UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
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May 29, 2012

John Buckley
Senior Project Manager/Hydrogeologist
Office of Nuclear Material Safety and Safeguards
United States Nuclear Regulatory Commission
Mail Stop: T-8F42
Washington, DC 20555-0001

Re: Comments on the 2012 Updated Corrective Action Plan (CAP) for the Homestake Mining Company Site

Dear Mr. Buckley:

The Environmental Protection Agency (EPA) has reviewed the referenced report and generally finds it to be a very comprehensive document with in-depth information about reclamation activities at the Site. The EPA appreciates the efforts of Homestake Mining Company (HMC) to incorporate in detail the compliance requirements of all regulating agencies at this Site.

EPA's comments are focused on regulatory issues that have been identified in the attached December 13, 2011, letter (Re: Comprehensive Environmental Response Compensation and Liability Act (CERCLA) requirements for the HMC Site) submitted to the Nuclear Regulatory Commission (NRC). In that letter the EPA identified CERCLA requirements that are essential for site closure and deletion.

HMC has incorporated EPA's site closure requirements in the CAP in Section 1.1.3.4 -Removal from NPL as stated in the December 13, 2011, letter and found in the The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300.425(e)). However, the CAP does not include potential Applicable, Relevant and Appropriate Requirements (ARRAs) regarding radon emissions from the site. HMC should include the potential ARARs identified in the December 13, 2011 letter. In addition the EPA has the following comments on radon management at the site:

Appendix B Tailings Stabilization and site Reclamation Plan. Appendix A: Radon emanation Modeling.

1. The radon emanation modeling that was done in October 1986 assumed that the radium content of the sands is 100 pCi/g; the actual amount is approximately 90 pCi/g. and the radium content of the slimes is assumed to be 1,000 pCi/g; the actual amount is approximately 900 pCi/g. The emanation modeling then concludes that if the tailings

sand are pushed over the tailings slime they would reduce the emission from the slime. It needs a cover of 15 feet of sand over the slime and then a final one foot cover of compacted soil to reduce the radon emission to levels much lower than the requirements of 40 CFR Part 61 subpart- T of not exceeding 20 pCi/(m^2 -sec).

However, the actual flux measurements that were done in 2011 radon flux survey, reported 39 out of 65 measurements were higher than the standard of 20 pCi/(m^2 -sec) in the large Tailing Pile (LTP) and 14 out of 35 measurements exceeded the standard in the Small Tailing Pile (STP).

According to 40 CFR part 61 App B Method-115, 100 radon flux measurements should be taken from each type of region. The two piles were considered to be as one pile. If the two piles are not connected they should be treated as separate piles and 100 radon flux measurement from each pile and region should be collected. Method 115 should be followed or the results would be invalid.

2 It was reported that three flux measurements (29, 17 and 4) had an average of 165.90 pCi/(m^2 -sec) and additional interim cover was placed over these areas to reduce the emission down to 36.8 pCi/(m^2 -sec) and thus reduce the total average to below the 20 pCi/(m^2 -sec).

Measurements need to be repeated from the top region of the LTP and at a minimum 100 measurements need to be made before concluding that the radon emission is below the standard as per method 115.

3 The evaporation pond on the STP was assumed to emit zero radon gas because it is covered with water. However, forced spraying of the evaporation water into the air would release radon into the atmosphere and this was not accounted for in the flux measurements for the STP. Need to provide amount of water forced into air and daily schedule of spraying evaporation pond water into the air.

4 Equilibrium factor between radon gas and its progeny.
It was assumed that the equilibrium factor between radon gas and its progeny is 20%. The generally accepted equilibrium value is 40%. If an assumption is going to be made, it should be in accordance with the generally accepted value. If a site specific value of 20% will be used, then it has to be justified by actual measurements of the equilibrium factor between radon gas and its progeny on site and at the fence line. In March 2011, the EPA made the recommendation as part of the Remedy System Evaluation recommendations to demonstrate equilibrium by measurement.

Other EPA comments regarding the remediation strategy are:

5 One of the five components of the CAP is land treatment. The EPA has previously recommended as part of the RSE recommendations that HMC consider ground water treatment as opposed to land treatment. HMC has responded that traditional treatment methods such as the ion exchange method do not work based on the water chemistry at the site. HMC should implement alternate treatment methods as soon as practical if current pilot tests are successful in treating extracted ground water.

6 On Page 1-2 please provide approximate time frame for submission of the Decommissioning and Restoration Plan (DRP).

7 In Section 5.2 Evaluation of Alternate Treatment Technologies additional details should be made available about the pilot test evaluation or referenced to another document that provides the information.

8 In Section 5.5.2.2, it states that in the RSE report, the authors' conclusion regarding the adequacy of plume control in the alluvial and three chinle aquifers is incorrect. The RSE report concluded that concentration reductions in the plume are primarily due to dilution than mass removal. HMC asserts that the RSE team did not fully follow EPA guidance in performing the plume capture analysis and hence arrived at the incorrect conclusion. The EPA recommends that HMC conduct the capture zone analysis to prove this.

If you have any questions regarding EPA's request please contact me at 214-665-3126.

Sincerely,

Sai Appaji

Sai Appaji, Remedial Project Manager
Environmental Protection Agency
Region 6