

1.0 Ambrosia Lake, New Mexico, Disposal Site

1.1 Compliance Summary

The Ambrosia Lake, New Mexico, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on August 27, 2008. The disposal cell and all associated surface water diversion and drainage structures were in excellent condition and functioning as designed. The site access road, owned by Rio Algom Mining LLC (Rio Algom), was temporarily realigned in 2006 to allow for construction of a waste haul road; waste hauling operations are complete, and the site access road is scheduled for restoration in 2009. Slight settlement may be recurring at a location on the cell cover that was repaired in 2005; this location will continue to be monitored. No maintenance needs or cause for a follow-up or contingency inspection were identified.

1.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Ambrosia Lake Disposal Site are specified in the *Long-Term Surveillance Plan [LTSP] for the Ambrosia Lake, New Mexico, Disposal Site* (DOE/AL/62350–211, Rev. 1, U.S. Department of Energy [DOE], Albuquerque Operations Office, July 1996) and in procedures established by DOE to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). These requirements are listed in Table 1–1.

Table 1–1. License Requirements for the Ambrosia Lake Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 6.0	Section 1.3.1
Follow-Up or Contingency Inspections	Sections 6.0 and 7.0	Section 1.3.2
Routine Maintenance and Repairs	Section 8.0	Section 1.3.3
Groundwater Monitoring	Section 5.0	Section 1.3.4
Corrective Action	Section 9.0	Section 1.3.6

Institutional Controls—The 356-acre disposal site 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 1998. 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 disposal site, as defined by DOE Policy 454.1, consist of federal ownership of the property, warning/no-trespassing signs placed along the property boundary, and a locked gate at the entrance to the site access road. Verification of these institutional controls is part of the annual inspection.

Inspectors found no evidence that these institutional controls were ineffective or violated.

1.3 Compliance Review

1.3.1 Annual Inspection and Report

The disposal site, located north of Milan, New Mexico, was inspected on August 27, 2008. The results of the inspection are described below. Features and photograph locations (PLs) mentioned in this report are shown on Figure 1–1. Numbers in the left margin of this report refer to items summarized in the “Executive Summary” table.

1.3.1.1 Specific Site-Surveillance Features

Access Road, Entrance Sign, and Perimeter Signs—Access to the Ambrosia Lake Disposal Site is along a gravel road that crosses private property and leads to the site for approximately 1 mile from New Mexico State Highway 509. There is a locked gate across this road where it leaves Highway 509 because the road continues to private mining and grazing interests that lie east of the site. Numerous locks are connected in series to allow other users to pass through the gate. The access road continues through the DOE-owned property along the southern boundary of the site. DOE has been granted permanent access to the disposal site.

Rio Algom temporarily realigned the access road in 2006 to bypass a new waste haul road. Waste hauling operations were near completion at the time of the inspection, and restoration of the access road by Rio Algom is scheduled for 2009. Reclamation of the temporary road will be the responsibility of Rio Algom, which owns all of the property between Highway 509 and the disposal site.

The entrance sign and all perimeter signs were in good condition. Posts for perimeter signs P1 through P15 include mining restriction-area warning signs.

Site Markers, and Survey and Boundary Monuments—The two granite site markers (PL–1), three combined survey and boundary monuments (PL–2), and five additional boundary monuments were all undisturbed and in excellent condition.

Monitor Wells—Two monitor wells (MW–0675 and MW–0678) are present on the site and were in good condition. Gully formation adjacent to monitor well MW–0678 appears to be stabilizing.

Mine Vents—One mine vent shaft, associated with abandoned underground mines, is within the site boundary in the northern portion of the site; a second vent shaft lies just outside the site boundary in the southwest corner. The vents have casings that rise approximately 3 feet above the ground and were secure at the time of the inspection. The mine vent north of the disposal cell has a spot-welded cover (PL–3), and the other vent located just outside the southwest corner of the site has a bolted-on cover. The vents were secure at the time of the inspection.

1.3.1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into four areas referred to as *transects*: (1) the riprap-covered top of the disposal cell, (2) the riprap-covered side slopes and apron of the cell, (3) the graded and revegetated area between the disposal cell and the site perimeter, and (4) the outlying area.

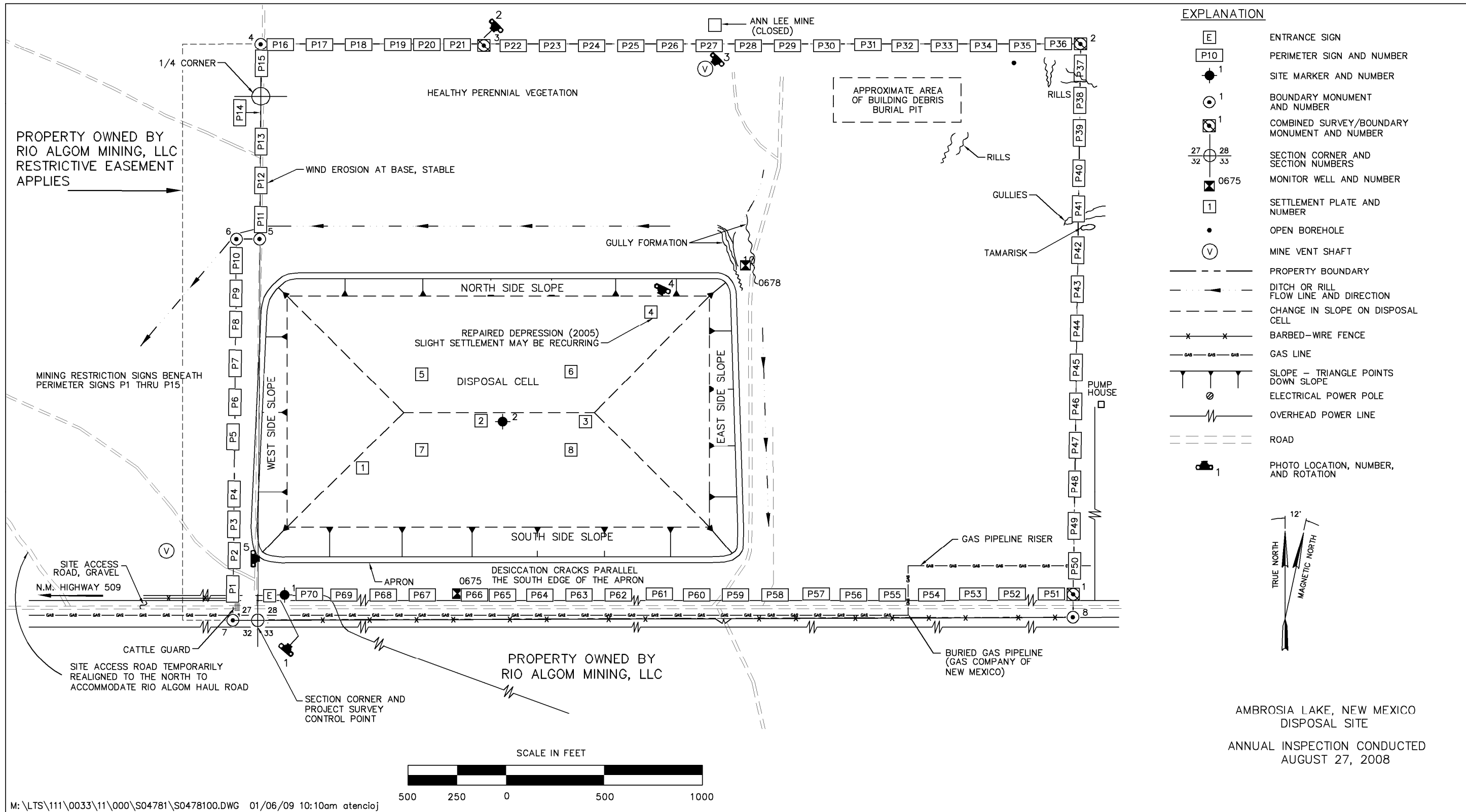


Figure 1-1. 2008 Annual Compliance Drawing for the Ambrosia Lake Disposal Site

This page intentionally left blank

Within each transect, inspectors examined specific site-surveillance features, such as survey and boundary monuments, signs, and site markers. Inspectors examined each transect for evidence of erosion, settling, slumping, or other disturbance that might affect the site's integrity or long-term performance.

1A Top of Disposal Cell—The 91-acre disposal cell was completed in 1994. The basalt riprap-covered top of the disposal cell was in good condition. There was no evidence of cracking, slumping, or erosion. In August 2005, repairs were made to a shallow depression in the cell cover around settlement plate SP-4. Surveys of the settlement plates in 2005, 2006, and 2007 indicated no change in the surface elevations. However, visual observations during the 2008 inspection indicated that slight settlement may be recurring at SP-4 (PL-4). This location will continue to be visually monitored.

Scattered annual weeds and clumps of grass were observed growing on the disposal cell cover and are insignificant. Deep-rooted woody shrubs, potentially damaging to the radon barrier, are periodically cut and treated with herbicide.

Side Slopes and Apron—The basalt riprap-covered side slopes and apron were in excellent condition and showed no evidence of cracking, settling, slumping, or erosion (PL-5). Desiccation cracks occur in the clay-rich backfill soil parallel to the apron along the south side of the cell. The cracks do not pose a threat to the disposal cell.

Tamarisk, a deep-rooted noxious shrub, often is present within the apron near the southeast corner of the cell where standing water has been observed in the past. No tamarisk shrubs were observed within the site boundary during the 2008 inspection, and standing water was not present.

Graded and Revegetated Site Area—In general, site vegetation was healthy. Some areas are windswept and have little growth; however, most areas had excellent coverage. The site is unfenced and open to grazing by cattle. Grazing on the site has not been a problem.

Rills and gullies within the DOE property north and east of the disposal cell have been monitored for several years. These erosional features, which appear to be stabilizing, do not present a threat to the performance or integrity of the disposal cell. The features are sufficient distances from the disposal cell, with headward erosion occurring away from the cell and no significant sedimentation.

The access road and a power line cross the site near and parallel to the southern boundary of the site. In addition, there is a gas pipeline riser in the southeastern part of the site. This riser is associated with a buried gas pipeline along the south edge of the site. No changes or disturbances associated with these features were observed.

Outlying Area—The area within 0.25 mile of the site boundary was inspected and, except for the realigned access road, was unchanged. There was no activity identified that would impact the site.

1.3.2 Follow-Up or Contingency Inspections

DOE will conduct follow-up inspections if (1) a condition is identified during the annual inspection or other site visit that requires a return to the site to evaluate the condition, or (2) DOE is notified by a citizen or outside agency that conditions at the site are substantially changed.

No follow-up or contingency inspections were required in 2008.

1.3.3 Routine Maintenance and Repairs

No maintenance or repairs were necessary in 2008.

1.3.4 Groundwater Monitoring

In accordance with the LTSP, groundwater monitoring is not required at this site because (1) the groundwater is heavily contaminated from underground uranium mining and naturally occurring mineralization, and (2) the uppermost aquifer is of limited use due to its low yield. Consequently, NRC concurred in the application of supplemental standards at the site and the exemption of both compliance and performance groundwater monitoring. However, at the request of the New Mexico Environment Department, DOE conducts limited monitoring at two locations as a best management practice.

Monitor well MW-0675 is completed in Mancos Shale alluvium, and monitor well MW-0678 is completed in the uppermost sandstone unit of the Mancos Shale Formation. DOE will sample these locations once every third year for 30 years. The samples are analyzed for molybdenum, nitrate, selenium, sulfate, and uranium.

1B The latest sampling event occurred in November 2007. Analytical results from the post-closure sampling events are presented in Table 1-2. The results indicate apparent upward trends for selenium and nitrate in MW-0675 and sulfate in MW-0678. Downward trends for molybdenum and uranium in MW-0675, and selenium and molybdenum in MW-0678, appear to be occurring. DOE will monitor groundwater again in 2010.

Table 1-2. Analytical Results for Groundwater Sampling at the Ambrosia Lake Disposal Site

Well	Uranium (mg/L)	Molybdenum (mg/L)	Selenium (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)
December 7, 2001					
MW-0675	3.24	3.96	0.46	41.7	4,040
MW-0678	0.073	0.023	0.169	479	7,340
September 21, 2004					
MW-0675	1.1	0.60	0.66	50	3,200
MW-0678	0.057	0.012	0.23	520	6,800
November 7, 2007					
MW-0675	0.27	0.12	0.86	66	3,200
MW-0678	0.053	0.0057	0.12	390	8,200

Key: mg/L = milligrams per liter

1.3.5 Settlement Plate Monitoring

The main tailings pile at the Ambrosia Lake Disposal Site was stabilized in place. Relocated contaminated materials (soil and debris) were placed on top of the tailings and covered with a radon/infiltration barrier. The top slopes and side slopes of the disposal cell were armored with rock to prevent wind and water erosion of the underlying radon/infiltration barrier and tailings. The stabilized disposal cell was constructed above the ground surface.

The tailings and contaminated materials were compacted before the radon barrier was placed; however, further consolidation was expected. Therefore, eight settlement plates (referred to as *displacement monuments* in the LTSP) were installed on the top of the disposal cell to monitor the anticipated consolidation of the tailings embankment during placement of contaminated materials and the disposal cell cover. The settlement plates were installed on various layers within the cell. The LTSP does not require that the settlement plates be monitored during routine annual inspections, but the settlement plates may be used to measure significant long-term settlement of the disposal cell.

A shallow depression around settlement plate SP-4, near the northeast corner of the disposal cell cover, was first noted during the 1997 inspection and continued to grow in depth and area in subsequent years. The depression was repaired in August 2005. Surveys of the eight settlement plates were conducted in September 2005, September 2006, and September 2007 to monitor for continued settlement at SP-4. The surveys indicated no significant changes at the repaired location. Although apparently slight settlement was observed in 2008, additional surveys will be conducted only if significant settlement is observed.

1.3.6 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 2008.

1.3.7 Photographs

Table 1-3. Photographs Taken at the Ambrosia Lake Disposal Site

Photograph Location Number	Azimuth	Description
PL-1	40	Site marker SMK-1.
PL-2	225	View southwest from combined survey/boundary monument BM-3.
PL-3	225	Concrete-filled vent shaft cover.
PL-4	205	Repaired surface at settlement plate SP-4.
PL-5	90	View east along the south side slope and apron.



AMB 8/2008. PL-1. Site marker SMK-1.



AMB 8/2008. PL-2. View southwest from combined survey/boundary monument BM-3.



AMB 8/2008. PL-3. Concrete-filled vent shaft cover.



AMB 8/2008. PL-4. Repaired surface at settlement plate SP-4.



AMB 8/2008. PL-5. View east along the south side slope and apron.