

1994 Annual Prelicensing Inspection of the Salt Lake City (South Clive), Utah, UMTRA Project Disposal Site

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Signature Page

The Salt Lake City (South Clive), Utah, UMTRA Project Disposal Site was inspected on April 14, 1994, in accordance with guidance and direction provided in *Guidance for Implementing the UMTRA Project Long-Term Surveillance Program* (DOE 1992a) and the *Surveillance and Maintenance Plan, South Clive Disposal Site, Utah* (DOE 1987). Contained in this report are the results of the inspection.

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(in pocket in back)

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1.0 Introduction

1.1 Purpose

This report presents the results of the U.S. Department of Energy's (DOE's) Uranium Mill Tailings Remedial Action (UMTRA) Project Office poststabilization Annual Prelicensing Inspection (API) of the Salt Lake City (South Clive), Utah, disposal site. The inspection was conducted on April 14, 1994, by C.S. Goodknight (Chief Inspector) and M.P. Plessinger (Assistant Inspector) of RUST Geotech Inc., operating contractor at the DOE Grand Junction Projects Office (GJPO). Inspectors' qualifications are summarized in Appendix A, "Résumés of Inspectors." S. J. Arp, Site Manager DOE UMTRA Project Office, and R. Carlson, U.S. Nuclear Regulatory Commission (NRC) were present during portions of the inspection. This inspection was the fourth poststabilization API of the South Clive disposal site. The first API was completed in July 1991 (DOE 1992b), the second in June 1992 (DOE 1993a), and the third in May 1993 (DOE 1994).

The purpose of an API is to ensure that the disposal cell continues to comply with UMTRA Project design standards. The procedures and specifications for this API are based on guidance provided in the *Guidance for Implementing the UMTRA Project Long-Term Surveillance Program* (DOE 1992a) and the *Surveillance and Maintenance Plan, South Clive Disposal Site, Utah* (SMP) (DOE 1987). Postremedial action monitoring of ground water is not required at this site based on data collected from 17 monitor wells installed at the site before placement of the tailings (DOE 1984).

1.2 Site Description

Located in northwestern Utah, the South Clive disposal site (Figure 1-1) is in Tooele County, approximately 70 miles west of Salt Lake City in the northeast quarter of Section 32, Township 1 South, Range 11 West, Salt Lake Principal Meridian. The site covers approximately 56 acres. It is surrounded by the mixed hazardous and low-level radioactive waste disposal facility operated by Envirocare of Utah, Inc. (Envirocare), in the remainder of Section 32. An Envirocare administration building is situated within 100 feet of the northwest corner of the site. A State of Utah Site Radiation Control Office is in a trailer about 500 feet north of the northwest corner of the site.

The site is near the east edge of the flat expanse of the Great Salt Lake Desert that extends about 60 miles westward to the Nevada-Utah border. Approximately 6 to 8 miles east of the site, the north-trending Cedar Mountains (Figure 1-1) rise up about 3,500 feet above the 4,280-foot (above sea level) elevation of the site. Surface drainage at the site follows the nearly imperceptible slope to the southwest.

The arid climate at the site supports only sparse, low-growing desert shrubs. Average annual precipitation is approximately 5 inches. January is the driest month, with an average of 0.3 inch of precipitation, while June is the wettest month with an average of 0.7 inch. The maximum 24-hour precipitation recorded is 1.33 inches, and the maximum recorded monthly precipitation is 3.0 inches. During many months, however, no precipitation has been recorded. Snowfall is generally light and infrequent; the maximum monthly snowfall on record is 14.6 inches in January. Moderate to strong winds, generally from a westerly direction, are common at the site. Recorded temperatures at the site have ranged from -19 to 112 °F. Daily average minimums range from 18 to 67 °F for January and July, respectively, while daily average maximums range from 36 to 92 °F for the same months.

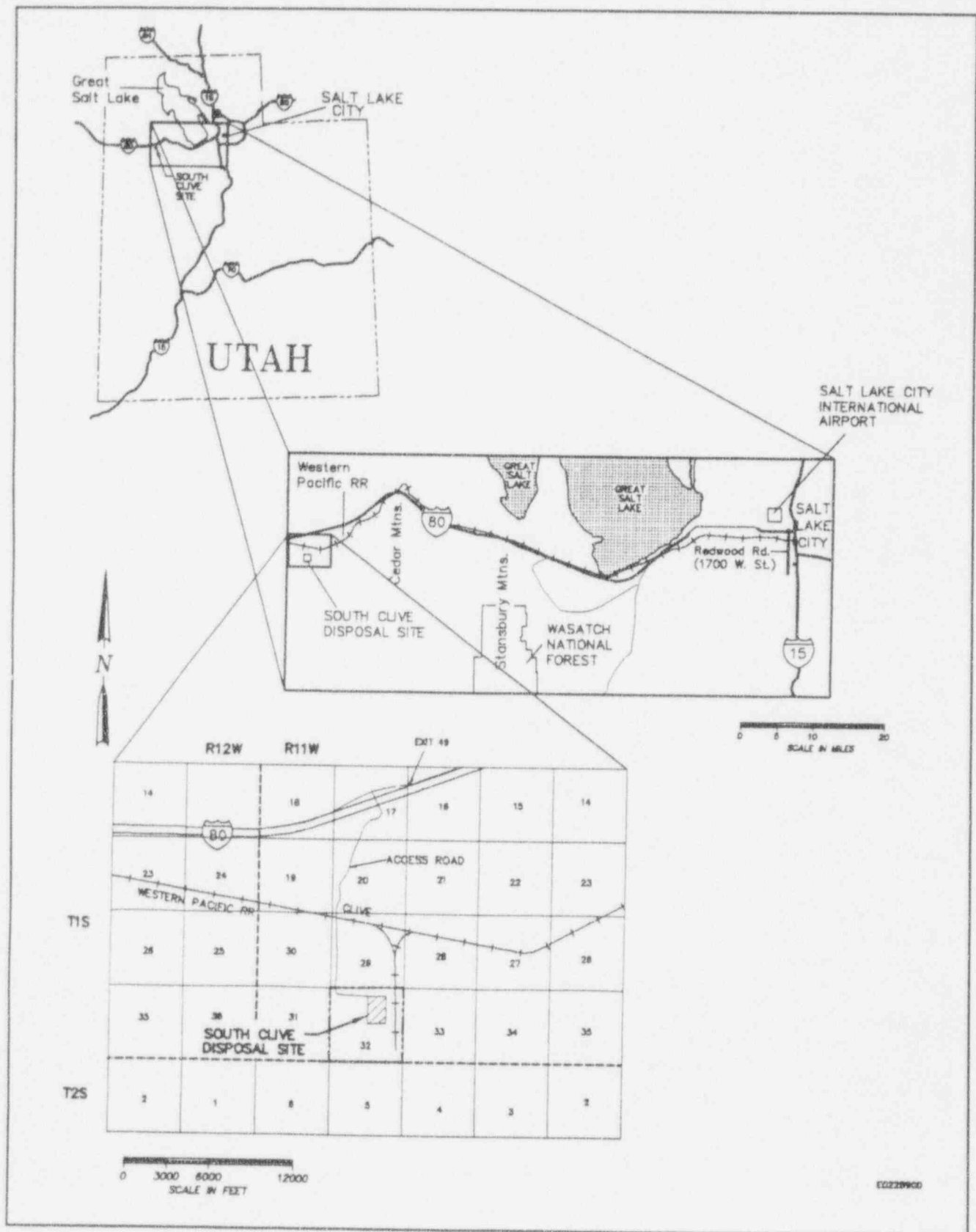


Figure 1-1. Location of South Clive, Utah, Disposal Site

The depth to ground water at the site varies from about 25 to 35 feet. In the site area, ground-water movement appears to be mainly to the northeast, which is opposite the direction of surface-water flow. The ground water hydraulic gradient is small—approximately 3 feet per mile (DOE 1984).

1.3 Site History

Residual radioactive materials (uranium mill tailings) from the former Vitro Chemical Company processing site in South Salt Lake City, Utah, are stabilized on the South Clive site in trenches 1,000 to 2,000 feet long, 100 to 150 feet wide, and about 20 feet deep. Remedial action was accomplished by the State of Utah under the direction of the UMTRA Project Office. Work began at the South Clive site in 1984 and was completed in 1988.

The South Clive site is currently in poststabilization, prelicensing status. The site is expected to remain in this status until licensed by the NRC under provisions of U.S. Code of Federal Regulations, 10 CFR 40.27, for long-term surveillance and maintenance. Title to the site is held by the State of Utah. The State will transfer title to the DOE at the time the site is licensed.

1.4 Site Access

The route from the west part of Salt Lake City to the site entrance gate is shown in Table 1-1.

Table 1-1. Route and Mileage to Site

Mileage	Route
0.0	Intersection of Interstate Highway 80 and Redwood Road (shown on some maps as 1700 W Street). Proceed west on I-80.
68.1	Clive exit (Exit 49). Leave I-80; use off ramp to the right.
68.5	Turn left at the top of the off ramp and proceed south across overpass onto paved road that soon becomes an all-weather graded dirt and gravel road at mile 69.0.
70.3	Cross double track of the Western Pacific Railroad and continue south on the road to Envirocare. (The road to the southwest is the route to a waste incinerator facility operated by U.S. Pollution Control, Inc.)
71.1	Turn left (east) at the fork in the road and follow the sign to Envirocare.
71.8	Entrance gate at northwest end of the site. Envirocare's administration building is to the left (north) and the State of Utah Site Radiation Control Office is in a trailer about 100 yards north of the Envirocare building.

2.0 Annual Prelicensing Inspection

Inspection methods and results are described in the following sections. Supporting information is provided in Appendix B (Inspection Checklist), Appendix C (Inspection Photograph Log and Photographs), and Plate 1 (Inspection Drawing).

2.1 Methods

To ensure that the site was thoroughly and efficiently inspected, the site was divided into manageable areas of various sizes and shapes referred to as transects. Inspectors walked the transects and examined all as-built features and other features of note or interest within each transect. Normally, the inspection of one transect was completed before another was begun.

The four transects used for this inspection are listed and described in Table 2-1. The first three of these transects are shown on Plate 1. Specific features such as the entrance gate, entrance and perimeter signs, site markers, boundary monuments, and settlement plates were inspected and photographed. These specific site surveillance features are listed in Table 2-2 and their locations are shown on Plate 1.

Table 2-1. Transects Used During Inspection of South Clive Disposal Site

Transect	Explanation
Top	Top surface of the disposal cell.
Side-Slope Apron	Consists of four parts: <ol style="list-style-type: none">1. Side slopes that flank the disposal cell on all four sides.2. Toe drain that surrounds the disposal cell. The top and side slopes of the disposal cell are designed to drain into the toe drain, which drains across the maintenance road into the perimeter diversion channel at the southwest corner of the site.3. Maintenance road that lies between the toe drain and the perimeter diversion channel.4. Perimeter diversion channel that lies between the maintenance road and the security fence. The perimeter diversion channel is designed to collect off-site as well as on-site storm water and divert it to the west and southwest through the outflow channel.
Site Perimeter	Extends from the perimeter diversion channel to about 5 feet outside the site property boundary. Includes the security fence, the Envirocare fence, the enclosed area between the security and Envirocare fences, the outflow channel, and the Envirocare ground-water monitor wells.
Outlying Areas	Selected areas more than 5 feet outside the site property boundary. Includes fuel storage tanks just west of the site property boundary, various Envirocare structures near the site, and the section corner monuments at the northwest and northeast corners of Section 32.

Table 2-2. Specific Site Surveillance Features

Identifier	Feature	Photograph Location Number
--	Entrance Gate	1
E	Entrance Sign	2
P	Perimeter Signs (16 total)	3(P1) and 4(P14)
SMK-1	Site Marker 1	5
SMK-2	Site Marker 2	6A
BM-1	Boundary Monument 1	7
BM-2	Boundary Monument 2	8
BM-3	Boundary Monument 3	9
BM-4	Boundary Monument 4	10
SP-1	Settlement Plate 1	11
SP-2	Settlement Plate 2	12
SP-3	Settlement Plate 3	13
SP-4	Settlement Plate 4	14
SP-5	Settlement Plate 5	15
SP-6	Settlement Plate 6	16
SP-7	Settlement Plate 7	17
SP-8	Settlement Plate 8	18
SP-9	Settlement Plate 9	19

Equipment used during the inspection included a 35-mm camera, a north arrow (2 feet long) for showing scale and orientation of photographs, measuring tapes, a Brunton compass, a field notebook, and forms for recording observations and photographic information. Photographs were taken without filtration on color-negative film (Kodacolor ISO 200). Photographs are identified in the text of this report, in Appendix C, and on Plate 1 by photograph location (PL) number.

2.2 Results

Results of the 1994 inspection are reported in Section 2.2.2 ("Access Road and Specific Site Surveillance Features") and Section 2.2.3 ("Transects"). Although most site specific surveillance features are within a transect, they are reported separately by type of feature for two reasons. First, each type of feature is an important focus of the inspection. Second, reporting by type of feature allows the performance of each as-built feature to be evaluated separately.

Observations may include reference to specific photographs provided in Appendix C, which contains 93 photographs taken at 54 locations. Photographs are identified by a letter suffix when more than one photograph was taken at a location (e.g., 6A, 6B).

Because no as-built drawing exists for this site, Plate 1, Inspection Drawing, is a compilation of information from early design drawings and on-site observations by the inspection team. Plate 1 is, therefore, only an approximation of conditions on the ground at the site (Note 3, Plate 1). Most features shown on Plate 1 are probably not in their true location. An accurate survey (as-built drawing) of this site is needed.

2.2.1 Previous Issues and Current Status

No significant new observations or issues were found during this API. Issues from previous investigations were discussed with the UMTRA Project Site Manager. These issues and their status, as a result of these discussions, are identified in the information below.

2.2.2 Access Road and Specific Site Surveillance Features

After a description of the access road, specific site surveillance features are discussed in the order presented in Table 2-2.

Access Road

The access road to the site from I-80 is paved for the first 0.5 mile and then is an all-weather graded dirt and gravel road for the remaining 2.8 miles to the site. The road was dry and in excellent condition at the time of the inspection.

Entrance Gate and Signs

The entrance gate and entrance sign, which is designated on Plate 1 by an "E," are in excellent condition (PL-1 and PL-2, respectively). A stop sign, which is on the site security fence just south of the entrance gate (PL-1), has been damaged by four bullet holes from a large-caliber rifle.

In addition to the entrance sign, 16 perimeter signs are in place around the site on the security fence. All the perimeter signs are in excellent condition. Perimeter signs are designated by a "P" on Plate 1 and are numbered (e.g., P1, P2) for use as reference points in clockwise order starting at the northeast corner of the security fence. Two types of perimeter signs exist—one is in standard UMTRA format with magenta-colored lettering (PL-3) and the other is smaller and in nonstandard UMTRA format (PL-4). Only the three perimeter signs on the north security fence (P14 through P16) are in the nonstandard UMTRA format. An additional perimeter sign (P16) was found during this inspection near the east end of the north security fence. The three perimeter signs on the north security fence should be replaced during the 1995 inspection with larger perimeter signs that meet current UMTRA Project specifications (DOE 1992a).

Only two perimeter signs (P7 and P8) are on the approximately 1,200-foot length of the south security fence. UMTRA Project specifications (DOE 1986) require that perimeter sign spacing be no greater than 500 feet. During the 1995 inspection, P7 should be moved about 100 feet westward, and a new perimeter sign that meets current UMTRA Project specifications (DOE 1992a) should be placed on the south security fence about 200 feet from the southeast corner (Plate 1).

Site Markers

Two site markers are in place at the site. SMK-1 is just inside the entrance gate (PL-5 and PL-2), and SMK-2 is at the center of the top of the disposal cell (PL-6A). Both markers are in excellent condition and show no sign of deterioration or disturbance.

Survey Monuments

No survey monuments have been established at the site. A minimum of one permanent survey monument is required by UMTRA Project specifications, and three monuments are generally required (DOE 1992a). As stated in the SMP, the installation of survey monuments within the site boundary will occur at a later date. In the meantime, "unofficial" monuments will be the three section corner monuments (southwest, northwest, and northeast) of Section 32, Township 1 South, Range 11 West. (The location and condition of section corner monuments at the northwest and northeast corners of Section 32 are discussed under "Outlying Areas" on pages 12-13.) The establishment of permanent survey monuments is related to the need for resurveys of the settlement plates on top of the disposal cell. This issue was discussed during the inspection with the UMTRA Project Site Manager who will

ask the Remedial Action Contractor (RAC) to evaluate the requirement for resurveys of the settlement plates (see below under "Settlement Plates"). If resurvey of settlement plates is no longer required, there may be no need for permanent survey monuments.

Boundary Monuments

Four boundary monuments are set at the corners of the rectangle-shaped site, BM-1 through BM-4 (PL-7 through PL-10, respectively). The monuments are in excellent condition except for BM-1, which is loose. Damage to this monument may have occurred during installation of the adjacent fence by Envirocare. Although loose in the ground, BM-1 appears to be in the correct location, and no repair is recommended.

All the boundary monuments are outside the site security fence, but they are within 1 to 1.5 feet (on the disposal site side) of the Envirocare fence that provides some protection for the monuments from vehicles and other activities on Envirocare property. Boundary monuments BM-1 and BM-2 are further protected by orange-painted pipe barricades.

Settlement Plates

Nine settlement plates are present in three rows across the top of the disposal cell (Plate 1). All the settlement plates are marked by a section of galvanized pipe that rises less than 1 foot above the rock-covered surface. Each pipe is topped by a threaded cap and all pipe and caps are painted orange. The exposed portions (above ground surface) of all the settlement plates are in excellent condition (PL-11 through PL-19).

Initial survey data for the settlement plates from *The Surveyor's Notebook* (State of Utah 1990) were received through the UMTRA Project Office. These data indicate that the settlement plates are numbered in sequence from right to left, starting on the north row of plates and moving southward by row. This numbering sequence is shown on Plate 1 and is different from the numbers die stamped on the caps of each settlement plate.

According to *The Surveyor's Notebook* (State of Utah 1990), the last resurvey of the settlement plates occurred in January 1990. The resurveys had, as a questionable point of beginning, a nail embedded in a power pole just west of the site property boundary. The SMP states that the settlement plates will be monitored annually for 5 years or until settlement is complete. More than 5 years have passed since the disposal cell was completed; however, it is uncertain that settlement has ceased. This issue of settlement plate resurveys was discussed during the inspection with the UMTRA Project Site Manager who will ask the RAC to evaluate the requirement for additional resurveys of the settlement plates. If additional resurveys are deemed necessary, then a permanent survey monument should be established as a point of beginning for the resurveys.

2.2.3 Transects

Inspection transects are shown on Plate 1 and listed in Table 2-1.

Top

The top of the disposal cell covers approximately 45 acres and slopes slightly to the east and west away from a north-trending crest along the center of the cell (Plate 1). It was inspected by a series of north-south traverses, each spaced approximately 20 yards apart. No settling, slumping, or erosion was observed on top of the cell.

A 360° panorama of the top of the cell was taken from SMK-2 and is included in Appendix C, PL-6B through PL-6I. This panorama includes a series of eight photographs, starting at due north and continuing in a clockwise direction at 45° azimuth intervals. The panorama shows the expanse of the top of the disposal cell, as well as the nature of the topography and the environment that surrounds the disposal site.

Rounded rock, which ranges from coarse pebble to cobble size, covers the top of the disposal cell, and the top is mostly free of plants. Several small areas that support small, sparse plant growth were noted (e.g., PL-20); however, no trend of increasing colonization of the disposal cell by small plants is apparent. The size of these areas with plants varies from several square feet to approximately 100 square feet. Evidence of plant growth was seen at only two of the five small areas noted during the 1993 inspection (DOE 1994). These two areas are in the northeast part of the cell top near SP-1 (Plate 1, PL-20 shows one area north of SP-1). One new area of plant growth southeast of SP-1 and three areas near the west edge of the south half of the disposal cell top were found during this inspection (Plate 1).

Here, as at several other UMTRA Project disposal sites in the West, plants are rooted in patches of fine-grained material that occur at widely scattered places in the rock cover material. The patches are considered an artifact of cover installation. There is no indication that these patches of fine material indicate thin spots in the rock cover.

A vegetation growth study of this disposal cell in August 1991 (DOE 1992c) found that plants consist mainly of *Halogeton* and ironweed. Plants appear to begin growing with the help of moisture early in the growing season but soon die as winds and high temperatures dry out the soil. Plants seen on the top of the disposal cell during this inspection were dead and left over from one or more previous seasons. Previous growth appears to have reached up to about 1 foot in height. Plant growth for the 1994 growing season had not yet begun to appear. No trees or deep-rooted plants, such as tamarisks, were seen. Plant growth will be monitored during future inspections.

Side-Slope Apron

The side-slope apron transect includes the side slopes of the disposal cell, the toe drain that surrounds the disposal cell, the maintenance road that lies between the toe drain and the perimeter diversion channel, and the perimeter diversion channel that lies between the maintenance road and the security fence (Table 2-1 and Plate 1). All of these features are easily visible from the maintenance road that parallels the center of the side-slope apron transect.

The general nature and condition of the side-slope apron transect are shown by 270° photographic panoramas taken from each of the four corners of the top of the disposal cell and by photographs taken from the maintenance road at the four corners of the disposal cell base. Table 2-3 presents photograph location numbers and locations.

The side slopes and toe drains at the bottom of all four side slopes are in fair-to-good condition. Because of uneven cover installation, the side slopes have minor surface variations, and these irregularities are not related to erosion, cracking, or settling. The side slopes will continue to be monitored for irregularities.

Although the toe drains are designed to carry water from the side slopes to the southwest base of the disposal cell, water was ponded at various places in the toe drains during this inspection. The deepest (up to 18 inches) and most extensive ponded water was in the south end of the east toe drain

*Table 2-3. Photograph Location Numbers and Locations
on Corners of Side-Slope Apron Transect*

Photograph	Location
PL-21A through PL-21G	Northwest corner, top of disposal cell
PL-22A through PL-22G	Northeast corner, top of disposal cell
PL-23A through PL-23G	Southeast corner, top of disposal cell
PL-24A through PL-24G	Southwest corner, top of disposal cell
PL-25A through PL-25C	Maintenance road, northwest corner of disposal cell base
PL-26A and PL-26B	Maintenance road, northeast corner of disposal cell base
PL-27A and PL-27B	Maintenance road, southeast corner of disposal cell base
PL-28A and PL-28B	Maintenance road, southwest corner of disposal cell base

(PL-29) near the southeast corner of the disposal cell. Ponded water in the east toe drain extended approximately 1,500 feet north from the southeast base of the disposal cell (Plate 1, PL-23B, and PL-23C). The west toe drain contained ponded water, but it was shallower and not as continuous (Plate 1) as in the east toe drain. Accumulation of moss (PL-30) in the ponded water in the east toe drain as well as the occurrence of brine shrimp indicate that the water has been present for several months, possibly since the fall of 1993. Ponded water in the toe drain near the southeast corner of the disposal cell base appears to have reached a level high enough to have briefly flowed over the maintenance road (PL-27B) and into the east perimeter diversion channel.

Plant growth occurs in small areas and as scattered individual plants on the east and west side slopes (Plate 1). Plants were the same types as seen on top of the disposal cell, and they were all dead remains of growth during one or more previous years. The amount of plant growth on the side slopes is greater than noted during previous seasons. The largest areas of plant growth on the east and west side slopes (PL-31 and PL-32, respectively) are in the lower parts of the side slope and are near or adjacent (PL-32) to ponded water in a toe drain. The ponded water probably enhances plant growth through a wicking process that transfers moisture laterally into the lower parts of the side slopes. The elimination of ponded water in the toe drains would likely decrease the amount of plant growth on the side slopes.

The problem of water ponding in the toe drains was discussed with the UMTRA Project Site Manager during the inspection. The GJPO understands that the Site Manager will ask the RAC to evaluate the ponded water problem. On the basis of design criteria, the RAC will recommend either that the problem be corrected or that the present condition be accepted.

The maintenance road is in good condition, as shown in PL-25A through PL-28B. The one exception is just east of the southwest corner of the disposal cell where erosion caused by water flowing from the toe drain into the south perimeter diversion channel has damaged the road (PL-33). This erosive condition has been noted during previous inspections, and erosion will continue as additional water flows cross the road. Also, the potential for similar erosion across the maintenance road exists just north of the southeast corner of the disposal cell base where high water from the ponded toe drain appears to have flowed over the road into the east perimeter diversion channel. Construction of a swale in the maintenance road, similar to the one at the northwest corner of the disposal cell where high-water flows from the perimeter diversion channels cross the road (PL-25C), would protect the maintenance road from erosion at both southwest and southeast locations.

The problem of erosion on the maintenance road was discussed with the UMTRA Project Site Manager during the inspection. The Site Manager will ask the RAC to evaluate the problem. On the basis of site design criteria, the RAC will recommend either that the problem be corrected or that the present condition be accepted.

The four perimeter diversion channels lie between the maintenance road and the security fence. The diversion channels intercept off-site runoff, collect runoff from the toe drain, and divert these high-water flows off site to Envirocare property to the west and southwest through the outflow channel (discussed in the section entitled "Site Perimeter" on pages 10-11). The perimeter diversion channels are in good condition except for the rock material that is missing from the north perimeter diversion channel and the problem of water ponding (not draining) at the southwest corner of the site at the junction of the south and west perimeter diversion channels.

As reported from previous inspections, rock material is missing from the south side of the north perimeter diversion channel for a distance of about 100 yards (PL-34). This issue was discussed with the UMTRA Project Site Manager during the inspection. The GJPO understands that the Site Manager will ask the RAC to evaluate the missing rocks problem. On the basis of site design criteria, the RAC will recommend either that the problem be corrected or that the present condition be accepted.

In addition to the ponded water in the perimeter diversion channels at the southwest corner of the site (PL-24D), areas of shallow ponded water were present in the north, east, and west perimeter diversion channels (Plate 1). Water had been high enough (during the past year) in the perimeter diversion channels to flow over the maintenance road swale (PL-25C). Ponded water at the southwest corner of the site extends for several hundred feet along the south and west perimeter diversion channels (PL-28A, PL-28B, and PL-35). Moss accumulation in this area of ponded water (PL-28C) indicates that the water has been present for several months.

The problem of water not draining from the site and ponding in the southwest corner of the site was discussed with the UMTRA Project Site Manager during the inspection. Again, the GJPO understands that the Site Manager will ask the RAC to evaluate the problem. On the basis of site design criteria, the RAC will recommend either that the problem be corrected or that the present condition be accepted.

Site Perimeter

The site perimeter transect extends from the outer edge of the perimeter diversion channel to about 5 feet outside the site property boundary. This transect includes the security fence, the Envirocare fence, the enclosed area between the security and Envirocare fences, the outflow channel, and the Envirocare ground-water monitor wells. The transect is in good condition except for minor damage to the security fence, minor erosion and ponded water in the enclosed area between the security and Envirocare fences, and water drainage not occurring at the outflow channel.

The security fence is set well within the property boundary at this site, except at the northwest corner of the site where a short section of north-trending fence that contains the entrance gate is set several feet outside the boundary. It is recommended that the section of security fence containing the entrance gate be moved approximately 8 feet east so it is inside the site property boundary. The alternative would be to extend the property line to the west far enough to enclose the fence and entrance gate. This would require a change to the legal description of the property.

The security fence is set inside the site boundary (except in the area of the entrance gate, as discussed above) by the following approximate amounts: 13 feet on the north, 75 feet on the east,

100 to 114 feet on the south, and 96 feet on the west (Plate 1). Minor damage in the form of bent fence posts has occurred to the security fence in the north (PL-36), east, and south (Plate 1) fence lines. No additional fence post damage has occurred since the 1993 inspection, and the damage does not threaten the integrity of the security fence.

The fence constructed by Envirocare is positioned immediately outside (1.5 feet or less) the site property boundary defined by the boundary monuments. There is no access for the DOE to this site perimeter area (of the widths described above) enclosed by the site security and Envirocare fences. This enclosed area contains boundary monuments and at least three, and possibly four, ground-water monitor wells (Plate 1). To allow DOE access to this enclosed area, it is recommended that two pedestrian access gates (3 feet wide) be installed in the security fence, one at the northwest corner of the site and the other at the southwest corner as shown in Plate 1.

The Envirocare fence just outside the north, east, and south sides of the site was present at the time of the 1993 inspection and is constructed with spade posts and chain link mesh. At the time of this inspection, Envirocare had constructed a new fence just outside the west side of the site south of the entrance gate. This new fence is like a stock fence, because it is constructed with spade posts and three strands of barbed wire (PL-37).

Since the 1993 inspection, much of the enclosed area between the security fence and the Envirocare fence has been scraped free of vegetation in areas where Envirocare removed radiologic contamination (PL-38 through PL-40). In the narrow area between the fences at the north end of the site, vegetation remains in areas that were apparently not radiologically contaminated (PL-36). Most of the area between the fences is flat and featureless (PL-38). Surface-water drainage is poorly defined in several areas along the Envirocare fence where ponded water occurs (Plate 1 and PL-40). Minor erosion has created small rills and shallow depressions in several places in the north part of the east area between fences (Plate 1 and PL-39). The areas of erosion and ponded water are minor and do not threaten the site integrity; changes in these areas will be monitored in future inspections.

The outflow channel extends from the junction of the south and west perimeter diversion channels (PL-41) westward under the security fence, through the enclosed area between the fences (PL-42), and through the culvert under the Envirocare access road. As stated in the section, "Side-Slope Apron," on page 10, ponded water at the junction of the perimeter diversion channels indicates that the outflow channel is not diverting this water from the site as intended. Water will continue to pond if the grade of the outflow channel is not adjusted to provide drainage to the west and southwest. The UMTRA Project Site Manager is aware of this problem and will ask the RAC to evaluate the outflow channel drainage problem, along with the other problems discussed in this report, and recommend correction of the problem or acceptance of the variance.

Two Envirocare-installed ground-water monitor wells, GW-16 and GW-4 (PL-43 and PL-44, respectively), are in the enclosed area between the fences at the south end of the site. One Envirocare-installed ground-water monitor well, GW-17 (PL-45), is in the area between the fences at the west end of the site; an unidentified well (PL-46) near the entrance gate also occurs in this area. These wells, both on the site property, are all in good condition. The locations of these wells are only approximately shown in Plate 1. Three other Envirocare ground-water monitor wells, GW-23 (PL-47), GW-22 (PL-48), and GW-5 (Plate 1), occur several feet outside the site property and outside the Envirocare fence.

Other features several feet outside the site property include three Envirocare Environmental Stations (Numbers 32 through 34) designated by signs (PL-49) just outside the Envirocare fence along the west side of the site (Plate 1). Also just outside the Envirocare fence along the west side of the site

is a power pole, which has a nail embedded in it on its east side about 18 inches above the ground surface (PL-50). This nail was the point of beginning for the State of Utah resurveys of settlement plates on the disposal cell. As stated in the section, "Settlement Plates" (page 7), if resurveys of settlement plates are resumed, then a survey monument of more permanence than a nail in a power pole should be established as a point of beginning.

Outlying Areas

The area surrounding the site (more than 5 feet outside the site property boundary) was examined for signs of erosion, development, or other disturbance that may affect the site. The site is surrounded by active waste burial operations by Envirocare. The Envirocare administration building is immediately northwest of the northwest corner of the site (PL-21D and PL-25C). A trailer housing a security guard and a trailer containing the State of Utah Site Radiation Control Office (Plate 1) are about 100 yards north of the Envirocare building.

Because Envirocare operations surround the site, a permanent easement across Envirocare property is necessary to ensure DOE access to the site. This issue was discussed with the UMTRA Project Site Manager during the inspection. At the time the site is licensed and title is transferred to the DOE, the GJPO understands that the DOE will obtain a permanent and perpetual easement to the site from the State.

Envirocare access roads parallel the north, east, and west sides of the site (Plate 1). The road west of the site has the most traffic and provides access to gasoline and diesel fuel tanks (PL-51) about 15 to 20 feet west of the site property. Access is also provided to an Envirocare ground-water monitor well, SC-1 (Plate 1), and a buried waste area south of the site (PL-24B and PL-24C). An Envirocare gate (PL-52) just south of the southwest corner of the site provides access to the waste-burial area south of the site. Vehicle parking areas and material storage areas (PL-21D and PL-21E) are east of the Envirocare administration building and north of the site. Also east of the site is a railroad spur with facilities for unloading waste materials from railroad cars (PL-22D and PL-22E). East and southeast of the site are temporary storage areas for hazardous waste (PL-23B and PL-23C). Several miles to the west, the U.S. Pollution Control, Inc. waste incineration facility can be seen (PL-24E). In contrast to previous inspections, no debris from these surrounding operations was found against the security fence, the Envirocare fence, or on the disposal site. The extent of private waste disposal operations and their impact on the site will continue to be monitored during future inspections.

Other significant features in this transect are the section corner monuments at the northwest and northeast corners of Section 32, Township 1 South, Range 11 West (Plate 1). These monuments are two of the three Section 32 corner monuments that were designated in the SMP (DOE 1987) as nonpermanent survey monuments. The monuments are both damaged. The monument at the northwest corner of Section 32 (PL-53A and PL-53B) can be lifted from its deteriorated base at the ground surface level. Information on the cap of the monument at the northeast corner of Section 32 is undecipherable, and the base of the monument is bent (PL-54). Both survey monuments are inadequate as permanent survey monuments for the site. If they are to serve such purpose, both damaged section corner monuments must be reestablished. (See discussion under "Survey Monuments" on pages 6-7.) The third monument (not visited during this inspection) is at the southwest corner of Section 32.



3.0 Conclusions and Recommendations

3.1 Conclusions

The South Clive disposal site is in fair condition at this time. The most significant change at the site since the previous inspection in May 1993 is the accumulation of ponded water at the base of the disposal cell in the toe drains and in the perimeter diversion channels. This condition indicates that the drainage of water from the site toward the west and southwest is not functioning according to design. Other continuing concerns include the need for establishment of permanent survey monuments and the installation of additional rock material for the north perimeter diversion channel.

3.2 Previous Issues and Current Status

Several recurring issues and their current status from the 1994 inspection are:

1. Resurveys of settlement plates are required on an annual basis for 5 years, or until settlement is complete (DOE 1987). If resurveys are deemed necessary, then a permanent survey monument should be established as a point of beginning for the resurveys. (See page 8.)
2. The toe drains do not drain as designed to carry water from the base of the disposal cell side slopes toward the southwest and into the perimeter diversion channels. (See pages 9-10.)
3. Erosion is occurring across the maintenance road near the southwest corner of the base of the disposal cell. (See pages 10-11.)
4. Rock material is missing from a section about 100 yards long in the south side of the north perimeter diversion channel. (See page 11.)
5. The perimeter diversion channels do not perform as designed to carry water from the site perimeter to the southwest corner of the site where an outflow channel, which also does not perform as designed, drains water off the site to the west and southwest. (See page 12.)

The five issues stated above were discussed during the inspection with the UMTRA Project Site Manager. For the first issue, the Site Manager will ask the RAC to evaluate the requirement for additional resurveys and recommend resumption or termination of the surveys. For issues 2 through 5, the Site Manager will ask the RAC to evaluate the problems based on site design criteria, and to recommend either that the problems be corrected or that the problems be accepted, as variance, in their present condition.

6. Additionally, because the site is surrounded by Envirocare operations, a permanent easement to the DOE site property is necessary to ensure continued access. The UMTRA Project Site Manager advised that a permanent easement to the site will be obtained from the State at the time the site is licensed and title is transferred to the DOE. (See page 13.) This will no longer be considered an issue at this site.

3.3 Further Observations and Recommendations

Additional observations and recommendations from the 1994 inspection include the following:

1. Three perimeter signs on the north security fence are in nonstandard UMTRA format. The approximately 1,200 foot-length of the south security fence contains only two perimeter signs. UMTRA Project specifications (DOE 1986) require that perimeter sign spacing be no greater than 500 feet. (See page 7.)

Recommendation: During the 1995 inspection, replace the three perimeter signs on the north security fence with perimeter signs that meet current UMTRA Project specifications (DOE 1992b). Also, on the south security fence, move existing perimeter sign, P7, about 100 feet westward and install a new perimeter sign about 200 feet from the southeast corner.

2. At the northwest corner of the site, a short north-trending section of security fence that contains the entrance gate is set several feet outside the site property boundary. (See page 11.)

Recommendation: Move the section of security fence containing the entrance gate approximately 8 feet east so that the fence is within the site property.

3. The site security fence is set inside the site property boundary (except in the area of the entrance gate) by distances that range from 13 feet on the north to 114 feet on the south. Envirocare has constructed a fence around the site that is approximately 1 to 1.5 feet outside the site property boundary. As a result, the DOE has no access to this enclosed part of the site between the fences. (See pages 11-12.)

Recommendation: Install two pedestrian access gates (3 feet wide) in the security fence, one at the northwest corner of the site and the other at the southwest corner.

3.4 Contingency Plans

As indicated in the SMP (DOE 1987), the DOE established notification procedures with the National Weather Service, the Utah Comprehensive Emergency Management, the Earthquake Information Center, and the Tooele County Sheriff's Department. These agencies will contact the DOE if any unusual event comes to their attention that might affect the security or integrity of the South Clive site.

4.0 References

DOE (U.S. Department of Energy), 1984. *Final Environmental Impact Statement, Remedial Actions at the Former Vitro Chemical Company Site, South Salt Lake, Salt Lake County, Utah*.

DOE/EIS-0099-F, prepared by the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico.

_____, 1986. *Guidance for UMTRA Project Surveillance and Maintenance*, UMTRA-DOE/AL-350124.0000, DOE UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico.

_____, 1987. *Surveillance and Maintenance Plan, South Clive Disposal Site, Utah*, draft, UMTRA-DOE/AL-350202.0000, DOE UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico.

_____, 1992a. *Guidance for Implementing the UMTRA Project Long-Term Surveillance Program*, UMTRA-DOE/AL-350125.0000, Rev. 1, DOE UMTRA Project Office, Albuquerque Field Office, Albuquerque, New Mexico.

_____, 1992b. *1991 Annual Prelicensing Inspection of the Salt Lake City (South Clive), Utah, UMTRA Project Disposal Site*, DOE/ID 12584-109, DOE Idaho Operations Office, Grand Junction Projects Office, Grand Junction, Colorado.

_____, 1992c. *Vegetation Growth Patterns on Six Rock-Covered UMTRA Project Disposal Cells*, UMTRA-DOE/AL-400677.0000, DOE UMTRA Project Office, Albuquerque Field Office, Albuquerque, New Mexico.

_____, 1993a. *1992 Annual Prelicensing Inspection of the Salt Lake City (South Clive), Utah, UMTRA Project Disposal Site*, DOE/ID/12584-122, DOE Albuquerque Field Office, Albuquerque, New Mexico.

_____, 1993b. *Occurrence Reporting and Processing of Operations Information*, DOE Order 5000.3B (January 19, 1993).

_____, 1994. *1993 Annual Prelicensing Inspection of the Salt Lake City (South Clive), Utah, UMTRA Project Disposal Site*, DOE/ID/12584-144, DOE Albuquerque Operations Office, Albuquerque, New Mexico.

State of Utah, 1990. *The Surveyor's Notebook of Settlement Plates and Rock Pile Cross Sections: The South Clive, Disposal Site*, unpublished from the Department of Environmental Quality, Salt Lake City, Utah.

Appendix A
Résumés of Inspectors

Craig S. Goodknight

Fields of Competence

Mineral resource assessment; geologic mapping; geologic and geohydrologic characterization of hazardous and/or radiologic sites; project management; Environmental Assessment/Environmental Impact Statement (EA/EIS) process; and Comprehensive Environmental Response, Compensation, and Liability Act Remedial Investigation/Feasibility Study (CERCLA RI/FS) process.

Experience Summary

Twenty-one years of varied professional experience, including 7 years in uranium exploration and uranium resource evaluation, 2 years of supervision and planning for conducting Uranium Mill Tailings Remedial Action (UMTRA) assessment and verification surveys, 3 years of evaluation and management of geologic and mineral resources on Federal lands, and 9 years of radiologic and hazardous waste site (CERCLA RI/FS-related) investigations and geologic/geohydrologic feasibility and characterization studies.

Credentials

B.S., Geology, University of Tulsa, Tulsa, Oklahoma
M.S., Geology, University of New Mexico, Albuquerque, New Mexico
Member, Geological Society of America
Member, Association of Engineering Geologists
Wyoming Professional Geologist, No. 1063

Employment History

1986-Present	RUST Geotech Inc., (operating contractor for the U.S. Department of Energy Grand Junction Projects Office) Grand Junction, Colorado
1977-1986	Bendix Field Engineering Corp., Grand Junction, Colorado
1974-1977	U.S. Bureau of Land Management, Utah and Colorado

Key Projects

Project Manager for characterization of two Operable Units of the Denver Radium (Superfund) site, which contained radium and thorium contamination commingled with base metals.

Principal Investigator for evaluation of areas favorable for uranium deposits in Colorado, New Mexico, Wyoming, and Nevada for the DOE National Uranium Resource Evaluation (NURE) program; numerous NURE publications resulted from this work.

Geologist for a study for the U.S. Environmental Protection Agency (EPA) Regions III and IV that identified areas that have potential for high indoor radon concentrations on the basis of screening of NURE data and geologic characteristics.

Supervisor of the Bendix Field Engineering Radiologic Support Department that assessed or characterized uranium mill tailings contamination at properties in Grand Junction, Colorado; Edgemont, South Dakota; and Monticello, Utah. Department responsibilities also included verification surveys to confirm that tailings-related contamination had been removed according to EPA standards.

Geologist for geologic/geohydrologic investigations as part of characterizations of hazardous waste sites in Colorado, Texas, Utah, and Ohio. Conducted geologic investigations in support of geophysical detection of tunnels constructed by the North Koreans along the Demilitarized Zone in South Korea.

Mark P. Plessinger

Fields of Competence

Hazardous waste site remediation technologies; Feasibility Studies under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); underground storage tank (UST) site remediation; environmental regulatory considerations; nuclear engineering and radioactive waste handling; and heat transfer/fluid mechanics experimental research.

Experience Summary

Thirteen years of varied professional experience, including 6 years of CERCLA Remedial Investigation/Feasibility Study (RI/FS)-related work. UST site remedial actions, transuranic radioactive and mixed-waste handling studies, and management of design group performing Feasibility Studies and site remedial action designs. Also experienced with nuclear reactor operations and experimental research in nuclear reactor thermal hydraulics.

Credentials

B.S., Mechanical Engineering, Colorado State University, Fort Collins, Colorado
M.S., Mechanical Engineering, University of Idaho, Moscow, Idaho
Registered Professional Engineer, Colorado and Idaho
Member, American Society of Mechanical Engineers
Member, American Nuclear Society

Employment History

1989-Present	RUST Geotech Inc., (operating contractor for the U.S. Department of Energy Grand Junction Projects Office) Grand Junction, Colorado
1981-1989	EG&G Idaho, Inc., Idaho National Engineering Laboratory, Idaho Falls, Idaho

Key Projects

Project Manager responsible for the DOE portion of CERCLA activities at a low-level radioactive waste disposal site.

Inspector and report author for Uranium Mill Tailings Remedial Action Project disposal site inspections under DOE Long-Term Surveillance and Maintenance Program (LTSM).

Manager responsible for CERCLA Feasibility Studies for Federal facilities in Texas and Illinois having a variety of hazardous waste problems, including soil and ground-water contamination.

Primary author of a CERCLA Feasibility Study for a U.S. Air Force base in Massachusetts involving ground-water contamination, fuel spills, and landfills.

Manager responsible for design of a number of UST removals at Federal facilities in Colorado and Hawaii.

Individual responsible for conducting studies to characterize transuranic and mixed radioactive wastes to determine waste volumes and packaging requirements to enable final waste disposal.

Researcher/experimenter for numerous experiments and author of several publications related to nuclear reactor thermal hydraulics and associated instrumentation.

Appendix B
Inspection Checklist

Inspection Checklist

Annual Prelicensing (Phase 1) Inspection

Site: Salt Lake City (South Clive) Title I (UMTRA Project)
Disposal Site

Date Prepared: April 5, 1994

Date of Last Inspection: May 4, 1993

Type of Inspection: Annual Prelicensing Inspection (API)

Date of Next Inspection: April 14, 1994

Type of Inspection: API

I. General Instructions

- A. This inspection checklist is site specific. It incorporates general and site-specific requirements for annual inspections of the subject site. This checklist may be revised in response to new requirements as results of previous inspections and maintenance require, or as new information about the site is received.
- B. Purpose of the checklist is to support
 - Planning for the inspection
 - Inspection of the site
 - Evaluation of the thoroughness of the inspection before the inspection party leaves the site at the conclusion of the inspection
 - Preparation of the inspection report
- C. This checklist is provided for the convenience of those planning and conducting the inspection. Other information, materials, or guidance may be used in place of or in addition to the checklist if warranted by site conditions.

II. Preparation for the Inspection Review

- A. Review license requirements, if applicable, and inspection guidance documents:
 - *Guidance for UMTRA Project Surveillance and Maintenance* (DOE 1986)—expected to apply to pre-September 1992 as-built features at the site.
 - *Guidance for Implementing the UMTRA Project Long-Term Surveillance Program* (DOE 1992b)—may apply to changes at the site after September 1992.
 - *Surveillance and Maintenance Plan, South Clive Disposal Site, Utah* (DOE 1987).

B. Review previous inspection reports, field notes from previous inspections, maps and drawings of the site, and other documents as necessary to become familiar with site history, current conditions at the site, and the results of recent inspections and maintenance. Obtain copies of maps, plans, and other documents required for the inspection:

- Long-Term Surveillance Plan (LTSP). [The LTSP for this site will not be prepared until the State submits the Site Completion Report. In the meantime, use the *Surveillance and Maintenance Plan, South Clive Disposal Site, Utah* (DOE 1987).]
- 1993 inspection report and field notes
- Specifications for site maintenance (if applicable)
- UMTRA Project Office responses to recommendations from the 1993 inspection report

C. Review site access procedures and protocols. Notify affected agencies. Complete actions required to enter the site.

- State of Utah: Mr. L. Anderson 801-536-4250
 Mr. M. Day 801-536-4169
- UMTRA Project Office: Ms. S. Arp 505-845-5668
- Grand Junction Projects Office: Mr. J. Virgona 303-248-6006
- Obtain keys for locks on gates

D. Review specific observations to be made and problems to be studied or resolved during the coming inspection. (See Section III of this checklist.)

E. Inspection Equipment: Assemble and pack field equipment required for the inspection of the site:

- Camera
- Spare batteries
- Camera accessories
- Film, five rolls of 36-exposure, ISO 200 (or equivalent) color print film
- Photograph scale/north arrow
- Brunton compass
- 50-foot tape
- 10- to 20-foot tape
- Keys

- Clipboard
- Canteens or other provision for water in hot weather
- Sun protection
- Field photograph forms
- Orange field notebook
- Black, indelible, felt-tip marker, with broad point
- Day packs (optional but advisable for this site)
- First aid kit

III. Site Inspection

- A. The checklist is not intended to be exhaustive or constraining. The inspection party is free to make other observations as judgment and site conditions dictate.
- B. Before the inspection of the site is completed and before the inspection party leaves the site, the inspection party should satisfy itself that the site has been fully inspected and evaluated and that adequate photographs and measurements have been obtained.
- C. Health and Safety
 1. The South Clive site can be hot and dry in summer, cold and windy in winter. Personnel should make provision for
 - a. Summer:
 - Sun protection.
 - Drinking water. Personal canteens recommended.
 - b. Winter:
 - Warm clothing, preferably layered.
 2. The disposal cell is covered with unstable, rounded rocks, and sturdy boots with high ankle support are required.
 3. Medical emergency
 - Envirocare administration building immediately adjacent to the northwest corner of the site. Three individuals employed at the Envirocare site are trained as Emergency Medical Technicians.

- Call 911 from the Envirocare administration building to reach the Tooele County Sheriff's Department.

D. General Surveillance

1. Specific Site Surveillance Features

- Access road
- Entrance gate
- Entrance sign
- Perimeter signs, 15
- Site markers, 2
- Site security fence and entrance gate
- Boundary monuments, 4
- Settlement plate casings, 9

2. Transects

- Top of disposal cell
- Side-slope apron
 - Side slopes
 - Toe drain
 - Maintenance road
 - Perimeter diversion channel
- Site perimeter
- Outlying areas

3. For All Transects:

- Settlement, slumping, heaving, cracking
- Erosion
- Windblown sand accumulation
- Invasion by plants or animals
- Intrusion by humans or domestic animals
- Irregularities in cover materials

- Rock: type, size, quality, installation
- Revegetation: vigor, density

4. Area Within 0.25 Mile of the Site

- Change in land use
- New construction or development
- Earth movement or erosion

5. Specific Tasks and Observations

- a. Check the continuity of rock material along the north perimeter diversion channel. Has new rock material been installed where it was previously missing?
- b. Inspect the condition of the maintenance road at the southwest corner of the disposal cell. What is the extent of erosion across the road compared to the 1993 inspection?
- c. Inspect the long, linear depression in the toe drain at the southeast corner of the disposal cell base for signs of recent standing water.
- d. Note the extent of plant growth on top of the disposal cell.
- e. Examine the three Envirocare ground-water monitor wells on site property and look for other evidence of private-sector encroachment on the site.

E. Maintenance recommended by previous inspection:

- Install (by the State) an armored channel between the toe drain and the perimeter diversion channel to form a low-water crossing in the maintenance road near the southwest corner of the disposal cell.
- Complete construction (by the State) of the north perimeter diversion channel by laying down rock material of proper size and composition where it is missing.

IV. Inspection Closeout Summary

A. At the end of the inspection and before leaving the site, the inspection team should:

1. Satisfy itself that it has sufficient information (photographs, measurements, sketches, etc.) to describe and evaluate findings and observations for the site inspection report.
2. Summarize, in the field notes or elsewhere, the following information:
 - Serious problems or threatening factors requiring immediate attention or follow-up action;

- Actual or potential problems not requiring immediate attention but that require further observation possibly including a follow-up inspection; and
- Changes recommended for this checklist before the next inspection.

B. If serious problems are identified during the inspection, the inspection team should:

1. Notify the UMTRA Project Site Manager immediately.
2. Follow GJPO procedures for compliance with DOE Order 5000.3B (DOE 1993b).

Appendix C
Inspection Photograph Log and Photographs

Inspection Photograph Log

Explanation

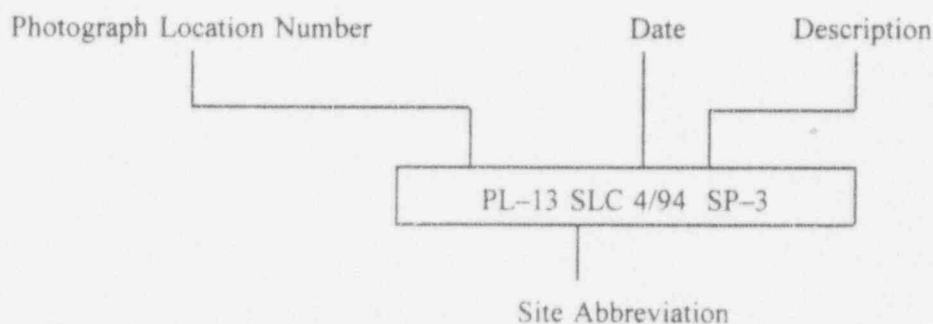
Appendix C includes all photographs referred to in the text of this report, along with a complete list of these photographs. Photographs are identified by photograph location (PL) number. PL numbers also appear on the Inspection Drawing (Plate 1).

Specifications

All photographs were taken on Kodacolor 135 film, ISO 200, with a variable focal length (zoom) lens. Focal lengths vary between 35 and 105 mm. All photographs were exposed with daylight illumination and without filtration.

Photograph Labels

Photographs in Appendix C are labeled as follows:



When more than one photograph was taken at a given photograph location, different photographs are identified by a letter suffix (e.g., 27A, 27B).

Abbreviations

The following abbreviations are used in this appendix.

N	North	BM	Boundary monument
NE	Northeast	DC	Disposal cell
ENE	East-northeast	OC	Outflow channel
E	East	P7	Perimeter sign and number
SE	Southeast	PAN	Panorama
S	South	PDC	Perimeter diversion channel
SW	Southwest	SMK	Site marker
WSW	West-southwest	SP	Settlement plate
W	West	TD	Toe drain
WNW	West-northwest	USGLOS	U.S. General Land Office Survey
NW	Northwest		

Inspection Photograph Log

Site: Salt Lake City (South Clive), Utah

Date of Inspection: April 14, 1994

Time of Day: 8:45 a.m. to 7:00 p.m.

Weather Conditions: Mostly cloudy to clear, strong N wind, 50 to 60 °F.

Photographer's Location Number ^a	Azimuth ^b	Photograph Description/Remarks
1	090	Entrance gate
2	090	Entrance sign and SMK-1
3	270	Standard sign, P1
4	180	Nonstandard sign, P14
5	---	SMK-1
6A	---	SMK-2
6B	000	PAN at SMK-2, view N
6C	045	PAN at SMK-2, view NE
6D	090	PAN at SMK-2, view E
6E	135	PAN at SMK-2, view SE
6F	180	PAN at SMK-2, view S
6G	225	PAN at SMK-2, view SW
6H	270	PAN at SMK-2, view W
6I	315	PAN at SMK-2, view NW
7	---	BM-1, monument is loose
8	---	BM-2
9	---	BM-3
10	---	BM-4
11	---	SP-1
12	---	SP-2
13	---	SP-3
14	---	SP-4
15	---	SP-5
16	---	SP-6
17	---	SP-7
18	---	SP-8
19	---	SP-9
20	---	Plant growth on top of DC near SP-1
21A	180	PAN at NW corner of top of DC, view S
21B	225	PAN at NW corner of top of DC, view SW
21C	270	PAN at NW corner of top of DC, view W
21D	315	PAN at NW corner of top of DC, view NW
21E	000	PAN at NW corner of top of DC, view N
21F	045	PAN at NW corner of top of DC, view NE
21G	090	PAN at NW corner of top of DC, view E
22A	270	PAN at NE corner of top of DC, view W
22B	315	PAN at NE corner of top of DC, view NW
22C	000	PAN at NE corner of top of DC, view N
22D	045	PAN at NE corner of top of DC, view NE

^aSee Plate 1 for map of photograph locations.

^bDeclination angle of 14° E.

Inspection Photograph Log

Site: Salt Lake City (South Clive), Utah

Date of Inspection: April 14, 1994

Time of Day: 8:45 a.m. to 7:00 p.m.

Weather Conditions: Mostly cloudy to clear, strong N wind, 50 to 60 °F.

Photographer's Location Number ^a	Azimuth ^b	Photograph Description/Remarks
22E	090	PAN at NE corner of top of DC, view E
22F	135	PAN at NE corner of top of DC, view SE
22G	180	PAN at NE corner to top of DC, view S
23A	000	PAN at SE corner of top of DC, view N
23B	045	PAN at SE corner of top of DC, view NE
23C	090	PAN at SE corner of top of DC, view E
23D	135	PAN at SE corner of top of DC, view SE
23E	180	PAN at SE corner of top of DC, view S
23F	225	PAN at SE corner of top of DC, view SW
23G	270	PAN at SE corner of top of DC, view W
24A	090	PAN at SW corner of top of DC, view E
24B	135	PAN at SW corner of top of DC, view SE
24C	180	PAN at SW corner of top of DC, view S
24D	225	PAN at SW corner of top of DC, view SW
24E	270	PAN at SW corner of top of DC, view W
24F	315	PAN at SW corner of top of DC, view NW
24G	000	PAN at SW corner of top of DC, view N
25A	085	Maintenance road at NW corner of DC, view E
25B	180	Maintenance road at NW corner of DC, view S
25C	300	Swale in maintenance road and entrance gate area, view WNW
26A	180	Maintenance road at NE corner of DC, view S
26B	270	Maintenance road at NE corner of DC, view W
27A	270	Maintenance road at SE corner of DC, view W
27B	000	Maintenance road at SE corner of DC, view N
28A	000	Maintenance road at SW corner of DC, view N
28B	090	Maintenance road at SW corner of DC, view E
28C	225	Moss in ponded water at junction of S and W perimeter diversion channels, view SW
29	180	Ponded water in toe drain near SE corner of DC, view S
30	135	Moss in ponded water in toe drain midway along E side slope of DC
31	220	Largest area of plant growth on E side slope of DC
32	090	Largest area of plant growth on W side slope of DC
33	170	Erosion in maintenance road just E of SW corner of DC
34	090	Missing rock material along S edge of N perimeter diversion channel, view E
35	260	Ponded water in S perimeter diversion channel, view W
36	100	Bent fence post on N security fence, view E

^aSee Plate 1 for map of photograph locations.

^bDeclination angle of 14° E.

Inspection Photograph Log

Site: Salt Lake City (South Clive), Utah

Date of Inspection: April 14, 1994

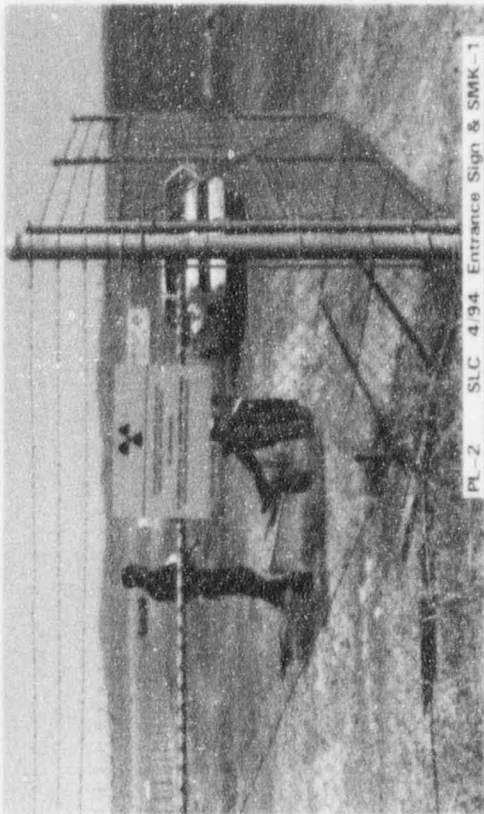
Time of Day: 8:45 a.m. to 7:00 p.m.

Weather Conditions: Mostly cloudy to clear, strong N wind, 50 to 60 °F.

Photographer's Location Number ^a	Azimuth ^b	Photograph Description/Remarks
37	180	New stock fence set by Envirocare along the W site boundary, view S
38	090	Wide enclosed area at S end of site between the security fence and the Envirocare fence, view E
39	180	Shallow depression and small rill caused by minor erosion in enclosed area on E side of site between the security fence and the Envirocare fence, view S
40	120	Ponded water on E side of site adjacent to the Envirocare fence, view SE
41	070	Ponded water in outflow channel just W of junction of perimeter diversion channels at SW corner of site, view ENE
42	250	Outflow channel that drains water from SW corner of site, view WSW
43	---	Envirocare ground-water monitor well GW-16
44	---	Envirocare ground-water monitor well GW-4
45	---	Envirocare ground-water monitor well GW-17
46	---	Unidentified ground-water monitor well on site property just SE of entrance gate
47	145	Envirocare ground-water monitor wells GW-4 and GW-23, which is just inside Envirocare property
48	220	Envirocare ground-water monitor well GW-22, which is just inside Envirocare property
49	100	Envirocare Environmental Station No. 32 just outside SW corner of site
50	---	Nail at top of wood stake in power pole just W of site is starting point for survey of settlement plates
51	170	Gasoline and diesel fuel tanks just W of site property
52	100	Entrance gate to Envirocare property just S of SW corner of site
53A	---	USGLOS section corner monument at NW corner of Section 32
53B	---	Same as PL-53A, closeup of survey cap
54	---	Damaged survey monument at NE corner of Section 32

^aSee Plate 1 for map of photograph locations.

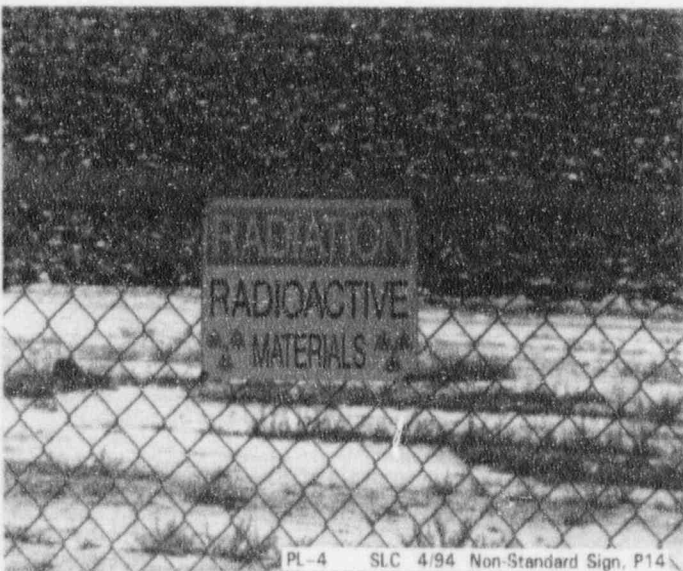
^bDeclination angle of 14° E.



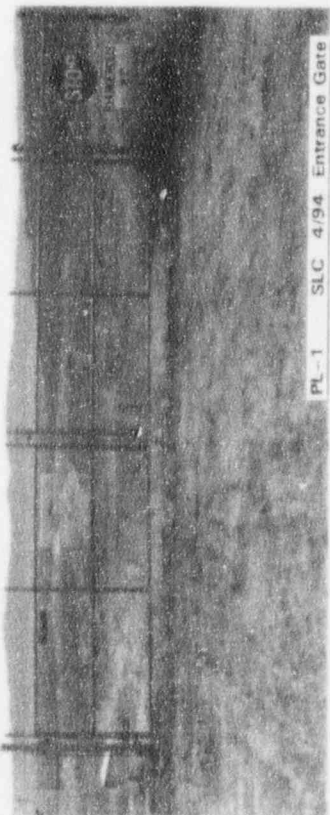
PL-2 SLC 4/94 Entrance Sign & SMK-1



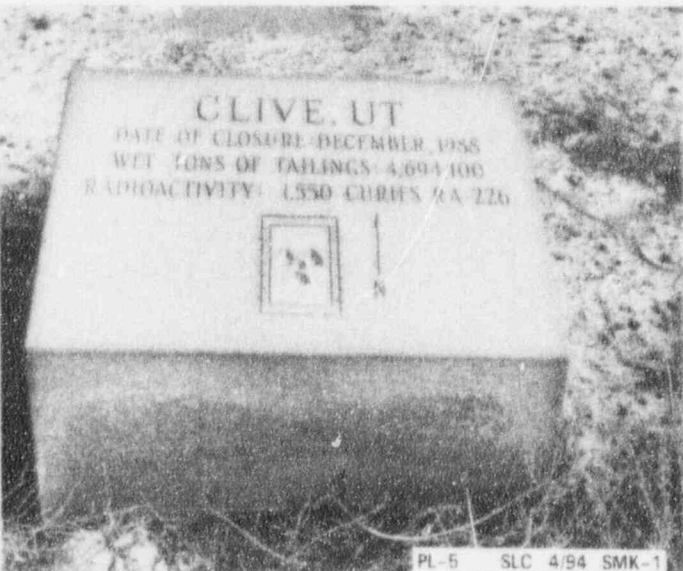
PL-3 SLC 4/94 Standard Sign, P1



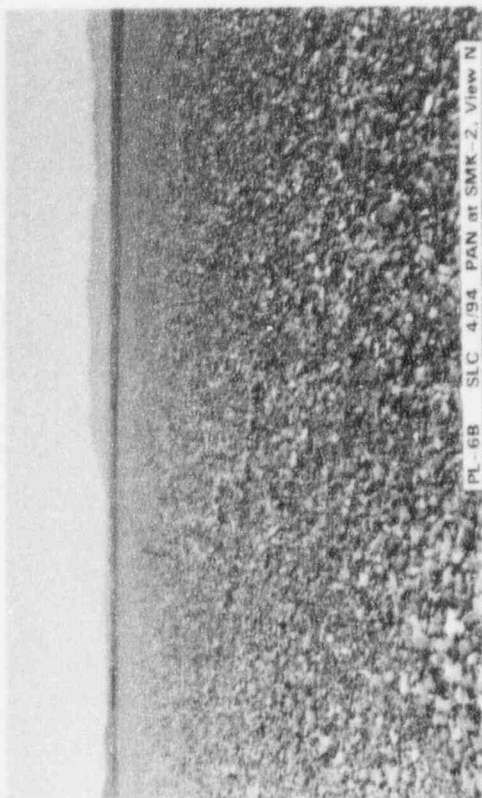
PL-4 SLC 4/94 Non-Standard Sign, P14



PL-1 SLC 4/94 Entrance Gate



PL-5 SLC 4/94 SMK-1



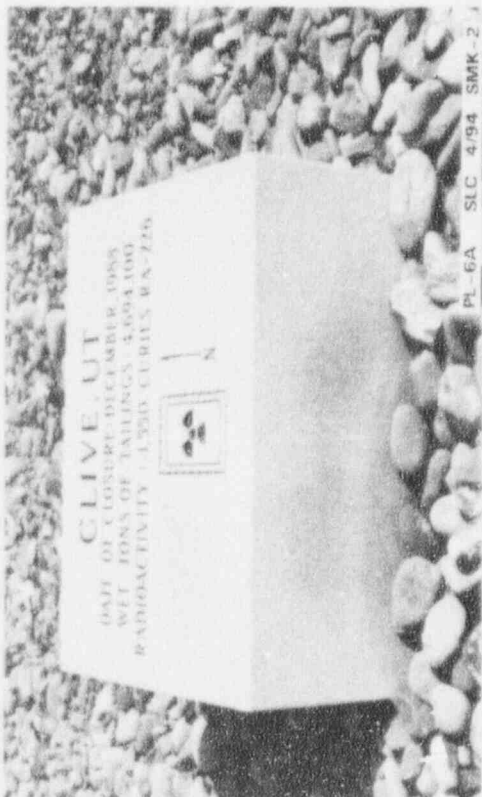
PL-6B SLC 4/94 PAN at SMK-2, View N



PL-6C SLC 4/94 PAN at SMK-2, View NE



PL-6D SLC 4/94 PAN at SMK-2, View E

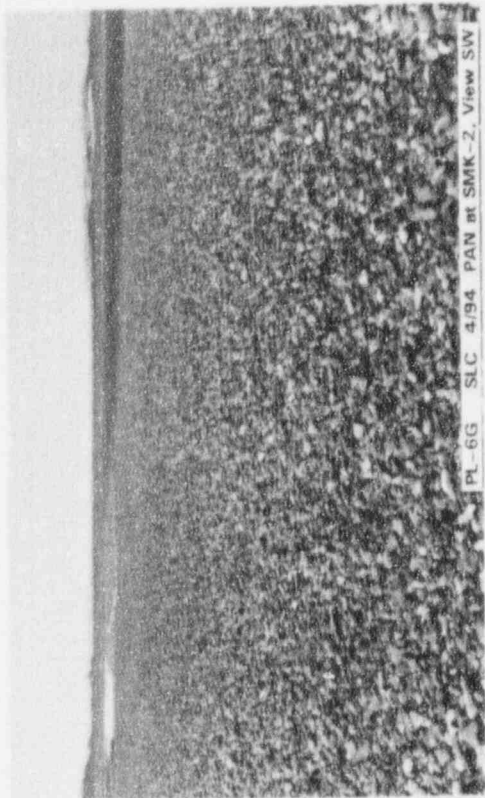


PL-6A SLC 4/94 SMK-2

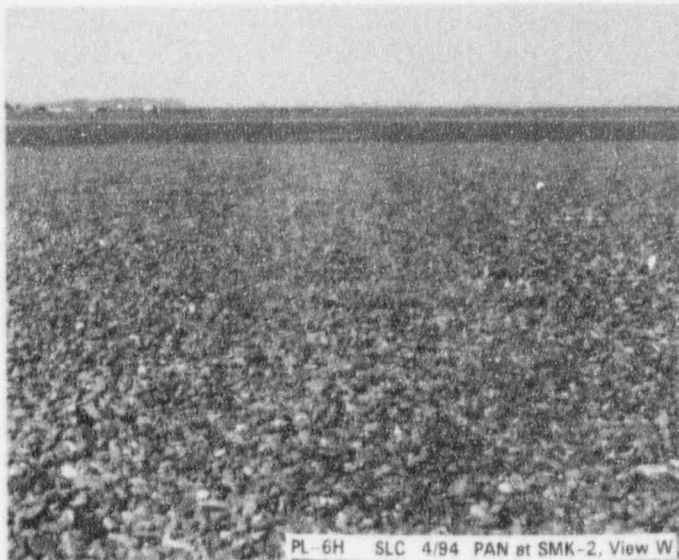
CLIVE, UT
DATE OF CLOSURE: DECEMBER 1985
WET TONS OF TAILINGS: 4,004.100
RADIOACTIVITY: 1,350 CURIES R.N.-726



PL-6E SLC 4/94 PAN at SMK-2, View SE



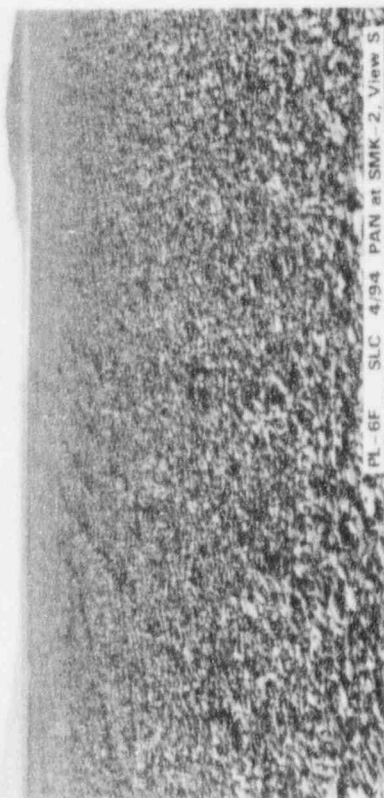
PL-6G SLC 4/94 PAN at SMK-2, View SW



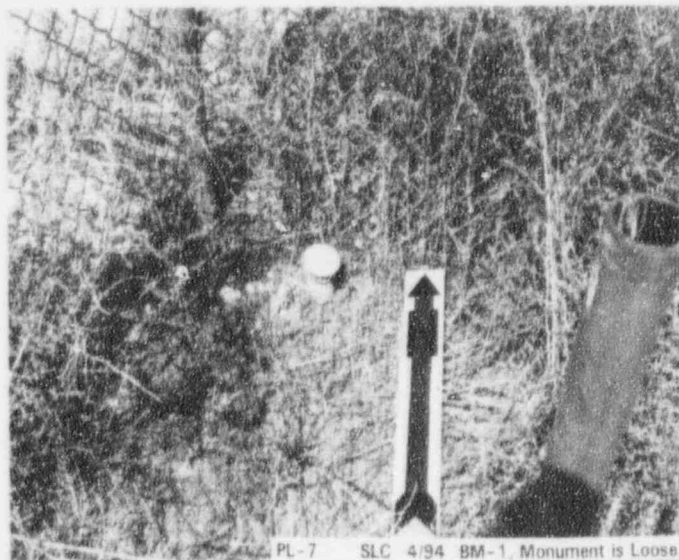
PL-6H SLC 4/94 PAN at SMK-2, View W



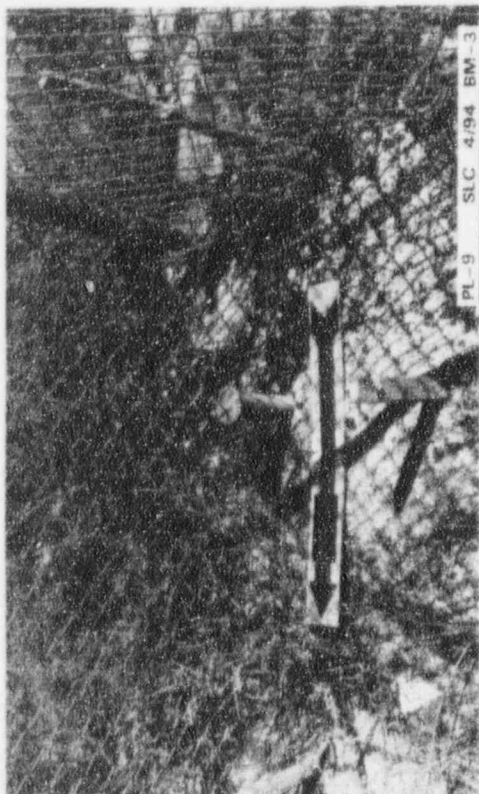
PL-6I SLC 4/94 PAN at SMK-2, View NW



PL-6F SLC 4/94 PAN at SMK-2, View S



PL-7 SLC 4/94 BM-1, Monument is Loose



PL-9 SLC 4/94 BM-3



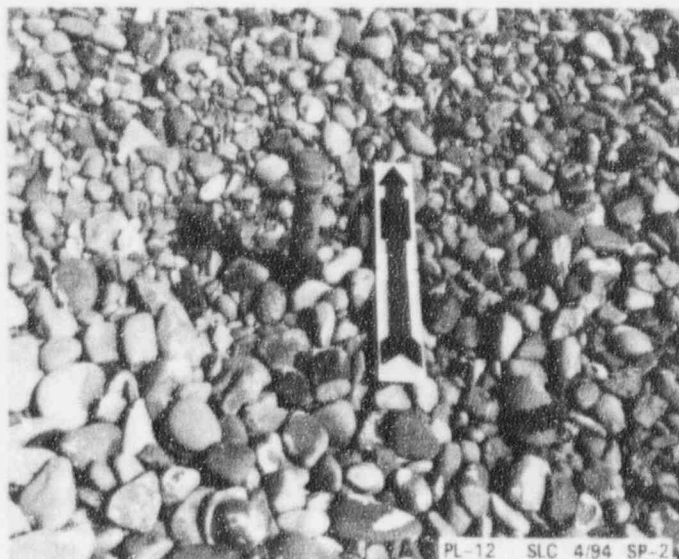
PL-10 SLC 4/94 BM-4



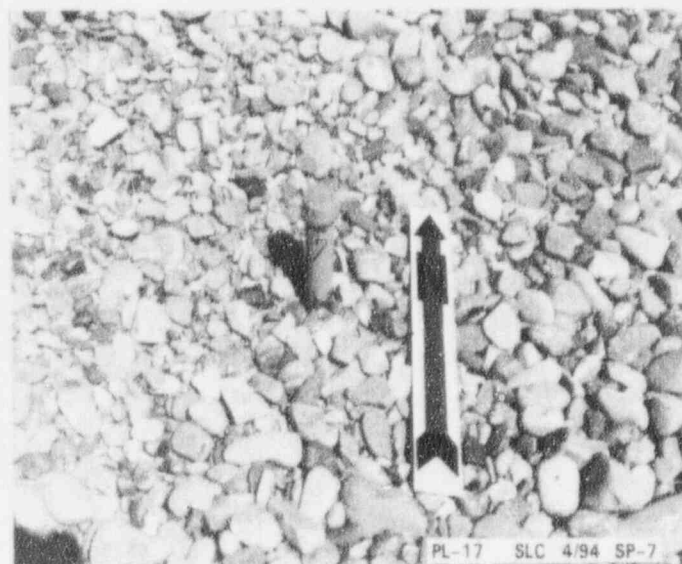
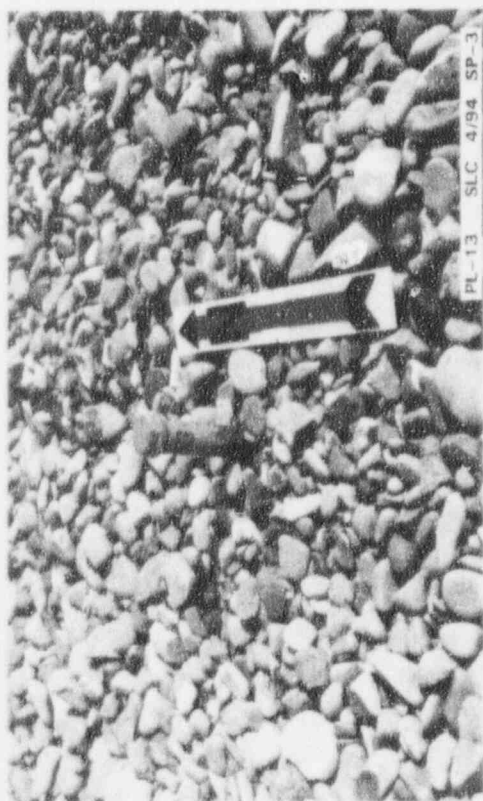
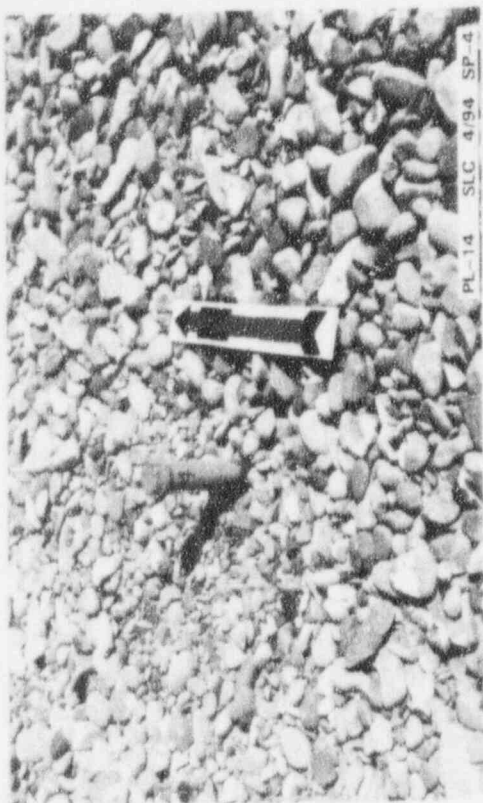
PL-11 SLC 4/94 SP-1

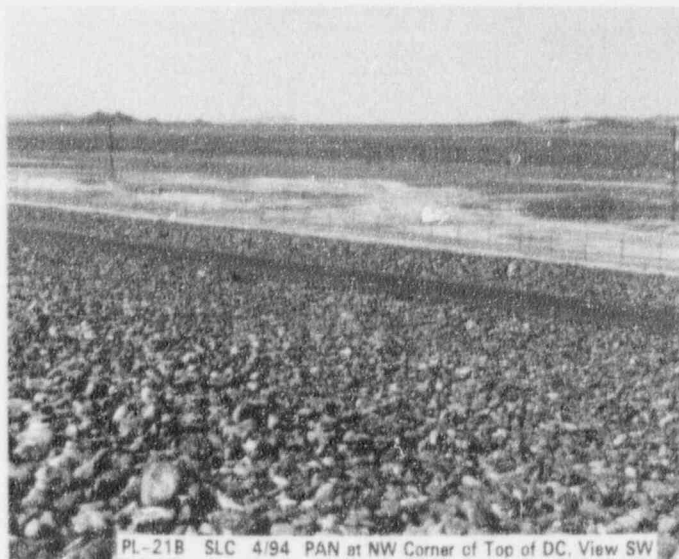
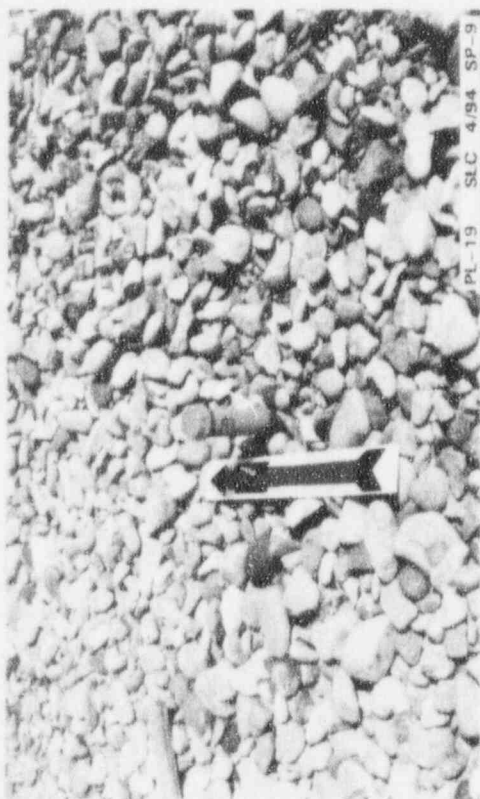


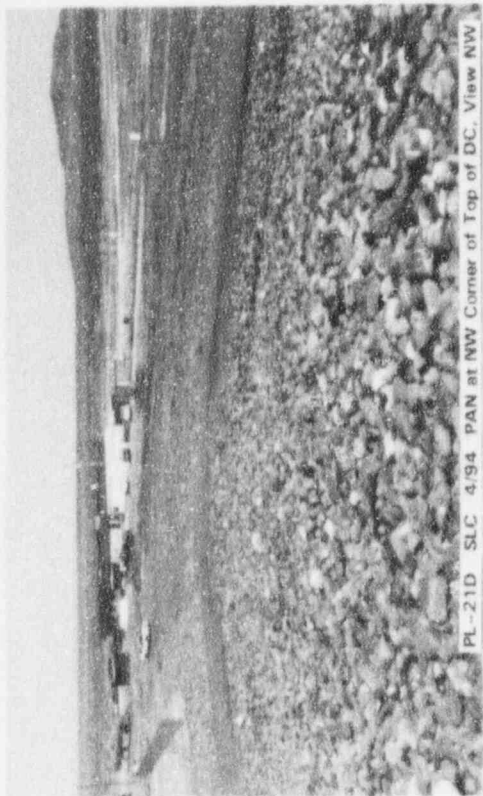
PL-8 SLC 4/94 BM-2



PL-12 SLC 4/94 SP-2







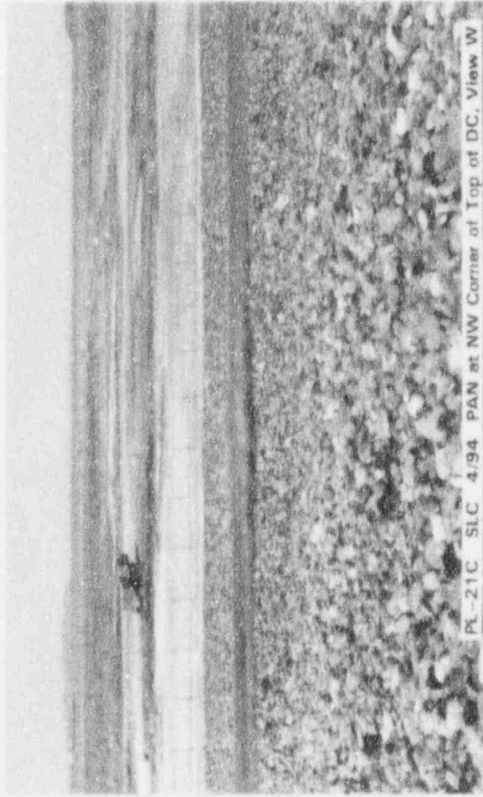
PL-21D SLC 4/94 PAN at NW Corner of Top of DC, View NW



PL-21E SLC 4/94 PAN at NW Corner of Top of DC, View N



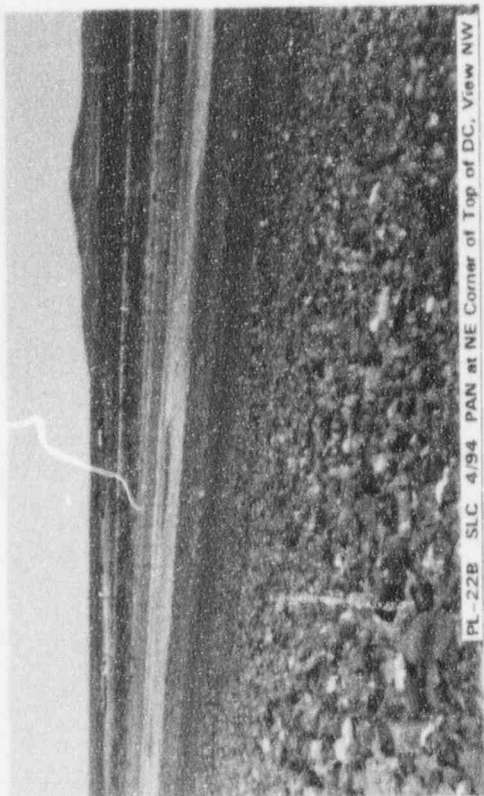
PL-21F SLC 4/94 PAN at NW Corner of Top of DC, View NE



PL-21C SLC 4/94 PAN at NW Corner of Top of DC, View W



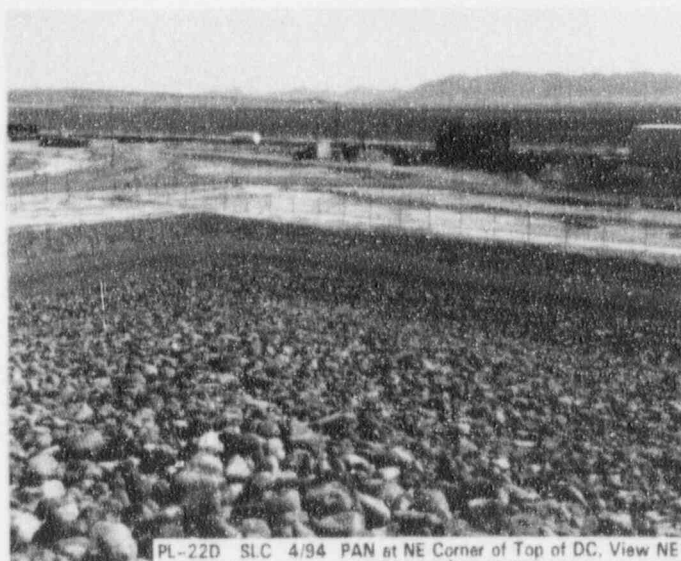
PL-21G SLC 4/94 PAN at NW Corner of Top of DC, View E



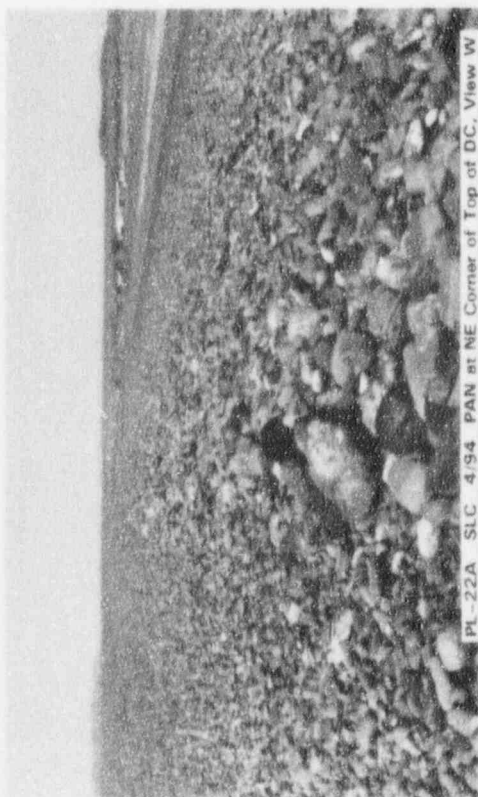
PL-22B SLC 4/94 PAN at NE Corner of Top of DC, View NW



PL-22C SLC 4/94 PAN at NE Corner of Top of DC, View N



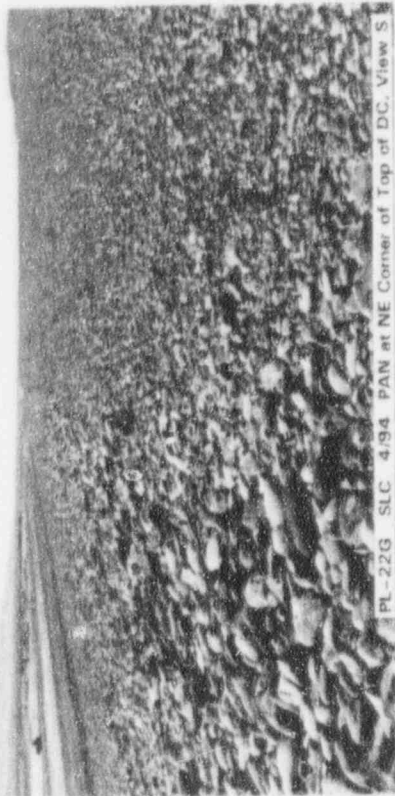
PL-22D SLC 4/94 PAN at NE Corner of Top of DC, View NE



PL-22A SLC 4/94 PAN at NE Corner of Top of DC, View W



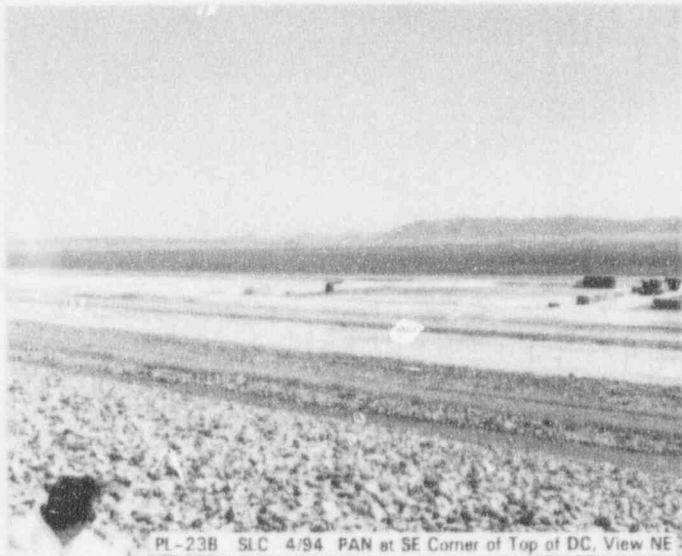
PL-22E SLC 4/94 PAN at NE Corner of Top of DC, View E



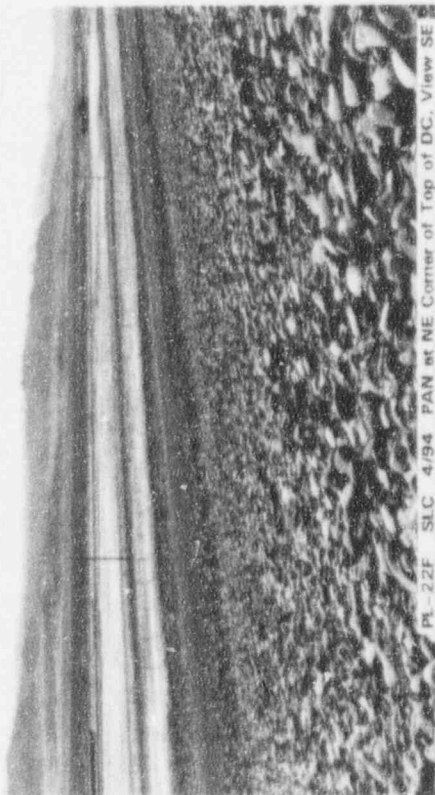
PL-22G SLC 4/94 PAN at NE Corner of Top of DC, View S



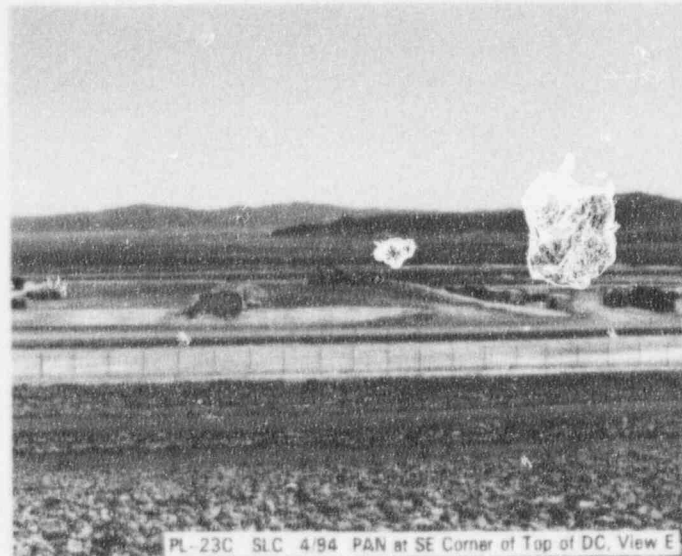
PL-23A SLC 4/94 PAN at SE Corner of Top of DC, View N



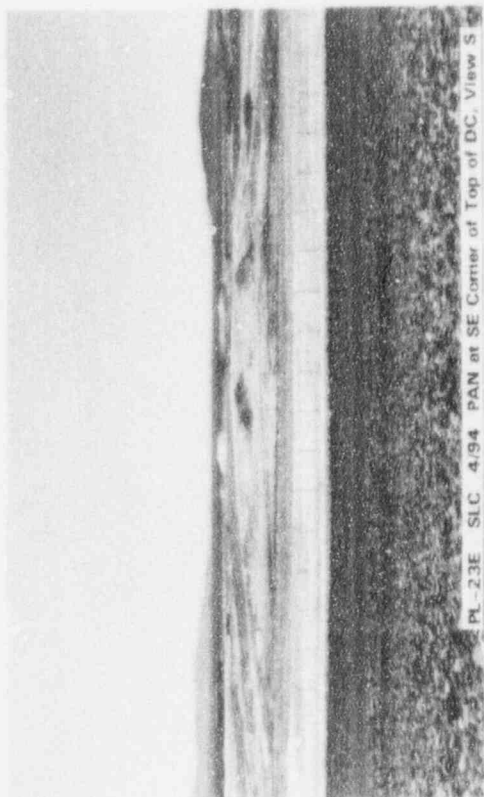
PL-23B SLC 4/94 PAN at SE Corner of Top of DC, View NE



PL-22F SLC 4/94 PAN at NE Corner of Top of DC, View SE



PL-23C SLC 4/94 PAN at SE Corner of Top of DC, View E



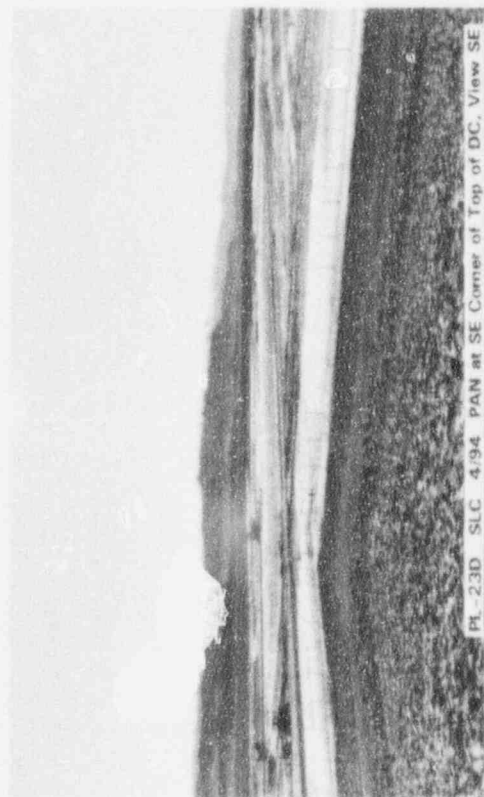
PL-23E SLC 4/94 PAN at SE Corner of Top of DC, View S



PL-23F SLC 4/94 PAN at SE Corner of Top of DC, View SW



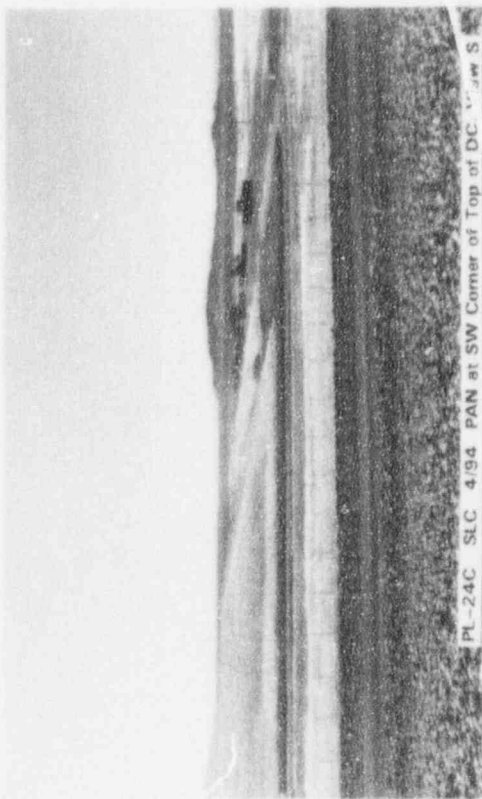
PL-23G SLC 4/94 PAN at SE Corner of Top of DC, View W



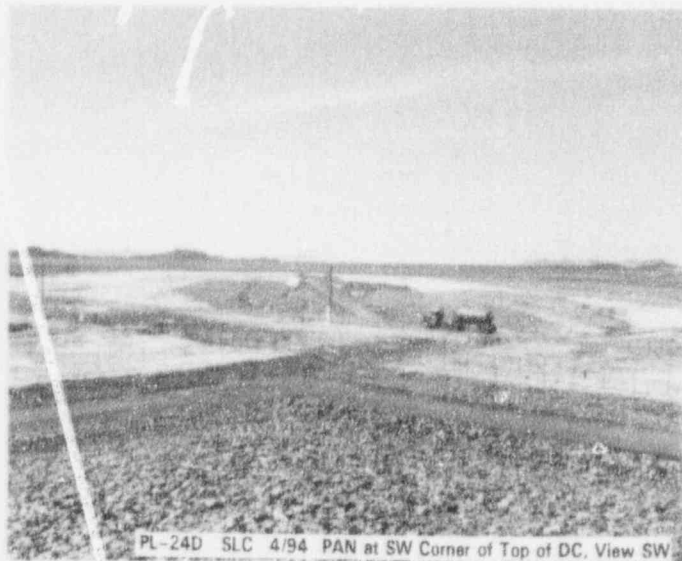
PL-23D SLC 4/94 PAN at SE Corner of Top of DC, View SE



PL-24A SLC 4/94 PAN at SW Corner of Top of DC, View E



PL-24C SLC 4/94 PAN at SW Corner of Top of DC, View S



PL-24D SLC 4/94 PAN at SW Corner of Top of DC, View SW



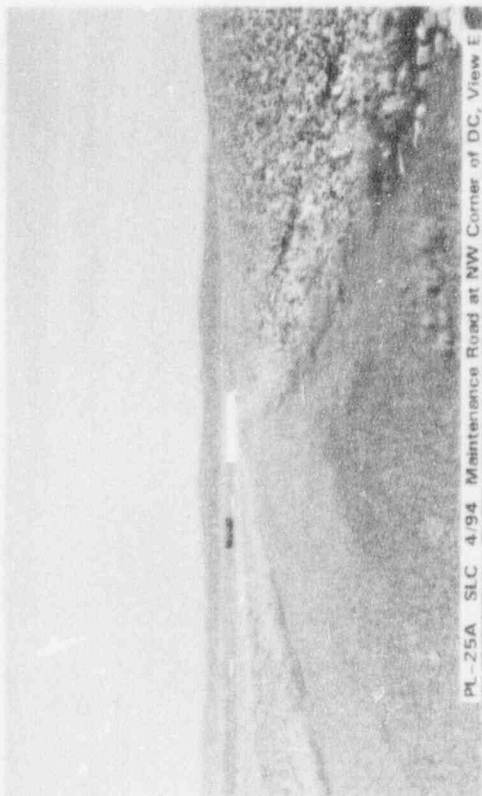
PL-24E SLC 4/94 PAN at SW Corner of Top of DC, View W



PL-24B SLC 4/94 PAN at SW Corner of Top of DC, View SE



PL-24F SLC 4/94 PAN at SW Corner of Top of DC, View NW



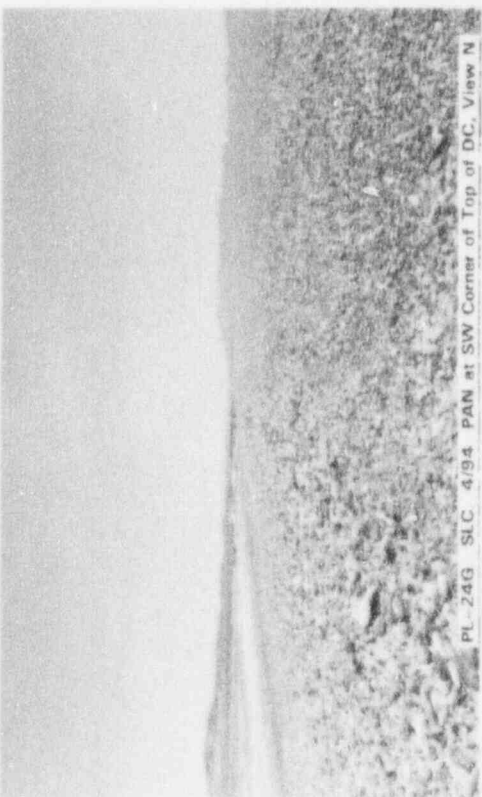
PL-25A SLC 4/94 Maintenance Road at NW Corner of DC, View E



PL-25B SLC 4/94 Maintenance Road at NW Corner of DC, View S



PL-25C SLC 4/94 Swale in Maintenance Road, View WNW



PL-24G SLC 4/94 PAN at SW Corner of Top of DC, View N



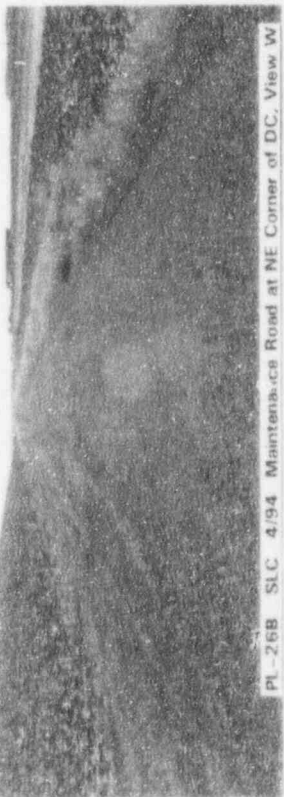
PL-26A SLC 4/94 Maintenance Road at NE Corner of DC, View S



PL-27A SLC 4/94 Maintenance Road at SE Corner of DC, View W



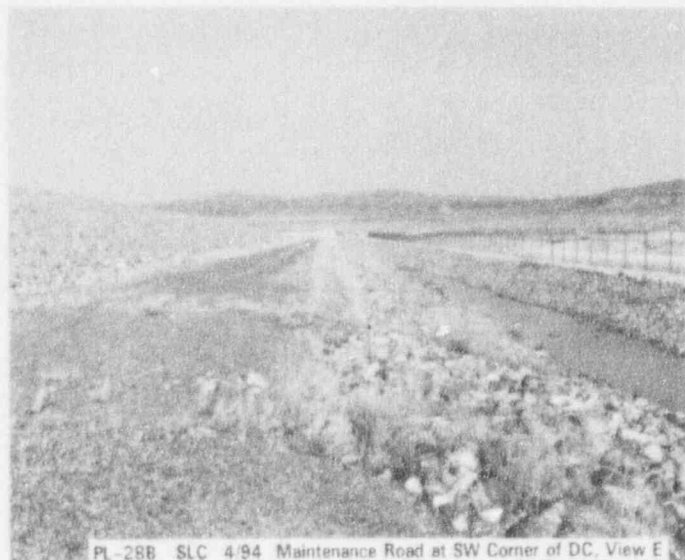
PL-27B SLC 4/94 Maintenance Road at SE Corner of DC, View N



PL-26B SLC 4/94 Maintenance Road at NE Corner of DC, View W



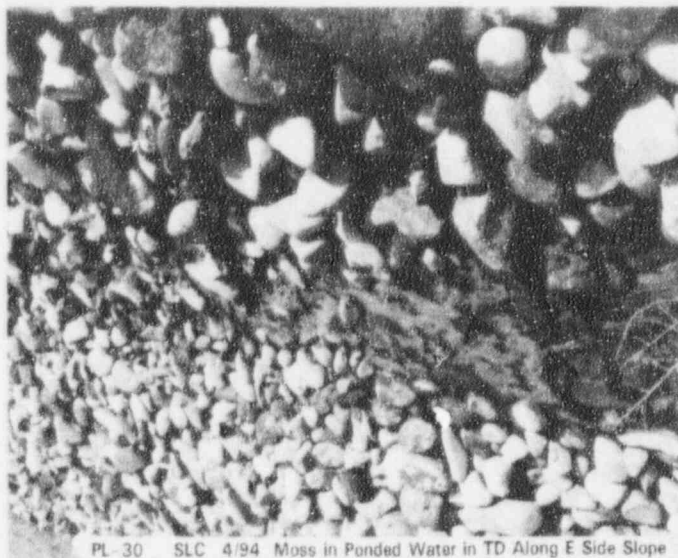
PL-28A SLC 4/94 Maintenance Road at SW Corner of DC, View N



PL-28B SLC 4/94 Maintenance Road at SW Corner of DC, View E



PL-29 SLC 4/94 Ponded Water in TD Near SE Corner of DC



PL-30 SLC 4/94 Moss in Ponded Water in TD Along E Side Slope



PL-31 SLC 4/94 Plant Growth on E Side Slope of DC



PL-28C SLC 4/94 Moss in Ponded Water at Jct of S & W PDCs



PL-32 SLC 4/94 Plant Growth on W Side Slope of DC



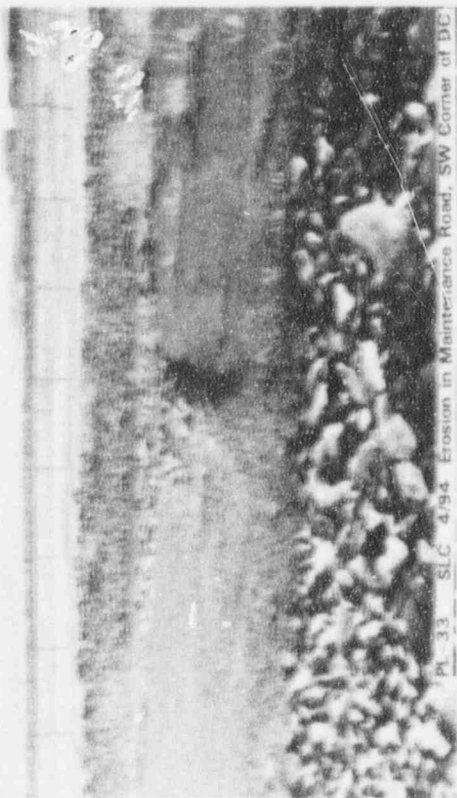
PL-34 SLC 4/94 Missing Rock Material Along S Edge of N PDC



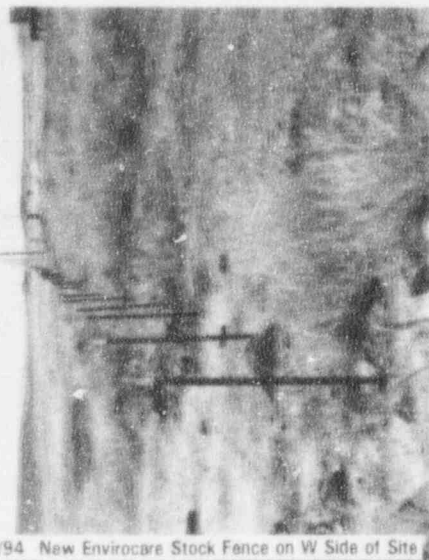
PL-35 SLC 4/94 Ponded Water in S PDC



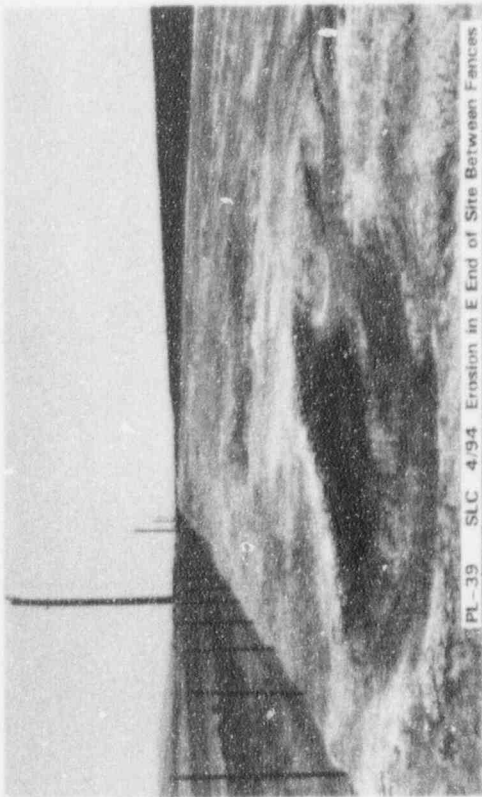
PL-36 SLC 4/94 Bent Fence Post on N Security Fence



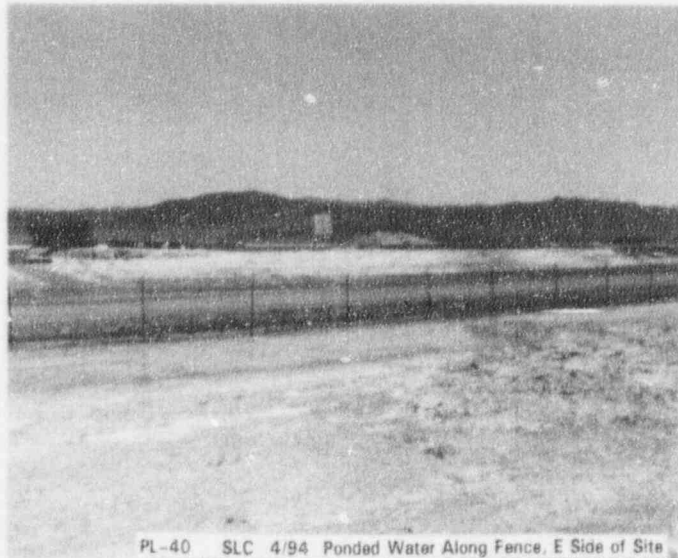
PL-33 SLC 4/94 Erosion in Maintenance Road, SW Corner of DC



PL-37 SLC 4/94 New Envirocare Stock Fence on W Side of Site



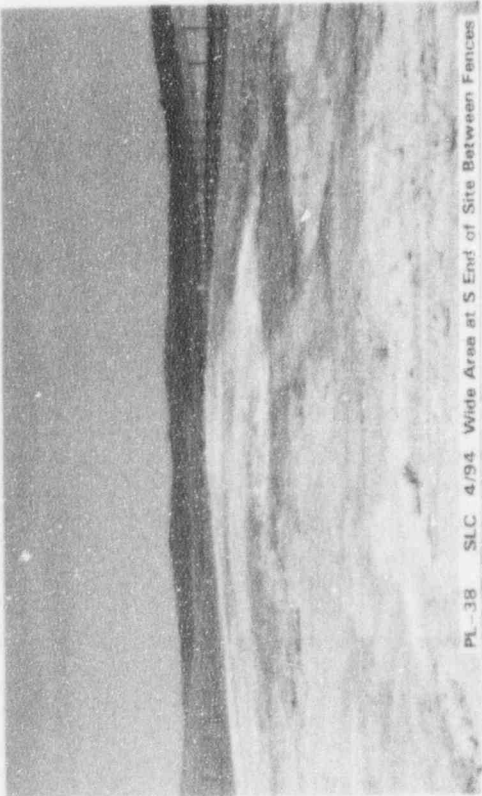
PL-39 SLC 4/94 Erosion in E End of Site Between Fences



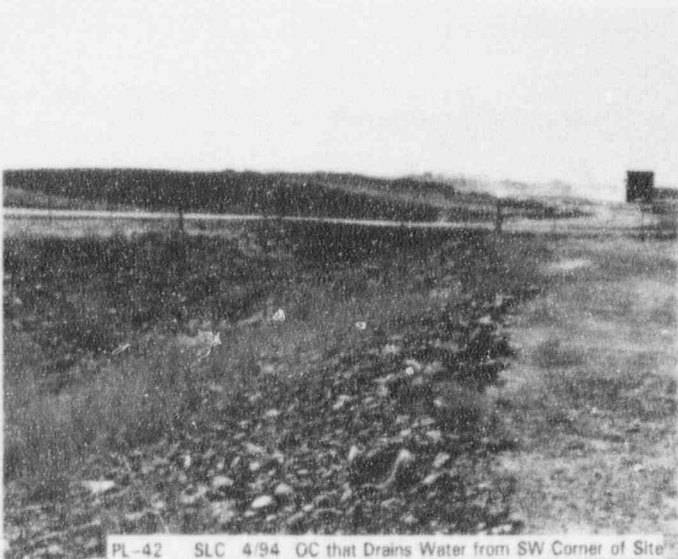
PL-40 SLC 4/94 Pooled Water Along Fence, E Side of Site



PL-41 SLC 4/94 Pooled Water in OC, SW Corner of Site



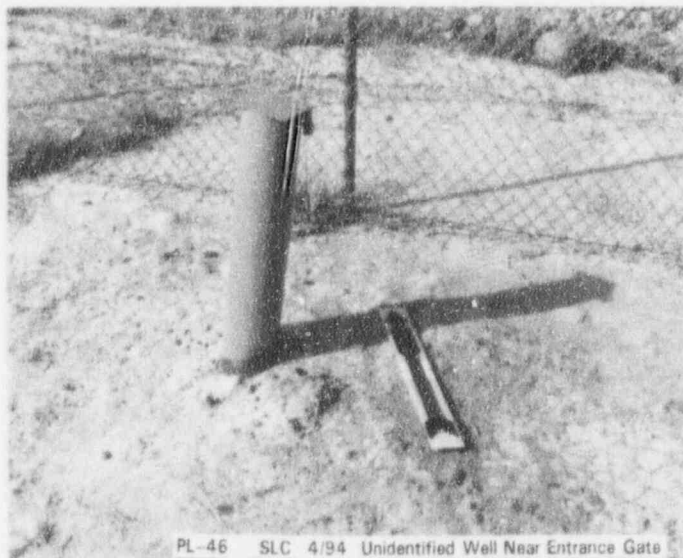
PL-38 SLC 4/94 Wide Area at S End of Site Between Fences



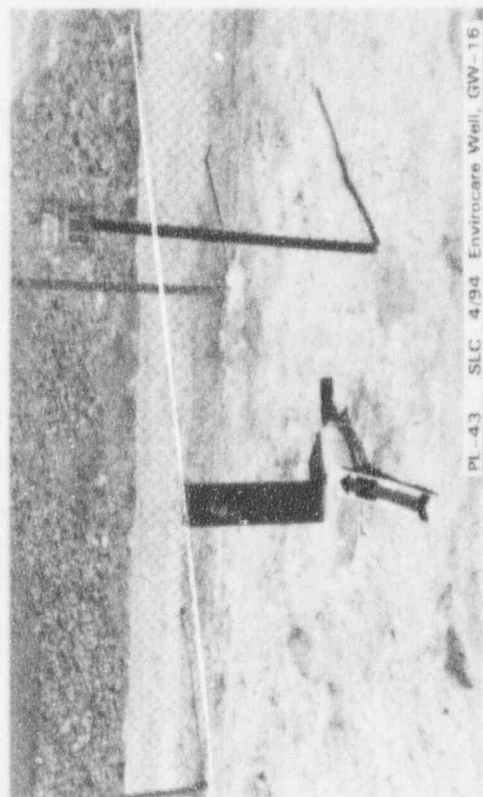
PL-42 SLC 4/94 OC that Drains Water from SW Corner of Site



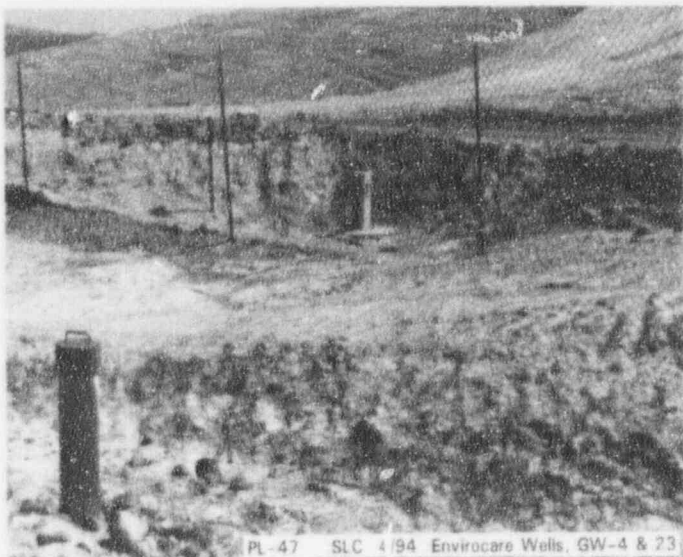
PL-45 SLC 4/94 Envirocare Well, GW-17



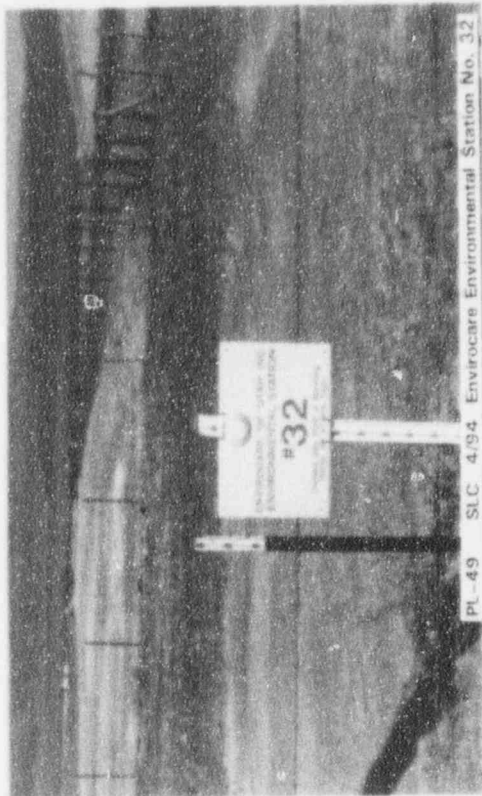
PL-46 SLC 4/94 Unidentified Well Near Entrance Gate



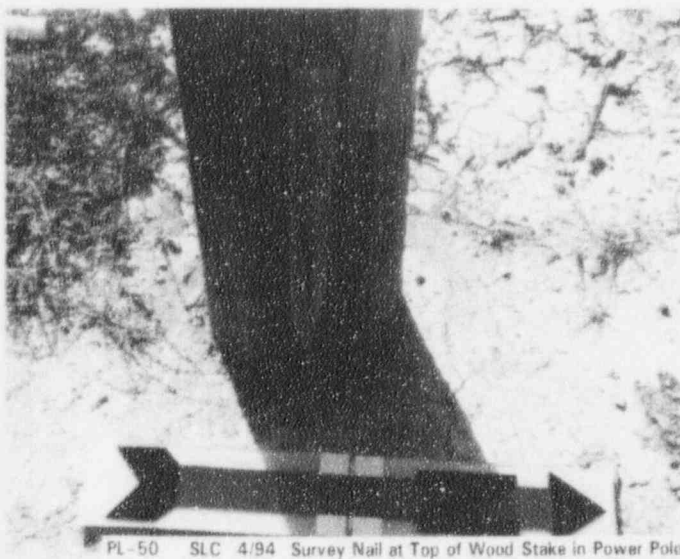
PL-43 SLC 4/94 Envirocare Well, GW-15



PL-47 SLC 4/94 Envirocare Wells, GW-4 & 23



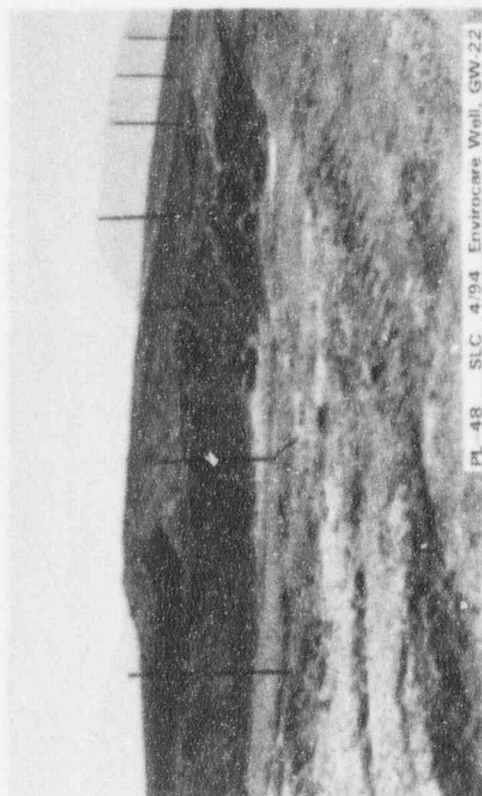
PL-49 SLC 4/94 Envirocare Environmental Station No. 32



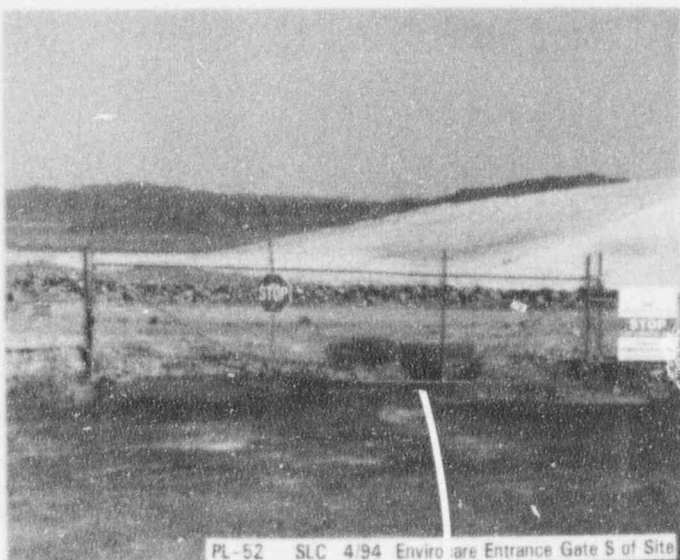
PL-50 SLC 4/94 Survey Nail at Top of Wood Stake in Power Pole



PL-51 SLC 4/94 Gasoline and Diesel Fuel Tanks



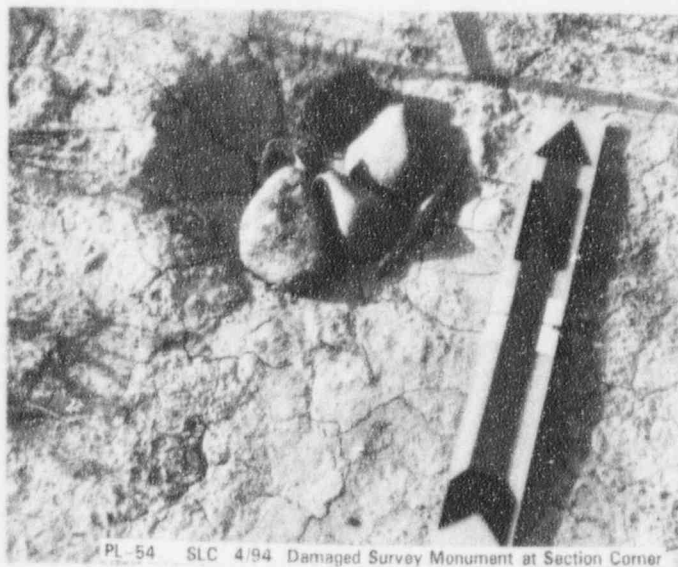
PL-48 SLC 4/94 Envirocare Well, GW-22



PL-52 SLC 4/94 Envirocare Entrance Gate S of Site



PL 53B SLC 4/94 Closeup of Survey Cap., USGLOS Monument



PL 54 SLC 4/94 Damaged Survey Monument at Section Corner



PL 53A SLC 4/94 USGLOS Section Corner Monument

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