

August 11, 2005

Mr. Donald R. Metzler  
Moab Federal Project Director  
U.S. Department of Energy  
2597 B<sup>3</sup>/<sub>4</sub> Road  
Grand Junction, CO 81503

SUBJECT: REVIEW OF RADIOLOGICAL INCLUSION/EXCLUSION AND VERIFICATION  
PROCEDURES, MOAB, UTAH PROJECT

Dear Mr. Metzler:

By letter dated May 16, 2005, you requested the U.S. Nuclear Regulatory Commission (NRC) to review and concur on the document, "Field Services Procedures for the Radiological Excavation Control and Radiological Verification of the Moab Project Site (May 2005)" that the U.S. Department of Energy (DOE) is proposing for use during remedial action at the Moab Project site. The procedures are to be used to demonstrate DOE compliance with the appropriate standards in 40 CFR 192. The NRC staff has reviewed the document and finds that it needs additional information to complete its review. The information needed is identified in the enclosure.

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>.

If you have any questions concerning this letter please contact me at (301) 415-6629 or by e-mail at [mhf1@nrc.gov](mailto:mhf1@nrc.gov).

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: Request for Additional Information

August 11, 2005

Docket No.: WM-110  
Mr. Donald R. Metzler  
Moab Federal Project Director  
U.S. Department of Energy  
2597 B<sup>3</sup>/<sub>4</sub> Road  
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Enclosure: Request for Additional Information  
Docket No.: WM-110

DISTRIBUTION: FCFB r/f

**ML052210131**

\*See previous concurrence

<b>OFC</b>	FCFB		FCFB		FCFB	
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<b>DATE</b>	08/10/05		08/11/05		08/11/05	

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**REQUEST FOR ADDITIONAL INFORMATION  
FIELD SERVICES PROCEDURES FOR THE RADIOLOGICAL EXCAVATION CONTROL  
AND RADIOLOGICAL VERIFICATION OF THE MOAB PROJECT SITE (MAY 2005)**

Attachment 1, Page 4, Section 2.4

For inclusion/exclusion surveys, the U.S. Department of Energy (DOE) proposes to soil sample if the highest outdoor gamma (HOG) equals or exceeds 25  $\mu\text{R/hr}$  above background averaged over 100 m<sup>2</sup>. Since the Moab background is about 12-14  $\mu\text{R/hr}$ , this means the grid would have to average three times background. Since many tailings deposits at vicinity properties at other Uranium Mill Tailings Radiation Control Act (UMTRCA) sites were buried, this criterion could exclude properties that could have a tailings deposit that should be included in the program. Also, the requirement for the HOG to be greater than or equal to 25  $\mu\text{R/hr}$  above background is not shown in the decision tree.

REQUEST: The inconsistency between the decision tree and section 2.4 should be resolved. If DOE proposes to use the criterion of 25  $\mu\text{R/hr}$  above background for initiating soil sampling, the potential for excluding properties with buried tailings should be addressed.

Attachment 2, Page 1, Table 1

The footnote to Table 1 states that the mill site will be remediated for Ra-226 and Th-230 but the vicinity properties will be remediated for Ra-226. While Th-230 and U-nat from uranium milling wastes are not directly addressed in 40 CFR 192, these radionuclides could represent a potential health hazard.

REQUEST: Indicate the reason for not considering Th-230 or U-nat contamination at vicinity properties.

Attachment 2, Page 6, Section 3.7

The procedure states that for excavation control gamma surveys, the detector probe will be 3 feet above the ground. This distance will not allow the detection of small areas of contamination that could indicate buried deposits. It would also limit the removal of soil contamination in excess of the Environmental Protection Agency (EPA) standards.

REQUEST: Consider performing gamma scans with the detectors a few inches above the ground during excavation control.

Attachment 2, Page 8, Section 4.2

Under the heading of "aliquots" it states that the verification sample may be composited from two to twelve aliquots. Under the heading "standard verification," it indicates that one to nine aliquots are combined to form the verification sample.

REQUEST: Indicate the criteria for deviating from the nine-aliquot verification sample referred to in other sections (e.g., Section 3.7).

Enclosure

Attachment 2, Page 12, Section 4.11

This section refers to analytical methods for verification of Th-230 and U-nat and refers to Section 4.4. However, the information is not in Section 4.4 of the attachment. Uranium analysis is discussed in Attachment 4, but there does not appear to be a discussion of Th-230 analysis.

REQUEST: Discuss the analytical method to be used for Th-230 and properly reference both the Th-230 and U-nat analysis.

Attachment 2, Page 14, Section 5.2

Paragraph two states that an abbreviated method may be used to determine the annual radon level by measuring 3 to 4 months in the spring or the fall.

REQUEST: Provide the reference or data to substantiate that this is a reliable method for estimating the annual average.

Attachment 2, Page 17, Section 9.1

This section indicates that backfill soil may contain Ra-226 up to 5 pCi/g if it used subsurface (below 6 inches). Since background Ra-226 levels in Moab are 1 pCi/g (Section 3.5), there is no apparent reason to allow backfill soil to average over 2 pCi/g. Soil at 5 pCi/g used as fill around a basement has been shown to cause a radon problem.

REQUEST: Provide justification for using backfill with Ra-226 up to 5 pCi/g above background, or revise the Ra-226 limit for backfill.

Attachment 3, Appendix A

The Opposed Crystal System (OCS) is to be used to measure Ra-226 levels in soil. Page 8 of the procedure (step 11.1) indicates that very wet soils may be dried, and that an average amount of soil moisture is optimum but not required. Page 9, (step 12.2) states that to correct for moisture and radium-radon disequilibrium, the value is corrected based on a correlation of the data obtained with the OCS and analytical laboratory data.

REQUEST: Indicate how many data points were used in the correlation and how many were based on very wet soils. Also, indicate if there are any significant differences between this OCS procedure and the one used by DOE at other UMTRCA sites.

Attachment 6, Page 1, Section 2.1

This section discusses documenting the gamma scan results and the method for soil sampling. It is not clear if all verification grids will be sampled or only a percentage of the grids. If there is a reasonable radium-gamma correlation, EPA guidance allows some verification by only gamma scans.

REQUEST: Clarify what percentage of verification grids will be soil sampled.

Attachment 6, Page 3, Section 3.2.1

This section implies that loose soil on top of bedrock that exceeds the standard will be cleaned by high pressure washing. This method would appear to result in contaminated material being dispersed. Exploration by shovel and a visual check to determine if additional soil remains might be a more efficient method to demonstrate compliance in this situation. Additionally, it appears that bedrock will be sampled regardless of gamma scan results.

REQUEST: Describe the method in more detail, especially how soil is controlled and removed using high pressure washing. Also, explain the need for sampling bedrock in the absence of high gamma scan results.

**EDITORIAL**

Attachment 6, Page 1, Section 2.1

In documenting the verification gamma scan, the gamma reading that is most commonly observed during the scan of the excavation is identified as the "average." This new definition of "average" is misleading and another term, such as "most observed value," should be used instead.