August 2020 Inspection report there was no reported issues.

LMI would have a concern with having the signs six feet to ensure visibility above snow, as there are Inuit that live and travel via snowmobile in the winter at and around Lupin. It is LMI's understanding during the review process for the renewal of 2AM-LUP152 that CIRNAC does not carry out winter inspections and LMI is not required to carry out winter inspections so LMI believes the height of the signs is a hazard.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

CIRNAC did not provide any further comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

LMI considers this item resolved

Interested Party:	CIRNAC	**Technical Comment No:**	5
Subject/Topic:	Executive Summary Improvement		

Reference:

- Executive Summary

Detailed Review Comment by Party (April 8, 2021):

In the executive summary, LMI did not capture the overview of the QA/QC plan and did not provide the Inuktitut and Inuinnaqtun translation of the executive summary.

This information is vital as the executive summary intends to provide readers with the overview of the QA/QC plan. The essence of translating the executive summary is to provide interested parties including community members the opportunity to participate effectively in the review process.

It will be helpful if LMI expand the executive summary to capture the overview of the QA/QC Plan.

Request or Recommendation by Party (April 8, 2021):

(R-05) CIRNAC recommends that LMI:

- Further develop the executive summary of the QA/QC plan to present the overview of the plan.
- Translate the executive summary of the QA/QC plan to Inuktitut and Inuinnaqtun for the benefit of the interested parties including community members involve in the review process.

LMI Response (June 15, 2021):

LMI will further develop the executive summary and then have the further developed executive summary translated to Inuktitut and Inuinnaqtun.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

CIRNAC did not provide any further comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

LMI considers this item resolved

Interested Party:	CIRNAC	**Technical Comment No:**	6
Subject/Topic:	Title Page Project Status		

Reference:

- Title Page

Detailed Review Comment by Party (April 8, 2021):

In the title page of the QA/QC Plan, LMI indicated the current phase of the closure period as Care and Maintenance. In section 6.0, of the Post Closure Monitoring Plan (PCMP), LMI stated that the Active Closure Period (Phase 1 monitoring), began in the summer of 2019 and forecasted that reclamation will be completed in the summer of 2021. This statement shows the project has moved away from Care and Maintenance phase to an Active Closure status.

It will be helpful if LMI indicate the current status of the project reclamation to avoid confusion to the readers.

Request or Recommendation by Party (April 8, 2021):

(R-06) CIRNAC recommends that LMI updates the QA/QC Plan title page to reflect the current Active Closure period.

LMI Response (June 15, 2021):

LMI will change the cover page to state Active Closure and Reclamation Phase.

Reference(s): n/a

Attachment: n/a

Detailed Review Comment By Party (June 23, 2021):

CIRNAC did not provide any further comments.

Request or Recommendation by Party: n/a

LMI Response (July 5, 2021):

LMI considers this item resolved