

2011 Annual Inspection of the DOE Monticello, Utah, Mill Tailings Site and Monticello Vicinity Properties

November 2011



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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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 27 and 28, 2011. DOE inspects these sites annually to ensure that the selected remedies remain protective of human health and the environment. Under those remedies, contamination remains in place at some locations where use is restricted and exposure is limited. Annual inspections (1) verify that DOE long-term surveillance and maintenance (LTS&M) activities implemented throughout the year are effective and appropriate, (2) confirm that the institutional controls restricting land and water use under the MMTS and MVP remedies remain effective, and (3) identify deficiencies and recommend corrective actions as needed. This report summarizes the results of the 2011 annual inspection.

Repository Findings

The repository is well maintained and well managed. No remedy-related maintenance items were identified. Most site features and support structures were in good to excellent condition. The repository perimeter fence was in good condition, although several areas were identified that require minor repairs, including a broken gate in the northeast corner of the site near perimeter sign P18. Minor repairs are also required in the Pond 4 fence and interior wildlife fence. “No Hunting” signs at perimeter gates have become illegible and will be replaced. Two tumbleweed accumulations along the perimeter fence were large enough to require removal. No new erosion or gullies were apparent at the repository site. A deep gully along the western boundary continues to fill in with sediment over time. Increasing numbers of vole burrows were found across the site. Site vegetation was healthy and composed primarily of desirable species. Several patches of noxious weeds were found onsite and herbicide treatment is planned in October 2011. The vegetation on the repository cover remained ecologically healthy and diverse.

City Property Findings

No violations of institutional controls restricting land and water use were evident during the 2011 annual inspection. Drainage and runoff control structures were in good condition. There were no remedy-related repair or maintenance items requiring action by the City of Monticello. Construction on Properties MP-00211 and MP-00181, on the western portion of the former mill site, has been properly monitored for radiological control by on-site LTS&M personnel. The construction work includes placing fill materials from off-site, and it involves no soil excavation below the fill. Bicycle/walking trails had been graded recently. No areas of new erosion were identified.

City Streets and Utility Corridor Findings

No unplanned or unmonitored excavations were evident during the 2011 annual inspection. No new erosion of highway shoulders and along the Highway 191 embankment at Montezuma Creek was apparent. On-site representatives confirmed that construction projects involving City and State infrastructure upgrades were appropriately monitored for radiological control.

Private Property Findings

No violation of any land or water use restriction was evident during the 2011 annual inspection. In 2008, a land use change occurred on Property MP-00990 when water from Montezuma Creek was diverted to a pond for irrigation, but which does not affect original site risk assumptions. No other land use changes on restricted properties were apparent. No well drilling occurred in 2011 in or near the Groundwater Restricted Area.

Records Findings

No major deficiencies were noted in radiological as-built drawings, site record books, or surveillance checklists. Some excavations, appropriately recorded in the record book(s), did not appear on maps because the excavations were located outside the map boundaries. LTS&M documents were available electronically from the field office. The Information Repository and Operable Unit III Administrative Record were present and in good condition. Updating the Information Repository is planned for November 2011. 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.

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 27 and 28, 2011. DOE inspects these sites annually to ensure that the selected remedies remain protective of human health and the environment. Under those remedies, contamination remains in place at some locations where use is restricted and exposure is limited. Annual inspections (1) verify that DOE long-term surveillance and maintenance (LTS&M) activities implemented throughout the year are effective and appropriate, (2) confirm that the institutional controls restricting land and water use under the MMTS and MVP remedies remain effective, and (3) identify deficiencies and recommend corrective actions as needed. This report summarizes the results of the 2011 annual inspection to identify site conditions that may compromise remedy protectiveness and therefore warrant corrective action by DOE. Results of this annual inspection will also be incorporated into the compulsory five-year reviews of the MMTS and MVP, due in June 2012, as mandated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

1.1 Monticello Site Background Information

Between the early 1940s and 1960, uranium and vanadium ore was intermittently processed at the mill and ore-buying station in Monticello, Utah. 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 used for construction in Monticello. Drainage of liquids from the impounded tailings contaminated groundwater in the underlying shallow alluvial aquifer.

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. DOE, in accordance with CERCLA, as implemented through a Federal Facilities Agreement, completed remediation of soil contamination at the MMTS and MVP in August 1999. Radiologically contaminated materials were placed in an engineered disposal cell about 1 mile south of the former mill site. The disposal cell, completed in October 1999, and associated support facilities are known collectively as the repository site (see Figure 2). The repository site includes a temporary storage facility (TSF), where newly excavated radiologically contaminated materials are stored before eventual disposal off site.

In some locations, radiologically contaminated material was left in place in compliance with supplemental standards, as codified at Title 40 *Code of Federal Regulations* Part 192.21. These locations, referred to as supplemental standards areas (see Figures 3 and 4), occur on City and private property, beneath City streets, and in utility corridors. Land use restrictions are applied to these properties and to the former mill site. Restrictions are also applied to properties overlying contaminated groundwater. The former mill site property and several adjacent properties that include supplemental standards areas were transferred to the City of Monticello in 2000 for use as a public park. City and private properties are described in more detail in Section 1.3.

In the following summary of the annual site inspection, many of the inspection items refer to a specific property identification, such as MP-00177. These identifications were assigned during remedial actions for the purpose of tracking the scope and progress of remedial actions on individual land holdings. Figure 3 identifies the locations of the Monticello properties affected by

the remedial actions and that are subject to annual inspection, as referenced in the following sections of this report.

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 routinely inspecting, operating, and maintaining the on-site permanent disposal cell and leachate management system; routinely inspecting all properties affected by land and water use controls to ensure compliance with the controls; and monitoring and managing radiologically contaminated soil encountered at City and Utah Department of Transportation (UDOT) excavations in Monticello. Activities associated with Operable Unit III, including groundwater treatment, are not LTS&M activities. In association with Operable Unit III, groundwater and surface water quality are monitored and results are reported annually. CERCLA 5-year reviews (begun in 1997) are also conducted to monitor and document the protectiveness of the MMTS and MVP remedies.

LTS&M activities, including the annual inspection and reporting, are conducted by on-site and off-site personnel in accordance with the procedures provided in the *Long-Term Surveillance and Maintenance Plan for the Monticello NPL Sites* (LTS&M Plan).

1.3 Annual Site Inspection Scope

Annual inspections of the MMTS and MVP focus on four general topics: Recordkeeping and Administrative Review, DOE Repository Site, City and Private Properties, and City Streets and Utility Corridors. The Annual Inspection Checklist records the items inspected; Appendix A includes the completed checklist for the 2011 annual inspection. Revised in 2009, this checklist format was approved by EPA and UDEQ through Federal Facilities Agreement meetings. The checklist supersedes Appendix K of the LTS&M Plan.

Recordkeeping and Administrative Review

Recordkeeping by the on-site LM contractor staff is reviewed for proper documentation of day-to-day activities and recorded in Section II of the Annual Inspection Checklist. On-site record books, surveillance checklists, and radiological as-built maps are verified (radiological as-built maps, in addition to on-site record books, document the location and findings of radiological control measures provided by on-site LM contractor staff during municipal construction activities conducted in Monticello).

The inspection also confirms that deed annotations applicable to the supplemental standards areas remain accurately filed at the County Courthouse; that the Information Repository and Operable Unit III (OU III) Administrative Record documents are complete and current; that updated copies of relevant LTS&M documents are available to the on-site staff; and that workers accessing the TSF are appropriately trained or escorted. The inspection no longer includes a review of the MMTS and MVP Administrative Record because these files were sent to the Federal Records Center in Denver, Colorado, per CERCLA guidelines, in 2008.

DOE Repository Site

The repository site is inspected for the integrity of constructed features and support facilities (e.g., signs, buildings, fences, gates) and the integrity of the disposal cell cover, including the health of the plant community. Observations are recorded in Section III of the Annual Inspection Checklist. Areas needing maintenance or repair are noted, as are areas of soil erosion or siltation. The repository site inspection also includes the management and operation of the TSF and the management and operation of the disposal cell leachate collection system including Pond 4 (an engineered pond for evaporation of disposal cell leachate). Because control of noxious weeds on Federal properties is required by law, infestations of noxious weeds are also identified during the inspection.

City and Private Properties

City and private properties are inspected annually to confirm that institutional controls, as described in the LTS&M Plan, remain effective, and to document any change in site 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, VII, and VIII-C of the Annual Inspection Checklist.

Land and water use restrictions apply to the following City and private properties (see Figure 3 for locations):

- City-owned properties transferred from DOE: MP-00181, MP-00391, MS-00893, MP-01040 (north), MP-01041, MP-01042, and MP-01077. All of these properties are restricted to recreational day use. Overnight camping and the building of habitable structures are prohibited.
- Piñon/Juniper properties supplemental standards areas (a subset of the City-owned properties): MP-00391, MP-01041, and MP-01077. These properties have an added restriction of no soil removal.
- Former mill site (a subset of the City-owned properties): MP-00181 and MS-00893. In addition to other restrictions, damage to wetlands is prohibited in these areas.
- Groundwater Management Area (also known as the Groundwater Restricted Area [GWRA]; includes both City-owned and private properties): MP-00179, MP-00181, MP-00211, MS-00893, MP-00947, MP-00951, MP-00990, MG-01026, MG-01027, MG-01029, MG-01030, MG-01033, MP-01077, MP-01083, and MP-01084. Domestic use of groundwater from the alluvial aquifer is prohibited on these properties. This institutional control is administered by the State Engineer's Office through the well permitting process.
- Montezuma Creek Soil and Sediment Properties (also known as the Montezuma Creek Restrictive Easement Area; privately owned): MP-00951, MP-00990, MG-01026, MG-01027, MG-01029, MG-01030, MG-01033, and MP-01084. Portions of these properties have restrictive easements to prohibit soil removal or the construction of habitable structures.
- Properties MP-00211 (City-owned but not transferred from DOE) and MS-00176 (privately owned). Special zoning ordinances, which require radiological scanning for certain ground-disturbing activities, affect these properties.

Surface components of the OU III groundwater treatment system and inactive monitoring well surface completions, located on private property MP-00179, are also inspected annually. Inspectors also note any evidence of standing water, saturated soil, surface disturbance, or stressed vegetation in the area of the groundwater treatment system.

City Streets and Utility Corridors

During the annual inspection, City streets, utility corridors, and Highway 191 and 491 rights-of-way are inspected for evidence of unmonitored excavations or soil movement. Results are recorded in Sections VIII-A and VIII-B of the Annual Inspection Checklist.

Radiologically contaminated soil remains in some places beneath streets and utility corridors in Monticello, in the Highway 191 embankment over Montezuma Creek, and UDOT rights-of-way along Highways 191 and 491. Supplemental standards have been applied to these areas. Through a cooperative agreement with the City, the on-site LM contractor staff monitors all excavations in these areas for radiologically contaminated material, and the City transports any such material to the TSF under direction of the on-site staff. On-site staff also monitors all excavations of Highways 191 and 491. 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 on-site staff, haul the material to the TSF.

1.4 2011 Annual Site Inspection Participants and Schedule

Inspection team members and affiliations are listed on page 1 of the Annual Inspection Checklist (Appendix A). L. Sheader and P. Wetherstein conducted the physical site inspection on September 27 and 28, 2011. J. Dayvault and J. Nguyen of DOE participated in portions of the inspection. M. Stilson, of the Utah Department of Natural Resources Division of Water Rights, was also contacted on October 6, 2011, to verify that no prohibited well permits were sought within restricted areas.

Tuesday, September 27, 2011

Inspection team members convened at the Monticello field office in the morning, and P. Wetherstein reviewed health and safety documents with the inspection team. In the afternoon, L. Sheader and P. Wetherstein inspected repository features, including Pond 4, the repository cover, cover penetrations, wildlife fence, drain ditches and toe trenches, and the field office. City-owned properties also were inspected. J. Dayvault and J. Nguyen accompanied the inspectors for portions of the inspection.

Wednesday, September 28, 2011

The repository perimeter fence, perimeter signs, and boundary markers were inspected in the morning along with privately owned property MS-00176 and City-owned property MP-00211. In the afternoon, the administrative and records inspection was conducted, the TSF was inspected, and institutional controls at the Montezuma Creek Soil and Sediment Properties and Groundwater Management Area were verified.

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, run-on and runoff drainage controls, Pond 4, the disposal cell cover, and cover penetrations (manholes, settlement monuments, and structures associated with the embedded lysimeter). Results of the repository 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. Site access signs displaying contact information were current and visible. Infestations of two noxious weed species (Russian knapweed [*Acroptilon repens*] and spotted knapweed [*Centaurea diffusa*]) were identified and flagged prior to the annual inspection near the field office buildings and entrance gate; herbicide treatment in October 2011 is planned. The site's paved access road was in good condition, with vegetation mowed along the margins.

2.1.2 Temporary Storage Facility

The TSF is a restricted-access, gravel-surfaced area enclosed by an 8-foot-high chain link fence. The fence was appropriately posted with access control signs, and there was no evidence of vandalism or trespassing. Within the fence, the TSF bin and lay-down area for potential mixed waste were in good working order. At the time of the inspection, the bin contained about 6 cubic yards of low-level radiologically contaminated soil and debris derived from city street and utility excavations. There was no mixed waste stored in the TSF.

2.1.3 Repository Perimeter

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 and P1–P39) are fixed to the fence or on separate posts nearby. The site entrance gate is locked at night and at other times when on-site personnel are not present.

Perimeter Fence

The perimeter fence along the south edge of the repository site was rebuilt in November 2010. Repaired sections of the fence were in very good condition. Other sections of fence were in need of minor repair, as some wires were broken or slack. One gate at the northeast corner of the site near P18 was broken and was found partially open during the inspection. No evidence of vandalism was present.

Location-Reference Signs

All perimeter signs were legible and in good condition, although perimeter signs P12 and P15 (Photo 1) were scratched. “No Hunting” signs, posted at all gates along the perimeter fence, were weathered and largely illegible. “No Hunting” signs may be particularly important along the eastern site boundary, where land use changes are likely to occur with the recent sale of the property. No evidence of bullet holes or other vandalism was present.

Boundary Markers

All six boundary markers were located and were in good condition.

Erosion and Gullies

No new erosion was apparent during the 2011 inspection. Previous inspection reports describe a gully between perimeter signs E and P2, which threatened portions of the fence line along the west boundary of the site. Because sources of water to the gully have been rerouted or repaired by UDOT, no action was taken by DOE to fill the gully or to move the perimeter fence. As in 2010, the gully was still present in 2011. Deposition has continued, slowly filling in washout areas (Photo 2). This process will likely continue to fill the gully over time.

Perimeter Vegetation

Vegetation between the perimeter fence and the wildlife fence (inner fence) is healthy and composed primarily of desirable species. One large patch of spotted knapweed was located in the southeastern portion of the site and will be treated with herbicide in October 2011. A small patch of mullein (*Verbascum thapsus*), which can be locally invasive, was found near perimeter sign P30 and also will be treated to prevent its spread. Field bindweed (*Convolvulus arvensis*), a Category C noxious weed species, also was present in places; because it is not spreading, it does not require control. Two areas of tumbleweed accumulation—near perimeter signs P15 and P18—were identified during the inspection.

Maintenance Item: Treat infestations of noxious weeds near the access area, front gate, and perimeter fence with herbicide.

Maintenance Item: Repair weather-damaged sections of the perimeter fence.

Maintenance Item: Repair the stock gate at the northeast corner of the site near perimeter sign P18.

Maintenance Item: Replace “No Hunting” signs at all gates in the perimeter fence with sturdy metal signs.

Maintenance Item: Remove tumbleweed accumulations near perimeter signs P15 and P18.

2.1.4 Repository Run-on and Runoff Controls

Engineered rock-lined drainage controls that collect and direct runoff from the disposal cell are the West Drain Ditch, South Drain Ditch, East Toe Trench, and North Toe Trench. These features are designed to prevent gully erosion of the disposal cell. Some areas of siltation, the result of natural processes where rock channels are filled in slowly over time, were observed within the ditches and trenches. All ditches and trenches are in good condition and do not contain excessive vegetation.

West Drain Ditch

In 2002, eroded areas in the West Drain Ditch channel immediately north of the inner fence were repaired, and the channel was lined with rock all the way to North Draw. Erosion was also observed in a small gully connected to the West Drain Ditch during the 2008 inspection. No evidence of additional erosion in either area was apparent in 2011 (Photos 3 and 4). One small

elm tree has become established in the West Drain Ditch, and it will continue to be monitored. If the tree has the potential to block flow, it will be removed.

South Drain Ditch

Stabilized erosion rills were present on the South Drain Ditch's north side in places and had not changed. Shrubs were observed in portions of the South Drain Ditch but do not block potential flow.

East Toe Trench and North Toe Trench

Some rock at the surface of the East Toe Trench and North Toe Trench has degraded in the past, but no new degradation was noted. Erosion or bypass of these trenches is not evident. Soils and vegetation have accumulated in the drainage downgradient of the East Toe Trench, but flows are not impeded. Soils and vegetation have also accumulated in the drainage downgradient of the North Toe Trench; no new erosion was noted in this area.

2.1.5 Pond 4

Pond 4 is a lined solar evaporation pond that collects water pumped from the disposal cell leachate collection and recovery system (LCRS). Pond 4 also collects a small amount of precipitation. Pond 4 is constructed with an LCRS and leak detection system (LDS). In the past, when Pond 4 was used to store construction water or during times of increased precipitation, the pond's LCRS infrequently collected water. The Pond 4 LDS has never collected water. An 8-foot-high security fence surrounds Pond 4, and a rope barrier surrounds the pond within the security fence. Locked chain link gates are present at the northeast and southwest corners of the security fence, and a locked vehicle access gate is in the west fence. Water rescue equipment is stored in weatherproof metal cabinets on the berm near the northeast corner of Pond 4 and near the vehicle entrance gate.

Gate, Fence, Entrance, and Perimeter Signs

All gates were in good working condition. Warning signs on the perimeter fence were easily visible and legible. The following warning signs were posted on the perimeter fence: "Danger Do Not Enter," "Controlled Area, Enter at Designated Access Only," "Contaminated Water, Do Not Discharge," and a sign posting current contact information, which included a "No Trespassing" warning. There was no evidence of vandalism or trespass, but damage to the security fence from snowmelt was apparent. Most damaged sections have been repaired by on-site personnel, but two additional holes, large enough to allow human or animal access, were discovered during the inspection (Photo 5). These holes require repair.

Pond Perimeter and Berm

The pond's rope barrier was intact, and warning signs—"Contamination Area" postings and notices that life jackets are required—were visible and legible. Animal burrows, primarily made by voles, were visible on and below the pond berm on all sides (Photo 6). No large burrows, which might threaten the berm's integrity, were found. Animal burrows will continue to be monitored during routine Pond 4 inspections. Vegetation on the slopes of the berm was well established and primarily composed of non-weedy species.

Lifesaving Equipment

The cabinets containing the water rescue equipment were highly visible, adequately labeled, and in good condition. The contents of the cabinets (throw buoys, rope, rope ladders, personal flotation devices) were easily accessible and in good condition.

Pond 4 LCRS/LDS Control Cabinet

The LCRS/LDS control cabinet was in good condition. No evidence of insects or rodent damage was present, and the cabinet remained weatherproof. Operation of the Pond 4 LCRS and LDS is reported under Section 2.1.6, “Cover Penetrations.”

Liner, Anchors, and Pond Interior

Although no visible evidence of holes in the pond liner was observed, repairs to known holes in the pond liner are planned in October 2011. Liner anchors, consisting of sand-filled polyethylene pipe installed in 2007, were in good condition. Less than 1 foot of water was standing in the northeast corner of the pond. The pond contained silt and vegetation, including saltcedar (*Tamarisk ramosissima*, a noxious species), but this vegetation was later removed during liner repairs (Photo 7).

Maintenance Item: Repair holes in the security fence around Pond 4.

2.1.6 Disposal Cell Cover

The repository cover inspection includes the disposal cell cover and other features within the inner wildlife fence, including roads, riprap areas, and site monuments. The wildlife fence is a 6-foot-high wire-mesh fence that contains a vehicle access gate on the west end, a Pond 4 access gate on the east end, and five narrow gate apertures that allow wildlife to pass through.

Roads, Wildlife Fence, Site Monuments, and Raptor Perches

The unpaved road surrounding the disposal cell and the road to Pond 4 was recently graded and in very good condition (Photo 8). One hole was discovered in the wildlife fence in its northeast section (Photo 9). The hole, probably caused by snow damage, may present a hazard to wildlife and will be repaired. Other sections of the wildlife fence and gates, open at the time of the inspection, were in acceptable condition and showed no evidence of vandalism. Both site monuments, one at the west access gate through the wildlife fence (Photo 10) and one at the apex of the repository, were present and intact. Six raptor perches, installed near the disposal cell cover in 2007, were in good condition.

Vegetation

Desirable plants remained well established on the cover, and no significant barren areas, eroded areas, or phreatophyte shrubs were identified (Photo 11). Some dead sagebrush (*Artemisia tridentata*) and rabbitbrush (*Ericameria nauseosa*) plants—killed from a 2006 vole infestation—were still scattered across the cover. As in 2010, a large number of healthy, desirable shrub seedlings were apparent. Small quantities of field bindweed were found on the cover; because it is not spreading, control is not necessary.

The Repository Cover Vegetation Index, developed in 2009 for use during annual inspections (pages A-11 and A-12 in Appendix A), indicates that the cover vegetation remains healthy. A vegetation condition score of 3.67 out of 5.00 was assigned to the cover. An average score is considered to be 3.00. The vegetation condition score is used to detect trends in the health of the

vegetation community; no significant upward or downward trends were apparent. Dominant species identified on the cover in 2011 include sagebrush, western wheatgrass (*Pascopyrum smithii*), crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*Thinopyrum intermedium*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and smooth brome (*Bromus inermis*). None of these species are weedy.

Vegetation on the repository's soil-covered side slopes and outlying areas is also in good condition. Plants also have established on portions of the rock riprap armoring (Photo 12), mainly rabbitbrush, yarrow (*Achillea millefolium*), and grass species with occasional patches of oak brush (*Quercus gambelii*). Because none of this vegetation overlies tailings or threatens the integrity of the side slopes, it is not of concern.

Burrowing

More active burrows (Photo 13) were observed during the 2011 inspection than in 2010, indicating that vole populations may be cyclically increasing at the site. However, the increased presence of raptors and recent decreases in standing dead vegetation due to heavy snowfall are expected to prevent widespread damage to the cover shrubs in 2011. There is no evidence that burrows penetrate beneath the cover's biointrusion layer.

Stability

No area of the cover indicated settling, slumping, fracturing, seepage, ponding, or significant erosion. The steep, rock-lined slopes showed no evidence of rock movement or degradation, settling, slumping, or erosion (Photo 14).

Maintenance Item: Repair the hole in the wildlife fence in its northeast section.

2.1.7 Cover Penetrations

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 (see Figure 2).

Manholes and Video Ports

Manholes 1 and 3 enclose equipment for the disposal cell LCRS and LDS. They were not entered during the annual inspection, but the exteriors were in good condition. On-site personnel reported that equipment in Manholes 1 and 3 remained in good condition. All five manhole covers were secure and operable, appropriate safety warnings and entry procedures were posted, the 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 on MH-1 and MH-2 were locked and secure.

Settlement Monuments

Nine settlement monuments, identified by the letters A through I, are on the disposal cell. The outer protective casings (12-inch PVC pipe) and the inner plates were intact and undamaged. Data from elevation surveys of the settlement monuments in 2006 indicate no evidence of settlement. Settlement monument elevations are planned in conjunction with the upcoming CERCLA five-year review.

Embedded Lysimeter

External features of the embedded lysimeter were inspected, and no drainage or seepage was detected at the outlet or along cover penetrations. Instrumentation installations were in good condition.

Operation of Repository and Pond 4 LCRS and LDS

Monitoring of leachate production is performed automatically via the repository telemetry system. Upgraded in 2007, the telemetry system relays data to the LM Systems Operation and Analysis at Remote Sites (SOARS) system, for off-site viewing, evaluation, and management. On-site personnel routinely monitor leachate production in accordance with specifications in the LTS&M plan. Leachate production rates are presented in quarterly reports to DOE, EPA, and UDEQ. Annual inspection of the repository telemetry system is conducted through interviews with the on-site staff and through reviews of the quarterly reports. The Repository and Pond 4 LCRS and LDS are operating properly with no anomalous readings or conditions.

2.2 City-Owned Properties

City-owned properties MP-00181, MP-00391, MS-00893, MP-01040 (north), MP-01041, MP-01042, and MP-01077 were transferred from DOE to the City of Monticello in 2000. Specific restrictions on these properties are summarized in Section 1.3 (City and Private Properties). Photos 15 through 17 show the wetlands, creek, and southern slope of the former mill site during the 2011 inspection.

Property MP-00211 was always City-owned and is subject only to zoning restrictions on excavation and construction.

Results of the 2011 annual inspection are summarized below and in Section IV of Appendix A.

Recreational Use

The City-owned properties transferred from DOE are accessible to the public. In 2007, these properties were annexed by the City of Monticello. Hunting with firearms is not allowed within city limits, but bow hunting was authorized in 2009. Walking and mountain bike trails are used throughout the properties. During the annual inspection, the City had recently re-graded the surface of the walking trails (Photo 18).

Overnight camping is not allowed on these properties. No evidence of past or present overnight camping was observed during the 2011 inspection.

Construction of Habitable Structures

Construction of habitable structures is prohibited on these properties. The construction of any habitable structures was not observed during the 2011 inspection.

Supplemental Standards Areas on Piñon/Juniper Properties

No evidence of new soil removal by human activity or natural processes was noted on any of the Piñon/Juniper properties supplemental standards areas. The supplemental standards areas are physically delineated by four-strand wire fence. The City of Monticello breached sections of this fence to accommodate mountain bike trails, and other sections of the fence have degenerated due

to age. Past radiological scans of the bike trails indicated no concerns, and survey records are available at the Monticello field office. DOE will continue to monitor these areas regularly.

Soil Movement, Drainage, and Runoff Controls

Construction on properties MP-00211 and MP-00181, on the western portion of the former mill site, was apparent at the time of the inspection. The construction work includes the placement of fill materials from off-site, and it involves no soil excavation below the fill (Photo 19).

All riprap-armored structures, dams, check dams, berms, and runoff control drainages (see Figure 4) are intact and functional. One structure, Deer Draw Dam, is shown in Photo 20. No major erosion issues or evidence of recent erosion were noted during the 2011 inspection.

Wetlands

Wetlands on the former mill site were constructed according to EPA-specific criteria, and these wetlands are protected by cooperative agreement. Under this agreement, the City will not disturb these areas without prior approval from appropriate State and federal agencies and is not responsible for repairing damage to these areas by natural causes. Montezuma Creek and three constructed marsh wetlands on the City-owned properties are ecologically healthy, and no evidence of damage by human activity or natural causes was observed during the 2011 inspection.

Groundwater Use

No evidence of groundwater use or water-well drilling on City-owned properties with groundwater restrictions was observed during the 2011 inspection or through the year. No applications to drill were filed with the Utah Department of Natural Resources Division of Water Rights for these areas (see Section 2.6 below).

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

Results of the 2011 annual inspection of City streets and utility corridors, and UDOT rights-of-way are found in Appendix A, Section VIII. No unmonitored or unplanned excavations were identified. On-site LM contractor personnel were aware of all planned excavations, which include natural gas pipeline upgrades, improvements to the state's Port-of-Entry facility east of Monticello, construction of a gasoline station/convenience store along Highway 491, excavations associated with the construction of a new outdoor school at 4th and Main, construction of a sewer line adjacent to Highway 191 north of the city limits, and City street resurfacing. Excavations related to natural gas pipeline upgrades have been completed south of Main Street, and no new excavations are planned in this area in the near future. Natural gas pipeline upgrades north of Main Street are planned for 2012. Along the shoulders of Highway 191 and 491 or at the Highway 191 embankment at Montezuma Creek, no new erosion was evident.

2.4 Private Property MS-00176-VL

Before a habitable structure is constructed on this property, Monticello zoning ordinance requires that a special building permit, based on radiological scanning results, be obtained. There is no evidence of erosion, soil removal, or construction of habitable structures (see Appendix A, Section VIII-C). A portion of this property was sold in 2006. The portion that was sold does not

have supplemental standards areas, but the new owner did not remove the land use restriction annotated to the deed.

2.5 Properties in the Montezuma Creek Restrictive Easement Area

There was no evidence of significant erosion or soil removal from the restricted areas of these properties during the 2011 inspection (see Appendix A, Section V).

In 2006, a new residence was constructed on property MP-00990 outside the supplemental standards area. At that time, on-site personnel helped the landowner delineate the restricted area of this property. Portions of this property and Property MG-01033, including the residence, were sold in 2010 to a new landowner. No land use changes are apparent.

A portion of property MP-00990 is cultivated in the easement area in compliance with the land use restriction. In 2008, the landowner changed the land use by diverting water from Montezuma Creek near monitoring well 92-09 to an irrigation pond to apply to cultivated areas. DOE evaluated this land use change and found no significant associated risk.

2.6 Groundwater Restricted Area

There has been no evidence of well-drilling activity in or near the GWRA (Appendix A, Section VI). On October 6, 2011, M. Stilson of the State Engineer's Office confirmed the lack of well-drilling activity and indicated that there were no applications filed in the past year for shallow or deep water wells in or near the Monticello GWRA.

2.7 Operable Unit III

Permeable Reactive Barrier (PRB) and Auxiliary Treatment System

A groundwater treatment system comprising the PRB and treatment cells is on property MP-00179 (private property) east of the former mill site. Features of these systems are inspected each year to ensure that the current land use, ranching, is not adversely affected. Due to access restrictions, this property was not inspected during the annual inspection. However, in October, 2011, groundwater was sampled and a change-out of treatment cell media was performed on the property. No anomalies were reported during these activities.

Water Quality Monitoring Well Inspection

OU III water quality is monitored at an established network of active groundwater monitoring wells and surface water monitoring sites. Active wells are inspected during sampling in April and October of each year, and field personnel noted no deficiencies during routine well inspections in 2011.

2.8 Administrative and Records Inspection

The following documents and records, recorded by the on-site staff, were inspected for completeness and accuracy of information (see Appendix A, Section II):

- Radiological as-built drawings (residential and utility maps that document the location and results of radiological control provided by on-site LM contractor personnel).

- Site record books, which include the repository, the TSF, City-owned properties, private property restricted areas, and public roads and utilities.
- Surveillance checklists, which include meteorological monitoring data; TSF access/security logs; and monthly, quarterly, and Pond 4 surveillance checklists. Pond 4 and repository LCRS and LDS monitoring records are maintained electronically.

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

- LTS&M Plan (including site-specific emergency response information), the *Health and Safety 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 on-site and unescorted City employees accessing the TSF).

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

No major deficiencies were noted in any of the above administrative categories. However, the Information Repository collection was not updated in April 2011; an update is scheduled for November 2011. LTS&M documents were available electronically from the field office. Although the most current version of the LTS&M Plan was available, portions of the plan require update. The Information Repository and Operable Unit III Administrative Record were present and in good condition. 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 site record books were correct and complete. Minor errors in the TSF record book were corrected by on-site personnel during the inspection. Some excavations, appropriately recorded in the record book(s), did not appear on maps because the excavations were located outside the map boundaries.

3.0 Conclusions and Recommendations

The 2011 annual inspection confirmed that DOE LTS&M activities implemented throughout the year remain effective and appropriate, and institutional controls restricting land and water use as part of the MMTS and MVP remedies remain effective. No corrective actions are necessary.

The following maintenance issues were identified during the 2011 annual inspection and are scheduled to be resolved between April and June 2012, or sooner if possible:

- Treat infestations of noxious weeds near the access area, front gate, and perimeter fence with herbicide.
- Replace weather-damaged sections of the perimeter fence.
- Repair the stock gate at the northeast corner of the site near perimeter sign P18.

- Replace “No Hunting” signs at all gates in the perimeter fence. Replace with sturdy metal signs.
- Remove tumbleweed accumulations near perimeter signs P15 and P18.
- Repair holes in the security fence around Pond 4.
- Repair the hole in the wildlife fence in its northeast section.

4.0 Photograph Log and Photographs

Photographs were taken to document findings of the 2011 annual inspection. The location and orientation of the photographs included below are identified in Figures 2, 3, and 4. A Field Photograph Log associated with all photographs taken during the 2011 annual inspection is included as Appendix A, Section IX.



1. Perimeter sign P15, scratched but legible.



2. Gully along western perimeter fence.



3. Rock-lined drainage between the West Drain Ditch and North Draw.



4. Stabilized erosion area near the West Drain Ditch.



5. One of two holes discovered in the Pond 4 security fence.



6. Animal burrows on and below the Pond 4 berm.



7. Pond 4 showing siltation, vegetation, and standing water.



8. Repository cover and recently graded perimeter road.



9. Hole in northeast section of wildlife fence.



10. Site Monument at west access gate through wildlife fence.



11. Vegetated disposal cell cover, view to the west from center monument.



12. Vegetation on rock side slope of repository.



13. Animal burrow on repository cover.



14. Rock side slope of repository and North Toe Trench.



15. Wetland 1 at former mill site, view to the south.



16. Wetland 2 at former mill site, view to the south.



17. Wetland 3 and Montezuma Creek at former mill site, view to the southeast.



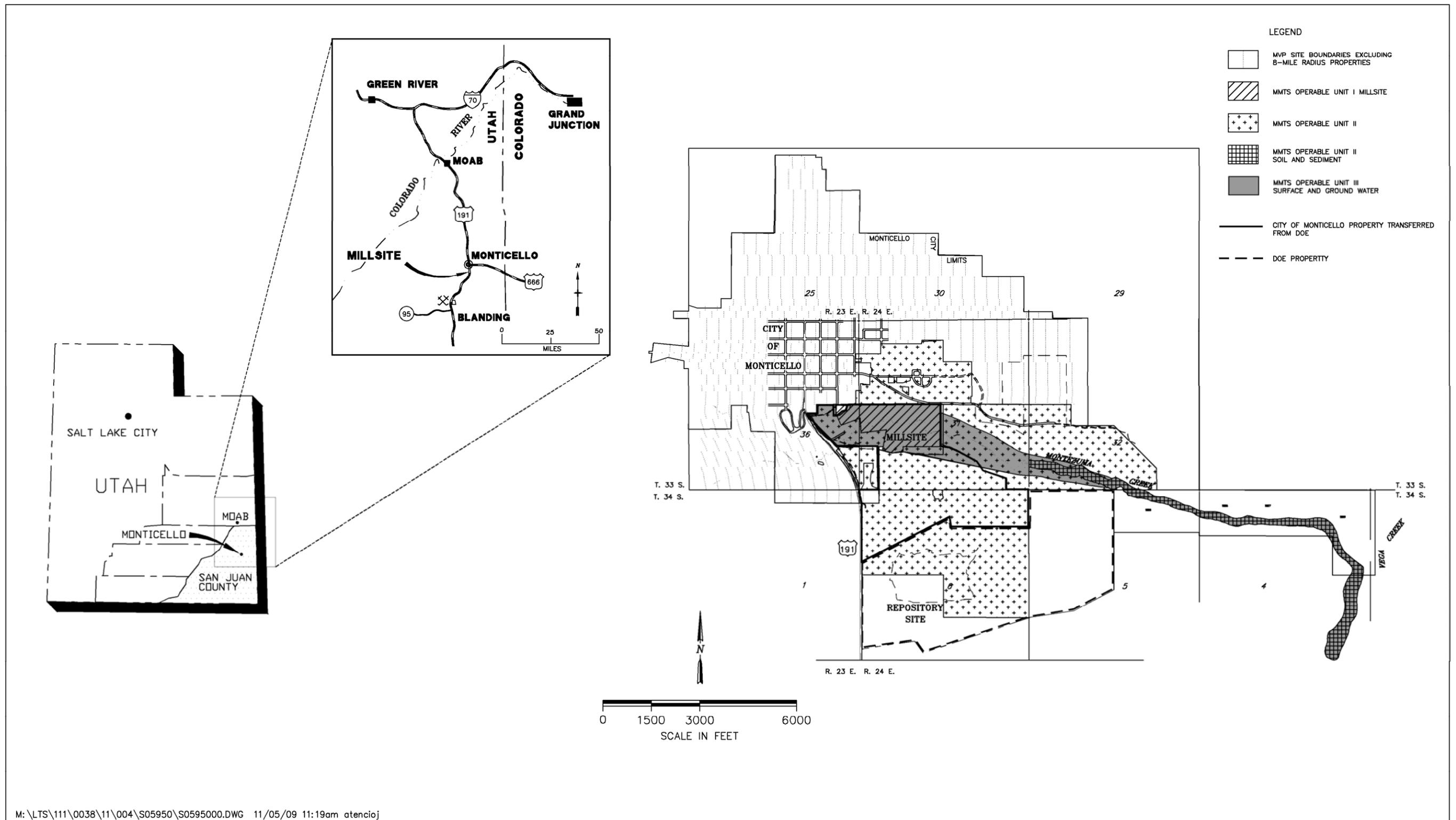
18. Recently graded bike path at former mill site.



19. Fill materials at City-Owned Property MP-00211.



20. Runoff/drainage control structure, Deer Draw Dam.



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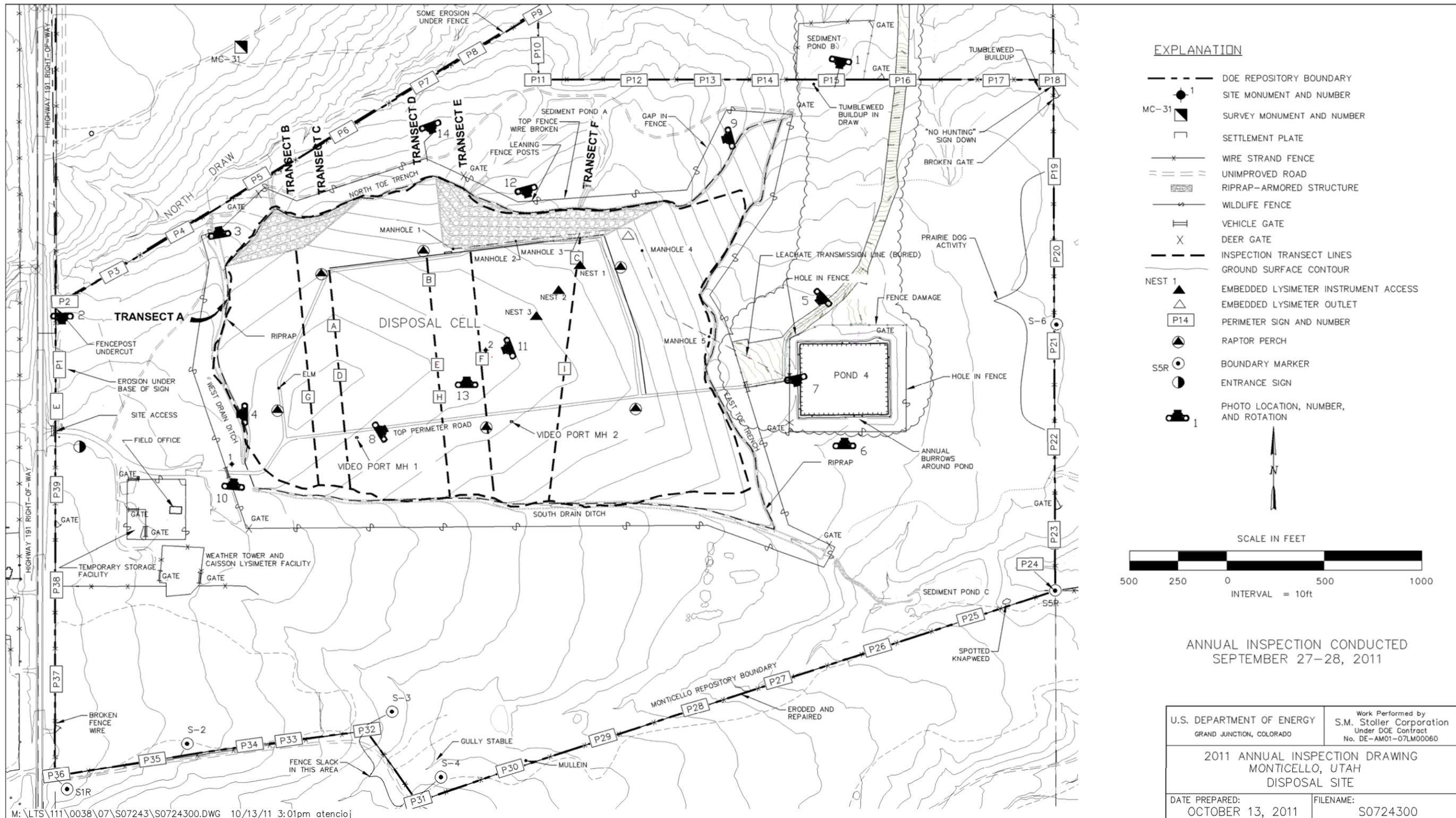


Figure 2. Monticello, Utah, Repository Site

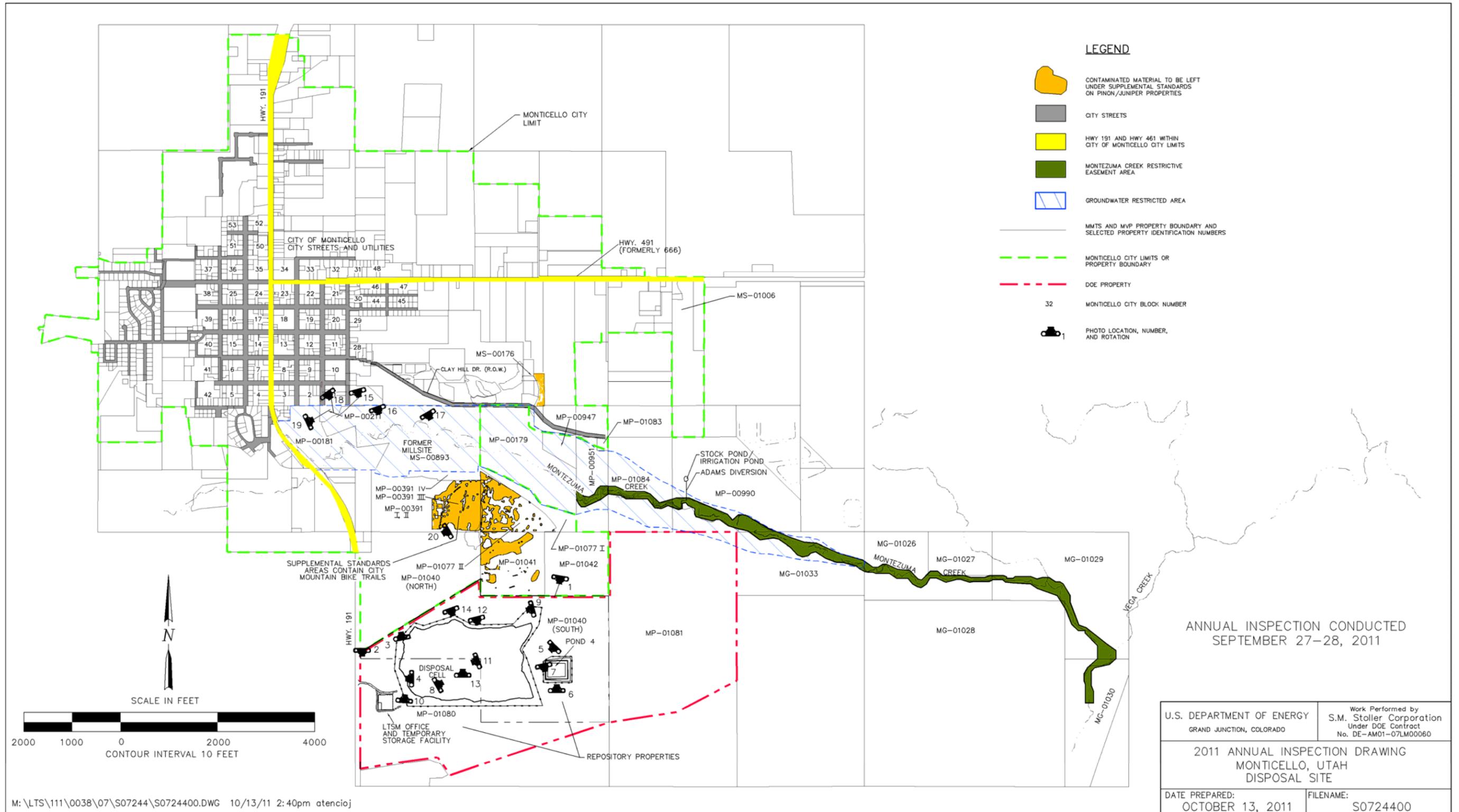


Figure 3. MMTS and MVP Supplemental Standards and Groundwater Restricted Areas

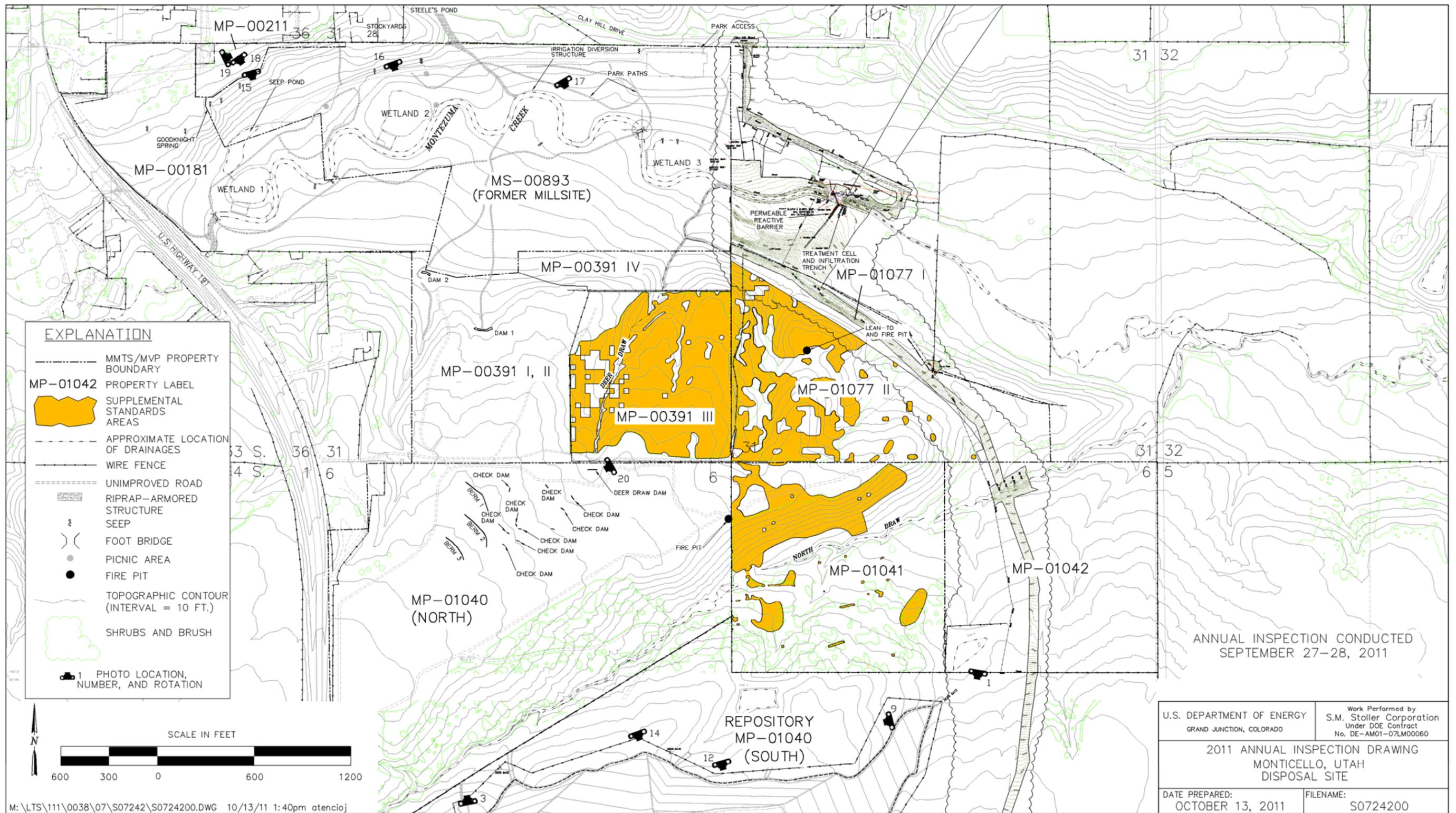


Figure 4. Monticello, Utah, Former Mill Site and Surrounding Area

Appendix A

MMTS & MVP Annual Inspection Checklist

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MMTS: Monticello Mill Tailings (USDOE) 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

Note: Section 6.1 of the Long-Term Surveillance and Maintenance Plan contains detailed inspection procedures. See attached maps for the location of site inspection features identified in this checklist.

Annual Inspection Preparation:

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

	Y	N
Review annual inspection requirements outlined in Section 6.1 of the LTS&M Plan	X	<input type="checkbox"/>
Schedule site inspection and appoint chief inspector	X	<input type="checkbox"/>
Review previous reports and records as outlined in Section 6.1.2 of LTS&M Plan	X	<input type="checkbox"/>
Notes:		
Review OU III water quality data for contaminant trends and distribution	X	<input type="checkbox"/>
Provide team members with background information, maps, and inspection checklists	X	<input type="checkbox"/>
Notify EPA and UDEQ at least 2 weeks prior to 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"/>
Verify key contact information listed in Section 6.1.2 of the LTS&M Plan	X	<input type="checkbox"/>
Contact State Engineer's Office for water well permit applications in/near GWMA	X	<input type="checkbox"/>
Verify annual contact with UDOT re: planned highway projects for current year	X	<input type="checkbox"/>
Verify regular contact with City of Monticello re: planned or unplanned excavations	X	<input type="checkbox"/>

Date(s) of Annual Inspection: 9/27/11–9/28/11

Inspection Team Members

Name	Affiliation	Phone Number	E-mail
Linda Sheader	S.M. Stoller Corp. (Plant Ecologist and curator of Information Repository records and the OU III Administrative Record)	970-248-6711	Linda.Sheader@lm.doe.gov
Paul Wetherstein	S.M. Stoller Corp. (Environmental Compliance)	970-248-6645	Paul.Wetherstein@lm.doe.gov
Jalena Dayvault	U.S. Department of Energy (Site Manager)	970-248-6016	Jalena.Dayvault@lm.doe.gov
Jason Nguyen	U.S. Department of Energy	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
Todd Moon	On-Site LM Representative	September 28, 2011
<p>Notes:</p> <p><i>Property 1081 has transferred to a new owner; land use may change to hunting (guest ranch). A very small portion of the property may have groundwater restrictions in place. (Note: no deed restrictions were ever in place for 1081; verified by LS at county recorder's office).</i></p> <p><i>Todd Moon and Montana Carr visited pinyon-juniper properties and inspected day camp area found last year. The lean-to has collapsed, and no new activity was evident.</i></p> <p><i>The City has a grant to gravel the pathways at the former mill site; recently graded. (Note: City Streets and Utilities activities are recorded under Section VIII-A of the checklist.)</i></p>		
Name of Individual Interviewed	Affiliation	Date Interviewed
	City of Monticello	
<p>Notes:</p> <p><i>Individuals from the City of Monticello were not interviewed during the 2011 inspection.</i></p>		
Name of Individual Interviewed	Affiliation	Date Interviewed
Mark Stilson	State Engineer	October 6, 2011
<p>Notes:</p> <p><i>P. Wetherstein contacted M. Stilson by phone to verify that no well drilling permits were issued in restricted areas. No well drilling permits were requested or issued in restricted areas in 2011 for shallow or deep water wells.</i></p>		
Name of Individual Interviewed	Affiliation	Date Interviewed
Training Department (J. Blanck)	S.M. Stoller	e-mail 9/29/11
<p>Notes:</p> <p><i>Training confirmed that rad-related training requirements are up-to-date for T. Moon and M. Carr. No other unescorted personnel entered the TSF since the 2010 inspection.</i></p>		

II. Administrative and Records Inspection

	Readily Available		Current	
	Y	N	Y	N
1. General LTS&M Documents				
Ready access from field office to online manuals (Long-Term Surveillance and Maintenance Plan, Health and Safety Manual, QA Manual)	X	<input type="checkbox"/>	X	<input type="checkbox"/>
2. LTS&M Training Records (<i>ID names in TSF log; verify with Training dept.</i>)				
On-site employees			X	<input type="checkbox"/>
City workers (<i>unescorted workers must have current training</i>)			X	<input type="checkbox"/>
3. Public Records (<i>verify records are present and in order</i>)				
OU III Administrative Record	X	<input type="checkbox"/>	X	<input type="checkbox"/>
Information Repository (Monticello)	X	<input type="checkbox"/>	<input type="checkbox"/>	X
Information Repository (Grand Junction)	X	<input type="checkbox"/>	<input type="checkbox"/>	X
4. Record Books (<i>Note: Inspection guidelines are listed inside covers of record books; LTS&M Plan Appendix B contains record book management and entry protocol</i>)				
Record book entries/documentation	X	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i>
Repository Site Record Book	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TSF Record Book (<i>see LTS&M Plan Section 3.4</i>)	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
City-owned properties (<i>see LTS&M Plan Section 4.4</i>)	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private Property Restricted Areas (<i>see LTS&M Sec. 4.4</i>)	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Roads and Utilities Record Book	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Documentation/recordkeeping requirements met	X	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i>
Information readily traced to updated drawings	X	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i>
Rad scan info for eroded/excavated material	X	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i>
Entries include TSF transfers	X	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i> <input type="checkbox"/> <i>N/A</i>
Entries include info on stockpiled material and follow-up scan results	X	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i> <input type="checkbox"/> <i>N/A</i>
Hwy 191/491 entries include information on scan Results and material returned to excavation	X	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i> <input type="checkbox"/> <i>N/A</i>
Storm event surveys documented	<input type="checkbox"/>	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i> <input checked="" type="checkbox"/> <i>N/A</i>
Notes for Record Books Inspection:				
Update for the Information Repository is overdue; scheduled for October. M. Carr current on Rad Worker II (6/29/11); T. Moon current on Rad Control Tech (7/1/11). Record book entries are not all recorded on as-built maps in some areas north and east of the city; these areas lie beyond the map boundary.				
5. Radiological As-Built Drawings				
Drawing updated annually	X	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i>
Documentation/recordkeeping requirements met	X	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i>
Radiological scan information recorded	X	<i>satisfactory</i>		<input type="checkbox"/> <i>unsatisfactory</i>
6. Surveillance Checklists and Records				
<i>(Note: Repository and Pond 4 LCRS and LDS monitoring records are sent electronically on a regular basis.)</i>				
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:				
TSF record book had complete logs, but some entries were not recorded in the entry log. This was corrected. Met data and some quarterly checklists filed out of order; this was also corrected.				
7. Agreements (<i>Note: verify inclusion in Information Repository</i>)				
DOE/City Cooperative Agreement			X	<input type="checkbox"/>
DOE/UDOT Memorandum of Understanding			X	<input type="checkbox"/>
8. Zoning Restriction—Overlay Zone OL-1				
Restriction is verified as current through City for property MP-00211-VL			X	<input type="checkbox"/>
Restriction is verified as current through City for property MP-00176-VL			X	<input type="checkbox"/>

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

Properties Transferred from DOE to City of Monticello

IC Annotations in Place

DOE ID	Parcel	Document	Book	Page	Y	N
MP-00181-OT	A33230367201& 33S23E367204 A34240063004	E061691	B788	100-113	X	<input type="checkbox"/>
				electronic record	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"/>
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"/>

Note: Correction to quitclaim deed for properties transferred to City recorded as E062130, B789, P450-452.

Montezuma Creek Soil and Sediment Properties

DOE ID	Parcel	Document	Book	Page	Y	N
MP-00990-CS	33S24E324800	E063343	B793	831-852	X	<input type="checkbox"/>
	33S24E328400		B921	474-476	X	<input type="checkbox"/>
	33S24E324802			electronic record	X	<input type="checkbox"/>
MG-01033-VL	34S24E050000	E063343	B793	831-852	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	E063219	B793	390-404	X	<input type="checkbox"/>
	34S24E040001			electronic record	X	<input type="checkbox"/>
MP-00951-VL	33S24E317200	E063926	B796	188-202	X	<input type="checkbox"/>
	33S24E317204			electronic record	X	<input type="checkbox"/>
MP-01084-VL	33S24E326000	E063926	B796	188-202	X	<input type="checkbox"/>

Note: Correction to warranty deed for MP-01084-VL recorded as E073394, B830, P611.

Utah Department of Transportation Properties

DOE ID	Parcel	Document	Book	Page	Y	N
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"/>

Notes for deed restriction inspection:

New records added to above table to reflect properties sold or divided. Oil and gas leases are in effect for Properties MP-00951-VL and MP-01084-VL.

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)	6	
Health and safety/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:

Drums and secondary containment stored in shed; on-site personnel reported condition. Noxious weed, Russian knapweed, found along fence and in fenced lot; treatment planned in October 2011.

B. Repository Perimeter (Note locations of erosion, noxious weeds, vandalism, or excessive vegetation on map)

- 1. **Outer Fencing and Gates** Satisfactory **x** Repairs/Maintenance Needed
- 2. **Signs** (Note condition of 40 numbered reference signs and posts)
Signs damaged but legible, requiring monitoring: P12, P15 (scratched but legible)
Signs requiring replacement: none
- 3. **South Boundary Markers** **x** All six markers located Marker(s) _____ not located
- 4. **Erosion/Gullying** **x** Not evident Evident
- 5. **Vegetation** **x** Not excessive Excessive growth
 Noxious weeds absent **x** Noxious weeds present
- 6. **Land use changes on adjoining property** **x** No change Change
- 7. **Vandalism/trespassing** **x** Not evident Evident

Notes for condition of repository perimeter (e.g., repairs needed, erosion areas, vandalism):
Minor repairs needed for outer fencing and gates, especially broken gate near P18. No new erosion. Noxious weeds found – spotted knapweed near entrance gate and between P24 and P25; field bindweed does not require control; will spray mullein near P30.

C. Repository Runoff/Run-On Controls (North and East Toe Drains; South and West Drain Ditches)

- 1. **Settlement** **x** Not evident Evident
- 2. **Material Degradation** **x** Not evident Evident
- 3. **Erosion/gullies** **x** Not evident Evident
- 4. **Siltation** **x** Not evident Evident
- 5. **Obstructions** **x** Not evident Evident
- 6. **Excessive Vegetation** **x** Not evident Evident

Notes for condition of repository runoff and run-on controls (Note: locate all areas of concern on map):
No changes observed since 2010. Elm tree in West Drain Ditch not currently obstructing flow, but should probably be removed in future. Shrubs in ditches not obstructing flow.

D. Pond 4 (Note: locate all areas of concern on map)

- 1. **Perimeter Fence and Access Gate** Satisfactory **x** Unsatisfactory
- 2. **Erosion/Biointrusion of Pond Berm** Not evident **x** Evident
- 3. **Safety Equipment** Pond barrier rope intact **x** Yes No
Personal floatation device posting present and visible **x** Yes No
PFD storage containers appropriately marked and in good condition **x** Yes No
PFDs accessible, in good condition, and appropriately sized **x** Yes No
- 4. **Pond 4 LCRS and LDS Electrical Housing/Surface Installations**
Physical condition is: **x** Satisfactory Unsatisfactory
- 5. **Liner—Holes/Cracks/Tears** **x** Not Evident Evident
- 6. **Liner Anchors** **x** Intact Not intact
- 7. **Siltation and Vegetation in Pond 4** Not evident **x** Evident
- 8. **Pond 4 Water Level** Estimated water depth is < 1 ft.
- 9. **Vandalism** **x** Not evident Evident

Notes for condition of Pond 4 features:
Security fence was damaged in many places by drifting and melting snow. Most broken areas repaired in spring 2011 by on-site personnel. Two additional holes have developed in the fence that could allow human or animal access and require repair. The pond liner is scheduled to be repaired. Animal burrows, chiefly from voles, occur on and below the pond berm on all sides. These burrows are shallow and do not threaten the integrity of the berm.

E. 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	
Wildlife gates are:	<input checked="" type="checkbox"/> Open	<input type="checkbox"/> Closed	
3. Cover Vegetation	See attached Repository Cover Vegetation Index form; note areas of concern on map		
4. Rip-Rap 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 (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:			
Hole in northeast portion of wildlife fence requires repair; location noted on map. An increased number of animal burrows, mostly by voles, found on cover. Burrows along surface water enclosure for lysimeter may affect functioning of enclosure.			
F. 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	<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	
Telemetry surface installations in good condition	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Vaults are posted as confined-spaces	<input checked="" type="checkbox"/> Yes	<input 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	
Manholes are posted as confined-spaces	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Notes for condition of manholes:			
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 type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
4. Settlement Monuments (A to I) (Note: plates surveyed during 5-year reviews only)			
Surface completions undamaged	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Inner plates undamaged	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
5. Embedded Lysimeter			
Evidence of seepage at outlet	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Instrumentation installations undamaged	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Evidence of drainage along cover penetrations	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Telemetry surface installations in good condition	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	

6. Operation of Repository and Pond 4 LCRS and LDS (interview on-site LM operator)

LCRS and LDS pumps, water level sensors,
and flow meters are fully operational Yes No
 Telemetry system is fully operational Yes No
 Leachate production is below action levels Yes No
 Leachate production rates are stable Yes No
 Water levels do not exceed top of sumps Yes No
 Monitoring data are managed through SOARS Yes No
 Pumping rates (gallons/week): LCRS 1 < 1000 LCRS 2 < 1000 LDS 1 0
 LDS 2 0 Pond 4 LCRS 1 0 Pond 4 LDS 1 0

Notes for cover penetrations inspection and operation of LCRS/LDS:

Information summarized from quarterly reports. No anomalies reported.

IV. City-Owned Properties Inspection

A. City-Owned Properties Transferred from DOE

(MP-00181, MP-00391, MS-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	<input checked="" type="checkbox"/>	<input type="checkbox"/>												
Evidence of camping	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
Habitable structure(s)	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
Gullies/erosion	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
Runoff/drainage controls intact and in good repair (ditches, riprap structures, dams, check dams, berms)	<input checked="" type="checkbox"/>	<input type="checkbox"/>												
Land use changes	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
Evidence of vandalism	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
Soil removal evident	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Water well installation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		n/a		n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wetland/creek damage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		n/a		n/a		n/a	
Supp. Stds. fence intact	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		n/a		<input checked="" type="checkbox"/>	<input type="checkbox"/>	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Describe any violations of institutional controls and/or repair/maintenance issues (locate on map):

Supplemental standards fence was cut in several places to access mountain bike trails. No significant new erosion or gullies observed in 2011. Construction continues on Properties MP-00211 and MP-00181, but no excavation is involved. City has graded paths and will probably gravel the surface. Supplemental standards areas were inspected by on-site personnel in early September 2011; no new disturbance was found.

B. City-Owned Property MP-00211

	Yes	No	N/A
Evidence of excavation or construction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If yes, confirm the following with on-site LM representative:			
In accordance with Monticello zoning district Overlay Zone (OL-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Violation has been reported	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Radiological contamination was encountered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Radiological contamination was appropriately managed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Corrective action required	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Notes for City-owned property MP-00211 inspection:

Construction in filled areas only

V. Montezuma Creek Soil and Sediment Properties

(Note: Refer to Plates 2 and 3 in the LTS&M Plan for boundary of restricted areas on these properties: MP-00951, MP-00990, MP-01084, MG-01026, MG-01027, MG-01029, MG-01030, and MG-01033)

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 checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Land owners 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	<input checked="" type="checkbox"/> N/A
Corrective action required	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	

Notes for Soil and Sediment Properties inspection:

* confirm with on-site LM representative

VI. Groundwater Management Area

(Note: the boundary of the Groundwater Management Area [GWMA] is shown in Plate 4 of the LTS&M Plan and includes the following properties: MP-00181, MS-00893, MP-00211, MP-00179, MP-00947, MG-00951, MG-01084, MG-00990, and MG-01033)

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	<input checked="" type="checkbox"/> 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	

Notes for Groundwater Management Area inspection:

* confirm with on-site LM representative

† confirm with State Engineer's Office

VII. OU III Monitoring Wells and Water Treatment Systems

A. Monitoring well surface completions *(Note: active wells are inspected and maintained twice annually during sampling events. Inactive wells are inspected during the annual inspection [see attached map for locations])*

	Yes	No
Active wells in working condition (verify with sampling teams)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Outer casing or flush mount vault intact	<input type="checkbox"/>	<input type="checkbox"/>
Wells are locked/flush mount well lids secured	<input type="checkbox"/>	<input type="checkbox"/>

Notes for inactive monitoring well inspection (note location of any maintenance issues on map):

Inactive wells were not inspected during annual inspection due to restricted land access. Inspected by well sampling crew in October 2011. No anomalies found.

B. Permeable Reactive Barrier (PRB) and Auxiliary Treatment Cells and Infiltration Trench

	Yes	No
Electrical panel, antenna, fence, and vault access in satisfactory condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Evidence of ponded water or saturated soil	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Evidence of surface disturbance	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Evidence of stressed vegetation	<input type="checkbox"/>	<input type="checkbox"/>

Notes for PRB and treatment cells inspection:

Structures not inspected during annual inspection due to land access. Structures maintained by Environmental Sciences personnel. No problems reported.

VIII. MVP Field Inspection

A. City Streets and Utilities

Roads/Utilities under Construction	Y	N
Unmonitored excavations observed during inspection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Planned excavations are identified by on-site LM representative	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiological material is properly controlled and managed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The utility locator service is contacted regularly by the on-site LM representative	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Notes for city streets and utilities inspection:

Gas lines south of Main Street finished; no new excavations are planned. In 2012, construction will begin north of Main Street. Street excavations related to a new Maverick gas station on Highway 491 are underway. Excavations related to upgrades at the Port-of-Entry on 491 east of city are also ongoing; no rad-contaminated soils returned to excavations. Excavations related to sewer line north of Monticello along 191 are ongoing. City is resurfacing streets, including milling, but activities do not penetrate to underlying soils. Excavations related to new Outdoor school at 4th and Main also ongoing. All construction areas are monitored.

B. UDOT Highways 191 and 491 Rights-of-Way

1. Roads under Construction	Y	N
Unmonitored excavations observed during inspection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Planned excavations are identified by on-site LM representative	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiological material is properly controlled and managed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The local UDOT official is contacted periodically by the on-site LM representative	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Notes for UDOT highways inspection:

See above.

2. Erosion (highway shoulders and Highway 191 embankment at Montezuma Creek)

New erosion evident
 Previous erosion evident; unchanged
 No erosion evident

Eroded material scanned for radiological contamination and properly managed

Yes
 No
 N/A

Describe erosion noted on UDOT highways:

C. Property MS-00176 (Note: observations and activities for MS-00176-VL are recorded by the on-site 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 on-site LM representative.

	Y	N
Unmonitored excavations observed during inspection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Planned excavations are identified by on-site LM representative	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Site conditions indicate ICs properly implemented	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Notes for Property MS-00176 inspection:

IX. Photo Log (attach additional pages as necessary)		
Photo No.	Feature Photographed	Description (include photo location on map)
Note: numbers in parentheses indicate the photo number used in this report		
1	Pond 4	Entrance signs
2 (6)	Pond 4	Animal burrows on south berm and below
3	Pond 4	Close-up of animal burrow on southeast berm
4	Pond 4	Hole in east fence
5 (5)	Pond 4	Hole in north fence
6 (7)	Pond 4	Water, silt and vegetation (including <i>Tamarix</i>) in pond
7 (10)	Repository Cover	Monument at west access gate through wildlife fence
8	Repository Cover	Cell top from southwest corner, looking northeast
9 (8)	Repository Cover	Cell top from access road, south central portion
10 (13)	Repository Cover	Animal burrow on cover
11 (11)	Repository Cover	Cover vegetation, view west from monument
12	Repository Cover	Burrows on lysimeter surface runoff structure
13	Repository Cover	Drainage below East and North Toe Trenches
14 (9)	Repository Cover	Gap in wildlife fence at northeast area
15 (12)	Repository Cover	Cell side slope showing vegetation
16 (14)	Repository Cover	Cell north side slope
17	Repository Cover	West Drain Ditch, view north-northwest
18 (4)	Repository Cover	Former erosion area near West Drain Ditch
19	City-Owned Properties	Wetland 2
20 (16)	City-Owned Properties	Wetland 2 and hillside (south side of mill site)
21 (17)	City-Owned Properties	View toward Wetland 3 and south hillside
22	Repository Perimeter	Gully along west fence, filling in
23	Repository Perimeter	Gully with rock fill near P1
24 (2)	Repository Perimeter	Posts in gully, filling in over time
25	Repository Perimeter	Posts in gully
26	Repository Perimeter	Northwest site perimeter fence
27 (3)	Repository Perimeter	Drainage from West Drain Ditch offsite to North Draw
28	Repository Perimeter	Drainage near P7 showing no new erosion
29	Repository Perimeter	Sign P12, scratched but legible
30 (1)	Repository Perimeter	Sign P15, scratched but legible
31	Repository Perimeter	East perimeter fence, view to the north
32	Repository Perimeter	Draw near Sign P27 showing no new erosion
33	Repository Perimeter	Stable gully between P31 and P32
34 (20)	City-Owned Properties	Deer Draw Dam
35 (19)	City-Owned Properties	Stockpiled materials (MP-00211)
36	City-Owned Properties	Stockpiled materials
37	City-Owned Properties	Fill material
38 (18)	City-Owned Properties	Newly graded bike/walking path on former mill site
39 (15)	City-Owned Properties	Wetland 1

Repository Cover Vegetation Index
Monticello, Utah

Date inspected: 9/27/11 Inspected by: L. Sheader, J. Dayvault, J. Nguyen

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>Artemisia tridentata</i>	X				X	X		
<i>Pascopyrum smithii</i>		X			X	X		
<i>Agropyron cristatum</i>		X			X			X
<i>Pseudoroegneria spicata</i>		X			X	X		
<i>Bromus inermis</i>		X			X			X
<i>Thinopyrum intermedium</i>		X			X			X

Less common species present on repository cover: *Medicago sativa, Helianthus annuus, Machaeranthera sp., Bromus tectorum, Tragopon dubius, Gutierrezia sarothrae, Elymus trachycaulus, Astragalus cicer, Salsola tragus, Viguiera multiflora, Sphaeralcea coccinea, Sphaeralcea parviflora, Sphaeralcea grossulariifolia, Sisymbrium altissimum, Lactuca serriola, Krascheninnikovia lanata,*

Noxious weed species present (record locations on map or GPS): *Convolvulus arvensis*
(scattered in small populations in places on cover; not spreading)

Additional notes: _____

Vegetation Condition Score (see reverse): 3.67

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 recommendation(s).)

Many sagebrush seedlings observed; some fresh vole burrows; several old burrows from larger animals. Vegetative cover condition score has fluctuated slightly down from 2010 but remains high. Cover in very good condition.

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; non-weedy perennial species <20% of total cover	Annual weeds abundant and expanding; non-weedy perennial species 20–40% of total cover	Annual weeds present and expanding; non-weedy perennial species 40–60% of total cover	Some weeds present; non-weedy perennial species 60–80% of total cover	No obvious weeds; non-weedy 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 non-weedy; species evenly distributed with some monoculture patches	More than 3 species dominant across site, at least 2 of which are non-weedy perennials; few patches of monocultures	More than 4 non-weedy perennial species dominant across site; few to no patches of monocultures
Diversity of Trace Species	0–1 non-weedy trace species observed on cover	2 non-weedy trace species observed	3–4 non-weedy trace species observed	5–6 non-weedy trace species observed	7 or more non-weedy 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 on site causing burial or abrasion of vegetation	Sheet erosion not obvious; no visible rills or rills stabilized OR soil swept from off site 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	1	1	5	2

Add up all columns for total condition score:

$$\begin{array}{r}
 \underline{0} \quad (\text{Column 1}) \times 1 = \underline{0} \\
 \underline{2} \quad (\text{Column 2}) \times 2 = \underline{4} \\
 \underline{1} \quad (\text{Column 3}) \times 3 = \underline{3} \\
 \underline{4} \quad (\text{Column 4}) \times 4 = \underline{16} \\
 + \quad \underline{2} \quad (\text{Column 5}) \times 5 = \underline{10} \\
 \hline
 \underline{33} \quad \text{Total}
 \end{array}$$

Divide total by 9 to calculate vegetative cover condition score = 3.67