

4.0 Durango, Colorado, Disposal Site

4.1 Compliance Summary

The Durango Disposal Site was inspected on June 8, 2004, and was in good condition. A missing perimeter sign was replaced, and a couple of other perimeter signs had new bullet holes. Vegetation on top of the cell, consisting primarily of seeded grass species, was healthy. Scattered woody vegetation (trees and shrubs) continues to encroach on the side slopes and plants greater than 3 feet tall were removed. Infestations of noxious weeds at the site continue to be monitored and controlled with herbicide. No requirement for a follow-up or contingency inspection was identified.

Construction of a new reservoir is occurring south and west of the disposal site. Heavy construction traffic is present on the county road that crosses the southwest corner of the site. A boundary monument was destroyed during pipeline construction activities adjacent to the site. The monument will not be replaced because two witness monuments at that property corner are intact. Recreational use of the area is expected to increase substantially upon completion of the reservoir project, and evidence of trespassing and vandalism will continue to be monitored.

4.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Durango, Colorado, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I disposal site are specified in the *Long-Term Surveillance Plan [LTSP] for the Bodo Canyon Disposal Site, Durango, Colorado* (DOE/AL/62350-77, Rev. 2, U.S. Department of Energy [DOE], Albuquerque Operations Office, September 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 4-1.

Table 4-1. License Requirements for the Durango, Colorado, Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 6.0	Section 4.3.1
Follow-up or Contingency Inspections	Section 7.0	Section 4.3.2
Routine Maintenance and Repairs	Section 8.0	Section 4.3.3
Ground Water Monitoring	Section 5.0	Section 4.3.4
Corrective Action	Section 5.0	Section 4.3.5

4.3 Compliance Review

4.3.1 Annual Inspection and Report

The site, located southwest of Durango, Colorado, was inspected on June 8, 2004. Results of the inspection are described below. Features and photograph locations (PLs) discussed in this report are shown on Figure 4-1. Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

4.3.1.1 Specific Site Surveillance Features

Access Road, Entrance Gates, Entrance Sign, and Perimeter Signs—The site is accessed by La Plata County Road 212, which is a dedicated public right-of-way that crosses the southwest corner of DOE property. The new entrance gate and guardrails along the county road, installed in October 2000, and the original entrance gate closer to the cell were in good condition.

- 4A Perimeter sign P1 near the site entrance was missing and was replaced. Numerous perimeter signs have bullet holes but all remain legible; three signs along the north property boundary had new bullet damage.

Trespass and vandalism have been difficult to control at the site. Although DOE has implemented various engineered, institutional, and administrative controls at this site, including increased patrols by County Sheriff officers, vandalism continues to be an ongoing concern and maintenance issue. Impacts resulting from the construction of the nearby Animas-La Plata Project and increased recreational use in the area will be monitored.

Site Markers, Survey and Boundary Monuments—Site markers and survey monuments were in good to excellent condition. The site marker near the entrance gate (SMK-1) has been slightly damaged by bullets; however, it was legible and in generally good condition. Boundary monument BM-6, located at the southwest corner of the site, was missing and presumably was destroyed during pipeline construction associated with the reservoir project (PL-1). The monument will not be replaced because two witness monuments at that property corner are intact. The remaining boundary monuments were intact and generally in good condition.

Monitor Wells—Monitor wells were locked and in excellent condition.

4.3.1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into six areas referred to as transects: (1) the top of the disposal cell; (2) the side slopes of the disposal cell; (3) the drainage ditches; (4) the treatment cells and holding pond; (5) the site boundary; and (6) the outlying area.

Top of Disposal Cell—The top of the disposal cell was in excellent condition. No evidence of settling, slumping, or erosion was observed.

Vegetation on top of the cell was in good condition (PL-2). The vegetation consisted of seeded grasses and several volunteer species including deep-rooted shrubs. No woody species of trees and shrubs were found on the cell top during the 2004 inspection; the LTSP requires removal of these plants from the disposal cell (top and side slopes) when they exceed 3.5 feet in height. Noxious weeds were found on the cell top and herbicide was applied during the spring, summer, and fall.

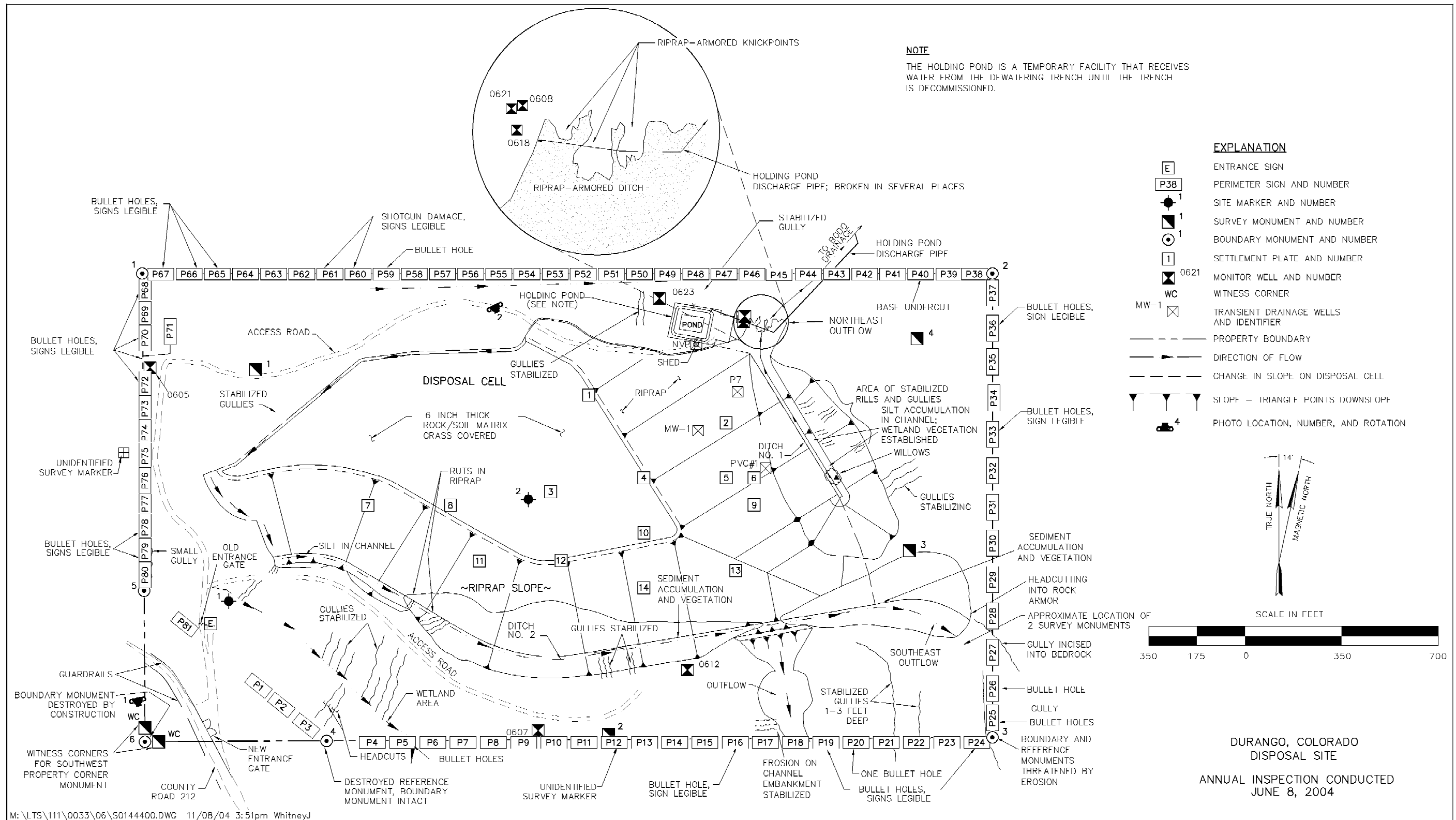


Figure 4-1. 2004 Annual Compliance Drawing for the Durango, Colorado, Disposal Site

Side Slopes of Disposal Cell—The riprap-covered side slopes of the disposal cell were in excellent condition. Disturbances resulting from natural processes, such as subsidence, rock deterioration, or slope failure, were not observed. Minor ruts in the southern side slope riprap cover were observed and most likely were caused by the herbicide applicator vehicle. Although not a problem at this time, this damage will be monitored as herbicide applications continue.

Vegetation continues to encroach on the side slopes of the cell. The species included deep-rooted shrubs and trees and several noxious weeds that require control by the state or La Plata County. The woody trees and shrubs greater than 3 feet tall were cut and herbicide was applied to their stalks. Herbicide was applied to the noxious weeds during the spring, summer, and fall.

Drainage Ditches—Rock-armored drainage ditches were constructed along the northwest, south, and east sides of the disposal cell. These ditches direct runoff into natural drainages that carry storm water away from the disposal site. Erosion and sedimentation has occurred at several places along these channels where the slopes above the ditches are steep. There was no evidence of recent slope erosion or accumulations of sloughed material into the drainage ditches in 2004.

Moist sediments support wetlands vegetation and willows at places in Ditch No. 1 along on the east side of the cell. The sediment deposits and plant growth will not compromise the performance of the drainage ditches in the event of a large storm. Should water be impounded in the ditches, it would drain away from the disposal cell along bedding planes and permeable zones in the bedrock. However, if there is evidence of water impoundment, maintenance will be conducted to restore flow out of the ditches.

The riprap-covered outflow of Ditch No. 1 was designed to erode back to a rock-filled trench and self-armor in the process. Significant movement of the knickpoint has not occurred since it was surveyed in 1999.

Infestations of noxious weeds in the drainage ditches and surrounding areas continue to be monitored and controlled. The weeds were treated with herbicide in the spring, summer, and fall 2004.

Treatment Cells and Holding Pond—Contaminated seeps developed along the downgradient slope of the disposal cell shortly after construction. Beginning in 1989, the seep water was intercepted by a collection drain and piped by gravity flow to a holding pond, where it was regularly treated with the application of lime and then discharged to a nearby wash. A permeable reactive barrier facility was constructed adjacent to the holding pond in 1995 and has been operating since 1996. The treatment cells of the barrier contain zero-valent iron to remove metals from transient drainage water after it exits the collection drain and before it enters the pond. The system is shut down and winterized each fall due to difficult access and to avoid freeze damage to the system's valves.

At the time of the inspection, the holding pond, permeable reactive barrier facility, and surrounding security fence were in good condition. The water level in the pond was very low and only a small quantity of water was draining into the pond. The holding pond discharge pipe is broken at several locations but does not require repair because no discharges are occurring or are expected to occur from the holding pond.

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The LTSP states that the collection drain may be closed after water draining from the cell reaches an equilibrium elevation of 7,055 feet above mean sea level. At the time the system was reopened in spring 2004, the phreatic surface elevation of the pore water within the cell had remained steady at 7,049 feet during the previous 6 months. DOE plans to follow the closure guidance in the LTSP by leaving the collection drain closed for the next 2 years and monitoring the phreatic surface of the cell water using dataloggers. If the water elevation rises above 7,055 feet during any 6-month period, the drain will be reopened. If the steady state water elevation remains below 7,055 feet after 2 years, DOE will prepare plans for decommissioning the collection drain system, the permeable reactive barrier facility, and the holding pond.

Site Boundary—The site is not fenced. Missing and damaged perimeter signs indicate continued trespassing and vandalism. However, the new entrance gate off of the county road has effectively prevented vehicular trespass and the associated damage that had occurred prior to installation of the gate.

Areas of rill and gully erosion on the south-facing slope along the southern boundary of the site were stable. Establishment of vegetation in these areas and exposure of resistant bedrock in the gully are effectively preventing further erosion. Evidence of active gully erosion was noted on a hill slope near the southwest corner of the site; however, this erosion and sedimentation will not impact the disposal cell or its drainage ditches. No other areas of recent erosion were observed on or around the site.

Significant infestations of noxious weeds are present in the areas between the cell and the property boundary. These areas were sprayed with herbicide during spring, summer, and fall applications.

Outlying Area—The area beyond the site boundary for a distance of 0.25 mile was visually inspected for signs of erosion, development, or other disturbance. The U.S. Bureau of Reclamation is constructing the Animas-La Plata Project. A water intake and pumping plant structure is being constructed at the Animas River on the site of the former raffinate ponds. The pipeline to the Ridges Basin Reservoir—currently under construction southwest of the disposal site—is adjacent to County Road 211 and passes just south of the cell. Pipelines that were within the footprint of the reservoir were rerouted parallel to County Road 212 on the west side of the disposal site. Recreational use of the area is expected to increase substantially upon completion of the reservoir project.

4.3.2 Follow-up or Contingency Inspections

No follow-up or contingency inspections were required in 2004.

4.3.3 Routine Maintenance and Repairs

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The missing perimeter sign was replaced. Woody species on the cell side slopes were cut and their stems were treated with herbicide. Noxious weeds identified at the site were treated with herbicide during spring, summer, and fall applications.

4.3.4 Ground Water Monitoring

Ground water is monitored at the Durango site to verify the initial performance of the disposal cell. The monitoring network consists of six wells. Four wells are completed in the uppermost aquifer (bedrock of the Cliff House Sandstone and the Menefee Formation), including one upgradient well (MW-0605) and three downgradient point of compliance wells (MW-0607, MW-0612, and MW-0621). Two wells are completed in the alluvium upgradient (MW-0623) and downgradient (MW-0608) from the disposal cell. Monitor well MW-0618 (screened to the bottom of the alluvial aquifer) near companion well MW-0608 (screened to 10 feet above the base of the alluvial aquifer) was added to the monitoring network in 2002 because it intercepts the full section of the alluvial aquifer.

Ground water samples are collected annually and analyzed for three indicator parameters: molybdenum, selenium, and uranium. The standards for the three indicator parameters are the respective maximum concentration limits (MCL) established by the U.S. Environmental Protection Agency in Table 1 to Subpart A of 40 CFR 192. The MCLs are 0.1 milligrams per liter (mg/L) for molybdenum, 0.01 mg/L for selenium, and 0.044 mg/L for uranium.

4D With the exception of the uranium concentration in MW-0618, the results of monitoring in 2004 were consistent with previous years. Concentrations of all three indicator analytes were below their respective MCLs, and most results were less than detection limits or minimum detectable activity. Time versus concentration plots for selenium and uranium are included as Figures 4-2 and 4-3. Concentrations of molybdenum were less than 0.001 mg/L.

The uranium concentration in monitor well MW-0618 increased substantially in 2004, the second annual sampling event for that well. The concentration in 2004 was 0.043 mg/L, which is just below its MCL. DOE is in the process of evaluating the cause of increasing uranium concentrations in this well. Monitoring frequency has been increased for MW-0618 to determine if there are any trends in uranium concentration in the well that can be correlated with closure of the collection drain system.

4.3.5 Corrective Action

Corrective action is action 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 2004.

4.3.6 Photographs

Table 4-2. Photographs Taken at the Durango, Colorado, Disposal Site

Photograph Location Number	Azimuth	Description
PL-1	170	Inspector marks the location of missing boundary monument BM-6; the north witness corner is in the foreground.
PL-2	155	Healthy vegetation on the disposal cell top.

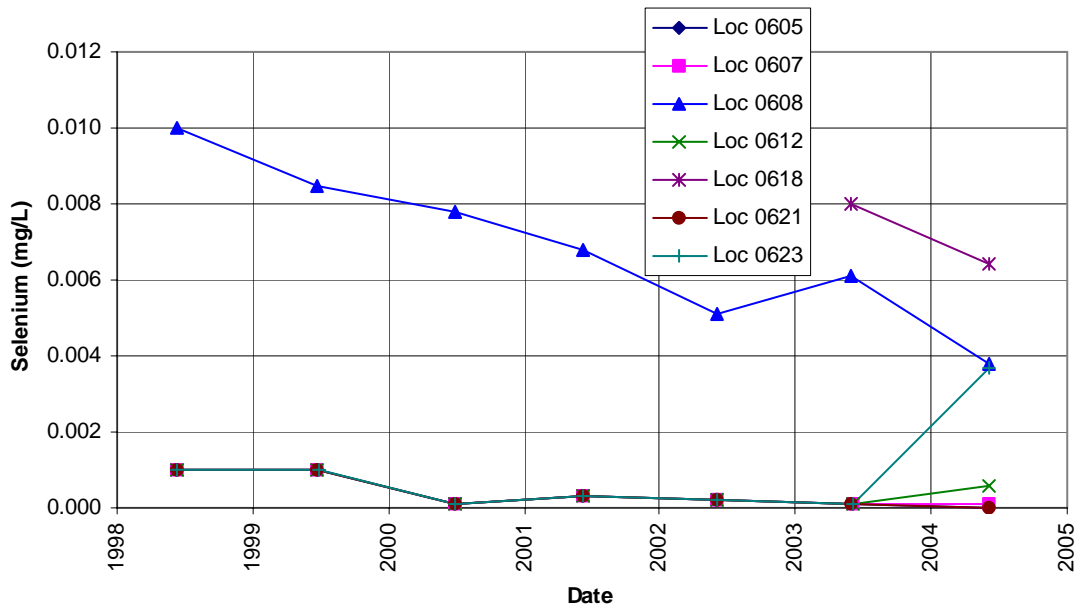


Figure 4-2. Time-Concentration Plots of Selenium in Ground Water at the Durango, Colorado, Disposal Site

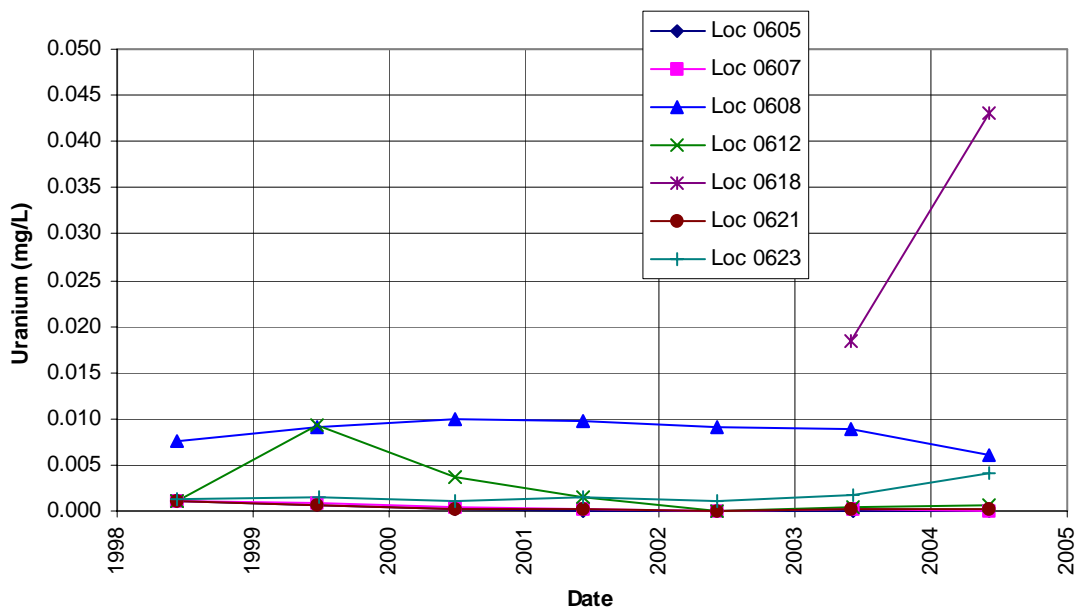


Figure 4-3. Time-Concentration Plots of Uranium in Ground Water at the Durango, Colorado, Disposal Site



DUR 6/2004. PL-1. Inspector marks the location of missing boundary monument BM-6; the north witness corner is in the foreground.



DUR 6/2004. PL-2. Healthy vegetation on the disposal cell top.

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