

12.0 Mexican Hat, Utah, Disposal Site

12.1 Compliance Summary

The Mexican Hat Disposal Site, inspected on September 11, 2003, was in excellent condition. Damages caused by storm runoff prior to the 2002 inspection have been repaired. Another severe storm event occurred two days before the 2003 inspection; however, no site features were damaged by the runoff. No maintenance tasks or cause for a follow-up or contingency inspection were identified.

12.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Mexican Hat, Utah, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I disposal site are specified in the *Long-Term Surveillance Plan for the Mexican Hat Disposal Site, Mexican Hat, Utah* (DOE/AL/62350–207, Rev. 2, U.S. Department of Energy [DOE], Albuquerque Operations Office, June 1997) and in procedures established by the DOE office at Grand Junction to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). These requirements are listed in Table 12–1.

Table 12–1. License Requirements for the Mexican Hat, Utah, Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 3.1	Section 12.3.1
Follow-up or Contingency Inspections	Section 3.4	Section 12.3.2
Routine Maintenance and Repairs	Section 5.0	Section 12.3.3
Ground Water Monitoring	Section 4.3	Section 12.3.4
Corrective Action	Section 6.0	Section 12.3.5

12.3 Compliance Review

12.3.1 Annual Inspection and Report

The site, located south of Mexican Hat, Utah, was inspected on September 11, 2003. Results of the inspection are described below. Features and photograph locations (PLs) mentioned in this report are shown on Figure 12–1. Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

12.3.1.1 Specific Site Surveillance Features

Access, Fence, Gate, and Signs—The site is accessed via a short unmarked dirt road off of U.S. Highway 163 that ends at a graded parking area. Vehicular access from the parking area to the entrance gate is restricted by an eroded channel. DOE secured perpetual access to the site through a Custody and Access Agreement with the Navajo Nation.

A high-quality barbed-wire fence with a chain link entrance gate surrounds the site. Both the gate and the fence were in excellent condition. The entrance sign is located at the gate and was in excellent condition.

12A There are 43 perimeter sign locations and each location has a pair of signs: an upper property ownership sign and a lower radioactive materials disposal site warning sign. The lower sign was missing at locations P41 and P42 but the signs were found nearby and replaced. Some perimeter signs have bullet holes but all signs are legible. Perimeter sign P4, noted as unstable during the 2002 inspection, had been stabilized and was in good condition.

Site Markers and Monuments—The two site markers, four survey monuments, and 12 boundary monuments were inspected and found to be in good condition.

12B Rock was placed around boundary monument BM-11 and grading was performed to divert runoff around the monument to protect it from damage by erosion.

Monitor Wells—Sampling of monitor wells is not required by the Long-Term Surveillance Plan.

12.3.1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into four areas referred to as transects: (1) the riprap-covered disposal cell top slope; (2) the riprap-covered side slopes and diversion ditches; (3) the area between the disposal cell and the site boundary; and (4) the outlying area.

Top of Disposal Cell—The top of the riprap-armored disposal cell was in excellent condition. There was no evidence of differential settling, cracking, burrowing, or other modifying process that could affect the integrity of the cell.

Side Slopes and Diversion Ditches—Inspectors saw no evidence of differential settling, slumping, or other evidence of instability on the side slopes of the disposal cell.

The sloughing of red country rock and soil along the south apron did not increase significantly during the past year; the accumulation remains approximately 18- to 24-inches high against the base of the adjacent hill slope (PL-1). As in previous years, inspectors did not find evidence of channel erosion in this area, and the sloughed material does not appear to have filled the void spaces in the riprap beyond the toe of the hill slope. A photograph will be taken for the record annually until conditions stabilize.

12C Substantial erosional damage to the upper section of the West Ditch caused by a severe storm in 2002 was repaired following a geotechnical evaluation of the damage. Another severe storm totaling 1.25 inches of rainfall in the town of Mexican Hat occurred on September 9, 2003. The repaired washout area of the West Ditch was intact (PL-2), and no evidence of erosion, settling, or slumping was observed on the side slopes or in the diversion ditches. Some sediment and weeds were present in the lower end of West Ditch but do not affect the performance of the diversion ditch.

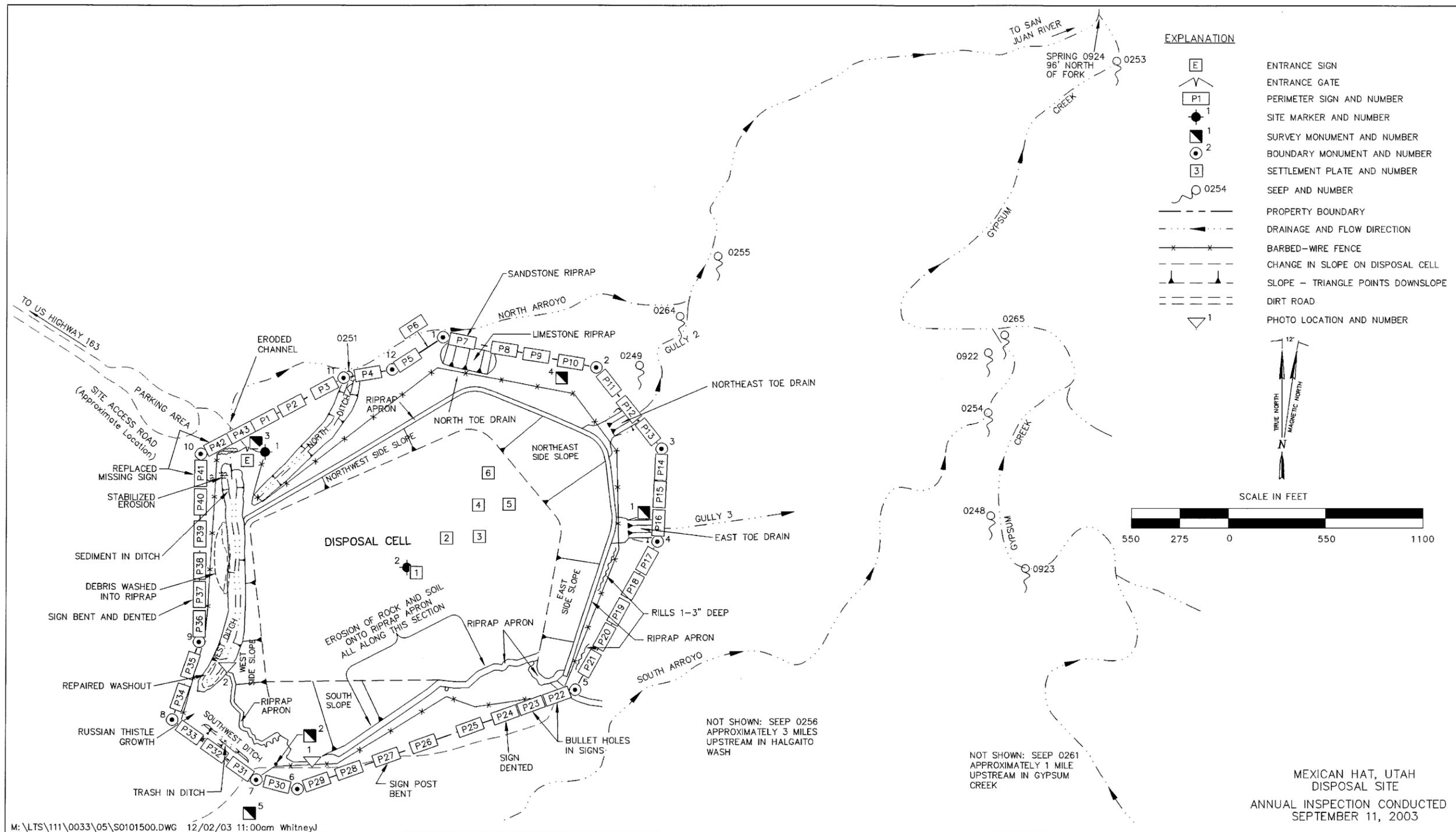


Figure 12-1. 2003 Annual Compliance Drawing for the Mexican Hat, Utah, Disposal Site

Area Between the Disposal Cell and the Site Boundary—Minor rills were present upstream of West Ditch and along the east side slope. Trash (primarily cans and bottles) had washed onto the site in the vicinity of West Ditch. Hill slopes around the disposal cell remain stable with only minor accumulations of loose material at the toe of the slopes.

Tumbleweed accumulation along the perimeter fence was insignificant. The only evidence of trespassing was the previously noted removal of perimeter signs.

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. Nothing appeared to have changed except for evidence of storm runoff in the arroyos such as debris and localized sediment erosion and deposition.

12.3.2 Follow-Up or Contingency Inspections

No follow-up or contingency inspections were required in 2003.

12.3.3 Routine Maintenance and Repairs

All damages resulting from the 2002 storm were repaired prior to the 2003 inspection. Two missing perimeter signs were replaced during the 2003 inspection.

12.3.4 Ground Water Monitoring

Ground water in the uppermost aquifer is not affected by the disposal cell or by historical processing activities because of an effective aquitard and an upward hydraulic gradient. Both of these characteristics prevent downward migration of water into the aquifer; therefore, monitoring of this aquifer is not required by the Long-Term Surveillance Plan.

12D Shallow ground water recharged by local precipitation is perched on top of the aquitard and emerges as seeps at several locations. Seep volume is low and does not constitute a water resource. The Long-Term Surveillance Plan requires annual monitoring of six seeps to assess disposal cell performance (seeps 0251 and 0264 along North Arroyo, and seeps 0248, 0254, 0261, and 0922 along Gypsum Creek). DOE monitored additional seeps on a quarterly basis since 1998 at the request of the Navajo Nation. Based on the seep assessment report sent to the Navajo Nation in April 2002, quarterly sampling was discontinued because there is no human health or ecological risk associated with exposure to the seep water. DOE sampled the six seeps in February 2003.

Sample results for three target analytes—nitrate, sulfate, and uranium—are shown on Figures 12–2 through 12–4. Maximum concentration limits of 44 milligrams per liter (mg/L) for nitrate (as NO₃) and 0.044 mg/L for uranium are established by the U.S. Environmental Protection Agency in Table 1 to Subpart A of 40 CFR 192.

Concentrations of nitrate have been variable in the two North Arroyo seeps for the past several years and have declined substantially from greater than 2,000 mg/L to less than 500 mg/L in the past 3 years (Figure 12–2). Nitrate concentrations have remained relatively stable in the Gypsum Creek seeps for the past 5 years ranging from 150 to 400 mg/L. Concentrations in the background seep remain below 1 mg/L.

Sulfate concentrations similarly have decreased in the two North Arroyo seeps from greater than 6,000 mg/L to less than 4,000 mg/L since early 2000 (Figure 12–3). Concentrations in the Gypsum Creek seeps and the background seep have remained relatively steady between 3,000 and 4,000 mg/L during this time.

Concentrations of uranium in the North Arroyo seeps have decreased from greater than 2.0 mg/L to less than 1.0 mg/L since November 1999 (Figure 12–4). Concentrations remain relatively constant in the Gypsum Creek seeps at approximately 0.5 mg/L. Background levels at seep 0261 averaged 0.024 mg/L for the past several years.

Results of monitoring in 2003 show that concentrations of all target constituents are generally decreasing in the North Arroyo seeps and remaining relatively stable in the Gypsum Creek seeps. No trends of increase in concentrations are evident that would suggest degradation of the disposal cell cover.

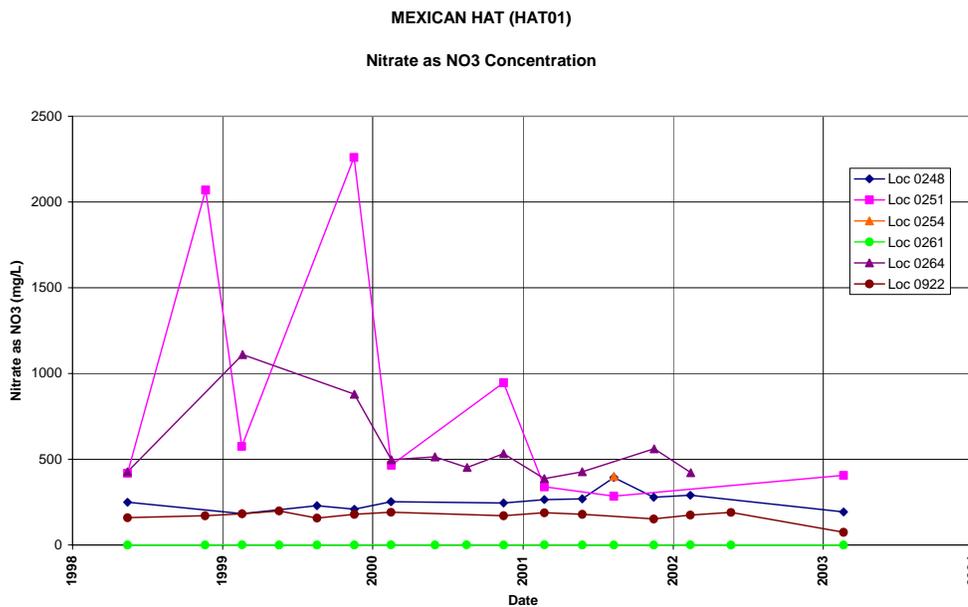


Figure 12–2. Time-Concentration Plots of Nitrate (as NO₃) in Seep Water at the Mexican Hat, Utah, Disposal Site

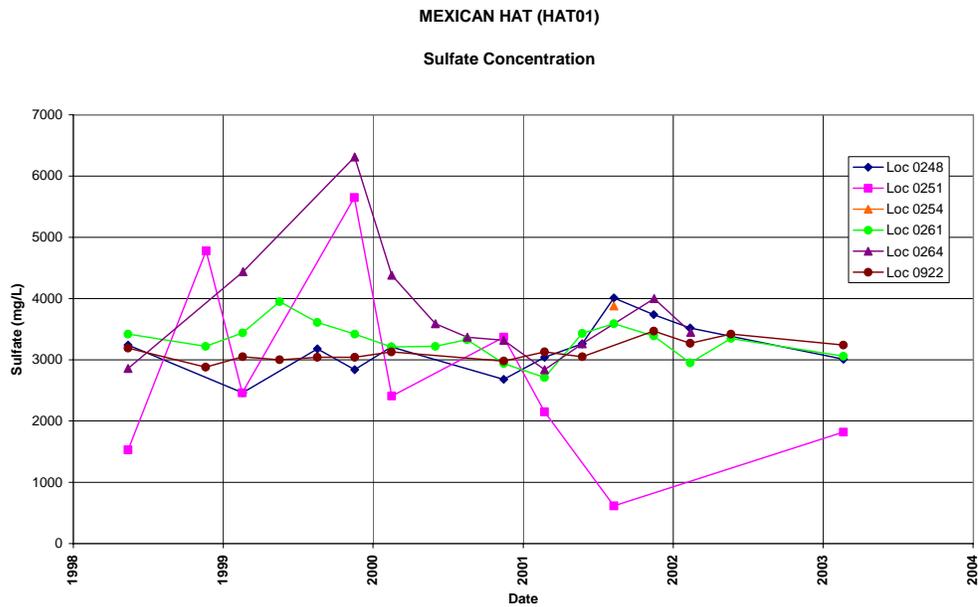


Figure 12–3. Time-Concentration Plots of Sulfate in Seep Water at the Mexican Hat, Utah, Disposal Site

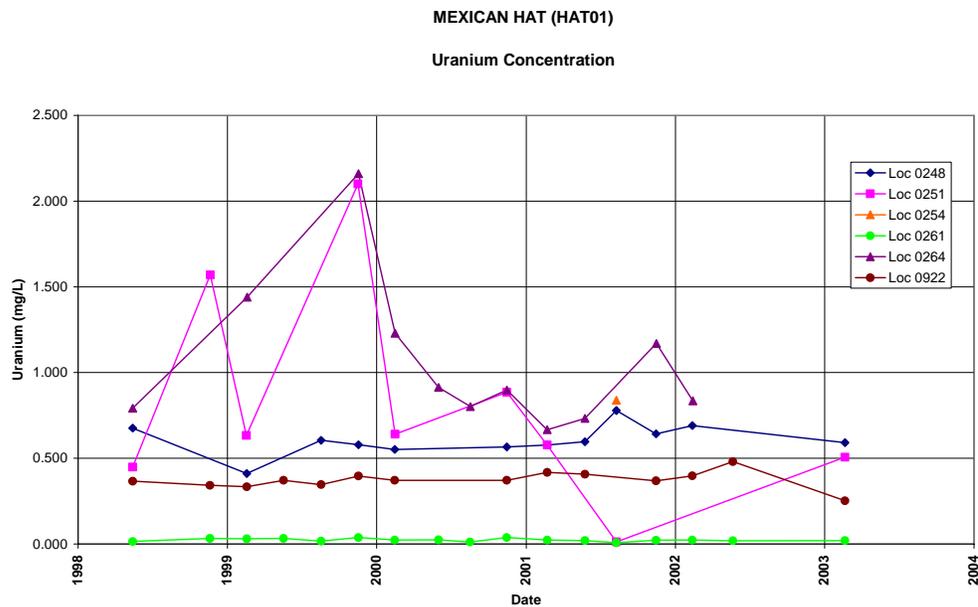


Figure 12–4. Time-Concentration Plots of Uranium in Seep Water at the Mexican Hat, Utah, Disposal Site

12.3.5 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 2003.

12.3.6 Photographs

Table 12-2. Photographs Taken at the Mexican Hat, Utah, Disposal Site

Photograph Location Number	Azimuth	Description
PL-1	60	Baseline location photograph of sloughing hill slope materials along the south apron.
PL-2	240	Repaired washout area at the head of West Ditch.



HAT 9/2003. PL-1. Baseline location photograph of sloughing hill slope materials along the south apron.



HAT 9/2003. PL-2. Repaired washout area at the head of West Ditch.

End of current section