12.0 Mexican Hat, Utah, Disposal Site

12.1 Compliance Summary

The Mexican Hat, Utah, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on April 15, 2014. The disposal cell was in excellent condition. A broken perimeter fence strand was repaired. No additional maintenance needs or cause for a follow-up inspection was identified.

A required annual assessment of six designated seeps was conducted during the inspection. Five seeps were dry and one was moist. Sampling was not conducted because there were no significant changes in seep flow since the previous year.

12.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Mexican Hat, Utah, (UMTRCA Title I), Disposal Site, San Juan County, Utah* (LTSP) (DOE-LM/1530-2007, Rev. 3, U.S. Department of Energy [DOE], October 2007) and in procedures that DOE established to comply with the requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). Table 12-1 lists these requirements.

Table 12-1. License Requirements for the Mexican Hat Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Sections 3.3 and 3.4	Section 12.4
Follow-Up Inspections	Section 3.5	Section 12.5
Maintenance	Section 3.6	Section 12.6
Emergency Measures	Section 3.6	Section 12.7
Environmental Monitoring	Section 3.7	Section 12.8

12.3 Institutional Controls

The United States of America holds the 119-acre disposal site (Figure 12-1) in trust for the U.S. Bureau of Indian Affairs; the Navajo Nation retains title to the land. DOE and the Navajo Nation executed a Custodial Access Agreement that conveys to the federal government title to the residual radioactive materials stabilized at the repository site and ensures that DOE has perpetual access to the site. UMTRCA authorized DOE to enter into a Cooperative Agreement (DE-FC04-85AL26731) with the Navajo Nation, and required it to be in place before bringing the site under the general license. The purpose of the Cooperative Agreement was to perform remedial actions at the former uranium processing sites on the Navajo Nation.

The site was accepted under the U.S. Nuclear Regulatory Commission general license (10 CFR 40.27) in 1997. 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 the following features that are inspected annually: a site perimeter fence and a locked entrance gate, perimeter warning signs, site markers, and boundary and survey monuments.

12.4 Inspection Results

The site, south of Mexican Hat, Utah, was inspected on April 15, 2014. The inspection was conducted by J. Gillespie and R. Cyr of Stoller Newport News Nuclear, Inc. (SN3), a wholly owned subsidiary of Huntington Ingalls Industries, Inc. SN3 is the DOE Legacy Management Support contractor.

The purposes of the inspection were to confirm the integrity of visible features at the site, to identify changes in conditions that might affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring. Numbers in the left margin of this chapter refer to items summarized in Table ES-1 of the "Executive Summary."

12.4.1 Site Surveillance Features

The locations of site surveillance features are shown on Figure 12-1. 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 12-1 by photograph location (PL) numbers.

12.4.1.1 Site Access, Entrance Gate, and Entrance Sign

The site is accessed via a short unmarked dirt road off U.S. Highway 163 that ends at a graded parking area. Erosion continues to occur along the dirt road, but the site continues to be accessible. The locked entrance gate and the entrance sign were in good condition.

12.4.1.2 Fence and Perimeter Signs

A barbed-wire perimeter fence is located between the disposal cell features and the site boundary and was in good condition. Periodically, the fence is damaged by livestock, erosion, or
12A vandalism and requires repair. A single strand was broken near the east toe drain (PL-1 and PL-2). The broken strand was repaired.

The site has 43 perimeter sign locations positioned along the site boundary. Each location has a pair of signs: an upper property ownership/no-trespassing sign and a lower sign identifying the site as a radioactive materials disposal site. The signs are attached to steel posts set in concrete. Several signs have bullet damage but remain legible (PL-3).

12.4.1.3 Site Markers

Two granite site markers are on the site. Site marker SMK-1, inside the perimeter fence near the entrance gate, was in good condition (PL-4). Its concrete base has several minor cracks, but repairs are not necessary at this time. Site marker SMK-2, on the disposal cell top slope, was in excellent condition (PL-5).

12.4.1.4 Boundary and Survey Monuments

Twelve boundary monuments mark the site boundary. Five survey monuments were installed for survey control during cell construction. All of the monuments were in good condition (PL-6).

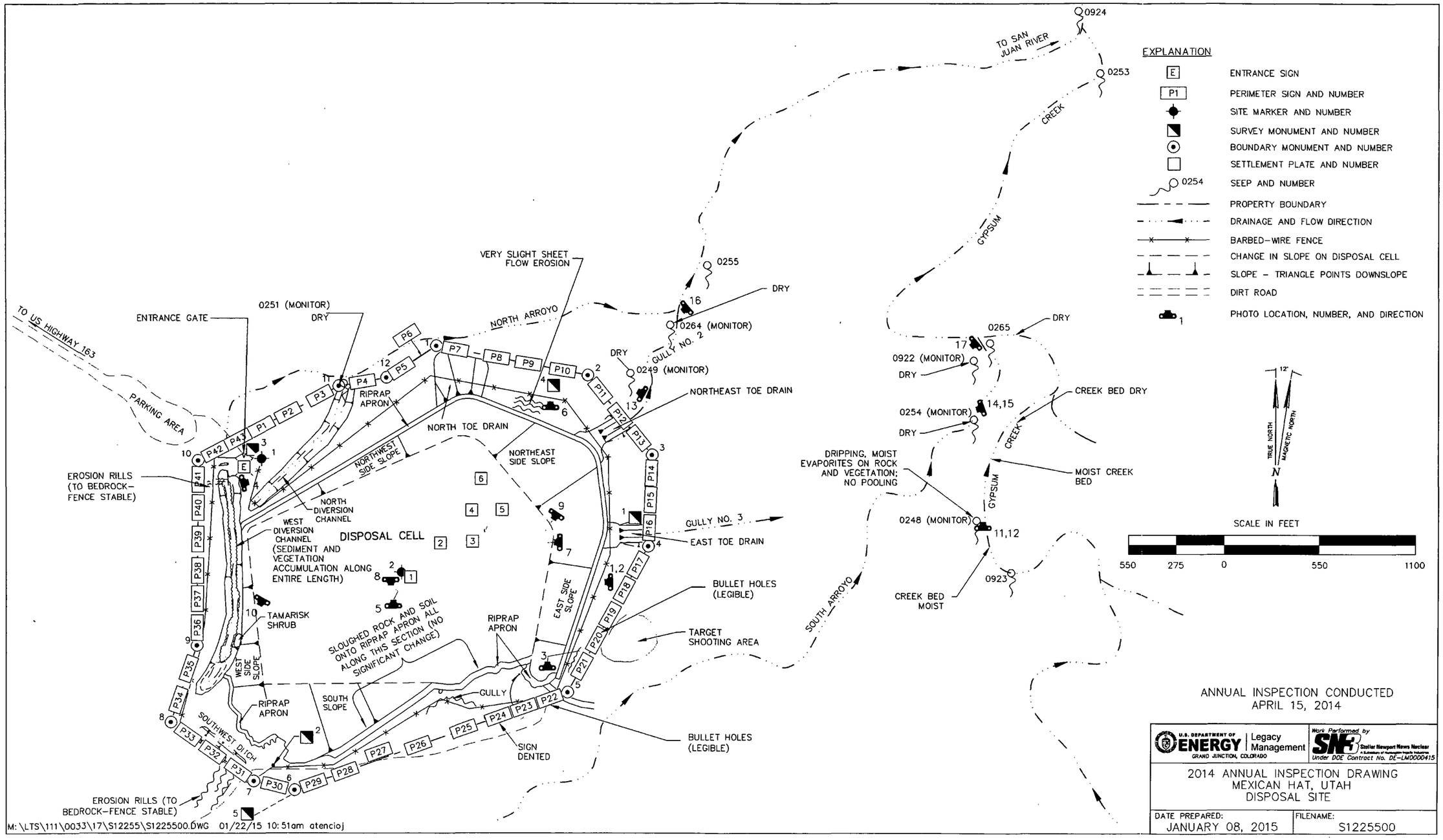

Figure 12-1. 2014 Annual Inspection Drawing for the Mexican Hat Disposal Site

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12.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into four inspection areas (referred to as "transects" in the LTSP) to ensure a thorough and efficient inspection. The inspection areas are: (1) the disposal cell; (2) the toe drains and diversion channels; (3) the balance of the site and the site perimeter; and (4) the outlying area.

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

12.4.2.1 Disposal Cell

The top slope of the disposal cell was in excellent condition (PL-7 and PL-8). Inspectors found no evidence of differential settling, cracking, erosion, or burrowing. All visible components of the riprap-armored disposal cell top and side slopes were functioning as designed.

There was no noticeable increase of sloughed red country rock and soil along the south apron (PL-9). Because the apron in this area is immediately adjacent to the base of the steep rocky cliff face along the southern edge of the disposal cell cover, it is expected that sediment and unstable rock from the cliff face will continue to fall onto the apron. The accumulated material is not impacting the function of the apron but this area will continue to be monitored.

12.4.2.2 Toe Drains and Diversion Channels

The disposal cell toe drains and diversion channels were in excellent condition and functioning as designed. Upgradient offsite areas continue to erode and transport sediment onto the site and into the west diversion channel (PL-10). The sediment accumulation has promoted the growth of vegetation in the channel, including perennial grasses and annual weeds; however, the sediment and vegetation are not affecting the performance of the diversion channel.

12.4.2.3 Balance of the Site and Site Perimeter

Minor erosion continues to occur in upgradient areas along the west and southwest portions of the site. This is an expected natural process and a result of the site coming to equilibrium with the outlying areas. Erosion in these areas will continue to be monitored, but it is not a concern unless it damages the perimeter fence or impacts the performance of the west diversion channel.

Scattered trash (broken glass, bottles, cans, cardboard, and paper containers) is accumulating in the more accessible portions of the site where vehicle access is available. The most noticeable accumulations of trash continue to be along the entrance road and in the parking area, the areas on DOE property along the perimeter fence between perimeter signs P31 and P42, and the southern portion of the site between perimeter signs P22 and P27.

Trespassing just inside the disposal site property boundary (outside the disposal cell perimeter fence) occurs in the same areas where trash accumulations are present, as evidenced by vehicle and all-terrain vehicle tracks. Vandalism continues, as indicated by new bullet holes in several perimeter signs. This is expected to be an ongoing problem at the site because access to these areas cannot be restricted. Damaged perimeter signs are replaced when they become illegible.

12.4.2.4 Outlying Area

The area surrounding the site was visually inspected for signs of erosion, development, or other disturbance that might affect site integrity or security. There were no activities in the immediate vicinity that would impact the site.

12.5 Follow-Up 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 inspection was identified.

12.6 Maintenance

A broken strand of the cell perimeter fence was repaired. No other maintenance needs were identified.

12.7 Emergency Measures

Emergency measures are the actions that DOE will take in response to "unusual damage or disruption" that threaten or compromise site safety, security, or integrity in compliance with 10 CFR 40, Appendix 1, Criterion 12. No need for emergency measures was identified.

12.8 Environmental Monitoring

12.8.1 Groundwater Monitoring

Groundwater monitoring is not required because the uppermost aquifer is hydrogeologically isolated from contamination in the overlying formation. No groundwater monitoring wells remain at the site.

12.8.2 Seep Monitoring

An annual assessment of six designated seeps was conducted during the inspection in accordance with Section 3.7.2 of the LTSP and approved recommendations presented in *Resolution of Seep and Ground Water Monitoring at the Mexican Hat, Utah, UMTRCA Title I Disposal Site*, (DOE-LM/GJ1139-2006, DOE Office of Legacy Management, March 2006). The seeps are primarily the result of perched water that leaked from the former processing site tailings pond for many years and, to a lesser degree, the result of transient drainage from the wet tailings placed in the disposal cell. Signs warning against drinking the water are posted at five of the seep locations.

Annual visual observations of the seeps are required through 2016, at which time an evaluation will be conducted to determine whether to continue or discontinue monitoring. The need to sample the seeps will be evaluated if observed seep flows significantly increase compared to historical seep flow rates.

Since 2010, seep flow has been observed only at upgradient (background) seep 0248. This seep
12B area was moist and only dripping water was observed, and it was impacted by the collapse of overhanging rock. The remaining seeps, all considered to be hydraulically downgradient of the site, were dry with no indication of recent moisture. No sampling was warranted because there were no significant increases in water flow at the seeps. Table 12-2 provides observations and qualitative descriptions of seep flows, along with a reference to photographic documentation.

Table 12-2. Observations of Seeps Near the Mexican Hat Disposal Site

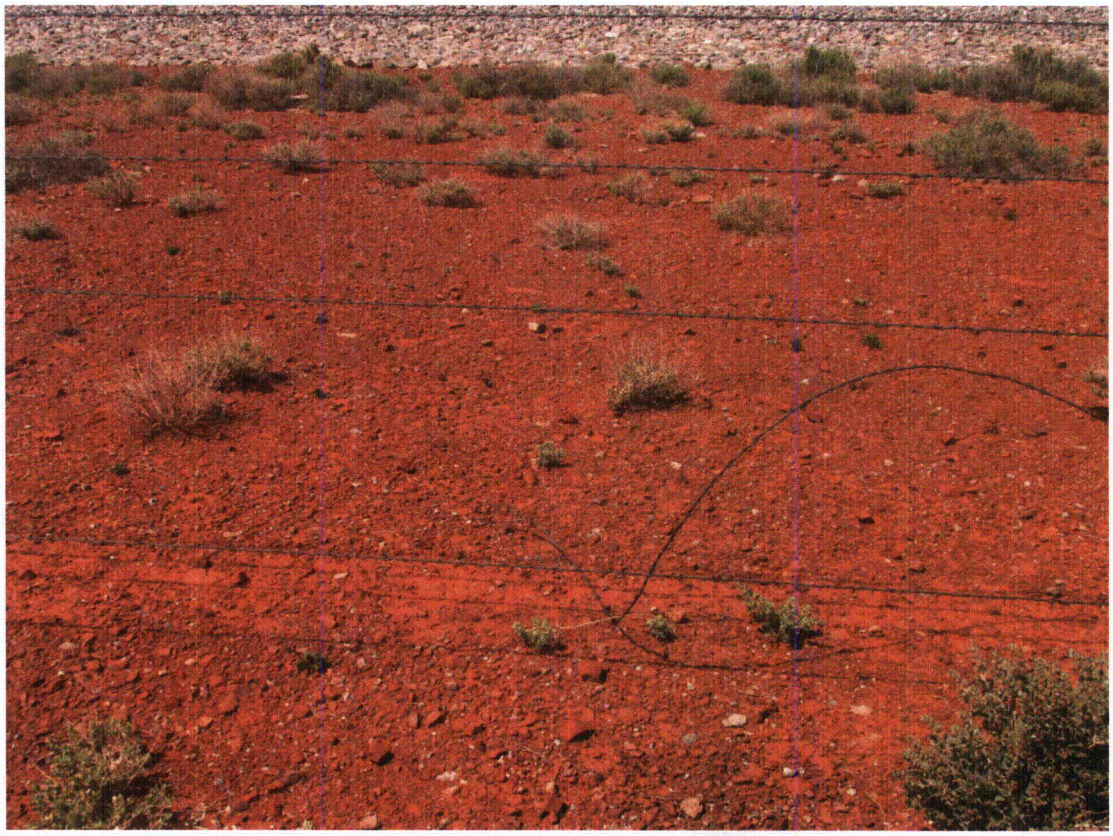
Seep Location Number	Drainage	Photo Location Numbers	Observed Seep Conditions
0248	Gypsum Creek	PL-11, PL-12	Moist adjacent rock face; soils moist and dripping water but no pooling in the seep area (no change in flow conditions from previous year). Overhanging rock collapsed and the warning sign was partially covered with sediment.
0249	Gully No. 2	PL-13	Dry (no change from previous year).
0251	North Arroyo	No photo	Dry (no change from previous year).
0254	South Arroyo	PL-14, PL-15	Dry (no change from previous year). Location is not posted.
0264	North Arroyo	PL-16	Dry (no change from previous year).
0922	South Arroyo	PL-17	Dry (no change from previous year).

12.8.3 Vegetation Monitoring

In accordance with the LTSP, vegetation conditions are observed during annual inspections to ensure that undesirable plant species, including deep-rooted plants on the disposal cell cover and noxious weeds, do not proliferate at the site. Natural plant community succession is expected and will not adversely impact the performance of the disposal cell features. No vegetation was growing on the disposal cell top slope, and one tamarisk shrub was the only noxious weed on the site.

12.9 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	270	Broken fence near east toe drain.
PL-2	68	Broken fence near east toe drain.
PL-3	0	Perimeter sign P20 with bullet holes.
PL-4	80	Site marker SMK-1 near entrance gate.
PL-5	0	Site marker SMK-2 on disposal cell top slope.
PL-6	0	Survey monument SM-4.
PL-7	270	View west across disposal cell top slope.
PL-8	180	South portion of disposal cell top slope.
PL-9	214	Erosion protection along south apron.
PL-10	210	Upgradient portion of west diversion channel.
PL-11	0	Seep 0248 with sloughed rock and sediment.
PL-12	0	Seep 0248 (moist soil and dripping water).
PL-13	300	Seep 0249 (dry).
PL-14	166	Seep 0254 (dry).
PL-15	166	Seep 0254 (dry).
PL-16	230	Seep 0264 (dry).
PL-17	230	Seep 0922 (dry).



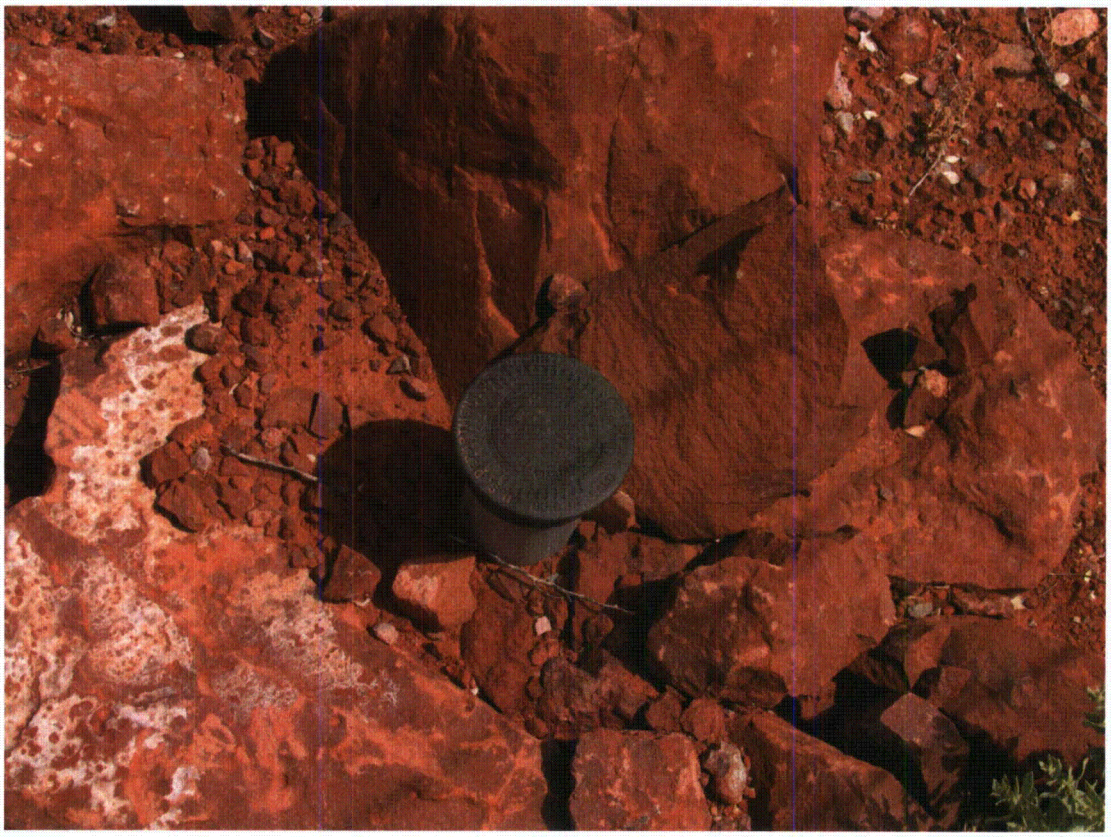
HAT 4/2014. PL-1. Broken fence near east toe drain.

HAT 4/2014. PL-2. Broken fence near east toe drain.

HAT 4/2014. PL-3. Perimeter sign P20 with bullet holes.

HAT 4/2014. PL-4. Site marker SMK-1 near entrance gate.

HAT 4/2014. PL-5. Site marker SMK-2 on disposal cell top slope.



HAT 4/2014. PL-6. Survey monument SM-4.

HAT 4/2014. PL-7. View west across disposal cell top slope.

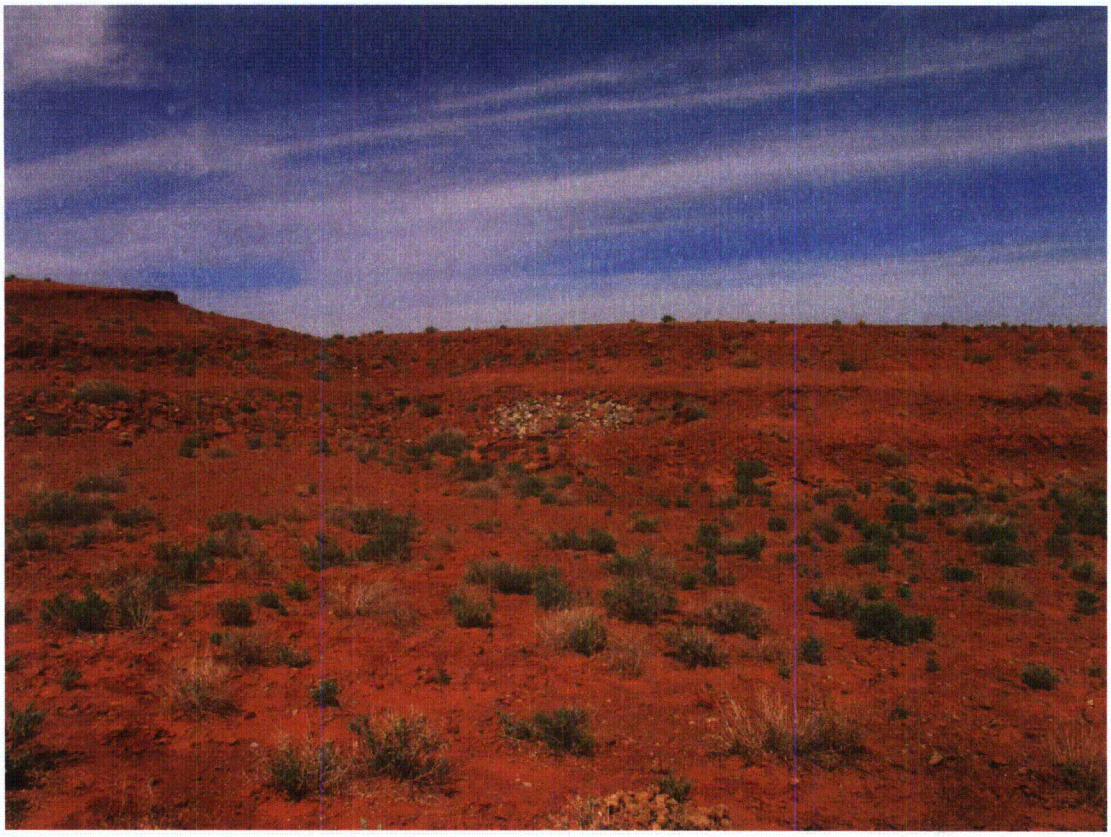
HAT 4/2014. PL-8. South portion of disposal cell top slope.

HAT 4/2014. PL-9. Erosion protection along south apron.

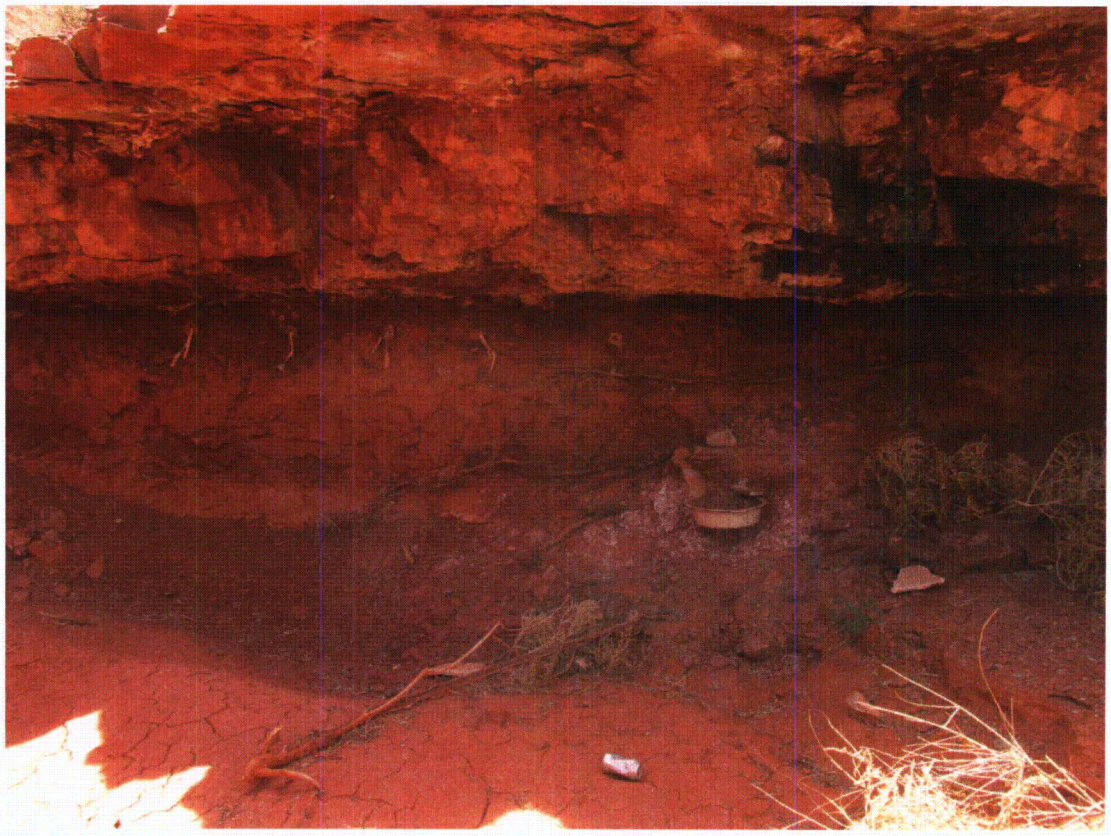
HAT 4/2014. PL-10. Upgradient portion of west diversion channel.

HAT 4/2014. PL-11. Seep 0248 with sloughed rock and sediment.

HAT 4/2014. PL-12. Seep 0248 (moist soil and dripping water).



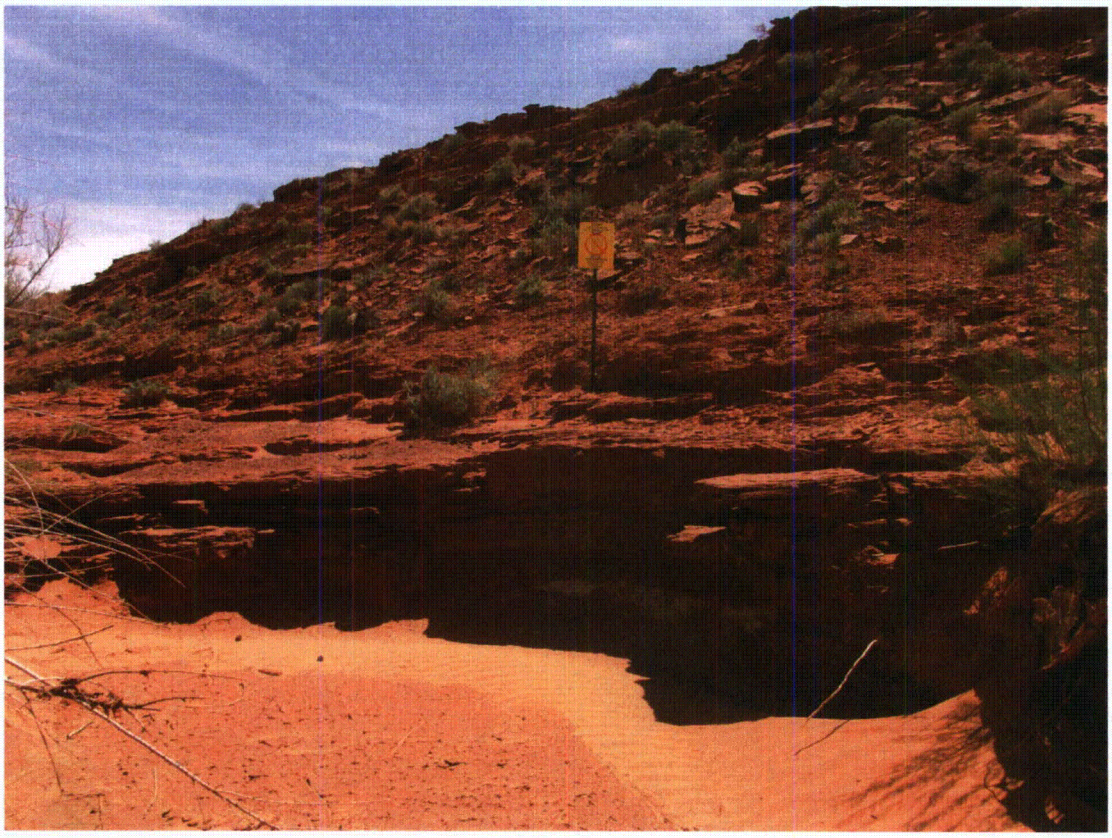
HAT 4/2014. PL-13. Seep 0249 (dry).



HAT 4/2014. PL-14. Seep 0254 (dry).

HAT 4/2014. PL-15. Seep 0254 (dry).

HAT 4/2014. PL-16. Seep 0264 (dry).



HAT 4/2014. PL-17. Seep 0922 (dry).

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13.0 Naturita, Colorado, Disposal Site

13.1 Compliance Summary

The Naturita, Colorado, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on May 13, 2014. The site was in excellent condition. Erosion repairs were conducted on the disposal cell access road and boulders were removed from the toe drains in March 2014. Inspectors identified no maintenance needs or cause for a follow-up inspection.

13.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Upper Burbank Disposal Cell, Uravan, Colorado* (LTSP) (DOE/AL/62350-250, Revision 1, U.S. Department of Energy [DOE], July 1999) and in procedures that DOE established to comply with the requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). Table 13-1 lists these requirements.

Table 13-1. License Requirements for the Naturita Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Sections 3.0 and 6.2	Section 13.4
Follow-Up Inspections	Section 3.4	Section 13.5
Maintenance and Repairs	Section 4.0	Section 13.6
Groundwater Monitoring	Section 2.6	Section 13.7
Corrective Action	Section 5.0	Section 13.8

13.3 Institutional Controls

The 26.65-acre disposal site (Figure 13-1) is owned by the United States of America and was accepted under the U.S. Nuclear Regulatory Commission (NRC) general license (10 CFR 40.27) in 1999. 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 ownership of the property and the following features that are inspected annually: a site perimeter fence, perimeter warning signs, site markers, survey and boundary monuments, and a locked gate at the entrance to the site access road.

13.4 Inspection Results

The site, northwest of Naturita, Colorado, was inspected on May 13, 2014. The inspection was conducted by D. Traub and L. Sheader of Stoller Newport News Nuclear, Inc. (SN3), a wholly owned subsidiary of Huntington Ingalls Industries, Inc. SN3 is the DOE Legacy Management Support contractor. S. Kaufman (SN3) attended the inspection.

The purposes of the inspection were to confirm the integrity of visible features at the site, to identify changes in conditions that might affect site integrity, and to determine the need, if any,

for maintenance or additional inspections and monitoring. Numbers in the left margin of this chapter refer to items summarized in Table ES-1 of the "Executive Summary."

13.4.1 Site Surveillance Features

Figure 13-1 shows the locations of site surveillance features. 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 in Figure 13-1 by photograph location (PL) numbers.

13.4.1.1 Entrance Gate, Entrance Sign, and Access Road

Access to the Naturita disposal site is off State Highway 141 in Hieroglyphic Canyon along Montrose County Road EE22. Road EE22 borders the northeast side of the site.

The entrance gate consists of a locked pair of tubular metal gates. The gate was in good condition. The chain and padlock were replaced with a heavier gauge chain and lock following the inspection. The site entrance sign was in good condition.

13A The disposal cell access road along the northwest side of the site was repaired in March 2014 (PL-1). Repairs included removing fallen rocks, placing new gravel, and regrading the road; the road was in excellent condition (PL-2). Two gates where the cell access road crosses the property boundary near boundary monument BM-9 were in good condition.

13.4.1.2 Perimeter Fence and Perimeter Signs

A barbed-wire stock fence encloses the site. Overall, the fence is in good condition. Loose strands are present at several locations but do not impair the function of the fence (PL-3); they will be repaired when other site repairs are necessary.

Perimeter signs mounted on steel posts are set approximately 5 feet inside the perimeter fence (PL-4). Perimeter sign P2 has bullet damage but remains legible. The other 24 perimeter signs were in good condition.

13.4.1.3 Site Markers

Two granite site markers identify the site. Site marker SMK-1 is set just inside the entrance gate, and site marker SMK-2 (PL-5) is on the top slope of the disposal cell. Both markers were in good condition.

13.4.1.4 Survey Monuments and Boundary Monuments

Survey and boundary monuments mark the boundary of the site. The survey monuments were installed during site construction for survey control, and the boundary monuments were installed after completion of construction. The 17 survey and boundary monuments were undisturbed and in good condition.

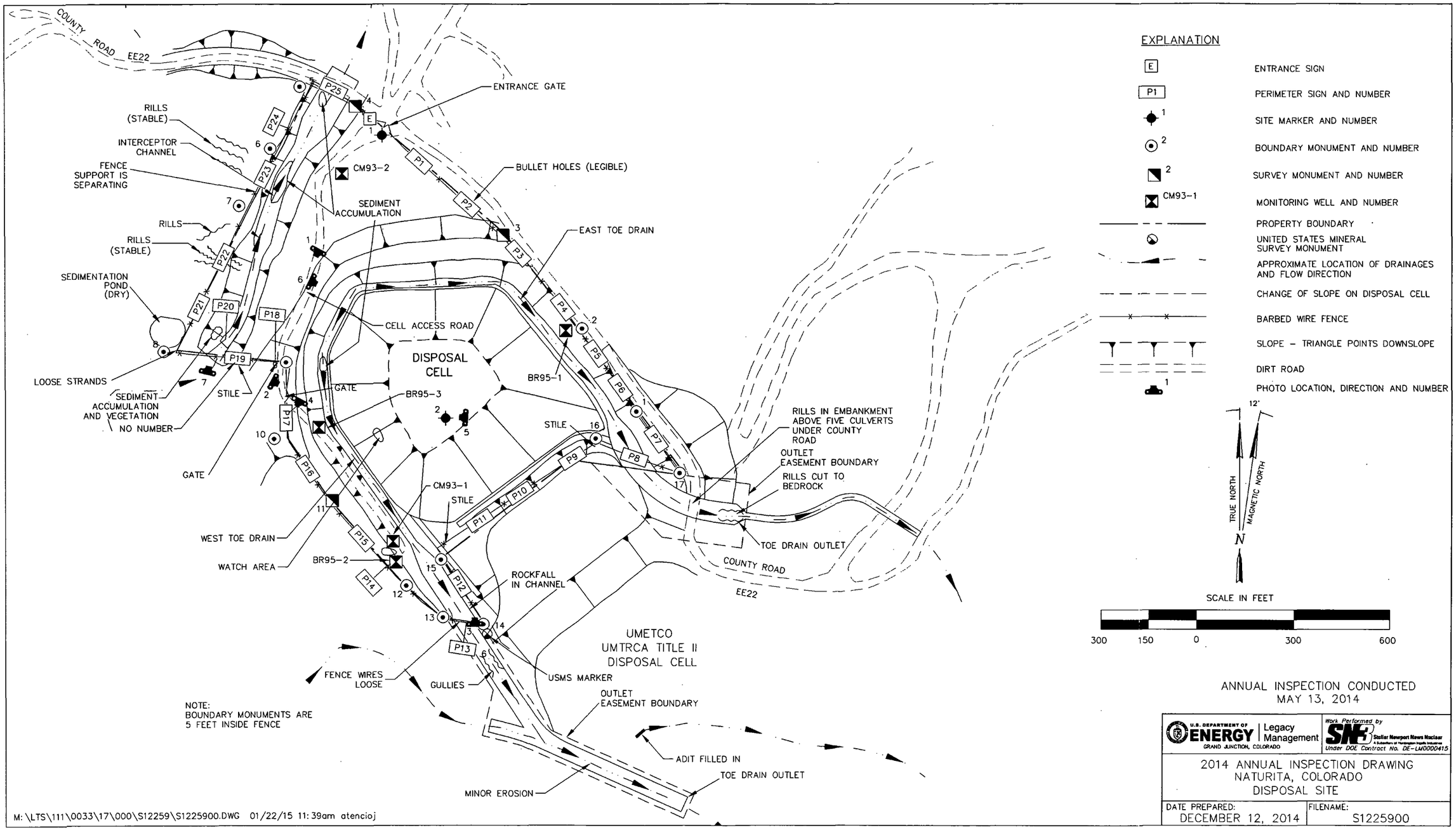

Figure 13-1. 2014 Annual Inspection Drawing for the Naturita Disposal Site

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13.4.1.5 Monitoring Wells

The five groundwater monitoring wells were locked and in good condition.

13.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into three inspection areas to ensure a thorough and efficient inspection. The inspection areas are: (1) the disposal cell, (2) the remainder of the site, and (3) the outlying area.

Within each area, inspectors examined specific site surveillance features. Inspectors also looked for evidence of erosion, settling, slumping, or other disturbance that might affect the site's integrity, protectiveness, or long-term performance.

13.4.2.1 Disposal Cell

Rock covers the 2-acre top of the disposal cell and the approximate 8 acres of side slopes (PL-6). The rock is rounded, with larger rock on the side slopes than on the top. The rock-covered surfaces were in excellent condition. A small area on the southwest side of the disposal cell was noted during the 2013 inspection as being slightly higher than the surrounding cell sides (shown as an area to be watched in Figure 13-1). This area, which may be a feature left from final rock placement, was inspected in 2014 but no change was evident. No degradation or significant vegetation was identified on the cell.

13.4.2.2 Remainder of the Site

Two riprap-filled toe drains collect water from the cell side slopes and divert it to the southeast. The west toe drain exits the south corner of the site via a channel quarried through the wall of the Burbank Pit. Some sediment has accumulated in the upper end of the west toe drain allowing scattered plants to grow. Soft bedrock is being eroded near the outlet of the west toe drain, but this erosion does not threaten the performance of the toe drain or the disposal cell and repairs are not necessary. The east toe drain exits the east corner of the site and conveys water through culverts under County Road EE22. Erosion has exposed resistant bedrock near the outlet of the east toe drain; however, the toe drain is performing as designed and repairs are not necessary.
13B Two large boulders that had fallen into the toe drains were removed in March 2014.

A riprap-armored interceptor channel, upgradient and northwest of the disposal cell, diverts storm water and snowmelt run-on to the northeast under County Road EE22. Some erosion has occurred outside the property uphill from perimeter sign P23 and between perimeter signs P22 and P23 resulting in deposition of sediment in the channel (PL-7). The channel is in good condition, however, and the current sediment accumulation and associated vegetation do not impair the function of the channel.

13.4.2.3 Outlying Area

The area within 0.25 mile of the site boundary has been highly disturbed by mining, quarrying, reclamation, and road building. No changes in land use were observed during the inspection.

13.5 Follow-Up 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 inspection was identified.

13.6 Maintenance and Repairs

The disposal cell access road was repaired and boulders were removed from the toe drains. Loose fence strands will be repaired when other site maintenance is necessary. No other maintenance needs were identified.

13.7 Groundwater Monitoring

In accordance with a letter from NRC to DOE dated April 15, 2014, groundwater monitoring is
13C no longer required at the site. The LTSP will be revised as required by 10 CFR 40.27(c) to exclude groundwater monitoring and will be submitted to NRC for concurrence.

13.8 Corrective Action

In accordance with the LTSP, corrective action is taken to correct conditions that threaten the integrity of the disposal cell or compliance with 40 CFR 192. No need for corrective action was identified.

13.9 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	0	Repaired section of cell access road (image from March erosion repairs).
PL-2	120	Repaired access road at gate near boundary monument BM-9.
PL-3	30	Perimeter fence with loose strand at south corner of site.
PL-4	240	Perimeter sign P17; boundary monument BM-10 in vegetation between rocks and fence.
PL-5	175	Site marker SMK-2 on top of disposal cell.
PL-6	135	Disposal cell.
PL-7	150	Sediment and vegetation in interceptor channel.

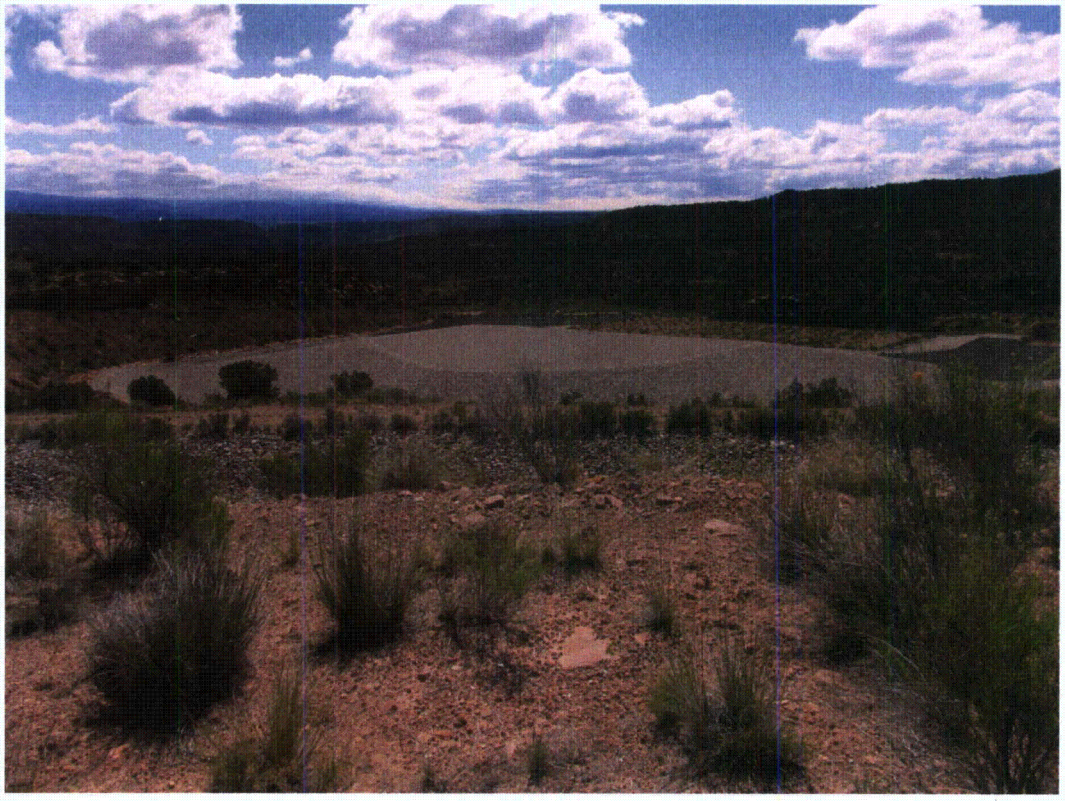
NAD 5/2014. PL-1. Repaired section of cell access road (image from March 2014 erosion repairs).

NAD 5/2014. PL-2. Repaired access road at gate near boundary monument BM-9.

NAD 5/2014. PL-3. Perimeter fence with loose strand at south corner of site.

NAD 5/2014. PL-4. Perimeter sign P17; boundary monument BM-10 in vegetation between rocks and fence.

NAD 5/2014. PL-5. Site marker SMK-2 on top of disposal cell.



NAD 5/2014. PL-6. Disposal cell.

NAD 5/2014. PL-7. Sediment and vegetation in interceptor channel.