# 5.0 Cumulative Impacts

This chapter addresses the potential for cumulative environmental impacts resulting from implementation of the on-site or off-site disposal alternatives and other past, present, and reasonably foreseeable future actions in the affected region.

Council on Environmental Quality regulations implementing the procedural provisions of NEPA require federal agencies to consider the cumulative impacts of a proposal (40 CFR 1508.25[c]). A cumulative impact on the environment is the impact that would result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7). This type of assessment is important because significant cumulative impacts can result from several smaller actions that by themselves do not have significant impacts.

The on-site and off-site alternative locations under consideration are located in rural areas with no major industrial or commercial centers nearby. In the Klondike Flats area, no past, present, or reasonably foreseeable future actions are anticipated to result in cumulative impacts when considered with the proposed alternative. However, other present and reasonably foreseeable future actions could result in cumulative impacts to the other sites when considered together with the on-site or off-site disposal alternatives. These actions are

- Seasonal tourism in and around Moab
- Widening of US-191 between Moab and Crescent Junction
- Planned Williams Petroleum Products pipeline project
- Ongoing activities at the White Mesa Mill site

These actions, and the potential for creating cumulative impacts, are addressed below.

## 5.1 Seasonal Tourism

Several national parks are in the vicinity of the Moab site and the off-site alternatives. Arches National Park is adjacent to the north border of the Moab site, and Canyonlands National Park is approximately 12 miles southwest of the site. In 2002, 765,000 visitor days were recorded at Arches National Park; 41,524 of that number included at least one overnight stay. Most of the land in the area is open to recreational uses, and tourism is an important part of the Moab economy. Favorable weather allows recreational access for hikers, bikers, and off-highway vehicle users and others in all seasons. The Colorado River adjacent to the Moab site is a source of extensive recreational use for spring and summer water sports. The land directly south of the Moab site is often used by campers and hikers throughout the summer. Activities at the Moab site, together with tourism, could have a significant cumulative impact on traffic congestion (e.g., increases in truck traffic as high as 186 percent; see Table 2–28) in central Moab and could have socioeconomic impacts related to available housing and public safety (police, fire, and hospitals).

## 5.2 Widening of US-191

US-191 is being upgraded to four lanes between Moab and the intersection of US-191 and SR-313. The upgrades also include adding two turn lanes at the entrance to Arches National Park, at Gemini Bridges, and at SR-313; adding a 2-mile-long bicycle lane on the northeast side of US-191; and adding center divides along some stretches of the highway. Because these upgrades are planned to be completed in 2004, it is unlikely that this highway construction project and the transport of uranium mill tailings from the Moab site would result in cumulative impacts.

## 5.3 Williams Petroleum Products Pipeline Project

The Williams Petroleum Products pipeline project is a recently approved project that will extend from Bloomfield, New Mexico, to Salt Lake City, Utah. The pipeline project includes (1) converting approximately 220 miles of an existing natural gas pipeline system to transport refined petroleum products from Bloomfield to Crescent Junction and (2) constructing approximately 260 miles of new refined petroleum product pipeline extending west from Crescent Junction to a terminal just north of Salt Lake City. The Williams pipeline project was approved by BLM in a ROD signed October 12, 2001; however, construction has not begun because of ongoing litigation (Mackiewicz 2003). This pipeline project will include aboveground and underground facilities near the proposed Crescent Junction disposal site.

The purpose of the Williams pipeline project is to transport refined petroleum products from northwest New Mexico to intermediate storage locations at Crescent Junction and Nephi, Utah, and ultimately to a terminal north of Salt Lake City, where the petroleum products can be distributed to markets in Utah and western Colorado. The pipeline project is being designed to transport up to 75,000 barrels per day of gasoline, diesel, and jet fuel (a barrel of petroleum contains 42 gallons). The project involves

- Converting 220 miles of existing 10- and 12-inch-diameter natural-gas pipelines to transport refined petroleum products from Bloomfield to a proposed terminal east of Crescent Junction
- Constructing a new 12-inch refined-petroleum pipeline on a 50-ft-wide right-of-way extending from the new Crescent Junction terminal to a terminal with existing refineries in the north Salt Lake City area
- Constructing new product terminals consisting of storage tanks and truck-loading facilities at Crescent Junction and Nephi

The portion of the project between Bloomfield and Crescent Junction is further outlined below because this segment of the pipeline project could lead to future interactions with the disposal of mill tailings at the Crescent Junction site alternative.

The 220-mile, 10- and 12-inch conversion segment extends north from Williams Kutz Pump Station near Bloomfield to the proposed Crescent Junction terminal near the US-191/I-70 junction. The existing 10- and 12-inch pipelines currently carry natural-gas products. These pipeline segments will be retrofitted by installing 43 motor and manual valves that can be used to shut down the pipeline in the event of a large leak or failure. In addition, a new pump station will be built on approximately 4 acres near DOE’s proposed Crescent Junction site. The existing pipeline segments to be converted will be used in their present condition once the valves, end piping, and pump stations are completed. Because these sections already comply with current pipeline safety requirements, they are not subject to hydrostatic testing or inspection in association with the proposed change in service (DOI 2001). The existing pipelines are situated within an existing utility corridor that includes several other utility lines, including natural gas pipelines and electric transmission lines.

The new 12-inch pipeline segment will extend from the proposed Crescent Junction terminal to an existing terminal north of Salt Lake City. Proceeding west from Crescent Junction, the first 98 miles of new pipeline will be installed within a new 75-foot-wide construction right-of-way generally running parallel to an existing utility corridor. The construction right-of-way will revert to a 50-foot-wide permanent right-of-way after surface rehabilitation. This section of new pipeline will cross the Green River once and the Price River twice. The remaining sections of new pipeline extending from Price to the Salt Lake City area will also lie within existing utility corridors. These pipeline sections are not discussed further because these areas are a considerable distance from the actions associated with the Moab project.

The Crescent Junction terminal will be constructed on a 65-acre tract of BLM-administered land in Section 26, T. 22 S., R. 19 E. This site is adjacent to existing railroad lines and just east of the US-191/I-70 junction. The terminal facility will include petroleum product storage tanks, a truck-loading rack, vapor combustion system, electrical substation, offices, and warehouse buildings, all to be situated within a 50-acre fenced area served by a new access road connecting to US-191. The terminal offices will house control equipment and serve as an office for station operations. A technician shop and product-testing laboratory building will also be constructed at this terminal facility. The total terminal tank storage capacity will be approximately 190,000 barrels. Tanks will include three gasoline storage tanks; two fuel oil storage tanks; individual storage tanks for gasoline mix, fuel oil mix, and butane; and one relief tank. All tanks will be enclosed within an earthen berm of sufficient height to contain 110 percent of the total contents of the largest tank. Initial products planned for truck loading and shipment include regular and premium unleaded gasoline and low-sulfur No. 2 fuel oil. Vapors produced during truck loading will be collected into a positive, closed-loop system and disposed of by combustion. Average throughput for truck dispatch is estimated to be approximately 10,000 barrels per day. On the basis of use of single trucks that can load 180 barrels per load, the expected truck traffic visits will likely range from 50 to 60 trucks per day.

The new pipeline will be built in three different pipeline construction spreads. The Crescent Junction-to-Price pump station spread is considered a high-production spread that will require about 90 to 150 workers. The new pipeline construction involves several sequences of construction, starting with clearing and grading and ending with placement of final erosion-control features and reclamation. After ground clearing and leveling, heavy equipment will be brought in to dig ditches. Ditches may be open several days until the pipe is placed and backfilled. Typical soil cover depth after placement will be approximately 3 ft or less in rocky terrain. Pump stations will be located adjacent to the right-of-way, and construction will involve the installation of pump equipment and piping. The pumps will be connected to the pipeline by lateral lines, and shutoff valves will be installed to isolate the pump stations from the pipeline in the event of an emergency. Construction of the Crescent Junction pump station will follow the same general construction procedures for the Crescent Junction terminal except that no large tanks or truck racks will be constructed. Approximately 20 to 50 workers will be needed to construct the proposed Crescent Junction pump station. Construction of the Crescent Junction terminal will require a construction crew of 20 to 30 workers for initial site work and 40 to 60 workers for tank erection and installation of the mechanical and electrical facilities. The terminal will require an estimated 8 to 12 months to complete. Construction crews will consist of general contractors, heavy equipment operators, pipe welders, electricians, instrumentation specialists, millwrights, laborers, and quality assurance specialists.

The completed pipeline will be patrolled from the air every 3 weeks at a minimum and at least 26 times per year. Williams will employ a leak-detection system integrated with its SCADA monitoring system. To help prevent external corrosion leading to leaks, a protective coating will be applied to the exterior of the new pipeline segments, and cathodic protection will be used on all pipeline segments to help minimize corrosion.

The impacts of constructing and operating the Williams pipeline project, including increases in truck traffic and consequences of an accident, could result in cumulative impacts when considered together with the impacts of constructing a uranium mill tailings disposal cell at the Crescent Junction site alternative. Even if both DOE and Williams decide to implement these projects at the same time, the magnitude of potential traffic impacts would be small, as the extent of overlapping use of roadways within the Crescent Junction area would be a mile or less before Williams employees would merge onto I-70 and no longer compete with DOE traffic.

## 5.4 Ongoing Operations at White Mesa Mill

The White Mesa Mill site is a 5,415-acre parcel that is privately owned by IUC. On-site facilities consist of a uranium mill, uranium-ore storage pad, and four lined uranium mill-tailings disposal cells. Since 1997, the mill has processed more than 100,000 tons of uranium ore. Although mill operations and disposal of tailings from the Moab site would occur on the White Mesa Mill site, the two operations are not expected to result in cumulative doses to the workforces for each operation because there would be sufficient distance between the two operations. This expectation is based on the assumption that there would be two separate groups of workers: one group that would work exclusively on the IUC areas of the White Mesa facility and one group that would work exclusively on the disposal cell for the Moab tailings. For each group of workers, the radon and gamma dose would be predominantly from the tailings in their immediate vicinity, not from tailings located at a distance. For example, the radon dose from tailings in a person’s immediate vicinity is about 10 times greater than the radon dose from tailings located in an adjacent cell. For gamma doses, the dose from tailings in a person’s immediate vicinity is more than 10 times greater than the gamma doses from tailings located in an adjacent cell.

If IUC decides to expand its operations at the White Mesa Mill site, this expansion would result in an increase in the disturbed area and a potential increase in the disturbance of cultural resources. Although expansion is unlikely given the foreseeable business climate and the available capacity in the existing disposal cells, an expansion of the facility, together with the potential use of approximately 346 acres for a disposal cell for the Moab tailings, could result in cumulative impacts to cultural resources.

## 5.5 References

40 CFR 1500-1508. Council on Environmental Quality, “Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.”

DOI (U.S. Department of the Interior), 2001. *Final Environmental Impact Statement, Questar, Williams, and Kern River Pipeline Project*, June.

Mackiewicz, M., 2003. Personal communication, M. Mackiewicz, BLM Realty Specialist, Price (Utah) Field Office, with G. Karriker, S.M. Stoller Corporation, July 25.

End of current text

# 6.0 Unavoidable Impacts, Short-Term Uses and Long-Term Productivity, and Irreversible or Irretrievable Commitment of Resources

In addition to a discussion of the environmental impacts of the proposed action and a discussion of alternatives, NEPA requires that an EIS contain information on any adverse environmental impacts that are unavoidable, on short-term uses and long-term productivity of the environment, and on any irreversible or irretrievable commitment of resources.

## 6.1 Unavoidable Adverse Impacts

Under all action alternatives, there would be a very slight increase in radiation doses to the public and workers as a result of remediation and disposal activities, which could result in a very slight increase in excess cancer risk based on a 5-year remediation period and a 30-year post remediation exposure period. For these activities, the highest increased total risk of a latent cancer fatality for the maximally exposed member of the public in Moab for the duration of the activities would be 3.9E-3 under the on-site disposal alternative; the total risk of a latent cancer fatality for the maximally exposed member of the public in Moab for the duration of the activities under the off-site disposal alternatives would be 8.8E-3. In addition, radon exposures at the off-site disposal sites would result in a latent cancer fatality risk to the maximally exposed member of the public of 2.2E-5 at Klondike Flats, 9.4E-5 at Crescent Junction, and 9.7E-6 at White Mesa Mill.

For the population around Moab, the total risk of a latent cancer fatality would be 0.26 for the on-site disposal alternative. The total risk of a latent cancer fatality for the population around Moab for the off-site disposal alternatives would be 1.0 if the truck or rail transportation options were used, or 0.74 latent cancer fatalities if the slurry pipeline option were used. In addition, radon exposures at the off-site disposal sites would result in a latent cancer fatality risk of 0.014 for the population around Klondike, 0.010 for the population around Crescent Junction, and 0.015 for the population around White Mesa.

Under the action alternatives, it is estimated that there would be 12 latent cancer fatalities in the population exposed at vicinity properties. If the vicinity properties were not remediated, it is estimated that there would be 26 latent cancer fatalities in the population exposed at vicinity properties. For the maximally exposed individual at the vicinity properties, the risk of a latent cancer fatality is estimated to be 0.029 for the action alternatives and 0.067 if the vicinity properties were not remediated.

Under the action alternatives, there would be an unavoidable increase in truck and other construction-related traffic and traffic due to commuting workers. This unavoidable adverse impact would occur 5 to 7 days a week, would last for the duration of Moab site surface remediation activities (up to 8 years), and would primarily but not exclusively impact US-191. Off-site transportation of tailings by truck would result in the greatest increase in traffic. The highest traffic impacts would occur if tailings were trucked to White Mesa Mill. Under this disposal alternative and transportation mode there would be an unavoidable impact (121 percent increase in truck traffic) on the already congested traffic situation in downtown Moab.

Additional traffic and noise associated with remediation activities would result in displacement and increased mortality of wildlife close to construction areas and transportation routes.

Under all off-site alternatives, projected annual withdrawals of Colorado River water would exceed the 100-acre-foot protective limit set by USF&WS. Maximum estimated annual requirements range from 235 to 730 acre-feet and would continue for 3 to 5 years, depending on work schedules and transportation modes. Pipeline transportation to Klondike Flats or Crescent Junction would require the greatest volume of Colorado River water; river water requirements for a pipeline to White Mesa Mill would be partially offset by the use of Recapture Reservoir for recycle water.

Unavoidable adverse impacts to cultural resources and traditional cultural properties would likely occur under all but the No Action alternative. Unavoidable impacts would be greatest under the White Mesa Mill alternative. The density, variety, and complexity of cultural resources that would be unavoidably and adversely affected would be so great under the White Mesa Mill alternative that mitigation would be extremely difficult. Although a similar potential for unavoidable adverse effects would occur under the other alternatives, the lower densities of known resources would allow mitigation measures to be more easily implemented.

## 6.2 Relationship Between Local Short-Term Uses of the Environment and Long-Term Productivity

Implementation of the alternatives would create a conflict between the local short-term uses of the environment and long-term productivity. Under all alternatives, land required for the disposal cell would be unavailable for other uses in perpetuity. This conflict would be more significant for the on-site disposal alternative, given the proximity of the Moab site to the city of Moab and to heavily used recreation areas such as Arches National Park. Under the on-site alternative, at least the entire 130-acre pile would be unavailable for other uses in perpetuity. Moreover, under all alternatives, the area at the Moab site used for ground water treatment would be unavailable for at least 75 years. This area could be 40 acres or more if an evaporation technology were implemented. Also under any alternative, the final decisions on possible future release and uses of the approximately 309-acre off-pile area of the Moab site must be deferred pending a determination of the success of surface remediation.

Under the off-site alternatives, the 346- to 439-acre disposal cell areas would be unavailable in perpetuity. This conflict would be the least significant for the White Mesa Mill site alternative because that site already includes four uranium mill tailings disposal cells.

## 6.3 Irreversible or Irretrievable Commitment of Resources

The irreversible or irretrievable commitment of resources that would occur if the on-site or off-site disposal alternatives were implemented are (1) the use of fossil fuels in the transport of tailings and borrow materials, (2) the use of borrow materials, (3) the use of steel if the slurry pipeline transport were chosen, and (4) the use of land for the disposal cell in perpetuity. All alternatives would require an irretrievable commitment of millions of gallons of diesel fuel. The estimated total diesel fuel consumption for the on-site disposal alternative would be 4 to 5 million gallons (see Section 2.1.5.4). The estimated total diesel fuel consumption for off-site disposal would range from 12 to 20 million gallons for truck transportation, from 10 to

11 million gallons for rail transportation, and from 7 to 9 million gallons for slurry pipeline transportation.

Implementation of any of the alternatives would also require the use of borrow materials to cap the tailings pile and for site reclamation. These materials would include cover soils, radon/infiltration barrier soils, sand and gravel, and riprap. DOE estimates that the total volume of irretrievably committed borrow material would be approximately 1.7 million $yd^3$ for the on-site disposal alternative and 2.2 million $yd^3$ for each of the off-site disposal alternatives. DOE estimates that the maximum area of land that would be disturbed to extract borrow materials would be 550 acres for the on-site disposal alternative, 690 acres for the Klondike Flats or the Crescent Junction off-site disposal alternatives, and 174 acres for the White Mesa Mill off-site disposal alternative. The estimated acres of disturbed land do not include disturbances associated with obtaining sand, gravel, or riprap from commercial vendors. DOE believes these estimates represent maximum areas of disturbance; however, the final acreage of disturbed land would depend on the selection of borrow areas and depths to which borrow soils would be extracted.

Pipeline transport of tailings for off-site disposal would use between 4,400 tons (for Klondike Flats) and 24,000 tons (for White Mesa Mill) of steel that may become sufficiently contaminated to require disposal in the cell.

Under any alternative, there would be an irreversible and irretrievable commitment of the land that would be dedicated to the disposal cell. These commitments are described in Section 6.2.

All alternatives would result in the irretrievable commitment of Colorado River water, although the usages would all be within the limits of DOE's Colorado River water usage rights. Much of the use would be irretrievable because the water would be used for on-site or off-site decontamination, other construction-related uses, or possibly slurry production and ultimately would evaporate in double-lined evaporation ponds. The estimated maximum annual consumption of nonpotable water is 130 to 235 acre-feet for the rail transportation option, 135 to 240 acre-feet for truck transportation, and 730 acre-feet for slurry pipeline transportation (see Table 2–24). This water would be drawn from the Colorado River for the Klondike Flats and Crescent Junction alternatives. For the White Mesa Mill alternative, part of the decontamination water and the slurry pipeline makeup water would be drawn from the Recapture Reservoir. These annual figures are conservative upper bounds for irretrievable commitments of nonpotable water.

End of current text

# 7.0 Regulatory Requirements

This chapter presents descriptions of federal, tribal, and state regulatory requirements that may be applicable to the on-site and off-site disposal alternatives.

For this EIS, regulatory requirements are the laws, regulations, executive orders, and regulatory guidance that are, or may be, applicable to the alternatives analyzed in this EIS and that are critical to the decision-making process. The discussion of regulatory requirements is divided into three categories: federal, Native American, and state.

## 7.1 Federal Regulatory Requirements

### 7.1.1 National Environmental Policy Act, 42 *United States Code* (U.S.C.) §§ 4321 et seq.

NEPA requires that a federal agency evaluate the potential environmental effects of implementing a proposed action. The Council on Environmental Quality has promulgated regulations to implement the procedural provisions of NEPA. These regulations are binding on all federal agencies and are codified at 40 CFR 1500–1508. These regulations specify the content of an EIS and include requirements for cooperating agency and public involvement. In addition, DOE has promulgated its own NEPA-implementing regulations, which are codified at 10 CFR 1021. DOE has complied, or is complying, with these requirements in drafting this EIS.

This EIS is also intended for use by the BLM and the NPS to meet NEPA requirements for decisions they may need to make with respect to the proposed remediation and disposal of the Moab uranium mill tailings pile. The *Bureau of Land Management Manual 1790* (BLM 1988a) and *National Environmental Policy Act Handbook* (BLM 1988b) implement BLM NEPA regulations. NPS NEPA regulations are implemented under Director's Order 12 *Conservation Planning and Environmental Impact Analysis and Decision-Making* (NPS 2001).

### 7.1.2 Uranium Mill Tailings Radiation Control Act, 42 U.S.C. §§ 7901 et seq., as amended

In 1978, public concern about potential human health and environmental effects of uranium mill tailings led Congress to pass UMTRCA, which amended the Atomic Energy Act. In UMTRCA (Title I), Congress acknowledged the potentially harmful health effects associated with uranium mill tailings and identified 24 inactive uranium-ore processing sites that must be considered for remedial action. UMTRCA directs EPA, DOE, and NRC to undertake certain actions as described below.

Title I of UMTRCA provides the basis for

- EPA standards for the remediation of RRM-contaminated soils, buildings, and materials that ensure protection of human health and the environment.
- EPA standards and compliance options for RRM-contaminated ground water, including supplemental standards, ACLs, and institutional controls.
- EPA standards for remediation of vicinity properties.
- NRC review of completed site remediation for compliance with EPA standards.

- NRC licensing of the site, property transfers to states, or DOE long-term surveillance and maintenance.

In 1983, Congress amended UMTRCA, directing EPA to promulgate general environmental standards for the processing, possession, transfer, and disposal of uranium mill tailings. These standards, titled "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings" (codified at 40 CFR 192 [Subparts A, B, and C]), include exposure limits for surface contamination and concentration limits for ground water contamination. DOE is responsible for ensuring compliance with surface and ground water standards at Title I sites.

Title II of UMTRCA provides the basis for regulating active uranium-ore processing sites licensed by NRC. Although it is not applicable to the inactive Moab site, it is applicable to the currently operating White Mesa Mill.

The 40 CFR 192 Subpart A disposal standards for control of RRM are design based with specific performance requirements: ensure that a disposal cell will be reasonably effective for up to 1,000 years (and a minimum of 200 years); limit the release of radon-222 to the atmosphere; and provide ground water protection. Numerical standards are provided for radon-222 releases to the atmosphere and for ground water protection. Corrective actions are required within an 18-month period if contaminant concentrations in ground water at disposal sites exceed the ground water protection standards. Provisions in 40 CFR 192 also allow for the application of supplemental standards and ACLs for ground water contaminants based on site-specific circumstances.

Subpart B standards for cleanup provide numerical standards for cleanup that are based on concentrations of radium-226 in surface materials (e.g., soils) and for exposure to radiation in buildings. Ground water cleanup standards are the same as the protection standards specified in Subpart A. In addition to active remediation, natural flushing is an acceptable means of meeting the standards if they can be met within 100 years and if enforceable institutional controls can be put in place during this time.

Subpart C of 40 CFR 192 provides guidance for implementing Subparts A and B. Subpart C requires that standards be met on a site-specific basis using information gathered during site characterization and monitoring. A RAP is required to demonstrate how requirements of Subparts A and B are to be met. Criteria are also presented for determining the applicability of supplemental standards.

**Radon-222**

Radon is a naturally occurring inert radioactive gas found in soil, rock, and water throughout the United States. It has numerous isotopes, but radon-220 and radon-222 are the most common. Radon causes lung cancer and is a threat to human health because it tends to collect in homes, sometimes to very high concentrations. As a result, radon is the largest source of exposure to naturally occurring radiation.

Radon-222 is the decay product of radium-226. Radon-222 and its parent, radium-226, are part of the long decay chain for uranium-238. Because uranium is essentially ubiquitous in the Earth's crust, radium-226 and radon-222 are present in almost all rock, soil, and water.

Following a decision to remediate the Moab site, DOE would prepare a RAP for the site. The plan would describe the site restoration activities that, when remedial action was completed, would result in compliance with applicable environmental standards. This plan would be reviewed by NRC, which must approve the plan.

UMTRCA Title I also requires that upon completion of remedial action, each designated disposal site must be monitored and maintained by a federal agency under the NRC general license at 10 CFR 40.27. To meet this requirement, DOE would prepare a long-term surveillance plan for the disposal site. The plan would specify how DOE would care for and operate the disposal site. Upon NRC concurrence in the plan, the disposal site would be accepted under the general license. The NRC license does not expire. Thus, DOE, or a successor federal or state agency, would have responsibility to care for the disposal site in perpetuity.

### 7.1.3 Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law No. 106-398)

The Floyd D. Spence National Defense Authorization Act, enacted in October 2000, gave DOE responsibility for remediation of the Moab site and mandated that the site be remediated in accordance with Title I of UMTRCA. The act also directed that a Plan for Remediation be completed and that NAS provide assistance to DOE in evaluating costs, benefits, and risks associated with remediation alternatives.

### 7.1.4 Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)

The ESA provides for the protection of threatened and endangered species and designated critical habitat. Section 7 of the act requires federal agencies, having reason to believe that a prospective action may affect an endangered or threatened species or its critical habitat, to consult with USF&WS to ensure that the action does not jeopardize the continued existence of the species or destroy critical habitat. Endangered species and critical habitat exist in the vicinity of the Moab site.

### 7.1.5 Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.)

The Fish and Wildlife Coordination Act promotes more effectual planning and cooperation between federal, state, public, and private agencies for the conservation and rehabilitation of the nation's fish and wildlife and authorizes the U.S. Department of the Interior to provide assistance. This act requires consultation with USF&WS on the possible effects on wildlife if there is construction, modification, or control of bodies of water in excess of 10 acres in surface area.

### 7.1.6 Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703 et seq.)

The Migratory Bird Treaty Act, as amended, is intended to protect birds that have common migration patterns between the United States and Canada, Mexico, Japan, and Russia. It regulates the harvest of migratory birds by specifying conditions such as the mode of harvest, hunting seasons, and bag limits. The act stipulates that it is unlawful to "take, possess, . . . any migratory bird," unless obtained under a permit. Migratory birds may be affected by one or more of the alternatives.

### 7.1.7 Clean Water Act, 33 U.S.C. §§ 1251 et seq.

This act and its implementing regulations (40 CFR Parts 110−112, 122−125, 130−131, 230−231, and 404; and 33 CFR 322−330) regulate pollution prevention and discharges of point and non-point discharges, establish water quality standards, and regulate discharges of dredged or fill material into waters of the United States. Although mill tailings are exempt from the definition of a pollutant, discharges from wastewater treatment facilities (if required) may be subject to regulation under the Clean Water Act. Construction activities that disturb more than 1 acre of land require compliance with storm-water management and erosion-control regulations and require storm-water discharge permits. Dredging or filling activities of the Colorado River would also require a U.S. Army Corps of Engineers Clean Water Act Section 404 permit.

### 7.1.8 Rivers and Harbors Act of 1899, Section 10, 33 U.S.C. 403

This provision regulates the construction of any development or building that affects the "navigable capacity of any of the waters of the United States" and requires the U.S. Army Corps of Engineers' approval of any action "to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States. . . ."

### 7.1.9 Floodplain Management and Protection of Wetlands, 10 CFR 1022

DOE regulations codified at 10 CFR 1022 implement the requirements of Executive Orders 11988 (*Floodplain Management*) and 11990 (*Protection of Wetlands*) for actions that may affect these areas. Specifically, they require federal agencies to evaluate actions they may take to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain or a wetland. A portion of the Moab site falls within the 100-year floodplain of the Colorado River, and wetlands exist within and adjacent to the site; however, a formal wetlands delineation has not been conducted to date. A "Floodplain and Wetlands Assessment for Remedial Action at the Moab Site" as required by the DOE regulations is attached as Appendix F to this EIS. Any wetland area disturbance during remediation and restoration must comply with the appropriate requirements. Wetland areas must be identified and delineated for the Moab site and any off-site project locations.

### 7.1.10 Safe Drinking Water Act, 42 U.S.C. 300f et seq.

The primary objective of this act is to protect the quality of public water supplies. This law grants EPA the authority to protect the quality of public drinking water supplies by establishing national primary drinking water regulations. EPA has delegated authority for enforcement of drinking water standards to the states. EPA regulations (codified at 40 CFR Parts 123, 141, 145, 147, and 149) specify maximum contaminant levels, including those for radioactivity, in public water systems, which are generally defined as systems that serve at least 15 service connections or serve at least 25 year-round residents. The city of Moab derives most of its drinking water from a well field in the Glen Canyon aquifer near the northeast canyon wall of Spanish Valley. Two water-supply wells located near the entrance to Arches National Park are located in the Navajo Formation. The Colorado River is not currently used as a drinking water supply for the City of Moab.

### 7.1.11 Clean Air Act, 42 U.S.C. §§ 7401 et seq., as amended

This act and its implementing regulations regulate air emissions from treatment processes and construction equipment, fugitive dust, and radon emissions from the tailings pile. The National and Secondary Ambient Air Quality Standards (codified at 40 CFR Parts 50 and 53) address standards and monitoring requirements for $PM_{10}$ and for lead in ambient air. The National Emissions Standards for Hazardous Air Pollutants (NESHAP) (40 CFR 61 Subpart Q) requirements are applicable to control radioactive contamination on DOE facilities and would apply to the final tailings disposal location. However, the NESHAP requirements for radioactive emissions do not apply during periods of active remediation.

### 7.1.12 Archaeological Resources Protection Act, 16 U.S.C. §§ 470aa et seq., and National Historic Preservation Act, 16 U.S.C. §§ 470 et seq.

Cultural and historic resources are protected by these acts and their implementing regulations and by Executive Orders 11593 (*Protection and Enhancement of the Cultural Environment*) and 13007 (*Protection and Accommodation of Access to Indian Sacred Sites*). The regulations at 36 CFR 800 require federal agencies to take into account the effect of a proposed action on a structure or object that is included on or is eligible for the National Register of Historic Places and to establish procedures to identify and provide for preservation of historic and archeological data that might be destroyed through alteration of terrain as a result of a federal action. Cultural resources may be present in areas of the proposed alternatives.

### 7.1.13 Antiquities Act, 16 U.S.C. 431 et seq.

The Antiquities Act protects historic and prehistoric ruins, monuments, and objects of antiquity (including paleontological resources) on lands owned or controlled by the federal government. If historic or prehistoric ruins or objects were identified during the construction or operation of facilities, DOE would have to determine if adverse effects to these ruins or objects would occur. If so, the Secretary of the Interior would have to grant permission to proceed with the activity (36 CFR 296 and 43 CFR Parts 3 and 7).

### 7.1.14 Federal Land Policy and Management Act, 43 U.S.C. 1701 et seq.

The Federal Land Policy and Management Act (FLPMA), Title V, governs rights-of-way and withdrawals on federal lands administered by BLM (U.S. Department of the Interior). This act requires an application, review, and study by the administering agency and decisions by the Secretary of the Interior on withdrawal of federal lands, including terms and conditions of withdrawals. Access to and use of public lands administered by BLM are primarily governed by regulations regarding rights-of-way (43 CFR 2800) and withdrawals of public domain land from public use (43 CFR 2300).

### 7.1.15 Noise Control Act of 1972, 42 U.S.C. 4901 et seq., as amended

Section 4 of the Noise Control Act of 1972, as amended, directs all federal agencies to carry out "to the fullest extent within their authority" programs within their jurisdictions in a manner that furthers a national policy of promoting an environment free from noise jeopardizing health and welfare.

### 7.1.16 Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901 et seq., as amended

RCRA gives EPA the authority to control hazardous waste from "cradle to grave," including the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also established a framework for the management of nonhazardous wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. RCRA focuses only on active and future facilities and does not address abandoned or historical sites. However, based on historical practices at UMTRA sites, there is the potential for RCRA-regulated waste to be "commingled" with RRM at some vicinity properties. Regulations governing RCRA-regulated waste are in 40 CFR 260–273. This includes waste that may be subject to recycling provisions of the regulations. For the purpose of analysis in this EIS, DOE assumed that all commingled waste would ultimately be approved for management and disposal as RRM and would be disposed of in the selected disposal cell.

### 7.1.17 Hazardous Materials Transportation Act, 49 U.S.C 1801 et seq.

Transportation of hazardous and radioactive materials in commerce must be conducted in compliance with all applicable state and federal regulations as codified at 49 CFR 130–180. The DOT exemption at 40 CFR 761 may be applied to the bulk transportation of regulated radioactive mill tailings. This exemption provides relief from labeling, placarding, and manifesting requirements that are normally applicable to individual bulk shipments. Bulk transportation packaging requirements for haul trucks and rail cars (e.g., diapering tailgates on haul trucks, covering loads, reducing moisture content) would apply.

### 7.1.18 Toxic Substances Control Act, 7 U.S.C. 136 et seq.

Some of the provisions of the Toxic Substances Control Act regulate the management and disposal of asbestos and polychlorinated biphenyls (PCBs) that may be present at the site. Although these materials would be managed as RRM on the site, regulations in 40 CFR 761 and 763 would be applicable as best management practices. Both asbestos and PCBs are eligible for disposal in UMTRA disposal cells.

### 7.1.19 Executive Order 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, February 11, 1994)

This executive order requires each federal agency to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

## 7.2 Native American Regulatory Requirements

### 7.2.1 American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)

This act reaffirms Native American religious freedom under the first amendment to the U.S. Constitution and establishes policy to protect and preserve the inherent and constitutional right of Native Americans to believe, express, and exercise their traditional religions. This law ensures the protection of sacred locations and access of Native Americans to those sacred locations and traditional resources that are integral to the practice of their religions. Further, it establishes requirements that would apply to Native American sacred locations, traditional resources, or traditional religious practices potentially affected by construction and operation activities.

### 7.2.2 Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001)

The Native American Graves Protection and Repatriation Act directs the Secretary of the Interior to guide the repatriation of federal archaeological collections and collections that are culturally affiliated with Native American tribes and held by museums that receive federal funding. Major actions to be taken under this law include (1) the establishment of a review committee with monitoring and policy-making responsibilities; (2) the development of regulations for repatriation, including procedures for identifying lineal descent or cultural affiliation needed for claims; (3) the oversight of museum programs designed to meet the inventory requirements and deadlines of this law; and (4) the development of procedures to handle unexpected discoveries of graves or grave goods during activities on federal or tribal land. The provisions of the act would be invoked if any excavations associated with construction or operation activities led to unexpected discoveries of Native American graves or grave artifacts.

### 7.2.3 Executive Order 13007, Indian Sacred Sites

This order directs federal agencies, to the extent permitted by law and not inconsistent with agency missions, to avoid adverse effects to sacred sites and to provide access to those sites to Native Americans for religious practices. The order directs agencies to plan projects to provide protection of and access to sacred sites to the extent compatible with the project.

### 7.2.4 Executive Order 13175, Consultation and Coordination with Indian Tribal Governments

This order directs federal agencies to establish regular and meaningful consultation and collaboration with tribal governments in the development of federal policies that have tribal implications, to strengthen U.S. government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates on tribal governments.

## 7.3 State Regulatory Requirements

### 7.3.1 Clean Water Act Implementing Regulations

*Utah Administrative Code* (U.A.C.) Section R317-2-13 (Water Quality Standards) classifies the Colorado River and its tributaries as

1C Protected as a raw water source for domestic purposes with prior treatment processes as required by the Utah Department of Health;
2B Protected for boating, water skiing, and similar uses, excluding swimming;
3B Protected for warmwater species of game fish and other warmwater aquatic life, including the necessary aquatic organisms in their food chain; and
4 Protected for agricultural uses, including irrigation of crops and stock watering.

Numeric criteria specific to each of these use designations are specified at U.A.C. Section R317-2-14.

### 7.3.2 State Water Appropriations

Uses of surface water and ground water require compliance with water rights appropriations requirements that are administered by the Utah State Engineer's Office, Department of Natural Resources, Division of Water Rights. Ponding of ground water, construction dewatering of ground water, and use of surface water (i.e., Colorado River) for dust suppression and tailings compaction may be considered consumptive use.

### 7.3.3 Clean Air Act Implementing Regulations

Utah Air Conservation Rules (19 U.A.C. Section 19-2-101 et seq.) require that fugitive dust be minimized or that measures be taken to prevent its occurrence. Air emissions from a ground water treatment system could also potentially be regulated by these requirements and would require a permit. The Utah Administrative Code requires that ambient air quality be monitored during construction activities.

## 7.4 References

10 CFR 40. U.S. Nuclear Regulatory Commission, "Domestic Licensing of Source Material."

10 CFR 1021. U.S. Department of Energy, "National Environmental Policy Act (NEPA) Implementing Procedures."

10 CFR 1022. U.S. Department of Energy, "Compliance with Floodplain and Wetlands Environmental Review Requirements."

33 CFR 322-330. U.S. Department of Defense, "Navigation and Navigable Waters."

36 CFR 296. U.S. Department of Agriculture, "Protection of Archaeological Resources: Uniform Regulations."

36 CFR 800. Advisory Council on Historic Preservation, "Protection of Historic Properties."

40 CFR 50. U.S. Environmental Protection Agency, "National Primary and Secondary Ambient Air Quality Standards."

40 CFR 53. U.S. Environmental Protection Agency, "Ambient Air Monitoring Reference and Equivalent Methods."

40 CFR 61. U.S. Environmental Protection Agency, "National Emission Standards for Hazardous Air Pollutants."

40 CFR 110-112, 122-125, 130-131, 230-231, and 404. U.S. Environmental Protection Agency, "Protection of the Environment."

40 CFR 192. U.S. Environmental Protection Agency, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings."

40 CFR 260. U.S. Environmental Protection Agency, "Hazardous Waste Management System: General."

40 CFR 761. U.S. Environmental Protection Agency, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions."

40 CFR 763. U.S. Environmental Protection Agency, "Asbestos."

40 CFR 1500-1508. Council on Environmental Quality, "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act."

43 CFR 3. U.S. Department of the Interior, "Preservation of American Antiquities."

43 CFR 7. U.S. Department of the Interior, "Protection of Archaeological Resources."

43 CFR 2300. U.S. Department of the Interior, "Land Withdrawals."

43 CFR 2800. U.S. Department of the Interior, "Rights-of-Way, Principles and Procedures."

49 CFR 130. U.S. Department of Transportation, "Oil Spill Prevention and Response Plans."

BLM (Bureau of Land Management), 1988a. *BLM Manual Section 1790, National Environmental Policy Act of 1969* MS 1790, October 25.

BLM (Bureau of Land Management), 1988b. *National Environmental Policy Act Handbook*, BLM Handbook H-1790-1, October 25.

NPS (National Park Service), 2001. *Conservation Planning and Environmental Impact Analysis and Decision-Making*, NPS Director's Order and Handbook 12, January 8.

End of current text

# 8.0 List of Preparers and Disclosure Statements

This chapter identifies the individuals who were principal preparers of this document and provides the disclosure statement of all contractors participating in the preparation of this EIS.

| | | |
|---|---|---|
| ***Thomas L. Anderson*** | *Affiliation* | Battelle |
| | *Education* | B.S. Botany, Ohio State University |
| | *Technical Experience* | 31 years of experience and senior-level project management on more than 100 NEPA documents involving all aspects of DOE's nuclear and non-nuclear missions. |
| | *EIS Responsibility* | Project Manager and text preparation |
| ***Cheri I. Bahrke*** | *Affiliation* | Battelle |
| | *Education* | B.A. Geology, Indiana University |
| | *Technical Experience* | 11 years of experience in environmental restoration, 7 years of experience in preparing NEPA documents for all aspects of DOE environmental restoration projects. |
| | *EIS Responsibility* | Text preparation of Land Use and Institutional Controls chapter |
| ***James M. Becker*** | *Affiliation* | Battelle |
| | *Education* | M.S. Wildlife Ecology, University of Washington<br>B.S. Range and Wildlife Science, Brigham Young University |
| | *Technical Experience* | 10 years of experience in preparing ecological evaluations for NEPA documents, ecological risk assessments, and biological assessments for energy-related projects. |
| | *EIS Responsibility* | Terrestrial ecology; affected environment, environmental consequences, and biological assessment |
| ***Sandra J. Beranich*** | *Affiliation* | Subcontractor to S.M. Stoller Corporation |
| | *Education* | M.A. Geography, University of Oregon<br>B.A. Geology, Southern Illinois University |
| | *Technical Experience* | 20 years of diverse experience related to preparation of portions of or entire NEPA documents for federal agencies and general coordination and management of NEPA or related documents, including 8 years of experience working on NEPA reports and studies for the DOE UMTRA Project. Areas of expertise include land use and transportation. |
| | *EIS Responsibility* | General project coordination for Chapter 3.0, "Affected Environment"; preparation of transportation and traffic sections |

| | | |
|---|---|---|
| ***Joel Berwick*** | *Affiliation* | U.S. Department of Energy |
| | *Education* | B.S. University of Wyoming |
| | *Technical Experience* | 18 years of experience in managing and supporting remedial actions. His work on the Monticello project involved the construction oversight of a state-of-the-art water-balance repository cover. |
| | *EIS Responsibility* | DOE Project Engineer for Moab |
| ***Robert W. Bleil*** | *Affiliation* | Battelle |
| | *Education* | B.S. Natural Resources and Wildlife Management, Colorado State University<br>A.S. Pre-Law, Champlain College<br>Environmental Science – Berkshire Community College |
| | *Technical Experience* | 26 years of experience managing and preparing NEPA documents for BLM, USF&WS, private industry, and DOE. Contractor NEPA Compliance Lead at the DOE office in Grand Junction since 1990. |
| | *EIS Responsibility* | EIS Deputy Manager; technical content for aquatic and terrestrial ecology, biological assessment, regulatory requirements, and overall document preparation |
| ***Amoret L. Bunn*** | *Affiliation* | Battelle |
| | *Education* | Ph.D. Engineering, University of New Hampshire<br>M.S. Civil Engineering, University of New Hampshire<br>B.S. Biology, Virginia Polytechnic Institute and State University |
| | *Technical Experience* | 10 years of experience in preparing ecological evaluations for NEPA documents and ecological risk assessment and biological assessments for energy-related projects. |
| | *EIS Responsibility* | Aquatic ecology; affected environment, environmental consequences, and biological assessment |
| ***Clay Carpenter*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | M.B.A. George Washington University<br>B.S. Chemical Engineering, University of Virginia |
| | *Technical Experience* | 23 years of experience in risk assessment and project management. |
| | *EIS Responsibility* | Human health risk assessment, construction risks, and failure scenario evaluation |
| ***James R. Christensen*** | *Affiliation* | Subcontractor to S.M. Stoller Corporation |
| | *Education* | B.S. Anthropology, University of Idaho |
| | *Technical Experience* | Project Manager with SWCA Environmental Consultants, Historical Anthropology Program, Salt Lake City, Utah<br>11 years of experience in cultural resource management, specializing in historical archaeology, history, and prehistoric archaeology. |
| | *EIS Responsibility* | Evaluation of Moab Project site features for historical significance; supervision of Class III cultural resource survey on Moab Project site |

| | | |
|---|---|---|
| ***Laura E. Cummins*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | Ph.D. Geology, Florida State University<br>M.S. Geology, Bowling Green State University<br>B.S. Geology, Bowling Green State University |
| | *Technical Experience* | 15 years of technical and regulatory environmental experience, including the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), NEPA, risk assessment (human health and ecological), and geochemistry. Experience with DOE CERCLA/RCRA/UMTRA sites, EPA Superfund hazardous waste sites, and underground storage tank sites. |
| | *EIS Responsibility* | Human health and ecological risk, water quality issues, and ground water compliance |
| ***Dennis J. DuPont*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | Certificate, Mesa State College |
| | *Technical Experience* | 15 years of experience in document production. |
| | *EIS Responsibility* | Document coordinator and word processor |
| ***Linda M. Edwards*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | B.S. Organizational Management, Colorado Christian University |
| | *Technical Experience* | 8 years of experience in document production. |
| | *EIS Responsibility* | Review document redlines and prepared .pdf files |
| ***John E. Elmer*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | M.B.A. Western State University<br>B.S. Civil Engineering, Colorado State University |
| | *Technical Experience* | 10 years of experience in managing civil and environmental remediation projects, including studies, design, and construction and 15 years of experience managing environmental remediation projects for DOE involving low-level radioactive waste. |
| | *EIS Responsibility* | Lead for engineering and construction; text preparation |
| ***William E. Fallon*** | *Affiliation* | Battelle |
| | *Education* | Ph.D. Pharmaceutical Sciences, University of Rhode Island |
| | *Technical Experience* | 25 years of experience as manager of and technical contributor to large DOE and EPA programs. |
| | *EIS Responsibility* | Chapter 2.0 text preparation, integration, and technical coordination; cross-chapter consistency review |
| ***David S. Foster*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | B.A. Philosophy, University of Colorado; additional coursework in chemistry, geology, and hydrology |
| | *Technical Experience* | 25 years of experience: analyst, Union Carbide Corporation Environmental Laboratory; health physics technician, Oak Ridge Associated Universities; chemical sampling coordinator and technical writer/editor, Oak Ridge National Laboratory; technical writer/editor, S.M. Stoller Corporation |
| | *EIS Responsibility* | Technical editor |

| | | |
|---|---|---|
| ***Brad Fritz*** | *Affiliation* | Battelle |
| | *Education* | M.S. Environmental Engineering, Washington State University<br>B.S. Physics, Eastern Oregon University |
| | *Technical Experience* | 3 years of experience in data analysis. |
| | *EIS Responsibility* | Conducting and writing noise and vibration analyses |
| ***John Fritz*** | *Affiliation* | Subcontractor to S.M. Stoller Corporation |
| | *Education* | Ph.D. University of Utah<br>B.S. Eastern New Mexico University |
| | *Technical Experience* | 30 years of experience in cultural, archaeological, and traditional cultural property research and instruction. |
| | *EIS Responsibility* | Lead investigator for cultural archaeological and traditional cultural properties characterization |
| ***Michael J. Gardner*** | *Affiliation* | Battelle |
| | *Education* | M.A. Public Administration, University of Colorado<br>B.S. Geological Engineering, Brigham Young University |
| | *Technical Experience* | 16 years of environmental engineering and regulatory compliance experience associated with various DOE environmental restoration projects. |
| | *EIS Responsibility* | Collection of environmental monitoring data and text preparation |
| ***Craig S. Goodknight*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | M.S. Geology, University of New Mexico<br>B.S. Geology, University of Tulsa |
| | *Technical Experience* | 30 years of experience in geology of western Colorado and eastern Utah, includes experience as BLM District Geologist in eastern Utah, National Uranium Resource Evaluation program, and UMTRA Title I and II sites. |
| | *EIS Responsibility* | Technical Lead for preparation of geology section of EIS |
| ***Kenneth E. Karp*** | *Affiliation* | MFG, Inc. |
| | *Education* | B.S. Geology, Mesa State College |
| | *Technical Experience* | 15 years of experience in site investigations and feasibility and alternative evaluation studies; 10 years of experience managing environmental restoration and compliance projects related to CERCLA, RCRA, and UMTRA sites. |
| | *EIS Responsibility* | Lead for ground and surface water; text preparation |
| ***Marilyn K. Kastens*** | *Affiliation* | Battelle |
| | *Education* | M.S. Soil Science, Oregon State University<br>B.A. Geography, Oklahoma University |
| | *Technical Experience* | 20 years of experience in environmental compliance and NEPA issues with DOE and BLM. |
| | *EIS Responsibility* | Prepared cultural resource and visual resource sections of EIS |

| | | |
|---|---|---|
| ***N. Edward LaBonte*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | B.S. Computer Management Science, Metropolitan State College |
| | *Technical Experience* | 18 years of experience in Geographic Information Systems (GIS). |
| | *EIS Responsibility* | EIS Figure Coordinator and GIS Data Manager |
| ***Susan D. Lyon*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | Certificate, Mesa State College |
| | *Technical Experience* | 20 years of experience in document production. |
| | *EIS Responsibility* | Word process document and review redlines |
| ***Melvin W. Madril, P.E.*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | B.S. Civil Engineering, University of Southern Colorado |
| | *Technical Experience* | 25 years of civil engineering experience in site development, infrastructure design, and project and construction management; the last 18 years in engineering design and project management for radioactive contaminated soils and ground water remediation at various DOE sites. |
| | *EIS Responsibility* | Transportation studies, infrastructure conceptual design, labor, and equipment and natural resources consumption estimates |
| ***Steven J. Maheras*** | *Affiliation* | Battelle |
| | *Education* | Ph.D. Health Physics, Colorado State University |
| | *Technical Experience* | 15 years of experience in health physics, transportation risk assessment, and radiological assessment. |
| | *EIS Responsibility* | Transportation risk assessment, air quality analysis, human health and safety analysis |
| ***Thomas I. McSweeney*** | *Affiliation* | Battelle |
| | *Education* | Ph.D. Chemical Engineering, University of Michigan |
| | *Technical Experience* | 32 years of experience in risk assessment and safety analysis. |
| | *EIS Responsibility* | Transportation risk assessment |
| ***Donald R. Metzler, P.Hg.*** | *Affiliation* | U.S. Department of Energy |
| | *Education* | M.S. Hydrogeology, San Diego State University<br>Registered geologist in California and Arizona and certified professional hydrogeologist with the American Institute of Hydrology<br>B.S. Agricultural Science, California Polytechnic State University |
| | *Technical Experience* | Project Manager of the UMTRA Ground Water Project and involved in the UMTRA Program for 14 years. Work with uranium mill tailings has involved characterization, disposal cell cover performance, compliance strategy development, remedial action, and project management. |
| | *EIS Responsibility* | DOE Federal Project Director for the Moab, Utah, Uranium Mill Tailings Remediation Project. Development of ground water remediation strategy and technical reviewer of ground water modeling and disposal cell cover design |

| | | |
|---|---|---|
| ***Judith D. Miller*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | B.A. Communications, Mesa State College |
| | *Technical Experience* | Graphics design. |
| | *EIS Responsibility* | Graphics preparation |
| ***Duane A. Neitzel*** | *Affiliation* | Battelle |
| | *Education* | M.S. Biological Sciences, Washington State University<br>B.S. Zoology, University of Washington |
| | *Technical Experience* | 30 years of experience in managing and preparing NEPA documents for DOE and NRC. |
| | *EIS Responsibility* | Aquatic ecology; affected environment, environmental consequences, and biological assessment |
| ***Daniel W. Nordeen*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | B.S. Civil Engineering, Colorado State University |
| | *Technical Experience* | 15 years of experience in civil engineering site design and cost estimating with all aspects of the DOE UMTRA Project and CERCLA projects for disposal of low-level nuclear waste. |
| | *EIS Responsibility* | Conceptual design of alternatives, cost estimates, and text preparation |
| ***Douglas M. Osborn*** | *Affiliation* | Battelle |
| | *Education* | B.S. Chemical Engineering, Ohio State University |
| | *Technical Experience* | 6 years of experience operating nuclear reactors in the U.S. Navy; 3 years experience in managing and maintaining a mechanical engineering laboratory at Ohio State University; 3 months of experience as nuclear engineering research intern. |
| | *EIS Responsibility* | Technical support |
| ***Desiree Padgett*** | *Affiliation* | Battelle |
| | *Education* | B.A. Journalism, University of New Mexico |
| | *Technical Experience* | 18 years of experience editing technical documents for the U.S. Department of Defense and DOE, including 8 years of experience editing NEPA documents. |
| | *EIS Responsibility* | Technical Editor |
| ***Ray Plieness*** | *Affiliation* | U.S. Department of Energy |
| | *Education* | B.S. Civil Engineering, Montana State University |
| | *Technical Experience* | 25 years of experience managing construction, hazardous waste, and nuclear remediation projects. |
| | *EIS Responsibility* | Contractor EIS Project Manager and text preparation |
| ***Ted M. Poston*** | *Affiliation* | Battelle |
| | *Education* | M.S. Fisheries, University of Washington |
| | *Technical Experience* | 29 years of experience in ecological, environmental and toxicological research with 22 years of NEPA experience in community noise assessments and ecology. |
| | *EIS Responsibility* | Coordinated noise and ground vibration section and consulted on ecology sections |

| | | |
|---|---|---|
| ***Phyllis Price*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | A.A.S. Ferris State University |
| | *Technical Experience* | 28 years of experience in graphic design and illustration. |
| | *EIS Responsibility* | Graphics preparation |
| ***Cynthia L. Rakowski*** | *Affiliation* | Battelle |
| | *Education* | M.S. Watershed Science, Utah State University<br>B.S. Physics, Montana State University |
| | *Technical Experience* | 10 years of experience integrating geomorphology and habitat availability for endangered fishes. |
| | *EIS Responsibility* | Aquatic ecology |
| ***Michael T. Rectanus*** | *Affiliation* | Battelle |
| | *Education* | B.S. Chemical Engineering, Ohio University |
| | *Technical Experience* | 6 years of experience conducting air quality impact assessments for EISs and PSD construction permit applications. |
| | *EIS Responsibility* | Air quality analysis |
| ***Donna L. Riddle*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | B.S. Environmental Restoration, Mesa State College |
| | *Technical Experience* | 20 years of experience in quality assurance program definition and implementation and monitoring for DOE contractors. |
| | *EIS Responsibility* | Contractor QA Manager; quality consultation on EIS |
| ***Christine D. Ross*** | *Affiliation* | Battelle |
| | *Education* | A.A. Microcomputer Management, Specializing in Multimedia, Albuquerque Technical Vocational Institute |
| | *Technical Experience* | 9 years of experience in graphic and desktop publishing work, 4 years of experience in GIS software and technology. |
| | *EIS Responsibility* | Prepared population, low-income, and minority maps for Chapter 3.0. |
| ***Wendee K. Ryan*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | B.A. Speech Communication, Colorado State University |
| | *Technical Experience* | 7 years of experience in Public Affairs for DOE contractors. |
| | *EIS Responsibility* | Public relations |
| ***Linda Sheader*** | *Affiliation* | Subcontractor to S.M. Stoller Corporation |
| | *Education* | M.A. Botany, University of California Berkeley<br>B.A. Biology, Adams State College |
| | *Technical Experience* | 6 years of experience in wetlands delineation, restoration designs and monitoring, reclamation, botany, and plant ecology. |
| | *EIS Responsibility* | Revise floodplains and wetlands assessment and related sections |

| | | |
|---|---|---|
| ***Gregory M. Smith*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | M.S. Civil (Geotechnical) Engineering, Colorado State University |
| | *Technical Experience* | 20 years of experience designing and constructing low-level uranium waste disposal cells for DOE. |
| | *EIS Responsibility* | Wind rose diagrams and affected environment text |
| ***J. Amanda Stegen*** | *Affiliation* | Battelle |
| | *Education* | M.S. Biology, University of Washington<br>B.S. Wildlife Biology, Washington State University |
| | *Technical Experience* | 10 years of experience in preparing ecological evaluations for NEPA documents and ecological risk assessment and biological assessments for energy-related projects. |
| | *EIS Responsibility* | Aquatic ecology, affected environment, environmental consequences, and biological assessment |
| ***Lucinda Low Swartz*** | *Affiliation* | Battelle |
| | *Education* | J.D. Washington College of Law, The American University<br>B.A. Political Science and Administrative Studies (joint major), University of California at Riverside |
| | *Technical Experience* | 23 years of experience in environmental law and regulation. |
| | *EIS Responsibility* | Summary; Chapters 1.0 and 5.0 through 7.0, environmental laws and regulations; and technical review |
| ***Cathy Thomas*** | *Affiliation* | S.M. Stoller Corporation |
| | *Education* | M.L.S. Emporia State University<br>B.S. Education, Emporia State University |
| | *Technical Experience* | 30 years of experience in educational, medical, and corporate libraries conducting research for educators and clients. |
| | *EIS Responsibility* | Assisted in preparation of bibliographies |
| ***Carlos A. Ulibarri*** | *Affiliation* | New Mexico Institute of Mining and Technology and Battelle |
| | *Education* | Ph.D. Economics, University of New Mexico |
| | *Technical Experience* | 10 years of experience in evaluating socioeconomic impacts of DOE projects involving environmental, energy, and nuclear regulatory programs. |
| | *EIS Responsibility* | Technical lead for socioeconomic impact evaluation |
| ***Gretchen Van Reyper*** | *Affiliation* | HRL Compliance, independent subcontractor |
| | *Education* | B.S. Environmental Studies/Biology, Minnesota State University-Mankato |
| | *Technical Experience* | 10 years of wetland and botany experience in federal and private sectors; 3 years of NEPA document assistance. |
| | *EIS Responsibility* | Floodplain and wetland sections and sensitive plant species list |

| | | |
|---|---|---|
| ***Paul G. Wetherstein*** | *Affiliation* | Battelle |
| | *Education* | A.A.S. Environmental Restoration Technology, Mesa State College |
| | *Technical Experience* | 16 years of experience in environmental remediation, including 10 years in hazardous waste management involving DOE's uranium mill tailings work. |
| | *EIS Responsibility* | Research waste management issues for each alternative site |
| ***Toby Wright*** | *Affiliation* | MFG, Inc |
| | *Education* | M.S. Civil Engineering, Colorado State University<br>B.S. Geosciences, University of Arizona |
| | *Technical Experience* | 17 years of experience in environmental characterization, restoration and remediation design and management of private and federal clients. |
| | *EIS Responsibility* | Contractor Project Manager |
| ***Julio Zimbron*** | *Affiliation* | MFG, Inc. |
| | *Education* | Ph.D. Chemical Engineering, Colorado State University<br>M.Sc. Chemical Engineering, Colorado State University<br>B.S. Biochemical Engineering, Monterrey Institute of Technology, Mexico |
| | *Technical Experience* | Engineering design of water and air pollution control systems, including bioremediation, chemical treatment, and solids separation technologies. |
| | *EIS Responsibility* | Water treatment alternatives screening |

**Subcontract Agreement #STLR-3730-002-CP**
**NEPA DISCLOSURE STATEMENT FOR PREPARATION OF THE REMEDIATION OF THE MOAB URANIUM MILL TAILINGS SITE, GRAND COUNTY, UTAH**
**ENVIRONMENTAL IMPACT STATEMENT**

CEQ Regulations at 40 CFR 1506.5(c), which have been adopted by the DOE (10 CFR 1021), require a contractor who will prepare an EIS to execute a disclosure specifying that they have no financial or other interest in the outcome of the project. In accordance with these requirements, Battelle Memorial Institute hereby certifies that to the best of its knowledge it has no financial or other interest in the outcome of the referenced EIS project.

In accordance with these requirements, **Battelle Memorial Institute** hereby certifies as follows: check either (a) or (b).

(a) X To the best of **Battelle Memorial Institute's** knowledge, it has no financial or other interest in the outcome of the referenced EIS project.

(b) ___ Battelle Memorial Institute has the following financial or other interest in the outcome of the referenced EIS projects hereby agree to divest themselves of such interest prior to the start of the work.

Financial or Other Interest
1.
2.
3.

Certified by:
Lorraine N. Stein
Signature

for Ralph K. Henricks
Name

Contracting Officer
Title

02/18/2003
Date

# NEPA DISCLOSURE STATEMENT FOR PREPARATION OF THE REMEDIATION OF THE MOAB MILL TAILINGS SITE IN GRAND COUNTY, UTAH ENVIRONMENTAL IMPACT STATEMENT

CEQ Regulations at 40 CFR 1506.5(c), which have been adopted by the DOE (10 CFR 1021), require a contractor who will prepare an EIS to execute a disclosure specifying that they have no financial or other interest in the outcome of the project. The term "financial or other interest in the outcome of the project" for purposes of this disclosure, is defined in the March 23, 1981, guidance "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 FR 18026-18038 at Questions 71a and b.

"Financial or other interest in the outcome of the project" includes "any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)" 46 FR 18026-18038 at 18031.

In accordance with these requirements, **Intera Incorporated** hereby certifies as follows: check either (a) or (b).

(a) X **Intera Incorporated** has no financial or other interest in the outcome of the referenced EIS projects.

(b) ____ ____________________ has the following financial or other interest in the outcome of the referenced EIS projects hereby agree to divest themselves of such interest prior to the start of the work.

Financial or Other Interest

1.
2.
3.

Certified by:

[signature]
Signature

Patrick F. MALONE
Name

**Contracting Officer**
Title

JANUARY 20, 2003
Date

# NEPA DISCLOSURE STATEMENT FOR PREPARATION OF THE REMEDIATION OF THE MOAB MILL TAILINGS SITE IN GRAND COUNTY, UTAH ENVIRONMENTAL IMPACT STATEMENT

CEQ Regulations at 40 CFR 1506.5(c), which have been adopted by the DOE (10 CFR 1021), require a contractor who will prepare an EIS to execute a disclosure specifying that they have no financial or other interest in the outcome of the project. The term "financial or other interest in the outcome of the project" for purposes of this disclosure, is defined in the March 23, 1981, guidance "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 FR 18026-18038 at Questions 71a and b.

"Financial or other interest in the outcome of the project" includes "any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)" 46 FR 18026-18038 at 18031.

In accordance with these requirements, <u>MFG</u> hereby certifies as follows: check either (a) or (b).

(a) <u>X</u> <u>MFG</u> has no financial or other interest in the outcome of the referenced EIS projects.

(b) ___ ______________________, has the following financial or other interest in the outcome of the referenced EIS projects hereby agree to divest themselves of such interest prior to the start of the work.

<u>Financial or Other Interest</u>

1.
2.
3.

Certified by:

Craig A. Hamilton
Signature

Craig A. Hamilton
Name

President/COO
Title

<u>January 17, 2003</u>
Date

# NEPA DISCLOSURE STATEMENT FOR PREPARATION OF THE REMEDIATION OF THE MOAB MILL TAILINGS SITE IN GRAND COUNTY, UTAH ENVIRONMENTAL IMPACT STATEMENT

CEQ Regulations at 40 CFR 1506.5(c), which have been adopted by the DOE (10 CFR 1021), require a contractor who will prepare an EIS to execute a disclosure specifying that they have no financial or other interest in the outcome of the project. The term "financial or other interest in the outcome of the project" for purposes of this disclosure, is defined in the March 23, 1981, guidance "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 FR 18026-18038 at Questions 71a and b.

"Financial or other interest in the outcome of the project" includes "any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)" 46 FR 18026-18038 at 18031.

In accordance with these requirements, **S.M. Stoller Corporation** hereby certifies as follows: check either (a) or (b).

(a) **X** **S.M. Stoller Corporation** has no financial or other interest in the outcome of the referenced EIS projects.

(b) ____ ________________________ has the following financial or other interest in the outcome of the referenced EIS projects hereby agree to divest themselves of such interest prior to the start of the work.

Financial or Other Interest

1.
2.
3.

Certified by:

[signature]
Signature

James K. Archibald
Name

**V.P. and General Manager**
Title

January 17, 2003
Date

# NEPA DISCLOSURE STATEMENT FOR PREPARATION OF THE REMEDIATION OF THE MOAB MILL TAILINGS SITE IN GRAND COUNTY, UTAH ENVIRONMENTAL IMPACT STATEMENT

CEQ Regulations at 40 CFR 1506.5(c), which have been adopted by the DOE (10 CFR 1021), require a contractor who will prepare an EIS to execute a disclosure specifying that they have no financial or other interest in the outcome of the project. The term "financial or other interest in the outcome of the project" for purposes of this disclosure, is defined in the March 23, 1981, guidance "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 FR 18026-18038 at Questions 71a and b.

"Financial or other interest in the outcome of the project" includes "any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)" 46 FR 18026-18038 at 18031.

In accordance with these requirements, **Teledyne Brown Engineering, Inc**.hereby certifies as follows: check either (a) or (b).

(a) X **Teledyne Brown Engineering, Inc.** has no financial or other interest in the outcome of the referenced EIS projects.

(b) ____ ________________________ has the following financial or other interest in the outcome of the referenced EIS projects hereby agree to divest themselves of such interest prior to the start of the work.

Financial or Other Interest

1.
2.
3.

Certified by:

Renee H. Varner
Signature

Renee H. Varner
Name

**Sr. Contract Administrator**
Title

January 17, 2003

Date

# 9.0 List of Agencies, Organizations, and Individuals Receiving Copies of the EIS

**Government Officials—Federal**

Mr. Tom Chart, U.S. Fish and Wildlife Service
Mr. Jim Fairchild, U.S. Geological Survey
Mr. Myron Fliegel, U.S. Nuclear Regulatory Commission
Dr. Richard Graham, U.S. EPA Region 8
Mr. Norm Henderson, National Park Service
Mr. Paul Henderson, Canyonlands National Park
Mr. Steven Hoffman, Office of the Regional Solicitor, U.S. Department of the Interior
Ms. Cherie Hutchison, U.S. Department of Labor, Mine Safety and Health Administration
Mr. Ken Jacobson, U.S. Army Corps of Engineers
Mr. Sam Keith, Center for Disease Control
Mr. Henry Maddox, U.S. Fish and Wildlife Service
Ms. Anne Norton Miller, U.S. EPA Headquarters
Mr. Peter Penoyer, National Park Service
Mr. Cordell Roy, National Park Service
Mr. Larry Svoboda, U.S. EPA Region 8
Mr. Daryl Trotter, Bureau of Land Management
Ms. Mary vonKoch, Bureau of Land Management
Mr. Bruce Waddell, U.S. Fish and Wildlife Service
Mr. Dave Wood, National Park Service
Ms. Margaret Wyatt, Bureau of Land Management

**Elected Officials and Staffers—Federal**

The Honorable Wayne Allard, United States Senate
The Honorable Joe Baca, U.S. House of Representatives
The Honorable Joe Barton, U.S. House of Representatives
The Honorable Xavier Becerra, U.S. House of Representatives
The Honorable Robert F. Bennett, United States Senate
Ms. Alene Bentley, Office of Congressman James Matheson
The Honorable Shelley Berkley, U.S. House of Representatives
The Honorable Howard L. Berman, U.S. House of Representatives
The Honorable Marion Berry, U.S. House of Representatives
The Honorable Jeff Bingaman, United States Senate
The Honorable Rob Bishop, U.S. House of Representatives
The Honorable Mary Bono, U.S. House of Representatives
The Honorable Barbara Boxer, United States Senate
The Honorable Robert C. Byrd, United States Senate
The Honorable Ken Calvert, U.S. House of Representatives
The Honorable Chris Cannon, U.S. House of Representatives
The Honorable Lois Capps, U.S. House of Representatives
The Honorable Christopher Cox, U.S. House of Representatives

The Honorable Randy (Duke) Cunningham, U.S. House of Representatives
The Honorable Susan Davis, U.S. House of Representatives
The Honorable John Dingell, U.S. House of Representatives
The Honorable Pete Domenici, United States Senate
The Honorable Calvin M. Dooley, U.S. House of Representatives
The Honorable John Doolittle, U.S. House of Representatives
The Honorable David Dreier, U.S. House of Representatives
The Honorable Chet Edwards, U.S. House of Representatives
The Honorable Jo Ann Emerson, U.S. House of Representatives
The Honorable John Ensign, United States Senate
The Honorable Terry Everett, U.S. House of Representatives
The Honorable Diane Feinstein, United States Senate
The Honorable Bob Filner, U.S. House of Representatives
The Honorable Jeff Flake, U.S. House of Representatives
The Honorable Trent Franks, U.S. House of Representatives
The Honorable Elton Gallegly, U.S. House of Representatives
The Honorable Jim Gibbons, U.S. House of Representatives
The Honorable Raul Grijalva, U.S. House of Representatives
The Honorable Jane Harman, U.S. House of Representatives
The Honorable Orrin Hatch, United States Senate
The Honorable J. D. Hayworth, U.S. House of Representatives
The Honorable David L. Hobson, U.S. House of Representatives
The Honorable Duncan Hunter, U.S. House of Representatives
The Honorable Darrell E. Issa, U.S. House of Representatives
The Honorable Jim Kolbe, U.S. House of Representatives
The Honorable Jon Kyl, United States Senate
The Honorable Tom Latham, U.S. House of Representatives
The Honorable Carl Levin, United States Senate
The Honorable Jerry Lewis, U.S. House of Representatives
The Honorable James Matheson, U.S. House of Representatives
The Honorable John McCain, United States Senate
The Honorable Scott McInnis, U.S. House of Representatives
The Honorable Howard P. McKeon, U.S. House of Representatives
The Honorable Juanita Millender-McDonald, U.S. House of Representatives
The Honorable Gary G. Miller, U.S. House of Representatives
The Honorable Grace Napolitano, U.S. House of Representatives
The Honorable Bill Nelson, United States Senate
The Honorable Ben Nighthorse Campbell, United States Senate
The Honorable Devin Nunes, U.S. House of Representatives
The Honorable David R. Obey, U.S. House of Representatives
The Honorable Ed Pastor, U.S. House of Representatives
The Honorable John E. Peterson, U.S. House of Representatives
The Honorable Jon Porter, U.S. House of Representatives
The Honorable Harry Reid, United States Senate
The Honorable Rick Renzi, U.S. House of Representatives
The Honorable Silvestre Reyes, U.S. House of Representatives
Mr. Bruce Richeson, Office of Senator Robert F. Bennett
The Honorable Dana Rohrabacher, U.S. House of Representatives
The Honorable Lucille Roybal-Allard, U.S. House of Representatives

The Honorable Edward R. Royce, U.S. House of Representatives
The Honorable Linda Sanchez, U.S. House of Representatives
The Honorable Loretta Sanchez, U.S. House of Representatives
The Honorable Adam B. Schiff, U.S. House of Representatives
The Honorable John Shadegg, U.S. House of Representatives
The Honorable Brad Sherman, U.S. House of Representatives
The Honorable Ike Skelton, U.S. House of Representatives
The Honorable Hilda L. Solis, U.S. House of Representatives
The Honorable Ted Stevens, United States Senate
The Honorable William M. Thomas, U.S. House of Representatives
The Honorable Peter J. Visclosky, U.S. House of Representatives
The Honorable John Warner, United State Senate
The Honorable Maxine Waters, U.S. House of Representatives
The Honorable Diane E. Watson, U.S. House of Representatives
The Honorable Henry A. Waxman, U.S. House of Representatives
The Honorable C.W. Bill Young, U.S. House of Representatives

**Tribal**

Mr. Neil Cloud, Southern Ute Indian Tribe
Vice-Chairman Smiley Arrowchis, The Ute Tribe
Mr. O. Roland McCook, The Ute Tribe
Chairman Maxine Natchees, The Ute Tribe
Governor Arlen P. Quetawki, Sr., Pueblo of Zuni
Mr. Tom Rice, Ute Mountain Ute Tribe
Mr. Arvin Trujillo, Navajo Nation Division of Natural Resources

**Government Officials—State**

Ms. Sylvia Barrett, Metropolitan Water District of Southern California
Ms. LaVonne Garrison, State of Utah School & Institutional Trust Lands Administration
Mr. Hugh Kirkham, Utah Department of Transportation
Mr. Leroy Mead, Utah Division of Wildlife Resources
Mr. Loren Morton, Utah Department of Environmental Quality, Radiation Control
Mr. Fred Nelson, Utah State Attorney General's Office
Dr. Dianne Nielson, Utah Department of Environmental Quality
Mr. Ed Ranger, Arizona Department of Environmental Quality
Mr. Darren Rasmussen, Utah Department of Natural Resources Division of Water Rights
Ms. Terry Roberts, California State Clearinghouse, Governor's Office of Planning and Research
Mr. Bill Sinclair, Utah Department of Environmental Quality
Mr. Michael Stafford, State of Nevada
Ms. Carolyn Wright, Utah Department of Natural Resources

### Elected Officials—State

The Honorable Kenny C Guinn, Governor of Nevada
The Honorable Janet Napolitano, Governor of Arizona
The Honorable Bill Owens, Governor of Colorado
The Honorable Arnold Schwarzenegger, Governor of California
The Honorable Olene Walker, Governor of Utah

### Interest Groups

Sierra Club
Greenaction Indigenous Lands Project
Mr. Bradley Angel, GreenAction for Health and Environmental Justice
Mr. Bob Baird, URS Corporation
Ms. Sue Bellagamba, The Nature Conservancy, Moab Project Office
Mr. Norman Bloom, Williams Environmental Services, Inc.
Mr. Roger Featherstone, Earthworks
Mr. Frank Gardner, Khate
Dr. Jack Hamilton, University of Utah
Mr. Bill Hedden, Grand Canyon Trust, Moab Office
Mr. Ron Hochstein, International Uranium Corporation
Mr. Bill Love, Sierra Club
Mr. William B. Mackie, Western Governors' Association
Mr. Jay Norwood, Pipeline Systems, Inc.
Mr. Harold Roberts, International Uranium Corp.
Mr. Reed Tsosie, Nielsons Skanska Inc.
Mr. Jay Vance, Envirocare of Utah, Inc.
Mr. Ivan Weber, U.S. Green Building Council-Utah
Mr. Terry Wetz, International Uranium Corp.

### Local Officials

San Juan County, Board of County Commissioners
Grand County Council
Mr. Rick Bailey, San Juan County Commission
Ms. Judy Bane, Grand County
Ms. Joette Langianese, Grand County Council
Mr. Jim Lewis, Grand County Council
Mr. Patrick McDermott, Bluff Service Area Board of Trustees
Mayor Dave Sakrison, City of Moab
Mr. Chris Webb, City of Blanding

## Media—Print, Radio, and Television

Moab Times Independent
Mr. David Hasemyer, San Diego Union Tribune
Ms. Nancy Lofholm, The Denver Post
Mr. Phil Mueller, KCYN, 97.1 FM

## Private Citizens

Ms. Sherry Agnew
Mr. Dean Armstrong
Mr. Mark Belles
Ms. Ginny Carlson
Ms. Andrea Carpenter
Mr. Clay Conway, Gaeaorama, Inc.
Ms. Liza Doran
Ms. Sarah Fields
Mr. John Geddie
Mr. Delamar Gibbons
Mr. Gary Hazen
Mr. William Johnson
Mr. David Lacy
Mr. Casey Leeboy
Mr. Jim Marrs, Jim Marrs & Associates, Inc.
Ms. Rebecca Martin
Ms. Susanne Mayberry
Mr. and Mrs. Jeff and Wren McCleary
Mr. Gary Meunier
Mr. T.K. Miyoshi
Ms. Mary Moran
Mr. Robert S. Pattison
Mr. Bob Phillips
Mr. Don Policaro
Ms. Karen Robinson
Mr. Clay Rosson, SAIC
Mr. and Mrs. Sam and Polly Sanderson
Mr. Gene M. Stevenson
Mr. Kirk Treece, ECDC Environmental L.C.
Ms. Victoria Woodard

## Resources

DOE Grand Junction Public Reading Room
Blanding Branch Library
Grand County Library
White Mesa Ute Administrative Building
Ms. Amy Brunvand, University of Utah Marriott Library

End of current text

# 10.0 Glossary

| | |
|---|---|
| *active remediation* | The use of active ground water remediation methods such as gradient manipulation, ground water extraction and treatment, or in situ ground water treatment to restore ground water quality to acceptable levels. |
| *acute concentration* | The concentration of a contaminant in a medium (air, water, and soil) that would produce an acute exposure. Acute exposure is a single, short-term exposure (usually a day or less) to radiation, a toxic substance, or other stressors that may result in severe biological harm or death. |
| *alluvium* | Sediments generally composed of clay, silt, sand, gravel, or similar unconsolidated material deposited by flowing rivers and streams. |
| *ammonia* | A nitrogen-based compound that exists in either the un-ionized form ($NH_3$) or as the ammonium ion ($NH_4^+$). |
| *aquifer* | A geologic unit (rock or sediment) that can store and transmit water at rates sufficient to supply reasonable amounts of water to wells and springs. |
| *aquitard* | A layer of low-permeability formation immediately above or below an aquifer that retards but does not prevent the flow of ground water to or from the aquifer. It does not readily yield water to wells and springs but may serve as a storage unit for ground water. |
| *background ground water quality* | The composition of ground water in areas near the millsite that are geologically similar to the millsite and were not affected by ore-processing activities. |
| *benchmark* | An established criterion, known point, or metric used to compare measured or estimated values of chemicals in the environment. Benchmarks generally represent concentrations for a particular medium (e.g., air, soil, water, food) that are acceptable for given receptors (e.g., humans, animals). |
| *benthos* | The plants and animals living on the river bottom. |
| *biota* | Living organisms. |
| *borrow material* | Rock, soil, or other earth materials that are excavated from one location and transported for use at another location, generally for construction purposes (e.g., as fill material). |
| *brine* | The USGS classification of water with a TDS concentration of more than 35,000 mg/L. In the EIS, briny water in the basin fill aquifer beneath the Moab site is salty ground water, which became salty mostly from dissolution of evaporite minerals in the Paradox Formation. |

| | |
|---|---|
| *chronic concentration* | Concentration of a contaminant in an environmental medium (air, soil, and water) that would produce a chronic exposure. A chronic exposure is a continuous or intermittent exposure of an organism to a stressor (e.g., a toxic substance or ionizing radiation) over an extended period of time or significant fraction (often 10 percent or more) of the life span of the organism. Generally, chronic exposure is considered to produce only effects that can be observed some time following initial exposure. These may include impaired reproduction or growth, genetic effects, and other effects such as cancer, precancerous lesions, benign tumors, cataracts, skin changes, and congenital defects. |
| *cultural resources* | Historic properties, archaeological resources, and cultural items, such as (1) archaeological materials (e.g., artifacts) and sites that date to the prehistoric, historic, and ethnohistoric periods that are currently located on, or are buried beneath, the ground surface; (2) standing structures and/or their component parts that are more than 50 years of age or are important because they represent a major historical theme or era (e.g., Manhattan Project, Cold War); (3) structures that have an important technological, architectural, or local significance; (4) cultural and natural places, selected natural resources, and sacred objects that have importance for Native Americans; and (5) American folklife traditions and arts. |
| *decreaser grasses* | The grasses most eagerly sought after by grazing animals—they tend to decrease as grazing pressure increases. Most grasses are defined as being pasture increasers or decreasers. |
| *distribution coefficient (*$K_d$ *and* $R_d$*)* | A ratio of the concentration of a chemical in soil to the concentration in water under equilibrium conditions (i.e., concentration in soil divided by the concentration in water). |
| *floodplain (including 100 and 500 year)* | The surface or strip of relatively smooth land adjacent to a river channel, constructed by the present river, and covered with water when the river overflows its banks. The floodplain is built of alluvium carried by the river during floods and deposited in the sluggish water beyond the influence of the swiftest current. A 100-year floodplain is the area of land that has a 1.0 percent or greater chance of being flooded in any given year. A 500-year floodplain is the area of land that has a 0.2 percent chance of being flooded in any given year. |
| *flow-and-transport modeling* | Use of computer software to try to simulate subsurface movement of water and chemicals to predict future conditions in an aquifer. |

| | |
|---|---|
| *fresh water* | The USGS classification of water based on the following concentration ranges of TDS: fresh water has less than 1,000 mg/L TDS, slightly saline water has 1,000 to 3,000 mg/L TDS, moderately saline water has 3,000 to 10,000 mg/L TDS, very saline water has 10,000 to 35,000 mg/L TDS, and brine has more than 35,000 mg/L TDS. In the EIS, fresh water in the basin fill aquifer beneath the Moab site is referred to as the upper portion of the aquifer that overlies the deeper briny ground water. |
| *fugitive dust* | (1) Dust emitted that does not pass through a stack, vent, chimney, or similar opening where it could be captured by a control device. (2) Any dust emitted other than from a stack. |
| *increaser grasses* | Grasses that become better established as grazing pressure increases because they are less palatable—they tend to increase as more favored species are grazed out. Most grasses are defined as being pasture increasers or decreasers. |
| *institutional controls* | Used to limit or eliminate access to, or uses of, land, facilities, and other real and personal property to prevent inadvertent human and environmental exposure to residual contamination and other hazards. These controls maintain the safety and security of human health and the environment and of the site itself. Institutional controls may include legal controls such as zoning restrictions and deed annotations and physical barriers such as fences and markers. Also included are methods to preserve information and data and to inform current and future generations of the hazards and risks. |
| *kilovolt amperes (kVA)* | A unit of electric measurement equal to the product of a kilovolt volt and an ampere. For direct current, it is a measure of power and is the same as a kilowatt; for alternating current, it is a measure of apparent power. |
| *legacy plume* | Site-related ground water contamination that is found in the freshwater layer of the ground water system and that would still be present even if no further contamination of the ground water takes place. |
| *long-term surveillance and maintenance* | A task performed by the DOE Office of Legacy Management through the DOE in Grand Junction, Colorado. The Office of Legacy Management provides expertise and resources necessary to manage low-level radioactive material disposal and impoundment sites after remedial action is complete. |
| *macrophytes* | Large aquatic plants. |
| *maximally exposed individual* | A hypothetical individual whose location and habits result in the highest total radiological or chemical exposure (and thus dose) from a particular source for all exposure routes (e.g., inhalation, ingestion, direct exposure). |
| *millirem (mrem)* | One thousandth of a rem (0.001 rem); see *rem*. |

| | |
|---|---|
| *mixing zone* | A limited portion of a body of water, contiguous to a discharge, where dilution is in progress but has not yet resulted in a concentration that will meet certain standards for all pollutants (from State of Utah surface water regulation R317-2-13). |
| *natural flushing* | Allowing the natural ground water movement and geochemical processes to decrease contaminant concentrations. |
| *PEIS* | *Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project*, prepared by DOE in 1996 for the UMTRA Ground Water Project. The PEIS is intended to serve as a programmatic planning document that provides an objective basis for determining site-specific ground water compliance strategies at the UMTRA Project sites. |
| *pH* | A measure of the relative acidity or alkalinity of a solution, expressed in a scale of 0 to 14, with a neutral point at 7. Acid solutions have pH values lower than 7, and basic (i.e., alkaline) solutions have pH values higher than 7. Because pH is the negative logarithm of the hydrogen ion ($H^+$) concentration, each unit increase in pH expresses a change in state of a factor of 10. For example, pH 5 is 10 times more acidic than pH 6, and pH 9 is 10 times more alkaline than pH 8. |
| *plant community* | A group of interacting plant species that share a common habitat, including incoming solar radiation, soil water, and nutrients, that recycle nutrients from the soil to living tissue and back again and that alternate with each other in time and space. Plant community is a general term that can be applied to vegetation types of almost any size or longevity. A plant association is a particular type of community that has been described sufficiently and repeatedly in several locations. |
| $PM_{10}$ | Particulate matter in air small enough to move easily into the lower respiratory tract, defined as particles less than 10 micrometers in aerodynamic diameter. |
| *phytoremediation* | Use of plants to remove contaminants from ground water through root uptake. At the Moab site, tamarisk roots take in nitrogen compounds (e.g., ammonia and nitrate) from ground water. |
| *phreatophyte* | Deep-rooted plants that obtain water directly from the water table or a permanent ground water source. |
| *picocurie* | A unit of radioactivity equal to one trillionth ($10^{-12}$) of a curie. A curie is a unit of radioactivity equal to 37 billion nuclear disintegrations per second. |
| *plume* | The volume of contaminated ground water originating at a contaminant source such as the tailings pile at the Moab site and migrating downgradient. |

| | |
|---|---|
| *probable maximum flood* | The hypothetical flood that is considered to be the most severe reasonably possible flood, based on the comprehensive application of maximum precipitation and other hydrological factors favorable for maximum flood runoff (e.g., sequential storms and snowmelts). It is usually several times larger than the maximum recorded flood. |
| *radium-226* | A radioactive metallic element in the decay chain that begins with uranium-238 and ends with lead-206, a stable isotope. Radium-226 has a half-life of about 1,600 years and decays to radon-222, an inert gas. |
| *radon-222* | A radioactive inert gas in the decay chain that begins with uranium-238 and ends with lead-206, a stable isotope. Radon has a half-life of about 3.8 days and decays into polonium-218, a metallic ion. |
| *reasonable maximum exposure* | The highest exposure that is reasonably expected to occur at a site (EPA risk assessment guidance) (exposure is defined as the contact of an organism with a chemical or physical agent). |
| *recharge areas* | Areas in which water on the ground surface (e.g., precipitation or a water body) infiltrates downward and replenishes an aquifer. |
| *rem* | A unit of radioactive dose equivalent, equal to the absorbed dose in tissue multiplied by an appropriate quality factor and possibly other modifying factors. Derived from “roentgen equivalent man,” referring to the dose of ionizing radiation that will cause the same biological effect as one roentgen of X-ray or gamma ray exposure. |
| *record of decision (ROD)* | A public document that records a federal agency’s decisions concerning a proposed action for which the agency has prepared an EIS. The ROD is prepared in accordance with the requirements of the Council on Environmental Quality NEPA regulations (40 CFR 1505.2). A ROD identifies the alternatives considered in reaching the decision, the environmentally preferable alternatives, factors balanced by the agency in making the decision, whether all practicable means to avoid or minimize environmental harm have been adopted, and, if not, why they were not. |
| *rim syncline* | A local depression that develops between salt diapirs resulting from movement of underlying salt toward the diapir structure. |
| *river incision* | The geologic process by which the Colorado River cuts down through the bedrock sandstone outcroppings located upstream and downstream of the Moab site. |
| *river mile* | The distance of a point on a river measured in miles from the river’s mouth along the low-water channel. |

| | |
|---|---|
| *saline* | The USGS classification of water based on the following concentration ranges of TDS: fresh water has less than 1,000 mg/L TDS, slightly saline water has 1,000 to 3,000 mg/L TDS, moderately saline water has 3,000 to 10,000 mg/L TDS, very saline water has 10,000 to 35,000 mg/L TDS, and brine has more than 35,000 mg/L TDS. In the EIS, saline water in the basin fill aquifer beneath the Moab site is referred to as salty ground water, which is salty mostly from dissolution of evaporite minerals in the Paradox Formation. |
| *salt-cored anticline* | An anticline in which salt (from evaporating seawater, including other materials such as silt and clay) has flowed upward and formed the core of the anticline. |
| *salt diapir* | A dome or elongate anticlinal fold in which the overlying rocks have been ruptured or pierced by the squeezing out of low-density salt deposits and their resulting upward movement. |
| *settling* | The gradual compacting and lowering of the height of a tailings pile. It is caused by the weight of the pile squeezing liquids from slimes downward and out of the pile. |
| *slimes* | The fine-grained fraction of the mill tailings that consists of clay- and silt-sized grains; defined as material that will pass through a 200-mesh Tyler-equivalent sieve. |
| *steady-state conditions* | Conditions that exist when a system is in equilibrium and that do not change significantly over time (e.g., ground water constituent concentrations that remain essentially constant). |
| *subsidence* | The geologic process that is lowering the entire tailings pile at the Moab site because of ground water dissolving the Paradox Formation salt deposits that underlie the Moab-Spanish Valley. |
| *supplemental standards* | A narrative exemption from remediating ground water to prescriptive numeric standards (background concentrations, maximum concentration limits [MCLs], or alternate concentration limits [ACLs]), if one or more of the eight criteria in 40 CFR 192.21 are met. At the Moab site, the applicable criterion is limited-use ground water, (40 CFR 192.21[g]), which means that ground water has naturally occurring total dissolved solids (TDS) concentrations greater than 10,000 milligrams per liter (mg/L), and widespread TDS contamination is not related to past milling activities at the site. The PEIS (DOE 1996) also discusses supplemental standards within the context of “no ground water remediation.” However, guidance in 40 CFR 192.22 directs that where the designation of limited-use ground water applies, remediation shall “assure, at a minimum, protection of human health and the environment.” |
| *tailings pore fluids* | Water in the pore spaces between the mineral grains that make up the tailings pile at the Moab site. Fluids can be remnants of fluids disposed of in the former tailings ponds or precipitation that seeped into the pile. |

| | |
|---|---|
| *total dissolved solids (TDS)* | A measurement of the nonvolatile constituents dissolved in water. TDS is measured by filtering a water sample through a glass fiber filter having an average pore size of 1 micrometer, evaporating a measured volume of the filtered water to dryness at 105 degrees Celsius (°C), then drying the residue to a constant weight at 180 °C. The result is expressed in milligrams of residue per liter of water sample. Water with more than 2,000 to 3,000 mg/L TDS is generally too salty to drink. TDS concentration of seawater is about 35,000 mg/L. |
| *traditional cultural property (TCP)* | A significant place or object associated with historical and cultural practices or beliefs of a living community that is rooted in that community's history and is important in maintaining the continuing cultural identity of the community. |
| *UMTRA Project* | Uranium Mill Tailings Remedial Action Project that was approved by Congress in 1978 and gave DOE authority to clean up inactive uranium-ore processing sites and vicinity properties, including ground water. |
| *uranium* | A radioactive, metallic element that is the heaviest of the naturally occurring elements. Uranium has 14 known isotopes, of which uranium-238 (half-life of about 4.5 billion years) is the most abundant. Uranium-235 (half-life of about 700 million years) is used as a fuel for nuclear fission. |
| *vicinity properties* | Properties, either public or private in the vicinity of designated uranium-ore processing sites, that are believed to be contaminated with RRM and may be eligible for characterization and cleanup under the UMTRA Project. |
| *wetland* | Areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. |
| *working level* | A measure of radon daughter concentration, consisting of any combination of short-lived radon-222 decay products in 1 liter of air that result in the ultimate emission of alpha particle energy of $1.5 \times 10^5$ million electron volts. |
| *young-of-the-year* | Juvenile fish less than 1 year old. |
| *zooplankton* | The animal constituent of the small plants and animals that float or drift in fresh water, mainly insects or fish. |

End of current text

# 11.0 Index

## A



## B

# C



# D

# E



# F



# G

# H



# I



# J

No entries

# K



# L



# M



# N

## O



## P



## Q



## R



## S

# T

# U



# V



# W



# X, Y, Z

No entries