

**U.S. Environmental Protection Agency  
Region VIII  
Hazardous Waste Management Division  
Five-year Review (Type Ia)**

**Monticello Vicinity Properties (MVP) Site (San Juan County, Utah)**

**I. Introduction**

**Authority Statement. Purpose.** This review was conducted pursuant to Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) section 121(c), National Contingency Plan (NCP) section 300.430(f)(4)(ii), and Office of Solid Waste and Emergency Response (OSWER) Directives 9355.7-02 (May 23, 1991) and 9355.7-02A (July 26, 1994). The U.S. Department of Energy (DOE) Grand Junction Office (GJO) conducted the review for the U.S. Environmental Protection Agency (EPA) Region VIII in accordance with the Monticello Site Federal Facilities Agreement (FFA), dated December 1988, and with Executive Order 12580. This is a statutory review. The purpose of a five-year review is to ensure that a remedial action remains protective of public health and the environment and is functioning as designed. This document will become a part of the site file. This review (Type Ia) is applicable to a site at which response is ongoing. This document covers the first five-year review period from 1991 through 1996.

**Site Characteristics.** Contamination at Monticello resulted from the storage and milling of vanadium and uranium ore from 1940 to 1961. A mill and ore-buying station then operating on a tract at the south edge of town (Figure 1) generated extensive radiological and heavy-metal contamination. While most of this contamination remained at the millsite, wind and water erosion spread some contaminants across parts of Monticello and nearby rural areas. Private parties also removed tailings, ore, and contaminated scrap from the millsite for use as soil conditioner, backfill, building materials, or other purposes. Many individual properties—homes, businesses, agricultural tracts, and municipal facilities—have accordingly been contaminated.

The primary ore- and tailings-borne contaminants are radionuclides in the uranium decay series, particularly thorium-230, radium-226, radon-222, and daughters of radon-222. Significant exposure pathways affecting human health include:

- Inhalation of radon-222 and its daughters, which emit alpha radiation;
- External whole-body exposure to radionuclides that emit gamma radiation; and

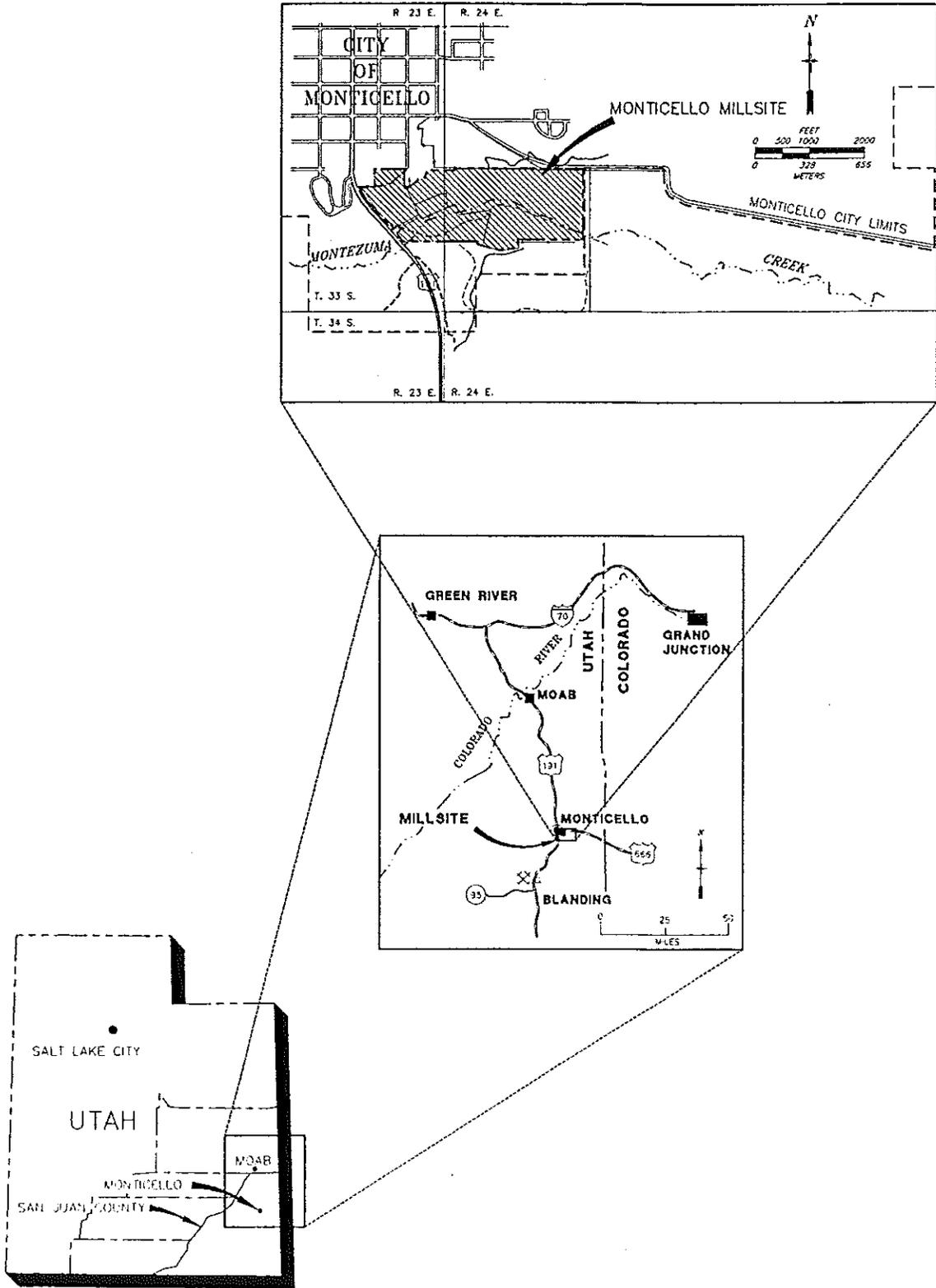


Figure 1  
 Monticello Vicinity Properties Locations

- Inhalation and ingestion of dust containing thorium-230 and radium-226, which emit alpha and gamma radiation.

Windblown tailings, either as dust or mixed with soil, are a major source of contamination. Other sources include tailings used as fill, as backfill around utility lines, as subbase under driveways, sidewalks, and concrete slabs, as backfill against foundations, and as aggregate in concrete, plaster, and mortar. Some properties also contain materials salvaged from mining and milling operations, as well as ore samples kept in collections or as souvenirs.

Under the FFA, DOE is the responsible party for remediating the Monticello Vicinity Properties Site. The site was placed on the National Priorities List (NPL) in June 1986, and a Record of Decision (ROD) was signed in November 1989. DOE began the cleanup in 1984, prior to the NPL listing, and had already finished remedial work at 62 properties when the ROD was signed. DOE is further responsible for certifying that the remediation is completed at each of the properties. The 420 individual properties included in the site as of December 1996, are grouped into eight operable units (OUs), designated A through H. These operable units are defined for administrative convenience and, except for OU E, do not imply geographic proximity of individual properties to each other.

For fiscal year 1996, 14 remedial actions were completed on Monticello Vicinity Properties. By the end of 1996, 389 properties were remediated on the Monticello Vicinity Properties Site.

## **II. Discussion of Chosen Remedies, Remedial Objectives, and Areas of Noncompliance**

**Operable Unit A.** OU A consists of 104 properties that DOE found to be contaminated before the FFA was signed. However, it does not include properties that were remediated before the effective date of the ROD. As of May 15, 1996, remedial construction for this OU was complete. A draft-final Remedial Action Report was submitted November 8, 1996. The report was approved by EPA, with the concurrence of the State, on January 13, 1997.

**Operable Unit B.** OU B consists of 243 properties that DOE found to be contaminated after the FFA was signed. As of December 13, 1996, construction was complete at 237 properties, 3 properties are in construction and 3 properties do not require remedial action because contamination exceeding standards was not found on the properties prior to remedial action even though they were included.

**Operable Unit C.** OU C consists of 34 properties with contamination traceable to uranium milling at Dry Valley, Utah, or to other sources not associated with the Monticello mill. Because these sources were not government-owned operations, DOE initially disputed the responsibility for remediating these properties. However, the dispute ended in September 1992 when DOE accepted this responsibility. As of December 13, 1996, construction was complete at 32 properties, one property was scheduled to be remediated, and one property

does not require remedial action because contamination exceeding standards was not found on the property prior to remedial action even though it was included.

**Operable Unit D.** OU D consists of six properties which were originally included in OUs A, B, or C. These are properties on which non-radiological hazardous substances are known or suspected to exist, based on site assessments conducted for radiological contamination or on evidence found during remedial action. DOE will remediate hazardous substances exceeding risk-based standards on 4 of the properties. On MS-00685 and MS-00688, because of current operations on these properties, the agencies agreed to limit remediation radiological contamination only, including radiological contamination mixed with non-radiological hazardous substances. As of December 13, 1996, construction was complete on 3 properties and 3 properties were in construction.

**Operable Unit E.** OU E consists of 8 properties crossed by Halls' Ditch, an irrigation ditch that passes through the millsite. Irrigation flows have spread contamination along the ditch and to adjoining areas of the eight properties. As of December 13, 1996, remedial action was in progress on these properties.

**Operable Unit F.** OU F consists of 10 properties, previously included in OUs A, B, or C, where owner negotiations or refusals have delayed remediation. Compensation issues and access issues are being resolved, and as of December 13, 1996, construction was completed on 4 properties. Owner negotiations are complete on 3 of the remaining properties. The remaining 3 properties are still in negotiation.

**Operable Unit G.** OU G holds new properties included in the MVP Site during 1995 and future years. It presently contains 10 properties, including the 5 properties identified during the Site Boundary Program. As of December 13, 1996, construction was completed on 3 properties. Remediation will not be required on one property because contamination does not exceed standards on the properties. The remaining 6 properties are either in design or scheduled for construction.

**Operable Unit H.** There are five properties being considered for supplemental standards within the MVP site. One property is privately owned and has dense stands of piñon and juniper trees. The property owner has requested DOE not to proceed with the remedial action due to the environmental degradation that will result from the cleanup work. Four of the properties are associated with the Highway 191 embankment where the cost of remediation may be excessive compared to the reduction in risk achieved by remediation. Supplemental standards are also being considered for city streets and utilities within the MVP site boundary. On November 4, 1996, the DOE submitted applications to EPA and UDEQ for implementing supplemental standards on these properties. On December 23, 1996, EPA and UDEQ concurred, with comment, on the utilization of supplemental standards at the proposed properties. Negotiations on specific issues are underway.

**Schedule for Remediation.** The present schedule for completing the remediation of the seven operable units is as follows:

Operable Unit	Engineering Complete	Construction Complete	Completion Reports Complete
OU A	September 6, 1994	May 15, 1996	November 6, 1998 (1)
OU B	February 1, 1996	November 27, 1997 (1)	November 6, 1998 (1)
OU C	February 13, 1996	July 1, 1997	October 8, 1998 (1)
OU D	October 17, 1996	November 27, 1997 (1)	August 10, 1998 (1)
OU E	October 4, 1996	October 7, 1997 (1)	May 11, 1998 (1)
OU F	March 23, 1998	October 29, 1998 (1)	March 15, 1999 (1)
OU G	April 27, 1998	October 29, 1998 (1)	March 15, 1999 (1)

(1) Proposed dates in the December 1996 Site Management Plan, Revision 1. These dates are subject to revision as the Site Management Plan is revised.

**Remedial Objectives.** The primary remedial objectives are (a) to excavate tailings and other byproduct materials or to modify existing structures to levels protective of human health and the environment, and (b) to temporarily store those wastes on the millsite. Ultimate disposal of the wastes will be in the on-site repository built for Operable Unit I of the Monticello Mill Tailings Site.

For radionuclides, the ROD states that cleanup standards for uranium mill tailings in 40 CFR 192 are considered protective. These standards require that average radium-226 concentrations in soil not exceed background by more than 5 picocuries per gram (pCi/g) in the surficial 15 centimeters (cm) averaged over 100 square meters, or by more than 15 pCi/g in successively deeper 15-cm layers. They also require, in habitable structures, that average concentrations of radon decay-products concentrations not exceed 0.02 working level to the extent practicable and in no case exceed 0.03 working level, and that gamma radiation not exceed background by more than 20 micro roentgen per hour. A property can be released for unlimited use and unrestricted exposure if these standards are met. Non-radiological hazardous substances present in OU D at concentrations that exceed risk-based cleanup standards will be excavated and removed as well, except on MS-00685 and MS-00688 as discussed under Section II, Operable Unit D. Hazardous wastes will be managed in accordance with the DOE *Special Waste Management Plan*, dated March 1995 and revised April 1996. The hazardous wastes must be managed in accordance with the Resource Conservation and Recovery Act and the Utah Solid and Hazardous Waste Act, and their implementing regulations, as required by the ROD.

Supplemental standards (40 CFR 192.21) may be appropriate at one or more Government- and privately-owned properties located near the millsite and repository. The moderately sloping hillsides on these properties are wooded with pinyon and juniper trees. Remediation costs and

environmental impacts may be excessive relative to the benefits gained from remediation for contaminants that do not pose a clear present or future risk to human health and the environment. DOE is also considering applying for supplemental standards for long-term management of areas such as city streets and the utilities buried beneath them and the Highway 191 embankment. Use of supplemental standards requires a long-term management plan and a contingency plan to control the affected properties. Plans, supporting documents for such long-term activities, and site-specific applications were submitted to EPA and the State of Utah on November 4, 1996. The EPA and the State have concurred, with comment, on the use of supplemental standards.

DOE conducted a program to locate additional properties that may contain Monticello millsite materials. The purpose of this program was to identify the geographic extent of includable properties, thereby defining the boundaries of the MVP Site. DOE sent letters to all property owners of record within an eight-mile radius of the millsite asking for information about any properties where contaminated materials from the millsite may have been taken. A total of 304 such letters were sent by mail on September 11, 1995, and another 146 were mailed on October 13, 1995. These mailing lists were consolidated and updated, and 267 letters were sent on March 28 and 29, 1996, notifying property owners that their last chance to notify DOE of possible radiological contamination on their property was April 30, 1996. DOE also published notices in two local newspapers of public record on September 19 and 20, 1995, to solicit information about Monticello millsite materials that may have been transported beyond the eight-mile radius. A full-page ad describing the program and stating the deadline was published in the April 2 edition of the *Blue Mountain Panorama* and the April 3 edition of the *San Juan Record*. The *San Juan Record* ran the ad again in April 10, 1996 issue. Smaller ads were also placed in the *Desert News* and the *Salt Lake Tribune*. A radio interview between DOE and KUTA radio in Blanding, Utah, was held Thursday, April 4. Sixty responses were received, and all but 6 of the 267 certified letters were verified as signed and delivered. Of the 60 responses, twenty properties required surveys and five were included. Exclusion letters were requested by 10 property owners who had been previously surveyed. The exclusion letters were obtained and mailed out.

**Areas of Noncompliance.** No areas of noncompliance were identified. However, the large number of individual properties and owners creates issues that need constant attention to assure that remedial objectives will be achieved. These issues include:

- **Owner Disputes.** Property owners may fail to cooperate with DOE, either by refusing to participate at all or by disputing some aspect of the remedial work. Case-by-case negotiations (or, if not avoidable, enforcement actions) must be taken to resolve these disputes.
- **Radon Decay-Product Concentration Failures.** In habitable structures, post-remediation measurements may show that the cleanup standard for radon-222 and its decay products (0.03 working level) was not achieved. RDC failures usually result in additional remedial actions being performed. An Action Plan has been developed for addressing the elevated working levels.

- **Extended Remediation.** At some properties now classified as “completed”, previously undiscovered contamination is occasionally found during remedial work on adjoining areas. Such discoveries result in another phase of assessment, design, and construction to remediate the newly found contamination and ensure that the property in question is, in fact, remediated in accordance with the ROD.

These issues are not confined to particular operable units, but can arise in any OU. Procedures exist for dealing with the issues, and appropriate site-specific measures are pursued at properties where one or more such issues exist. The objective is to assure that all such issues are resolved during the current remedial action, so that no areas of noncompliance actually develop.

Supplemental standards properties will not attain the cleanup standards in the ROD. This will not generate an area of noncompliance under the law, however. The granting of supplemental standards by EPA and the State constitutes a site-specific waiver, based on risk calculations, of the cleanup standards in accordance with the applicable or relevant and appropriate requirements. Supplemental standards are a “remedial action . . . that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure” (40 CFR 300.430(f)(4)(ii)) and are permitted under CERCLA, subject to ongoing five-year review.

### **III. Recommendations**

The following recommendations are made:

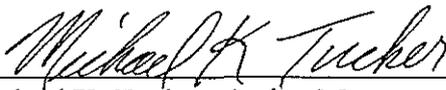
1. Continue the ongoing remediation as now planned.
2. Review and amend the existing Radiological and Engineering Assessments and remedial designs for any property where new evidence suggests that previous remedial work may have left contamination in place at levels exceeding the cleanup standards.
3. Add the Resource Conservation and Recovery Act and the Utah Solid and Hazardous Waste Act, together with appropriate regulations implementing them, to the ARARs for the site. These additions reflect the adoption of a double-liner design for the repository at the Monticello Mill Tailings Site and the subsequent decision to allow disposal of non-radiological wastes in the repository.
4. Finish developing the cleanup standards for non-radiological contaminants as a priority task so that the cleanup work is not delayed.
5. Finalize decisions as to whether supplemental standards will be used and where they will be used.

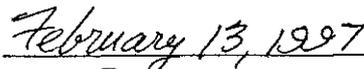
**IV. Statement on Protectiveness**

I certify that the remedies selected for this site, when fully implemented, will remain protective of human health and the environment.

**V. Next Five-Year Review**

The next five-year review will be conducted within five years after the date of issue of this report.

  
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Michael K. Tucker, Acting Manager  
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Date