

16.0 Annual Inspection of the Shiprock, New Mexico, UMTRCA Title I Disposal Site

16.1 Compliance Summary

The Shiprock, New Mexico, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on May 29, 2012. The disposal cell and all associated surface water diversion and drainage structures remained in good condition and were functioning as designed. Minor maintenance activities (e.g., fence repairs and debris removal) are required.

No settling, slumping, erosion, animal intrusion, riprap deterioration, or other disturbance was evident on the top and side slopes of the cell. Five open research pits, several small depressions caused by subsided historical piezocone pits, and vehicle ruts were present on the cell top. No significant changes were observed since the 2011 inspection. The research pits were covered after the inspection, and the other depressions will continue to be monitored. Several small woody shrubs were growing on the northwest side slope of the cell. Diversion channels and the outflow channel were in good condition. Vegetation appeared sparse and is not expected to obstruct drainage flow. No new erosion was evident along the terrace escarpment. No significant changes in land use associated with outlying areas were identified. The offsite portion of the outflow channel remained functional and in good condition.

All three of the site's entrance gates remained intact. All perimeter signs were present, legible, and in good condition. One pictorial entrance sign was missing from the northwest gate. Sediment had accumulated under the southwest gate. The perimeter fence, although damaged in places, was intact and functional. Inspectors placed rocks in all significant gaps that formed under the perimeter fence. Boundary monuments BM-2 through BM-6 were not found during the annual inspection; a survey team found and reestablished the missing boundary monuments after the inspection. One erosion control marker was previously damaged by a vehicle but remained functional.

No additional maintenance needs or cause for a follow-up or contingency inspection was identified.

Numbers in the left margin of this report refer to items summarized in the "Executive Summary" table.

16.2 Inspection 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 16.4
Follow-Up or Contingency Inspections	Section 7.0	Section 16.5
Routine Maintenance and Repairs	Section 8.0	Section 16.6
Groundwater Monitoring	Section 5.0	Section 16.7.1
Corrective Action	Section 9.0	Section 16.8

16.3 Institutional Controls

The 105-acre disposal site is held in trust by the U.S. Bureau of Indian Affairs. The Navajo Nation retains title to and ownership of the land. The site was accepted under U.S. Nuclear Regulatory Commission 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. Institutional controls at the site include federal custody of the disposal cell and its engineered features, and the following features that are inspected annually: site markers, survey and boundary monuments, warning/no-trespassing signs, a site perimeter fence, and locked gates at the site entrances.

16.4 Inspection Results

The site, located approximately 28 miles west of Farmington, New Mexico, was inspected on May 29, 2012. L. Sheader and M. Kastens of the S.M. Stoller Corporation, the Legacy Management Support contractor at the DOE office in Grand Junction, Colorado, conducted the inspection. L. Gersey of U.S. Nuclear Regulatory Commission Region 4 observed inspection activities. D. Steckley, the DOE Office of Legacy Management site manager, and L. Benally, of the Navajo Abandoned Mine Lands/Uraniun Mill Tailings Remedial Action Department, participated in the inspection. Also in attendance were C. Gauthier and S. Woods of the S.M. Stoller Corporation.

The purposes of the annual inspection were to confirm the integrity of visible features at the site, to identify changes in conditions that may affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring.

16.4.1 Site Surveillance Features

The locations of site surveillance features are shown on Figure 16–1. Inspection results and recommended maintenance activities associated with site surveillance features are included in the following subsections. Photographs to support specific observations are identified in the text and on Figure 16–1 by photograph location (PL) numbers.

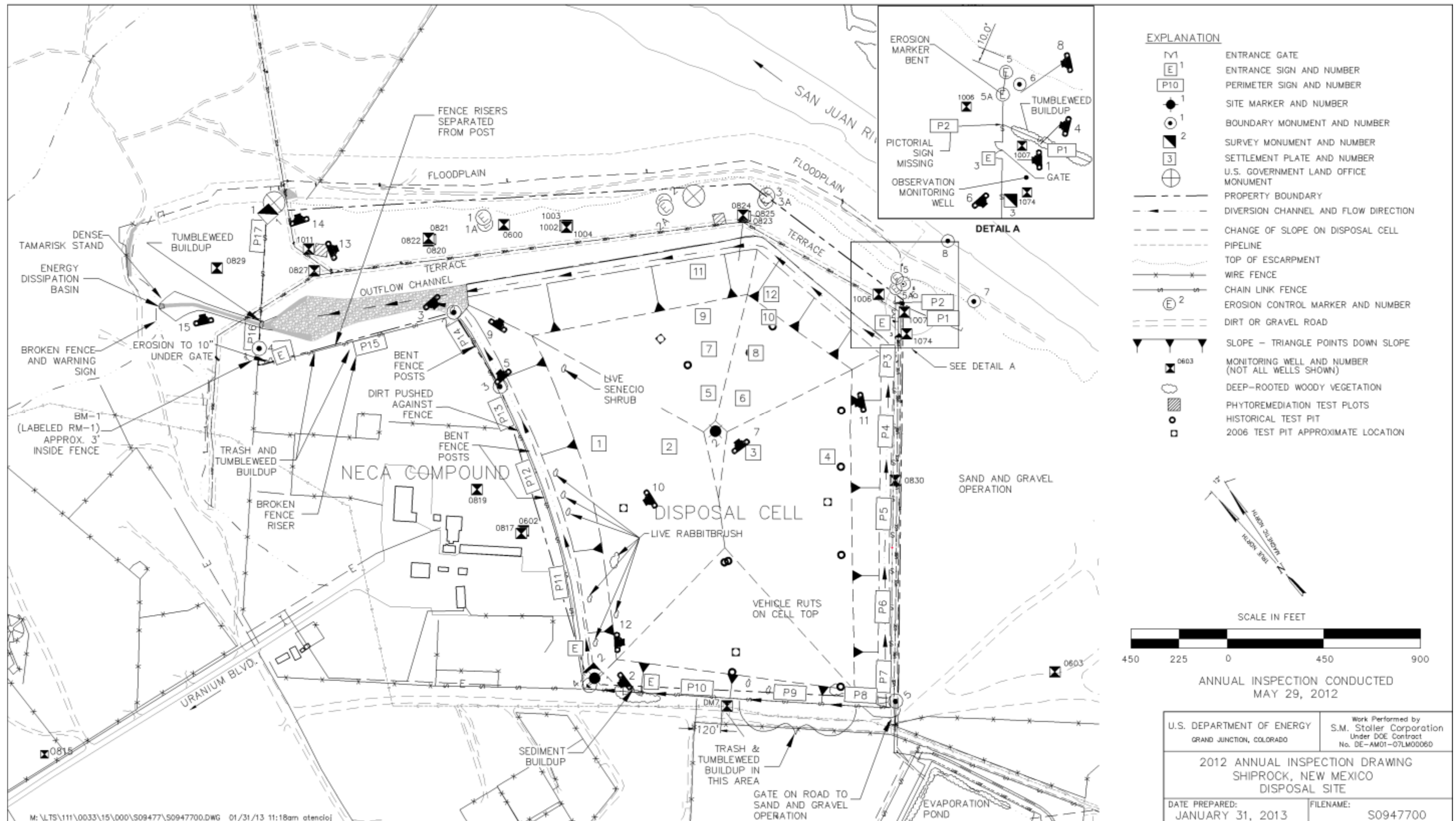


Figure 16-1. 2012 Annual Compliance Drawing for the Shiprock Disposal Site

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16.4.1.1 Entrance Gates, Entrance Signs, and Access Roads

Three gates allow entrance to the site: the east gate (the current main entrance gate near the terrace escarpment), the northwest gate (an auxiliary access gate), and the southwest gate (the former entrance gate). Near each gate, entrance signs are placed in pairs—one text and one pictorial (PL-1). The pictorial sign was missing from the northwest 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 Department was correct. The east and northwest gates were intact and functional. Sediment accumulated along the bottom of the southwest gate (PL-2). Access to the main entrance gate is gained by traveling through a gravel pit operated by the Navajo Engineering and Construction Authority (NECA). All access roads were in good condition.

16.4.1.2 Perimeter Fence and Perimeter Signs

As observed in previous years, the perimeter fence was intact and functional but damaged in a number of areas. Damaged fence sections reported in previous years include bent posts and bent fence fabric between perimeter signs P11 and P12, dirt mounded against the fence near P13, bent posts near P14, a broken fence riser near P15, and fence risers separated from posts between P15 and P16. New damage consists of a section of bent fence near P13; damage resulted from a large culvert placed in the adjoining NECA yard (PL-5). Damaged areas will continue to be monitored.

Trash and tumbleweeds have accumulated in many places along the perimeter fence (PL-3 and PL-4), including a section of fence across the outflow channel. These accumulations potentially represent a fire hazard and increase the possibility of damage to the fence, particularly during high winds. To improve the safety and appearance of the site the tumble weeds and trash have been removed.

There were small gaps beneath the fence, most formed by animals and wind erosion, along the site perimeter. In 2012, inspectors placed rocks in all significant gaps (PL-6).

Seventeen pairs of signs designated P1 through P17, each pair consisting of one pictorial sign and one sign with text, are located on the fence around the perimeter of the site. All perimeter signs were in good condition and showed no evidence of vandalism.

16.4.1.3 Site Markers

Site marker SMK-1, located just inside the southwest gate, and site marker SMK-2, located on top of the disposal cell (PL-7), were both in good condition. Minor cracks in the concrete base of SMK-1 were sealed in May 2003 and have not changed.

16.4.1.4 Survey Monuments and Boundary Monuments

In 2012, all three survey monuments (SM-1, SM-2, and SM-3) were located and in good condition. Although survey monument SM-2 was not observed during the 2011 annual inspection, it was verified in 2012.

Eight boundary monuments were originally installed at the site. Inspection of monument BM-7 was discontinued in 1999 because it is located on the steep embankment below the terrace in an area which cannot be accessed safely. BM-8 was located in 2012. It was intact and will be included in future inspections. BM-1 through BM-6 could not be located during the 2012 annual inspection. In January 2013, a survey team located monuments BM-2 through BM-6, which had been buried by sand. These monuments were unburied, flagged and staked with fence posts to locate them during future inspections. Additionally, the survey crew re-established boundary monument BM-1.

16.4.1.5 Erosion Control Markers

The four pairs of erosion control markers along the edge of the terrace escarpment were in good condition except for the marker near the east entrance gate. This marker was previously damaged by a vehicle (PL-8), but it is still functional and does not require repair at this time.

16.4.1.6 Monitoring Wells

Wells along the terrace and at offsite locations are associated with groundwater restoration and are not included in the annual inspection because the LTSP does not require groundwater monitoring for cell performance. Sampling teams inspect and maintain wells during regularly scheduled water sampling events. All of the wells encountered during the inspection were locked and in good condition.

16.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into three inspection areas (referred to as “transects” in the LTSP) to ensure a thorough and efficient inspection: (1) the disposal cell, including the riprap-covered top and side slopes, diversion channels at the base of the cell, and the outflow channel; (2) the terrace area north and northeast of the disposal cell; and (3) the outlying area.

Within each area, inspectors examined specific site surveillance features, drainage structures, vegetation, and other features. Inspectors examined each area for evidence of erosion, settling, slumping, or other disturbances that might affect the site’s integrity, protectiveness, or long-term performance.

16.4.2.1 Disposal Cell, Diversion Channels, and Outflow Channel

The riprap-covered top and side slopes of the cell were in good condition. No evidence of settling, slumping, erosion, animal intrusion, riprap deterioration, or other disturbance was found (PL-9). Five open research pits, described in previous annual inspection reports, were present on the cell top (PL-10). These research pits, installed in 2005 were filled in after the 2012 inspection. In 2002, Piezocones installed on the cell cover were removed and the associated pits filled in. Since that time, several of these pits have subsided slightly, forming conical depressions in the cover (PL-11). The surface of the cell was also covered with vehicle ruts (PL-12), many of which were formed in 2008 during herbicide treatment. The condition of the depressions and vehicle ruts is monitored annually and had not changed significantly since the 2011 inspection.

These features will continue to be monitored and photographed to document any changes. Inspectors noted the location and species of plants in accordance with the LTSP.

Diversion channels around the base of the disposal cell were in good condition and contained little vegetation. Small quantities of non-woody plants were growing in the outflow channel, and woody vegetation was growing on the banks of the channel; neither was 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 (Section 16.4.1.2).

16.4.2.2 Terrace Area

The terrace area is located north and northeast of the disposal cell along the top of a steep escarpment. Very little vegetation grows on the terrace (PL-13). The escarpment, approximately 300 feet from the eastern edge of the disposal cell, is prone to slumping. Fractures and incipient slumps can occur in the Mancos Shale bedrock along the escarpment northwest of erosion control marker 1A. No new erosion was evident in 2012 (PL-14).

16.4.2.3 Outlying Area

A NECA gravel pit is located immediately southeast of the disposal cell. No significant changes in land use associated with the gravel pit or with other outlying areas near the disposal cell were identified. Inspectors will continue to monitor sand and gravel operations to ensure that gravel pit activities do not encroach on or adversely impact the disposal site and perimeter fence.

The offsite portion of the outflow channel was functional and in good condition (PL-15).

16.5 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 need for a follow-up or contingency inspection was identified during the inspection.

16.6 Maintenance and Repair

The following maintenance items, identified during the 2012 inspection, have been addressed:

1. Remove sediment and debris from under the southwest entrance gate.
2. Remove accumulated tumbleweed and trash from along the disposal site's perimeter fence, the outflow channel, and the fence surrounding the evaporation pond.
- 16A 3. Cover five research pits in the disposal cell cover installed in 2005.
- 16B 4. Reestablish boundary monument BM-1, unbury boundary monuments BM-2 through BM-6, and install reference posts at all boundary monument locations.

The following items will be addressed before the 2013 inspection:

- 16C 1. Replace the pictorial sign missing from the northwest entrance gate.

16.7 Environmental Monitoring

16.7.1 Groundwater Monitoring

In accordance with the LTSP, cell performance monitoring of groundwater is not required at the site. Onsite wells are associated with separate groundwater restoration activities and are not included in the annual inspection.

16.8 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 2012.

16.9 Photographs

Photograph Location Number	Azimuth	Description
PL-1	310	New entrance sign at east gate.
PL-2	275	Sediment buildup along southwest gate.
PL-3	180	Trash and tumbleweed buildup in fence corner by perimeter sign P14.
PL-4	325	Tumbleweed buildup near the east gate.
PL-5	360	Bent fence (still intact) from large culvert in NECA yard near perimeter sign P13.
PL-6	180	Placing rocks in hole under perimeter fence.
PL-7	5	Site marker SMK-2.
PL-8	300	Erosion control marker damaged but functional.
PL-9	75	Side slope of disposal cell, view east.
PL-10	280	Open test pit on western portion of cell.
PL-11	300	Historical test pit on eastern edge of cell.
PL-12	130	Vehicle tracks visible on disposal cell cover, southwest portion of cell.
PL-13	110	View of terrace from the northern phytoremediation test plot.
PL-14	25	Repaired section of escarpment, view from near survey monument SM-1.
PL-15	30	Erosion control fabric along outflow channel.

*The azimuth is not given because the photo was taken at close range.



SHP 5/2012. PL-1. New entrance sign at east gate.



SHP 5/2011. PL-2. Sediment buildup along southwest gate.



SHP 5/2012. PL-3. Trash and tumbleweed buildup in fence corner by perimeter sign P14.



SHP 5/2012. PL-4. Tumbleweed buildup near the east gate.



SHP 5/2012. PL-5. Bent fence (still intact) from large culvert in NECA yard near perimeter sign P13.



SHP 5/2012. PL-6. Placing rocks in hole under perimeter fence.



SHP 5/2012. PL-7. Site marker SMK-2.



SHP 5/2012. PL-8. Erosion control marker damaged but functional.



SHP 5/2012. PL-9. Side slope of disposal cell, view east.



SHP 5/2012. PL-10. Open test pit on western portion of cell.



SHP 5/2012. PL-11. Historical test pit on eastern edge of cell.



SHP 5/2012. PL-12. Vehicle tracks visible on disposal cell cover, southwest portion of cell.



SHP 5/2012. PL-13. View of terrace from the northern phytoremediation test plot.



SHP 5/2012. PL-14. Section of escarpment near survey monument SM-1.



SHP 5/2012. PL-15. Erosion control fabric along outflow channel.