September 23, 1996

Mr. Fred Craft, Resident Manager
Homestake Mining Company
P.O. Box 98
Grants, New Mexico 87020

SUBJECT: COMMENTS ON RADIOLOGICAL SECTIONS OF COMPLETION REPORTS

Dear Mr. Craft:

This letter formally transmits the U.S. Nuclear Regulatory Commission technical staff comments (hard copy and diskette) on the radiological sections of the Homestake Mining Company (HMC) Mill Decommissioning Completion Report, transmitted to the NRC by HMC letter dated March 7, 1996, and the Completion Report for Soil Cleanup and Verification, transmitted to the NRC by HMC letter dated December 18, 1995. These comments were previously sent to HMC by fax, and draft responses to the comments were discussed between yourself and Elaine Brummett of the NRC staff on September 18, 1996.

The NRC staff would like to discuss some of the HMC responses during the Grants Mill site inspection scheduled for October 1-2, 1996. HMC's final responses to these comments, and to comments arising from the inspection, should be submitted to the NRC as addendums to the completion reports.

If you have any question regarding this letter or the NRC staff's review comments, please contact Ken Hooks, the NRC Project Manager for the Grants Mill site, at (301) 415-7777.

Sincerely,

/s/ Daniel Gillen For J. Holonich

Joseph J. Holonich, Chief
Uranium Recovery Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-8903
License No. SUA-1471
Enclosures: As stated
cc: Shawn Ghose, EPA Region 6
Kerrie Neet, NMED
Diane Malone, NSP
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STAFF COMMENTS ON THE
COMPLETION REPORT FOR RECLAMATION OF OFF-PILE AREAS
AT THE HOMESTAKE MINING COMPANY URANIUM MILL
AND
MILL DECOMMISSIONING COMPLETION REPORT

By letter dated December 18, 1995, the Homestake Mining Company of California (HMC) submitted, as required by License Condition 29F, the Completion Report documenting soil cleanup and verification for the uranium mill site at Grants, New Mexico. Also, by letter dated March 7, 1996, HMC provided the Mill Decommissioning Completion Report and requested an amendment to remove license conditions 29, 29D, and 29F. The staff has reviewed these documents and has the following comments.

Completion Report for Off-Pile Areas

1. Page four of the report discusses the Ra-226 cleanup criteria. This section of the report should have included characterization information and cleanup criteria for U-nat, and possibly Th-230. Specifically, HMC should address areas where yellowcake or crushed ore could result in the soil Ra-226 standard being met, but elevated levels of U-nat could remain. Also, HMC should indicate if there are areas with the potential for elevated Th-230 to remain after cleanup of Ra-226, and if so, what criteria would be applied. HMC states on page 16 that U-nat below 35 pCi/g is a value normally accepted for unrestricted release of property. HMC should be aware that a guideline limit of 30 pCi/g U-nat is applicable only when Ra-226 is at background levels, otherwise a value approaching 10 pCi/g U-nat must be considered.

2. Page 14 indicates that the trucking yard had elevated gamma counts due to shine from water processing equipment stored on the site. Figure C-1 demonstrates three areas of elevated gamma and Table C-1 indicates the highest Ra-226 value was 6.9 pCi/g. HMC should indicate the soil sample results from the three areas, as the grid numbering system is difficult to follow. Also, HMC should indicate the gamma level on the equipment.

3. Page 15 indicates that two samples from the North Toe Area (large pile) had elevated Ra-226 levels, but were covered by the apron. Appendix D indicates Ra-226 values of 0.4 to 27.6 pCi/g (wet chem 39.1) and U-nat 0.4 to 69.6 pCi/g. HMC should indicate if the full cell cover (e.g., radon barrier layer) was included in the apron.

4. Page 15 also states that near the north ore pad, one sample indicated 13.5 pCi/g, but the location "reportedly" was resampled and the result was 3.3 pCi/g Ra-226. HMC should provide the data sheets for both analyses.

5. Page 16 states that contamination along State Highway 605 north of the mill site is due to ore spillage and is not the responsibility of HMC. Also, Section 6.2.4 (pages 18 and 19) states that ore spillage along this highway north of County Road 63 is up to 2 feet deep. HMC should indicate what criteria were used to distinguish ore contamination from tailings,

how ore spillage came to be at a depth of two feet, and how the northern cleanup boundary (north of County Road 63) was chosen.

6. Page 17 indicates that for the State Highway 605 right-of-way along the mill site, one sample exceeded the cleanup criterion. The 29.3 pCi/g value apparently is due to HMC staff misreading the spectrometer (deleting one digit of the read out). HMC should provide the data sheet, or more detail to justify that 6 pCi/g is the actual value for this sample.

7. Page 17, Section 6.2.2, refers to the entrance to the Hamilton Construction Company and samples taken south of this landmark. HMC should indicate what figure demonstrates this landmark.

8. Page 18 states that the county road cleanup resulted in one subsurface sample with values of 23.8 pCi/g Ra-226 and 14.3 pCi/g U-nat. HMC explained that the sample was probably taken from the original road base material. HMC should indicate how the area of this sample can be accepted as meeting cleanup criteria.

9. Page 18 states that no gamma levels were measured (June 1994) for county road 63 (north of the large pile), because of the shine from the uncovered north side of the large pile. HMC should indicate why meters shielded with a sheet of lead were not used to provide supporting verification data.

10. The title to Section 6.2.4 (page 18) should indicate County Road 63, not County Road 93.

11. Page 27 states that all soil verification results for the outer zone were less than 8 pCi/g Ra-226. However, Appendix G sheet 5, indicates that sample D022109 resulted in 11.1 pCi/g (HMC value). HMC should explain this inconsistency and why this grid value above the criterion is acceptable. It is noted that the ERG value for that sample is 8.6 pCi/g, but details (method, precision, accuracy) of that analysis were not provided.

12. Page 28 states that results of the quality control (QC) program were evaluated and agreement was within normal analytical accuracy and precision. HMC should indicate how this was determined, i.e., what degree of agreement was necessary to accept on-site measured values as valid.

13. Staff notes that Appendix A contains pertinent License Amendments and that license condition 37C states that "The licensee shall submit a construction quality control program .... that will ensure that the specification which limits the activity of the radon barrier material to 5 pCi/g above background is not exceeded." HMC should indicate when this construction program was submitted and how they will demonstrate that the average Ra-226 level in the radon barrier meets Part 40 Appendix A Criterion 6(5) (cover to contain essentially background level of radioactivity).

14. The data presented in the tables of Appendices B through G should include

the associated analytical errors. Without this information, a thorough comparison of the data presented by HMC and their QA/QC contract laboratory cannot be performed.

15. The sketch at the end of Appendix B (Borrow Areas) does not clearly indicate where samples were taken and HMC should provide a legend to explain the symbols used.

16. Appendix D, Table D-2, contains characterization data for the West Barrow Area. HMC should explain why most of these Ra-226 values are negative numbers, and why data from the off-site laboratories are higher for the same samples.

17. Appendix E contains verification data obtained near the north ore pad. HMC should explain why, unlike most other data in this report, there are many negative Ra-226 values.

18. Appendix F, Table F-1 data indicates that State Highway 605 along the mill site had gamma levels mostly in the range of 2500-4000 cphm. However, 29 grids had values greater than 5000 cphm (over the 10,000 cpm guideline) with a high value of 9962 cphm. According to page 17, grab soil samples were taken at these "few" elevated gamma areas, and if the Ra-226 value approached the limit, additional soil was removed. HMC should indicate the measured Ra-226 levels for these high gamma grids.

19. Table F-5 (e.g., page 5-5) presents questionable data for the uranium activity. For example, sample number 3132 shows U-238 activity of 7.6 pCi/g and U-nat 1.7 pCi/g. HMC should clarify this apparent discrepancy.

20. HMC should indicate if Appendix G includes more data than that associated with the 52 statistical study grids.

21. The highest Ra-226 (HMC) values in the outer zone are for grids D113195 (10.1 pCi/g) and D022109 (11.1 pCi/g, also in Appendix H), but these are not the grids with the highest gamma levels in that block. HMC should provide the gamma levels for these two grids.

22. Appendix I gamma data is elevated for outer zone grids B103215 (20,531 cpm); D102147 (22,336 cpm); D102223 (22,371 cpm); D102235 (21,944 cpm); D104176 (21,963 cpm); and E101114 (21,766 cpm). HMC should indicate the Ra-226 values for these grids. The staff also notes that in block D102, 6 grids failed the gamma guideline; in D104, 14 grids failed; and in E101, 3 failed.

23. Gamma data is elevated for inner zone blocks H064 (11 grids in that block failed); H073053 (11 grids failed); and H074 (9 grids failed). HMC should indicate if all of these elevated grids will be addressed when the small disposal cell is completed.

24. HMC should clarify if the data provided in the report for U-nat are alpha spectrometry results for total uranium (U-235 + U-234 + U-238).

25. HMC should indicate what controls were used to prevent re-contamination during site decommissioning of previously verified areas (e.g., Trucking Yard Area).

26. HMC should reference any NUREGs that pertain to the site (e.g., environmental assessments), or any data that indicates the Ra/Th ratio in the ore that was processed, or in the slurry liquid. Such data should support the HMC assumption that these radionuclides were in equilibrium. Also, please indicate the date of the report on the cleanup of the 1977 slurry line spill.

Mill Decommissioning Completion Report

27. Page two indicates that the maintenance shop was decontaminated and released for later removal from the property. HMC should provided the surface activity data to NRC as an addendum to this report to verify that the cleanup meets the guidelines.

28. The burial pits are discussed on page three. HMC should indicate how the guidelines/criteria for disposal have been met. In particular, discuss how the pit outside the boundary meets release criteria, or reference previous relevant submittals.

29. Page four states that after soil removal from the mill site, radon flux measurements were made. HMC should indicate if this area is to be considered a disposal cell for waste byproduct material per Part 40 Appendix A Criterion 6(1), and if so, how it meets the other criteria such as stability.

30. Table 1 provides Ra-226 and U-nat values for windblown contaminated soil. The samples were obtained before soil removal, apparently to characterize the contamination. HMC should indicate why, compared to the HMC value, the wet chemistry values are low for Ra-226 but high for U-nat. Also, indicate where the different types of analyses are discussed.

31. Table 1 indicates sample 1072 had a wet chemistry result of Ra-226 1.2 pCi/g, but U-nat was 53 pCi/g. HMC should demonstrate how this meets cleanup guidelines.

32. HMC should explain the wide variation of results, in Table 1, with different type of analyses. For example, sample 1372 has 321 pCi/g Ra-226 (not windblown), yet wet chemistry result is 2.2 pCi/g. Also, sample 1092 has U-238 <7.3, and wet chemistry result is 78.3 pCi/g; and sample 1352 Ra-226 is 35.0, but wet chemistry result is 0.7 pCi/g.