



## U.S. Department of Energy

200 Grand Avenue  
Grand Junction, CO 81501

July 25, 2016

Ms. Kimberly Conway  
FSME Division of Waste Management and Environmental Protection  
U.S. Nuclear Regulatory Commission  
Mail Stop T8F5  
Washington, DC 20555-0001

Subject: Request to Change Moab UMTRA Project Specification and the RAIP for RRM and Debris Placement in the Crescent Junction Disposal Cell

Dear Ms. Conway:

This letter is to formally request your concurrence with several changes to one of the Crescent Junction disposal cell construction specifications and the associated Remedial Action Inspection Plan (RAIP) for the Moab Uranium Mill Tailings Remedial Action (UMTRA) Project. The requested changes are to allow an increase from 12 inches to 24 inches of loose residual radioactive material (RRM) in each lift in the disposal cell. The intent of this change is to allow for more efficient handling and compaction of RRM and debris in the disposal cell.

Addendum B to the *Final Remedial Action Plan and Site Design for Stabilization of Moab Title I Uranium Mill Tailings at the Crescent Junction, Utah, Disposal Site* (July 2008) (RAP) contains the Final Design Specifications. The relevant portions of specification 31-00-20, "Placement and Compaction of RRM and Interim Cover," are attached showing the proposed changes to Sections 3.2.1 RRM and Interim Cover Soil Placement and 3.2.5 Placement of Demolition Debris.

The change to Section 3.2.1 is to allow the 24-inch loose lift for RRM and RRM/debris. No change is requested for interim cover lifts, which will remain at 12 inches. The phrase "an average of" is added to lifts to be consistent with existing language in the RAIP. The main change to Section 3.2.5 is to specify that a ratio of no more than 50/50 debris to RRM by volume will be allowed. A phrase regarding how debris is placed was removed to facilitate spreading it in 24-inch lifts using a dozer. These changes minimize voids and are based on experience at other sites where debris and soil are co-disposed. The statement on additional size reduction of debris was modified to allow this to be performed at the Crescent Junction site, if necessary.

Corresponding changes are proposed to Addendum E, the RAIP, to make it consistent with the revised specification language for the 24-inch lift. Attached are the proposed changes to Sections 6.4.2 RRM Placement, 6.4.3 Inspection and Testing, 6.4.4 Demolition Debris, and the Cell Construction Material Installation Summary Table. The table also notes that the approximate compacted thickness of the 24-inch lift is 20 inches.

If you concur with these changes, the Specification 31-00-20 and the RAIP will be revised and included in the next Interim Completion report scheduled for submittal at the end of this calendar year.

If you have any questions or concerns with these changes, please do not hesitate to contact me at (970) 257-2115 or Deputy Federal Project Director Justin Peach at (435) 719-2845.

Sincerely,



Donald R. Metzler  
Moab Federal Project Director

Enclosures

cc w/enclosures:

Z. Cruz, NRC  
K. Armstrong, CBC  
K. Grimes, CBC  
J. Peach, MOAB  
K. Wethington, MOAB  
J. Biagini, RAC  
D. Dalga, RAC  
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M. Udovitsch, TAC  
Project File CRJ 2.12 (C. Smith)

## ADDENDUM B

Final Remediation Action Plan  
DOE-EM/GJ1547  
August 2011

### Final Design Specifications

<b>Number</b>	<b>Title</b>
31-00-00 R4	Earthwork
31-00-20 R4	Placement and Compaction of Tailings and Interim Cover
31-00-30 R7	Placement and Compaction of Final Cap Layers
31-32-11 R1	Surface Water management and Erosion Control
32-11-23 R8	Aggregate and Riprap

### 3.2.1 RRM and Interim Cover Soil Placement

RRM and Interim Cover soil shall be placed to the lines and grades shown on the drawings. A GPS guided Computer Aided Earthmoving System (CAES) shall be used to direct fill placement such that RRM and interim cover soil are placed in lifts of nearly uniform thickness not to exceed an average of ~~12 inches loose for interim cover lifts and 24 inches loose for RRM and RRM/debris lifts~~ and 12 inches loose for interim cover lifts. In areas where hand operated tampers must be used, the loose lift thickness shall not exceed 4 inches.

### 3.2.5 Placement of Demolition Debris

Demolition debris will be placed in the waste cell along with RRM material. Demolition debris will be sized by others, off-site before being placed in containers and hauled to the Crescent Junction disposal cell. Demolition debris is to be sized as follows:

Wood, Concrete, Masonry: Cut or break up to a maximum 3-foot size measured in any dimension.

Structural Steel Member, Pipes, Ducts, Other Long Items: Cut into maximum 10-foot lengths.

Concrete, Clay Tile, and Other Pipes: Crush concrete and clay tile pipes. Crush other pipes and ducts that are 6 inches or greater in diameter or, if crushing is impractical, cut pipes and ducts in half longitudinally. Do not crush asbestos-cement pipe.

Rubber Tires Excavated at the Site: Cut into two halves around the circumference.

Geomembranes and Other Sheet Material: Cut into strips a maximum of 4 feet wide and 4 feet long.

Tree limbs 4 inches in Diameter and Larger: Cut into lengths of 8 feet or less.

The contractor ~~may is not required to verify or~~ perform additional size reduction, as necessary. The above information is provided to inform the contractor of material sizes to be delivered for disposal. The contractor is responsible for placement of demolition debris in the waste disposal cell and compaction of RRM around the placed debris. ~~Each container of d~~Demolition debris shall be ~~spread in a single layer, not stacked, and~~ placed in a manner that results in a minimum of voids around the debris. The ratio of debris to RRM shall not exceed 50/50 by volume in each lift.

## Addendum E

Final Remedial Action Plan  
DOE-EM/GJ1547  
June 2011

### Remedial Action Inspection Plan (RAIP)

Number	Title	
Document	<a href="#">Remedial Action Inspection Plan (RAIP)</a>	
Attachment 1	<a href="#">Computer Aided Earthmoving System (CAES) For Landfills</a>	

#### 6.4.2 RRM Placement

Scarify at a minimum the top 1 inch of subsoil or preceding RRM lift using a footed roller or a dozer prior to placement of subsequent RRM layers. Fill materials shall be placed in continuous and planar lifts. The method of dumping and spreading RRM shall result in loose lifts of nearly uniform thickness, average thickness not to exceed ~~24~~<sup>2</sup> inches. Compaction equipment shall consist of footed rollers or dozers. Footed rollers shall have a minimum weight of 45,000 pounds and at least one tamping foot shall be provided for each 110 square inches of drum surface. The length of each tamping foot from the outside surface of the drum shall be at least 6 inches. During compaction operations, the spaces between the tamping feet shall be maintained clear of materials that would impair the effectiveness of the tamping foot rollers. Dozers shall have a minimum ground pressure of 1,650 pounds per foot. The CAES may be used to direct fill placement, monitor compaction, and record the location and thickness of each soil layer being placed.

#### 6.4.3 Inspection and Testing

QC shall visually inspect the ground preparation and fill placement operations. RRM shall be compacted to meet 90 percent of the laboratory determined maximum dry density as determined by ASTM D698. QC shall verify that the RRM placement is constructed in accordance with design plans and specifications by checking and confirming:

- Assessment tests shall be performed on RRM to ensure compliance with specified requirements and to develop compaction requirements for placement. A minimum of three tests for maximum dry density (ASTM D698) and optimum moisture content (optimum moisture plus or minus 3 percent) (ASTM D2216) shall be performed for each type of RRM soil observed.
- Fill material is properly moisture conditioned; one moisture content quick test will be performed each day material is placed in accordance with ASTM D4643, D4944, or D4959 until a sufficient number have been performed to demonstrate a clear correlation allowing a reduction in testing.
- Fill material is placed in continuous and planar lifts. The method of dumping and spreading RRM shall result in loose lifts of nearly uniform thickness, average thickness of fill area not to exceed ~~24~~<sup>2</sup> inches.
- Compaction meets specifications.
- Compaction by CAES – QC shall monitor CAES compaction by visually inspecting the process and reviewing the computer records for each layer of soil placed.
- Verification tests of in-place density shall be performed on the initial layer of RRM and on any layers in which the CAES indicates that problems occurred obtaining compaction. In-place density will be taken every 6 months to verify the performance of the CAES.

**NOTE:** Companion sand cone and moisture tests must be performed along with nuclear tests until a sufficient number have been performed to demonstrate a clear correlation.

If CAES is not used, the following testing requirements shall be followed.

- Compaction Verification Tests – Perform in-place density and moisture content tests on compacted fill material in accordance with the following requirements.
  - A verification representative sample from each principal type or combination of blended RRM materials shall be tested to establish compaction curves using ASTM D698.

- A minimum of one set of compaction curves shall be developed per 10,000 cubic yards of RRM material.
- In-place density and moisture content tests are performed on a soil layer; a minimum of two tests shall be performed per 5,000 cubic yards or 135,000 square feet of fill material placed.
- Compaction and moisture content tests shall be performed in accordance with the following methods.
  - ASTM D1556 – Density and Unit Weight of Soil in Place by the Sand-Cone Method
  - ASTM D2216 – Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass (Oven Moisture)
  - ASTM D6938 – In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
  - ASTM D4643 – Determination of Water (Moisture) Content of Soil by the Microwave Oven Heating
- After lift placement, moisture content shall be maintained until the next lift is placed.
- Erosion that occurs in the RRM layers shall be repaired and grades re-established.
- Freezing and desiccation of the RRM soil shall be prevented. If freezing or desiccation occurs, the affected soil shall be reconditioned as directed.
- Areas that have been repaired shall be retested as directed. Repairs to the RRM layers shall be documented including location and volume of soil affected, corrective action taken, and results of retests.

#### 6.4.4 Demolition Debris

Demolition debris will be placed in the waste cell along with RRM. ~~Each container of~~ ~~demolition debris shall be spread in a single layer, not stacked, and~~ placed in a manner that results in a minimum of voids around the debris. The ratio of debris to RRM shall not exceed 50/50 by volume in each lift.

The following materials will be placed in the waste cell:

- Wood, Concrete, Masonry: Cut or break up to a maximum 3-foot size measured in any dimension.
- Structural Steel Member, Pipes, Ducts, other Long Items: Cut into maximum 10-foot lengths.
- Concrete, Clay Tile, and other Pipes: Crush concrete and clay tile pipes. Crush other pipes and ducts that are 6 inches or greater in diameter or, if crushing is impractical, cut pipes and ducts in half longitudinally. Do not crush asbestos-cement pipe.
- Rubber Tires Excavated at the Site: Cut into two halves around the circumference.
- Geomembranes and other Sheet Material: Cut into strips a maximum of 4 feet wide by 4 feet long.
- Tree Limbs 4 inches in Diameter and Larger: Cut into lengths of 8 feet or less.



*Cell Construction Material Installation Summary Table*

<b>Cell Component</b>	<b>Material of Construction</b>	<b>Compaction Requirements</b>	<b>Lift Thickness max/approx loose/compact</b>	<b>Frequency of Verification Tests</b>
Cell Excavation	NA	NA	NA	NA
Perimeter Embankment	Common Fill	95 percent	12 inches/10 inches	Initial layer/Section 6.3.4
RRM Placement	RRM	90 percent	Average thickness <del>2442</del> inches/ <del>2040</del> inches	Initial layer/Section 6.4.3
Interim Cover	Common Fill	90 percent	Average 12 inches/10 inches	Initial layer/Section 6.5.4
Radon Barrier	Weathered Mancos Shale	95 percent	12 inches/10 inches	Initial layer/Section 6.7.4
Infiltration and Biointrusion Barrier	Stone	NA	NA	NA
Frost Protection	Common Fill	90 percent	Average thickness 12 inches/10 inches	Initial layer/Section 6.9.4
Cap Armoring	Stone	NA	NA	NA

approx = approximate; max = maximum; NA = not applicable