

16.0 Shiprock, New Mexico, Disposal Site

16.1 Compliance Summary

The Shiprock, New Mexico, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on June 1, 2011. The disposal cell and all associated surface water diversion and drainage structures remain in good condition and were functioning as designed.

In 2009, a conical depression was discovered on the disposal cell cover, and investigation revealed it to be a historical test pit. Since then, several similar conical depressions have been found and were mapped during the 2010 inspection. Although no displacement of materials is apparent in these areas, these depressions will be monitored in the future. Vehicle ruts, probably the result of herbicide application in 2008, are not deep enough to warrant concern but will also continue to be monitored. The condition of vehicle ruts, historical test pits, and research pits on the cell cover were unchanged in 2011.

With a few minor exceptions, all structures, including access roads, gates, entrance signs, fences, monitoring wells, site markers, perimeter signs, survey monuments, and erosion control markers, were in good condition. Several maintenance issues, unrelated to cell performance, were identified—a gap in the northwest gate, three missing pictorial signs, tumbleweed and trash accumulations along the perimeter and evaporation pond fences, outdated information on the sign at the entrance to the evaporation pond, and a section of broken fence and a broken warning sign in Bob Lee Wash. A dense stand of saltcedar, located near the dissipation basin at the end of the outflow channel, requires treatment. The planned 2012 inspection will include an attempt to identify missing survey and boundary monuments using a metal detector. No other maintenance needs or causes for a follow-up or contingency inspection were identified.

16.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Shiprock Disposal Site, Shiprock, New Mexico* (DOE/AL/62350–60F, Rev. 1, U.S. Department of Energy [DOE], September 1994; LTSP) and in procedures established by DOE to comply with the requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). Table 16–1 lists these requirements.

Table 16–1. License Requirements for the Shiprock Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 6.0	Section 16.3.1
Follow-Up or Contingency Inspections	Section 7.0	Section 16.3.2
Routine Maintenance and Repairs	Section 8.0	Section 16.3.3
Groundwater Monitoring	Section 5.0	Section 16.3.4
Corrective Action	Section 9.0	Section 16.3.5

Institutional Controls—The 105-acre site is held in trust by the U.S. Bureau of Indian Affairs. The Navajo Nation retains title to the land. The site was accepted under U.S. Nuclear Regulatory Commission (NRC) general license (10 CFR 40.27) in 1996. DOE is the licensee and, in

accordance with the requirements for UMTRCA Title I sites, is responsible for the custody and long-term care of the site. DOE Order 454.1 defines institutional controls as federal control of the property, site perimeter fencing, warning/no-trespassing signs along the property boundary, and a locked gate at the entrance to the site. Verification of these institutional controls is part of the annual inspection. Inspectors found no evidence that these institutional controls were ineffective or violated.

16.3 Compliance Review

16.3.1 Annual Inspection and Report

The results of the site inspection, conducted on June 1, 2011, are discussed below. Figure 16–1 shows features and photograph locations (PLs) mentioned in this report. Numbers in the left margin refer to items in the “Executive Summary” table.

16.3.1.1 Specific Site-Surveillance Features

Access Road, Gates, Fence, and Signs—Access to the site is via a gravel road off U.S. Highway 491 and through a sand and gravel processing facility, operated by the Navajo Engineering and Construction Authority (NECA), to the main entrance gate. DOE retains perpetual access to the site through a Custody and Access Agreement with the Navajo Nation (DE–FC04–83AL16258, October 7, 1983). All access roads were in good condition.

All three vehicle access gates—the main entrance gate at the east corner of the site (near the terrace escarpment), the gate providing terrace access at the northwest corner of the site, and the former entrance gate at the west corner of the site—were locked, intact, and functional. However, a gap has formed in the northwest gate (PL–1). This gap will be repaired, as will eroded areas under the gate that could allow animals or small children access to the site. Near each gate, entrance signs are placed in pairs—one text and one pictorial. One pair is placed near each of the east and northwest gates (E3 and E4, respectively), and two are placed near the west gate (E1 and E2). At the time of the inspection, the pictorial sign was missing from the northwest gate, and the pictorial sign from E1 was missing from the west gate. The remaining entrance signs were in good condition; on the signs, contact information for DOE and the Navajo Abandoned Mine Lands/Uranium Mill Tailings Remedial Action Office was correct.

The security fence along the perimeter was intact but has damage in several areas, as observed in previous years. Damaged areas consist of bent posts and bent fence fabric between perimeter signs P11 and P12, dirt mounded against the fence near perimeter sign P13, bent posts near perimeter sign P14, a broken fence riser near perimeter sign P15, and fence risers separated from posts between perimeter signs P15 and P16. Because the damage does not yet threaten the overall integrity of the fence, repairs are not recommended at this time. Damaged areas will continue to be monitored.

Tumbleweeds have accumulated in many places along the perimeter fence, particularly near the east gate (PL–2) and perimeter sign P8. These accumulations potentially represent a fire hazard and increase the possibility of damage to the fence, particularly during high winds. Trash has also accumulated along, and become entangled in, the fence. To improve the safety and appearance of the site, tumbleweed and trash around all site fences will be removed before the next annual inspection.

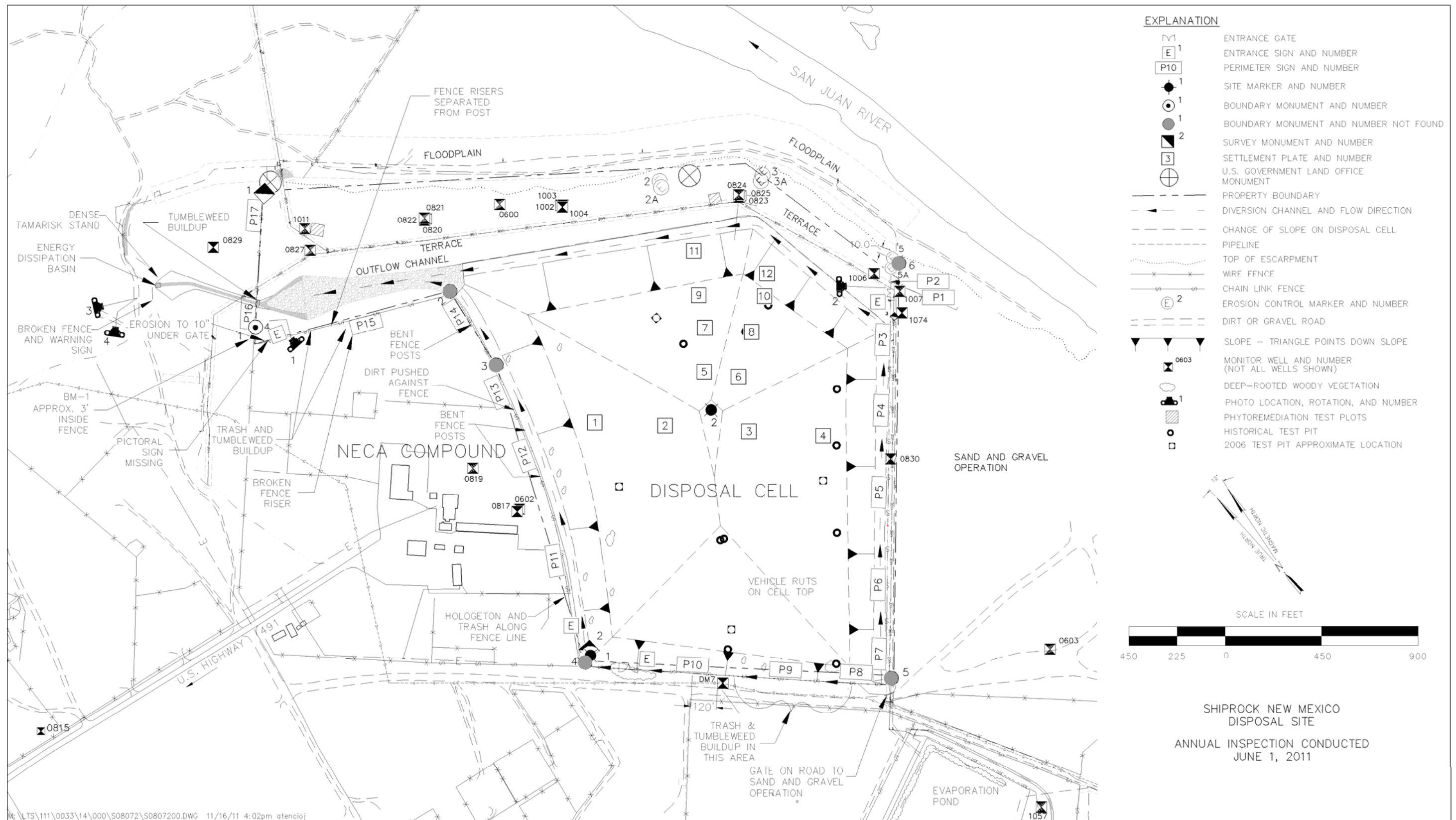


Figure 16-1. 2011 Annual Compliance Drawing for the Shiprock Disposal Site

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16A There are gaps beneath the fence, most formed by animals, along the site perimeter. Two 6-inch gaps were identified near perimeter sign P3, between perimeter signs P4 and P5, and between perimeter signs P14 and P15. In 2011, inspectors placed rocks in all significant gaps.

All perimeter signs were in good condition, showing no evidence of vandalism, with one exception: one pictorial sign near the entrance gate (P2) was missing. This sign will be replaced.

Site Markers and Monuments—Two site markers are placed at the site: site marker SMK–1 is just inside the former main entrance gate, and site marker SMK–2 is on top of the disposal cell. Minor cracking in the concrete around the base of SMK–1 was sealed in May 2003. Both site markers were in good condition at the time of the 2011 inspection.

All three survey monuments were inspected and in good condition. As was the case in previous inspections, only boundary monument BM–1 was located in 2011. The five remaining boundary monuments were buried by windblown sand or inadvertently removed during past construction activities. Because DOE does not own the land, the presence or exact location of these boundary monuments is not critical to managing the disposal site. However, the monuments were constructed with magnets inside the caps, which would allow them to be located with a metal detector. A search for these monuments will be attempted during the 2012 annual inspection. If all monuments cannot be located and missing monument locations become a critical issue in the future, DOE will subcontract a licensed surveyor to reestablish the monuments.

Erosion Control Markers—The four sets of erosion control markers along the edge of the terrace escarpment were in good condition except for the marker near the east entrance gate (ECM–5A on Figure 16–1). This marker was previously damaged by a vehicle, but the marker is still functional and does not require repair at this time.

Monitoring Wells—The LTSP does not require cell performance groundwater monitoring for this site. Numerous monitoring wells are present along the terrace and at off-site locations for monitoring associated with the processing site. These wells are not included in the annual inspection because the DOE groundwater restoration staff maintains the wells during the frequent sampling events. All wells encountered during the 2011 inspection were secure, locked, and in good condition.

16.3.1.2 Transects

To ensure a thorough and efficient inspection, inspectors divided the site into three areas called “transects”: (1) the disposal cell (including the riprap-covered top and side slopes, diversion channels, and outflow channel), (2) the terrace area north and northeast of the disposal cell, and (3) the outlying area.

The area inside each transect was inspected by walking a series of traverses. Within each transect, the inspectors examined specific site-surveillance features, drainage structures, vegetation, and other features. Inspectors also looked for evidence of settlement, erosion, or other modifying processes that might affect site integrity or long-term performance.

Disposal Cell, Diversion Channels, and Outflow Channel—The riprap-covered top and side slopes of the cell are in good condition; no evidence of settling or slumping was found. The

surface of the cell was covered with vehicle ruts, most of which were formed in 2008 during herbicide treatment activities. The condition of the ruts has not visibly changed since the 2010 inspection. Approximately 24 historical test pits were installed across the cell top for research purposes and repaired in 2002. In 2009, several of the pits began to subside slightly, forming conical depressions in the cover. For monitoring purposes, the subsided pits were mapped during the 2010 inspection. The condition of the pits had not changed in 2011. Four additional open research pits, described in previous annual inspection reports, were also present on the cell top. These pits are associated with ongoing research concerning cell performance and the collection of saturated hydraulic conductivity measurements. The condition of these pits also had not changed in 2011.

Diversions channels around the base of the disposal cell were in good condition and contained little vegetation. Small quantities of non-woody vegetation were growing in the outflow channel, and woody vegetation was growing on the banks of the channel; neither is expected to obstruct flow. However, tumbleweeds and trash have accumulated along the perimeter fence where it crosses the outflow channel and could potentially obstruct flow. Removal of this material is recommended. The off-site portion of the outflow channel remained in good condition (PL-3). To prevent potential entanglement of wildlife and remove a tripping hazard, it is recommended that a loose portion of erosion control fabric on the side slopes of the lower channel be removed.

Terrace Area and Site Perimeter—The terrace comprises the area north and east of the disposal cell between the cell and the escarpment. The escarpment, more than 300 feet from the eastern edge of the disposal cell, is prone to slumping. Four sets of erosion control markers along the terrace escarpment allow stability to be monitored. Fractures and incipient slumps commonly occur in the Mancos Shale bedrock along the escarpment northwest of erosion control marker ECM-1A. No new erosion was evident in 2011.

Outlying Area—A sand and gravel pit operated by NECA is located immediately southeast of the disposal cell. Gravel mining operations ceased in 2009, but gravel stockpiles were still present during the 2011 inspection. Inspectors will continue to monitor sand and gravel operations to ensure that gravel pit activities do not encroach upon or adversely impact the disposal site and perimeter area.

In 2002, DOE constructed an 11-acre lined evaporation pond (across the public access road) as part of the ongoing groundwater treatment program. A chain-link security fence encloses the area. Although the activities associated with the treatment of contaminated groundwater at this site are not within the scope of the LTSP, the pond is monitored for general condition and security as part of the annual inspections. At the time of the 2011 inspection, the pond liner appeared intact, and the pond was full of water.

The security fence was functional, with some damage along the southwestern edge. Tumbleweeds and trash had accumulated in several areas along the fence, and removal is planned. The contact information on the entrance sign is out of date and will be corrected.

A barbed-wire fence runs parallel to the disposal site along Bob Lee Wash, and signs with warnings not to drink the water are posted on the fence. In 2011, a section of the fence was broken, and a warning sign was damaged (PL-4). Fence repair and sign replacement is recommended.

16.3.2 Follow-Up or Contingency Inspections

DOE will conduct follow-up inspections if (1) an annual inspection or other site visit reveals a condition that must be reevaluated during a return to the site, or (2) a citizen or outside agency notifies DOE that conditions at the site are substantially changed.

No follow-up or contingency inspections were required in 2011.

16.3.3 Routine Maintenance and Repairs

The repairs identified in this report will be completed by the time the 2012 inspection is conducted.

16.3.4 Groundwater Monitoring

In accordance with the LTSP, groundwater monitoring is not required at the site. The LTSP concluded that the site is located over an aquifer (the alluvial aquifer) that is not useful as a source of water for drinking or any other beneficial purpose because of its poor quality, limited areal extent, and low yield. An effective confining layer (Mancos Shale) and upward hydraulic gradient protect the underlying aquifer. Based on these findings, no additional hydrogeologic investigations were planned for the site, and no cell performance monitoring of groundwater was proposed as part of the long-term surveillance program.

16.3.5 Corrective Action

Corrective action is taken to correct out-of-compliance or hazardous conditions that create a potential health and safety problem or that may affect the integrity of the disposal cell or compliance with 40 CFR 192.

No corrective action was required in 2011.

16.3.6 Photographs

Table 16-2. Photographs Taken at the Shiprock Disposal Site

Photograph Location Number	Azimuth	Description
PL-1	245	Gap in northwest gate.
PL-2	130	Tumbleweed accumulation near east gate.
PL-3	120	Outflow channel.
PL-4	50	Broken fence wire and warning sign.



SHP 6/2011. PL-1. Gap in northwest gate.



SHP 6/2011. PL-2. Tumbleweed accumulation near east gate.



SHP 6/2011. PL-3. Outflow channel.



SHP 6/2011. PL-4. Broken fence wire and warning sign.

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