



Water Resources Division
Nunavut Regional Office
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May 18, 2018

Richard Dywer
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PO Box 119
Gjoa Haven, NU X0A 1J0

CIDM # 1220060

**Re: 2AM-LUP1520 – Review of Interim Closure and Reclamation Plan –
Lupin Mine Property – Kitikmeot Region, Nunavut**

Please be advised that Indigenous and Northern Affairs Canada (INAC) has completed a review of the above noted documentation.

The NWB invited representations to be made to the Board concerning the documentation by May 18, 2018. In conducting this review, INAC has referred to all documents pertaining to Part C Item 4 on the Nunavut Water Board FTP site as it relates to 2AM-LUP1520.

Please feel free to contact me should you have any questions or comments. I can be reached at (819) 994-6772 or by email at ian.parsons@aandc-aadnc.gc.ca.

Sincerely,

Original signed by

Ian Parsons
Regional Coordinator

Cc. Spencer Dewar, Director of Resource Management, INAC, Nunavut Regional Office (NRO)
Erik Allain, Manager Field Operations, INAC, NRO
Eva Paul, Water Resources Officer, INAC, NRO



Review Comments on Lupin Mines, Interim Closure and Restoration Plan, Lupin Mine Site, NU

Background

The Lupin Mine Site is situated in Nunavut's Kitikmeot region, approximately 250 km West of Arviat, 285 km southeast of Kugluktuk, Nunavut, and about 400 km north of Yellowknife, Northwest Territories. The airstrip serving this Site is at 65° 46'00" N and 111° 14'41" W. The Site is on the western shore of Contwoyto Lake, approximately 60 km south of the Arctic Circle.

The mine property is currently owned by Mandalay Resources with the licensee of the site being Lupin Mines Inc. (Lupin or LMI). The Lupin Mine was in operation from 1982 to 2005 with temporary suspensions of activities between January 1998 and April 2000, and between August 2003 and March 2004. The mine resumed production in March 2004 to February 2005. The site has remained in Care and Maintenance since 2005.

Closure Status

In October of 2017 LMI submitted an updated Interim Closure and Reclamation Plan (ICRP) along with an updated closure cost estimate. LMI intends to finalize the ICRP early in 2018. The 2017 ICRP was the latest of a series of revisions (S5) to the closure plan as the site moves to a final plan for closure and restoration.

As noted in the plan, progressive site reclamation was initiated as early as 1988 during operation, and major works initiated on the tailings containment area (TCA) in 2005/6 with the placement of 1m of esker cover materials over much of the TCA. From 2006 to present, the closure plan was amended as various additional efforts and studies were undertaken as the site remained in care and maintenance. The current ICRP reflects the results of this work with the objective of completion of the closure works within the next 2 years. Given past works and prior investigations this should be a realistic target.

The currently planned closure and restoration activities as described in the ICRP include the following general activities. Either offsite removal of infrastructure and equipment or placement of such materials underground. Concrete slabs will be left in place and covered, with walls covered as is or knocked down prior to being covered in keeping with local topography. Former roads, yards, airstrip, and other such surfaces will be left as is after scarification and drainage enhancements. Remaining chemical and hazardous materials will be removed from site. Access to the underground will be sealed and openings filled. TCA dam and embankments will be stabilized at selected areas, and permanent drainage ways will be constructed to reduce ponded water elevation and allow for natural drainage from the area. Remaining exposed tailings will be covered with esker materials to create a saturated zone above the tailings.

Additional studies are noted as required to finalize the closure plan with respect to mitigation of impacted soils and management of potential acid generating (PAG) waste rock.



The ICRP notes that LMI is in the process of creating the final closure plan and that the completion of the closure works at the Lupin Mine is expected within two and a half years from the date of the ICRP.

Review Comments/Findings

The overall closure principles and objectives as articulated in LMI's 2017 Interim Closure and Restoration Plan (ICRP) are generally in keeping with good industry practice and appropriate for the nature and location of the site.

Past and planned activities related to demolition, disposal, and removal of infrastructure, materials and equipment, and for sealing of mine openings should ensure that existing or potential hazards associated with these aspects of the site are removed and that these site elements are stable and safe after completion of the remedial works.

Past and planned activities related to impacted soils, tailings and waste rock closure and rehabilitation are appropriately focused on addressing the need for physical and chemical stability and the reduction of contaminant loads to the receiving environment. However, efforts are still underway to refine final closure plans and designs related to impacted soils and waste rock to ensure long term physical and chemical stability. The reviewer understands that further details on the proposed work for these aspects of site closure and restoration will be provided in the Final Closure Plan.

The October 2017 version of the ICRP is the end-product of a series of earlier submissions to appropriate authorities and licensing agencies. As such it is reasonable to expect that potential concerns or issues associated with the plan, either in principal, or with respect to specific technical aspects of the plan, have been raised and addressed in past closure plan reviews. Within this context, the reviewer notes, but does not challenge, the following technical aspects of the plan, on the assumption that these items must have been reviewed in detail as part of earlier submissions (e.g. 2005 and 2006 comments on Final TCA Reclamation and Abandonment Plan):

- a 1m cover thickness for ARD mitigation via a saturated cover zone seems minimal thickness,
- enhanced dyke/dam slopes to 2.5:1 by addition of quarried waste rock is steeper than the 3:1 closure slopes in my experience,
- no use of seeding of mine site disturbed surfaces at the various site locations, reliance on natural revegetation.

Based on the ICRP review, it appears that the primary outstanding concerns raised in the ICRP relate to the:

- potential treatment of contaminated soils to site specific criteria yet to be defined through updated Human Health and Ecological Risk Assessment (HHERA) guidance, and,



- treatment of potentially acid generating waste rock which now is seen to represent about 2/3 of the waste rock materials, a volume that is much higher than originally considered, and could be a material issue with respect to the final closure plan costs.

The ICRP notes that these issues will be addressed in the Final Closure plan and as such we would expect that LMI will revise the ICRP and cost estimate accordingly at that time.

With respect to the generation of the Final Closure, the review notes that:

- As part of the Board Amendment 2 process, ECCC comments were provided to the Board on 20 November 2017. The reviewer agrees with ECCC comments and is pleased to note that LMI in its submission of 24 November 2017 agreed to address the issues raised in these comments in the Final Closure Plan.
- No explicit discussion of Climate Change and its considerations on closure design is provided in the ICRP. While it is recognized that such considerations have been undertaken as part of various detailed designs and analysis, it is suggested that the final closure plan would benefit from the inclusion of such a section.

In summary, review of the ICRP finds no material concerns with the plan in its current state and expects that subject to the inclusion of the appropriate measures for mitigation of impacted soils and management of (PAG) waste rock, and the various updates as noted above, the final plan should be appropriate for closure and restoration of the site.

Conclusion

The department accepts the Interim Closure and Reclamation plan as provided by LMI and looks forward to reviewing the Final Closure Plan.

As well, an updated closure cost estimate, to go with the ICRP, will be finalized and submitted to the board upon completion of a site visit.