Environment Canada | Environnement Canada

Prairie & Northern
Environmental Protection Operations
Environment Canada
Room 200, 4999-98th Avenue NW
Edmonton, AB T6B 2X3

May 26, 2008

File: 7834-3-37/E77-1

Aaron MacDonell
Environmental Coordinator
Lupin Operations, Zinifex Canada Inc.
401-1113 Jade Court
Thunder Bay, ON P7B 6M7

Dear Mr. MacDonell:

Re: Environmental Effects Monitoring (EEM) Study Design Review

The review of the Lupin Gold Mine EEM Study Design entitled, "*Environmental Effects Monitoring Study Design, Lupin Gold Mine, Nunavut, Canada – March 2008*", has been completed by the Technical Advisory Panel. Appended is a hardcopy of the compiled review comments that were sent to you electronically on May 26, 2008. These review comments should be addressed in the form of a simple addendum to the Study Design.

If you have any questions concerning the review of your EEM Study Design, please feel free to contact me at (780) 951-8754, or Paula Siwik ((780) 951-8824) once she returns to the office on July 8, 2008.

Sincerely,

Shelly Boss
Regional EEM Coordinator

Attachment

Nunavut Water Board
JUN 05 2008
Public Registry

cc:

Andrew Mitchell	Zinifex Canada Inc., Thunder Bay
Shauna Sigurdson	Environment Canada, Edmonton
Jenny Ferone	Environment Canada, Edmonton
Craig Broome	Environment Canada, Yellowknife
Anne Wilson	Environment Canada, Yellowknife
Christopher Baron	Fisheries and Oceans Canada, Winnipeg
Mike Palmer	Indian and Northern Affairs Canada, Yellowknife
David Hohnstein	Nunavut Water Board, Edmonton
Dionne Filiatrault	Nunavut Water Board, Gjoa Haven

EcoLogo Paper / Papier EcoLogo

Technical Advisory Panel (TAP) Comments on "Environmental Effects Monitoring Study Design Lupin Gold Mine Nunavut, Canada"

General Comments

1. The Mine's response to the 'Technical Advisory Panel's review comments on the Lupin Gold Mine Environmental Effects Monitoring Cycle 1 Interpretative Report' addressed most TAP comments on this facility's first EEM study. Any outstanding concerns with the Mine's responses are included in this study design review.

2. The use of past and future tense to describe the proposed 2008 Lupin Environmental Effects Monitoring (EEM) study design made it difficult to determine which methods will be followed during the Phase 2 EEM study. Please see the comments below asking for clarification.

3. The dates and times that samples will be collected for biological monitoring is a required component of EEM studies under the Metal Mining Effluent Regulations (MMER). Please provide the dates on which the benthic and fish monitoring surveys are estimated to begin.

4. Mines are encouraged to follow guidance in the *Metal Mining Guidance Document (MMGD*, Environment Canada 2002a). Other material available for use, including further guidance for the non-lethal sampling of fish and for benthic sample sorting and subsampling, is posted on the EEM web-site at **http://www.ec.gc.ca/eem/English/MetalMining/Guidance/default.cfm**

5. During the review of Interpretative Reports from the initial monitoring phase for mines in this and other regions of Canada, it was noted that data for zooplankton were in some cases being included in the benthic invertebrate community analysis. This is a general reminder to facilities that zooplankton are not considered part of the benthic invertebrate community and should not be included in the benthic invertebrate results and analysis reported within Interpretative Reports or included in the Mine's electronic EEM biological monitoring data.

Site Characterization

6. p. 8. Please describe any changes to the site that may have occurred since the submission of Lupin Mine's first EEM study design. A detailed description of any changes to the site characterization information since the submission of the most recent study design is required under the MMER.

7. p. 19. The TAP would appreciate the inclusion of any water quality monitoring data that may have been collected since 2005.

8. p. 19. Note: The "Addendum Report to the Environmental Effects Monitoring Cycle 1 Interpretive Report for the Lupin Mine" (Golder Associates Ltd. 2007) states that "based on available water quality data from 2005, it appears that concentrations higher than estimated by the model are present in Outer Sun Bay". The information from the addendum report should be incorporated within the present study design.

9. p. 19. Please confirm whether the Mine will be discharging in 2008 and whether the fish and benthic invertebrate community surveys will be performed when the Mine is discharging.

20. p. 35. The metals that will be measured within the sediment cores have not been identified. The TAP recommends that an ICP scan be performed on each sediment core.

21. p. 36. Please confirm the size of the sorting sieves that will be used during this EEM study. Note that the recommended sieve and/or mesh size for all freshwater mines is 500 µm (see p. 5-87 of the MMGD).

22. p. 36. Please provide a description of the benthic laboratory sub-sampling procedures that will be followed if sub-sampling is necessary. Please note that a revised sample sorting and subsampling guidance document is available for reference (Environment Canada 2002b).

23. p. 39. Note if laboratory sub-sampling is required, QA/QC protocols should include an evaluation of sub-sampling error (see Environment Canada 2002b). Please discuss how sub-sampling accuracy and precision will be estimated.

24. p. 39. Note that under the Regulations Amending the Metal Mining Effluent Regulations, which came into effect on October 3, 2006, the evenness index is now a required benthic invertebrate indicator for EEM biological monitoring studies (MMER, *Schedule 5, Section 16(a)(iii)*), replacing the Simpson's Diversity Index as an effect endpoint. Therefore, please use Simpson's Evenness Index in future reports as an effect endpoint. The Simpson's Diversity Index is now considered a supporting endpoint.

25. p 39. Please provide a description of the invertebrate data management QA/QC procedures that will be implemented (e.g., procedures used to ensure data verification and validity, screening for erroneous values and outliers, etc.).

26. p. 40. The specific statistical analyses that will be used to determine if there is an effect of mine effluent on the benthic invertebrate community in the exposure area were not mentioned in this report. Please describe the statistical analysis to be used to compare benthic invertebrate community endpoints between the exposure and reference areas.

27. p. 40. Please discuss how the supporting environmental data could be analyzed to help aid in the interpretation of the benthic invertebrate survey results.

28. p. 40. The values of alpha and beta to be used during data analysis have not been specified. Note that with 5 benthic stations per area, an alpha = beta = 0.1 is appropriate to achieve a power of 0.90, as recommended in the MMGD (see p. 5-54).

Fish Survey

29. p. 41. Please note that based on the results from the first EEM study, the TAP recommended that this facility sample ninespine stickleback at a second fish reference site in future EEM studies (see Lupin Gold Mine Environmental Effects Monitoring Cycle 1 Interpretative Report TAP report review comment #20). Please present possible locations for a second fish reference site.

30. p. 41. The field methods are described in past tense. Please confirm that for the 2008 EEM fish survey:
    a. Juvenile grayling and ninespine stickleback will be the target sentinel species for a lethal sampling program, and;

Sublethal Toxicity Testing

42. p. 53. Note that the taxonomic name of the freshwater algae used in 72 hour growth inhibition test has changed to *Pseudokirchneriella subcapitata.*

References

Environment Canada. 2002a. Metal Mining Guidance Document for Aquatic Effects Monitoring (MMGD). June 2002.

Environment Canada. 2002b. Revised Guidance for Sample Sorting and Subsampling Protocols for EEM Benthic Invertebrate Community Surveys. December 2002

Golder Associates Ltd. 2007. Addendum Report to the Environmental Effects Monitoring Cycle 1 Interpretive Report for the Lupin Mine. Prepared for Kinross Gold Corporation, Edmonton Alberta. Golder Report No. 05-1373-019.