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Subject: 2001 Annual Site Inspection and Monitoring Compliance Report for UMTRCA Title II
Disposal Sites

Dear Mr. Leach:

Four copies of the 2001 *Annual Inspection and Monitoring Compliance Report for Uranium Mill Tailings Radiation Control Act Title II Disposal Sites* are enclosed. This report is submitted to comply with reporting requirements of 10 CFR 40.28.

The report covers the annual inspections of the Edgemont, South Dakota; Bluewater, New Mexico; and Sherwood, Washington Title II disposal sites.

If NRC has comments or questions about this report, please contact me at 970-248-6037.

Sincerely,

A handwritten signature in black ink, appearing to read "Art K. Kleinrath".

Arthur Kleinrath
Program Manager

Enclosures

cc w/o enclosure:
M. Plessinger, MACTEC-ERS
Project Record File (LREP 6.3.2 thru A. Garcia)

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Long-Term Surveillance and Maintenance Program

2001 Annual Site Inspection and Monitoring Compliance Report for Uranium Mill Tailings Radiation Control Act Title II Disposal Sites

January 2002



Edgemont, South Dakota,
Disposal Cell Site, 2001



Sherwood, Washington, Disposal Cell Site, 2001

Long-Term Surveillance and Maintenance Program

**2001 Annual Site Inspection and Monitoring
Compliance Report
for
Uranium Mill Tailings Radiation Control Act
Title II Disposal Sites**

January 2002

Prepared by
U.S. Department of Energy
Grand Junction Office
Grand Junction, Colorado

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Summary

This report presents results of annual site inspections for the three Uranium Mill Tailings Radiation Control Act (UMTRCA) Title II mill tailings sites that currently fall under the DOE general license for long-term custody and care of uranium or thorium byproduct materials disposal sites (10 CFR 40.28). Specific inspection and monitoring requirements are in the Long-Term Surveillance Plans for each site.

The Bluewater, New Mexico, UMTRCA Title II disposal site was inspected on May 8 and May 10, 2001. The site is generally in good condition. No ponded water was present on top of the north end of the main tailings pile during this inspection where water had been discovered during previous inspections. Samples of the white carbonate precipitate from evaporated water were collected and analyzed for gross alpha and gross beta activity. The activity levels were negligible. Unauthorized livestock grazing was occurring on site. Open sections of the perimeter fence, presumably to allow livestock ingress and egress were discovered and repaired. Livestock intrusion does not threaten the integrity of the disposal site but it does present a management issue for DOE. Results of ACL and PCB groundwater monitoring showed all ACLs to be within specified limits and there was no detection of PCBs.

The Edgemont, South Dakota, UMTRCA Title II disposal site was inspected on June 5, 2001. The site is in good condition. Minor fence repairs are recommended. Ground-water monitoring is not required for this site.

The Sherwood, Washington, UMTRCA Title II disposal site was inspected on October 24, 2001. The site is in good condition overall. Two items of special interest exist: (1) the classification of the reclaimed tailings impoundment as a dam, and (2) the periodic ponding of water in a small area on the top of the tailings impoundment. The classification of the impoundment as a dam necessitates a dam safety inspection to assure continued compliance with the Federal Dam Safety Act. Occurrence of ponded water on top of the main tailings pile indicates slight settling of the tailings materials. No issues were identified during the dam safety inspection and the pond was dry at the time of the inspection. No evidence of excessive settlement was observed in the pond area. Ground-water monitoring and piezometer water level measurements conducted in July 2001 showed all measured parameters to be within acceptable ranges.

End of current text

1.0 Bluewater

Bluewater Site Long-Term Custody Compliance Requirements

The following list comprises the long-term custody compliance requirements for the Bluewater site as defined in Section 3.2 of the site Long-Term Surveillance Plan:

1. Annual site inspection.
2. Annual inspection report.
3. Follow-up inspections and inspection reports, as necessary.
4. Site maintenance as necessary to sustain design functions.
5. Emergency measures in the event of catastrophe.
6. Environmental monitoring as required.

The Bluewater site long-term custody compliance requirements were fulfilled for 2001 as follows:

1. The site was inspected on May 8 and May 10, 2001 in accordance with the inspection procedure as outlined in Section 3.3.2 of the Long-Term Surveillance Plan (LTSP).
2. This document serves as the annual inspection report.
3. No follow-up inspections were necessary.
4. No maintenance was necessary to sustain design functions, although fence repairs and road gully repairs were made.
5. No catastrophic events necessitated emergency measures.
6. The required ground-water monitoring, as specified in Section 3.7.1 of the LTSP, was completed and the results are summarized in this report (see pages 9 and 10).

Bluewater Site Inspection Results

M. R. Widdop (Chief Inspector) and M. E. Reed (Assistant Inspector), both of MACTEC-ERS, the Technical Assistance and Remediation contractor at the U.S. Department of Energy (DOE) Grand Junction Office (GJO), and A. W. Kleinrath of DOE-GJO conducted the inspection on May 8 and May 10, 2001. T. L. Johnson of the U.S. Nuclear Regulatory Commission observed a portion of the inspection. The inspection was conducted in accordance with the *Long-Term Surveillance Plan [LTSP] for the DOE Bluewater (UMTRCA Title II) Disposal Site near Grants, New Mexico* (July 1997) and procedures established by DOE-GJO to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.28 (10 CFR 40.28).

The purposes of the inspection were to confirm the integrity of visible features at the site, to identify changes in conditions that may affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring.

No photographs were taken during this inspection.

Entrance Gate, Access Road, and Access Gate

The entrance gate (at County Road 334) is a steel, double-swing stock gate. A chain and padlocks belonging to DOE and various utility companies that have rights-of-way across the site secure the gate. The access road leads from the entrance gate to the access gate. The access road is an all-weather road surfaced with crushed basalt and extends northward, along a narrow strip of DOE property, for approximately 1,700 feet to the site access gate. The access gate is also a steel, double-swing stock gate secured by padlocks keyed the same as the entrance gate. The entrance gate, access road, and access gate are all in excellent condition.

Perimeter Signs

Fifty-four perimeter or warning signs, designated P1 through P52 on Figures 1-1 and 1-2 (including perimeter signs P9A and P9B), are posted at access points along and right-of-way intersections with the site boundary and around the main and carbonate tailings disposal cells. At the Bluewater site, all signs are identical and convey the information typically conveyed on entrance signs at other Long-Term Surveillance and Maintenance (LTSM) Program sites.

The signs are mounted about 5 feet above the ground on steel posts set in concrete. Posts for signs along the property boundary are located about 5 feet inside the actual boundary line. The remaining 42 perimeter signs are spaced about 500 feet apart around the main and carbonate tailings disposal cells about 100 feet from the toe of the cells. All signs are in good condition but the trefoil is starting to fade. A self-adhesive label displaying the new area code (970) for the DOE 24-hour phone number was applied to each sign. Posts for perimeter signs P14, P15, and P16 are loosening, presumably from being used as rubbing posts by livestock (see "Site Perimeter and Outlying Areas" below).

Site Marker and Boundary Monuments

A granite site marker lies between the southwest corner of the main tailings disposal cell and the northwest corner of the carbonate tailings disposal cell. The marker is in excellent condition.

Twenty-four boundary monuments define the site boundary. These monuments are typically inside the perimeter fence, several feet inside the true corner or boundary line. The boundary monuments and the general area around the monuments were inspected for signs of disturbance. None was found.

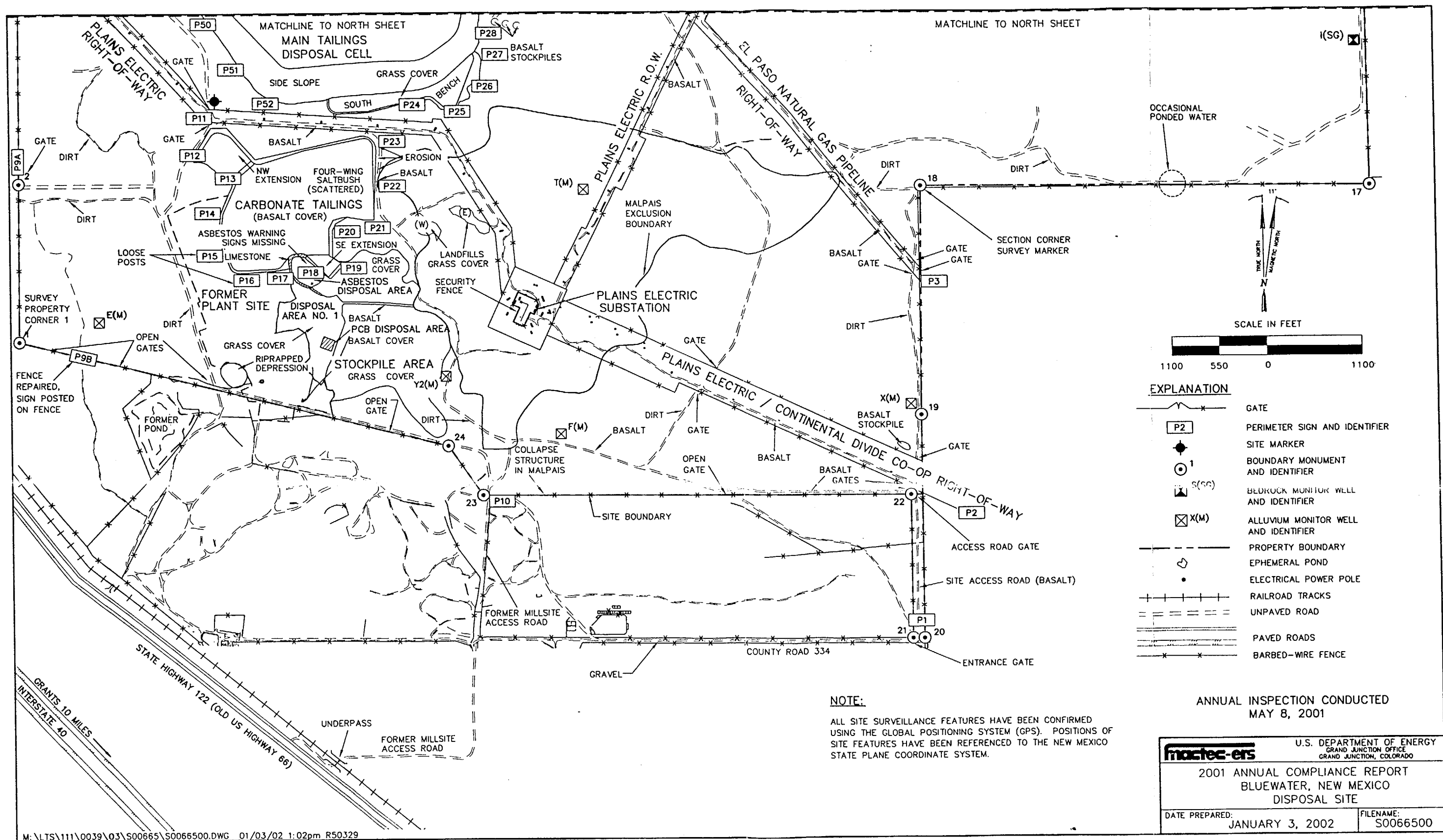


Figure 1-1. Bluewater, New Mexico, South Area, 2001 Inspection Drawing

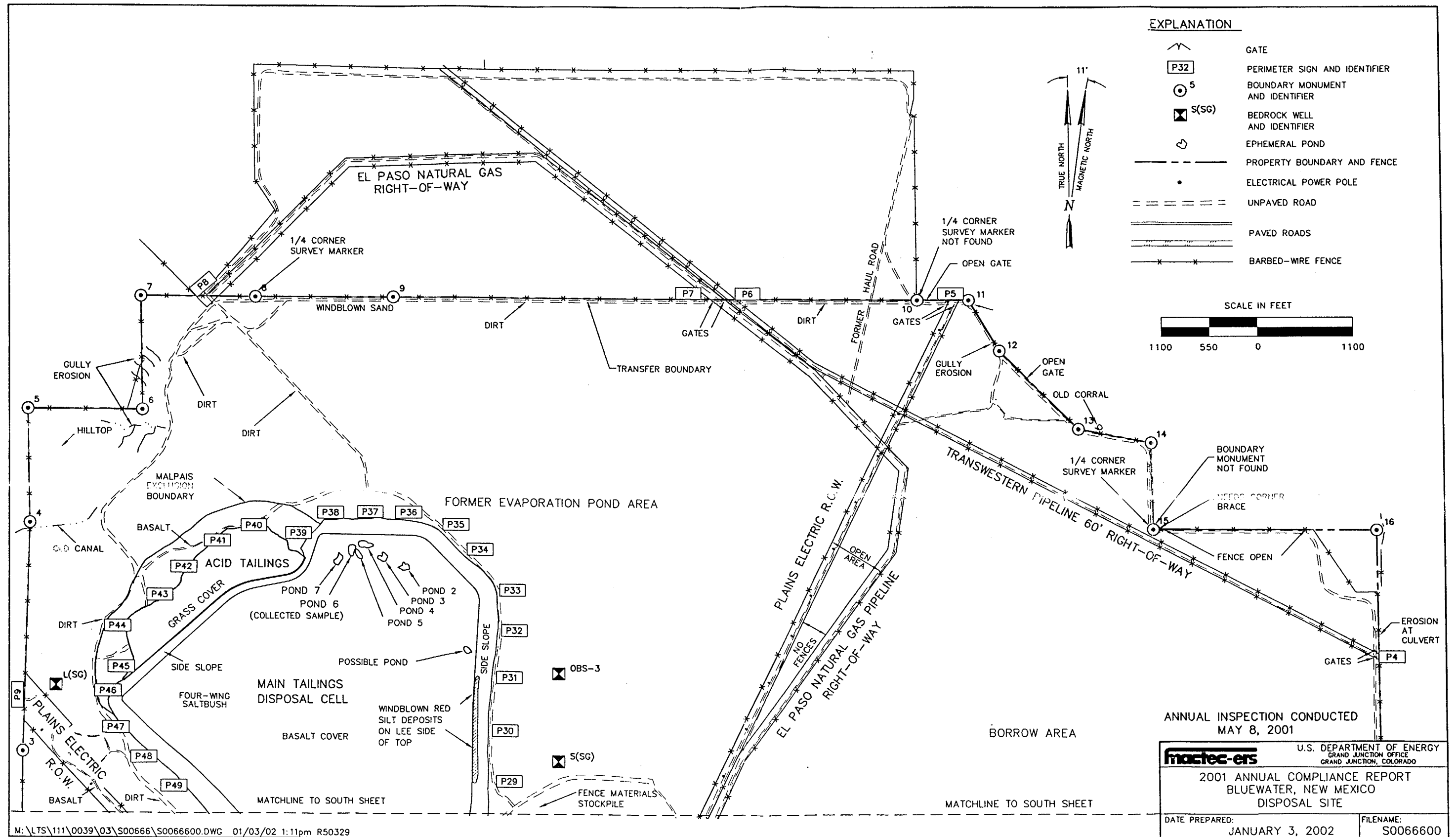


Figure 1-2. Bluewater, New Mexico. North Area, 2001 Inspection Drawing

Monitor Wells

There are nine monitor wells at this site. All are inside the site boundary. Five of the wells are screened in the alluvial aquifer (Figure 1-1). They include the letter "M" in their designation. The five alluvial wells, E(M), F(M), T(M), X(M), and Y2(M), are all in excellent condition.

The other four wells are screened in the San Andres Limestone-Glorieta Sandstone. The San Andres Limestone-Glorieta Sandstone is the bedrock aquifer at the site. Three of the four bedrock aquifer wells include the letters "SG" in their designation (Figures 1-1 and 1-2). A fourth well, OBS-3, is also screened in the bedrock aquifer. The four bedrock wells, L(SG), OBS-3, S(SG), and I(SG), are also in excellent condition.

Surface support equipment for the monitor wells (wiring and PVC piping) is weathered and shows evidence of disturbance by wildlife. However, these conditions have not impacted sampling activities.

Main Tailings, Acid Tailings, and South Bench Disposal Cells

These three disposal cells are contiguous and together constitute one large disposal area of approximately 320 acres. The main tailings disposal cell is covered with basalt riprap. It slopes northward. The top slope grade decreases from 3 to 4 percent at the south end to less than 0.5 percent at the north end. The top slopes of the acid tailings and the south bench disposal areas are essentially flat and covered by grass. The side slopes of all three disposal cells are protected by basalt riprap. All three disposal cells are generally in excellent condition.

Widely scattered dead plants are present on the main tailings disposal cell, mostly on the east side slope. The plants are predominantly Russian thistle, an annual weed. Neither DOE nor the U.S. Nuclear Regulatory Commission (NRC) considers plant encroachment an issue at this site.

Fine-grained windblown sand has been deposited for about 1,000 feet along the top of the east side slope of the main tailings pile. Mostly, the sand surface is 3 to 4 inches beneath the riprap surface, but occasionally the sand fills the riprap interstices to the top. This accumulation is insignificant at this time. Plants are not preferentially establishing in the sand. Because the climate is relatively dry and plant cover upwind from the disposal cell is sparse, sand accumulation may increase. Inspectors will continue to monitor accumulations of windblown sand, here and elsewhere on site.

At the north end of the main tailings disposal cell, the top slope flattens to less than 0.5 percent. In previous years, inspectors found water ponded in this area in depressions. This year the depressions did not contain standing water but fine-grained material beneath the riprap was moist. Inspectors collected a sample of the moist material for laboratory analysis. The white material was identified as a carbonate mineral, either calcite or dolomite. Gross alpha and gross beta activity was negligible (Grand Junction Office Analytical Laboratory, Requisition 17448, May 24, 2001).

The ponding may be due to settlement. The northern part of the main tailings disposal cell is the place where slimes from the settling ponds were placed. Just as likely, however, is that the low

spot is an artifact of construction. A grade as low as less than 0.5 percent is hard to achieve over an area as large as the north end of the main tailings disposal cell.

Inspectors will continue to monitor ponding on top of the main tailings disposal cell. Given that evaporation greatly exceeds precipitation in this area, ponding is believed to be infrequent and brief; therefore, it is not a significant concern.

Carbonate Tailings Disposal Cell, Asbestos and PCB Disposal Areas, and Landfills

The top and side slopes of the carbonate tailings disposal cell are covered by basalt riprap (Figure 1-1). The top, for the most part, slopes gently eastward. The small northwest and southeast extensions slope in their respective directions. The carbonate tailings disposal cell and its extensions are in excellent condition. Erosion was observed along the east edge of the apron below the carbonate tailings cell. Soil fill appeared to be washing away from the edge of the apron (Figure 1-1). This does not affect the performance of the apron at this time but should be monitored.

The asbestos disposal area is a bowl-like feature or depression just south of the carbonate pile. It is in excellent condition. The north, west, and south side slopes of this depression are covered by limestone riprap; the bottom of the bowl is grass covered.

Additionally, the small riprap-covered polychlorinated biphenyl (PCB) disposal area is in excellent condition. It is easily recognized because it is almost perfectly square, surrounded by grass, and covered with riprap. The two landfills in grass-covered depressions east of the carbonate pile are also in excellent condition.

Other Areas Inside the Site

Other areas inside the site were inspected by driving the site perimeter road and other roads, including some utility right-of-way roads. Much of the southern and western parts of the site are inaccessible by vehicle because they are covered by basalt flows. Inspectors walked portions of the perimeter fence that could not be inspected from the vehicle.

Several utility company rights-of-way cross the site. These rights-of-way are enclosed by stock fences with locked gates where the rights-of-way intersect one another, cross the site boundary, or cross the perimeter road. In 2000, inspectors cut the chains on access gates because nonstandard locks were installed and the inspection team did not have a key. Gates were re-secured with fence wire. Some of these were repaired in 2001 using repair links. LTSM Program management decided to leave right-of-way gates open as they were encountered, so there was no need to repair all the chains.

An electric power substation is enclosed by a security fence near the center of the site along the Plains Electric Company right-of-way (Figure 1-1). Fencing around this station is in good condition.

Two other disposal areas, disposal area number 1 and the stockpile area, occur on the site south of the carbonate tailings disposal cell. Both are grass-covered and in excellent condition.

Inspectors found cattle grazing on the site during the inspection (see below, "Site Perimeter and Outlying Areas"). Grazing is not part of the current management plan for this site.

Site Perimeter and Outlying Areas

The perimeter fence, a barbed-wire stock fence set several feet inside the property line, is generally in good condition. Inspectors repaired the fence in several locations on the west side of the site where stock could get underneath the fence. Repairs are needed along the northwest portion of the site, also. Inspectors determined that repairs and modifications to the entire fence were beyond the capabilities of this crew, and would require the services of a professional fence contractor. These repairs were completed by a fence contractor in November 2001.

The fence repair made in the southwestern corner of the site in 1998 and again in 1999 was intact and the warning sign remained wired to the fence. However, inspectors found the fence open at eight locations around the site perimeter. The fence could not be closed because stock would be closed in and cut off from water. LTSM Program personnel will contact adjacent landowners and inform them that DOE is concerned about trespass and destruction of federal property.

An area along the site boundary at the east end of the site has flooded in the past but was dry this year. Approximately 800 feet of the perimeter fence was down in this area, as reported in 1998. A subcontractor repaired this fence in November 2001.

The perimeter road consists of a dirt track covered at places with crushed basalt. The road runs along the site boundary in much of the southern and most of the northern and eastern parts of the site. Most of the road is in good to excellent condition, but will require periodic maintenance if it is to remain passable. Inspectors had to detour around a gully in the road near the northeastern corner of the site. A culvert was washing out south of boundary monument 16 and the road here may soon become impassable (see Figure 1-2). This erosion does not pose a threat to the disposal site function; however, road repairs and culvert replacement were conducted in November of 2001.

The area outside the site boundary for a quarter of a mile was visually inspected for erosion, development, change in land use, or other phenomenon that might affect the long-term integrity of the site. None was seen.

Ground-Water Monitoring Results

As a result of the timing of this report, ground-water sampling and analysis results for 2001 are available. Therefore sampling and analytical results for both 2000 and 2001 are presented below. The required ground-water sampling was conducted on November 11, 2000 and November 3, 2001. As specified in the LTSP only the alluvial aquifer was sampled in 2000 and both the alluvial aquifer and the San Andres Limestone-Glorieta Sandstone were sampled in 2001. All concentrations were less than the specified alternate concentration limit (ACL) for each parameter. The tables below summarize the analytical results. The results of the U.S. Environmental Protection Agency (EPA)-required PCB sampling are included for completeness. PCBs were not detected. During the November 3, 2001 sampling event alluvial aquifer point-of-compliance (POC) well T(M) was dry and therefore was not sampled.

Table 1-1. Alluvial Aquifer Analytical Results Summary, November 2000

Alluvial Aquifer					
Constituent	ACL	Background Well E(M)	POC Well F(M)	POC Well T(M)	EPA Well Y2(M)
U-Nat, mg/L	0.44	0.0036	0.0156	0.1170	N/A
Selenium, mg/L	0.05	ND	ND	0.006	N/A
Molybdenum, mg/L	0.10	0.0042	0.0008	0.0276	N/A
PCB, µg/L	N/A	ND	ND	ND	ND

N/A = not applicable

ND = constituent concentration was below the method detection limit

mg/L = milligrams per liter

µg/L = micrograms per liter

Table 1-2. Alluvial Aquifer Analytical Results Summary, November 2001

Alluvial Aquifer					
Constituent	ACL	Background Well E(M)	POC Well F(M)	POC Well T(M)	EPA Well Y2(M)
U-Nat, mg/L	0.44	<0.001	0.016	N/S-dry	N/A
Selenium, mg/L	0.05	0.002	0.002	N/S-dry	N/A
Molybdenum, mg/L	0.10	0.002	<0.001	N/S-dry	N/A
PCB, µg/L	N/A	ND	ND	N/S-dry	ND

N/A = not applicable

ND = constituent concentration was below the method detection limit

mg/L = milligrams per liter

µg/L = micrograms per liter

N/S = no sample

Table 1-3. Sandstone Aquifer Analytical Results Summary, November 2001

San Andres Limestone-Glorieta Sandstone Aquifer				
Constituent	ACL	Background Well L(SG)	POC Well OBS-3	POC Well S(SG)
U-Nat, mg/L	2.15	0.004	0.745	0.478
Selenium, mg/L	0.05	<0.001	<0.001	<0.001

N/A = not applicable

ND = constituent concentration was below the method detection limit

mg/L = milligrams per liter

Conclusion

The Bluewater disposal site is in good condition at this time. The occurrence of ponding near the north end of the top of the main tailings pile will continue to be monitored for impacts. Measured ground-water constituent concentrations remain less than their respective ACLs.

2.0 Edgemont

Edgemont Site Long-Term Custody Compliance Requirements

The following list comprises the long-term custody requirements for the Edgemont site as defined in Section 3.2 of the site Long-Term Surveillance Plan:

1. Annual site inspection.
2. Annual inspection report.
3. Follow-up inspections and inspection reports, as necessary.
4. Site maintenance as necessary to sustain design functions.
5. Emergency measures in the event of catastrophe.
6. Environmental monitoring as required.

The Edgemont site long-term custody compliance requirements were fulfilled for 2001 as follows:

1. The site was inspected on June 5, 2001, in accordance with the inspection procedure as outlined in Section 3.3.2 of the LTSP.
2. This document serves as the annual inspection report.
3. No follow-up inspections were necessary.
4. Additional minor fence repairs are in order.
5. No catastrophic events necessitated emergency measures.
6. The condition of the grass-covered features of the site were inspected and continue to function as designed. There is no ground-water monitoring required for this site.

Edgemont Site Inspection Results

The inspection was conducted on June 5, 2001, by M. R. Widdop (Chief Inspector) and M. E. Reed (Assistant Inspector), both of MACTEC-ERS, the Technical Assistance and Remediation contractor at the DOE Grand Junction Office (GJO). The inspection was conducted in accordance with (1) the Long-Term Surveillance Plan (LTSP) for this site, *Long-Term Surveillance Plan for the DOE Tennessee Valley Authority (UMTRCA Title II) Disposal Site Edgemont, South Dakota, June 1996*, and (2) procedures established by the GJO to comply with requirements of 10 U.S. Code of Federal Regulations (CFR) Section 40.28.

The purposes of the inspection were to confirm the integrity of visible features at the site, to identify changes in conditions that may affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring.

Photographs to support specific observations are identified in the text and on Figure 2-1 by photograph location (PL) numbers.

Access Road, Entrance Gate Area, Fencing, and Boundary Monuments

Access to the Edgemont disposal site is immediately off an all-weather county road and is unimpaired.

The tubular metal entrance gate is secured by a padlocked chain and is in excellent condition. The site marker and site entrance sign also are in excellent condition.

A four-strand barbed-wire fence was installed in spring 1999 along the site boundary to demarcate DOE property and to control grazing on the property. The entire fence line was walked to inspect the fence and the boundary monuments. Fence repairs are required at two locations. The wire was stretched on the west property boundary, north of the entrance gate. At the south side of the entrance gate, the horizontal member of the "H" brace came loose and the wire is slack (PL-1). The south gatepost was loose, also, and needs to be reset in concrete. DOE will ask the grazing permittee to repair the fence at these locations. Otherwise, the fence is in excellent condition.

The four boundary monuments are undisturbed and in excellent condition.

Top of Disposal Cell

The 100-acre top of the disposal cell is grass-covered. DOE manages the grass cover by controlled grazing. No cattle were on site the day of the inspection, but signs of recent grazing were evident. The grass is well established and was not over-grazed when inspected. There was no evidence of settling, slumping, or erosion on the disposal cell. Tire tracks were observed north of the west end of the embankment (PL-2). The tracks were probably left by the county weed control agent.

Tailings Dam Face and Drainage and Diversion Ditches

The tailings dam face is covered with riprap and represents the steepest slope on site. The slope is stable and the riprap shows no signs of degradation. Scattered plants, mostly grass, grow in the riprap (PL-3). These plants do not pose an immediate threat to stability of this structure but plant density will probably increase over time and needs to be monitored.

Water stands in the drainage outlet below the tailings dam, as reported previously. The drainage outlet is the lowest point on site and most meteoric water that falls on the site passes through this drainage outlet. Wetland vegetation has established in the drainage outlet below the dam.

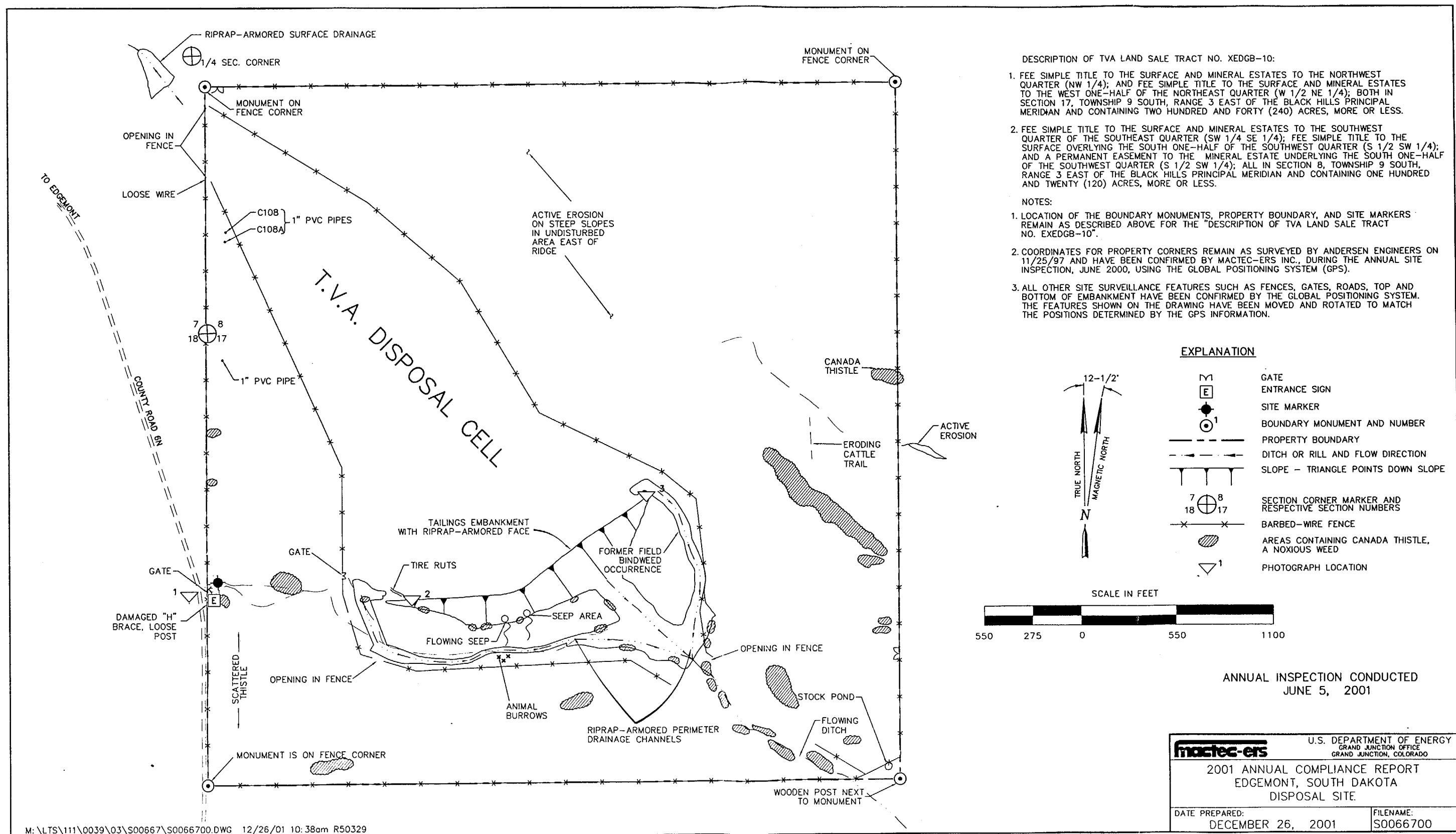


Figure 2-1. Edgemont, South Dakota, 2001 Inspection Drawing

Diversion and drainage ditches are grass-covered (upgradient) and riprap-armored (down gradient and on steeper slopes). Minor amounts of vegetation occur in the riprap. The vegetation density will likely increase over time and should be monitored. Grass in the vegetated portions of the drainage ditches is dense and healthy. There is no erosion.

The riprap-armored drainage channel at the northwest corner of the site property was stable and in good condition.

Area Between the Disposal Cell and the Site Perimeter

The area between the disposal cell (disposal basin) and the site perimeter is grass-covered. This area is also grazed in a controlled manner. The grass is well established but minor erosion persists on steeper portions of the site east of the ridge that separates the northeast portion of the site property from the area containing the tailings cell. This erosion is a significant distance from the disposal basin and does not threaten the integrity of the site.

Outlying Areas

The areas surrounding the Edgemont site boundary for about a quarter mile were visually inspected at a distance from the boundary fence. The city of Edgemont operates a municipal landfill north-northwest of the site. An occasional piece of wind-blown trash from the landfill was observed on site or along the fences. Inspectors did not observe any evidence of activity or change in land use that could affect the site.

Conclusion

The Edgemont disposal site is in good condition at this time. Minor fence repairs will be completed before the next inspection. Vegetation colonizing the riprap will continue to be monitored during future inspections.

Edgemont Inspection Photographs

Table 2-1. Photograph Descriptions for Edgemont, South Dakota, Disposal Site

Photograph Location Number	Description
EDG PL-1	Dislocated horizontal member of "H" brace at entrance gate.
EDG PL-2	Tire tracks on top slope near west end of embankment.
EDG PL-3	Embankment dam face.

End of current text



EDG 6/2001. PL-1. Dislocated horizontal member of "H" brace at entrance gate.



EDG 6/2001. PL-2. Tire tracks on top slope near west end of embankment.



EDG 6/2001. PL-3. Embankment face showing plant encroachment.

3.0 Sherwood

Sherwood Site Long-Term Custody Compliance Requirements

The following list comprises the long-term custody compliance requirements for the Sherwood site as defined in Section 3.2 of the site Long-Term Surveillance Plan:

1. Annual site inspection.
2. Annual inspection report.
3. Follow-up inspections and inspection reports, as necessary.
4. Site maintenance as necessary to sustain design functions.
5. Emergency measures in the event of catastrophe.
6. Environmental monitoring as required.

The Sherwood site long-term custody compliance requirements were fulfilled for 2001 as follows:

1. The site was inspected on October 24, 2001 in accordance with the inspection procedure as outlined in Section 3.3.2 of the Long-Term Surveillance Plan (LTSP).
2. This document serves as the annual inspection report.
3. No follow-up inspections were necessary.
4. No maintenance was necessary to sustain design functions.
5. No catastrophic events necessitated emergency measures.
6. The required ground-water monitoring, as specified in Section 3.7.1 of the LTSP, and the Dam Safety Inspection specified in Appendix D of the LTSP, were completed and the results are summarized in this report.

Sherwood Site Inspection Results

M.P. Plessinger (Chief Inspector) and M. K. Kastens (Assistant Inspector), both of MACTEC-ERS, the Technical Assistance Contractor at the DOE Grand Junction Office (GJO), conducted the inspection on October 24, 2001. J. P. Gilmore of the DOE-GJO assisted with the inspection and D. Stoffel of the Washington Department of Health accompanied the inspectors. The inspection was conducted in accordance with the *Long-Term Surveillance Plan (LTSP) for the DOE Sherwood Project (UMTRCA Title II) Reclamation Cell, Wellpinit, Washington*, (February 2001) and procedures established by DOE-GJO to comply with the requirements of Title 10 *Code of Federal Regulations* Part 40.28 (10 CFR 40.28). Because this was the initial annual inspection, a large number of photographs were taken to record baseline conditions.

The purposes of the annual inspection are to confirm the integrity of visible features at the site, to identify changes in conditions that may affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring.

Forty-four photographs are included in the Sherwood report. The photographs are referred to in the text of the report and on Figure 3-1 by photograph location (PL) numbers. Photographs taken of different views from a common location are identified by a letter following the photograph location number (PL-17A and PL-17B, for example).

Access Road and Perimeter Signs

The Bureau of Indian Affairs (BIA) maintains the all-weather site access road. A double-swing steel gate controls access to the Sherwood mine area and Tribe-owned facilities near the disposal site. There is a DOE lock on the gate in addition to the Tribe's lock.

Six perimeter or warning signs, designated P1 through P6, are placed at likely access points around the site property. The signs are attached at a height of about 5 feet above ground to steel posts set in concrete. Perimeter sign P4, north of the site, was placed at a fence boundary north of the actual site boundary along the old two-track road that approaches the site from the northeast. A typical perimeter sign is shown in photograph PL-1.

Site Marker and Boundary Monuments

One inscribed granite site marker (PL-2) is present on the site near the southwest boundary of the site property where the access road lies closest to the site boundary. The marker is in excellent condition.

Six boundary monuments designated BM-1, BM-2, BM-3, BM-3A, BM-4, and BM-5 define the site boundary. The monuments are shown in photographs PL-3 through PL-8. The monuments are all in new condition.

Monitor Wells and Piezometers

There are three monitor wells at the Sherwood site designated MW-2B, MW-4, and MW-10. The wells are shown in photographs PL-9, PL-10, and PL-11, respectively. MW-2B is the up gradient or background well. MW-4 and MW-10 are point-of-compliance wells. These three wells are sampled for sulfate, chloride, and total dissolved solids annually as a best management practice. All results from the July 2001 sampling event were within anticipated ranges and acceptable limits.

Four piezometers along the crest of the tailings dam, designated PZ-1 through PZ-4, are shown in PL-12 through PL-15. The piezometers were installed in November 2000 as part of the Dam Safety Inspection program. The piezometers are used to determine if saturation conditions exist within the tailings dam. At the time of installation PZ-2 contained slightly more than three feet of water. During the July 2001 sampling event PZ-2 contained slightly less than two feet of water. All other piezometers were dry at installation and dry during the July 2001 sampling event. Consequently the tailings dam is considered to be in an unsaturated condition, as desired.

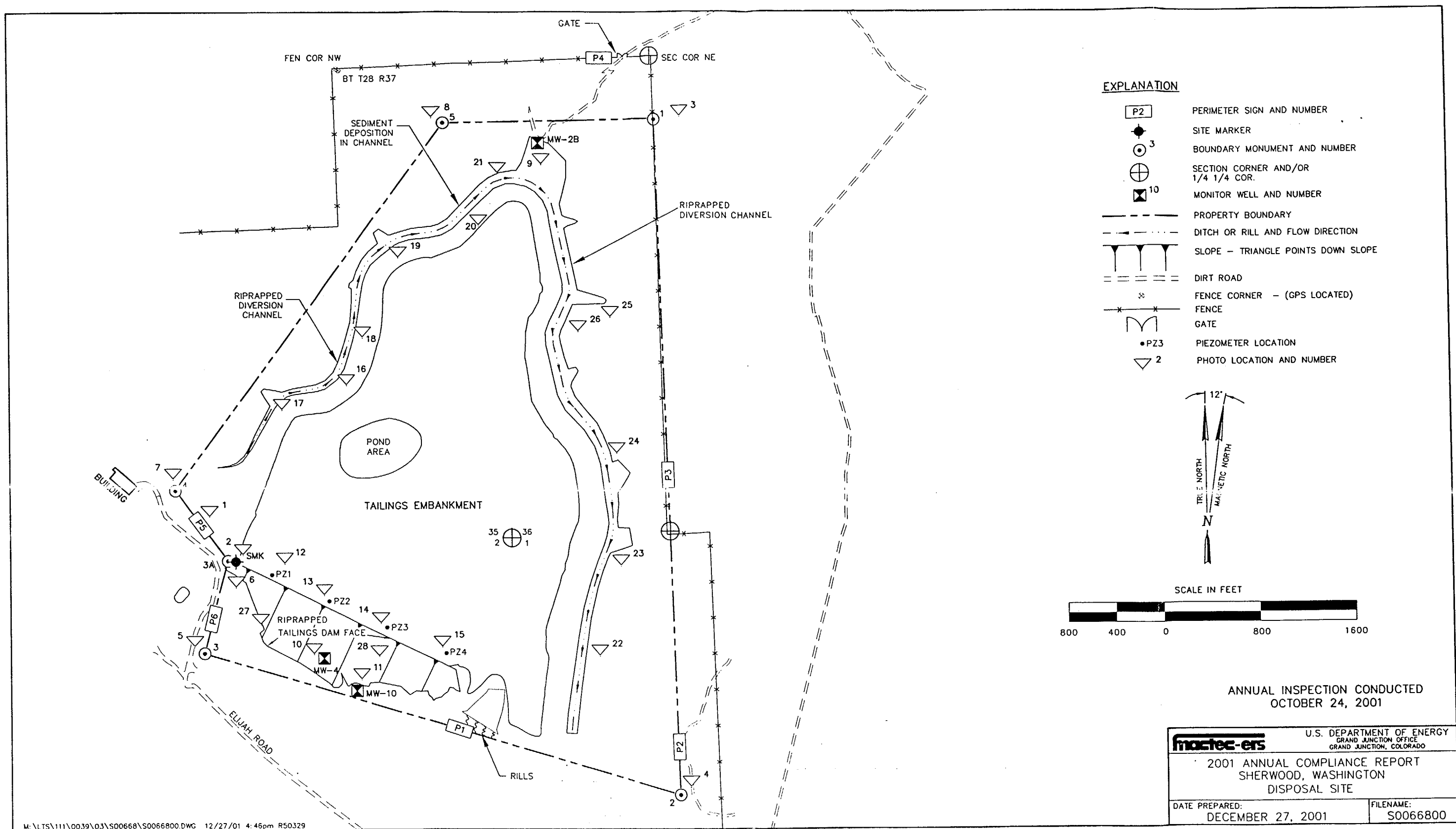


Figure 3-1. Sherwood, Washington, 2001 Inspection Drawing

Tailings Impoundment Cover

The tailings impoundment cover for the Sherwood site consists of 12 to 20 feet of uncompacted soils. Trees, shrubs, forbs, and grasses have been planted on the cover to accelerate the revegetation of the disturbed cover soils. A panoramic overview of the tailings impoundment cover is shown in photographs PL-16A through PL-16H. Inspectors walked parallel traverses across the impoundment cover to inspect this transect. There was no evidence of differential settlement other than the pond area observed during earlier orientation inspections. The pond area did not appear to have expanded in size.

In general vegetation is becoming well established. As is typical, some areas are progressing faster than other areas. The pond area was dry at the time of the inspection; however, the plant species present indicate that there is year-round moisture below the surface. Vegetation in the pond area is composed primarily of native wetland species such as hardstem bulrush (*Scirpus acutus*), Olney threesquare (*Scirpus americanus*), common spikerush (*Eliocharis palustris*), sandbar willow (*Salix exigua*), and plantain (*Plantago eriopoda*). The pond provides habitat for small mammals, birds, and reptiles and appears to be a water source for larger mammals such as deer and elk, whose sign was abundant in this area.

Diversion Channel and Impoundment Dam Face

Inspectors walked the length of the diversion channel and took a series of photographs (PL-17 through PL-26). Volunteer plant intrusion within the diversion channel is evident in most of the photographs. This plant intrusion is not expected to interfere with the design function of the diversion channel. Riprap placement and rock condition are the same as observed during earlier orientation inspections. Sediment deposition is evident in places on the west side of the diversion channel (PL-20A and PL-20B). Sediment deposition currently does not interfere with the design function of the diversion channel. The degree of sediment deposition should be noted during future inspections although it is not expected to increase to the degree that it could become a maintenance issue. Standing water was observed in the channel along the east side of the impoundment (PL-24B).

The impoundment dam face was inspected and photographed (PL-27A and PL-27B). The dam was inspected in accordance with the appended Dam Inspection Checklist (see Appendix A). No evidence of seepage, slumping, erosion, or instability was observed. In July 2001 water level measurements were made in the four piezometers installed across the crest of the dam to evaluate dam saturation conditions. Piezometer PZ-2 had 1.95 feet of water in the bottom of the casing. Piezometers PZ-1, PZ-3, and PZ-4 were dry. PZ-2 had 3.05 feet of water upon installation in November 2000. These results demonstrate that the impoundment dam continues to exist in an unsaturated state. Photograph PL-28 shows an undesirable weed species (dalmation toadflax) growing on the dam face.

Site Perimeter, Outlying Areas, and Balance of Site

The inspectors covered the site perimeter while searching for boundary monuments and warning signs. No evidence of off site activity that could affect the integrity of the tailings impoundment was observed. The site is surrounded by ponderosa pine forest. The site property as well as all surrounding lands is part of the Spokane Tribe of Indians Reservation. There are no residences within 0.25 mile of the site boundary.

Ground-Water Monitoring and Piezometer Water Level Results

Both the required ground-water sampling and the piezometer water level measurements were conducted on July 27, 2001. Ground-water constituent concentrations were less than the action level (Washington water quality criteria) for confirmatory sampling. Ground-water analytical results and piezometer water levels are presented in Table 3-1 and 3-2, respectively.

Table 3-1. Ground-Water Sampling and Analysis Results Summary, July 2001

Constituent	Water Quality Criteria	Background Well MW-2B	POC Well MW-4	POC Well MW-10
Chloride, mg/L	250	1.460	6.290	2.350
Sulfate, mg/L	250	3.040	27.500	25.500
TDS, mg/L	N/A	242	445	742

N/A = not applicable
mg/L = milligrams per liter

Table 3-2. Piezometer Water Levels, November 2000 and July 2001

Parameter	PZ-1	PZ-2	PZ-3	PZ-4
Water Level, November 2000 (initial reading at installation)	Dry	3.05 feet	Dry	Dry
Water Level, July 2001	Dry	1.95 feet	Dry	Dry

Conclusion

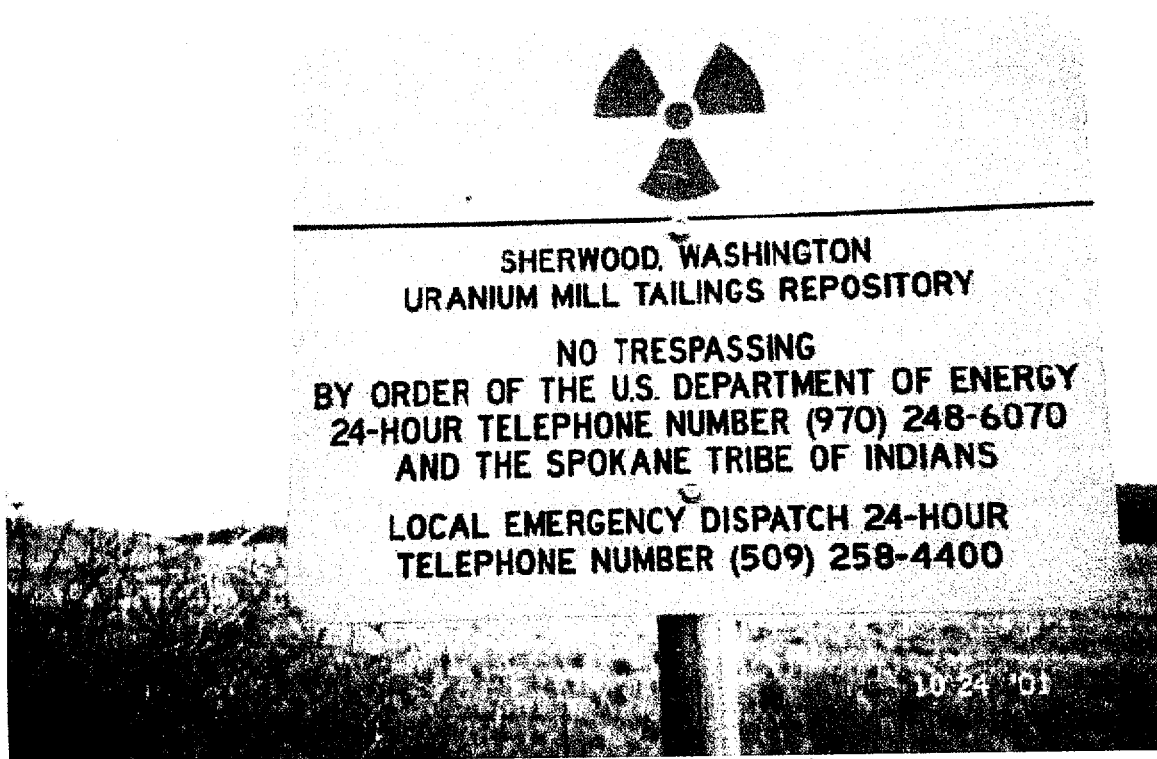
The Sherwood disposal site is in good condition at this time. No issues were identified during the dam safety inspection and no evidence of excessive settlement was observed in the pond area. The pond was dry at the time of the inspection. Ground-water monitoring and piezometer water level measurements conducted in July 2001 showed all measured parameters to be within acceptable ranges.

Sherwood Inspection Photographs

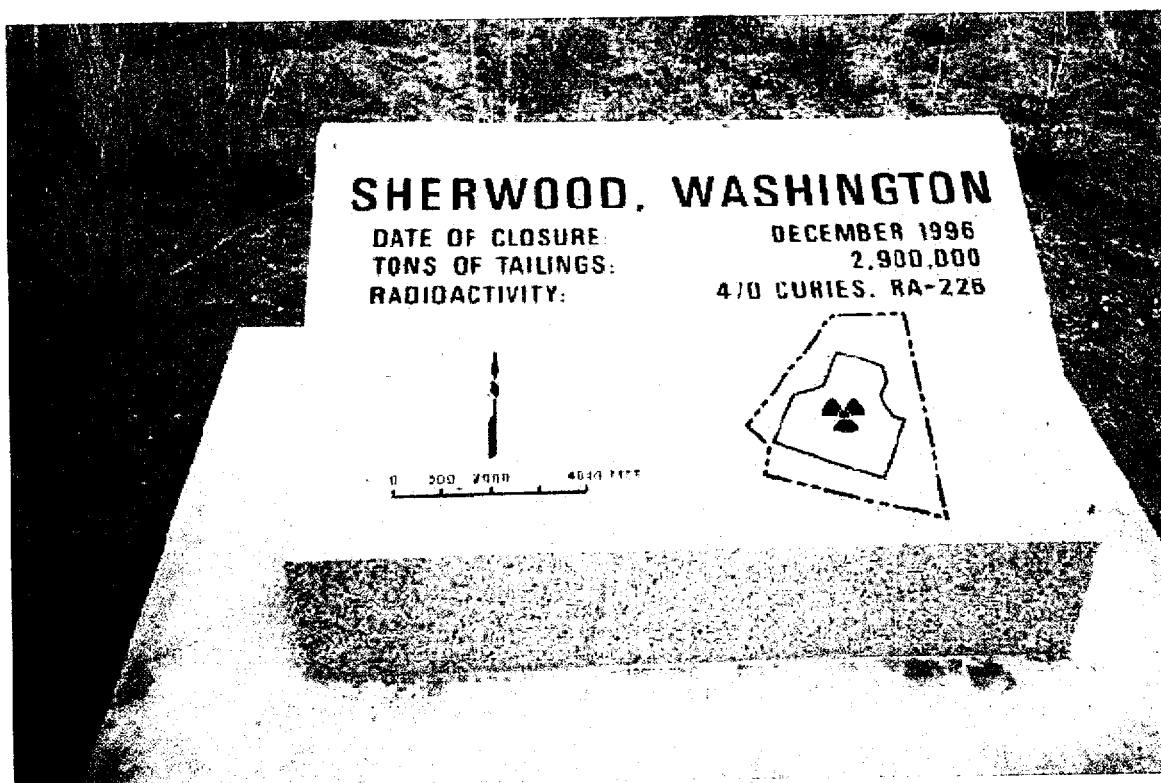
Table 3-3. Photograph Descriptions for Sherwood, Washington, Disposal Site

Photograph Location Number	Description
SHE PL-1	Typical perimeter sign
SHE PL-2	Site Marker
SHE PL-3	Boundary Monument BM-1
SHE PL-4A	Boundary Monument BM-2
SHE PL-4B	Boundary Monument BM-2
SHE PL-5	Boundary Monument BM-3
SHE PL-6	Boundary Monument BM-3A
SHE PL-7	Boundary Monument BM-4
SHE PL-8	Boundary Monument BM-5
SHE PL-9	Monitor Well MW-2B
SHE PL-10	Monitor Well MW-4
SHE PL-11	Monitor Well MW-10
SHE PL-12	Piezometer PZ-1
SHE PL-13	Piezometer PZ-2
SHE PL-14	Piezometer PZ-3
SHE PL-15	Piezometer PZ-4
SHE PL-16A	Panorama of impoundment cover
SHE PL-16B	Panorama of impoundment cover
SHE PL-16C	Panorama of impoundment cover
SHE PL-16D	Panorama of impoundment cover
SHE PL-16E	Panorama of impoundment cover
SHE PL-16F	Panorama of impoundment cover
SHE PL-16G	Panorama of impoundment cover
SHE PL-16H	Panorama of impoundment cover
SHE PL-17A	West diversion channel
SHE PL-17B	West diversion channel
SHE PL-18A	West diversion channel
SHE PL-18B	West diversion channel
SHE PL-19A	Groin-west diversion channel
SHE PL-19B	Groin-west diversion channel
SHE PL-20A	Sediment-west diversion channel
SHE PL-20B	Sediment-west diversion channel
SHE PL-21	North diversion channel
SHE PL-22A	East diversion channel
SHE PL-22B	East diversion channel
SHE PL-23A	East diversion channel
SHE PL-23B	East diversion channel
SHE PL-24A	East diversion channel
SHE PL-24B	East diversion channel
SHE PL-25	East diversion channel
SHE PL-26	East diversion channel
SHE PL-27A	Impoundment dam face
SHE PL-27B	Impoundment dam face
SHE PL-28	Toadflax on dam face

End of current text



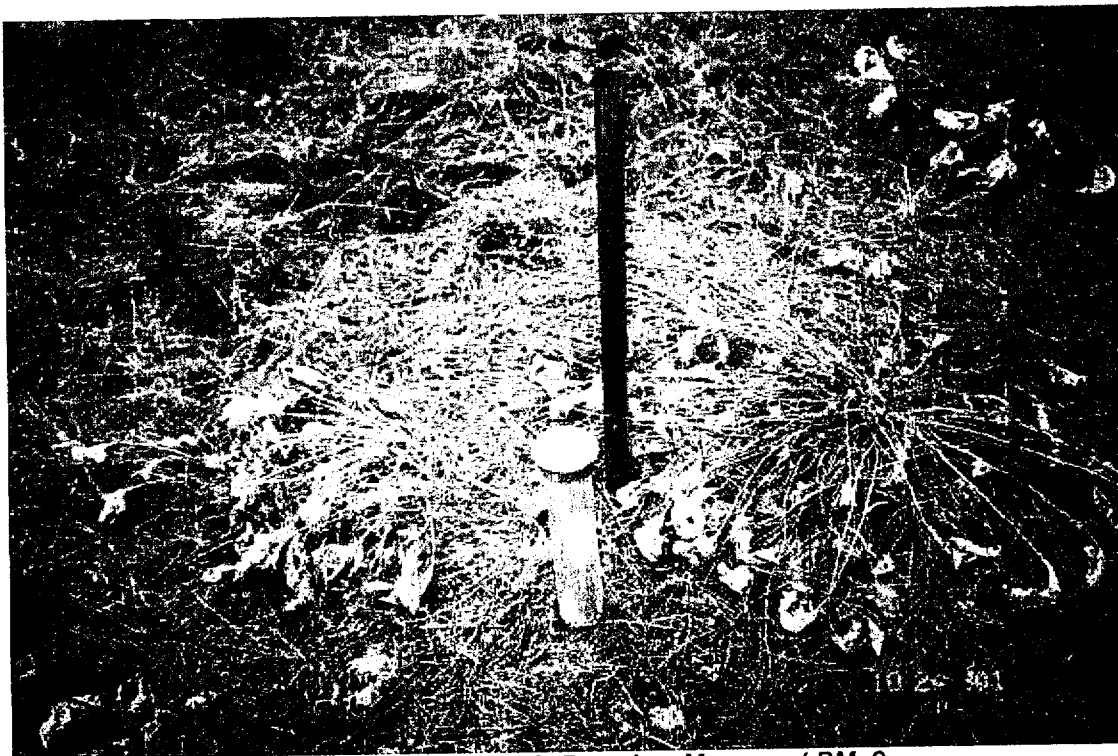
SHE 10/2001. PL-1. Typical perimeter sign.



SHE 10/2001. PL-2. Site Marker.



SHE 10/2001. PL-3. Boundary Monument BM-1.



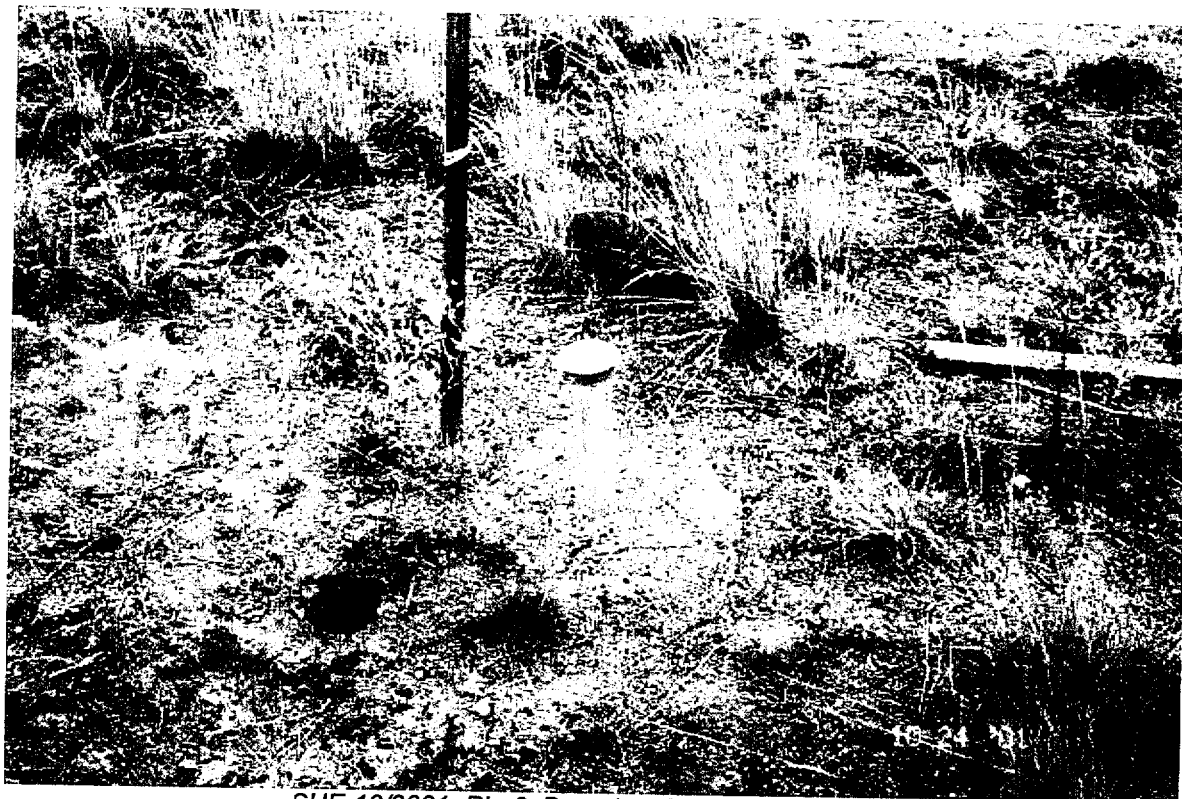
SHE 10/2001. PL-4A. Boundary Monument BM-2.



SHE 10/2001. PL-4B. Boundary Monument BM-2.



SHE 10/2001. PL-5. Boundary Monument BM-3.



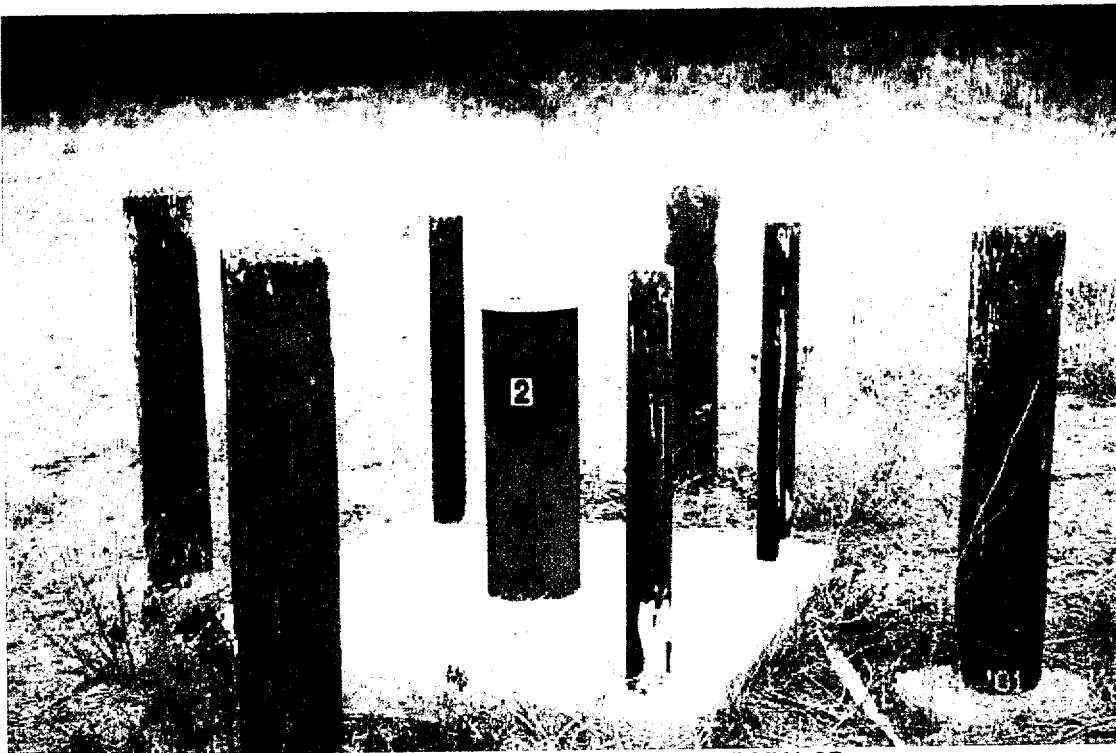
SHE 10/2001. PL-6. Boundary Monument BM-3A.



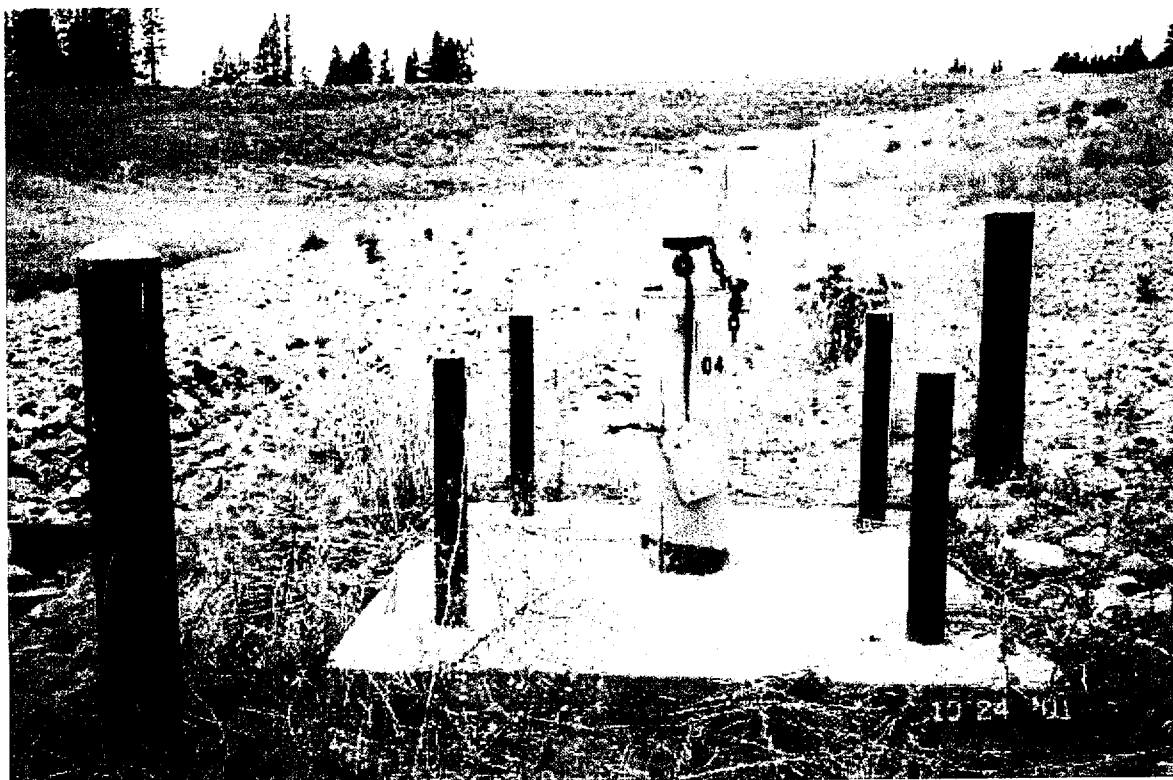
SHE 10/2001. PL-7. Boundary Monument BM-4.



SHE 10/2001. PL-8. Boundary Monument BM-5.



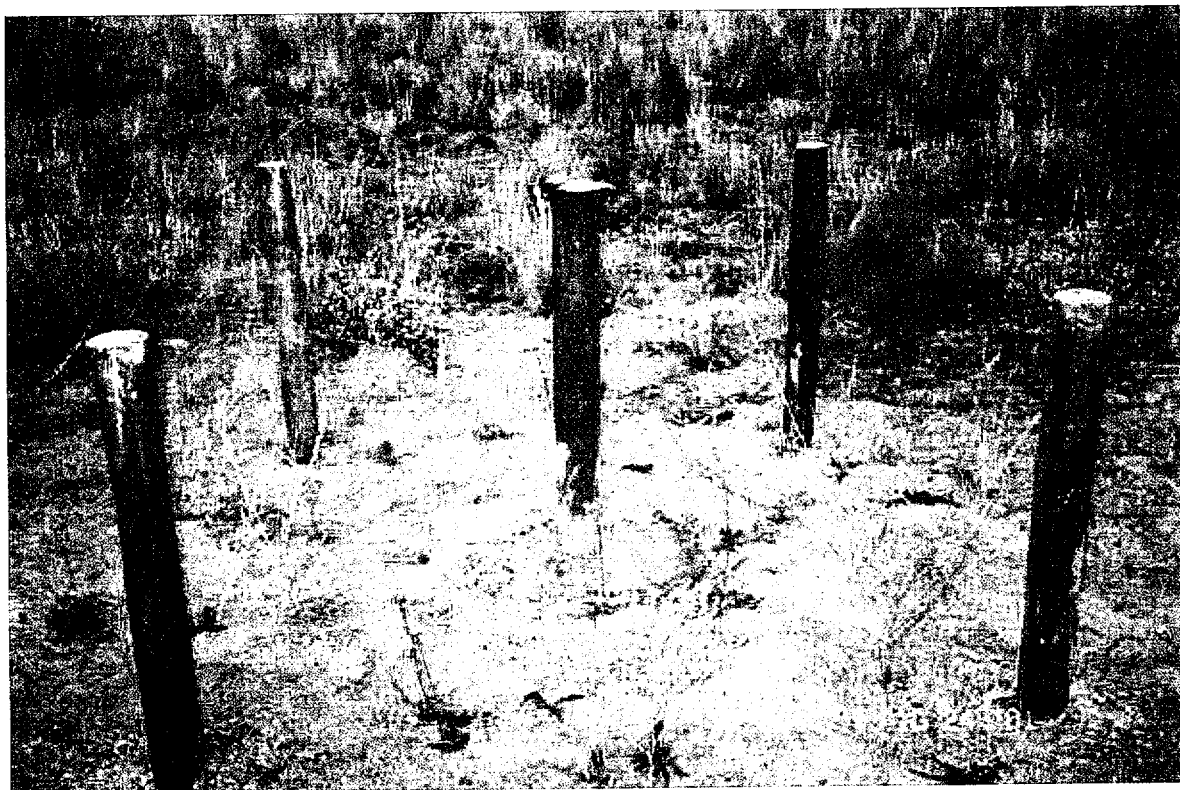
SHE 10/2001. PL-9. Monitor Well MW-2B.



SHE 10/2001. PL-10. Monitor Well MW-4.



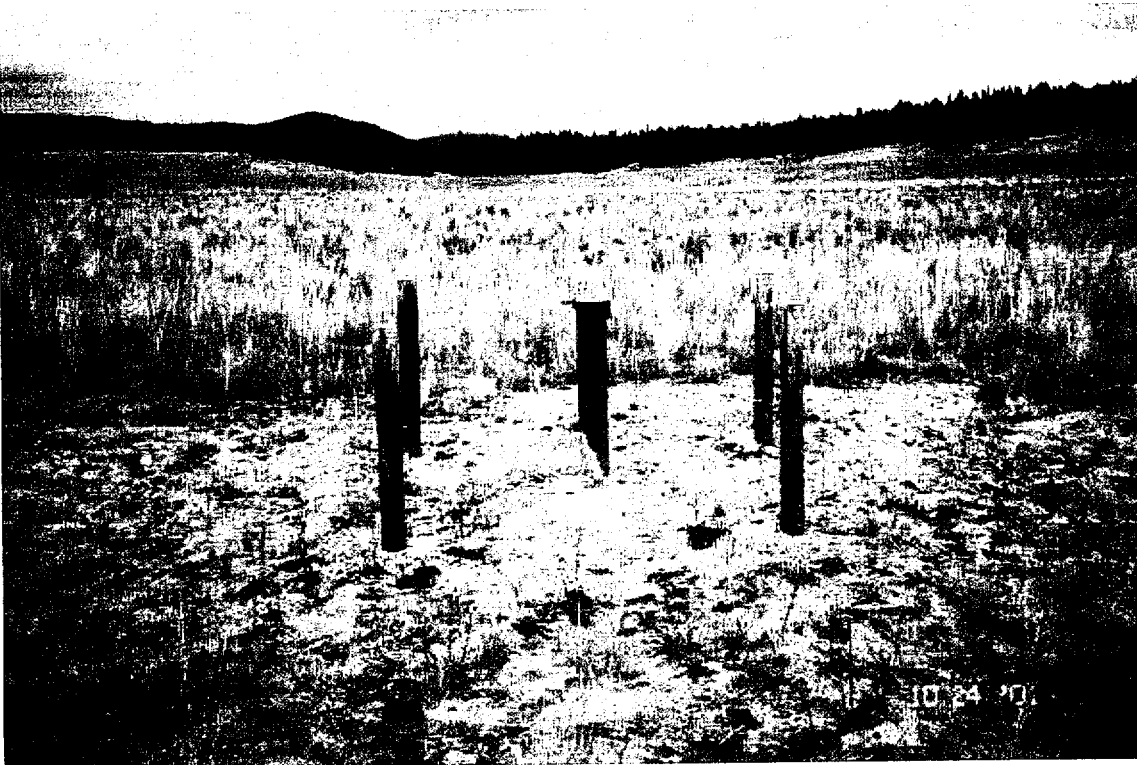
SHE 10/2001. PL-11. Monitor Well MW-10.



SHE 10/2001. PL-12. Piezometer PZ-1.



SHE 10/2001. PL-13. Piezometer PZ-2.



SHE 10/2001. PL-14. Piezometer PZ-3.



SHE 10/2001. PL-15. Piezometer PZ-4.



SHE 10/2001. PL-16A. Panorama of impoundment cover.



SHE 10/2001. PL-16B. Panorama of impoundment cover.



SHE 10/2001. PL-16C. Panorama of impoundment cover.



SHE 10/2001. PL-16D. Panorama of impoundment cover.



SHE 10/2001. PL-16E. Panorama of impoundment cover.



SHE 10/2001. PL-16F. Panorama of impoundment cover.



SHE 10/2001. PL-16G. Panorama of impoundment cover.



SHE 10/2001. PL-16H. Panorama of impoundment cover.



SHE 10/2001. PL-17A. West diversion channel.



SHE 10/2001. PL-17B. West diversion channel.



SHE 10/2001. PL-18A. West diversion channel.



SHE 10/2001. PL-18B. West diversion channel.



SHE 10/2001. PL-19A. Groin-west diversion channel.



SHE 10/2001. PL-19B. Groin-west diversion channel.



SHE 10/2001. PL-20A. Sediment-west diversion channel.



SHE 10/2001. PL-20B. Sediment-west diversion channel.



SHE 10/2001. PL-21. North diversion channel.



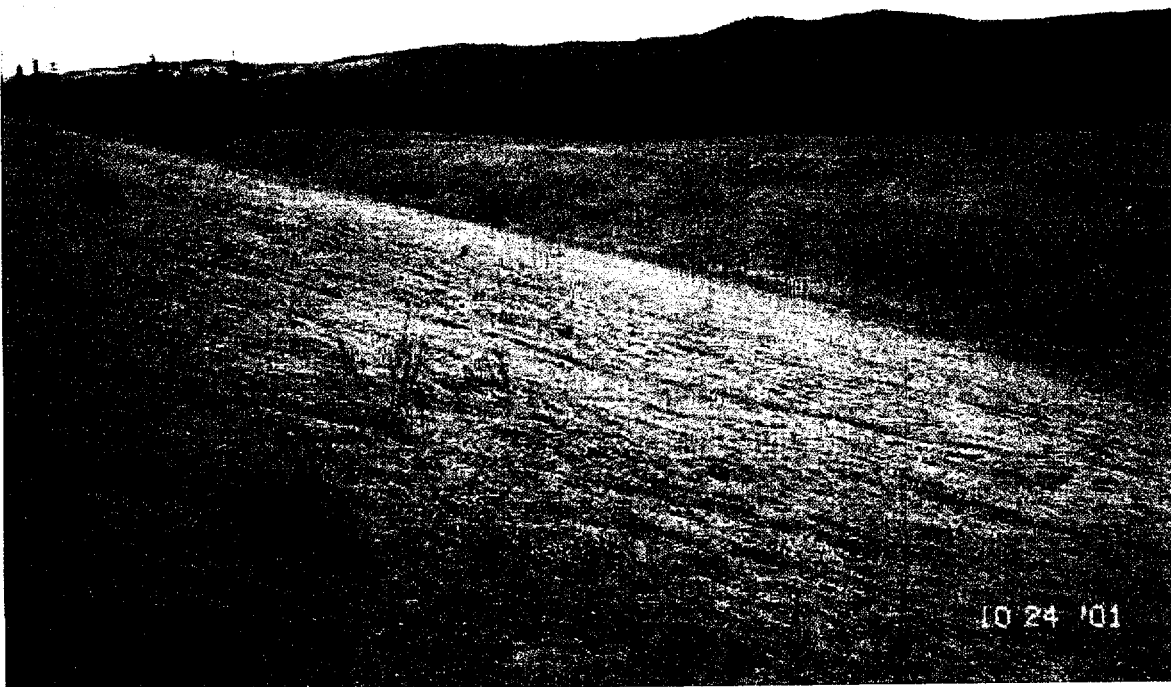
SHE 10/2001. PL-22A. East diversion channel.



SHE 10/2001. PL-22B. East diversion channel.



SHE 10/2001. PL-23A. East diversion channel.



SHE 10/2001. PL-23B. East diversion channel.



SHE 10/2001. PL-24A. East diversion channel.



SHE 10/2001. PL-24B. East diversion channel.



SHE 10/2001. PL-25. East diversion channel.



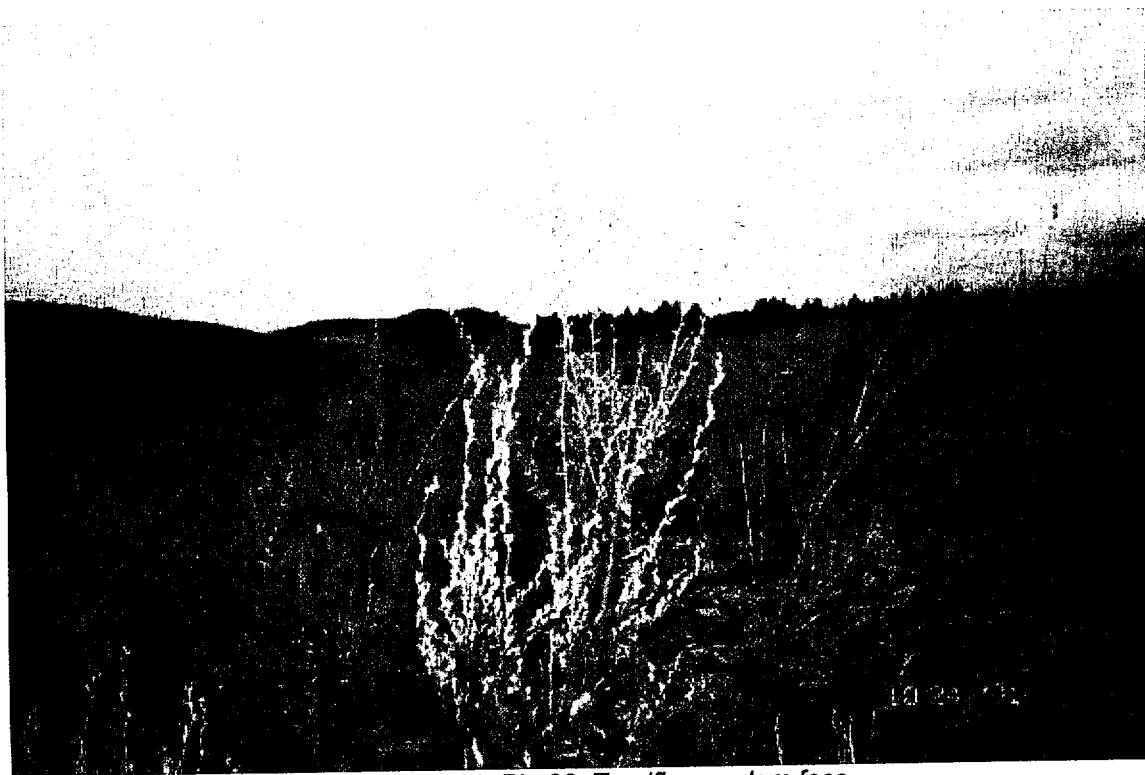
SHE 10/2001. PL-26. East diversion channel.



SHE 10/2001. PL-27A. Impoundment dam face.



SHE 10/2001. PL-27B. Impoundment dam face.



SHE 10/2001. PL-28. Toadflax on dam face.

Appendix A

Sherwood, Washington, Dam Inspection Checklist

Dam Inspection Checklist

Piezometer P1 current year water elevation

Dry

Piezometer P2 current year water elevation

1.95 FT OF WATER (3.05 FT

Piezometer P3 current year water elevation

Dry

WHEN
CONSTRUCTED)

Piezometer P4 current year water elevation

Dry

Was evidence of significant seepage observed on the dam face?
If yes discuss in report.

NO

Was evidence of significant slumping observed on the dam?
If yes discuss in report.

NO

Was evidence of significant erosion observed on the dam?
If yes discuss in report.

NO

Was vegetative growth that could compromise dam stability observed?
If yes discuss in report.

NO

Was any condition that presents imminent hazard the public health and
safety or the environment observed?

NO

If yes immediately contact the following:

DOE Project Manager (970) 248-6037
NRC Operations Center (301) 951-0550
Spokane Tribal Police/Sheriff (509) 258-4400

INSPECTOR/SIGNATURE: Mark P. Plessinger / M.P. Plessinger 10/24/01