February 15, 2005

Donald R. Metzler
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2597 B¾ Road
Grand Junction, CO 81503

SUBJECT: NRC's COMMENTS ON THE MOAB URANIUM MILL TAILINGS DRAFT ENVIRONMENTAL IMPACT STATEMENT

Dear Mr. Metzler:

By letter dated November 4, 2004, you transmitted a copy of the U.S. Department of Energy's (DOE's) *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Draft Environmental Impact Statement (DOE/EIS-0355D)* and requested U.S. Nuclear Regulatory Commission's (NRC) comments on the document. The Moab Project is the former Atlas Corporation uranium mill facility that held NRC license SUA-917 before being transferred to DOE in accordance with the Floyd D. Spence National Defense Authorization Act for FY 2001. We have completed our review of the Draft Environmental Impact Statement and our comments are enclosed. If you have any questions concerning the comments please contact me at (301) 415-6629 or by e-mail at mhf1@nrc.gov.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

/RA/

Myron H. Fliegel, Project Manager
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Enclosure: NRC's Comments

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Enclosure: NRC Comments

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U.S. NUCLEAR REGULATORY COMMISSION COMMENTS
U.S. DEPARTMENT OF ENERGY DRAFT ENVIRONMENTAL IMPACT STATEMENT
REMEDIATION OF THE MOAB URANIUM MILL TAILINGS,
GRAND AND SAN JUAN COUNTIES, UTAH

1. Figure 2-1 shows summary schedules of activities for on-site and off-site disposal.

   a. The schedules show "Characterization/Design/Bidding" beginning as soon as the Record of Decision is issued. Does the U.S. Department of Energy (DOE) need an appropriation from Congress before it can begin those activities? If so, the time to obtain the appropriation should be factored into the schedules.

   b. "Characterization/Design/Bidding" is shown on the schedules as requiring 2 years to complete. There is no discussion in the text regarding the details of this phase. Presumably, DOE's preparation of the Remedial Action Plan (RAP) and the U.S. Nuclear Regulatory Commission's (NRC's) review and concurrence with it, are included in the 2 years. How long will it take DOE to prepare the RAP? How long does DOE expect it to take to obtain NRC's concurrence? Note that on many previous Title I projects, because of revisions needed as a result of NRC's initial review, it took longer than 2 years to obtain NRC's concurrence on the RAP.

   c. How long does DOE expect the site characterization portion of "Characterization/Design/Bidding" to take. Shouldn't there be a difference in the time required for characterization of licensed sites (Moab and White Mesa), with much existing data, and new sites (Crescent Junction and Klondike Flats)?

2. On p. 2-7, the Draft Environmental Impact Statement (DEIS) states, "DOE would also perform flood analyses at Courthouse Wash to determine the best alignment and design requirements." Is DOE considering realigning Courthouse Wash? If so, the EIS should provide the justification and discuss the impacts.

3. On p. 2-34, the DEIS discusses drying of tailings prior to truck or rail transport under off-site disposal options. The DEIS does not, however, discuss the potential for additional contamination to seep into the ground water from the drying tailings. Note that a significant fraction of the existing uranium contamination in the ground water at the site resulted from seepage from the ore stored onsite prior to its processing in the mill. Sections 4.2.3, 4.3.3, and 4.4.3 should address this potential impact.

4. On p. 2-114, DOE states that removing tailings to the Envirocare site" would require an amendment to the existing license from NRC..." Note that effective August 16, 2004, NRC transferred its authority with respect to Envirocare (and other 11e.(2) byproduct material facilities) in Utah to the State.

5. On p. 2-132, figure 2-58 shows latent cancer fatalities (LCFs) for workers for the various disposal options. For the on-site option, the figure shows LCFs to be much less than 0.1 for "Moab site workers" but also shows LCFs of almost 0.3 for "disposal site workers." What does that mean for on-site disposal, i.e., how are "disposal site workers" different than "Moab site workers" for the on-site disposal option? Additionally,

the LCFs for “disposal site workers” for off-site disposal options are about 0.4. However, disposal at Moab will involve putting relatively low activity soils in the pile and some moving of the contaminated material on the top of the pile, while disposal for the off-site options will involve handling all of the material including the most radioactive materials. The EIS needs to explain the counter-intuitive conclusion that the latter will result in LCFs that are only 25 percent higher than the former.

6. Tables 2-35 (p. 2-180) and 4-8 (p. 4-40) provide information on the costs of the various options. The costs are, presumably, DOE’s best estimates, but there must be significant uncertainty in at least some of the estimates. It would be helpful if the uncertainties for the estimates were also provided. One would expect the uncertainties to vary by the component in Table 2-35 and by the site. For example, site characterization is shown to cost $1.6 million at all sites (the EIS should explain why the costs are estimated to be the same at Moab and White Mesa, where extensive site characterization data already exists, as at Klondike Flats and Crescent Junction, which have not yet been characterized). One would expect the uncertainty in site characterization costs to be greater at the sites that have relatively little site characterization data. As another example, one would expect the uncertainty in tailings handling costs to be greater for the off-site disposal options than for the stabilization in place option, since less is known about the deeply buried tailings that would have to be handled under the off-site disposal options.

7. On p. 4-10, the DEIS presents a discussion of potential impacts, with respect to potential ground water contamination, of a 100-year flood on the Colorado River. The DEIS estimates that as a result of flood water inundating the tailings pile during the flood, over 4 million gallons of contaminated water would drain from the pile at an average rate of 307 gallons per minute (gpm) over 10 days. No details of the analysis are provided.

   The DEIS needs to provide the technical basis for the estimates provided. First, there does not appear to be a mechanism to get that volume of river water into the pile. The side of the pile will be protected by a clay layer with a permeability of 10^{-8} cm/sec and the bottom of the pile, while not as impermeable, also has low permeability. The 1984 Colorado River flood, that is used as the model for the 100 year flood, only rose about 4 feet up the side of the tailings pile, so the head to drive water into the pile is not great. Additionally, estimates of leakage from the bottom of the pile during mill operations were somewhat above 100 gpm. At that time there was a full pool of water on the top of the pile, so the head driving the water seepage was much greater. It therefore seems unlikely that the pile can drain at a rate of 307 gpm.

8. On p. 4-12 the DEIS discusses storm water management. There is a brief statement that floods greater than the 25 year flood could result in tailings being carried into the Colorado River and that alternatives with site drying of tailings could result in more tailings being carried into the River. The same general statement is made for offsite disposal options (p. 4-64). In sharp contrast to the discussion in section 4.17 on disposal cell failure from natural phenomena, no details or analysis of the potential impacts to the River are provided. However, a storm or river flood overwhelming storm management features (which are only designed for a 25 year event) during construction and carrying tailings into the Colorado River is more credible than a catastrophic failure

of the stabilized cell putting 20 to 80 percent of the tailings into the river. Additionally, the consequences of an event beyond the design for storm water management are different for on-site and off-site disposal options. Under the on-site option, only small amounts of primarily the less-contaminated material would be available to be washed into the River, while for the off-site option larger amounts of material, including the most highly contaminated tailings, could be affected. The EIS should provide a detailed analysis of a failure of the storm water management system, including potential consequences and clean up costs.

9. On p. 4-33 the DEIS contains a discussion of the visual impact of the completed cell at the current site. It states that it does not meet BLM Class II objectives. However, on p. 4-25, the DEIS states that Grand County envisions future land use of the site (if tailings were removed) for low-density residences. The EIS discussion of visual impact should clarify that on-site stabilization would have less visual impact at the current site, than off-site disposal followed by residential construction.

10. On p. 4-42 and in table 4-10 the DEIS addresses radiation effects for the on-site disposal option and includes estimates of latent cancer fatality (LCF) risks to workers. The LCFs discussed in the text and shown in the table are the same as those in sections 4.2.15.1, 4.3.15.1, and 4.4.15.1 for workers at the Moab site for the three off-site disposal options. However, off-site disposal options involve significant handling of the most highly radioactive materials, while the on-site disposal option leaves those mostly undisturbed. The EIS needs to explain the apparently incongruous result that the LCF risks to workers handling mildly radioactive materials would be the same as the LCF risks to workers handling more radioactive material.

11. On pp. 4-50 and 4-51 the DEIS discusses a catastrophic release of tailings and identifies several processes, but it does not discuss in detail how the identified processes could actually lead to a catastrophic release. The processes identified are:

    Flooding - the DEIS does not acknowledge that large Colorado River floods are not erosive near the pile because the Portal downstream of Moab controls flow for this stretch of the River. In the event of a large flood, the area near the pile would be in backwater. It is difficult to see how this type of event would result in a catastrophic release of tailings.

    River Migration - the DEIS correctly points out that this would be a slow process, if indeed it were possible (evidence indicates that migration will take the River away from the pile). The DEIS correctly states that failure of long-term management would also have to occur to have a catastrophic release of tailings. Thus two processes, each very unlikely, would have to both occur to cause a catastrophic release of tailings.

    Seismic Activity/Basin Settling - in order for this process to lead to a catastrophic release of tailings, there would also have to be a major flood soon after an unlikely seismic event or there would have to be a failure of long-term management. Thus two processes, each very unlikely, would have to both occur to cause a catastrophic release of tailings.

Cap erosion/failure - this is identified as resulting in slow release of contaminants, rather than a catastrophic release.

The EIS should therefore highlight the conclusion that a catastrophic release of tailings, while theoretically possible, does not seem credible.

12. On p. 4-54, table 4-18 indicates that the concentration of radium-226 in the suspended load in the Colorado River following a catastrophic release of 20 percent of the tailings would be 944 pCi/g and would be 3776 pCi/g following a catastrophic release of 80 percent of the tailings. However, on p.3-10, it is stated that the mean concentration of radium-226 in the tailings solids is 516 pCi/g. The EIS needs to explain this apparent inconsistency.