



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

May 17, 2000

Mr. Michael J. Mocniak
Fansteel, Inc.
Number One Tantalum Place
Muskogee, OK 74403-9296

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - CONTAINMENT CELL
DECOMMISSIONING PLAN (TAC NO. L31225)

Dear Mr. Mocniak:

This refers to your application dated August 13, 1999, requesting an amendment to Materials License SMB-911 for approval of the decommissioning plan for the containment cell.

Our review of your application identified additional information that is needed before final action can be taken by NRC on your request. The enclosure to this letter contains the request for additional information (RAI), which was discussed with you in a meeting on February 15, 2000. A copy of the meeting minutes were provided to you in a memorandum dated March 9, 2000.

However, by letter dated May 9, 2000, you requested that NRC staff discontinue work on the August 1999 Decommissioning Plan (DP) until further notice. Based on a conference call between NRC staff and Fansteel management on May 9, 2000, it was determined that NRC should continue to send the RAI for informational purposes. There is no requirement for you to answer this RAI at this time. However, if in the future Fansteel requests that NRC restart the review of the August 1999 DP, then Fansteel will be required to provide responses to the RAI, and an appropriate time period for submitting the responses will be developed.

If you have any questions regarding this matter, please contact me at (301) 415-5819 or by e-mail at hma@nrc.gov. Please reference the above TAC No. L31225 in future correspondence related to this request.

Sincerely,

Heather Astwood, Project Manager
Licensing and International
Safeguards Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS

Enclosure: As stated

Docket 40-7580
License SMB-911

**Request for Additional Information
Application Dated August 13, 1999
Fansteel, Inc.
40-7580**

Based on our review of the referenced document, additional information is required to complete our review. The comments are grouped by subject area. Please provide the following information:

Surface Water Hydrology

Basis

The Remedial Design Report (RDR) discussed the possible flood conditions for the cell. The integrity of the disposal cell could be affected by adverse conditions such as dam failure. The RDR indicates that the site would be inundated by 11 feet of water following a failure of the Fort Gibson Dam based on the U.S. Army Corps of Engineers (USACE), inundation map (page B.2.1-7 and Attachment 4 of Appendix B.2). However, the submitted information does not provide the level of detail needed to adequately analyze the peak Probable Maximum Flood (PMF) or dam failure flood levels at the site. The long-term stabilization design relative to peak water levels and velocities expected from either a PMF, a dam failure, a dam failure resulting from a PMF, or multiple sequential failures of upstream dams should be analyzed.

Comment

As a minimum, the following information should be provided.

- a. Analyses of the Probable Maximum Flood and flood levels. The licensee should develop PMF estimates and water level estimates at the site associated with the PMF, assuming that the upstream dams do not fail.
- b. Analyses of flood levels associated with single or multiple failures of upstream dams, using unsteady flow models. Alternately, conservative simplified analyses may be used to "bound" the estimates of peak water level and velocity.
- c. Information related to the hydrologic design of the various dams upstream of the site. This information should include data regarding the dam height, reservoir volume, spillway design flood and/or ability to pass the PMF, and other pertinent facts about the dam. Much of this information may be available from Federal agencies such as the USACE.

Recommendation

The licensee should analyze the long-term stability of the disposal cell. Depending on the results of the hazard analysis (i.e., PMF and dam failure), design features such as the erosion protection may need to be modified.

Enclosure

Geochemistry

Basis

The Treatability Study Report (TSR) was reviewed for geochemical properties of the stabilized and solidified material. The stability of the waste matrix is an important issue relative to long-term performance of the disposal cell. Specifically, a loss of mechanical strength could lead to deformation of the disposal cell or could effect the leaching characteristics of the waste matrix. Several inconsistencies were noted in the results of the toxicity characteristic leaching procedure (TCLP) test results and the materials used in the feedstock for the mechanical strength testing.

Comment

- a. In Table 3 of the TSR, the fluoride concentration in the feedstock soils is 388 mg/kg. However, in the three mixes it is 26, 30, and 125 mg/kg. Addition of cement and CaCl_2 alone could not be responsible for this decrease in fluoride or the variability from mix to mix. The variability of the fluoride concentration could undermine the conclusions about the effectiveness of CaCl_2 in restoring mechanical strength as described in Sections 2.6 and 2.7, on Pages 6 and 7 of the TSP.
- b. The leachate from the TCLP has a fluoride concentration of 551 mg/L (see Table 4, Mix No 3). Concentrations of fluoride more than 4 mg/L exceed the Drinking Water Standard. This also undermines the discussion regarding the addition of calcium to the feedstock soil to tie up the fluoride as fluorite. The licensee should explain the high fluoride concentration and how it relates to the higher mechanical strength of the S/S cylinder samples from Mix No. 3.

Recommendation

The licensee should evaluate the above comments relative to the mechanical strength and stability of the waste matrix. The licensee should either provide additional justification as to why the fluoride concentration will not effect mechanical strength of the waste matrix or perform additional testing to evaluate the strength of the waste matrix with representative concentrations of the various components.

Performance Assessment

Basis

The Decommissioning Plan presents a dose assessment for the proposed disposal cell. Four cases were considered (a residential scenario with and without a soil cover, and an industrial scenario with and without a soil cover). The dose assessment serves as a basis for demonstrating compliance with 10 CFR Part 20, Subpart E. An important part of reviewing the dose assessment is evaluating parameters used in the assessment. Staff performed an independent evaluation of the dose assessment and identified several sensitive parameters that do not appear to be prudently conservative.

Comment

- a. No analysis has been conducted that incorporates a dose contribution from the concentration-based unrestricted release portion of the site to the dose-based restricted release portion of the site. This could be particularly important for dose contributions from groundwater. Although there is currently no published guidance on how to address this situation, staff proposes that the licensee show that the dose calculations include contributions from both the BTP and LTR areas of the site, and that, in combination, they will meet the standard. Alternatively, the licensee could be required to demonstrate separability of the site for dose contribution, either through geophysical conditions or engineered barriers.

Staff also questioned the timing for shutdown of the groundwater collection system. The licensee should perform an analysis with site-specific parameters to estimate the time required for collection water to meet regulatory limits and make provision for operation of collection system for that period of time. This could affect the contaminant concentration in the groundwater not associated with the disposal cell beneath the disposal cell.

- b. The licensee used of a runoff coefficient of 0.99. This value appears inconsistent with the HELP analysis conducted by the licensee. This HELP analysis would indicated that a value of 0.95 would be more appropriate. Changing the runoff coefficient value from 0.99 to 0.95 increases infiltration rate by approximately a factor of 5.
- c. The licensee selected the groundwater bearing zone to be the deeper shale aquifer. Based on the subsurface information presented in the decommissioning plan, it appears that a shallow aquifer in a sand stratum could be used for drinking water. The hydraulic and transport properties of these media are vastly different. Staff performed an independent evaluation using estimated parameters for the shallow aquifer. The results of this evaluation indicate that estimated doses could be significantly higher than those obtained modeling the deeper aquifer.
- d. The licensee selected a well intake depth of 10 meters. Staff's analysis indicate that a smaller value for the well intake depth would produce a higher dose. The decommissioning plan did not provide adequate justification for using the selected well intake depth.

Recommendation

It is recommended that the licensee perform a sensitivity analysis to determine which parameters have the greatest impact on dose for the predominant pathways. Guidance on performing a sensitivity analysis is provided in the "Preliminary Guidelines for Evaluating Dose Assessments in Support of Decommissioning." This document is available from NRC's decommissioning web site - "techconf.inl.gov." In addressing the above comments, the licensee should either provide additional justification as to why the comment is not applicable or perform additional modeling.