5.0 Falls City, Texas, Disposal Site

5.1 Compliance Summary

The Falls City Disposal Site, inspected on January 14, 2004, was in good condition. Maintenance items included continued grass management, and control of small trees and shrubs growing in the riprap on the side slopes. Results of ground water monitoring were consistent with results from previous years and indicate essentially steady-state conditions. No cause for a follow-up or contingency inspection was identified.

5.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Falls City, Texas, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I disposal site are specified in the *Long-Term Surveillance Plan* [LTSP] *for the Falls City, Texas, Disposal Site* (DOE/AL/62350–187, Rev. 3, U.S. Department of Energy [DOE], Albuquerque Operations Office, July 1997) 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 5–1. Additional ground water monitoring began in accordance with the Ground Water Compliance Action Plan (GCAP), which was submitted to the U.S. Nuclear Regulatory Commission (NRC) on March 19, 1998 and received concurrence on September 18, 1998.

Table 5–1. License Requirements for the Falls City, Texas, Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Sections 6.0 and 10.0	Section 5.3.1
Follow-up or Contingency Inspections	Section 7.0	Section 5.3.2
Routine Maintenance and Repairs	Section 8.0	Section 5.3.3
Ground Water Monitoring	Section 5.0 and the GCAP	Section 5.3.4
Corrective Action	Sections 5.0 and 9.0	Section 5.3.5

5.3 Compliance Review

5.3.1 Annual Inspection and Report

The site, located east of Falls City, Texas, was inspected on January 14, 2004. Results of the inspection are described below. Features and photograph locations (PLs) mentioned in this report are shown on Figure 5–1. Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

5.3.1.1 Specific Site Surveillance Features

Access Road, Entrance Gate, Fence, and Signs—Access to the site is through a vehicle gate directly off of a public right-of-way (Farm-to-Market Road 1344). The main entrance gate and another vehicle gate on the same side of the property were locked and in excellent condition. A barbed-wire fence, set on the property boundary, was in generally good condition. It leans outward above a steep bank along the northwest boundary, but is stable in this position and is

sufficient to keep cattle and casual intruders out (PL–1). The fence predates cell construction and requires occasional repairs of broken strands, and eventually will need to be replaced.

The entrance sign, located at the main entrance gate, was in excellent condition. There are 64 perimeter signs along the site boundary, and all signs were present and in good condition.

Site Markers and Monuments—The two site markers, three survey monuments, and two boundary monuments were undisturbed and in excellent condition.

Monitor Wells—Wells in the monitoring network were inspected and sampled during April and November 2004, at which times all sampled wells were secure and in excellent condition.

5.3.1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into three areas referred to as transects: (1) the top and side slopes of the disposal cell; (2) the site perimeter; and (3) the outlying area.

Top and Side Slopes of the Disposal Cell—The top of the disposal cell is covered with well-established coastal Bermuda grass and was in good condition. The grass is cut and baled by a local hay farmer, and numerous bales were on top of the cell at the time of the inspection. Grass cutting appears to be an effective control for keeping trees and woody shrubs from establishing on the cell top.

5A

The grass had not been cut since the previous inspection and some trees and woody shrubs had begun to appear on the cell top. The cell top vegetation was cut during summer 2004 and the bales were removed by the farmer. Some woody species were present along the edge of the cell top (transition zone) where the grass is not cut because of close proximity to the side-slope riprap. The shrubs were cut down and herbicide was applied to their stems.

The side slopes are covered with riprap and were in good condition. As noted during previous inspections, small amounts of fractured riprap were observed along the side slopes. The fractured riprap apparently is an artifact of quarrying and placement of the rock and does not appear to be degrading. However, DOE continues to visually monitor the riprap for indications of rock degradation.

Trees and woody shrubs, including deep-rooted greasewood, tend to establish on the side slopes and require periodic removal. Patches of these plants were present at the time of the inspection with some plants measuring 7 feet tall (PL–2). The trees and shrubs were cut down and herbicide was applied to their stems.

Site Perimeter—The area between the fence and the toe of the disposal cell is covered with well-established grass, primarily Kleingrass with some coastal Bermuda grass. Grass is managed by cutting and baling, which also is an effective control against the growth of trees or other woody plants. Grass is left uncut along the fence, along rock drains, and around the site markers.

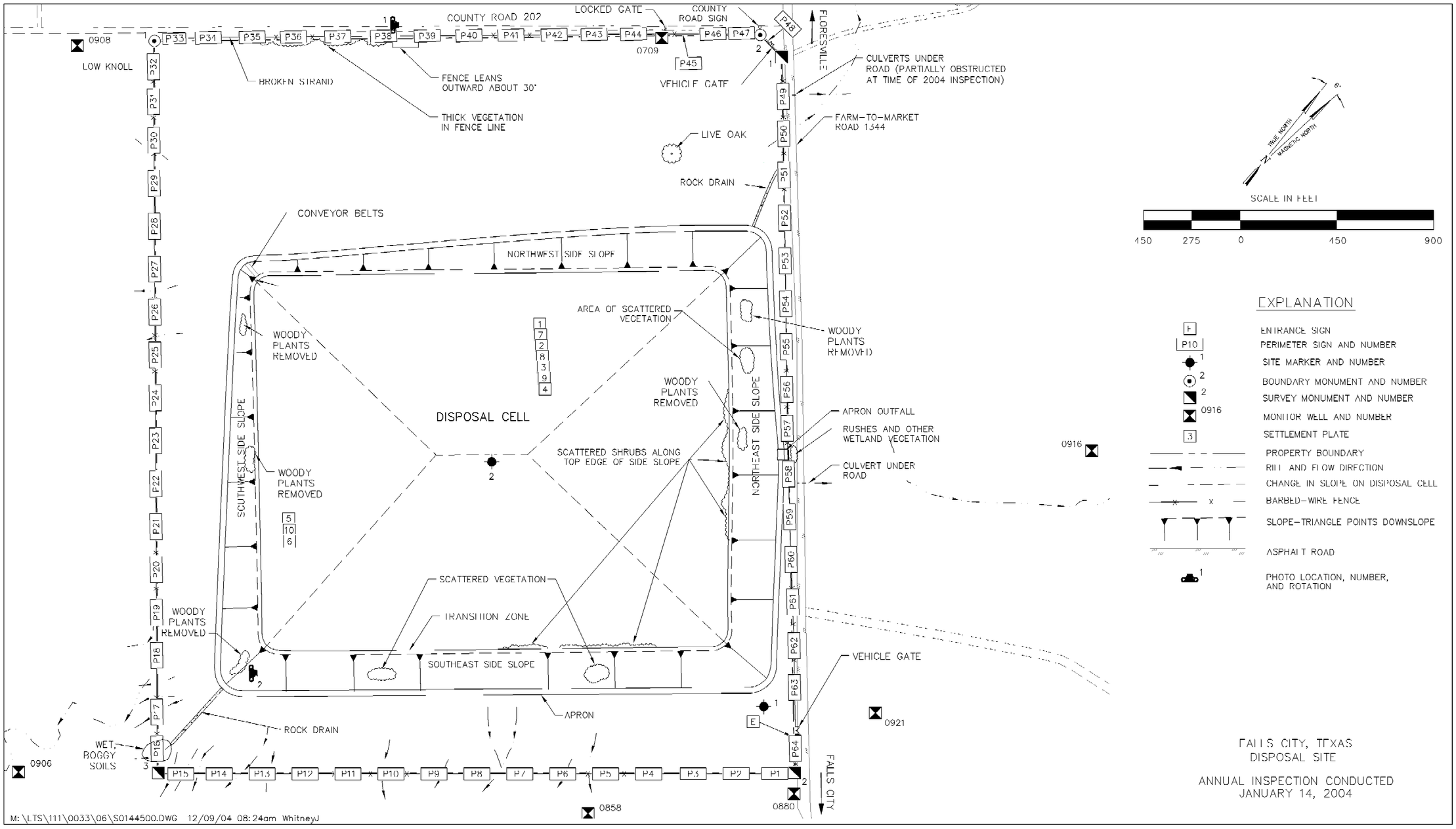

Figure 5–1. 2004 Annual Compliance Drawing for the Falls City, Texas, Disposal Site

No water was observed flowing in either the north or the south rock drains. Although no flow was observed at the time of the inspection, water had recently drained from the south rock drain, as indicated by saturated soils at the drain outfall. Grass growing in both drains has not historically impeded the flow of water draining from the cell. The apron outfall, midway along the northeast side slope, is not yet affected by grass encroachment. Grass in the rock drains may actually assist in dissipating the energy of site runoff, and may, therefore, be a desirable feature.

One of the three large culverts that extend beneath the Farm-to-Market Road 1344 near perimeter sign P49 was partially obstructed with sediment and weed accumulation. Although there is no evidence that runoff water has been blocked or obstructed in the past, this location will continue to be monitored and appropriate maintenance actions will be conducted as necessary to prevent runoff water from backing up and flooding within the site boundary.

Outlying Area—The area outward for a distance of 0.25 mile from the site boundary was visually inspected. No development or disturbance that could affect the site was evident. State-owned land east of the disposal site has been placed on the market for sale. Observers from the Texas Department of Health verified that the property had not yet sold. Potential land use changes by future owners will be monitored.

5.3.2 Follow-Up or Contingency Inspections

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

5.3.3 Routine Maintenance and Repairs

In 2004, DOE continued grass cutting and bailing on the cell top and between the cell and the site perimeter, and control of trees and woody shrubs growing in the riprap on the side slopes.

5.3.4 Ground Water Monitoring

DOE monitors ground water at the Falls City site as a best management practice to: (1) demonstrate the initial performance of the disposal cell, and (2) ensure that potential users of
5B ground water downgradient from the site are not exposed to processing-related contamination. Ground water samples are collected from the Conquista and Deweesville sandstone units (uppermost aquifer), and from the underlying Dilworth aquifer.

The disposal cell performance monitoring network consists of five monitor wells (MW−0709, MW−0858, MW−0880, MW−0906, and MW−0921) that are sampled semiannually as specified in the LTSP. Two additional cell performance wells (MW–0908 and MW–0916) were designated for water level measurements only. The ground water compliance monitoring network consists of five monitor wells (MW−0862, MW−0886, MW−0891, MW−0924, and MW−0963) that are sampled annually as specified in the GCAP. Ground water samples from the ten monitor wells are analyzed for 33 constituents, including ten which have maximum concentration limits specified in Table 1 to Subpart A of 40 CFR 192. The LTSP identifies pH levels in ground water as the indicator for disposal cell performance on the basis of tailings pore-fluid chemistry. It was anticipated that changes in pH could be used to predict changes in uranium concentrations. The monitor well network is shown on Figure 5–2.

Analytical results from 2004 are generally consistent with previous results and what would be expected of ground water conditions in a naturally mineralized area that has been impacted by uranium exploration and mining activities. Levels of pH have not varied significantly (Figures 5–3 and 5–4). Analyses of all pH and uranium sample results indicate that there is no statistical correlation between changes in pH and changes in uranium in any of the monitor wells.

Uranium concentrations in ground water in the vicinity of the disposal cell are consistent with the previous sampling event. The concentration in monitor well MW−0880 continues to be substantially greater than the other wells and continues to increase (Figure 5–5). The increase may be an indication of seepage from the disposal cell, as expected; there is no risk, however, because ground water is not used in the area. As shown on Figure 5–6, uranium in ground water in the compliance monitoring network has varied substantially in two wells (MW−0891 and MW−0924) since 1997 and exceeded the maximum concentration limit of 0.044 mg/L in four wells (MW–0886, MW−0891, MW−0924, and MW−0963). The increasing trend in uranium concentration in MW–0924 cannot be attributed to degradation of the cell because the wells between it and the cell continue to have low concentrations.

Monitoring for the designated suite of analytes in ground water does not appear to be an effective means to assess the initial performance of the disposal cell because the area is affected by widespread ambient contamination (naturally occurring uranium mineralization) and uranium exploration and mining activities. Ground water in the uppermost aquifer at the site is in contact with the naturally occurring uranium deposits and associated minerals, and water that might leach from the disposal cell, either through transient drainage or percolation of precipitation through the cover, will be chemically similar and perhaps indistinguishable from ambient and otherwise impacted conditions. DOE is evaluating the ground water monitoring program at the site to determine if protectiveness can be demonstrated with reduced monitoring requirements, such as sampling fewer wells, analyzing fewer constituents, and sampling the cell performance wells annually instead of every 6 months. If so, DOE will revise the LTSP for NRC concurrence. The revised plan would also recommend eliminating pH as an indicator for cell performance.

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Ground water levels in monitor wells near the disposal cell have declined by several feet since construction, but have been relatively constant for the last several years. Monitor wells MW–0908 and MW–0916, completed in the unsaturated zone of the Conquista Sandstone, have been dry at the time of sampling since 1996. The water level data indicate that the falling water table in the vicinity of the cell was related to dissipation of the processing site-related ground water mound beneath the disposal cell. Ground water levels at the compliance monitoring locations have remained relatively constant since monitoring began. Minor fluctuations in water level are likely caused by seasonal factors affecting recharge rates.

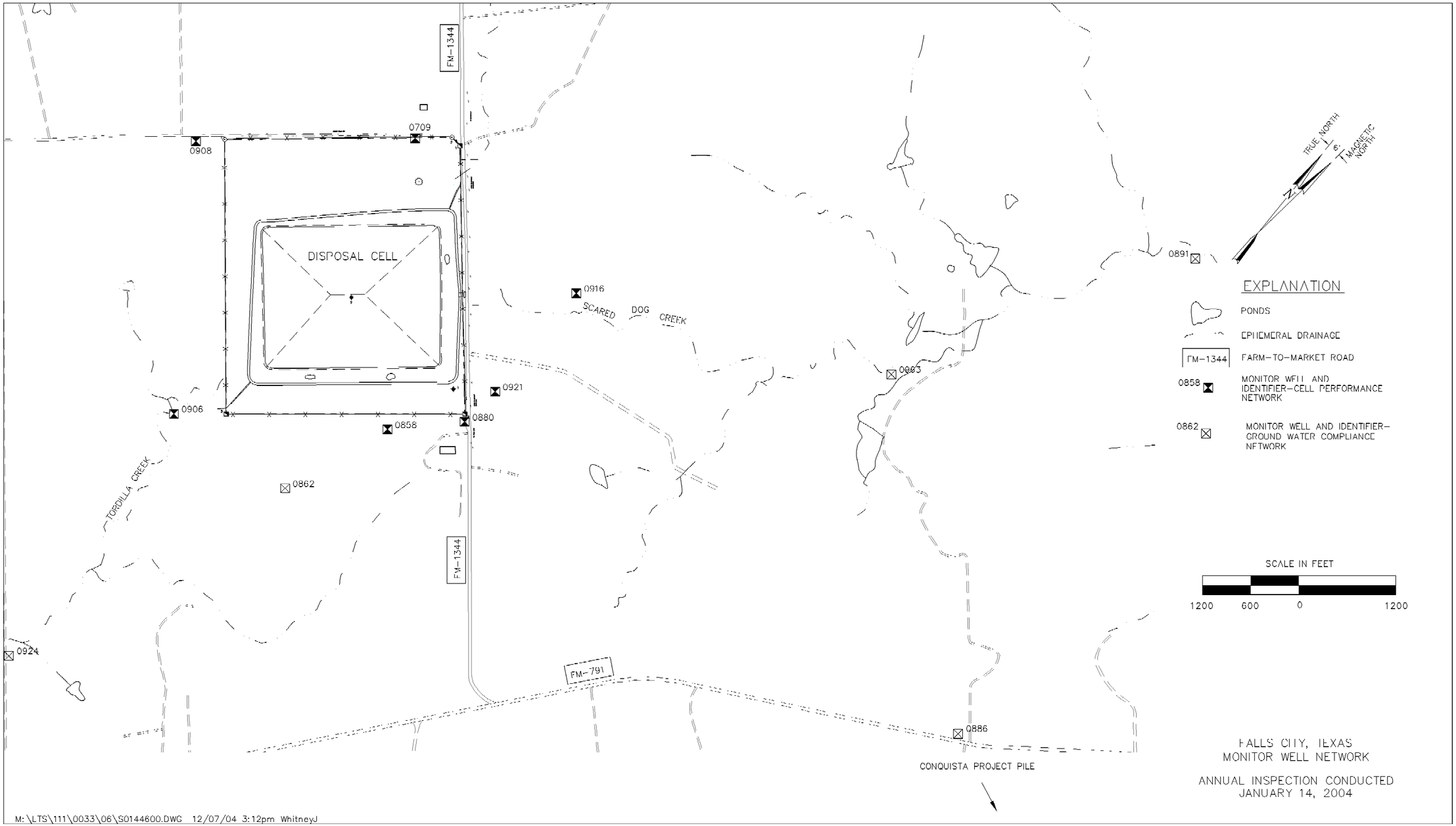

Figure 5–2. Monitor Well Network at the Falls City, Texas, Disposal Site

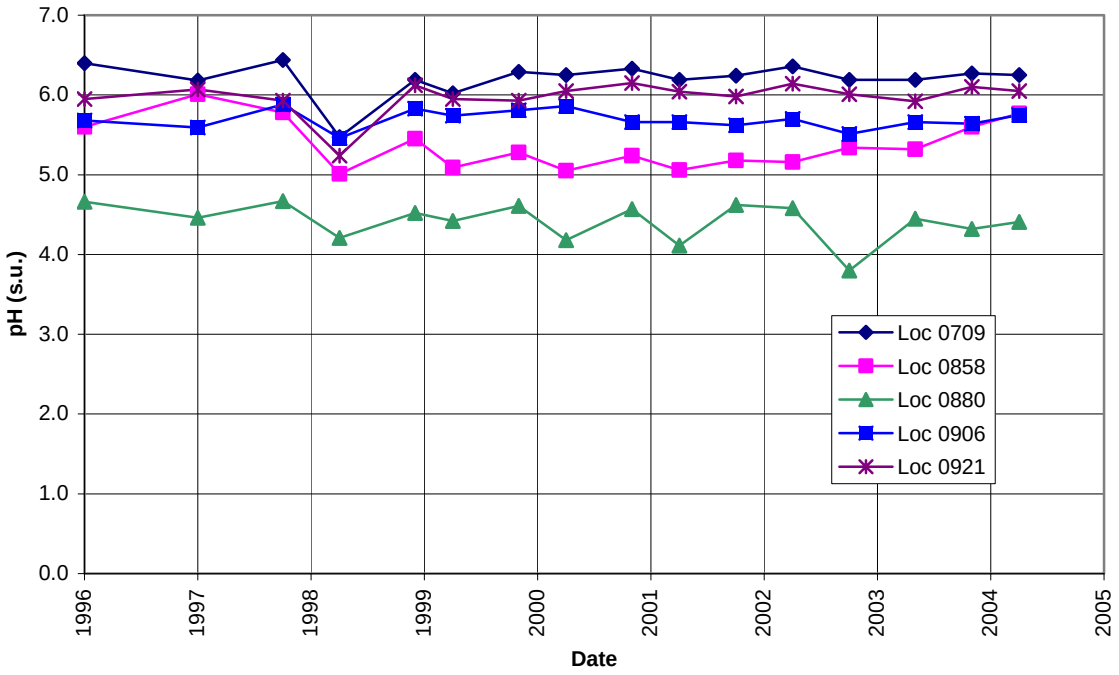

Figure 5−3. pH in Ground Water at Cell Performance Monitoring Locations at the Falls City, Texas, Disposal Site

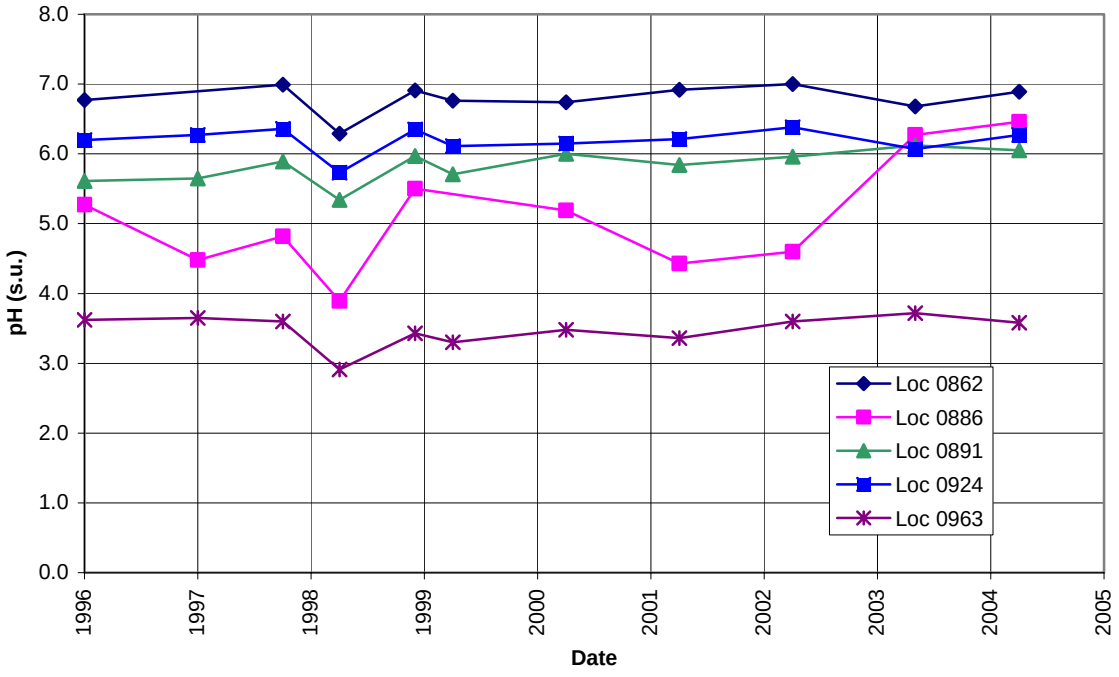

Figure 5−4. pH in Ground Water at Compliance Monitoring Locations at the Falls City, Texas, Disposal Site

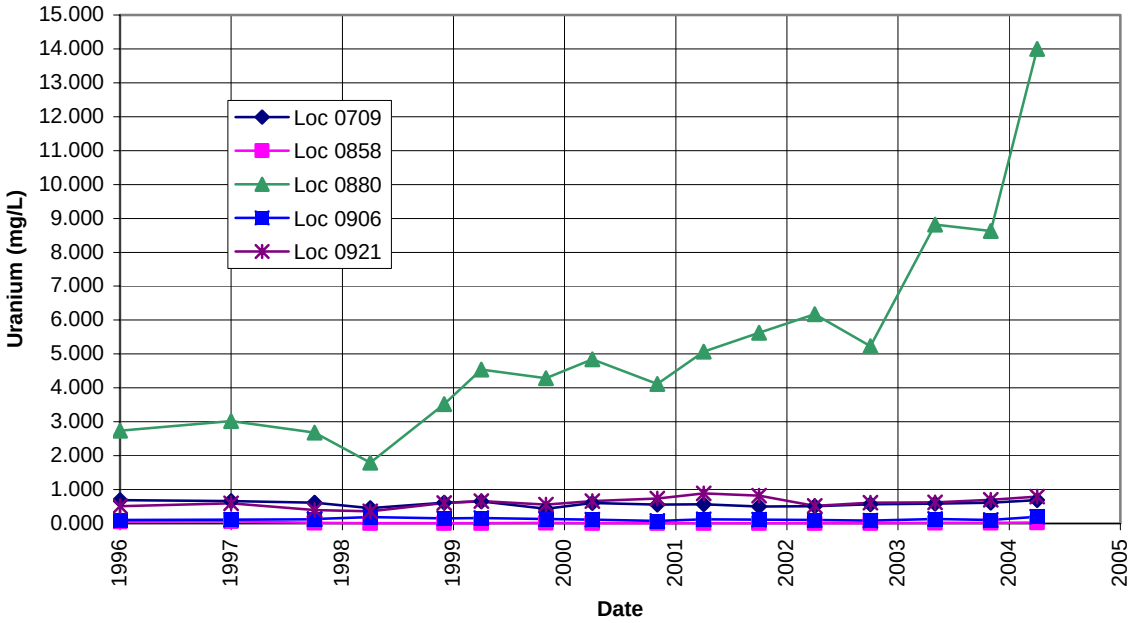

Figure 5−5. Uranium in Ground Water at Cell Performance Monitoring Locations at the Falls City, Texas, Disposal Site

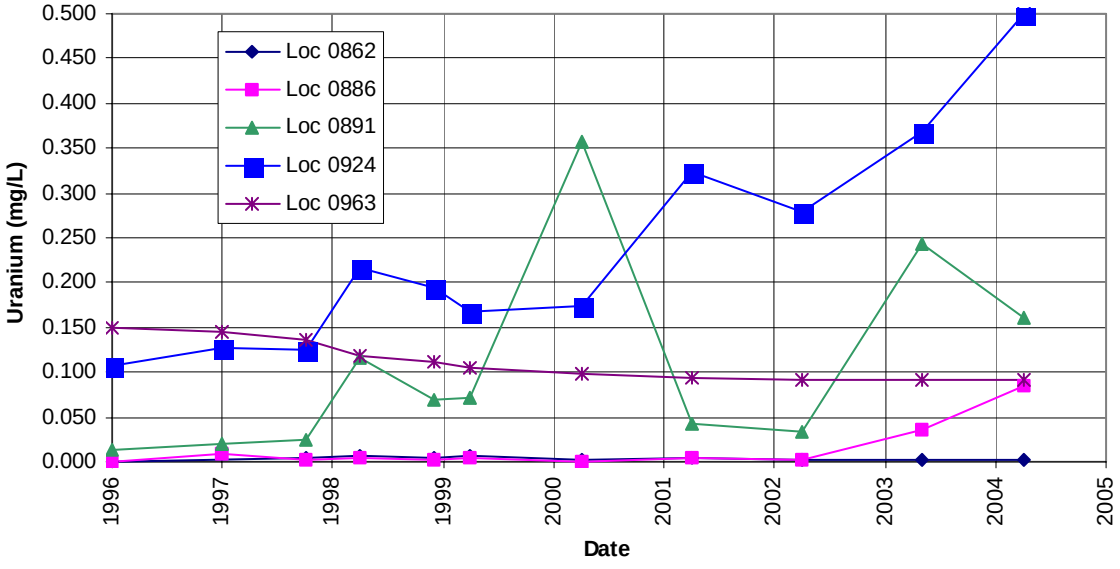

Figure 5−6. Uranium in Ground Water at Compliance Monitoring Locations at the Falls City, Texas, Disposal Site

5.3.5 Corrective Action

Corrective action addresses 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.

5.3.6 Photographs

Table 5–3. Photographs Taken at the Falls City, Texas, Disposal Site

Photograph Location Number	Azimuth	Description
PL−1	50	Section of perimeter fence leaning outward, located near perimeter sign P38 along County Road 202.
PL−2	50	Typical vegetation growth found on the side slopes of the disposal cell.

FCT 1/2004. PL–1. Section of perimeter fence leaning outward, located near perimeter sign P38 along County Road 202.

FCT 1/2004. PL–2. Typical vegetation growth found on the side slopes of the disposal cell.

End of current section