



State of New Mexico  
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**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

November 8, 2004

Ms. Jill S. Caverly, Project Manager  
U. S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards  
Mail Stop 8 F42  
Washington, DC 20555

Docket 40-8905

**RE: Comments on ACL applications for Rio Algom Mining Corporation – Quivira Mining Company, Ambrosia Lake Facility Docket No. 40-8905 – License No. SUA 1473**

Dear Ms. Caverly:

The New Mexico Environment Department (NMED) has reviewed the original alternate concentration limits (ACL) applications as well as correspondence between, the U.S. Nuclear Regulatory Commission (NRC), Rio Algom Mining Corporation (RAM) and the Center for Nuclear Waste Regulatory Analyses (CNWRA), which was contracted by NRC. The NMED appreciates the assistance provided by NRC in accessing the documents. A list of documents reviewed is as follows:

1. Corrective Action Program and ACL petition for upper most Bedrock Units Ambrosia Lake Uranium Mill Facility, February 15, 2000. RAM submittal to NRC. Prepared by AVM Environmental Services and Applied Hydrology Associates, Incorporated.
2. Application for Alternate Concentration Limits in the Alluvial Materials at the Quivira Mill Facility Ambrosia Lake, New Mexico, May 2001. RAM submittal to NRC. Prepared by Maxim Technologies.
3. RAM response to request for additional information – ACL applications, April 11, 2003.
4. RAM response letter, July 2003 NRC Accession No. ML0320501050.
5. CNWRA report, September 2003. NRC Accession No: ML0334905562.
6. RAM response letter, February 9, 2004. NRC Accession No. ML0404304190.

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7. CNWRA report, March 2004. NRC Accession No. ML0419704520
8. NRC cover letter for meeting summaries NRC Accession, July 12, 2004. No. ML0419504020.
9. NRC meeting summary, June 30, 2004. NRC Accession No. ML0419504180.
10. NRC meeting summary, June 30, 2004. NRC Accession No. ML0419504130.

### General Comments

The NMED has five issues with the above documents. First, it is unclear whether all proposed ACLs remain under consideration because there have been three submittals: the original applications dated 2000 and 2001, a RAM response dated April 2003 and a RAM response dated October 2003. The NMED would appreciate the opportunity to review the upcoming environmental assessment, which may clarify the numerical ACLs that would be recommended for approval by the NRC.

Second, while the RAM response dated April 2003 appears has the most reasonable proposal for the ACLs, the NMED is concerned about the proposed alluvial aquifer ACLs for uranium, selenium and molybdenum. The ACLs selected for uranium (11.1 mg/L), radium 226 + radium 228 (196.1 pCi/L) and selenium (3.1 mg/L) are maximum values from a 1980 to 1997 DOE alluvial well water quality data set. The ACL for molybdenum (3.8 mg/L) appears to be the ninety-fifth percentile with possibly well 706 data removed as an outlier. Apparently, the data were used under the premise that one mile of contaminant transport from the DOE site will occur without attenuation, while some attenuation will occur for a similar distance from the tailings impoundment on the RAM site. It seems more appropriate to reduce the ACL values to account for attenuation that would occur between the DOE and RAM sites. Also, the basis is unclear for the April 2003 proposed ACLs for uranium in the Tres Hermanos B bedrock aquifer because the monitoring data support an approximately stable or downward trend in uranium concentration. The originally proposed ACL for uranium of 0.25 mg/L is supported by the monitoring data for the Tres Hermanos B aquifer.

Third, the ACL application for the alluvial aquifer omits the Section 4 evaporation pond area. The NMED supports the removal of the Section 4 evaporation ponds and sediments, which should be placed in the tailing impoundment 2 area and covered. Leaving the ponds and sediments in place, will directly or indirectly allow more contamination of ground water than a removal scenario. Consolidation of Section 4 waste in the tailing impoundment 2 is the best option to its long-term management. The NMED understands that a RAM must submit a removal plan for approval by NRC.

Fourth, the ACL applications do not consider other non radiological contaminants such as sulfate, total dissolved solids, chloride and nitrate. The New Mexico Water Quality Act and Water Quality Control Commission Regulations require that all parameters that exceed ground water quality standards must be addressed through state regulatory processes. The NMED concurs with the CNRWA reports with respect to the need for post-closure monitoring in the aquifers to verify contaminant transport predictions and ensure water quality protection. Following completion of closure activities, the alluvial aquifer may continue its current trend that reduces its saturated thickness and extent. Even episodic precipitation events may result in partial saturation of the

alluvial material and transport of residual contaminants toward recharge areas of the bedrock aquifers such as the Tres Hermanos B, Tres Hermanos A and Dakota.

Fifth, the Westwater formation has not been included in the applications for either ACLs or a more current evaluation of the water levels. The applications do not address a significant recovery of water levels in recent years along the central and eastern portion (Section 33 and 35) of the RAM facility. The recovery rates may be used to audit the earlier ground water modeling predictions. This issue will be addressed in the NMED Ground Water Quality Bureau discharge permit DP-362.

The specific comments provided below address the above general comments as well as other issues.

### Specific Comments

1. CNWRA report, September 2003 report, Section 4.4.2, page 4-6. The prediction of hundreds of years for recovery for ground water may require further evaluation. The prediction appears to have been made in the late 1970s. Ground water for the Westwater formation has substantially recovered, such that water may already be moving north to northeast on the eastern portion of the site, where active pumping of shafts ceased in January 2000. Ongoing corrective action plan (CAP) pumping in Section 30E/30W will delay the recovery somewhat. The last few feet or percent of recovery may take many decades, however, there is some evidence of significant changes that require revisiting predictions made a few decades ago.
2. RAM response letter, April 2003. The NMED concurs with NRC that the geochemical fate and transport model needs additional evaluation of attenuation, selection of input values and sensitivity. The fate and transport model results are essential to the ACL evaluation. The responses addressed many of the NRC concerns, but the presentation of results is incomplete. For example, the uranium transport continued for only 100 years, at which time the concentration was increasing rapidly (figure 11, RAM response letter, April 2003).
3. RAM response letter, April 2003, Table 4. As a clarification to the definition of background, sources may include natural occurring as well as anthropogenic sources unassociated with and upgradient of the site. Granted, it is inherently difficult to determine background concentration in areas where the disturbance has continued for decades. The background concentrations in Table 4 are a mix of naturally occurring and anthropogenic sources. The background values in the Table 4 are based on water quality data at the DOE title I site, without attenuating the concentrations as the water travels about one mile to reach the proposed site boundary for long-term stewardship at the RAM site. This generates unreasonably high concentrations and supports very high ACLs even though the contaminant transport properties would reduce the concentrations en route to the RAM site.
4. Alluvial Material ACL application, 2001, pages 2-35 to 2-36. The risk based assessment of uranium did not consider the 10 CFR 192 proposed value for uranium of 30 pCi/L or 0.044 mg/L.

Ms. Jill Caverly, Project Manager

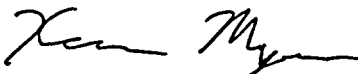
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5. Alluvial Material ACL application, 2001, figure 2.17; and RAM response letter, April 2003 Figure 12. There is no mention of the Section 4 evaporation ponds 11 through 21 and associated contamination in the alluvial aquifer, while the ponds appear in several figures.
6. Alluvial Material ACL application, 2001. Transient and steady state particle pathlines indicate potential off site contamination in figures C-6 and C-8 of appendix C. This adds evidence for the necessity of fate and transport modeling. In Section 2.2.2, the ACL application mentions that modeled concentrations would be exceeded at the point of exposure after 260 years. The ACL process should not allow for off site contamination. The ACL application should provide maps of isopleths for each contaminant at various modeling time steps out to 200 to 1000 years.
7. Alluvial ACL Application, 2001, page 2-18. The Table 2.3 modeling results omit uranium.
8. Alluvial Material ACL application, 2001, page 2-28, Section 2.3.2.1. New Mexico regulations contemplate that all ground water that enters a well may be a potential water supply in the future. The 150 gallon per day threshold for an aquifer is not useful in semi-arid or arid climates where water supplies are in demand and is not consistent with New Mexico regulations. Moreover, the alluvium recharges the deeper bedrock aquifers. The recharge from the alluvium may contaminate other aquifers.
9. Alluvial Material ACL application, 2001, page 2-28, Section 2.3.2.1. Population changes at the local, state or regional level may, in the future, place greater demands on areas sparsely populated today. Even if the Ambrosia Lake-Grants area is not populated in the future the demand for water in New Mexico may continue to increase.
10. None of the ACL applications or responses address chloride, sulfate, TDS, nitrate and other non-radiological contaminants present at the site. These constituents are currently being addressed under a State ground water discharge permit.

If you have any questions regarding the above, please contact Kevin Myers at (505) 476-3506.

Sincerely,



Kevin Myers, Hydrogeologist  
Mining Environmental Compliance Section  
Ground Water Quality Bureau  
New Mexico Environment Department

cc: DP-169, DP-71, DP-362  
Peter Luthiger, RAMC