

2018 Annual Inspection Report for the DOE Monticello, Utah, Mill Tailings Site and Monticello Vicinity Properties

December 2018



U.S. DEPARTMENT OF
ENERGY

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Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
GWRA	Groundwater Restricted Area
IC	institutional control
LCRS	Leachate Collection and Removal System
LDS	Leak Detection System
LM	Office of Legacy Management
LTS&M	long-term surveillance and maintenance
MMTS	Monticello Mill Tailings Site
MVP	Monticello Vicinity Properties
NPL	National Priorities List
OU	Operable Unit
PL	photograph location
PRB	permeable reactive barrier
TSF	Temporary Storage Facility
UDEQ	Utah Department of Environmental Quality
UDOT	Utah Department of Transportation

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Executive Summary

The annual inspection of the U.S. Department of Energy (DOE) Monticello Mill Tailings Site (MMTS) and Monticello Vicinity Properties (MVP) was conducted on September 10, 11, and 12, 2018. These sites, which are part of the Monticello, Utah, Disposal and Processing Sites, are inspected annually to ensure that the selected remedies remain protective of human health and the environment. Under those remedies, uranium mill tailings–related contamination remains in place at locations where use is restricted and exposure is limited. Annual inspections (1) verify that long-term surveillance and maintenance (LTS&M) activities implemented throughout the year are effective and appropriate, (2) confirm that the institutional controls (ICs) restricting land and groundwater use under the MMTS and MVP remedies remain effective, and (3) identify deficiencies and maintenance items and recommend corrective actions as needed. This report summarizes the results of the 2018 annual inspection.

Repository Findings. The repository site consists of the access area (support buildings and the Temporary Storage Facility [TSF]), the repository perimeter, runoff and run-on controls, Pond 4, the repository cover, and cover penetrations (manholes, settlement monuments, and structures associated with the embedded lysimeter). The site is well-maintained and well-managed. Signs displaying information were in order. The TSF bin did not contain any material; however, approximately 1.5 cubic yards of used personal protective equipment and operating materials used at the repository are stored in properly designated containers within the TSF fenced area. The repository cover did not show any settling, slumping, fracturing, seepage, ponding, or significant erosion. Site vegetation is healthy and composed primarily of desirable species. Sediment movement and vegetation were apparent in some of the drainage channels and toe trenches but do not impair their function. All perimeter signs have been replaced. The water in Pond 4 was approximately 7.6 feet deep, mostly from the operation of the groundwater remedy optimization system.

City-Owned Property Findings. There was no evidence that any ICs were violated on properties owned by the City of Monticello (City). Some signs on the properties posting ICs (such as a prohibition against overnight camping) were peeling and difficult to read. Replacement of the signs is being addressed. Wetlands were ecologically healthy and undamaged. No groundwater drilling applications were sought for the City-owned properties, and no drilling activities within the restricted area were noted or reported by onsite personnel. No fire pits or overnight campsites were discovered. The existing mountain bike trails were in good condition, and they appeared to be regularly used by the public. Intermittent work on an additional bike trail work showed no evidence that soil or brush has been removed from the site.

City Streets and Utility Corridor Findings. No unplanned or unmonitored excavations related to city streets and utility corridors were identified during the 2018 annual inspection. No new erosion of highway shoulders or along the U.S. Highway 191 embankment at Montezuma Creek was apparent. All planned excavations had been properly monitored by onsite personnel.

Private Property Findings. No changes in land use on restricted properties were apparent. No well-drilling permit applications were received by the Utah Division of Water Rights within the Montezuma Creek Restrictive Easement Area or the Groundwater Restricted Area. Onsite personnel verified that no wells were drilled in the alluvial aquifer for domestic use within the Groundwater Restricted Area. No significant land-use changes in these areas were apparent.

Records Findings. Deed restrictions were verified at the San Juan County Recorder’s Office, including those associated with the sale of properties. The Information Repository and the Operable Unit III Administrative Record were converted to electronic format in 2017. These collections were present and accessible electronically at the site. The site record books were correct and complete with only minor deficiencies, which were corrected before completion of the annual site inspection.

Operable Unit III Findings. Facilities related to the groundwater remedy optimization system—including the pipeline access road, transfer building, and extraction well field—were intact and functioning. Water sampling teams noted no deficiencies during routine well inspections in April 2018 and September 2018. Several inactive wells on property MP-00179 were repaired on November 3, 2017.

Conclusions and Recommendations. The 2018 annual inspection confirmed that DOE LTS&M activities implemented throughout the year remain effective and appropriate, and ICs restricting land and groundwater use as part of the MMTS and MVP remedies remain effective. No corrective actions or maintenance actions are necessary.

1.0 Introduction

The annual inspection of the U.S. Department of Energy (DOE) Monticello Mill Tailings Site (MMTS) and Monticello Vicinity Properties (MVP) was conducted on September 10, 11, and 12, 2018. These sites, which are part of the Monticello, Utah, Disposal and Processing Sites, are inspected annually to ensure that the selected remedies remain protective of human health and the environment. Under those remedies, uranium mill tailings–related contamination remains in place at locations where use is restricted and exposure is limited. Annual inspections (1) verify that long-term surveillance and maintenance (LTS&M) activities implemented throughout the year are effective and appropriate, (2) confirm that the institutional controls (ICs) restricting land and groundwater use under the MMTS and MVP remedies remain effective, and (3) identify deficiencies and maintenance items and recommend corrective actions as needed. This report summarizes the results of the 2018 annual inspection. Photographs to support specific observations are identified in the text and by photograph location (PL) numbers.

1.1 Monticello Site Background Information

1.1.1 Site History

Between the early 1940s and 1960, uranium and vanadium ore was intermittently handled and processed at the mill and ore-buying station in Monticello. Mill tailings with low-level radioactivity were impounded at the former mill, and some were dispersed over time to nearby properties by wind and water or were used for construction throughout the City of Monticello (City). Drainage of liquids from the impounded tailings contaminated groundwater in the underlying shallow alluvial aquifer, which eventually discharges into Montezuma Creek.

The MVP and MMTS projects were placed on the National Priorities List (NPL) in 1986 and 1989, respectively, to address mill-related contamination. Figure 1 shows the locations of the Monticello NPL sites. In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), DOE completed remediation of soil contamination at the MMTS and MVP in August 1999. Radioactively contaminated materials were placed in an engineered disposal cell approximately 1 mile south of the former mill site. The disposal cell (which was completed in October 1999) and associated support facilities are known collectively as the repository site (Figure 2).

In some locations, radioactively contaminated material was left in place in compliance with supplemental standards, as codified in Title 40 *Code of Federal Regulations* Section 192.21 (40 CFR 192.21). These areas referred to as supplemental standards areas (Figure 3 and Figure 4) are on City-owned and private properties, beneath city streets, and in utility corridors. ICs are applied to these properties and to the former mill site, although the former mill site is not a supplemental standards area. Restrictions are also applied to properties overlying contaminated groundwater.

Figure 3 identifies the locations of the Monticello properties affected by the remedial actions and subject to annual inspection. In this report, many of the inspection items refer to a specific property identifier, such as MS-00893. These identifiers were assigned during remedial actions for the purpose of tracking the scope and progress of remedial actions on individual land holdings.

1.1.2 Properties and ICs Included in the Annual Inspection

1.1.2.1 Repository Site

The repository site inspection includes the field office, the disposal cell, constructed features and support facilities, and Pond 4.

The field office consists of a main office building, support structures, and the Temporary Storage Facility (TSF). Support structures include outbuildings, concrete walks and pads, parking lots, electrical boxes, a meteorological station, an 8-foot-high chain-link fence, and gates. The TSF is a restricted-access, fenced, gravel-surfaced area where newly excavated or operations-generated radioactively contaminated materials are stored before eventual disposal offsite.

The disposal cell consists of a soil-covered, vegetated cap, and rock riprap side slopes (portions of which also contain surface soil). Around the base of the disposal cell are engineered, rock-lined runoff and run-on controls that collect and direct storm water and meltwater from the disposal cell. These include the West Drainage Channel, South Drainage Channel, East Toe Trench, and North Toe Trench. Cover penetrations include five manholes, two video ports, nine settlement monuments, and structures associated with a large lysimeter, which measures water flow, embedded in the eastern portion of the disposal cell (Figure 2). Manholes 1 and 3 enclose equipment for the repository Leachate Collection and Removal System (LCRS) and Leak Detection System (LDS).

Constructed features and support facilities include fences, gates, signs, access roads, boundary survey markers, and site monuments. A barbed-wire stock fence containing several gates marks the repository site boundary and discourages human trespass and livestock entry. Forty numbered location-reference signs (E for “entrance” and P1–P39 for “perimeter signs” 1–39) are fixed to separate posts along the perimeter, and additional signs are posted on or near site gates. Between the perimeter fence and disposal cell is an 8-foot-high wire-mesh wildlife fence that contains two vehicle access gates and five narrow wildlife apertures. Gravel-covered roads access the disposal cell, Pond 4, and the groundwater remedy optimization system. Two-track roads access other parts of the site, including most of the perimeter. Six boundary survey markers are located along the site perimeter fence. There is one site monument along the access road to the disposal cell and one at the apex of the disposal cell.

Pond 4 is a lined, solar-evaporation pond that collects disposal cell leachate, effluent from the groundwater remedy optimization system, and a small amount of precipitation. Pond 4 was constructed with its own separate LCRS and LDS. An 8-foot-high security fence surrounds Pond 4, and an appropriately posted rope barrier surrounds the radiological restricted area of the pond within the security fence. Water rescue equipment is also located around the pond. Two pedestrian gates and one vehicle gate are locked when not in use.

1.1.2.2 City-Owned and Private Properties

Figure 3 shows City-owned and private properties included in the annual inspection and subject to ICs. Supplemental standards areas are located on private property MS-00176 and properties in the Montezuma Creek Restrictive Easement Area (also known as the Montezuma Creek Soil and Sediment Properties: MP-00951, MP-00990, MG-01026, MG-01027, MG-01029, MG-01030, MG-01033, and MP-01084). Groundwater restriction ICs are applied to properties in the

Groundwater Restricted Area (GWRA) (also known as the Groundwater Management Area: MP-00179, MP-00181, MP-00211, MS-00893, MP-00947, MP-00951, MP-00990, MG-01033, and MP-01084).

DOE transferred several remediated properties to the City of Monticello in 2000 for use as a public park. The properties include the former mill site (MP-00181 and MS-00893), three nearby properties with supplemental standards areas (also known as Piñon/Juniper properties: MP-00391, MP-01041, and MP-01077), and two nearby properties without supplemental standards areas (MP-01040 and MP-01042). Property MP-00211, adjacent to the former mill site, was always City-owned. The City-owned properties were annexed in 2007 and are now within city limits, where bow hunting is allowed but hunting with firearms is prohibited. Pedestrian and mountain bike trails are used throughout the properties.

Land and groundwater use restrictions apply to the following City-owned and private properties:

- City-owned properties transferred from DOE are restricted to recreational day use. Overnight camping and the building of habitable structures are prohibited.
- City-owned supplemental standards properties (Piñon/Juniper properties) have an additional restriction that no soil be removed from the properties.
- In addition to the restrictions cited above, damage to Wetlands 1, 2, and 3 is prohibited on the former mill site properties.
- Within the Montezuma Creek Restrictive Easement Area, portions of the properties where supplemental standards have been applied have restrictive easements to prohibit soil removal or the construction of habitable structures.
- Within the GWRA, drilling for and appropriation of groundwater from the alluvial aquifer for domestic use is prohibited. This IC is administered by the Utah Division of Water Rights (Office of the State Engineer) through the well permitting and water rights processes.
- Special zoning ordinances affect properties MP-00211 and MS-00176; the ordinances require radiological scanning for certain ground-disturbing activities such as the construction of habitable structures.

1.1.2.3 City Streets and Utility Corridors

Radioactively contaminated soil remains in some places beneath city streets and utility corridors in Monticello, in the U.S. 191 embankment over Montezuma Creek, and in Utah Department of Transportation (UDOT) rights-of-way along U.S. 191 and U.S. 491. Supplemental standards have been applied to these areas. Through a cooperative agreement with the City, onsite personnel monitor excavations in supplemental standards areas for radioactively contaminated material, and the City transports any such material to the TSF under direction of the onsite personnel. Onsite personnel also monitor excavations of U.S. 191 and U.S. 491 within city limits. Through a Memorandum of Understanding between UDOT and DOE, UDOT has the option of returning contaminated material to the excavation as backfill or having City workers, under the direction of onsite personnel, haul the material to the TSF.

1.1.2.4 Operable Unit III

Surface components of the Operable Unit (OU) III groundwater remedy optimization system and groundwater well surface completions are inspected annually. The system is located on the DOE repository site, City-owned properties, and private property MP-00179.

In 2014, facilities related to the groundwater remedy optimization system were installed on property MP-00179, City-owned properties MP-01077 and MP-01042, and the repository site. Facilities include extraction wells, monitoring wells, utility vaults, a groundwater transfer building, and a water transmission pipeline. The system became functional in January 2015. Areas disturbed by the project were revegetated in 2015.

A groundwater treatment system comprising the permeable reactive barrier (PRB) and ex situ treatment cells is on property MP-00179. With the operation of the groundwater remedy optimization system, the treatment cells were deactivated in December 2014 and are no longer inspected. The PRB is a subsurface structure and cannot be inspected.

OU III water quality is monitored at an established network of active groundwater monitoring wells and surface water monitoring sites. A number of inactive wells are also located on property MP-00179.

1.2 Long-Term Surveillance and Maintenance

The DOE Office of Legacy Management (LM) administers the long-term stewardship of the Monticello NPL sites to ensure that the selected remedies continue to be protective of human health and the environment. The U.S. Environmental Protection Agency (EPA) Region 8 and the Utah Department of Environmental Quality (UDEQ) provide oversight. Annual inspections are one component of LTS&M at Monticello. Other primary components include operating and maintaining the disposal cell's leachate management system (LCRS and LDS), inspecting the repository site and properties affected by ICs on a monthly or quarterly basis, and monitoring and managing radioactively contaminated materials encountered at City and UDOT excavations inside Monticello city limits. Because the surface water and groundwater remedy is still being implemented, activities associated with OU III are not LTS&M activities. However, long-term procedures related to OU III are included in the *Long-Term Surveillance and Maintenance Plan for the Monticello NPL Sites* (LMS/MNT/S00387) (DOE 2018), hereafter called the LTS&M Plan, and several items are inspected annually (Section 2.7). CERCLA Five-Year Reviews (begun in 1997) are also conducted separately from the annual inspections to monitor and document the protectiveness of the MMTS and MVP remedies.

LTS&M activities, including annual inspection and reporting, are conducted by onsite personnel (LM contractor site operations lead and site representatives) and offsite personnel (LM and LM contractor employees) in accordance with the procedures provided in the LTS&M Plan.

1.3 Annual Site Inspection Scope

Annual inspections of the MMTS and MVP focus on five general topics: recordkeeping and administrative review, DOE repository site, City-owned and private properties, city streets and

utility corridors, and OU III. The “Annual Inspection Checklist” (Appendix A) records the items inspected; Appendix A comprises the completed checklist for the 2018 annual inspection.¹

Inspectors review site recordkeeping to ensure that day-to-day activities are properly documented. Findings are recorded in Section II of Appendix A. Onsite record books, surveillance checklists, and radiological as-built drawings are verified. Radiological as-built drawings, in addition to onsite record books, document the location and findings of radiological control measures provided by onsite personnel during municipal and State of Utah construction activities inside Monticello city limits in accordance with the LTS&M Plan. The inspection confirms that deed annotations applicable to restricted properties remain accurately filed and accessible at the San Juan County courthouse, updated copies of relevant LTS&M documents are available to onsite personnel, and workers accessing the TSF are appropriately trained or escorted. Inspectors also verify that the Monticello copy of the Information Repository and OU III Administrative Record documents are accessible to the public.²

The repository site is inspected for the integrity of constructed features, support facilities, the perimeter, the disposal cell cover, and cover penetrations. The disposal cell cover is monitored for evidence of slumping or settlement. The health and composition of vegetation, an integral part of vegetated cover performance, is assessed. The Pond 4 and TSF inspection are included in the repository site inspection. Observations are recorded in Section III of Appendix A.

City-owned and private properties related to MMTS and MVP are inspected annually to confirm that ICs, as described in the LTS&M Plan, remain effective and to document changes in conditions that may affect the protectiveness of the remedies. Properties are inspected for evidence of violations of applicable restrictions, and findings are recorded in Sections IV, V, VI, and VIII-C of Appendix A.

During the annual inspection, the supplemental standards areas within city streets and utility corridors and UDOT rights-of-way for U.S. 191 and U.S. 491 are inspected for evidence of unmonitored excavations or soil movement. Results are recorded in Sections VIII-A and VIII-B of Appendix A.

Surface components of the OU III groundwater remedy optimization system and groundwater well surface completions are inspected annually and recorded in Section VII of Appendix A. Facilities related to the groundwater remedy optimization system are regularly inspected and maintained by onsite personnel. Facilities include surface features of extraction and monitoring wells, utility vaults, the groundwater-transfer building, and the water transmission pipeline. Water sampling teams inspect groundwater wells during sampling in April and October of each year; onsite personnel also note any deficiencies during routine inspections.

¹ Revised in 2018, this checklist was taken from the revised LTS&M Plan (June 2018).

² The MMTS OU I and II and MVP Administrative Record documents were archived in accordance with CERCLA guidelines in 2008. The MMTS OU III Administrative Record and the sites’ Information Repository were scanned in 2018 and are available electronically onsite and on LM’s website.

1.4 2018 Annual Site Inspection Participants and Schedule

Inspection team members and affiliations are listed on page 1 of Appendix A. D. Marshall and P. Wetherstein conducted the physical site inspection on September 10, 11, and 12, 2018. J. Nguyen, F. Smith, and G. McKinnon also participated in the inspection. EPA representatives were not in attendance. M. Stilson, regional engineer with the Utah Division of Water Rights, was contacted in conjunction with the inspection.

Monday, September 10, 2018

Inspection team members convened at the DOE Monticello field office to review the inspection procedure, inspection checklist, and safety and health documents. Inspectors completed an inspection of the onsite records and the disposal cell cover and penetrations.

Tuesday, September 11, 2018

Field inspection included the TSF, Pond 4, repository site access area, field office facilities, runoff and run-on controls, perimeter, site monuments, boundary markers, and repository perimeter fence and signs.

Wednesday, September 12, 2018

The former mill site properties and City-owned supplemental standards areas were inspected. Property deed restrictions were verified at the San Juan County Recorder's Office. ICs in the Montezuma Creek Restrictive Easement Area were verified with the onsite personnel, and portions of Montezuma Canyon were inspected from observation points above the area.

1.4.1 Additional Inspection-Related Activities

In 2018, areas associated with OU III were inspected by water sampling crews in conjunction with maintenance and sampling activities at the OU III groundwater wells and surface water locations. Structures associated with the groundwater remedy optimization system were regularly inspected and maintained by onsite personnel. Compliance with drilling and water use ICs in the GWRA was verified in a phone call with M. Stilson of the Utah Division of Water Rights on September 6, 2018.

2.0 Site Inspection Results

2.1 DOE Repository Site and Disposal Cell

The repository site consists of the access area (support buildings and the TSF), the repository perimeter, runoff and run-on controls, Pond 4, the repository cover, and cover penetrations (manholes, settlement monuments, and structures associated with the embedded lysimeter). Results of the 2018 repository site inspection are summarized below and in Appendix A, Section III.

2.1.1 Access Area

The Monticello field office buildings and associated structures were in excellent condition and well-maintained (PL-1). A new electric front gate to the administrative building was installed the week of August 27 (PL-2). Safety bollards were installed in front of the electrical panels. Site access signs displaying contact information were visible, and the new signs containing updated information were in place and in good condition. The site's paved access road was in very good condition.

During the 2018 annual inspection, the TSF fence was appropriately posted with access control signs, and there was no evidence of vandalism or trespassing (PL-3). The TSF bin was not opened during the inspection, but the site operations lead reported that it did not contain any material. The TSF yard was well-maintained (PL-4). The lay-down area for potential mixed waste was in good working order, as were clamshell containers which contain approximately 1.5 cubic yards of used personal protective equipment, etc. The TSF was also inspected quarterly by site personnel in 2018, and inspection results were presented in quarterly reports to EPA and UDEQ.

2.1.2 Repository Perimeter

Perimeter Fence

Two sections of the northwest perimeter fence (PL-5 and PL-6) have been repaired. No evidence of vandalism or areas of excessive tumbleweed or debris buildup were present.

Location-Reference Signs

All perimeter signs were replaced in 2018 (PL-7). Black numbered decal stickers to identify the sign number are now used, replacing the black marker identification that ended up faded by exposure to the elements.

Boundary Markers

All six boundary markers were located during the inspection, and all were in good condition (PL-8).

Erosion and Gullies

Erosion channels and drainages around the site perimeter were generally well-vegetated and had not significantly changed since the 2017 annual inspection. Erosion controls and revegetated areas related to the groundwater remedy optimization system were in good condition, and no major erosional areas were noted. The deep gully on the west edge of the disposal site described in previous inspection reports had not changed significantly since 2017 (PL-9). The gully does not threaten the integrity of site features but will continue to be monitored.

Perimeter Vegetation

Vegetation between the perimeter fence and the wildlife fence (inner fence) was healthy and composed primarily of desirable species. Several small populations of noxious weeds were treated with herbicide after the annual inspection on September 12, 2018. Prairie dog activity

was observed along the eastern portion of the site. That activity, which had declined significantly over the past few years, continued to decrease in 2018.

2.1.3 Repository Runoff and Run-On Controls

Over time, siltation has occurred within the site's drainage channels and the North and East Toe Trenches.

South Drainage Channel and West Drainage Channel

The South and West Drainage Channels were in very good condition, with no evidence of new erosion (PL-10 and PL-11). Shrubs observed in portions of the ditches do not block potential flow, and burrows from small rodents that are found in places along the margin of the ditches do not threaten their integrity.

East Toe Trench and North Toe Trench

The East Toe Trench and North Toe Trench were in good condition. No erosion of these trenches was evident. Beginning in 2013, inspectors observed increased siltation from the repository side slope into both toe trenches during heavy rainfall events. The siltation does not impair the functioning of the trenches. PL-12 shows additional lighter-colored rock within the toe trench. There are no erosional features upgradient of this rock indicating that the rock has been displaced.

2.1.4 Pond 4

The Pond 4 area is inspected annually and also inspected monthly by site personnel. The results of the inspections are presented in quarterly reports to EPA and UDEQ.

Gate, Fence, Entrance, and Perimeter Signs

All gates were in good working condition. Warning signs on the perimeter fence were easily visible and legible. There was no evidence of vandalism or trespass, and all gates were locked at the time of the inspection (PL-13).

Pond Perimeter and Berm

The pond's radiological rope barrier was intact and in good condition. Animal burrows made by voles and other small rodents were visible on and below the pond's berm on all sides. However, no large burrows that might threaten the berm's integrity were found. Vegetation on the slopes of the berm was well-established and healthy. Pond 4 is shown in PL-14.

Lifesaving Equipment

Lifesaving rings and a rescue and work skiff were present and easily accessible near the pond. Cabinets containing water rescue equipment were also highly visible, adequately labeled, and in good condition.

Pond 4 LCRS/LDS Control Cabinet

The weatherproof LCRS and LDS control cabinet was in good condition. Operation of the Pond 4 LCRS and LDS is described in Section 2.1.6.

Liner and Pond Interior

The water in Pond 4 was approximately 7.6 feet deep at the time of the inspection, due mostly to the operation of the groundwater remedy optimization system. No visible evidence of holes or other damage to the pond liner was observed.

2.1.5 Repository Cover

The repository cover is inspected annually and also monthly by site personnel. Results of the monthly inspections are provided in quarterly reports to EPA and UDEQ.

Roads, Wildlife Fence, Site Monuments, and Raptor Perches

The gravel road surrounding the disposal cell and the road to Pond 4 were in very good condition. To address erosion issues, new water bars were constructed on the access road to the transfer building (PL-15). The wildlife fence and gate apertures were functional and showed no evidence of vandalism. Damaged sections of the wildlife fence were apparent, but the fence remained functional, and repairs were not required. All gates in the wildlife fence were open. Both site monuments—one at the west access gate inside the wildlife fence and one at the apex of the disposal cell (PL-16)—were present and intact. Six raptor perches, installed near the disposal cell cover in 2007, were also in good condition, and the supporting beam brace on one perch is still detached, but that does not interfere with its function.

Vegetation

Desirable plants remained well-established on the cover, and no significant barren or eroded areas were identified. No damage to vegetation or soils from rainstorms was apparent, and no species of phreatophyte shrubs were growing on the cover. As in recent years, there were a large number of healthy young sagebrush (*Artemisia tridentata*) plants. The small quantity of field bindweed (*Convolvulus arvensis*), which the State of Utah lists as a Class C noxious weed, was still present on the cover, but control was not necessary.

The Repository Cover Vegetation Index, developed in 2009 for use during annual inspections (Appendix A), indicated that the cover vegetation remains healthy. The vegetation condition score, used to detect trends in the health of the vegetation community, was 3.8 in 2018, similar to the score in 2017. Dominant species identified on the cover in 2018 included sagebrush (*Artemisia tridentata*), rubber rabbitbrush (*Ericameria nauseosa*), western wheatgrass (*Pascopyrum smithii*), crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*Thinopyrum intermedium*), smooth brome (*Bromus inermis*), and cheatgrass (*Bromus tectorum*). Three of these species are native, and one is weedy (cheatgrass).

Vegetation on the repository's soil-covered side slopes, rock slopes, and outlying areas, similar in composition to that on the repository cover, was also healthy.

Burrowing Animals

Evidence of small burrowing animals has been observed on the repository cover for years. Raptors and other predators have kept these populations at low to moderate levels since a vole outbreak in 2006. In 2013, prairie dog burrows were found on the repository cover for the first time. The burrows appeared to be abandoned in 2015, and there was no evidence of prairie dog activity in 2016. In 2018, no new prairie dog activity was observed. Because the repository cover

was engineered to withstand prairie dog and small rodent activity, populations are not a concern, but burrows will continue to be monitored. Inspectors and onsite personnel will look for evidence of gray-colored soils being cast to the surface, as this would indicate excavation into the biointrusion layer. No such soils have been observed on the surface to date.

Stability

No area of the cover indicated settling, slumping, fracturing, seepage, ponding, or significant erosion. An inspection was performed at the Monticello repository on September 11, 2018, with the lead inspector, site engineer, and G. Smith of Geo-Smith Engineering, LLC. The purpose was to evaluate geotechnical behavior of the repository as part of the comprehensive inspection. The areas inspected by the geotechnical engineer were observed to be in good to excellent condition from a geotechnical standpoint. No depressions, erosion, slope stability, or foundation conditions that present problems were observed. Mr. Smith's full report is attached in Appendix B.

2.1.6 Cover Penetrations

Manholes and Video Ports

The manholes are restricted areas and were not entered during the annual inspection, but the exteriors were observed and were in good condition (PL-17). All five manhole covers were secure and operable. Appropriate safety warnings and entry procedures were posted on all of the manholes (PL-18), exterior pump access ports were undamaged, telemetry surface installations were in good condition, and no leakage or drainage was evident. Covers of the inoperable video ports were locked and secure.

Settlement Plates

Nine settlement plates, identified by the letters A–I, are on the disposal cell. The outer protective casings (8-inch PVC pipe) and the inner plates were intact and undamaged (PL-19). Elevation surveys on the settlement plates are performed every 5 years in preparation for the CERCLA Five-Year Review. No significant settlement was reported in 2016 during the last survey, and the next scheduled survey is in 2021.

Embedded Lysimeter

External features of the embedded lysimeter were inspected. Along lysimeter cover penetrations, no seepage was evident, and instrumentation installations were in good condition. A new rain gauge was installed, in May 2018, on the northeast corner of the disposal cell.

Operation of Repository and Pond 4 LCRS and LDS

Monitoring of leachate production is performed automatically via the repository telemetry system, which relays data to the LM System Operation and Analysis at Remote Sites (SOARS) system for offsite viewing, evaluation, and management. Onsite personnel routinely monitor infrastructure and leachate production in accordance with specifications in the LTS&M Plan. Leachate production rates are provided in quarterly reports to EPA and UDEQ. Interviews with onsite operations personnel indicate that the repository and Pond 4 LCRS and LDS are operating properly.

2.2 City-Owned Properties

Results of the 2018 annual inspection of City-owned properties are summarized below and in Section IV of Appendix A.

2.2.1 Recreational Use

The City-owned properties transferred from DOE are accessible to the public. Access roads were serviceable, although roads on property MP-01040 were eroded and may not be accessible by two-wheel-drive vehicles. Some signs on these properties that post ICs (such as a prohibition against overnight camping) continue to be difficult to read. The signs were also outdated, as bow hunting is now allowed on the properties. Replacement of signs is being addressed. No evidence of overnight camping was observed on any of the properties. Mountain bike trails were in good condition, and they appeared to be regularly used by the public.

2.2.2 Construction of Habitable Structures

No evidence of construction of habitable structures was observed on these properties during the 2018 inspection.

2.2.3 Supplemental Standards Areas on Piñon/Juniper Properties

No evidence of soil removal was noted on any of the Piñon/Juniper properties supplemental standards areas, including in areas disturbed by the construction of new mountain bike trails. The supplemental standards areas were physically delineated by four-strand wire fences when the mill site remediation was complete. The City breached sections of these fences to accommodate mountain bike trails, and other sections of the fence have degenerated due to age. The bike trails and areas of eroded soils are routinely radiologically surveyed after heavy storms (as defined in the LTS&M Plan). Radiation levels above background have never been detected, and survey records are available at the Monticello field office.

2.2.4 Soil Movement, Drainage, and Runoff Controls

All riprap-armored structures, dams, check dams, berms, and runoff control drainages (Figure 4) were intact and functional. PL-20 shows a portion of City-owned property MP-01040, and PL-21 shows a portion of the access road near Deer Draw Dam. Both photographs illustrate the well-vegetated and intact soils that characterize the City-owned properties.

The erosion gully on the hillside on property MP-01077 above the transfer building was inspected in 2018. The gully has not deepened since 2017.

2.2.5 Wetlands

Wetlands 1, 2, and 3 on the former mill site (Figure 4) were ecologically healthy, and no evidence of damage by human activity or natural causes was apparent (PL-22, PL-23, and PL-24).

2.2.6 Groundwater Use

No evidence of water-well drilling on City-owned properties with groundwater restrictions was observed during routine inspections or during the 2018 annual inspection. No applications to appropriate water or to drill were filed with the Utah Division of Water Rights for these areas (Section 2.6), and no drilling activities within the restricted area were noted or reported by onsite personnel.

2.3 City Streets and Utility Corridors, and UDOT Rights-of-Way

Section VIII of Appendix A presents results of the 2018 annual inspection of UDOT rights-of-way and city streets and utility corridors. No unmonitored or unplanned excavations were identified. Onsite personnel were aware of all planned excavations, and excavations were monitored in accordance with the LTS&M Plan. PL-25 shows an area of work in city streets during 2018. PL-26 shows the U.S. 191 embankment along the former mill site with minimal erosion. On the embankment is a drainage pipe that was installed in 2018, with no excavation required. No excavation work was performed within any UDOT rights-of-way in 2018.

2.4 Private Property MS-00176-VL

During the 2018 annual inspection, there was no evidence of erosion, soil removal, or construction of habitable structures (Appendix A, Section VIII-C) on property MS-00176. Over time, storm water runoff has deposited sediment from this property along the road, and this sediment is radiologically surveyed after significant rainfall events by onsite personnel. Levels of radiation in the sediment have never been above background.

2.5 Properties in the Montezuma Creek Restrictive Easement Area

Properties in the Montezuma Creek Restrictive Easement Area are inspected on a regular basis by onsite and water sampling personnel; during these visits, no evidence of significant erosion or soil removal from the restricted areas of these properties was noted. In 2018, portions of Montezuma Canyon were inspected from observation points above the area, and no evidence of land-use changes or disturbance to the easement area was found. Observations in the easement area (PL-27) are recorded in Appendix A, Section V.

2.6 Groundwater Restricted Area

On September 13, 2018, M. Stilson of the Utah Division of Water Rights confirmed that there were no applications to appropriate water from the shallow alluvial aquifer in the GWRA. There were also no applications or approvals to drill into or through the shallow alluvial aquifer (Appendix A, Section VI). Onsite personnel also verified during routine surveillance that no new wells were installed within the GWRA.

2.7 Operable Unit III

2.7.1 Groundwater Remedy Optimization System

Facilities related to the groundwater remedy optimization system are regularly inspected and maintained by onsite personnel, and results are provided to EPA and UDEQ in quarterly reports and annual groundwater reports. During the annual inspection, the pipeline access road (PL-28), transfer building, and extraction well field were visited, and the visible components of the system were intact and functioning.

2.7.2 Water Quality Monitoring Well Inspection

Water sampling teams noted no deficiencies during routine well inspections in April and September 2018. During the 2017 annual inspection, several inactive wells on property MP-00179 were still missing surface components. On November 3, 2017, the well maintenance team made all the requested repairs to the inactive wells.

2.8 Administrative and Records Inspection

The following documents and records, recorded by the onsite personnel, were inspected for completeness and accuracy of information (Appendix A, Section II):

- Radiological as-built drawings (residential and utility maps that document the location and results of radiological control provided by onsite personnel).
- Site record books, which include the repository site, the TSF, City-owned properties, private property restricted areas, and public roads and utilities.
- Surveillance checklists, which include meteorological monitoring data; TSF access and security logs; and monthly, quarterly, and Pond 4 surveillance checklists. Pond 4 and repository LCRS and LDS monitoring records are maintained electronically.

Deed restrictions (verified in the San Juan County Recorder's Office) were inspected to ensure that administrative controls remain in effect with the City of Monticello and San Juan County.

The following categories of documents and records were inspected to ensure that pertinent information for implementing LTS&M activities is readily available to onsite personnel and the general public:

- LTS&M Plan (including site-specific emergency response information), the *Safety and Health Manual* (LMS/POL/S04321), and the *Quality Assurance Manual* (LMS/POL/S04320). These documents are available electronically.
- Information Repository and OU III Administrative Record.
- LTS&M training records (applicable to onsite personnel and unescorted employees from the City of Monticello who access the TSF).

No major deficiencies were noted in the above administrative categories. LTS&M documents were available electronically from the field office. Deed restrictions were verified at the San Juan County Recorder's Office, including those associated with the sale of properties. Annotations

were in place for properties sold or divided, and deed restrictions were attached. The Information Repository (updated in August 2018) and OU III Administrative Record (updated in October 2012) were present at the Monticello field office. The site record books were correct and complete and contained only minor errors that were corrected by onsite personnel before the end of the annual inspection.

3.0 Conclusions and Recommendations

The 2018 annual inspection confirmed that DOE LTS&M activities implemented throughout the year remain effective and appropriate, and ICs restricting land and groundwater use as part of the MMTS and MVP remedies remain effective. No corrective actions are necessary.

4.0 Photographs

Photographs were taken to document findings of the 2018 annual inspection. The location and orientation of the photographs are identified in Figure 2, Figure 3, and Figure 4.

5.0 References

40 CFR 192.21. U.S. Environmental Protection Agency, “Criteria for Applying Supplemental Standards,” *Code of Federal Regulations*.

DOE (U.S. Department of Energy), 2018. *Long-Term Surveillance and Maintenance Plan for the Monticello NPL Sites*, LMS/MNT/S00387, Office of Legacy Management, June.

Quality Assurance Manual, LMS/POL/S04320, continuously updated, prepared by Navarro Research and Engineering, Inc. for the U.S. Department of Energy Office of Legacy Management.

Safety and Health Manual, LMS/POL/S04321, continuously updated, prepared by Navarro Research and Engineering, Inc. for the U.S. Department of Energy Office of Legacy Management.



PL-1. Monticello Field Office Building



PL-2. New Electric Gate to the Administrative Building



PL-3. TSF Gate with Postings



PL-4. TSF Yard



PL-5. Repaired Gap in Northwest Fence Line



PL-6. Northwest Fence Repaired from Last Year



PL-7. New Perimeter Sign P32



PL-8. Boundary Survey Marker S-6



PL-9. Looking North Toward Perimeter Sign 1 Where Erosion Channel Shows Little Change



PL-10. South Drainage Channel, Looking East



PL-11. West Drainage Channel, Looking North



PL-12. East Toe Trench, Looking North



PL-13. Pond 4 Entry Gate



PL-14. Pond 4, Looking East



PL-15. Access Road and Transmission Pipeline, Looking North



PL-16. Looking North at Site Monument 2



PL-17. Looking North from Manhole 1



PL-18. Manhole 5 Showing Current Postings



PL-19. Looking at Interior of Settlement Plate A



PL-20. Well-Established Vegetation and Check Dams on City-Owned Property MP-01040



PL-21. Deer Draw Dam



PL-22. View of Wetland 1 on Former Mill Site



PL-23. View of Wetland 2 on Former Mill Site



PL-24. View of Wetland 3 on Former Mill Site



PL-25. Utilities Construction, Looking South on 1075 East and Center Street



PL-26. U.S. Highway 191 Embankment



PL-27. Montezuma Canyon, View Downstream



PL-28. Transfer Building, Looking West

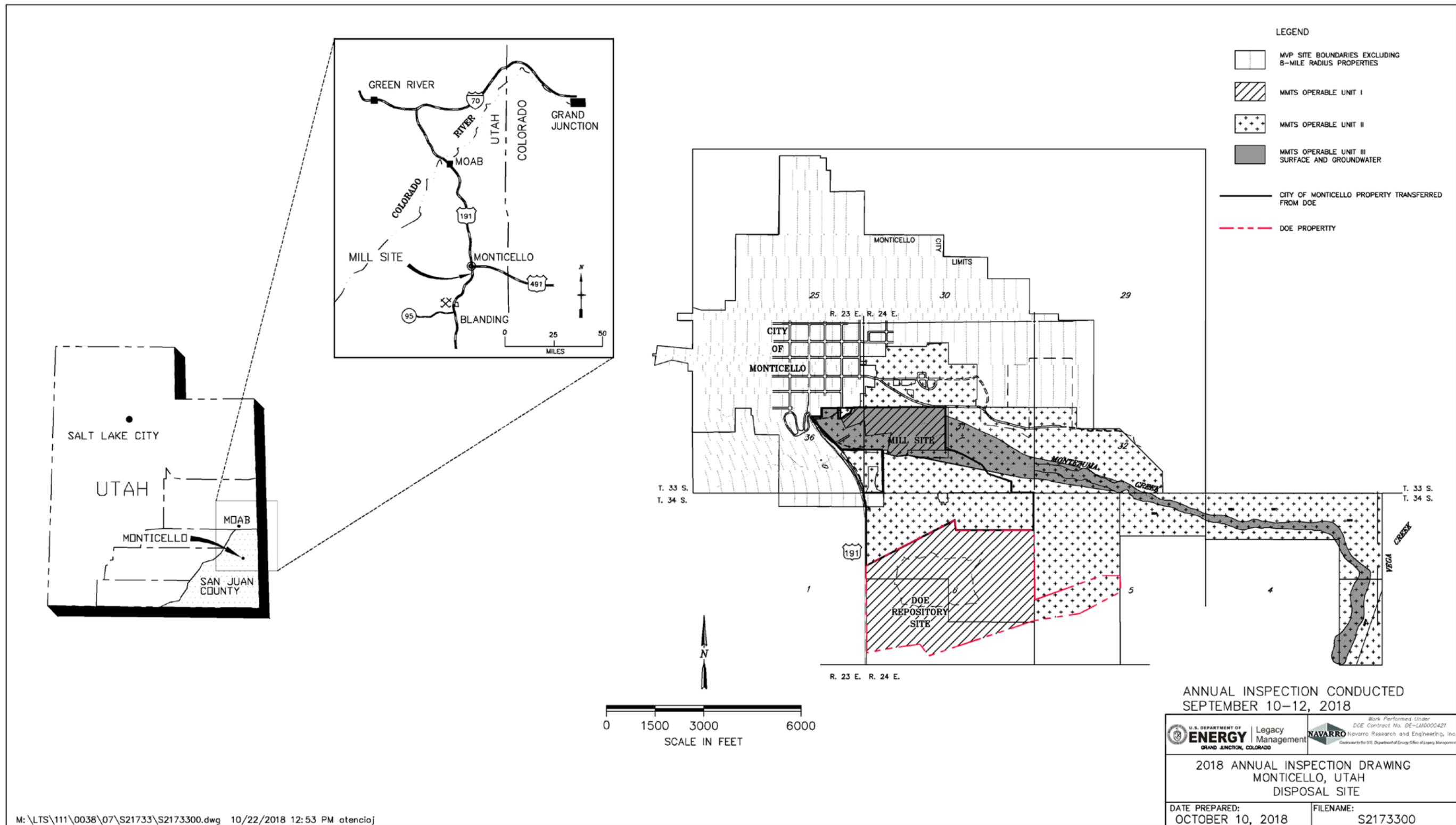


Figure 1. Location of Monticello MMTS and MVP Sites

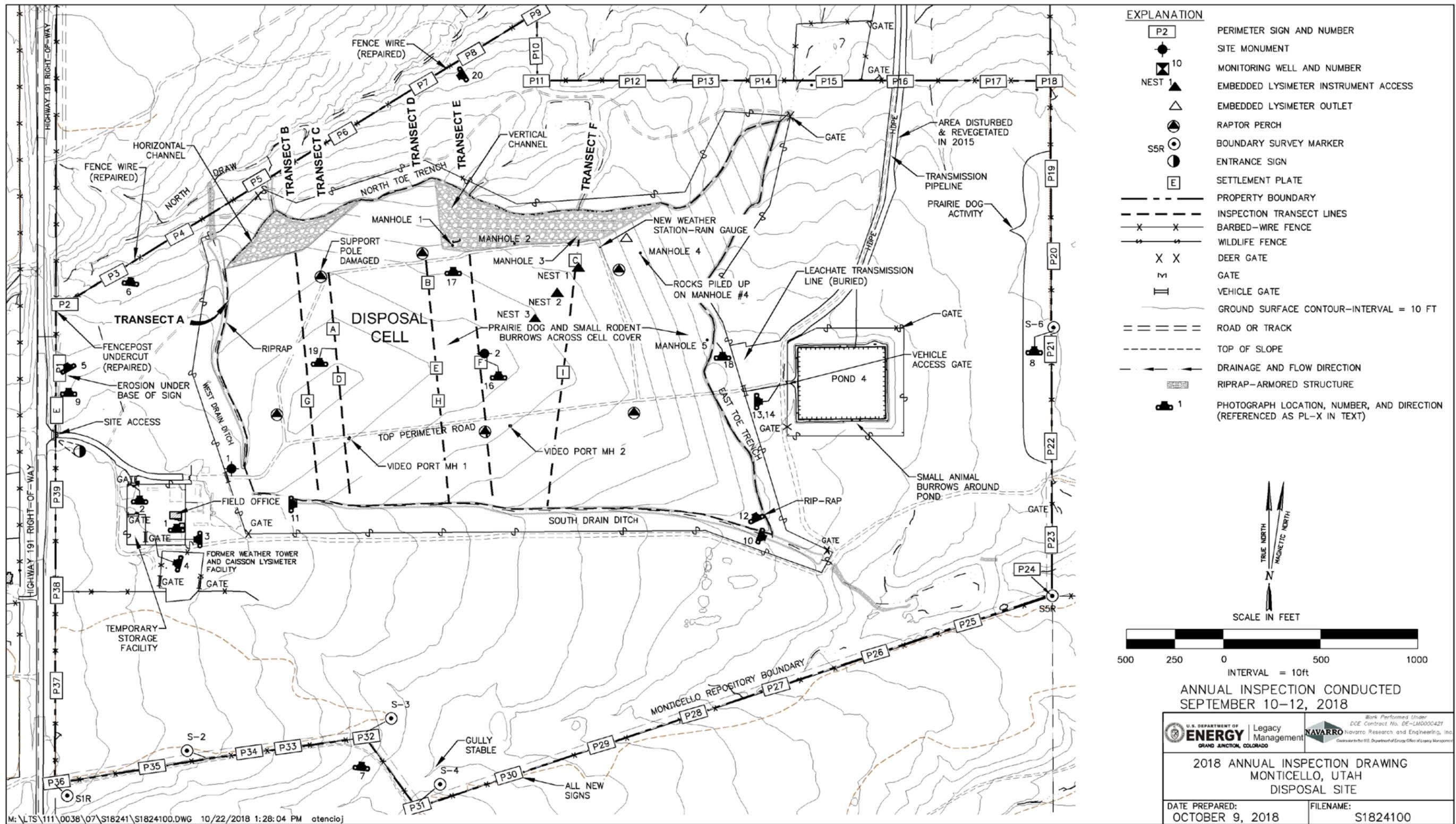


Figure 2. Monticello, Utah, Repository Site

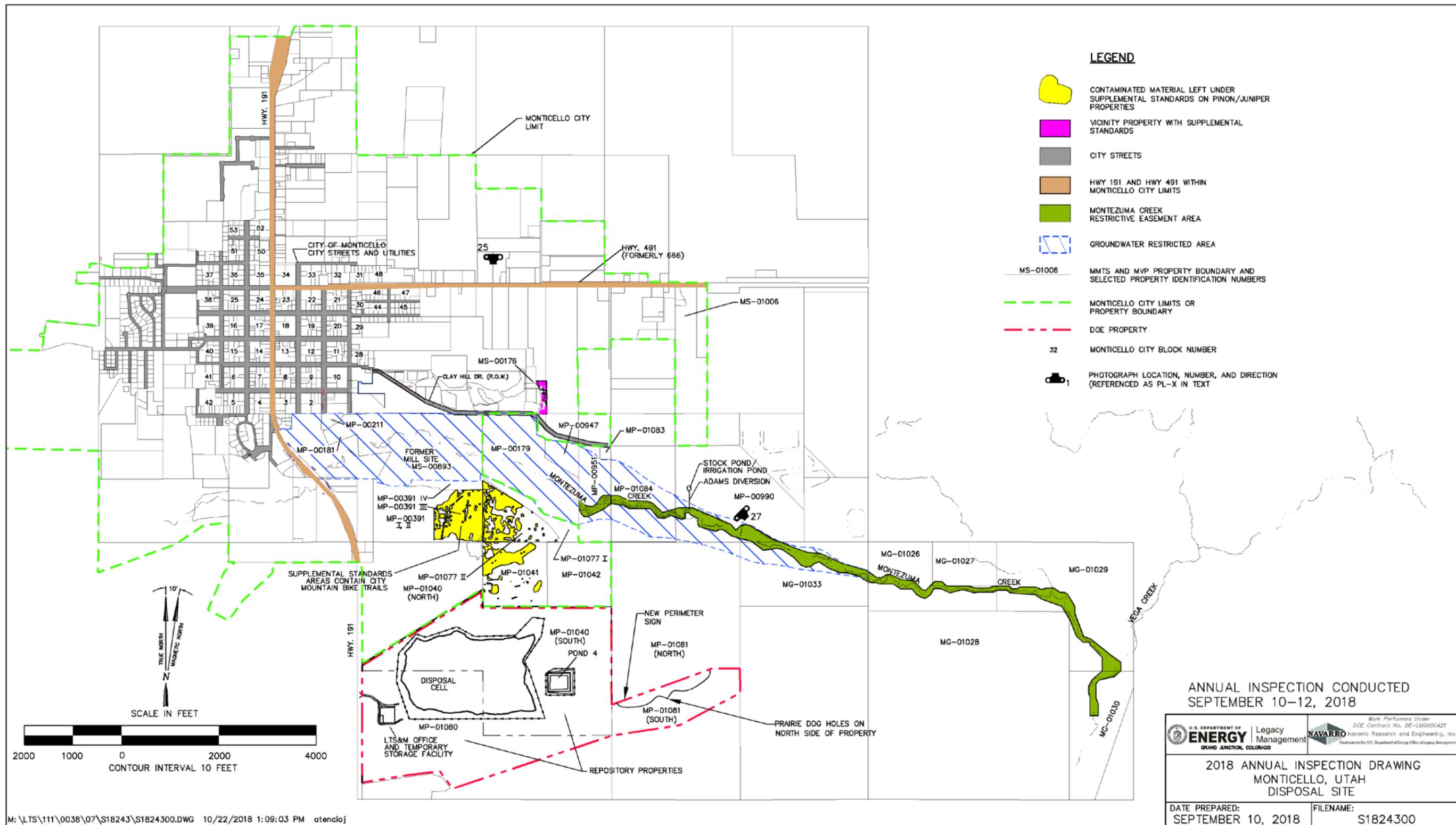


Figure 3. MMTS and MVP Supplemental Standards and Groundwater Restricted Areas

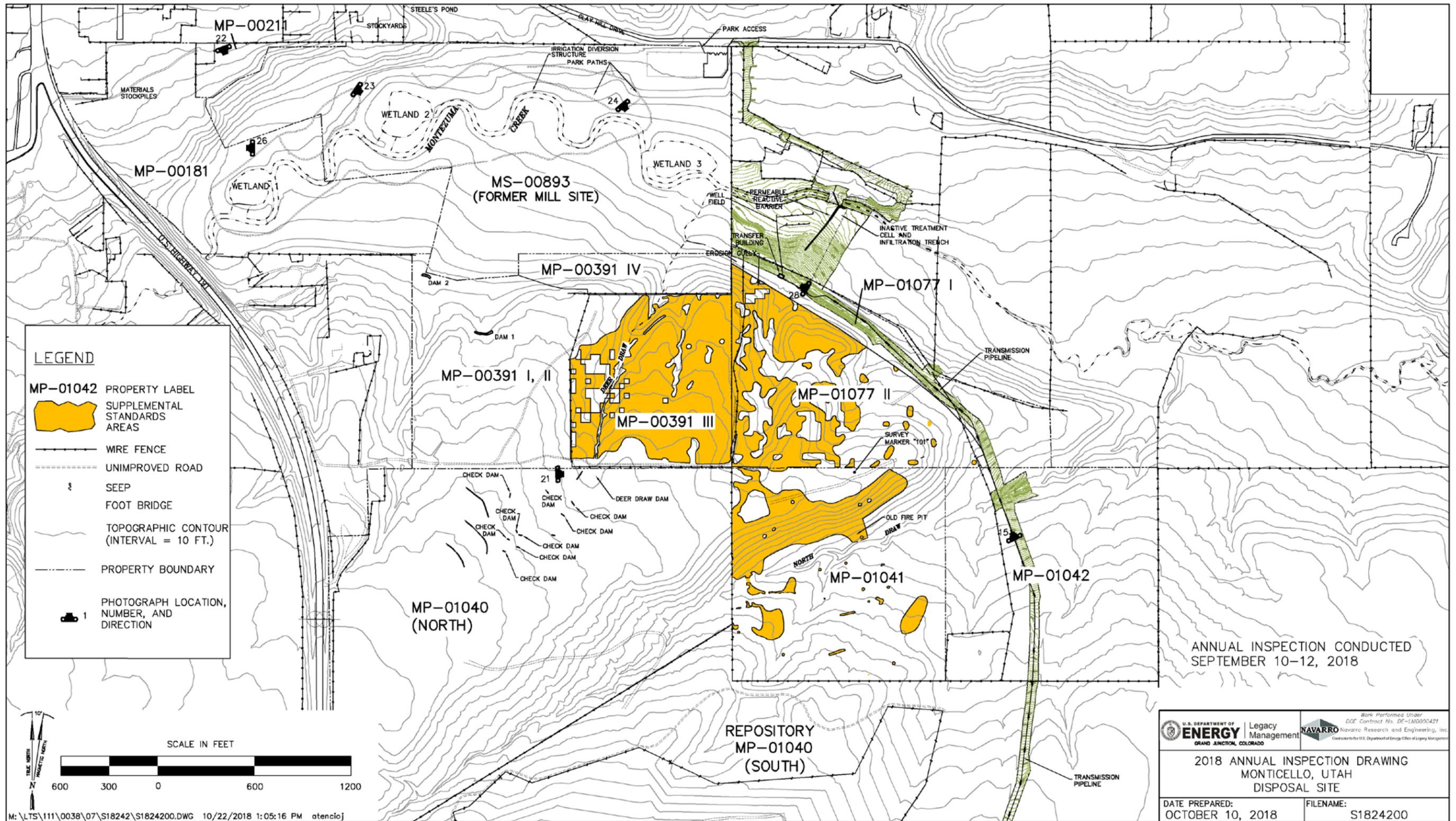


Figure 4. Monticello, Utah, Former Mill Site and Surrounding Area

Appendix A

Annual Inspection Checklist

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MMTS: Monticello Mill Tailings (DOE) Site; Operable Units I, II, and III (UT 3890090035)
MVP: Monticello Radioactively Contaminated Properties (Monticello Vicinity Properties) (UTD 980667208)
 Location: Monticello, Utah: EPA Region 8

Annual Inspection Preparation:

The following tasks were completed in preparation for the current MMTS and MVP annual inspection:

	<u>Y</u>	<u>N</u>	<u>NA</u>
Review annual inspection requirements in the LTS&M Plan	X	<input type="checkbox"/>	<input type="checkbox"/>
Review additional requirements for 5-Year Review inspections when applicable	<input type="checkbox"/>	<input type="checkbox"/>	X
Schedule site inspection and appoint lead and assistant inspectors	X	<input type="checkbox"/>	<input type="checkbox"/>
Review previous reports and records as outlined in the LTS&M Plan	X	<input type="checkbox"/>	<input type="checkbox"/>

Notes:

	<u>Y</u>	<u>N</u>
Provide team members with background information, maps, and inspection checklists	X	<input type="checkbox"/>
Prepare Job Safety Analysis and other required Safety and Health documents	X	<input type="checkbox"/>
Notify EPA and UDEQ at least 2 weeks before site visit and invite them to participate	X	<input type="checkbox"/>
Notify representatives from other agencies as necessary and invite them to participate	X	<input type="checkbox"/>
Verify names and telephone numbers of parties with access or notification agreements	X	<input type="checkbox"/>
Contact State Engineer's Office for water well permit applications in and near GWMA	X	<input type="checkbox"/>

Date(s) of Annual Inspection: 9/11/2018–9/12/2018

Inspection Team Members

Name	Affiliation	Phone Number	E-mail
Danika Marshall	Navarro Research and Engineering, Inc. (ecologist, lead inspector)	(970) 248-6137	Danika.Marshall@lm.doe.gov
Fred Smith	Navarro Research and Engineering, Inc. (site lead)	(970) 248-6182	Fred.Smith@lm.doe.gov
Paul Wetherstein	Navarro Research and Engineering, Inc. (Environmental Compliance)	(970) 248-6645	Paul.Wetherstein@lm.doe.gov
Jason Nguyen	U.S. Department of Energy (site manager)	(970) 248-6707	Jason.Nguyen@lm.doe.gov

Note: Attach additional sheets as needed for any of the following sections.

I. Interviews		
Name of Individual Interviewed	Affiliation	Date Interviewed
Gary McKinnon	Contractor operations lead	9/10/2018
<p>Notes:</p> <p><i>The onsite contractor operations lead accompanied inspectors on portions of the inspection. Notes are included in individual checklist sections below.</i></p>		
Name of Individual Interviewed	Affiliation	Date Interviewed
Marc Stilson	State engineer	9/6/2018
<p>Notes:</p> <p><i>Mr. Stilson, Southeastern Regional Engineer with the Utah State Engineer's office (i.e., Utah Division of Water Rights), confirmed during the interview to P. Wetherstein that in 2018:</i></p> <ul style="list-style-type: none"> • <i>There were no requests or approvals to drill into or through the shallow alluvial aquifer in DOE's Groundwater Restricted Area (GWRA).</i> • <i>There were no new applications or approvals, or change applications or approvals, to appropriate water for domestic purposes from or near the shallow alluvial aquifer in DOE's GWRA.</i> <p><i>Limitations on water appropriation and drilling activities in DOE's GWRA were established at DOE's request in the UDWR Ground-Water Management Policy for the Monticello Mill Tailings Site and Adjacent Areas, May 1999.</i></p>		
Name of Individual Interviewed	Affiliation	Date Interviewed
Fred Smith	Site lead	9/10/2018
<p>Notes:</p> <p><i>Mr. Smith, site lead with Navarro Research and Engineering, Inc., confirmed during the interview that in 2018:</i></p> <ul style="list-style-type: none"> • <i>There was no construction or disturbance within the planned restricted areas.</i> • <i>A new electric gate to the administrative building was installed the week of 8/27/2018.</i> • <i>A rain gauge was installed on the northeast corner of the disposal cell in May.</i> • <i>Flow model sampling was performed at Montezuma Creek in mid-July.</i> • <i>Water bars on the access road to the transfer building were constructed in June.</i> • <i>Access roads were bladed in June.</i> • <i>Joanna Hardin, the environmental scientist, was brought on as a new employee.</i> 		

II. Administrative and Records Inspection

	Readily Available		Current		
	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	
1. General LTS&M Documents					
Ready access from field office to online manuals	X	<input type="checkbox"/>	X	<input type="checkbox"/>	
Ready access from field office to online MMTS/MVP Administrative Record, OU III Administrative Record, and Information Repository collection	X	<input type="checkbox"/>	X	<input type="checkbox"/>	
2. LTS&M Training Records for Access to Radiologically Controlled Areas					
Onsite employees			X	<input type="checkbox"/>	
Unescorted City workers			<input type="checkbox"/>	<input type="checkbox"/>	X N/A
All City workers were escorted			<input type="checkbox"/>	<input type="checkbox"/>	X N/A
3. Record Books					
Record book entries and documentation	X Satisfactory <input type="checkbox"/> Unsatisfactory				
	Readily Available		Current		
	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	
Repository Site Record Book	X	<input type="checkbox"/>	X	<input type="checkbox"/>	
City-owned properties	X	<input type="checkbox"/>	X	<input type="checkbox"/>	
Private property restricted areas	X	<input type="checkbox"/>	X	<input type="checkbox"/>	
Public Roads and Utilities Record Book	X	<input type="checkbox"/>	X	<input type="checkbox"/>	
Documentation/recordkeeping requirements met	X Satisfactory <input type="checkbox"/> Unsatisfactory				
Information readily traced to updated drawings	X Satisfactory <input type="checkbox"/> Unsatisfactory				
Rad scan data for eroded/excavated material	X Satisfactory <input type="checkbox"/> Unsatisfactory				
Entries include TSF transfers	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory				X N/A
Entries include information on stockpiled material and follow-up scan results	X Satisfactory <input type="checkbox"/> Unsatisfactory				<input type="checkbox"/> N/A
U.S. 191/491 entries include information on scan results and material returned to excavation	X Satisfactory <input type="checkbox"/> Unsatisfactory				<input type="checkbox"/> N/A
Storm event surveys documented	X Satisfactory <input type="checkbox"/> Unsatisfactory				<input type="checkbox"/> N/A

Notes for Record Books Inspection:

General LTS&M documents are available online.

An electronic version of the paper-based system is located at the Monticello, Utah, sites. Evaluation of the electronic version of the Information Repository is posted to the website.

No transfer of radioactive material into TSF in fiscal year 2018.

Record books and radiological as-built drawings had some minor discrepancies that were corrected by the Monticello sites staff before the end of the inspection.

4. Radiological As-Built Drawings

Drawing updated annually	X Satisfactory <input type="checkbox"/> Unsatisfactory
Documentation and recordkeeping requirements met	X Satisfactory <input type="checkbox"/> Unsatisfactory
Radiological scan information recorded	X Satisfactory <input type="checkbox"/> Unsatisfactory

	Readily Available		Current		
	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	
5. Surveillance Checklists and Records					
TSF Access/Security Logs	X	<input type="checkbox"/>	X	<input type="checkbox"/>	
Meteorological Monitoring Data, Monthly and Quarterly Repository Surveillance Checklists, and Monthly Pond 4 Surveillance Checklists	X	<input type="checkbox"/>	X	<input type="checkbox"/>	

Notes for Checklist and Records Inspection:

6. Agreements (verify on Five-Year Review inspections only)

DOE/City Cooperative Agreement (verify current with Environmental Compliance)	<input type="checkbox"/>	<input type="checkbox"/>	X	N/A
DOE/UDOT Memorandum of Understanding doesn't expire				

7. Zoning Restriction—Overlay Zone OL-1 (verify on Five-Year Review inspections only)

Restriction is verified as current through City for property MP-00211-VL	<input type="checkbox"/>	<input type="checkbox"/>	X	N/A
Restriction is verified as current through City for property MP-00176-VL	<input type="checkbox"/>	<input type="checkbox"/>	X	N/A

8. Deed Restrictions (verify at San Juan County Recorder's Office, 117 S. Main Street)

Properties Transferred from DOE to City of Monticello

IC Annotations in Place

<u>DOE ID</u>	<u>Parcel</u>	<u>Document</u>	<u>Book</u>	<u>Page</u>	<u>Yes</u>	<u>No</u>
Electronic record	A34240063004	applies to all transferred city properties			X	<input type="checkbox"/>
MP-00181-OT	A33230367201	E061691	B788	100-113	X	<input type="checkbox"/>
	33S23E367204	E061691	B788	100-113	X	<input type="checkbox"/>
MP-00391-VL	33S24E316001	E061691	B788	100-113	X	<input type="checkbox"/>
MS-00893-OT	33S24E315400	E061691	B788	100-113	X	<input type="checkbox"/>
MP-01040-VL (N)	34S24E061200	E061691	B788	100-113	X	<input type="checkbox"/>
	34S24E061201		electronic record		X	<input type="checkbox"/>
MP-01041-VL	34S24E060600	E061691	B788	100-113	X	<input type="checkbox"/>
MP-01042-VL	34S24E060000	E061691	B788	100-113	X	<input type="checkbox"/>
MP-01077-VL	33S24E318400	E061691	B788	100-113	X	<input type="checkbox"/>

Notes:

Correction to quitclaim deed for properties transferred to City recorded as E062130, B789, P450-452 (applies to all of the above listed properties).

Properties Sold by DOE to Private Party

IC Annotations in Place

<u>DOE ID</u>	<u>Parcel</u>	<u>Document</u>	<u>Book</u>	<u>Page</u>	<u>Yes</u>	<u>No</u>
MP-01081-VL	34S24E053000	114283	933	105-111	X	<input type="checkbox"/>

Montezuma Creek Soil and Sediment Properties

<u>DOE ID</u>	<u>Parcel</u>	<u>Document</u>	<u>Book</u>	<u>Page</u>	<u>Yes</u>	<u>No</u>
MP-00990-CS	33S24E324800	E063343	B793	831-852	X	<input type="checkbox"/>
	33S24E328400	E063343	B921	474-476	X	<input type="checkbox"/>
	33S24E324802	E063343	electronic record		X	<input type="checkbox"/>
	A33240324802	E063343	electronic record		X	<input type="checkbox"/>
	A33240324804	E063343	electronic record		X	<input type="checkbox"/>
MG-01033-VL	34S24E050000	E063343	B793	831-852	X	<input type="checkbox"/>
	34S24E050601	E063343	electronic record		X	<input type="checkbox"/>
MS-01026-VL	34S24E043000	E063343	B793	831-852	X	<input type="checkbox"/>
MS-01027-VL	34S24E042400	E063343	B793	831-852	X	<input type="checkbox"/>
MG-01030-VL	34S24E047200	E063255	B793	526-538	X	<input type="checkbox"/>
MG-01029-VL	34S24E040000	E063255	B793	390-404	X	<input type="checkbox"/>
	34S24E040001	E063255	electronic record		X	<input type="checkbox"/>
MP-00951-VL	33S24E317200	E063926	B796	188-202	X	<input type="checkbox"/>
	33S24E317207	E063926	electronic record		X	<input type="checkbox"/>
	33S24E317204	E063926	electronic record		X	<input type="checkbox"/>
	A33240317206	E063926	electronic record		X	<input type="checkbox"/>
MP-01084-VL	33S24E326000	E063926	B796	188-202	X	<input type="checkbox"/>

Notes:

Utah Department of Transportation Properties

<u>DOE ID</u>	<u>Parcel</u>	<u>Document</u>	<u>Book</u>	<u>Page</u>	<u>Yes</u>	<u>No</u>
MS-00895-OT	A33230367811	E068703	B814	533	X	<input type="checkbox"/>
	A33230367825		electronic record		X	<input type="checkbox"/>
MS-00892-OT	A33230367202	E068704	B814	534	X	<input type="checkbox"/>
MS-01021-OT	A33230367812	E068705	B814	535-536	X	<input type="checkbox"/>
MS-01020-OT	A33230369001	E068706	B814	537-538	X	<input type="checkbox"/>
MS-01020-OT	A33230310090	E068885	B815	269	X	<input type="checkbox"/>

Notes for Deed Restrictions Inspection:

III. Repository Inspection

A. Access Area

- | | | | | |
|--|---|----------------|--------------------------|--------------------------------|
| 1. Site Access Sign/Emergency Information | X | Satisfactory | <input type="checkbox"/> | Repairs/Maintenance Needed |
| 2. Field Office | X | Satisfactory | <input type="checkbox"/> | Repairs/Maintenance Needed |
| 3. Temporary Storage Facility | X | Satisfactory | <input type="checkbox"/> | Repairs/Maintenance Needed |
| Bin cover | X | Functional | <input type="checkbox"/> | Not Functional |
| Approximate volume of bin contents (cubic yards) | | <u>1.5</u> | | |
| Safety and Health/RAD postings | X | Appropriate | <input type="checkbox"/> | Inadequate |
| Drums and secondary containment | X | Good condition | <input type="checkbox"/> | Unavailable/not good condition |
| Vandalism/trespassing | X | Not evident | <input type="checkbox"/> | Evident (locate on map) |

Describe Access Area Repairs/Maintenance Needed:

New safety bollards were installed in front of the electrical panels. A new electric gate was installed the week of August 27, 2018.

B. Repository Perimeter

(Note locations of erosion, noxious weeds, vandalism, or excessive vegetation on map)

- | | | | | |
|---|---|--------------------------|--------------------------|--|
| 1. Outer Fencing and Gates | X | Satisfactory | <input type="checkbox"/> | Repairs/Maintenance Needed |
| 2. Signs (Note condition of 40 numbered reference signs and posts) | | | | |
| Signs damaged but legible, requiring monitoring: | | <i>None</i> | | |
| Signs requiring replacement: | | <i>None</i> | | |
| 3. South Boundary Markers | X | All six markers located | <input type="checkbox"/> | Marker(s) _____ not located |
| 4. Erosion/Gullying | | X | <input type="checkbox"/> | Not evident Evident |
| 5. Vegetation | | X | <input type="checkbox"/> | Not excessive Excessive growth |
| | | <input type="checkbox"/> | X | Noxious weeds absent Noxious weeds present |
| 6. Land Use Changes on Adjoining Property | X | No change | <input type="checkbox"/> | Change |
| 7. Vandalism/Trespassing | | <input type="checkbox"/> | X | Not evident Evident |

Notes for Condition of Repository Perimeter (e.g., repairs needed, erosion areas, vandalism):

All the signs have been replaced and numbered with sticker decals to reference the signs. The outer fencing between signs P3 and P4 and P7 and P8 has been repaired.

Repository Runoff/Run-On Controls

(North and East Toe Trenches; South and West Drainage Channels)

- | | | | | |
|--------------------------------|---|--------------------------|--------------------------|---------------------|
| 1. Settlement | X | Not evident | <input type="checkbox"/> | Evident |
| 2. Material Degradation | X | Not evident | <input type="checkbox"/> | Evident |
| 3. Erosion/gullies | X | Not evident | <input type="checkbox"/> | Evident |
| 4. Siltation | | <input type="checkbox"/> | X | Not evident Evident |
| 5. Obstructions | X | Not evident | <input type="checkbox"/> | Evident |
| 6. Excessive Vegetation | X | Not evident | <input type="checkbox"/> | Evident |

Notes for Condition of Repository Runoff and Run-On Controls (Note: Locate all areas of concern on map):

No sign of erosion on the North and East Toe Trench. The runoff/run-on controls were inspected by Geo-Smith Engineering (see Appendix B).

Pond 4 (Note: Locate all areas of concern on map)

- | | | | | | |
|--|---|--------------------------|--------------------------|--------------------------|----|
| 1. Perimeter Fence and Access Gate | X | Satisfactory | <input type="checkbox"/> | Unsatisfactory | |
| 2. Erosion/Biointrusion of Pond Berm | | <input type="checkbox"/> | X | Not evident Evident | |
| 3. Safety Equipment | | | | | |
| Pond barrier rope intact | | X | Yes | <input type="checkbox"/> | No |
| Personal floatation devices and postings present and visible | | X | Yes | <input type="checkbox"/> | No |
| 4. Pond 4 LCRS and LDS Electrical Housing/Surface Installations | | | | | |
| Physical condition is: | X | Satisfactory | <input type="checkbox"/> | Unsatisfactory | |

- | | | | | |
|--|---|--|--------------------------|---------|
| 5. Liner—Holes/Cracks/Tears | X | Not Evident | <input type="checkbox"/> | Evident |
| 6. Siltation and Vegetation in Pond 4 | X | Not evident | <input type="checkbox"/> | Evident |
| 7. Pond 4 Water Level | | Estimated water depth is <u>7.6</u> feet | | |
| 8. Vandalism | X | Not evident | <input type="checkbox"/> | Evident |

Notes for Condition of Pond 4 Features:

Evidence of rodent biointrusion on the north and west sides, but liner function is not impaired. Continued monitoring is recommended.

C. Repository Cover Inspection

- | | | | | |
|--|--------------------------|--|--------------------------|----------------------------|
| 1. Top Perimeter Road and Road to Pond 4 | X | Satisfactory | <input type="checkbox"/> | Unsatisfactory |
| 2. Interior Wildlife Fence and Wildlife Gates | | | | |
| Physical condition is: | X | Satisfactory | <input type="checkbox"/> | Unsatisfactory |
| 3. Cover Vegetation | | | | |
| See attached <i>Repository Cover Vegetation Index</i> form; note areas of concern on map | | | | |
| 4. Riprap Armoring | | | | |
| X Slumping/sliding not evident | <input type="checkbox"/> | Slumping/sliding evident (locate on map) | | |
| X Rock deterioration not evident | <input type="checkbox"/> | Rock deterioration evident (locate on map) | | |
| 5. Settlement/Desiccation/Erosion/Gullies | | | | |
| X Settlement depressions not evident | <input type="checkbox"/> | Settlement depressions evident (locate on map) | | |
| X Desiccation cracking not evident | <input type="checkbox"/> | Desiccation cracking evident (locate on map) | | |
| X Erosion/gullies not evident | <input type="checkbox"/> | Erosion/gullies evident (locate on map) | | |
| 6. Holes/Burrows/Biointrusion | | | | |
| <input type="checkbox"/> Holes/burrows/biointrusion not evident | X | Holes/burrows/biointrusion evident (locate on map) | | |
| 7. Seepage/Ponding | | | | |
| X Seepage not evident | <input type="checkbox"/> | Seepage evident (locate on map) | | |
| X Ponding not evident | <input type="checkbox"/> | Ponding evident (locate on map) | | |
| X Soft subgrade not evident | <input type="checkbox"/> | Soft subgrade evident (locate on map) | | |
| X Phreatophytes not present | <input type="checkbox"/> | Phreatophytes present (note species/locate on map) | | |
| 8. Site Monument at Apex of Cover | X | Satisfactory | <input type="checkbox"/> | Repairs/maintenance needed |
| Site Monument at Boundary Gate | X | Satisfactory | <input type="checkbox"/> | Repairs/maintenance needed |

Notes for Repository Cover Inspection:

Evidence of small rodent biointrusion, but cover function is not impaired. Continued monitoring is recommended. A new rain gauge was installed on the northeast corner of the disposal cell top.

Cover Penetrations

(Caution: Confined space entry requirements in effect for all manholes)

- | | | | | |
|---|--------------------------|-----|--------------------------|----|
| 1. Manholes 1 and 3 (LCRS and LDS access vaults) | | | | |
| Covers secure and operable | X | Yes | <input type="checkbox"/> | No |
| Exterior pump access ports are undamaged | X | Yes | <input type="checkbox"/> | No |
| Evidence of leakage into vaults | <input type="checkbox"/> | Yes | X | No |
| Evidence of drainage through cover penetrations | <input type="checkbox"/> | Yes | X | No |
| 2. Manholes 2, 4, and 5 | | | | |
| Covers secure and operable | X | Yes | <input type="checkbox"/> | No |
| Evidence of drainage through cover penetrations | <input type="checkbox"/> | Yes | X | No |

Notes for Condition of Manholes (include condition of telemetry equipment and appropriateness of safety and health postings):

- | | | | | |
|---|---|-----|--------------------------|----|
| 3. LCR Video Ports (check covers only; ports are inoperable) | | | | |
| Covers secure and operable | X | Yes | <input type="checkbox"/> | No |
| Evidence of drainage through cover penetrations | X | Yes | <input type="checkbox"/> | No |

4. Settlement Monuments (A to I) (Note: Plates surveyed during Five-Year Review inspections only)

Surface completions undamaged Yes No
 Inner plates undamaged Yes No

5. Embedded Lysimeter

Evidence of seepage at outlet Yes No
 Instrumentation installations undamaged Yes No
 Evidence of drainage along cover penetrations Yes No
 Telemetry surface installations in good condition Yes No

6. Operation of Repository and Pond 4 LCRS and LDS (interview onsite LM operator)

Pumping rates are reported in quarterly Federal Facility Agreement reports to EPA and UDEQ. Reports are available in System Operation and Analysis at Remote Sites (SOARS).

Note Any Anomalies or Other Observations Reported by the LM Operator:

None

Notes for Cover Penetrations Inspection and Operation of LCRS/LDS:

None

IV. City-Owned Properties Inspection

A. City-Owned Properties Transferred from DOE

(MP-00181, MP-00391, MP-00893, MP-01040 (North Portion), MP-01041, MP-01042, and MP-01077)

Property	181		391		893		1040		1041		1042		1077	
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Accessible to public	X	<input type="checkbox"/>												
Evidence of camping	<input type="checkbox"/>	X												
Habitable structure(s)	<input type="checkbox"/>	X												
Gullies/erosion	<input type="checkbox"/>	X	X	<input type="checkbox"/>										
Runoff/drainage controls intact and in good repair (ditches, riprap structures, dams, check dams, berms)	X	<input type="checkbox"/>												
Land use changes	<input type="checkbox"/>	X												
Evidence of vandalism	<input type="checkbox"/>	X												
Soil removal evident	n/a		<input type="checkbox"/>	X	n/a		n/a		<input type="checkbox"/>	X	n/a		<input type="checkbox"/>	X
Water well installation	<input type="checkbox"/>	X	n/a		<input type="checkbox"/>	X	n/a		n/a		n/a		<input type="checkbox"/>	X
Wetland/creek damage	<input type="checkbox"/>	X	n/a		<input type="checkbox"/>	X	n/a		n/a		n/a		n/a	
Supplemental standards fence intact	n/a		<input type="checkbox"/>	X	n/a		<input type="checkbox"/>	X	n/a		<input type="checkbox"/>	X	n/a	

Describe Any Violations of Institutional Controls and/or Repair/Maintenance Issues (locate on map):

B. City-Owned Property MP-00211

	<u>Yes</u>	<u>No</u>	<u>N/A</u>
Evidence of Excavation or Construction	<input type="checkbox"/>	X	
If yes, confirm the following with onsite LM representative:			
In accordance with Monticello zoning district Overlay Zone (OL-1)	<input type="checkbox"/>	<input type="checkbox"/>	X
Violation has been reported	<input type="checkbox"/>	<input type="checkbox"/>	X
Radiological contamination was encountered	<input type="checkbox"/>	<input type="checkbox"/>	X
Radiological contamination was appropriately managed	<input type="checkbox"/>	<input type="checkbox"/>	X
Corrective Action Required	<input type="checkbox"/>	X	

Notes for City-Owned Property MP-00211 Inspection:

A spilled chemical container was observed on the property. The spill was reported to the city.

V. Montezuma Creek Soil and Sediment Properties

Evidence of Habitable Structures Within the Restricted Area	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	
Evidence of Soil Removal from the Restricted Area	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	
Land Use/Ownership Has Changed*	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	
Landowners Are Aware of Use Restrictions*	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	
Violations Have Been Reported *	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	X N/A
Corrective Action Required	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	

*confirm with onsite LM representative

Notes for Soil and Sediment Properties Inspection:

No anomalies have been reported by sampling teams or onsite representatives.

VI. Groundwater Management Area

Evidence of Water Well Installation Within the Restricted Area*	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	
No Permits for Water Well Installation Within the Restricted Area	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	
Violations Have Been Reported*	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	X N/A
Land Ownership Has Changed*	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	
Landowners Are Aware of Water Use Restriction*	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	
Corrective Action Required	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	

*confirm with onsite LM representative

Notes for Groundwater Management Area Inspection:

Onsite representatives regularly inspect area to verify that new wells have not been drilled.

VII. OU III Monitoring Wells and Water Treatment Systems

A. Monitoring Well Surface Completions

(Note: Active wells are inspected and maintained biannually during sampling events. Observations on inactive wells are reported to the sampling team.)

	<u>Yes</u>		<u>No</u>	
Outer Casing or Flush Mount Vault of Inactive Wells Intact	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
Wells Are Locked, and Flush Mount Well Lids Are Secured	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
Groundwater Treatment Facility and Building	<input checked="" type="checkbox"/>	Satisfactory	<input type="checkbox"/>	Repairs/Maintenance Needed
Pipeline	<input checked="" type="checkbox"/>	Satisfactory	<input type="checkbox"/>	Repairs/Maintenance Needed

Notes for Inactive Monitoring Well Inspection (Note location of any maintenance issues on map):

Wells are checked and maintained twice a year by groundwater sampling team. The inactive wells with missing bolts and covers were repaired on November 3, 2017, by the well maintenance team.

VIII. MVP Field Inspection

A. City Streets and Utilities

	<u>Yes</u>		<u>No</u>	
Roads/Utilities Under Construction				
Unmonitored excavations observed during inspection	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
Planned excavations are identified by onsite LM representative	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
Radiological material is properly controlled and managed	<input type="checkbox"/>		<input type="checkbox"/>	X N/A

Notes for City Streets and Utilities Inspection:

Onsite personnel normally drive city streets daily to look for excavation work. The utility locator service is accessed through blue stakes notices (811 from the State of Utah). No radioactive material was encountered during 2018.

VIII. MVP Field Inspection (continued)
B. UDOT U.S. Highways 191 and 491 Rights-of-Way

	<u>Yes</u>	<u>No</u>	
Roads Under Construction			
Unmonitored excavations observed during inspection	<input type="checkbox"/>	<input type="checkbox"/>	X N/A
Planned excavations are identified by onsite LM representative	<input type="checkbox"/>	<input type="checkbox"/>	X N/A
Radiological material is properly controlled and managed	<input type="checkbox"/>	<input type="checkbox"/>	X N/A

Notes for UDOT Highways Inspection:

UDOT information available on website; no construction. Onsite LM representative routinely consults website and the local UDOT manager for future projects. No highway projects in 2018.

Erosion (highway shoulders and U.S. 191 embankment at Montezuma Creek)

New erosion evident X Previous erosion evident; unchanged No erosion evident

Eroded Material Scanned for Radiological Contamination and Properly Managed

Yes No X N/A

Describe Erosion Noted on UDOT Highways:

No changes noted since last inspection.

C. Property MS-00176

(Note: Observations and activities for MS-00176-VL are recorded by the onsite LM representative in the Private Properties Restricted Areas Record Book)

Monticello zoning district Overlay Zone (OL-1) requires radiological scanning of the footprint of new habitable structures. Radiologically contaminated material is removed under the direction of the onsite LM representative.

	<u>Yes</u>	<u>No</u>
Unmonitored Excavations Observed During Inspection	<input type="checkbox"/>	X
Planned Excavations Are Identified by Onsite LM Representative	X	<input type="checkbox"/>
Site Conditions Indicate ICs Properly Implemented	X	<input type="checkbox"/>

Notes for Property MS-00176 Inspection:

No changes noted since last annual inspection.

Record the photographs taken during the annual inspection, including the location on map(s), azimuth, and a brief description of the feature(s) photographed.

Repository Cover Vegetation Index

Monticello, Utah

Date inspected: 9/12/2018 Inspected by: Danika Marshall

Dominant species present on the repository cover at time of inspection
(Note: Dominant species make up an estimated 10% or more of the vegetative cover):

Species Name	Growth Form			Life Cycle		Vegetation Type		
	Shrub	Grass	Other	Annual	Perennial	Native	Weedy	Other
<i>Agropyron cristatum</i>		X			X			X
<i>Thinopyrum intermedium</i>		X			X			X
<i>Bromus inermis</i>		X			X			X
<i>Artemisia tridentata</i>	X			X		X		
<i>Pascopyrum smithii</i>		X			X			X
<i>Ericameria nauseosa</i>	X			X		X		
<i>Bromus tectorum</i>		X				X		

Less common species present on repository cover:

Grindelia squarrosa, *Machaeranthera canescens*, *Lactuca serriola*, *Viguiera multiflora*, *Sisymbrium altissimum*, and *Convolvulus arvensis*.

Noxious weed species present (record locations on map or GPS):

Convolvulus arvensis (State of Utah Class C noxious weed; no control warranted).

Additional notes:

Pascopyrum smithii did not bloom; low moisture and drought year.

Vegetation Condition Score (see reverse): 3.8

Notes:

(Has the composition of vegetation changed, including plant diversity? If so, how? Describe any evidence of vegetation disturbance or relevant climate factors. If the vegetation score is less than 3.0, provide explanation and/or recommendations.)

Condition of Vegetative Cover

(indicate number in each row that best represents current conditions):

Indicator	1	2	3	4	5
Composition of plant cover (estimated visually)	Annual weeds dominant; nonweedy perennial species <20% of total cover	Annual weeds abundant and expanding; nonweedy perennial species 20%–40% of total cover	Annual weeds present and expanding; nonweedy perennial species 40%–60% of total cover	Some weeds present; nonweedy perennial species 60%–80% of total cover	No obvious weeds; nonweedy perennial species exceeding 80% of total cover
Total plant cover (visual estimate)	Canopy cover less than 30%	Canopy cover 30%–50%	Canopy cover 50%–70%	Canopy cover 70%–90%	Canopy cover over 90%
Bare soil	Mostly bare soil	Large areas of bare soil	Moderate areas of bare soil	Few areas of bare soil	No obvious areas of bare soil
Diversity of dominant species	One species dominant across site	2–3 species dominant across site, one or both of which are weedy; species occur in patches	2–3 species dominant across site, both of which are nonweedy; species evenly distributed with some monoculture patches	More than 3 species dominant across site, at least 2 of which are nonweedy perennials; few patches of monocultures	More than 4 nonweedy perennial species dominant across site; few to no patches of monocultures
Diversity of trace species	0–1 nonweedy trace species observed on cover	2 nonweedy trace species observed	3–4 nonweedy trace species observed	5–6 nonweedy trace species observed	7 or more nonweedy trace species observed
Plant residue	No plant residue on soil surface	1%–10% of soil surface covered with plant residue	10%–20% of soil surface covered with plant residue	20%–30% of soil surface covered with plant residue	30%–70% plant residue on soil surface
Standing dead vegetation (visual estimate)	Standing dead >25%	Standing dead 15%–25%	Standing dead 5%–15%	Standing dead <5%	No obvious standing dead
Erosion	Sheet erosion visible; rills/gullies present, or blowouts or dunes forming	Sheet erosion visible; some small rills present, or soil swept from onsite, causing burial or abrasion of vegetation	Sheet erosion not obvious; no visible rills or rills stabilized, or soil swept from offsite, causing burial or abrasion	No obvious sheet erosion; rills not present or fully stabilized, or some soil deposition from off site without burial or abrasion	No visible signs of current or past sheet or wind erosion
Disturbance	Evidence of mass disturbance to several species of vegetation (fire, animal damage, etc.)	Evidence of some disturbance to several species of vegetation or major disturbance to one species	Evidence of minor disturbance to one or two species of vegetation; localized to individual patches	Evidence of minor damage to individual plants only; disturbance not sitewide	No evidence of disturbance to any plant species or individual plants
Total each column	0	0	3	4	2

Add up all columns for total condition score:

$$\begin{aligned}
 & \underline{\quad 0 \quad} \text{ (Column 1)} \times 1 = \underline{\quad 0 \quad} \\
 & \underline{\quad 0 \quad} \text{ (Column 2)} \times 2 = \underline{\quad 0 \quad} \\
 & \underline{\quad 3 \quad} \text{ (Column 3)} \times 3 = \underline{\quad 9 \quad} \\
 & \underline{\quad 4 \quad} \text{ (Column 4)} \times 4 = \underline{\quad 16 \quad} \\
 & + \underline{\quad 2 \quad} \text{ (Column 5)} \times 5 = \underline{\quad 10 \quad} \\
 & \qquad \qquad \qquad \textbf{Total:} \quad = \underline{\quad 35 \quad}
 \end{aligned}$$

Divide total by 9 to calculate vegetative cover condition score = 3.8

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Appendix B

Geotechnical Inspection Report

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October 23, 2018

Fred Smith
Monticello Site Lead
Navarro Research and Engineering

RE: Geotechnical Inspection, Monticello Repository

Introduction

An inspection was performed at the Monticello Repository September 11, 2018 to evaluate geotechnical behavior of the repository as part of the comprehensive inspection performed by Navarro Research and Engineering. This report follows the 2017 geotechnical inspection closely.

The site was visited by Greg Smith of Geo-Smith Engineering, LLC. Mr. Smith initially met with Mr. Bill Cary from Navarro the morning of September 11, 2018 for a safety briefing prior to the site visit. Mr. Smith was accompanied by Mr. Chris Oliver, the Navarro Site Engineer and Mr. Fred Smith, Navarro Site Lead. Weather was clear and warm during the field visit.

The repository cover, erosion of rock covered side slopes, diversion ditches and swales, Pond 4 and the ground water collection and transfer building were observed during the inspection. No new photographs were taken due to lack of any significant change from 2017, photos from 2017 adequately represent current conditions. Accordingly, photo imaged from the 2017 report are used herein to add clarity to reported observations. The repository was observed to be in good to excellent condition from a geotechnical stand point. No depressions, erosion or slope stability conditions exist presenting problems.

Erosion control riprap slope conditions:

The north facing riprap slope was visited to investigate and to verify reported rock movements had not occurred (reported in annual site inspection reports: 2015 and 2016). Rock movement previously reported as horizontal features, have not changed during the course of 2018 since the last annual site inspection in 2017 (see Figure No. 1, note: the same photo obtained in 2016 supports suspected movement reported in 2017). Suspected rock movement expressed as horizontal features is seen as ridges in the slope surface and is the result of construction equipment tracks (for example see Figure No. 2). Inspections in 2017 and 2018 revealed no change in the rock surface as shown in Figure No's 3 and 4, therefore no change nor adverse conditions exist.



Figure No. 1, Slope in question, construction tracks (parallel ridges) shown lower slope, upper-middle-right [obtained in 2016, reported again in 2017 & 2018 report]



Figure No. 2, Horizontal ridges on a Northwest riprap slope, Monticello, UT, [from 2016 & 2017 report]



Figure No. 3, North Slope [from 2017 report]

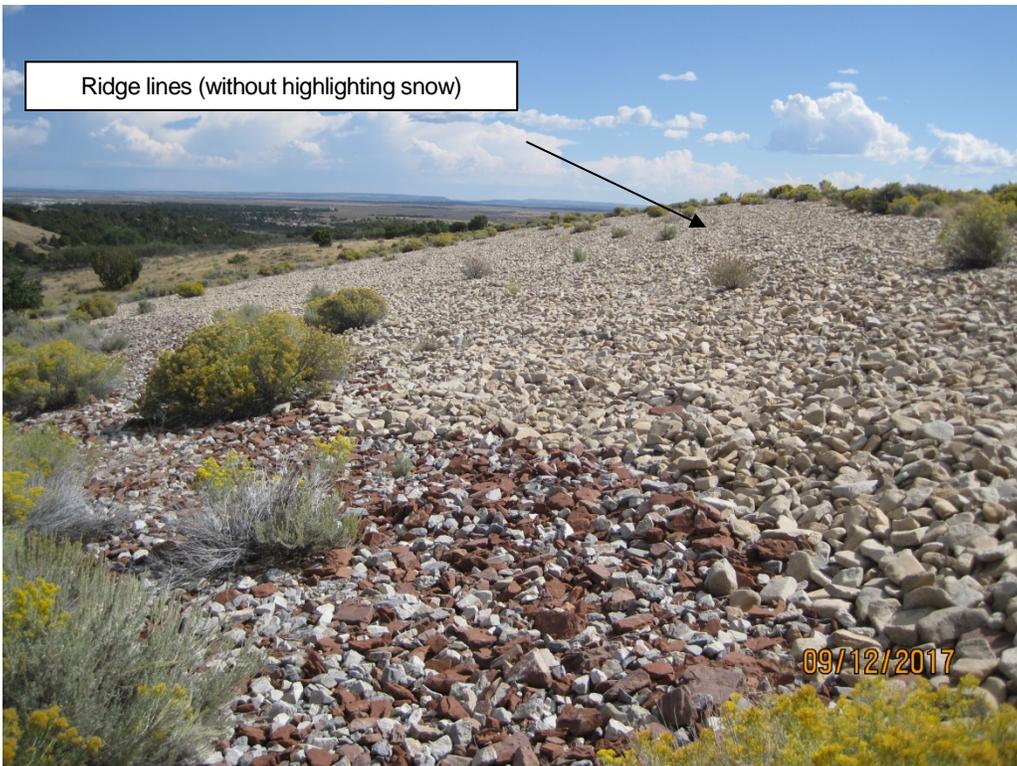


Figure No. 4, Track marks (ridge lines), northwest slope [from 2017 report]

Cover conditions:

During the inspection the condition of the top slope cover was assessed. Vegetation and soils continue to be in a dry condition, reflecting a continued lack of rainfall. Again, no erosion was observed on the cover, the soil/rock matrix in combination with vegetation have resisted erosion and the 2017 photos shown in Figures No's 5 and 6 adequately represent the 2018 inspected cover conditions.



Figure No. 5, Top slope cover, general view from crest (2017 photo)



Figure No. 6, Top slope cover, soil/rock matrix and vegetation, (2017 photo)

Ground water collection and transfer building:

Foundation conditions were again observed to be in excellent condition at the ground water collection and transfer building. No foundation movements were observed. Three slight construction cracks still exist on the interior concrete floor slab of the building. These small cracks appear to be due to concrete shrinkage of the slab due to a lack of control joints, as opposed to any foundation movement. The building is in excellent condition from a geotechnical stand point.

Pond 4:

Slope and liner were observed at Pond 4. No slope issues, either erosion or stability were observed. The pond contains water from dewatering efforts at the former mill site and transient drainage from the repository.

Diversion ditches and swales:

Both west and south diversion ditches were observed to be in excellent condition. No erosion was seen at either outfall. Buried rock cutoff aprons were not exposed at the southern diversion ditch that would indicate erosion had occurred, (the western diversion ditch has been extended to the north to intersect the natural drainage of North Draw). Additionally, no rock degradation was evident and the 2017 photo provided in Figure No. 7 adequately represents the 2018 inspection conditions.



Figure No. 7, Outfall, South diversion ditch (2017 photo)

Overall the Monticello repository and facilities were in good to excellent geotechnical condition at the time of the inspection.

Please contact me with any questions or comments.

Sincerely,

Gregory M. Smith



Gregory M. Smith, P.E.
Manager, Geo-Smith Engineering, LLC

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