

LUPIN MINES INCORPORATED

## 2021 Post Closure Monitoring Plan

### *Technical Comment Responses*

Submitted to:

**Nunavut Water Board**

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Submitted by:

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On behalf of:

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## 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 (SJCI) on behalf of the KIA. Following the call, on the same date, LMI received comments from KIA/SJCI.

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

A second call was held on March 25, 2021 with CIRNAC, ECCC, the KIA/SJCI. 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/SJCI 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 in-person consultation 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, SJCI on behalf of the 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 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/SJCI 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.

On July 16, 2021, CIRNAC and KIA/SJSI submitted comments, or advised they were satisfied LMI's responses to the NWB in response to LMI's July 5, 2021 submission of the PCMP.

On August 10, 2021, CIRNAC and the KIA/SJSI advised they were satisfied with LMI's responses to the NWB in response to LMI's July 29, 2021 submission of the PCMP, with the exception of CIRNAC not being fully satisfied with Comment #6. LMI has responded to CIRNAC's comment #6, as presented, below.

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## 2.0 ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC)

<b>Interested Party:</b>	ECCC	<b>Technical Comment No:</b>	1
<b>Subject/Topic:</b>	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

**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.

**RESOLVED with COMMITMENT**

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<b>Interested Party:</b>	ECCC	<b>Technical Comment No:</b>	2
<b>Subject/Topic:</b>	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

**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.

**RESOLVED**



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

<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	1
<b>Subject/Topic:</b>	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.

#### 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.

**Detailed Review Comment by Party (July 16, 2021):**

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 concentrations of metals of concern. This was part of a larger discussion which also included the pH for the trigger for active to passive discharge.

Prior discussions referenced the Metal and Diamond Mining Effluent Regulations, but in their July 6, 2021 response LMI has clarified any discharge from the TCA will meet water licence requirements. CIRNAC is satisfied with this answer and recommends section 6.2.2 of the PCMP be modified to remove any reference to discharging from the TCA at a pH of 5.5, since this would not meet water licence requirements.

**Request or Recommendation by Party (July 16, 2021): n/a**

**LMI Response (July 29, 2021):**

LMI will make changes to Section 6.2.2 to address CIRNAC's pH 5.5 concerns.

**Detailed Review Comment by Party (August 10, 2021):**

In our July 16, 2021 reply letter to LMI's 2<sup>nd</sup> responses, CIRNAC confirmed that comments 3 and 8 were addressed and CIRNAC was satisfied with the response to comment 1 but recommended that LMI modify section 6.2.2 of the PCMP to remove reference to discharging from the TCA at a PH of 5.5, since this would not meet water licence requirements. Comment 6 still remained an outstanding concern.

In their July 6, 2021 response, LMI clarified that any discharge from TCA will meet water licence requirements. CIRNAC is satisfied with the response but recommended that section 6.2.2 of the PCMP be modified to remove reference to discharging from TCA at a PH of 5.5, since this would not meet water licence requirements.

LMI in its response, committed to make changes to section 6.2.2 of the PCMP to address CIRNAC's concerns. CIRNAC's concerns were addressed.

**Request or Recommendation by Party (August 10, 2021): n/a**

**LMI Response (August 17, 2021):**

Thank you. CIRNAC has reconfirmed that LMI has addressed their concerns with the LMI's July 29, 2021 commitment above.

**RESOLVED with COMMITMENT**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	2
<b>Subject/Topic:</b>	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 perimeter 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 –

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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

**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.

**Detailed Review Comment by Party (July 16, 2021):**

LMI provided responses on June 15, 2021 to CIRNAC's original comments from June 1, 2021 that addressed seven of our eleven comments regarding the Post-Closure Monitoring Plan (PCMP). Specifically, comments 2, 4, 5, 7, 9, 10 and 11 were considered resolved. Resolution of comments 4, 9, 10 and 11 involved follow-up actions which LMI committed to.

**LMI Response (July 29, 2021):**

Thank you. CIRNAC has reconfirmed that LMI has addressed their concerns.

**RESOLVED**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	3
<b>Subject/Topic:</b>	Community Consultation		

**Reference:**

- Schedule J, Item 1

**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 11 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 11.

**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)

**Detailed Review Comment by Party (July 16, 2021):**

CIRNAC recommended 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 11. LMI has provided translated materials as well as details on the community consultation events which address CIRNAC's concerns.

**LMI Response (July 29, 2021):**

Thank you. CIRNAC has advised that LMI has addressed their concerns.

**RESOLVED**



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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	4
<b>Subject/Topic:</b>	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.

**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.

**Detailed Review Comment by Party (July 16, 2021):**

LMI provided responses on June 15, 2021 to CIRNAC's original comments from June 1, 2021 that addressed seven of our eleven comments regarding the Post-Closure Monitoring Plan (PCMP). Specifically, comments 2, 4, 5, 7, 9, 10 and 11 were considered resolved. Resolution of comments 4, 9, 10 and 11 involved follow-up actions which LMI committed to.

**LMI Response (July 29, 2021):**

Thank you. CIRNAC has reconfirmed that LMI has addressed their concerns with the LMI's June 15, 2021 commitment above.

**RESOLVED with COMMITMENT**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	5
<b>Subject/Topic:</b>	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 review of historical data and estimate of waste rock quantities use across the site for construction of dams and other permanent structures;
- 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 m<sup>3</sup>. 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 m<sup>3</sup> 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.

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

CIRNAC concerns were addressed.

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

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**LMI Response (July 5, 2021):**

Thank you.

LMI considered this item resolved.

**Detailed Review Comment by Party (July 16, 2021):**

LMI provided responses on June 15, 2021 to CIRNAC's original comments from June 1, 2021 that addressed seven of our eleven comments regarding the Post-Closure Monitoring Plan (PCMP). Specifically, comments 2, 4, 5, 7, 9, 10 and 11 were considered resolved. Resolution of comments 4, 9, 10 and 11 involved follow-up actions which LMI committed to.

**LMI Response (July 29, 2021):**

Thank you. CIRNAC has reconfirmed that LMI has addressed their concerns.

**RESOLVED**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	6
<b>Subject/Topic:</b>	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

**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.

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

CIRNAC recommended 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's response states: "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." Therefore, at minimum, 10 years of monitoring would be necessary. CIRNAC's concern remains outstanding.

**LMI Response (July 29, 2021):**

LMI believes that CIRNAC may be misunderstanding LMI's response. Physical stability of the TCA will be **achieved** at the completion of active reclamation work and annual DSIs will **confirm** that physical stability. Any tailings that may have been deposited outside of the tailings cells during historical operation or in areas currently not covered have been exposed to weathering since their deposition decades ago. The covering of any exposed tailings with esker sand during closure activities would aim to stop this exposure to weathering. 5 years is adequate to provide the evidence of TCA chemical stability or provide evidence that longer monitoring is required. As stated in the approved Closure Plan for the TCA (Holubec 2005): "Lupin started to cover exposed tailings in completed cells in 1988, and to monitor the covered tailings to assess the effectiveness of the covers. As a result, Lupin has collected the most extensive and longest observed performance records of covered cells in permafrost

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areas.” LMI has continued to monitor these covers since 2005 so there is currently 23 years of monitoring to date in this area.

CIRNAC’s original comment (June 1, 2021 above) included a paragraph from Section 6 but excluded the paragraph that followed which states: “The following sections describe the Phase 1 and Phase 2 monitoring plans for each component, including water quality, soils, and geotechnical requirements. It is noted that LMI will implement all Water Licence monitoring requirements. It is **anticipated** that active monitoring will occur for 2.5 years and passive monitoring will take **approximately** 5 years following completion of the reclamation work, **or until the global objectives for the mine site can be confirmed (as outlined in Section 1.2).**”

As stated in LMI’s previous comment (June 15, 2021 above), 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.

LMI considers this item resolved as the PCMP allows for enhanced monitoring if closure objectives of physical stability and chemical stability are not met by the end of the passive closure period in 2026.

#### **Detailed Review Comment by Party (August 10, 2021):**

LMI’s July 29, 2021 response resolved comment 1 with a commitment to make changes to section 6.2.2 of the PCMP to address CIRNAC concerns. LMI in response to comment 6, stated that they will carry out 2.5 years of active monitoring and 5 years of passive monitoring after closure with a possibility of extension if closure objectives of physical stability and chemical stability are not met by the end of the closure period in 2026. CIRNAC is of the opinion that 2.5 years of active monitoring and 5 years passive monitoring are not adequate to confirm the site physical and chemical stability or to determine if an extended monitoring is required.

CIRNAC recommended that the PCMP support the proposed 5 years passive monitoring period with the evidence that permanent physical and chemical stability of the site could be achieved in this time frame.

*LMI in its response stated that “5 years is adequate to provide the evidence of chemical stability or provide evidence that longer monitoring is required.”*

*It went further to state that “As stated in the approved Closure Plan for TCA (Holubec 2005): Lupin started to cover exposed tailings in the completed cells in 1988, and to monitor the covered tailings to assess the effectiveness of the covers. As a result, Lupin has collected the most extensive and longest observed performance records of the covered cells in permafrost areas” “LMI has continued to monitor these covers since 2005 so there is currently 23 years of monitoring to date in this area.”*

LMI also in its June 23, 2021 response stated that: “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.”

The TCA has been on care and maintenance for up to 15 years and as such, LMI’s opinion is that the impact of the site on the receiving environment is known. CIRNAC partially agree with LMI’s assessment as the releases from TCA have been collected and treated in the tailings ponds prior to discharge during those years of care and maintenance. At the mill site, surface waste rock was oxidized and flushed into the environment during operations and in the early days of care and maintenance leaving only residual stored oxidation products to be

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flushed in the more recent time periods. This water quality was used by LMI in the assessment of the dome impact on the environment after closure. In this regard, it is noted that excavation and reshaping of the dome will expose fresh waste rock for oxidation and seepage quality and loadings to the receiver may be different than predicted. An adequate time period is required to confirm LMI's geochemical assessment and that performance predictions are keeping with actual site geochemical status. These conditions are consistent with LMI's reference to Klohn statement that Acid Rock Drainage (ARD) could occur 5 to 10 years. However, geochemical status of the site do not support a reduction in the timeframe for long term post closure monitoring of geochemical behaviour and stability.

Furthermore, CIRNAC is not convinced with LMI's assertion that 5 years post closure monitoring is enough to confirm the long term physical stability and ensure that all constructed features are capable of long term performance to ensure stability.

Significant construction works will be undertaken at the K and M dams, cover placement at cell 3, 5 and behind the N dam, all of which will be new construction that should be monitored for more than 5 years to confirm performance. The timeframe should be long enough to allow for meaningful performance monitoring of engineered structure components at the dome and the TCA with respect to the impacts of climate change in general and severe events, to provide confidence in long term performance and stability.

The current Final Closure and Reclamation Plan security includes for an extended period of monitoring up to 25 years. CIRNAC concern still outstanding.

#### **Request or Recommendation by Party (August 10, 2021):**

CIRNAC recommends a period of ten (10) years active monitoring, followed by fifteen (15) years passive monitoring. However, until a minimum of five (5) years sampling results are available no reduction in the overall period of monitoring should be contemplated.

#### **LMI Response (August 17, 2021):**

LMI appreciates the opportunity to provide a final response to CIRNAC's PCMP comment #6.

CIRNAC's response is technically flawed to apply the findings of the 1992 testing on tailings to the current status of the waste rock at the mill site. The ore and waste rock are different mineralogically and the waste rock has been spread in a thin layer on surface around the mill site for a period of between 23 and 43 years. The most relevant geochemical characterization of the waste rock is Golder (2017a), which is cited in the FCRP and which states " ... much of the sulphur present was in the form of sulphate rather than sulphide, indicating that oxidation of the waste rock was well advanced." As described in Section 4.3.2 in the FCRP, the oxidized state of the waste rock drives the strategy to consolidate and cover the waste rock under the "dome" because it will reduce the flushing of existing acidity and oxidation products. The relocation activity is not expected to materially increase the presence of fresh faces in the waste rock (in comparison to the historical underground drilling and blasting and hauling to surface which produced the surface waste rock deposits in the first place.) The excavation of waste rock to date (for example in cleanup activities) has not visually indicated the presence of currently buried zones of unoxidized waste rock. For these reasons, the loadings assumed in the HHERA (i.e., reduced volumes of chemistry similar to the current seeps) are expected to be verified by the seep monitoring that is currently proposed in the PCMP.



CIRNAC's August 10, 2021 recommendation above would substantially change the PCMP and the approved FCRP and is not in line with the water licence monitoring requirements.

The PCMP is a further defined extension of the approved FCRP post closure monitoring plan under section 5.0 Monitoring. The approved FCRP states under Executive Summary, Item 7: *“Post-Closure monitoring of the site will be conducted to confirm global objectives of physical stability, chemical stability, and future use and aesthetics are effective at the site after closure. **A Post-Closure Monitoring plan has been developed and is provided in the FCRP (refer to Section 5.0).** It is anticipated that active monitoring will occur for 2.5 years and passive monitoring will take approximately 5 years following completion of the reclamation work, or until the global objectives for the mine site can be confirmed.”*

The PCMP required under the current water licence is based on commitments made during the regulatory review process for the amendment to support the monitoring requirements of the approved FCRP for a Mining Undertaking: Closure and Reclamation project (as defined in the cover to the current water license) which confirms the water licence is not due to expire until 2032.

The approved FCRP, and carried over to the PCMP, defines active closure monitoring as, *“Active Closure Period (Active Closure Monitoring in PCMP) (Phase 1) refers to the **2.5 year period during which active on-site reclamation work is completed**. LMI projects the manpower presence at the Site will increase marginally during care and maintenance for active reclamation work. The increased presence of personnel on-site is anticipated for the reclamation period.”* LMI anticipates that the **on-site reclamation will be completed this year**. LMI submitted the FCRP for approval in 2018 and therefore will have completed 3.5 years of active closure monitoring by March 2022. LMI would like to note that for the active closure phase, some areas at Lupin already have extensive monitoring, such as the TCA cover which has approx. 23 years of cover performance monitoring. Once the reclamation program is completed LMI will not have full time staff on-site and will be in the Passive Closure Monitoring phase.

The approved FCRP, and carried over to the PCMP, defines passive closure monitoring as, *“Passive Closure Period (Passive Closure Monitoring for the PCMP) (Phase 2) refers to the period of **(5) years following the completion of active reclamation work**. Environmental monitoring will be conducted to determine the success of the reclamation measures and confirm objectives have been achieved. Consistent with the Care and Maintenance phase, LMI does not project continuous manpower presence on-site during this Phase.”* For passive closure monitoring LMI supports a scientific objective-based approach for closure as outlined in CIRNAC guidelines.

The PCMP also states: *“The PCMP covers the 2.5-year time period during reclamation (Active Closure; Phase 1) and the following 5-year period from 2022 to 2026 (Passive Closure; Phase 2). **The PMCP is a living document that will be updated on a regular basis to reflect changes in monitoring program design as the project moves from the active to passive closure. Monitoring will continue after this time period per the Water Licence requirements and adaptive monitoring framework for the project, as applicable.** Post closure monitoring through active and passive closure will be conducted to meet the global objectives of Physical Stability, Chemical Stability, and Future Use and Aesthetics.”*

The water licence refers to the active closure and reclamation phase defined as: **“Closure Phase”** means when an Operator ceases operations at a facility without the intent to resume mining activities in the future as defined in the Mine Site Reclamation Guidelines for the Northwest Territories (INAC, 2007);” and the post closure phase defined as, **“Post Closure Phase”** means the period of time **after the Closure Phase** where confirmatory water quality, stability, aquatic effects, and ecosystem monitoring is conducted in order to ensure closure objectives

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*have been met.”* The active Closure Phase and the Post Closure Phase both have varying monitoring requirements within the water licence.

In accordance with the license Schedule A: Abandonment is defined to mean *the permanent dismantlement of a facility so it is permanently incapable of its intended use. This includes the removal of associated equipment and structures as defined in the Mine Site Reclamation Guidelines for the Northwest Territories (INAC, 2007); and “Closure Phase” means when an Operator ceases operations at a facility without the intent to resume mining activities in the future as defined in the Mine Site Reclamation Guidelines for the Northwest Territories (INAC, 2007);*

LMI notes the 2007 Guidelines developed by INAC, formerly AANDC, now Crown Indigenous Relations and Northern Affairs Canada states: *“A Performance Assessment Report is prepared at the end of the initial monitoring period. This is typically a number of years following completion of the primary reclamation work at a time when environmental conditions were initially projected to demonstrate that all, or the primary, reclamation objectives have been achieved. At this time the closure criteria, and any ongoing residual and/or environmental risks are **re-assessed and the monitoring and maintenance plan is updated.**”*

The guidelines developed by INAC 2007 **do not specify** an “arbitrary” unscientific timeline or period for the initial monitoring to be completed, but rather acknowledges that *“closure criteria and ongoing residual and/or environmental risks are re-assessed and monitoring and maintenance plans updated”* and allows that *“in some cases where the reclamation objectives and closure criteria have not been fully achieved or where this remains uncertain, there may be need to carry out an extended monitoring and maintenance program”* where appropriate.

CIRNAC's June 1, 2021 comment advised that the *Federal Contaminated Sites Action Plan Long-Term Monitoring Planning Guidance (March, 2013)* “recommends 25 years of monitoring to verify equilibrium conditions at landfills in northern regions.” LMI would note that the Lupin Mine site is not considered a federal contaminated site. LMI would also note that the *Federal Contaminated Sites Action Plan Long-Term Monitoring Planning Guidance* provides that 5 years of landfill monitoring is carried out and depending on the results may be discontinued or may have further monitoring depending on the results. Within the report it states: *“The AMSRP (AANDC's 2009 Abandoned Military Sites Remediation Protocol (AMSRP) guidance document) specifies that LTM (long-term monitoring) **will not be less than five (5) years in duration with a minimum number (usually three) of monitoring events** specified within the first phase of LTM [ ]. **Upon completion of the first phase of LTM, an evaluation of the results is completed and documented in a Performance Assessment Report.** With input from third party expert support a determination is made regarding the requirement to enter the scope of the next phase of monitoring.*

*The monitoring approach undertaken by the DEW Line Project for onsite containment structures (e.g. landfills), which represents a significant level of effort, sets the standard for LTM requirements in the North (Pike 2011). The AANDC landfill monitoring protocol for abandoned military sites is an example of **how components of a contaminated site can be broken down and analyzed in terms of scope and frequency of monitoring. A similar protocol could be followed for a landfill at a mine site, and the phased approach can be used for any engineered structure such as a tailings cap, waste rock pile or other major earthworks component.**”* This scientific objective base approach is consistent with LMI approach and INAC/AANDC (now CIRNAC) guidelines for mine site reclamation.

Within CIRNAC's, AMSRP guidelines it states: *“During Phase I, monitoring would take place in years 1, 3, 5. The five-year term was selected on the basis that ground-temperature thermal regimes at these specific landfills would **require three to five years to reach equilibrium.** An evaluation of the Phase I data would be carried out at the end of five years to confirm that thermal equilibrium has been achieved, and that no stability issues had been*

*identified. The Phase I monitoring program may be extended, if required.” and also states: “At the completion of Phase I monitoring and review of the results, the Phase II monitoring frequency **may be modified or downgraded. If no significant issues are identified for landfills of low potential environmental risk (as defined by the landfill evaluation matrix), monitoring may be discontinued at the conclusion of Phase I.”***

LMI is required to comply with our water licence and has re-iterated several times that they are **committed to the closure objectives of physical stability and chemical stability**, and is aware that Part 1, Item 1c scope states: *Compliance with the terms and conditions of this Licence does not absolve the Licensee from the responsibility for compliance with all applicable legislation, guidelines and directives.* In addition, LMI recognizes that in accordance Part G, Item 17 LMI shall consider *the principles of adaptive management in construction, reclamation, and closure upon approval by the Board. The proposed adaptive management principles or actions shall comply with the Licence terms, and relevant legislation.* As stated in LMI's previous comment (June 15, 2021 above), 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.

**LMI supports** a scientific objective-based approach to the final closure and reclamation and monitoring of the Lupin mine site consistent with the criteria established by the guidelines adopted by the NWB in our current licence developed by INAC in 2007/AANDC 2013 and consistent with LMI's approved FCRP that passive monitoring will take approximately 5 years following completion of the reclamation work, **or until the global objectives for the mine site components can be confirmed.**

**LMI does not support** the application of arbitrary unscientific prescriptive timelines to assess closure reclamation and monitoring at Lupin. And notes that even in more recent guidelines, MVLWB/AANDC Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories (2013), are consistent with CIRNAC's 2007/2013 guidelines for closure and reclamation in which CIRNAC supports an objective-based approach to be applied.

LMI appreciates the opportunity to provide a **final response** to CIRNAC's PCMP comment #6.

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	7
<b>Subject/Topic:</b>	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)

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

CIRNAC concerns were addressed.

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

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**LMI Response (July 5, 2021):**

Thank you.

LMI considers this item resolved.

**Detailed Review Comment by Party (July 16, 2021):**

LMI provided responses on June 15, 2021 to CIRNAC's original comments from June 1, 2021 that addressed seven of our eleven comments regarding the Post-Closure Monitoring Plan (PCMP). Specifically, comments 2, 4, 5, 7, 9, 10 and 11 were considered resolved. Resolution of comments 4, 9, 10 and 11 involved follow-up actions which LMI committed to.

**LMI Response (July 29, 2021):**

Thank you. CIRNAC has reconfirmed that LMI has addressed their concerns.

**RESOLVED**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	8
<b>Subject/Topic:</b>	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.

**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.

**Detailed Review Comment by Party (July 16, 2021):**

CIRNAC recommended the PCMP be modified to include a schedule of activities with expected completion dates. LMI has provided a schedule and committed to including it in the Final Closure and Reclamation Plan addendum. This addresses CIRNAC's concerns.

**LMI Response (July 29, 2021):**

Thank you. CIRNAC has advised that LMI has addressed their concerns.

**RESOLVED**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	9
<b>Subject/Topic:</b>	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.

**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.

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**Detailed Review Comment by Party (July 16, 2021):**

LMI provided responses on June 15, 2021 to CIRNAC's original comments from June 1, 2021 that addressed seven of our eleven comments regarding the Post-Closure Monitoring Plan (PCMP). Specifically, comments 2, 4, 5, 7, 9, 10 and 11 were considered resolved. Resolution of comments 4, 9, 10 and 11 involved follow-up actions which LMI committed to.

**LMI Response (July 29, 2021):**

Thank you. CIRNAC has reconfirmed that LMI has addressed their concerns with the LMI's June 15, 2021 commitment above.

**RESOLVED with COMMITMENT**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	10
<b>Subject/Topic:</b>	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.

**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.

**Detailed Review Comment by Party (July 16, 2021):**

LMI provided responses on June 15, 2021 to CIRNAC's original comments from June 1, 2021 that addressed seven of our eleven comments regarding the Post-Closure Monitoring Plan (PCMP). Specifically, comments 2, 4, 5, 7, 9, 10 and 11 were considered resolved. Resolution of comments 4, 9, 10 and 11 involved follow-up actions which LMI committed to.

**LMI Response (July 29, 2021):**

Thank you. CIRNAC has reconfirmed that LMI has addressed their concerns with the LMI's June 15, 2021 commitment above.

**RESOLVED with COMMITMENT**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	11
<b>Subject/Topic:</b>	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

**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.

**Detailed Review Comment by Party (July 16, 2021):**

LMI provided responses on June 15, 2021 to CIRNAC's original comments from June 1, 2021 that addressed seven of our eleven comments regarding the Post-Closure Monitoring Plan (PCMP). Specifically, comments 2, 4, 5, 7, 9, 10 and 11 were considered resolved. Resolution of comments 4, 9, 10 and 11 involved follow-up actions which LMI committed to.

**LMI Response (July 29, 2021):**

Thank you. CIRNAC has reconfirmed that LMI has addressed their concerns with the LMI's June 15, 2021 commitment above.

**RESOLVED with COMMITMENT**

## 4.0 KITIKMEOT INUIT ASSOCIATION (KIA)

<b>Interested Party:</b>	KIA	<b>Technical Comment No:</b>	1
<b>Subject/Topic:</b>	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

### 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.

**Detailed Review Comment by Party (July 15 & 16, 2021):**

The KIA appreciates LMI making the correction that there are 2 phases of closure monitoring and not 3 as was stated inadvertently in the PCMP text.

LMI has confirmed in its response that P-C monitoring will continue for as long as required as stipulated in the Water Licence, and not necessarily for 5 years as is stated several times in the PCMP text. This should be corrected in the next update to the PCMP.

The KIA considers this item resolved.

**LMI Response (July 29, 2021):**

Thank you. KIA has confirmed that LMI has addressed their concerns with the LMI's June 15, 2021 commitment above.

**RESOLVED with COMMITMENT**

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<b>Interested Party:</b>	KIA	<b>Technical Comment No:</b>	2
<b>Subject/Topic:</b>	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

**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/SJCI 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

**Detailed Review Comment by Party (July 15 & 16, 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.

Text in the next updated PCMP should include a discussion on the wider range of triggers that may be required as a result of site monitoring.

The KIA consider this item resolved.

**LMI Response (July 29, 2021):**

Thank you. KIA has confirmed they consider this item resolved.

**RESOLVED**

<b>Interested Party:</b>	KIA	<b>Technical Comment No:</b>	3
<b>Subject/Topic:</b>	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/SJCI, 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.

**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/SJCI 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

**Detailed Review Comment by Party (July 15 & 16, 2021):**

The KIA accepts that LMI is mentioning the possible future application for a lower final discharge pH limit in the PCMP and that the text is not intended to be the beginning of an application for such a change.

The KIA considers this item resolved.

**LMI Response (July 29, 2021):**

Thank you. KIA has confirmed they consider this item resolved.

**RESOLVED**

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<b>Interested Party:</b>	KIA	<b>Technical Comment No:</b>	4
<b>Subject/Topic:</b>	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/SJCI 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

**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

**Detailed Review Comment by Party (July 15 & 16, 2021):**

LMI states the Water Licence requested a description of thresholds that may trigger reduced monitoring requirements. Including such text in the PCMP is considered appropriate. However, there is no presentation in the PCMP of other scenarios that may require adaptive management responses as it would seem short-sighted to only include adaptive management to reduce monitoring requirements and not also include triggers that may warrant increases in monitoring or other remedial measures. The text of Section 6.2.2 mentions the implementation of a forensic program should the discharge pH be dropping during the active phase. However, this only presents one possible scenario and at one time. A range of scenarios should be presented in the final version of the PCMP in a revised Section 6.2.6, which could be titled Adaptive Management Framework, of which reductions could be one sub-section, and increases in another.

**LMI Response (July 29, 2021):**

As stated above, 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 updated version of the PCMP’s.

LMI considers this item resolved as any required changes to monitoring requirements would be carried forward to updated version of the PCMP’s.

**RESOLVED**

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<b>Interested Party:</b>	KIA	<b>Technical Comment No:</b>	5
<b>Subject/Topic:</b>	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 SJCI 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.

#### **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/SJCI 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.

### **Detailed Review Comment by Party (July 15 & 16, 2021):**

The introductory section of the latest LMI document states;

*“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.”*

As SJCI stated previously, the consultations should have begun well before March 2020 when the reclamation plan was being developed which seems to be when LMI considered having the consultations. Through COVID, and now, with the active reclamation work nearly completed, the community will have little input in what is done at the site and how the community can be involved.

It is understood that the first consultations by LMI with the Kugluktuk community was in early April 2021.

Secondly, the goal is not for LMI to provide an “...in-person update at some point in the near future” but to have a two-way discussion on the reclamation plan and the post-closure period plans and what possible considerations the company can make to accommodate the community’s concerns and/or suggestions.

It is understood from the KIA that LMI did not want to utilize a consultation group with selected participants that were familiar with the Contwoyto Lake area and would have involved intervenor funding to enable participation, as is typical in such industrial and especially mining projects.

The LMI response mentions a June 24, 2021 community engagement call but does not mention any comments or suggestions that came from the call. The KIA appreciate LMI's efforts in making the call a more successful exchange of information with the community.

LMI should continue to involve the community in the future as the final active reclamation work is being completed and longer-term closure monitoring is implemented.

The KIA consider this item resolved.

### **LMI Response (July 29, 2021):**

LMI would like to clarify for the record a few points, as a few of KIA/SJCI comments above do not provide context and there may be some confusion with LMI's previous responses.

As per LMI's response above (see July 5, 2021 response) there was community consultation in 2019/2020 during the water licence renewal application process, which included the Final Closure and Reclamation Plan. There may be some confusion, when LMI stated their plans for community consultation in 2020; this was based on the current review process in relation to the PCMP (not the FCRP), as required under terms and conditions in Water Licence 2AM-LUP2032 issued in February 2020 and approved by the Minister of Northern Affairs in April 2020. The comment that the first consultation was in April 2021 is incorrect if the KIA/SJCI is referring to the entire



renewal application/FCRP approval process completed in February 2020. LMI's engagement in relation to the PCMP with community organizations and community members began in February 2021.

LMI acknowledges the use of the word "update" in the Introduction, above, was not the correct word to use and have replaced it with "consultation".

In regard to the statement from the KIA/SJCI that LMI did not want to utilize a consultation group with selected participants, LMI would like to make clear that it wholly disagrees with this statement. LMI was excited at the KIA's suggestion to assist in facilitating LMI with a consultation group during the call on April 8, 2021. However, during this discussion, KIA advised that LMI would need to pay the organization/participants and the KIA would approve who participated. LMI advised that Mandalay Resources (which includes LMI as a wholly owned subsidiary) has policies in place that does not allow them to pay organizations or participants for community consultation processes. These payments could be construed as facilitation payments. LMI offered to ask management if an exception could be made but noted that, if this was granted, LMI would need to publicly disclose to the NWB that payments were made for comments received from the consultation group, facilitated by the KIA. LMI was advised by the KIA that LMI would not need to disclose this information. This caused concerns for LMI. Mandalay Resources management did not grant an exception due to the potential of it being construed as a facilitation payment as well as the potential conflict of not being able to disclose this information. Furthermore, LMI is confused by the statement that this is typical in such industrial and especially mining projects. With the extensive experience of the Mandalay Resources Board of Directors and management, especially in the mining industry, we are not aware of this being typical at all and many mining companies have policies in place not allowing this to occur. LMI hopes that the KIA/SCJI will respect the policies Mandalay has in place.

If the KIA would be willing to provide LMI with the names and contact information for the potential participants that are familiar with the Contwoyto Lake area, LMI would be happy to contact them to see if they are interested in being a part of a consultation group on the Lupin Mine project.

The questions asked during the June 24, 2021 consultation call were either related to the FCRP or in relation to an area outside of the purview of the Lupin Mine project. We believe that we addressed these questions to the satisfaction of the questioner during the consultation conference call. The consultation questions and answers will be included in the annual report.

KIA has confirmed they consider this item resolved.

**RESOLVED**

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<b>Interested Party:</b>	KIA	<b>Technical Comment No:</b>	6
<b>Subject/Topic:</b>	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.

**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.

**Detailed Review Comment by Party (July 15 & 16, 2021):**

SJCI thanks LMI for clarifying that the ECCC is the owner and operator of the weather station. The KIA has no further comment on this issue although no clarification has been received by SJCI on the fate of the station moving forward. It is hoped that if the station continues to be operated that the data from it would be available, likely presented in the site's annual report to NWB or directly upon request from ECCC.

**LMI Response (July 29, 2021):**

Thank you. KIA has confirmed they consider this item resolved.

**RESOLVED**

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<b>Interested Party:</b>	KIA	<b>Technical Comment No:</b>	7
<b>Subject/Topic:</b>	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

**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)

**Detailed Review Comment by Party (July 15 & 16, 2021):**

CIRNAC had similar concerns in their TC 11.

LMI and CIRNAC consider this item resolved (based on their latest communications as provided in the July 5, 2021 LMI document).

The KIA also considers this item resolved.

**LMI Response (July 29, 2021):**

Thank you. KIA has confirmed they consider this item resolved.

**RESOLVED**

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

<b>Interested Party:</b>	ECCC	<b>Technical Comment No:</b>	1
<b>Subject/Topic:</b>	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

**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.

**RESOLVED**

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<b>Interested Party:</b>	ECCC	<b>Technical Comment No:</b>	2
<b>Subject/Topic:</b>	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.



**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.

**RESOLVED**

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<b>Interested Party:</b>	ECCC	<b>Technical Comment No:</b>	3
<b>Subject/Topic:</b>	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.

**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**

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**LMI Response (July 5, 2021):**

Thank you.

**RESOLVED**

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<b>Interested Party:</b>	ECCC	<b>Technical Comment No:</b>	4
<b>Subject/Topic:</b>	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.

**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.

**RESOLVED with COMMITMENT**

<b>Interested Party:</b>	ECCC	<b>Technical Comment No:</b>	5
<b>Subject/Topic:</b>	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.

**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.

**RESOLVED with COMMITMENT**

<b>Interested Party:</b>	ECCC	<b>Technical Comment No:</b>	6
<b>Subject/Topic:</b>	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.

**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.

**RESOLVED**

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

<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	1
<b>Subject/Topic:</b>	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

### 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

**Detailed Review Comment by Party (July 16, 2021):**

CIRNAC did not provide any further comments.

**LMI Response (July 29, 2021):**

**RESOLVED**



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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	2
<b>Subject/Topic:</b>	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 field 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 in 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

**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

**Detailed Review Comment by Party (July 16, 2021):**

CIRNAC did not provide any further comments.

**LMI Response (July 29, 2021):**

**RESOLVED**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	3
<b>Subject/Topic:</b>	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 with Type 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

**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

**Detailed Review Comment by Party (July 16, 2021):**

CIRNAC did not provide any further comments.

**LMI Response (July 29, 2021):**

**RESOLVED**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	4
<b>Subject/Topic:</b>	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.

**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

**Detailed Review Comment by Party (July 16, 2021):**

CIRNAC did not provide any further comments.

**LMI Response (July 29, 2021):**

**RESOLVED**

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	5
<b>Subject/Topic:</b>	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.

**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

**Detailed Review Comment by Party (July 16, 2021):**

CIRNAC did not provide any further comments.

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**LMI Response (July 29, 2021):**

RESOLVED

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<b>Interested Party:</b>	CIRNAC	<b>Technical Comment No:</b>	6
<b>Subject/Topic:</b>	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.

**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

**Detailed Review Comment by Party (July 16, 2021):**

CIRNAC did not provide any further comments.

**LMI Response (July 29, 2021):**

**RESOLVED**