

Office of Environmental Management – Grand Junction



Moab UMTRA Project
Supplement Analysis for the Remediation
of the Moab Uranium Mill Tailings, Grand and
San Juan Counties, Utah, Final Environmental
Impact Statement

October 2015



U.S. Department
of Energy

Office of Environmental Management

**Moab UMTRA Project
Supplement Analysis for the Remediation of the
Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah,
Final Environmental Impact Statement**

October 2015

Contents

| Section | Page |
|---|-------------|
| Acronyms and Abbreviations | ii |
| 1.0 Introduction..... | 1 |
| 1.1 Background..... | 1 |
| 1.2 Purpose of and Need for SA | 1 |
| 2.0 Proposed Action | 2 |
| 3.0 Affected Environment | 3 |
| 3.1 Resource Areas Considered in this SA | 3 |
| 3.1.1 Geology..... | 3 |
| 3.1.2 Human Health..... | 3 |
| 4.0 Evaluation and Comparison of Impacts | 4 |
| 4.1 Geology Impacts..... | 4 |
| 4.2 Human Health Impacts | 4 |
| 5.0 Conclusion | 5 |
| 6.0 NEPA Determination..... | 6 |
| 7.0 References..... | 7 |

Tables

| | |
|--|---|
| Table 1. Worker Exposures Related to Rail Transportation | 4 |
| Table 2. Non-radiological Worker Fatality Risks Related to Rail Transportation | 5 |

Acronyms and Abbreviations

| | |
|-------|---|
| CFR | Code of Federal Regulations |
| DOE | U.S. Department of Energy |
| EM | Environmental Management |
| FEIS | Final Environmental Impact Statement |
| kip | kilopounds |
| NEPA | National Environmental Policy Act of 1969 |
| ROD | Record of Decision |
| SA | Supplement Analysis |
| UMTRA | Uranium Mill Tailings Remedial Action |

1.0 Introduction

The U.S. Department of Energy (DOE) implemented Title 42 United States Code Section 4321 (42 USC 4321), the National Environmental Policy Act of 1969 (NEPA), early on in the Moab Uranium Mill Tailings Remedial Action (UMTRA) Project. DOE prepared this Supplement Analysis (SA) to examine the proposed action to continue operations as defined in the *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Final Environmental Impact Statement* (DOE/EIS-0355) (FEIS) in light of new rockfall analyses. This SA was prepared in accordance with Title 10 Code of Federal Regulations Part 1021.314 (10 CFR 1021.314) “National Environmental Policy Act Implementing Procedures, Supplemental environmental impact statements” and DOE’s Recommendations for the Supplement Analysis Process.

1.1 Background

In 2000, Congress enacted the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106-398), and in October 2001, DOE was given the responsibility for remediation of the Moab site in Utah. In July 2005, DOE issued the FEIS to analyze the existing risks and compare and analyze reasonable alternatives available to control, reduce, or eliminate risks to the extent practicable. In September 2005, DOE published the *Record of Decision for the Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah* (ROD) to implement the preferred alternatives identified in the FEIS.

By implementing the preferred alternatives, DOE is removing uranium mill tailings and other contaminated material from the Moab millsite and nearby off-site properties and relocating them to the Crescent Junction disposal site, using predominantly rail transportation, and is remediating contaminated ground water at the Moab site.

1.2 Purpose of and Need for SA

Since the publication of the ROD for the Project, several NEPA reviews have been performed. The *Amended Record of Decision for the Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah*, was published in the Federal Register in February 2008. The Amended ROD provided the flexibility to use either truck or rail for all materials shipped. Other NEPA reviews were conducted for the domestic waterline from Thompson Springs, Utah, and the Green River construction waterline to Crescent Junction. In 2009, a review was performed for Project activities funded by the American Recovery and Reinvestment Act of 2009 (Public Law 111-5). In 2012, an adequacy review of the Moab site General Access Area for the existing maintenance road and proposed biking/hiking trail was performed. In 2013, DOE conducted a 5-year review and issued an SA that documented no significant changes from the original analysis.

On November 18, 2014, a major rockslide occurred on the hillside above the rail bench at the Moab site. This rockfall event prompted DOE to reevaluate whether the risks to workers associated with such events were adequately addressed in the original EIS. Although the potential for a rockfall was recognized in the FEIS, it did not include a detailed analysis of the affected human environment associated with rockfalls. This SA considers quantitative data generated and probability and consequence analyses performed based on awareness of the November 2014 rockfall event and evaluated potential impacts of rockfall events on resource areas to determine if they constituted substantive changes to the FEIS.

DOE will consider the results of analyses provided in this SA and the uncertainties in those analyses when determining the significance of the new information compared to the proposed action in the FEIS. DOE regulations (10 CFR 1021) require a Supplemental EIS to be issued when “there are substantial changes to the proposal” or there are “significant new circumstances or information relevant to environmental concerns.” In accordance with DOE regulations, this SA provides information to assist DOE with determining if a Supplemental EIS or new EIS should be prepared, or no further NEPA documentation is required at this time.

2.0 Proposed Action

The FEIS evaluated transportation of the tailings by truck or by rail. The Amended ROD allows the tailings to be shipped by either method. The total fatality risk in the FEIS for trucking was 0.49 and 0.33 for rail for the life of the Project, which was estimated to be 7 to 10 years. Although the risks are similar for either method, DOE proposes to continue using rail as the preferred transportation option with only the recent geology information and potential impacts to worker health being further analyzed in this SA. Following is a brief discussion of the current operations related to the proposed action.

In preparation for beginning relocation of the tailings by rail, DOE performed significant infrastructure construction on the hillside above State Route 279 in 2008 and 2009. A one-way haul road was constructed to the southern end of the rail bench where tailings containers are loaded onto railcars for transport to Crescent Junction. The road traverses the rail bench and forms a loop to another one-way road at the northern end that returns to the tailings container staging area. A portion of the branch line track was removed so the grade could be lowered to allow railcars to be loaded on that track. A siding was added to accommodate splitting the train in two sections to maximize the overall length of train that could be loaded in the available space.

Metal containers are filled with tailings and brought by haul trucks up the south haul road to the rail bench. A gantry crane transfers the filled containers from the haul trucks to railcars. Empty containers brought back on the railcars from the disposal cell are placed on haul trucks to return to the tailings pile to be refilled. The gantry crane trams up and down the tracks during the train loading process, but does not travel to the southern portion of the rail bench.

In addition to train loading operations, there are several other activities performed on the rail bench. Before loading the train each workday, the Project performs a rail bench and railcar inspection. Any rocks that have fallen on the rail bench are noted on a daily inspection report. The train is also inspected before being released for shipment to Crescent Junction. The railcars and track are routinely maintained. Routine maintenance of the gantry cranes is also performed, and occasionally, more extensive maintenance or repairs, such as replacing the lifting chains, are required. Because of the size of the cranes, work on them is performed on the rail bench. Following some storm events, debris that fills the ditches and culverts on the rail bench must be removed. Inspections of the hillside geology are conducted approximately monthly and as needed. Occasionally, construction of facility upgrades on the rail bench is necessary.

3.0 Affected Environment

3.1 Resource Areas Considered in This SA

This SA evaluated the environmental impacts of rockfall potential associated with construction, operations, inspections, and maintenance activities on the rail bench. Because rockfall events could impact these activities and thus human health, the geology and human health resource areas were further analyzed in this SA. Because rockfall events would not increase impacts to other resource areas evaluated in the FEIS, no further detailed analysis of them was needed.

3.1.1 Geology

The November 2014 rockslide originated within the Wingate Sandstone 800 feet (ft) above the rail bench. The slide area was approximately 150 ft wide and an estimated 4,500 cubic yards of rock fell, almost all of which landed at the southern end of the rail bench.

Following the rockslide, DOE brought in subject matter experts to assist with analyzing the potential for future similar rockfalls and hazards associated with working on the rail bench. The analyses included investigations to better understand the site-specific geology of the hillside. Geotechnical mapping was conducted to evaluate the strength (hardness and coefficient of restitution) of each geologic unit. DOE had detailed aerial photography taken of the entire hillside above the rail bench to augment existing aerial photographs and were used to create a topographical map for slope and drainage pattern analysis. The investigations also showed that the southern portion of the rail bench has a steeper slope and that the slope becomes progressively less steep northward along the rail bench. In addition, DOE reviewed readily available historical records of rockslides between 1944 and 2015 and confirmed that rockfalls such as the November 2014 event occur extremely infrequently (one comparable event near the site every 40 years), though minor rockfalls, often of a single rock, can occur several times a year.

3.1.2 Human Health

The FEIS evaluated both radiological and non-radiological impacts to human health. This SA addresses only the potential non-radiological risks associated with rockfalls to the various workers who perform work on the rail bench.

Workers involved in the daily rail loading operations include gantry crane operators, truck drivers, and train inspectors and operators. Workers performing maintenance on the gantry cranes, cleaning out culverts or performing other drainage activities, and track maintenance are considered, as are workers who inspect the rail bench for normal wear or the hillside for evidence of rockfalls or rock movement. This SA also considered workers involved in construction activities, such as facility upgrades. Table 1 shows the total hours of exposure for an individual in each worker type. The total hours of exposure are represented in days over the remaining life of the Project, conservatively estimated to be 15 years.

The gantry crane operator has the most exposure time of all the worker types associated with rail operations, inspections, and maintenance; however, the gantry crane does not operate in the southern portion of the rail bench where the highest rockfall hazards exist, whereas the haul trucks pass through this area with each container to reach the train.

Table 1. Worker Exposures Related to Rail Transportation

| Worker Type | Lifetime Exposure (days) |
|-------------------------------|--------------------------|
| Gantry crane operator | 875 |
| Truck driver | 382 |
| Train or rail bench inspector | 88 |
| Maintenance worker | 111 |
| Laborer (construction worker) | 20 |

4.0 Evaluation and Comparison of Impacts

DOE evaluated the extent to which its current proposal to continue operations on the rail bench in light of the most recent rockfall analyses constitutes significant new circumstances or information relevant to environmental concerns previously analyzed in the FEIS and other NEPA documents.

4.1 Geology Impacts

Impacts from construction activities, such as facility upgrades, to the geology would be short-term during soil movement and other minor disturbances. The impacts to the geology from the rail bench operations, inspections, and maintenance are also minimal. The risks to worker health posed by the geology are discussed in Section 4.2.

4.2 Human Health Impacts

Impacts to worker health were initially evaluated in the FEIS within each resource area. This SA evaluates the additional risk of rockfalls resulting in worker fatalities associated with rail transportation. The risk is discussed separately for construction and operations, which includes inspections and maintenance activities.

To assist with calculating worker impacts, DOE used industry-accepted rockfall modeling software to simulate rocks being released from the hillside above the rail bench. To add conservatism to the modeling, the energies of falling rocks were maximized, thus overestimating the probability of a fatality. Results of the modeling show that less than 50 percent of the rocks released from the Wingate Sandstone will reach the southern end of the rail bench. At the northern end, modeling showed less than 1 percent of the rocks released would reach the rail bench. Of rocks reaching the rail bench on the southern end, the rock bounce heights can exceed 15 ft and have energy on the order of 5,000 ft-kilopounds (kips), whereas on the northern end, the bounce heights average 1.1 ft with energy less than 65 ft-kips.

Rockfall occurrences and consequences are difficult to evaluate due to their dependence on many unrelated environmental factors, such as precipitation trends and freeze-thaw events. In addition, the variability of the weathering of geologic deposits and affect of vegetation present on the hillside cannot be accurately modeled.

DOE calculated the unmitigated risk to construction workers involved in performing facility upgrades. Construction durations were assumed to be 160 hours each for three activities over the remaining life of the Project (15 years). For conservatism, all the construction activities were assumed to take place in the area of the rail bench having the highest risk of rockfall.

Worker impacts were also evaluated for operations, inspections, and maintenance activities. The calculation assumes one train is loaded daily, 4 days per week, consisting of 136 containers. Train and rail bench inspections are performed daily, and hillside inspections are performed as needed. Maintenance activities are performed approximately monthly. The frequency of rockfalls used in the risk calculation for construction and operations was conservative and based on previously recorded events of various magnitudes.

Table 2 shows the risk of fatality for rail transportation evaluated in the FEIS and the added unmitigated risk associated with rockfall events occurring during construction activities and operations for the remaining life of the Project.

Table 2. Non-radiological Worker Fatality Risks Related to Rail Transportation

| Type of Work | FEIS Fatality Risk | Unmitigated Risk with Rockfall Data |
|--------------|--------------------|-------------------------------------|
| Construction | 0.32 | 0.322 |
| Operations | 0.29 | 0.315 |

As shown in Table 2, the proposed action is not anticipated to have adverse impacts on worker health. In comparison the added unmitigated risk of a fatality caused by rockfall events is very low. **When the unmitigated risk of rockfall fatalities is added to the rail transportation risk evaluated in the FEIS, it is still below the 0.43 calculated risk for the truck transport alternative evaluated in the FEIS.**

5.0 Conclusion

In this SA, DOE considered additional information generated and analyses conducted as a result of the November 2014 rockfall event. The potential for operations on the rail bench to be adversely affected by rockfall events was the primary area evaluated for significant impact determination.

The information and analyses identified additional potential fatalities over the estimated remaining 15 years of the Project; however, though measurable, the increase in fatalities is not significant compared to total transportation fatalities in the FEIS. Therefore, continuing to ship the tailings by train under existing rail operations is not anticipated to have adverse impacts on worker health.

The probability of rockfall events causing a worker fatality is very low. However, there is still some scientific uncertainty in the calculations conducted and results of data collected. The SA evaluated the uncertainty associated with these risks given the available data and conservative parameters used in the analyses and determined that the results are reasonable.

Based on the evaluation herein, the conclusion of this SA is that identified and projected impacts of rockfall events on worker health do not present a substantial change from the FEIS, nor do they present significant new circumstances or information relative to human environmental concerns; therefore, there is no need for a Supplemental EIS or to prepare a new EIS.

6.0 NEPA Determination

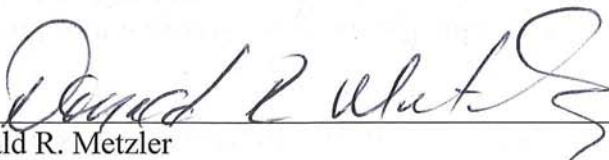
The U.S. Department of Energy (DOE) Office of Environmental Management (EM) Moab Uranium Mill Tailings Remedial Action (UMTRA) Project (Project) has prepared this Supplement Analysis (SA) to determine if the *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Final Environmental Impact Statement* (FEIS) remains adequate, or if additional documentation under the National Environmental Policy Act (NEPA) is required.

This SA has been prepared in accordance with DOE requirements under Title 10 Code of Federal Regulations Part 1021.330 (d) (10 CFR 1021.330 (d)) "National Environmental Policy Act Implementing Procedures, Programmatic (including site-wide) NEPA documents," and 10 CFR 1021.314, "National Environmental Policy Act Implementing Procedures, Supplemental environmental impact statements," which outlines the type of information to be presented in an SA.

This SA evaluated the information presented in the FEIS on rockfall hazards in light of the November 2014 rockslide. Additional investigations conducted by DOE to evaluate rockfall hazards have demonstrated that the probability for rockfall events resulting in a fatality does not substantially increase the risk to workers on the rail bench.

Based on the analysis of the information presented in this SA, the undersigned hereby determine that the proposed action does not constitute a substantial change from the FEIS or result in significant new circumstances or information relevant to human environmental impacts in accordance with 40 CFR 1502.9, "Environmental Impact Statement, Draft, final, and supplemental statements."

Therefore, pursuant to 10 CFR 1021.314, no further NEPA documentation is required. Should there be a change in the information upon which this analysis is based, a revised SA must be submitted and approved. A Notice of Availability of this SA will be published in local newspapers, posted on the Project website, distributed to the Moab Tailings Project Steering Committee, and made available in the Grand County Library Public Reading Room.



Donald R. Metzler
Moab Federal Project Director

October 5, 2015

Date



10/05/2015

For: Ralph Holland
EM Consolidated Business Center Director

Date

7.0 References

10 CFR 1021.314 (Code of Federal Regulations), “National Environmental Policy Act Implementing Procedures, Supplemental environmental impact statements.”

40 CFR 1502.9 (Code of Federal Regulations), “Environmental Impact Statement, Draft, final, and supplemental statements.”

42 USC 4321 (United States Code), National Environmental Policy Act.

DOE (U.S. Department of Energy), *Amended Record of Decision for the Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah*.

DOE (U.S. Department of Energy), NEPA Recommendations for the Supplement Analysis Process (DOE/EIS-0279).

DOE (U.S. Department of Energy), *Record of Decision for the Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah*.

DOE (U.S. Department of Energy), *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Final Environmental Impact Statement* (DOE/EIS-0355).

Public Law 106-398, Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001.