

2019 Annual Inspection Report for the DOE Monticello, Utah, Mill Tailings Site and Monticello Vicinity Properties

December 2019



U.S. DEPARTMENT OF
ENERGY

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Management

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Appendixes

Appendix A	Annual Inspection Checklist
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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
GRO	groundwater remedy optimization
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 23, 24, and 25, 2019. 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 2019 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 soil; 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 were in good condition. The water in Pond 4 was approximately 8 feet deep, mostly from the operation of the groundwater remedy optimization (GRO) system.

City-Owned Property Findings. There was no evidence that any ICs were violated on properties owned by the City of Monticello (City). 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, performed by other parties, on an additional bike trail 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 2019 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 City-owned property record book had four missing weekly entries. Site staff explained this was due to inclement weather and bad road conditions. Future inspections that cannot take place due to road conditions will be noted in the weekly log. All other 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 GRO 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 October 2018 and April 2019.

Conclusions and Recommendations. The 2019 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 23, 24, and 25, 2019. 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 2019 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 (GRO) 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 GRO 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.

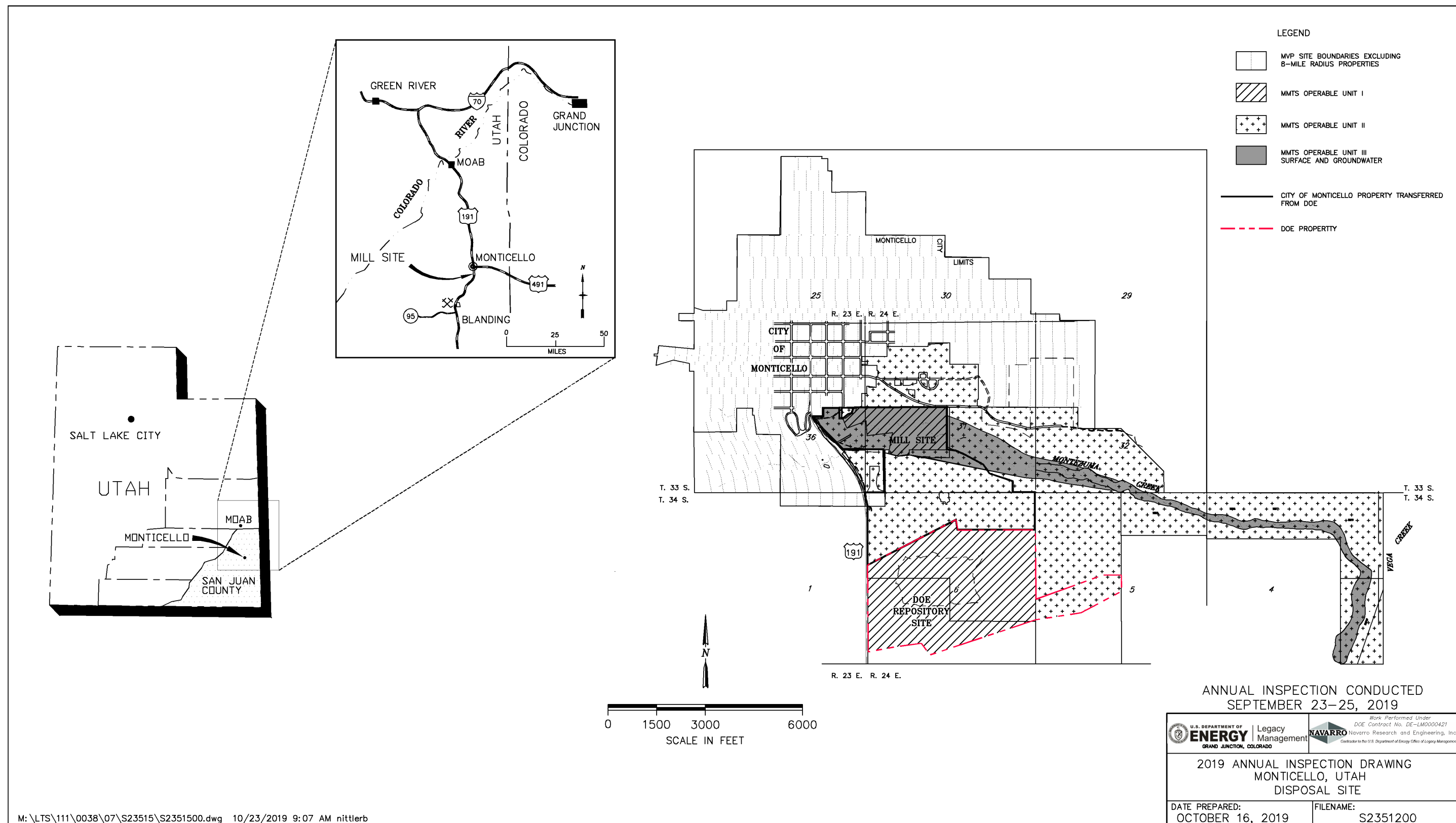


Figure 1. Location of Monticello MMTS and MVP Sites

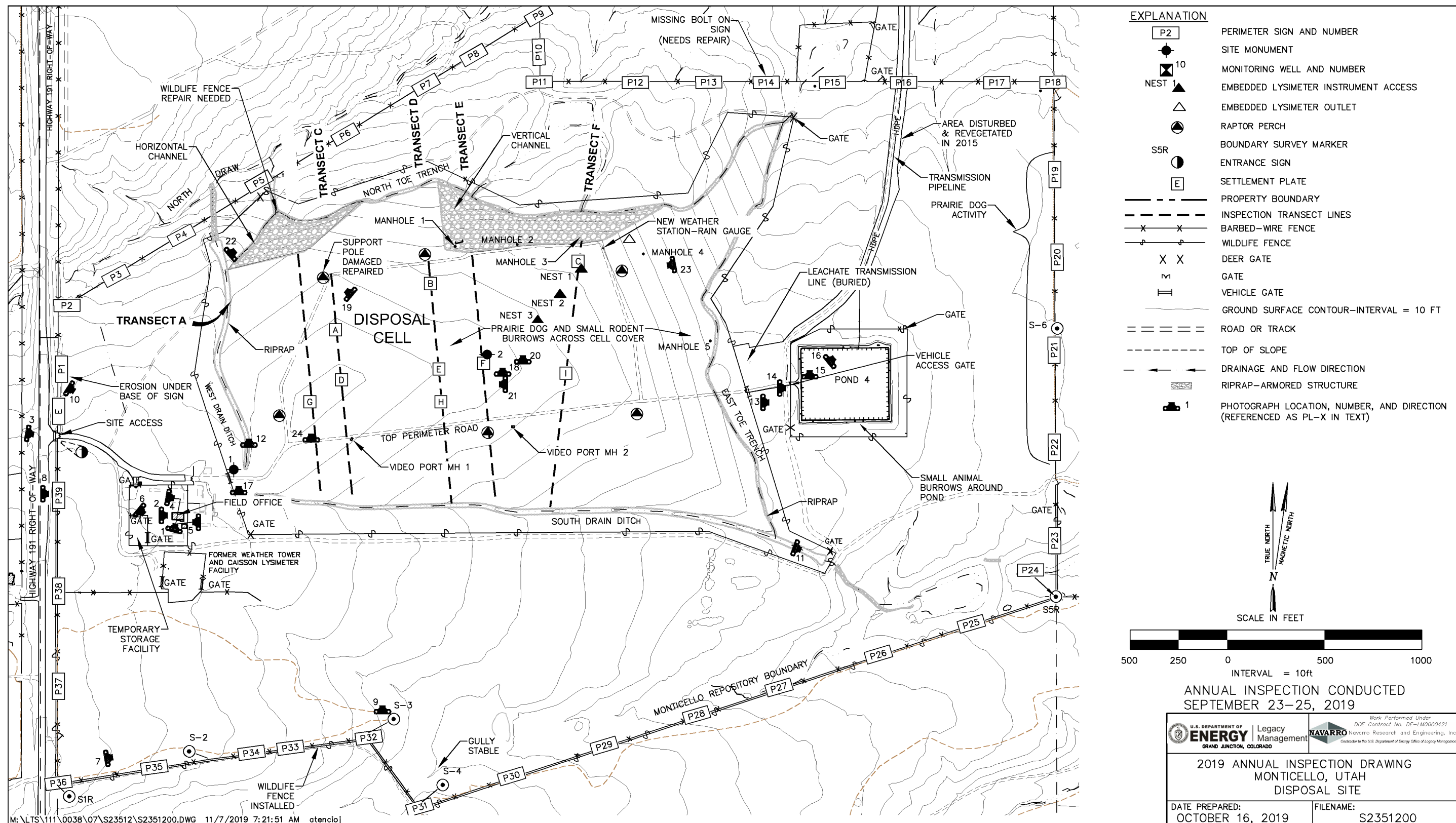


Figure 2. Monticello, Utah, Repository Site

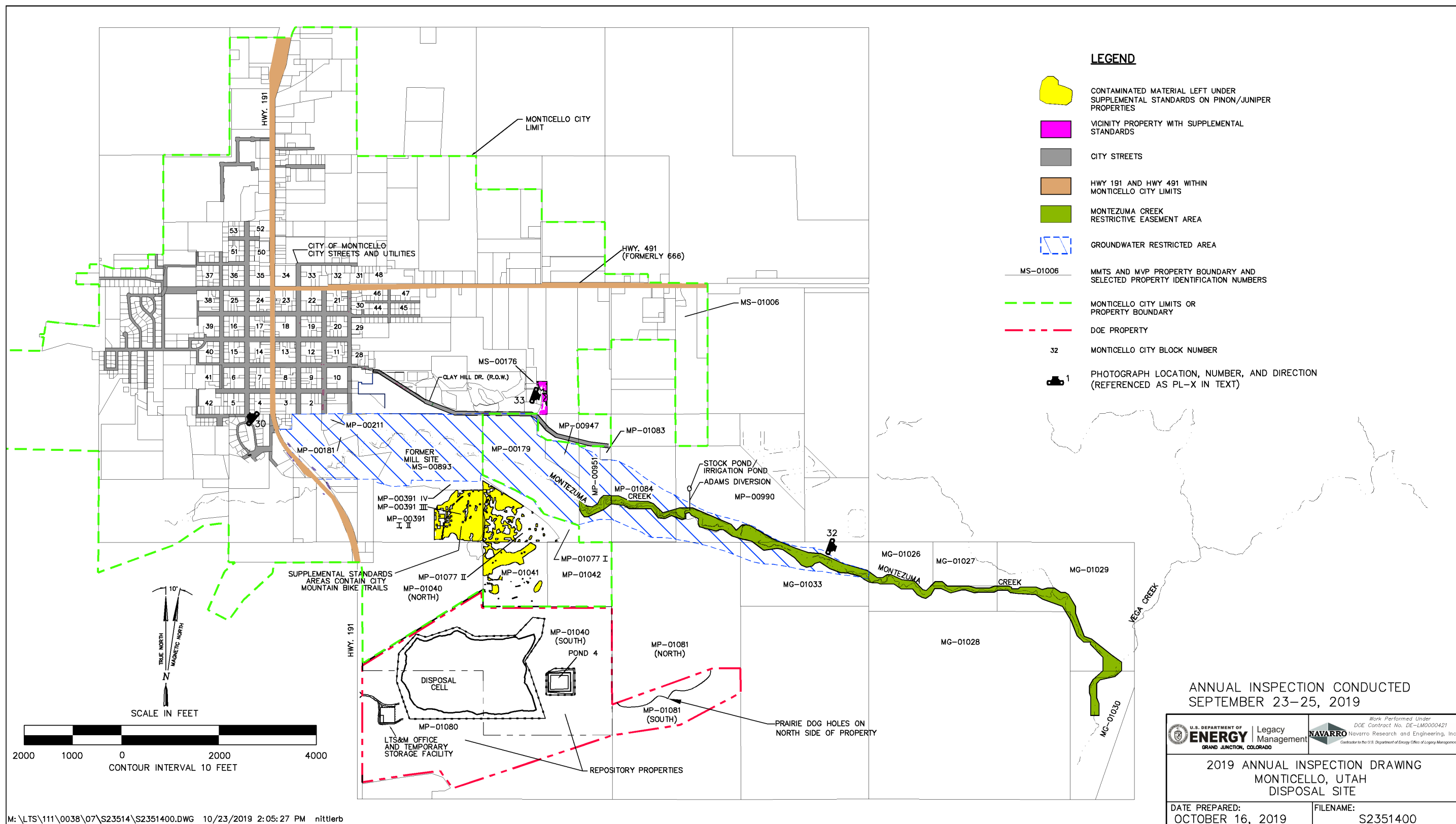


Figure 3. MMTS and MVP Supplemental Standards and Groundwater Restricted Areas

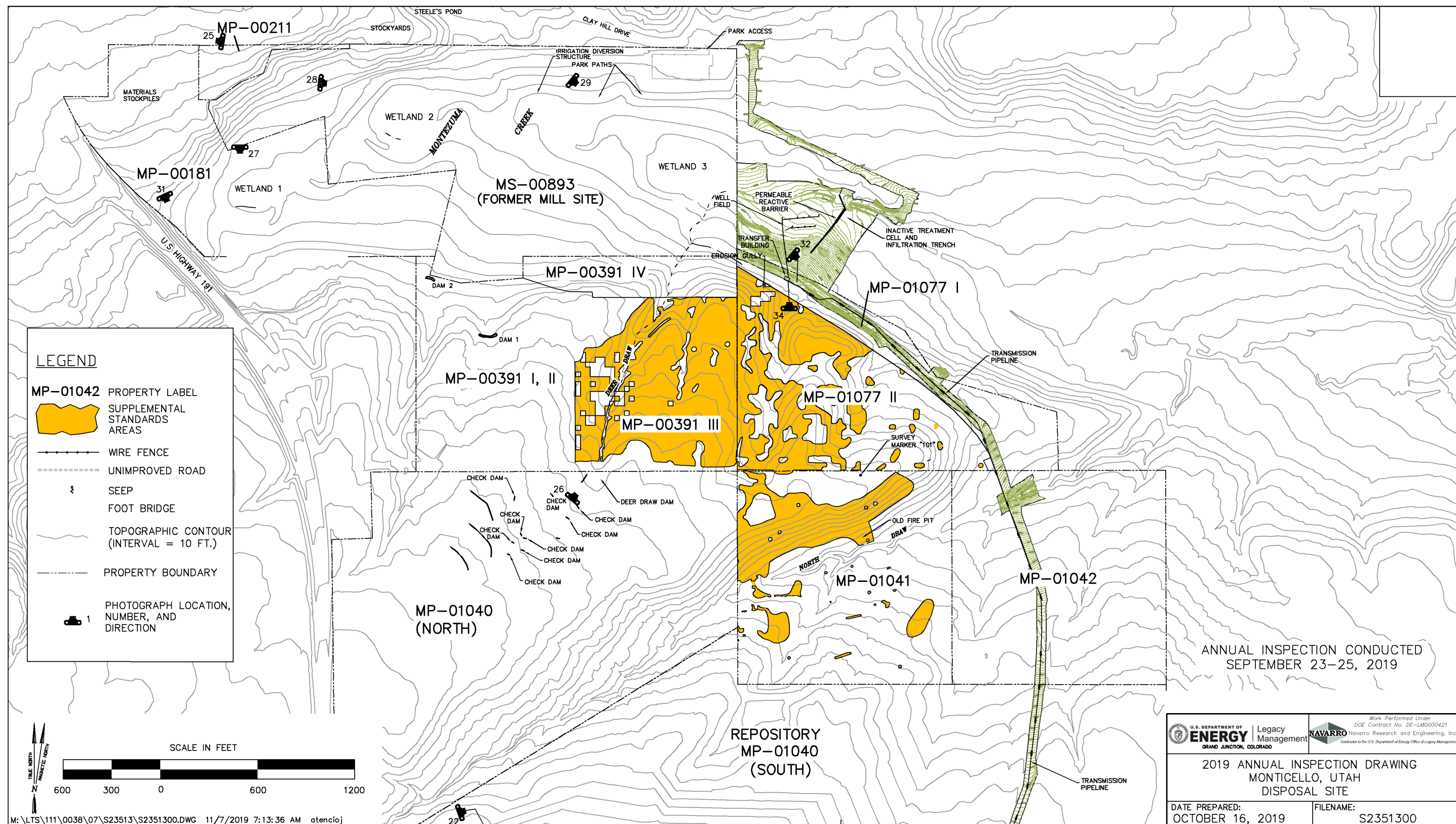


Figure 4. Monticello, Utah, Former Mill Site and Surrounding Area

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 GRO 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 GRO 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 GRO 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. There are 69 PRB (permeable reactive barrier) wells located on property MP-00179. The wells are listed as inactive and are not included in the monitoring program. However, water levels are collected from these locations annually in October.

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* (DOE 2018), hereafter called the LTS&M Plan, and several items are inspected annually (Section 2.7).

Part of the Annual Site Inspection Checklist does include items associated with the GRO system, as the GRO is associated with OU III and the disposal site.

Items inspected annually include the following:

- Onsite record books: Document emergency system shutdown drills, maintenance of the system and the GRO building, work in the Area of Attainment (e.g., transducer replacement), property owner concerns, and so on.
- Surveillance checklists: Particularly Pond 4, which is part of the GRO system.
- Deed annotations: Inspection confirms that deed annotations applicable to restricted properties remain accurately filed and accessible at the San Juan County courthouse. This includes OU III properties.
- Contact with the Utah Division of Water Rights is documented on the Annual Site Inspection Checklist to verify that no well applications have been granted in the OU III restrictive easement area.

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 2019 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 surveys 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 must be Rad Worker II certified. Workers without Rad Worker II certification must be escorted. Inspectors also verify that the Monticello copies 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

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

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 GRO system and groundwater well surface completions are inspected annually and recorded in Section VII of Appendix A. Facilities related to the GRO 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.

1.4 2019 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 23, 24, and 25, 2019. J. Nguyen, F. Smith, G. McKinnon, C. Oliver, C. Mueller, and G. Smith also participated in the inspection. EPA representative N. Davis was in attendance. M. Stilson, regional engineer with the Utah Division of Water Rights, was contacted in conjunction with the inspection.

Monday, September 23, 2019

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 24, 2019

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

Wednesday, September 25, 2019

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 2019, 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 GRO 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 26, 2019.

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 2019 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). Four new HVAC units were installed (PL-2). A new electric gate was installed at the front main entrance (PL-3). New electrical wiring was installed to both storage sheds (PL-4). 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 2019 annual inspection, the TSF fence was appropriately posted with access control signs, and there was no evidence of vandalism or trespassing (PL-5). The TSF bin was not opened during the inspection, but the site operations lead reported that it did not contain any soil. The TSF yard was well-maintained (PL-6). The lay-down area for potential mixed waste was in good working order, as were clamshell containers that contain approximately 1.5 cubic yards of used personal protective equipment, etc. The TSF was also inspected quarterly by site personnel in 2019, and inspection results were presented in quarterly reports to EPA and UDEQ.

2.1.2 Repository Perimeter

Perimeter Fence

In July, approximately 7861 feet of old southeastern perimeter fence was replaced with a new wildlife-friendly fence (PL-7). No evidence of vandalism or areas of excessive tumbleweed or debris buildup was present.

Location-Reference Signs

All perimeter signs were in good condition (PL-8). Black-numbered decals to identify sign numbers were in good condition.

Boundary Survey Markers

All six boundary markers were located during the inspection, and all were in good condition (PL-9). PL-9 is a one photo representation of a boundary survey marker. Photos of all six boundary markers are kept in the annual inspection photo log.

Erosion and Gullies

Erosion channels and drainages around the site perimeter were generally well-vegetated and had not significantly changed since the 2018 annual inspection. Erosion controls and revegetated areas related to the GRO 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 has changed since 2018 (PL-10), as increased vegetation from a high precipitation year has stabilized much of it. 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. One small population of noxious weeds was treated with herbicide after the annual inspection on September 26, 2019. Prairie dog activity was observed along the eastern portion of the site. That activity, which had declined significantly over the past few years, seems to be the same in 2019.

2.1.3 Repository Runoff and Run-On Controls

Siltation in the channels has been photographed and noted in prior inspections. Legacy Management Support engineers have noted that sedimentation is minor and collects naturally over time. The deposition is monitored during the annual inspection. No substantial change has been identified (see Appendix B).

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-11 and PL-12). 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.

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. The excess vegetation along the pond's access road was mowed in May. 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. Vegetation around the work and safety skiff was mowed for accessibility (PL-15). 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. Electrical upgrades to it were done in May (PL-16). 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 8.0 feet deep at the time of the inspection, due mostly to the operation of the GRO system. Only the exposed liner is inspected. 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. Material was added to the access road to create positive drainage. Water bars on the access road to the transfer building were in good condition. 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; however, there is one section of the fence near perimeter sign 4 that needs repaired. All gates in the wildlife fence were open. Both site monuments (PL-17)—one at the west access gate inside the wildlife fence and one at the apex of the disposal cell (PL-18)—were present and intact. Six raptor perches, installed near the disposal cell cover in 2007, were also in good condition, and the detached supporting beam brace on one perch was repaired (PL-19).

Vegetation

Desirable plants remained well-established on the cover, and no significant barren or eroded areas were identified (PL-20, PL-21, and PL-22). 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 4.3 in 2019, higher than the score in 2018. Enhanced vegetation growth and cover was due to a high precipitation year. Dominant species identified on the cover in 2019 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 2019, 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 24, 2019, with the lead inspector, site engineer, and G. Smith of Geo-Smith Engineering LLC. The purpose was to evaluate any geotechnical activity of the repository, as part of the comprehensive inspection. From a geotechnical standpoint, the areas inspected by the geotechnical engineer were observed to be in good to excellent condition. No depressions, erosion, slope stability, or foundation conditions that present problems were observed. Mr. Smith's full report is attached as 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-23). All five manhole covers were

secure and operable. Appropriate safety warnings and entry procedures were posted on all of the manholes, 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-24). 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. The new rain gauge, installed in 2018, was in good condition.

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 2019 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. Signs on these properties that post ICs (such as a prohibition against overnight camping) that were difficult to read during the 2018 inspection were replaced. 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 2019 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 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 sites 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-25 shows a portion of City-owned property MP-00211, and PL-26 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 2019. 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-27, PL-28, and PL-29).

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 2019 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 2019 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-30 shows an area of work in city streets during 2019. PL-31 shows the U.S. 191 embankment along the former mill site with no erosion. No excavation work was performed within any UDOT rights-of-way in 2019.

2.4 Private Property MS-00176-VL

During the 2019 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. Monitoring of this erosion will continue, but at this time no maintenance is required.

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 2019, 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-32) are recorded in Appendix A, Section V.

2.6 Groundwater Restricted Area

On September 13, 2019, 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 GWR. 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 GWR.

2.7 Operable Unit III

2.7.1 Groundwater Remedy Optimization System

Facilities related to the GRO 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, transfer building (PL- 33), and extraction well field were visited (PL-34), and the visible components of the system were intact and functioning (PL-35).

2.7.2 Water Quality Monitoring Well Inspection

Water sampling teams noted no deficiencies during routine well inspections in October 2018 and April 2019.

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 surveys 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 *LMS Safety and Health Program* (LMS/POL/S20043), 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 2019 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 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.

LMS Safety and Health Program (LMS/POL/S20043), continuously updated, prepared by Navarro Research and Engineering, Inc., for the U.S. Department of Energy Office of Legacy Management.

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.

5.0 Photographs

Photographs were taken to document findings of the 2019 annual inspection. The location and orientation of the photographs are identified in Figure 2, Figure 3, and Figure 4.



PL-1. Monticello Field Office Building



PL-2. New Administrative Building HVAC Install



PL-3. New Main Entrance Electrical Gate



PL-4. Storage Buildings with New Electrical Wiring



PL-5. TSF Gate with Postings



PL-6. TSF Yard



PL-7. New Section of Wildlife-Friendly Fence



PL-8. Perimeter Sign P39



PL-9. Boundary Survey Marker S-3



PL-10. Looking North Toward Perimeter Sign 1 Where Erosion Channel Shows Increased Vegetation



PL-11. South Drainage Channel, Looking East



PL-12. West Drainage Channel, Looking North



PL-13. Pond 4 Entry Gate



PL-14. Pond 4, Looking East



PL-15. Mowed Vegetation Around Pond 4 Skiff



PL-16. Pond 4 LCRS/LDS Control Cabinet



PL-17. Site Monument 1



PL-18. Site Monument 2



PL-19. Northeast Raptor Perch with Repaired Support



PL-20. Top of Disposal Cell Cover, Looking North



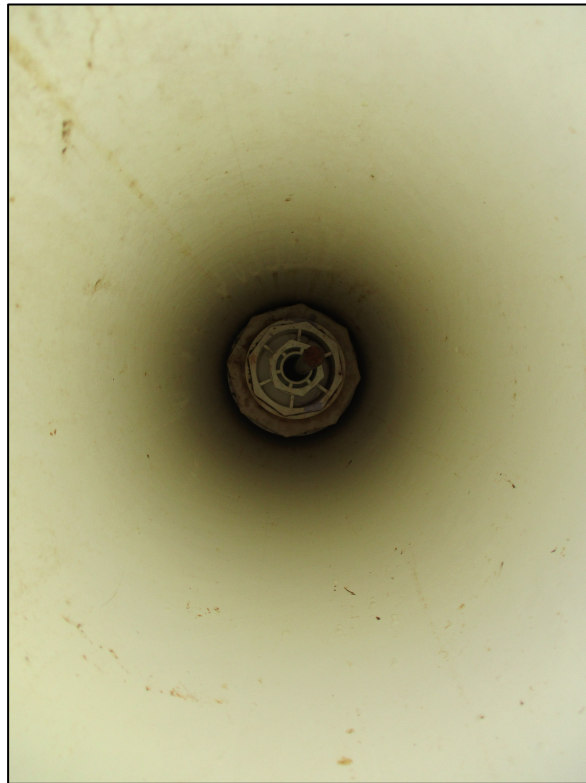
PL-21. Top of Disposal Cell Cover, Looking West



PL-22. Northeast Slope of Disposal Cell, Looking East



PL-23. Manhole #4, Looking North



PL-24. Settlement Plate G



PL-25. City Property MP-00211



PL-26. Deer Draw Dam



PL-27. View of Wetland 1 on Former Mill Site



PL-28. View of Wetland 2 on Former Mill Site



PL-29. View of Wetland 3 on Former Mill Site



PL-30. Completed Sewer Line Replacement at 517 South and 100 West Street



PL-31. U.S. Highway 191 Embankment



PL-32. Montezuma Canyon, View Downstream



PL-33. Transfer Building



PL-34. Extraction Well Field on Property MP-00179



PL-35. Transfer Building Interior

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

Notes:

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

Date(s) of Annual Inspection: 9/23/2019–9/25/2019

Inspection Team Members

Name	Affiliation	Phone Number	E-mail
Danika Marshall	Navarro Research and Engineering, Inc. (Ecologist)	(970) 248-6137	Danika.Marshall@lm.doe.gov
Paul Wetherstein	Navarro Research and Engineering, Inc. (Environmental Compliance)	(970) 248-6645	Paul.Wetherstein@lm.doe.gov
Fred Smith	Navarro Research and Engineering, Inc. (Site Lead)	(970) 248-6182	Fred.Smith@lm.doe.gov
Jason Nguyen	U.S. Department of Energy (Site Manager)	(970) 248-6707	Jason.Nguyen@lm.doe.gov
Natasha Davis	U.S. EPA (Remedial Project Manager)	(303) 312-6225	Davis.Natasha@epa.gov
Chris Oliver	Navarro Research and Engineering, Inc. (Engineer)	(970) 248-6159	Chris.Oliver@lm.doe.gov
Connor Mueller	Navarro Research and Engineering, Inc. (Engineer)	(970) 248-6258	Connor.Mueller@lm.doe.gov
Greg Smith	Geo-Smith Engineering (Engineer)	(970) 243-6736	Gsmith@geo-smith.com

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

I. Interviews		
Name of Individual Interviewed	Affiliation	Date Interviewed
Notes: <i>The onsite contractor operations lead accompanied inspectors on portions of the inspection. Notes are included in individual checklist sections below.</i>		
Name of Individual Interviewed	Affiliation	Date Interviewed
Marc Stilson	State Engineer	9/26/2019
Notes: <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 2019:</i> <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> <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>		
Name of Individual Interviewed	Affiliation	Date Interviewed
Gary McKinnon/Fred Smith	Contractor Operations Lead/Site Lead	9/24/2019
Notes: <i>Gary McKinnon, contractor operations lead, and Mr. Smith, site lead, both with Navarro Research and Engineering, Inc., were interviewed in tandem. Both confirmed during the interview that in 2019:</i> <ul style="list-style-type: none"> <i>No construction or disturbance within the planned restricted areas.</i> <i>LCRS/LDS control cabinet electrical upgrade.</i> <i>Leachate collection recovery system electrical upgrade.</i> <i>New electrical wiring installed to the administrative storage sheds.</i> <i>Road maintenance on site access roads.</i> <i>Wildlife-friendly fence installed on the southeast perimeter of the disposal cell.</i> <i>Four new HVAC units were installed at the administrative office.</i> <i>Electrical gate at the sites' main entrance was installed.</i> <i>Design and cost estimates made for the new solar array.</i> <i>Mowing and cutting maintenance around Pond 4, Vaults 1 and 3, and the OU III monitoring wells</i> <i>Safety equipment was purchased for Vaults 1 and 3.</i> <i>DOE supported City Council outreach in July.</i> <i>Continued progress made on the OU III closure status.</i> <i>Comprehensive asbestos assessment of the ceiling tiles in the administrative building prior to tile replacement.</i> 		

II. Administrative and Records Inspection

	Y	N	Y	N	
	<u>Y</u>	<u>N</u>	<u>Y</u>	<u>N</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		
Repository Site Record Book	X	<input type="checkbox"/>	X	<input type="checkbox"/>	
City-owned properties	<input type="checkbox"/>	X	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, site. Evaluation of the electronic version of the Information Repository is posted to the website.

No transfer of radioactive material into TSF in fiscal year 2019.

City-owned property record book had four missing weekly entries. Site staff explained this was due to weather and bad road conditions. Future inspections that cannot take place due to road conditions will be noted in the weekly log. Record books and radiological as-built drawings had some minor discrepancies that were corrected by the Monticello 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

	Y	N	Y	N	
	<u>Y</u>	<u>N</u>	<u>Y</u>	<u>N</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>Y</u>	<u>N</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>Y</u>	<u>N</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>Y</u>	<u>N</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>Y</u>	<u>N</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 Restriction Inspection:

Deed restrictions will now be inspected onsite by the Navarro real property team, not by the lead and assistant inspector.

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)	_0_		
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:			
None			
B. Repository Perimeter			
<i>(Note locations of erosion, noxious weeds, vandalism, or excessive vegetation on map)</i>			
1. Outer Fencing and Gates	X	Satisfactory	Repairs/Maintenance Needed
2. Signs <i>(Note condition of 40 numbered reference signs and posts)</i>			
Signs damaged but legible, requiring monitoring:			
Signs requiring replacement:			
3. South Boundary Markers	X	All six markers located	<input type="checkbox"/> Marker(s) _____ not located
4. Erosion/Gullying	X	Not evident	<input type="checkbox"/> Evident
5. Vegetation	X	Not excessive	<input type="checkbox"/> Excessive growth
		Noxious weeds absent	x Noxious weeds present
6. Land Use Changes on Adjoining Property	X	No change	<input type="checkbox"/> Change
7. Vandalism/Trespassing	<input type="checkbox"/>	Not evident	X Evident
Notes for Condition of Repository Perimeter (e.g., repairs needed, erosion areas, vandalism):			
7861 feet of new wildlife-friendly fence was installed along the southwest perimeter (see Figure 1).			
Repository Runoff/Run-On Controls			
<i>(North and East Toe Trenches; South and West Drainage Channels)</i>			
1. Settlement	X	Not evident	<input type="checkbox"/> Evident
2. Material Degradation	<input type="checkbox"/>	Not evident	X Evident
3. Erosion/gullies	X	Not evident	<input type="checkbox"/> Evident
4. Siltation	<input type="checkbox"/>	Not evident	X 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"/>	Not evident	X 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>8</u> feet		
8. Vandalism	<input checked="" type="checkbox"/> 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. Vegetation along the access road and the skiff was mowed in September 2019. LCRS and LSD electrical was upgraded in July 2019.			
C. Repository Cover Inspection			
1. Top Perimeter Road and Road to Pond 4	<input checked="" type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
2. Interior Wildlife Fence and Wildlife Gates	Physical condition is: <input type="checkbox"/> Satisfactory <input checked="" type="checkbox"/> Unsatisfactory		
3. Cover Vegetation	See attached <i>Repository Cover Vegetation Index</i> form; note areas of concern on map		
4. Riprap Armoring	<input checked="" type="checkbox"/> Slumping/sliding not evident <input type="checkbox"/> Slumping/sliding evident (locate on map) <input checked="" type="checkbox"/> Rock deterioration not evident <input type="checkbox"/> Rock deterioration evident (locate on map)		
5. Settlement/Desiccation/Erosion/Gullies	<input checked="" type="checkbox"/> Settlement depressions not evident <input type="checkbox"/> Settlement depressions evident (locate on map) <input checked="" type="checkbox"/> Desiccation cracking not evident <input type="checkbox"/> Desiccation cracking evident (locate on map) <input checked="" type="checkbox"/> 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 <input checked="" type="checkbox"/> Holes/burrows/biointrusion evident (locate on map)		
7. Seepage/Ponding	<input checked="" type="checkbox"/> Seepage not evident <input type="checkbox"/> Seepage evident (locate on map) <input checked="" type="checkbox"/> Ponding not evident <input type="checkbox"/> Ponding evident (locate on map) <input checked="" type="checkbox"/> Soft subgrade not evident <input type="checkbox"/> Soft subgrade evident (locate on map) <input checked="" type="checkbox"/> Phreatophytes not present <input type="checkbox"/> Phreatophytes present (note species/locate on map)		
8. Site Monument at Apex of Cover	<input checked="" type="checkbox"/> Satisfactory	<input type="checkbox"/> Repairs/maintenance needed	
Site Monument at Boundary Gate	<input checked="" type="checkbox"/> 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.			
Cover Penetrations			
<i>(Caution: Confined space entry requirements in effect for all manholes)</i>			
1. Manholes 1 and 3 (LCRS and LDS access vaults)	Covers secure and operable <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Exterior pump access ports are undamaged <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Evidence of leakage into vaults <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of drainage through cover penetrations <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
2. Manholes 2, 4, and 5	Covers secure and operable <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Evidence of drainage through cover penetrations <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Evidence of drainage through cover penetrations <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

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

Surface completions undamaged	X	Yes	X	No
Inner plates undamaged	X	Yes	<input type="checkbox"/>	No

5. Embedded Lysimeter

Evidence of seepage at outlet	<input type="checkbox"/>	Yes	X	No
Instrumentation installations undamaged	X	Yes	<input type="checkbox"/>	No
Evidence of drainage along cover penetrations	<input type="checkbox"/>	Yes	X	No
Telemetry surface installations in good condition	X	Yes	<input type="checkbox"/>	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:

Electrical upgrades occurred in July.

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"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>
Evidence of camping	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X
Habitable structure(s)	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X
Gullies/erosion	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<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"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>
Land use changes	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X
Evidence of vandalism	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X	<input type="checkbox"/>	X
Soil removal evident	n/a		<input type="checkbox"/>	<input type="checkbox"/>	n/a		n/a		<input type="checkbox"/>	<input type="checkbox"/>	n/a		<input type="checkbox"/>	<input type="checkbox"/>
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	n/a	<input type="checkbox"/>	X	n/a	<input type="checkbox"/>	X		<input type="checkbox"/>	<input type="checkbox"/>

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

None

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:

None

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
Corrective Action Required	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<i>* confirm with onsite LM representative</i>				
Notes for Soil and Sediment Properties Inspection:				
<i>No anomalies have been reported by sampling teams or onsite representatives.</i>				
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
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
<i>* confirm with onsite LM representative</i>				
Notes for Groundwater Management Area Inspection:				
<i>Onsite representatives regularly inspect area to verify that new wells have not been drilled.</i>				
VII. OU III Monitoring Wells and Water Treatment Systems				
A. Monitoring Well Surface Completions				
<i>(Note: Active wells are inspected and maintained biannually during sampling events. Observations on inactive wells are reported to the sampling team.)</i>				
	<u>Yes</u>	<u>No</u>		
Outer Casing or Flush Mount Vault of Inactive Wells Intact	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Wells Are Locked, and Flush Mount Well Lids Are Secured	<input type="checkbox"/>	<input checked="" 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):				
<i>Wells are checked and maintained twice a year by groundwater sampling team. The field was mowed for well access in September 2019.</i>				
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"/>	<input checked="" type="checkbox"/>	N/A
Notes for City Streets and Utilities Inspection:				
<i>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 2019.</i>				

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:			
<i>UDOT information available on website; no construction. Onsite LM representative routinely consults website for future projects. No highway projects in 2019.</i>			
Erosion (highway shoulders and U.S. 191 embankment at Montezuma Creek)			
<input type="checkbox"/> New erosion evident	<input type="checkbox"/> Previous erosion evident; unchanged	X No erosion evident	
Eroded Material Scanned for Radiological Contamination and Properly Managed			
		<input type="checkbox"/> Yes	<input type="checkbox"/> No X N/A
Describe Erosion Noted on UDOT Highways:			
<i>High precipitation events increased vegetation growth along the embankment of U.S. 191 at Montezuma creek. Previous erosion is no longer present.</i>			
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)			
<i>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.</i>			
	<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:			
<i>No changes noted since last annual inspection.</i>			

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: 9/25/2019

Inspected by: David Holbrook

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*, *Helianthus annuus*, 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 in bloom; high moisture year.

Vegetation Condition Score (see reverse): 4.3

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.)

High moisture year, increased plant canopy cover.

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	0	6	3

Add up all columns for total condition score:

$$\begin{array}{rcl}
 \underline{\quad 0 \quad} & (\text{Column 1}) \times 1 = & \underline{\quad 0 \quad} \\
 \underline{\quad 0 \quad} & (\text{Column 2}) \times 2 = & \underline{\quad 0 \quad} \\
 \underline{\quad 0 \quad} & (\text{Column 3}) \times 3 = & \underline{\quad 0 \quad} \\
 \underline{\quad 6 \quad} & (\text{Column 4}) \times 4 = & \underline{\quad 24 \quad} \\
 + \underline{\quad 3 \quad} & (\text{Column 5}) \times 5 = & \underline{\quad 15 \quad} \\
 \hline
 & \text{Total:} = & \underline{\quad 39 \quad}
 \end{array}$$

Divide total by 9 to calculate vegetative cover condition score = 4.3

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Appendix B

Geotechnical Inspection Report

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Geotechnical, Geohydrological and Geoecological Consulting Services

October 17, 2019

Fred Smith
Monticello Site Lead
Navarro

RE: Geotechnical Inspection, Monticello Repository

Introduction

An inspection was performed at the Monticello Repository September 24, 2019 to assess the geotechnical condition of the repository as part of a comprehensive inspection performed annually by Navarro Research and Engineering. This report follows the 2018 inspection report.

The site was visited by Greg Smith of Geo-Smith Engineering, LLC on September 24, 2019. Mr. Smith met Colton Berube from Navarro to receive site training; later Mr. Bill Cary gave Mr. Smith a Job Safety Analysis for the day's inspection. Mr. Smith was accompanied by Ms. Natasha Davis from the U.S. EPA, Mr. Fred Smith, Mr. Chris Oliver, Mr. Conner Muller, Mr. Paul Weatherstein, and Ms. Danika Marshall of Navarro, on the inspection.

Overall site condition

The site was in good to excellent condition during the inspection. A good amount of winter precipitation allowed vegetation on the top and vegetated side slope to be in a healthy growth condition. No serious geotechnical problems were identified on the repository or site. Figure No. 1 shows the overall cover conditions.



Figure No. 1, Over top slope cover, September 24, 2019

Erosion control riprap side slopes

The northwest riprap side slope was initially visited and found to be in excellent condition as evident in Figure No. 2. The slope is protected against erosion by diorite riprap (as shown in Figure No. 3), and materials were in excellent condition. Shallow channels with occasional shallow rills were found on the soil/rock interface of the side slope, above the riprap slope indicating surface flow probably from melting snow cover and/or precipitation. These features do not currently pose any difficulties, however continued monitoring is needed to ensure erosional problems are not created.



Figure No. 2, Northwest riprap slope seen from U.S. Highway 191



Figure No. 3, Northwest riprap side slope

Some sediment is currently being transported to the edge of riprap slopes (see Figure No. 4). This is identical to processes working on vegetated side slopes above rock filled channels/aprons (shown on Figure No. 5) located at the base of slopes. Flow in apron/channels does not appear to be affected, and is not considered a problem. In each of these cases vegetation is establishing in the sediment and does not pose in erosion problems. However, these examples of minor erosion should continue to be monitored. Some break down of sandstone rock is evident, as seen in Figure No 6. This breakdown is not ubiquitous, nor widespread and is not considered a problem.

Pond 4 and Ground water collection and transfer building

No problems were reported at either Pond 4 (see Figure No. 7), nor the ground water transfer building, so neither of these facilities was visited for the geotechnical inspection. As seen in Figure No. 7, Pond 4 is in good condition.



Figure No. 4, Sediment at top of northwest slope



Figure No. 5, Sediment transport into toe apron, east side slope



Figure No. 6, Break down of sandstone rock, east side slope apron



Figure No. 7, Pond 4 from east side slope

Respectfully submitted,

Gregory M. Smith

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