



Department of Energy

Albuquerque Operations Office  
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JAN 06 1993

Mr. John J. Surmeier  
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Division of Low-Level Waste  
Management and Decommissioning  
Office of Nuclear Materials Safety  
and Safeguards  
Mail Stop 5E-4 OWFN  
U.S. Nuclear Regulatory Commission  
Washington DC 20555

Dear Mr. Surmeier:

Enclosed for your information are three copies of the 1991 Annual Prelicensing Inspection Report for the following UMTRA disposal sites: Canonsburg, PA; Burrell, PA; Spook, WY; Green River, UT; Salt Lake City (South Clive), UT; and Shiprock, NM. The purpose of these reports is to present results of the annual UMTRA post-stabilization, prelicensing inspection of the disposal sites. The inspections were conducted during the summer of 1991, by the Department of Energy's Grand Junction Projects Office.

Should you have any questions, please contact the respective DOE site manager at (505) 845-4628.

Sincerely,

Albert R. Chernoff  
Project Manager  
Uranium Mill Tailings Remedial Action  
Project Office

6 Enclosures

cc:  
See page 2

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NRC

Mr. John J. Surmeier

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cc w/o enclosures:

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M. Haque, NRC

J. Virgona, GJPO

S. Hamp, UMTRA

R. Edge, UMTRA

J. Stelmach, UMTRA

M. Abrams, UMTRA

E. Artiglia, TAC

M. Leaf, TAC

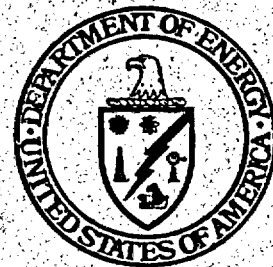
C. Yancey, TAC

M. Day, TAC

# **1991 Annual Prelicensing Inspection of the Spook, Wyoming, UMTRA Project Disposal Site**

**September 1992**

**U. S. Department of Energy  
Albuquerque Field Office  
Grand Junction Projects Office  
Grand Junction, Colorado**



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**1991 Annual Prelicensing Inspection  
of the Spook, Wyoming,  
UMTRA Project Disposal Site**

**September 1992**

**Prepared for  
U.S. Department of Energy**

**Prepared by  
Chem-Nuclear Geotech, Inc.  
Under DOE Contract No. DE-AC04-86ID12584  
U. S. Department of Energy  
Grand Junction Projects Office  
Grand Junction, Colorado**

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Date 9-14-92

By: Charles A. Jones  
Charles A. Jones, Assistant Inspector  
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Date 9-11-92

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Chem-Nuclear Geotech, Inc.

Date 9-11-92

Approved by: Charles A. Jones  
Charles A. Jones, Manager, LTSM Program  
Chem-Nuclear Geotech, Inc.

Date 9-11-92

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## Plate

*(in pocket in back)*

<b>Plate 1. Inspection Drawing for Spook, Wyoming, Disposal Site</b>
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# 1.0 Introduction

## 1.1 Purpose

The purpose of this report is to present the results of the U.S. Department of Energy's (DOE's) Uranium Mill Tailings Remedial Action (UMTRA) Project Office annual poststabilization, prelicensing inspection of the Spook, Wyoming, UMTRA Project disposal site. This inspection was conducted on August 19, 1991, by D. L. Scheuerman, Chief Inspector, and C. A. Jones and M. P. Plessinger, Assistant Inspectors, of Chem-Nuclear Geotech, Inc., operating contractor at the DOE Grand Junction Projects Office (GJPO). Also present in oversight and consulting capacities were R. Edge and S. Beranich of Jacobs/Weston, Technical Assistance Contractor (TAC) at the DOE UMTRA Project Office.

This inspection was the first poststabilization, Annual Prelicensing Inspection (API) at the Spook disposal site. The inspection also fulfilled DOE requirements for the Verification and Orientation (V&O) inspection. Requirements of the V&O inspection are to (1) verify as-built and other features shown on inspection drawing(s) by visual comparison with features observed at the site and (2) orient the GJPO to the layout of the site and the location of long-term surveillance and maintenance features at the site. Both objectives of the V&O inspection were met during this API.

The procedures and specifications for this API are based on guidance provided in *Guidance for UMTRA Project Surveillance and Maintenance* (DOE, 1986) and the draft *Surveillance and Maintenance Plan for the Spook UMTRA Site in Converse County, Wyoming* (SMP) (DOE, 1989). Remediation of the Spook site was a joint cooperative action of the DOE and the State of Wyoming Abandoned Mine Lands Program. The DOE, however, has sole responsibility for the long-term surveillance and maintenance of the site.

On the basis of an evaluation of site characterization data, a program to monitor groundwater in the uppermost aquifer (upper sandstone unit) downgradient from the Spook disposal cell is not required. The principal reason is that the predicted concentrations of hazardous constituents, attributable to leachate percolation from the disposal cell, would be indiscernible from the existing contamination and from the natural range of background concentrations in groundwater beneath and downgradient from the site (DOE, 1989).

## 1.2 Site Description

The Spook disposal site (Figure 1-1) is a 13-acre area located in east-central Wyoming approximately 48 miles northeast of Casper in Converse County, Wyoming; approximately 32 miles northeast of Glenrock, Wyoming; and 36 miles northwest of Douglas, Wyoming. The site is located in Sections 27 and 28, Township 38 North, Range 73 West, 6th Principal Meridian. Large, privately owned ranches that have been owned by the same families for generations and are used for grazing sheep and/or cattle surround the site. Two ranches with an estimated average year-round population of 10 individuals are within 3 miles of the site. The nearest residence is 1.4 miles southwest of the site.

Topography in the site area consists of sparsely vegetated flat areas and rolling hills. The site is just north of the Dry Fork of the Cheyenne River and at the southern edge of the Thunder Basin National Grassland. The elevation difference between the lowlands in the area and the tops of the hills averages about 200 feet; elevation of the site is between 5030 and 5160 feet above sea level. Vegetation consists of native grasses and sagebrush with a few cottonwoods located



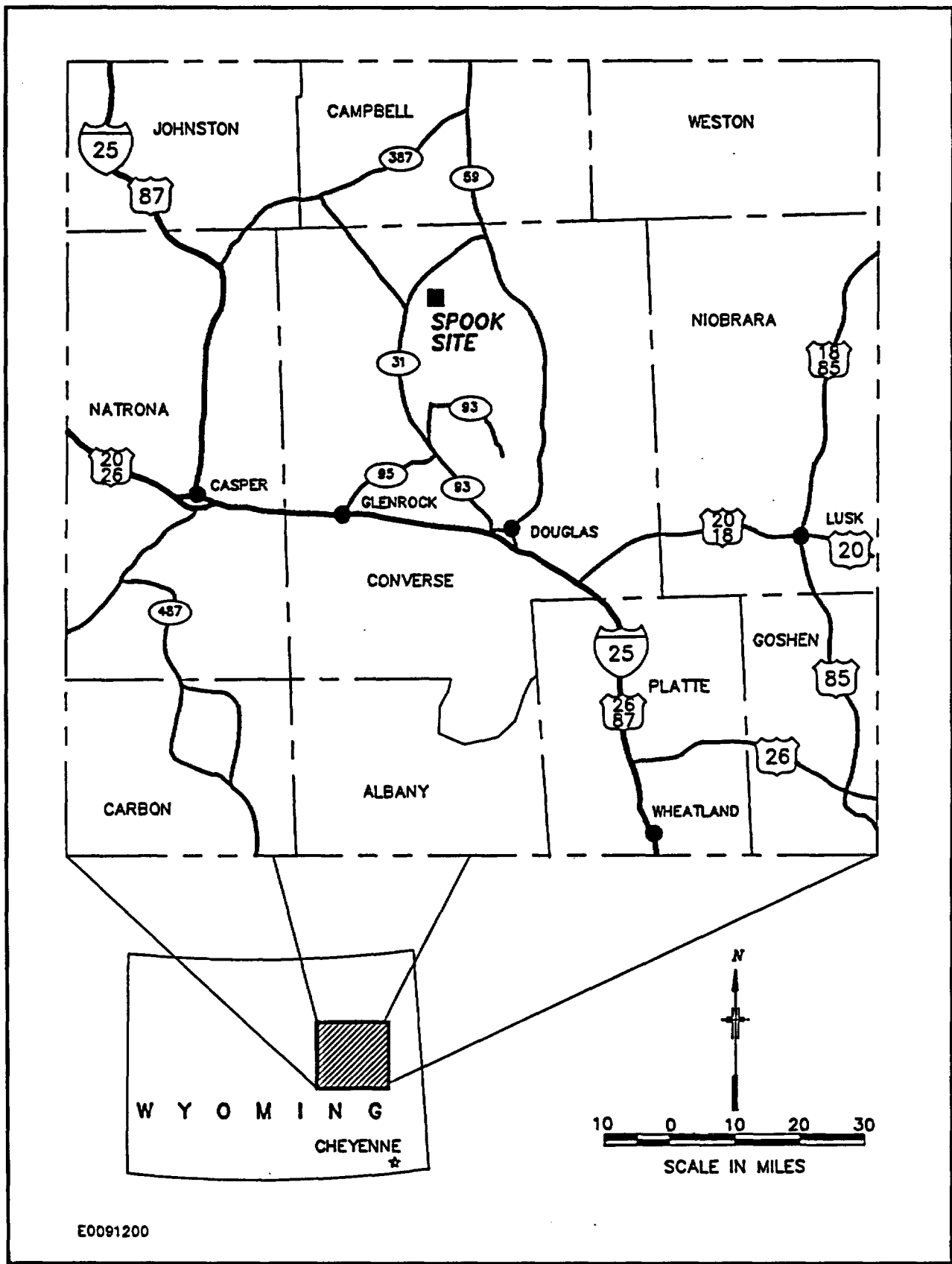


Figure 1-1. Location of the Spook Site in Converse County, Wyoming

along the Dry Fork, which is the nearest water body and is an ephemeral tributary to the Cheyenne River.

Because of its relatively high elevation and exposure, the site is subject to persistent moderate winds that occasionally reach speeds of 30 to 40 miles per hour and usually blow from the southwest. Thunderstorms are common in the area and are sometimes accompanied by severe hail, wind, and rain. The average annual precipitation is approximately 13 inches. Precipitation in late spring and summer normally is scattered thundershowers that can vary greatly in frequency and intensity through September. Precipitation is lowest during the fall and winter months but begins to increase in early spring with heavy, wet snowfalls that give way to rain and thunderstorms.

The site, located near the southern margin of the extensive topographic and structural basin known as the Powder River Basin, is geologically uncomplicated. Essentially, flat-lying sandstone and shales of the Tertiary Wasatch Formation are overlain by a shallow overburden of weathered bedrock on the hillslopes. Bedrock was exposed in the Spook open-pit mine and consisted of medium- to coarse-grained sandstones with claystones and carbonaceous shales of the Monument Hill unit of the Wasatch Formation.

Underlying the Wasatch Formation are layers extending to 2,000 feet thick of sandstones and shales of the Fort Union Formation. The shale and claystones strata of the Fort Union act as confining layers to the upward and downward migration of groundwaters.

### 1.3 Site History

The Spook uranium mine area consisted of 122.7 acres that was formerly mined by the Wyoming Mining and Milling Company. The Spook open pit mine was first excavated in 1962 and operated as a producing mine until 1966. The mining area included the Spook open pit mine and nine piles of overburden or spoil materials that were removed from the pit during mining.

The residual radioactive materials (tailings) and other contaminated materials were consolidated in the south central portion of the Spook pit (Plate 1). During remedial action, the open pit was backfilled with contaminated materials and covered with 49 to 65 feet of overburden materials. The surface of the pit and overburden area was contoured and seeded with endemic plant species. Because of the presence of adjacent subsurface mineral resources, a 200-foot buffer zone around the perimeter of the pit highwalls was established as the restricted site boundary (DOE, 1989). The final restricted Spook disposal site (13 acres) was not fenced.

### 1.4 Site Access

The Spook disposal site is 32 miles northeast of Glenrock, Wyoming, via State Highway 95, County Road 31, and an unpaved gravel road (Figure 1-2). The site can be reached by following the directions in Table 1-2.

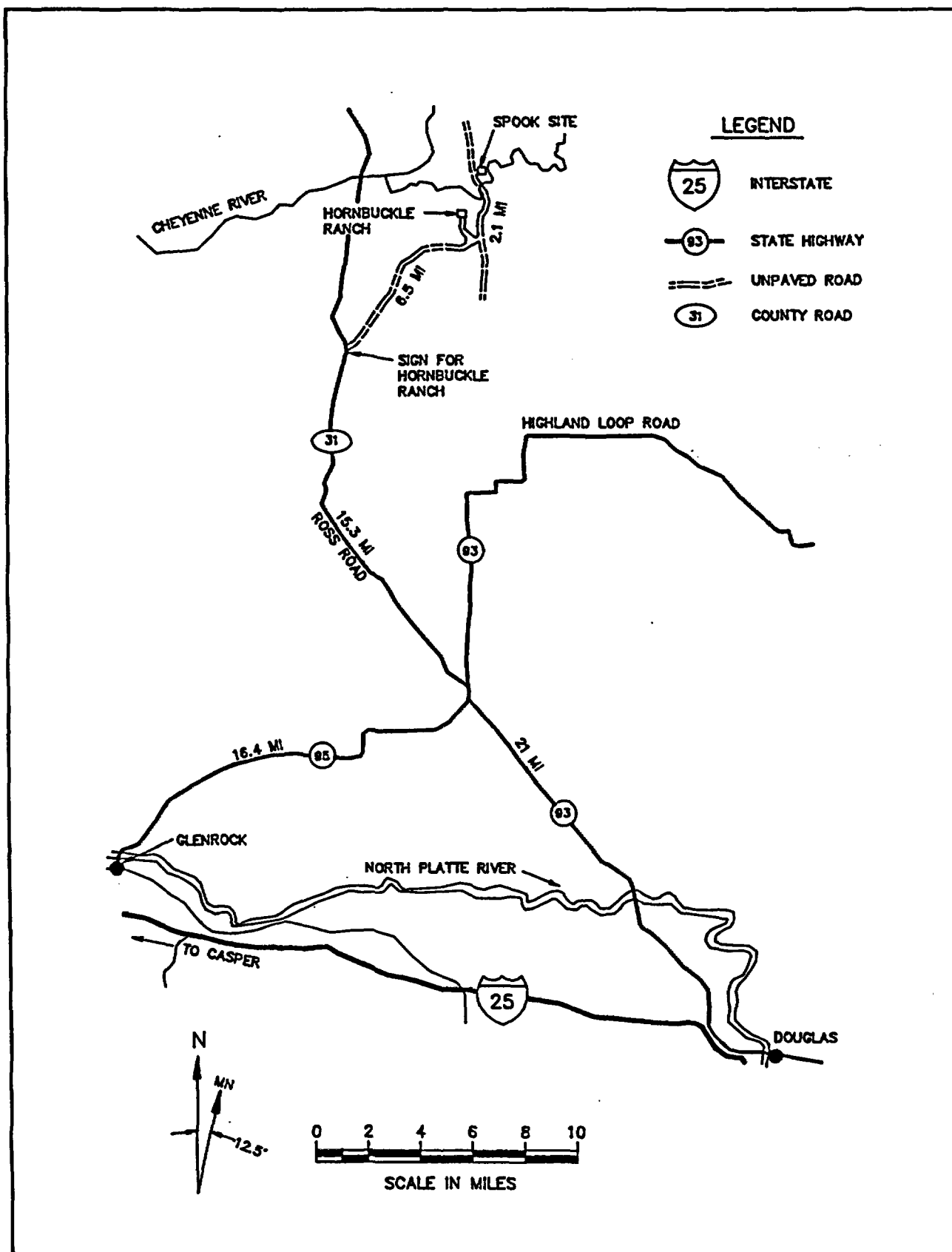


Figure 1-2. Vicinity of the Spook Site

**Table 1-2. Site Routing and Mileage**

<b>Mileage</b>	<b>Route</b>
0.0	<ul style="list-style-type: none"><li>• Glenrock, Wyoming: Stop light in center of town.</li><li>• Proceed northeast on State Highway 95 for 16.4 miles.</li></ul>
16.4	<ul style="list-style-type: none"><li>• Intersection with State Highway 93.</li><li>• Turn left on State Highway 93, proceed 200 feet, turn left onto County Road 31 and proceed northwest for 15.3 miles.</li></ul>
31.7	<ul style="list-style-type: none"><li>• Turn right onto gravel road marked by Hornbuckle Ranch sign and proceed northeast for 6.5 miles.</li></ul>
38.2	<ul style="list-style-type: none"><li>• Turn left onto gravel road and proceed north for 2.1 miles.</li><li>• Turn right onto short access road leading to an unlocked gate in the gravel road right-of-way fence. The Spook site is located immediately east of the gate.</li></ul>

The 13-acre disposal site is marked by warning signs but otherwise is not easily recognized because the contouring and vegetation matches the entire 122.7-acre reclaimed area.

To locate the site, note at the intersection of the two gravel roads, that a power line crosses over the north branch of the road. In the vicinity of the site, rock mounds are visible on the east side of the road and a stock corral is located on the west side of the road. The site is immediately east of the road and the fence that parallels the road. Warning signs locate the approximate boundary of the site.

## 2.0 Annual Prelicensing Inspection

Methods used during the inspection and the results of the inspection are described under appropriate headings that follow. Supporting information is provided in Appendix A, Inspection Photo Log and Photographs; and Plate 1, Inspection Drawing.

### 2.1 Methods

The inspection was conducted by walking two transects across the site and one transect around the perimeter of the site boundary on the north, east, and south sides. Monuments, site markers, perimeter signs, and other features of the site were inspected. The location of specific features discussed below are shown on the inspection drawing (Plate 1). Table 2-1 lists specific site-surveillance features.

Equipment used during the inspection include 35-mm camera, 2-foot scale with north arrow for scale and orientation of photographs, measuring tapes, Brunton compass, and notebook and forms for recording observations and photographs. Photographs were taken without filtration on color-negative film (Kodacolor ISO 200). Photographs are identified in the text of this report, in Appendix A, and on Plate 1 by photo location (PL) number. A total of 36 inspection photographs are included in this report in Appendix A.

### 2.2 Transects

To ensure a thorough and efficient inspection, the site is divided into small manageable units referred to as transects. Transects are areas of various size and shape. Within each transect, inspectors examine all surveillance features, as well as other features of note or interest. Normally, the inspection of one transect is completed before proceeding to the next. Transects used during the inspection of the Spook disposal site are shown in Figure 2-1 and listed in Table 2-2.

*Table 2-1. Specific Site Surveillance Features at the Spook Disposal Site*

Number	Feature	Photograph Location
---	Entrance Sign	1
---	Perimeter Signs (10 total)	---
SMK-1	Site Marker 1	2
SMK-2	Site Marker 2	3
SM-1	Survey Monument 1	4
SM-2	Survey Monument 2	5
SM-3	Survey Monument 3	6
BMT-1	Boundary Monument 1	7
BMT-2	Boundary Monument 2	8
BMT-3	Boundary Monument 3	9
BMT-4	Boundary Monument 4	10
BMT-5	Boundary Monument 5	11
BMT-6	Boundary Monument 6	12
BMT-7	Boundary Monument 7	13
BMT-8	Boundary Monument 8	14

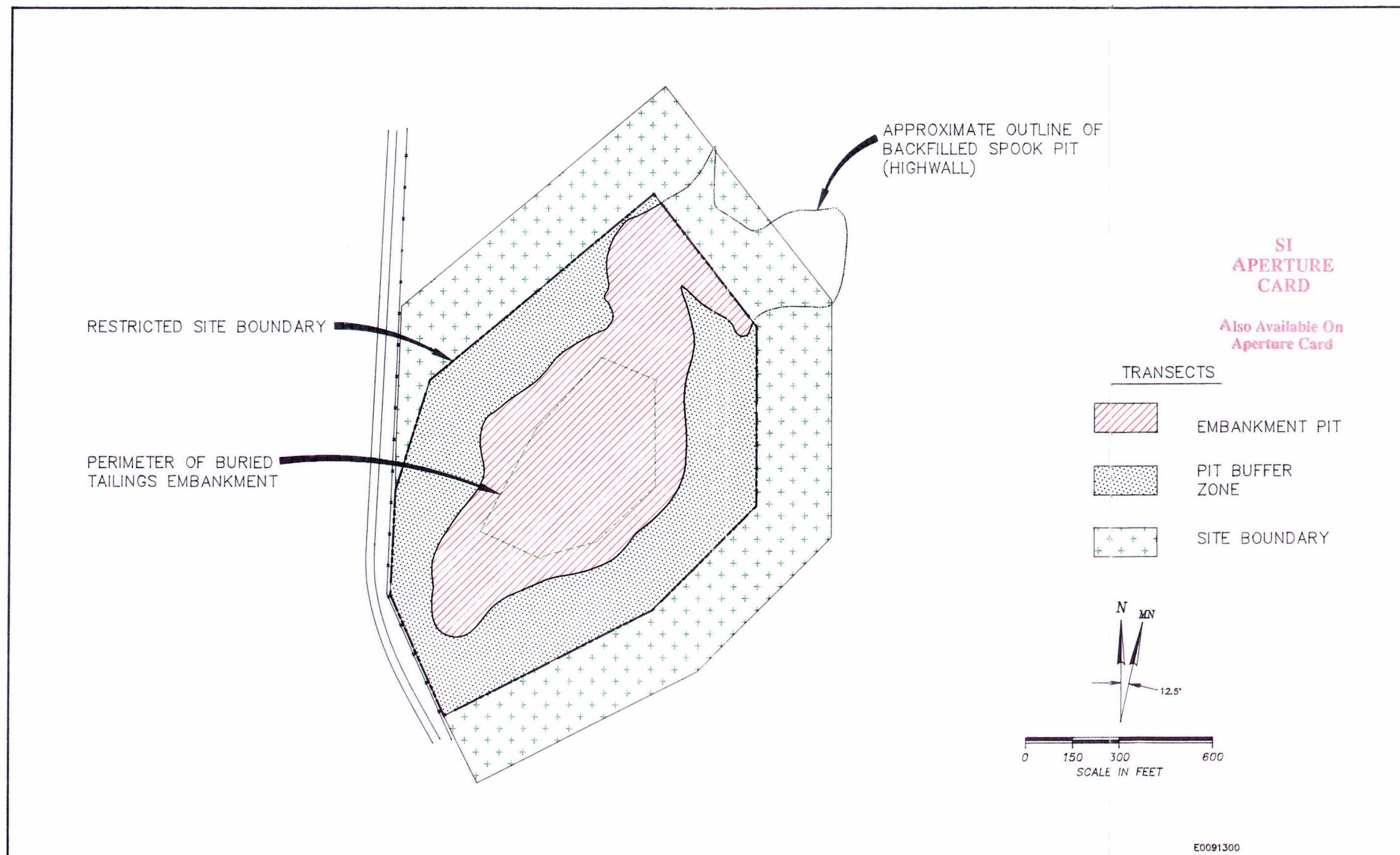


Figure 2-1. Map of Transects of Spook Disposal Site

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## 2.3 Results

Results of the 1991 inspection are reported under two main headings—site surveillance features and transects. Although most surveillance features are within a transect, these features are reported separately, by category, because (1) they are an important focus of the inspection and (2) reporting by category allows the performance of each kind of feature to be evaluated separately as a group. The access road and specific surveillance features are discussed first, followed by a description of the condition of each transect.

Observations may include reference to specific photographs provided in Appendix A. Photographs are identified in the text, in Appendix A, and on Plate 1 by photograph location (PL) number. When more than one photograph was taken at a specific photograph location, photographs are identified by a letter suffix, e.g., 4A, 4B.

### 2.3.1 Access Road and Site Surveillance Features

Following a description of the access road, specific surveillance features are discussed in the order presented in Table 2-1.

#### Access Road

The access road that leads to the site from County Road 31 is graded, graveled, and hard packed. It is in good condition.

#### Entrance and Perimeter Signs

The entrance sign is in place and is undamaged (PL-1). The entrance sign is located south of the short driveway leading from the gravel county road to a gate in the highway fence (PL-23).

Ten perimeter signs are in place at the site in addition to the entrance sign. All of the signs are in their designated locations and are not damaged. The perimeter signs are shown by the symbol "P" and number (P1 through P10) on the inspection drawing (Plate 1). The entrance sign is designated with the symbol "E."

#### Site Markers

Two site markers exist at the Spook disposal site—SMK-1 and SMK-2. SMK-1 (PL-2) is located just outside the southwest perimeter of the buried tailings embankment (Plate 1, stabilized pile); SMK-2 (PL-3) is located just outside the northern corner of the buried tailings embankment. Both site markers are located on top of the Spook pit backfill and inside the restricted site boundary. Both site markers are in excellent condition and show no sign of deterioration.

The site marker closest to the entrance, SMK-1, cannot be read from the entrance sign. The location of SMK-1 seems to be out of specification with the current UMTRA Project specifications for site markers, which state:

One site marker will be placed at the entrance to the site or, if there is no defined entrance, on the boundary of the site closest to the nearest public highway. (*Guidance for UMTRA Project Surveillance and Maintenance*, January 1986, page 15).



Although the UMTRA Project specification is not perfectly clear, the intention seems to be that a visitor should be able to ascertain a perspective of the site from the entrance. With SMK-1 at its current location, a visitor must cross the restricted site boundary to have the "proper perspective" of the disposal site. However, it is believed that the UMTRA Project Office intends to accept this variance because the site is not fenced and, therefore, has no formal entrance.

### Survey Monuments

Three survey monuments are in place at the Spook disposal site—SM-1, SM-2, and SM-3. The monuments are located inside the site boundary and outside the previous Spook pit highwall (Plate 1; PL-4A, PL-5A, and PL-6A). The monuments are undisturbed and in good condition.

### Boundary Monuments

Eight boundary monuments exist at the site—BM-1, BM-2, BM-3, BM-4, BM-5, BM-6, BM-7, and BM-8. The monuments delineate the approximate boundary of the 200-foot buffer zone around the perimeter of the former Spook pit highwall (PL-7 through PL-11, PL-12A, PL-13, and PL-14). All the boundary monuments are undisturbed and in good condition.

### 2.3.2 Transects

Transects are listed in Table 2-2 and shown on Figure 2-1.

*Table 2-2. Transects Used During Inspection of the Spook Disposal Site*

Transect	Explanation
Embankment/Pit	The area includes the buried tailings embankment and the backfilled Spook pit inside the site boundary.
Pit Buffer Zone	The area between the Spook pit highwall outline and the site boundary.
Site Boundary	A site perimeter transect marked by boundary monuments and perimeter signs; includes an area 200 feet outward from the site boundary.

### Embankment/Pit

The embankment containing tailings and other contaminated materials and the open pit uranium mine were covered with overburden materials. The surface of the pit and overburden area were contoured and vegetated with an appropriate seed mixture. It was inspected by a series of north-south traverses, each spaced approximately 60 feet apart.

A panorama showing the embankment/pit surface taken from the location of BM-6 is included in Appendix A, PL-12B through PL-12F. This 180-degree eastern panorama is five photographs taken clockwise from north to south at 45-degree azimuth intervals. The panorama shows the northeasterly downsloping surface of the site, as well as the nature of the topography and environment that surrounds the disposal site.

The vegetation over the surface of the site was planted in 1989 and will be monitored for three consecutive growing seasons. The vegetation density appears to be successful at this time.



No problems were noted within the embankment/pit transect. The embankment/pit surface is in excellent condition. Potentially significant phenomena, such as settling, slumping, or erosion, were not observed.

#### **Pit Buffer Zone**

The site is restricted by a 200-foot buffer zone around the approximate outline of the backfilled Spook Pit (Figure 2-1). The surface of the buffer zone was contoured and vegetated with an appropriate seed mixture. The surface was inspected by a series of east-west traverses, each spaced approximately 60-feet apart. Most of the pit buffer zone is in excellent condition (PL-12B, PL-12C, and PL-12D). Two erosion channels were observed along the east boundary of the pit buffer zone.

The first erosion observed (PL-15) bears 200 degrees from BM-2 at a distance of approximately 200 feet to the head of the erosion channel. The contoured slope in the area of the erosion channel drains to the northeast (Figure 2-2). The direction of the erosion channel shown in PL-15 is in a northeasterly direction. The location of this erosion channel is sufficiently removed from the embankment/pit fill area and does not cause concern at this time.

The second erosion observed (PL-16) bears 340 degrees from SM-3 at a distance of approximately 90 feet to the head of the erosion channel. The contoured slope in the area of this erosional channel is to the northeast and channels surface runoff into the channel (Figure 2-2). The erosion is not considered to be a threat to the integrity of the backfilled embankment/pit area. The erosion at PL-16 does not require preventive maintenance at this time. Erosional development of both of these channels will be observed and measured at the next site inspection.

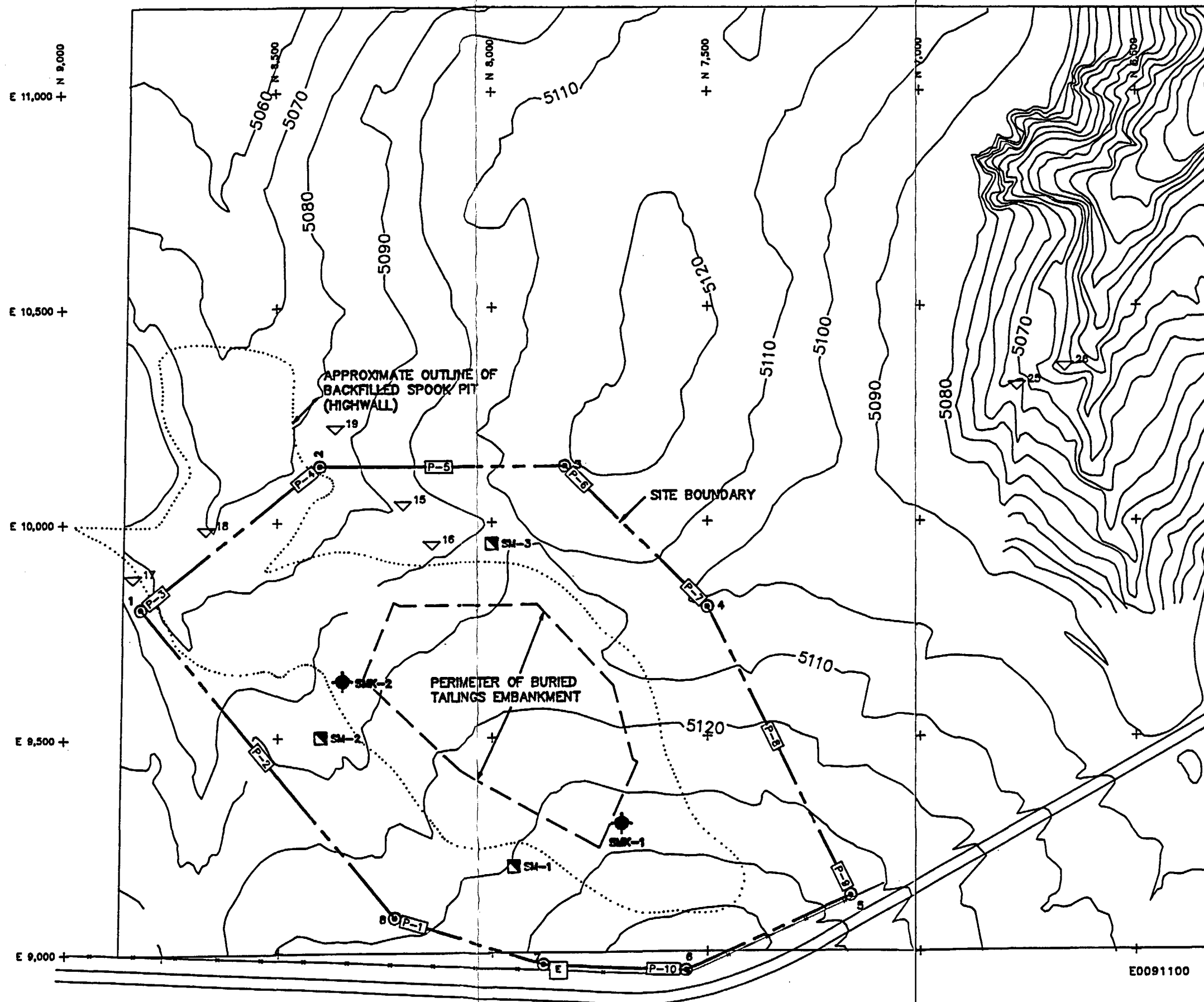
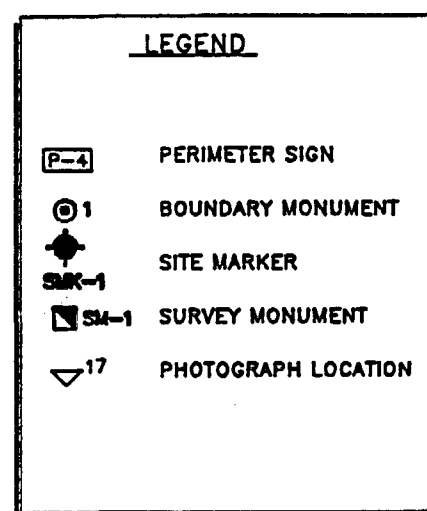
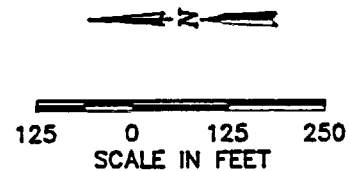
#### **Site Boundary**

The site boundary is not fenced but is marked by boundary monuments and perimeter signs. The site boundary transect extends outward approximately 200 feet from the site perimeter. This area was also recontoured and seeded in 1989. The surface was inspected by walking traverses, each spaced approximately 60 feet apart and parallel with the site boundary around the entire perimeter of the site.

The general nature and condition of the site boundary is shown in photographs taken at PL-12B, PL-12E, PL-12F, and PL-17 through PL-24. The condition of the site boundary is generally good. Isolated erosion has occurred and one abandoned borehole was located.

The erosion observed was a channel along the northeast boundary of the site between BM-1 and BM-2 (PL-18A and PL-18B). This erosion channel trends in a southeasterly direction. This channel is not considered unusual because the contoured topography drains to the southeast in this area (Figure 2-2). Photographs PL-17 and PL-19 show the contoured topography. The erosion is not considered serious or significant because the buried embankment is approximately 500 feet away. This channeling will be monitored during future inspections.

An old abandoned borehole was observed (PL-22) at BM-5. The borehole is approximately 3 feet outside the restricted site boundary. The borehole was estimated to be approximately 100 feet deep by dropping a stone down the open hole. The open borehole may vent radon gas from either groundwater or mineralized rock and will be a hazard to grazing animals. The borehole should be plugged and abandoned.



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Figure 2-2. As-Built Topographic Map

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## **Appendix B**

### **Résumés of Inspectors**

## **David L. Scheuerman**

### **Fields of Competence**

Hazardous waste remediation, uranium mill and tailings decommissioning, environmental restoration, project development and management of contract operator, project scheduling, construction procedures with associated Quality Assurance inspections, fiscal management and resource maximization, structure and foundation design, and public relations.

### **Experience Summary**

Twenty-three years of professional experience including 6 years of managing environmental restoration, 4 years of uranium mine technical and economic/financial feasibility studies, 8 years of structural and foundation design, and 5 years of national and international security.

### **Credentials**

B.S., Civil Engineering, University of Wyoming, Laramie, Wyoming

Graduate Studies, Business Administration, University of Tennessee, Knoxville, Tennessee

### **Employment History**

1990–Present Chem-Nuclear Geotech, Inc., Grand Junction, Colorado

1971–1990 Tennessee Valley Authority, Chattanooga, Tennessee, and Casper, Wyoming

1966–1971 United States Air Force, U.S. and International Locations

### **Key Projects**

Project Manager for the Monticello Remedial Action Project (MRAP), Utah. The former millsite with associated buried tailings, materials, and equipment will be environmentally restored.

Project Manager for the Long-Term Surveillance and Maintenance (LTSM) Program, Grand Junction, Colorado. Perform constructibility inspections and associated maintenance activities.

Project Manager for the Edgemont Mill Decommissioning, South Dakota. Managed contract operator to excavate and transport 4.5 million tons of radioactive waste to an engineered disposal site. Coordinated on-site logistics for contract agreements with DOE (GJPO and Chem-Nuclear), the U.S. Environmental Protection Agency, the city of Edgemont, and the State of South Dakota.

Project Manager for the Marquez Uranium Mine, New Mexico. Evaluated feasibility of contract operator proposed mine plan. Coordinated plan and budget approvals and prepared a technical and economic/financial feasibility study.

Designed new electrical transmission line right-of-way locations working with property owners and governmental agencies. Prepared and conducted public meetings discussing all aspects of the design. Designed and drafted structural details for various transmission line and substation structures with supporting foundations.

## **Charles A. Jones**

### **Fields of Competence**

- Geologic site characterization
- Regulatory compliance
- Mineral resource assessment
- Environmental impact analysis
- NEPA compliance

### **Experience Summary**

Five years experience in uranium exploration and uranium resource evaluation. Nine years experience in management of site characterization studies at proposed high-level waste disposal sites.

Two years experience in implementation and management of surveillance and maintenance activities at DOE disposal sites.

### **Credentials**

B.A., Geology, University of California, Berkeley, California

Ph.D., Geology, University of Oregon, Eugene, Oregon

Geological Society of America

Society of Economic Paleontologists and Mineralogists

Sigma Xi

### **Employment History**

1990–Present Program Manager, Chem-Nuclear Geotech, Inc.

1986–90 Program/Project Manager, UNC Geotech

1975–86 Geologist and Program/Project Manager, Bendix Field Engineering Corporation

1972–75 Assistant Professor, Chadron State College, Chadron, Nebraska

### **Key Projects**

DOE National Uranium Resource Evaluation (NURE) program: uranium resource evaluation in Texas and Utah; publications in uranium resource evaluation; managed field operations at five district offices.

DOE Office of Nuclear Waste Isolation (ONWI): managed geochemical and mineralogical research projects, isotopic dating of host rock and formation waters, and established sample archival system in support of site characterization projects in Texas and Washington.

DOE Long-Term Surveillance and Maintenance (LTSM) Program: responsible for implementation and management of new surveillance and maintenance program for long-term custody of remote DOE disposal sites, primarily those decontaminated and stabilized by DOE remedial action programs and projects.

# **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 site remediation; environmental regulatory considerations; nuclear engineering and radioactive waste handling; heat transfer/fluid mechanics experimental research.

## **Experience Summary**

Ten years of varied professional experience including four years of CERCLA remedial investigation/feasibility study-related work. Underground storage tank site remedial actions, transuranic radioactive and mixed-waste handling studies, 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

Author or co-author of six technical publications.

## **Employment History**

1989-Present Chem-Nuclear Geotech, Inc., Grand Junction, Colorado

1981-1989 EG&G Idaho, Inc., Idaho National Engineering Laboratory, Idaho Falls, Idaho

## **Key Projects**

Managerial responsibility for a feasibility study under CERCLA for a federal facility in Texas. The site has a variety of hazardous waste problems including soil and groundwater contamination.

Managerial responsibility for a feasibility study under CERCLA for a U. S. Air Force base in Illinois. The site had a variety of hazardous waste problems.

Primary author of a feasibility study under CERCLA for a U. S. Air Force base in Massachusetts. The site had a variety of hazardous waste problems, including groundwater contamination, fuel spill areas, and landfills.

Design oversight for a number of underground storage tank removals at federal facilities in Colorado and Hawaii.

Conducted studies for the characterization of transuranic (TRU) and mixed radioactive wastes to determine waste volumes and packaging requirements to enable final waste disposal.

Numerous experiments and several publications related to nuclear reactor thermal hydraulics and associated instrumentation.

### **2.3.3 Area Adjacent to the Site**

In addition to the inspection transects (Figure 2-1), inspectors examined the outlying area beyond the site boundary for signs of erosion, development, or other disturbance that may affect the site.

The original disturbed area (122.7 acres) was recontoured and revegetated during remedial action. The primary land use of the area, including the area across the access road to the west, is grazing. At this time, the grazing appears to be a low-impact activity with regard to site security and integrity. No adjacent off-site activity such as road building, construction, mining or excavation, or other activity that might affect the site was observed. However, erosion southeast of the site was observed.

The first erosion observed (PL-25) is south-southeast of BM-3. An erosion control barrier of "straw bales" has been placed across the "floodplain." The surface runoff has found a flow path of least resistance as shown in PL-25.

The second erosion observed (PL-26) is a channel southeast of PL-25. The channel and floodplain (PL-25) are not considered unusual because the contoured topography drains in the same direction in this area (Figure 2-2). This erosion is not considered serious or significant. The erosion and channeling will be monitored during future inspections.

## 3.0 Conclusions and Recommendations

### 3.1 Conclusions

The Spook disposal site is in good condition at this time. Because the 1991 inspection is the first API of this site, no observations are available from previous inspections for reinspection and evaluation. The report of the 1991 inspection provides baseline information on site conditions for future inspections.

### 3.2 Observations and Recommendations

Observations and recommendations from the 1991 inspection are

1. The site marker SMK-1 appears to be out of specification because an individual standing at the entrance does not have the "proper perspective" of the disposal site.

**Recommendation:** If the UMTRA Project Office finds this variance acceptable, it may wish to record this acceptance in the *Surveillance and Maintenance Plan for the Spook UMTRA Site in Converse County, Wyoming*, or other appropriate site-specific document.

2. Two erosional channels have formed within the eastern side of the pit buffer zone transect.

**Recommendation:** No action is recommended at this time. Because the tailings are buried beneath 49 to 65 feet of overburden, it is unlikely that this erosion will pose a threat over the short-term. However, the erosion will be reevaluated during the next site inspection.

3. One erosional channel has formed within the northeast portion of the site boundary transect.

**Recommendation:** No action is recommended at this time. Because the tailings are buried beneath 49 to 65 feet of overburden, it is unlikely that this erosion will pose a threat over the short-term. However, the erosion will be reevaluated during the next site inspection.

4. Two erosion areas have formed in the area surrounding the site southeast of the buried tailings embankment.

**Recommendation:** No action is recommended at this time. The area is sufficiently removed from the buried tailings embankment. However, the erosion will be monitored during future inspections.

5. An open borehole was found along the western edge of the site boundary transect near boundary marker BM-5.

**Recommendation:** The borehole should be plugged and abandoned. The borehole may vent radon gas and will pose a hazard to grazing animals.



### **3.3 Site Maintenance**

No site maintenance is recommended before the 1992 inspection.

### **3.4 Contingency Plans**

As indicated in the *Surveillance and Maintenance Plan for the Spook UMTRA Site in Converse County, Wyoming* (DOE, 1989), a working relationship has been established by the Uranium Mill Tailings Remedial Action Project Office with the Converse County Sheriff's Department. The Sheriff's Department will contact the DOE should any human intrusion, fire, or other unusual events occur that would affect the security or integrity of the Spook site.

## 4.0 References

DOE (U.S. Department of Energy), 1986. *Guidance for UMTRA Project Surveillance and Maintenance*, UMTRA-DOE/AL-350124.0000, DOE UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico.

\_\_\_\_\_, 1989. *Surveillance and Maintenance Plan for the Spook UMTRA Site in Converse County, Wyoming*, UMTRA-DOE/AL-\_\_\_\_\_, DOE UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico.

Ford, Bacon & Davis Utah Inc., 1981. *Engineering Assessment of Inactive Uranium Mill Tailings, Spook Site, Converse County, Wyoming*, UMTRA-DOE/AL-DE-AC04-76GJ01658, DOE UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico.

**Appendix A**  
**Inspection Photo Log and Photographs**

# Inspection Photo Log

## Explanation

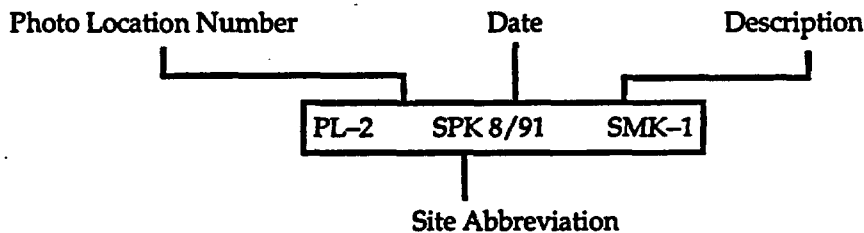
Photographs referred to in the text of this report, as well as a list of these photographs, are included in this appendix (Appendix A). Photographs are identified by photograph location (PL) number. PL numbers also appear on the inspection drawing (Plate 1).

## Specifications

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

## Photograph Labels

Photographs in Appendix A 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., 4A, 4B.

## Abbreviations

The following abbreviations are used in the photograph log:

N	North	SMK	Site Marker
NE	Northeast	SM	Survey Monument
E	East	BM	Boundary Monument
SE	Southeast	in.	inches
S	South	ft	feet

# Photo Log

Site: Spook, Wyoming

Weather Conditions: Cloudy, dry, temperature 85°F

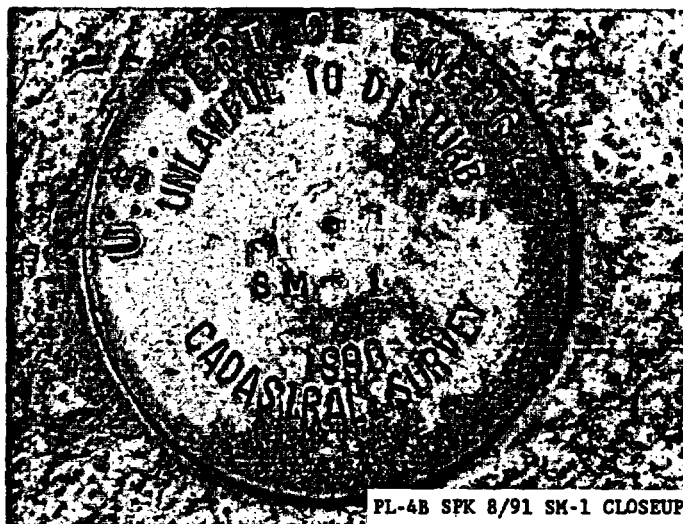
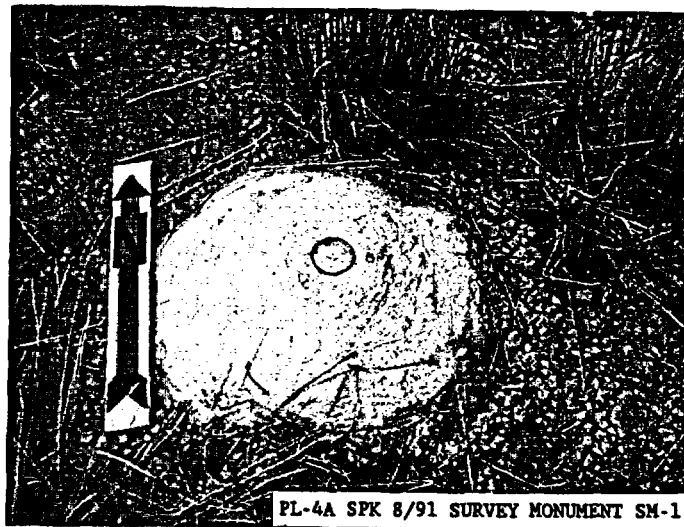
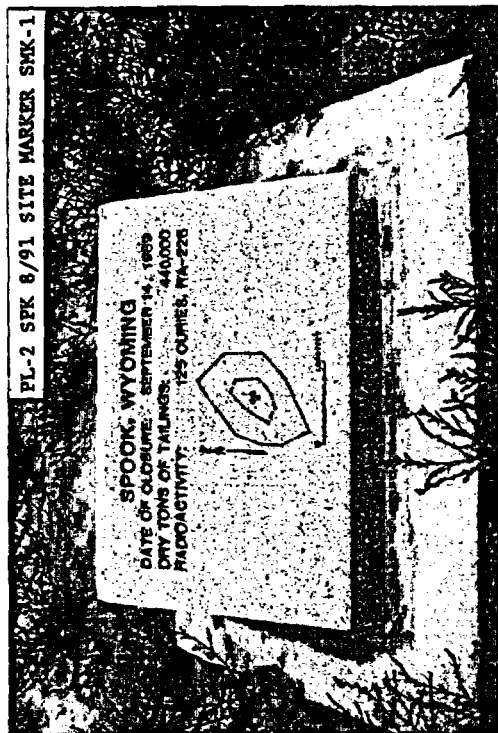
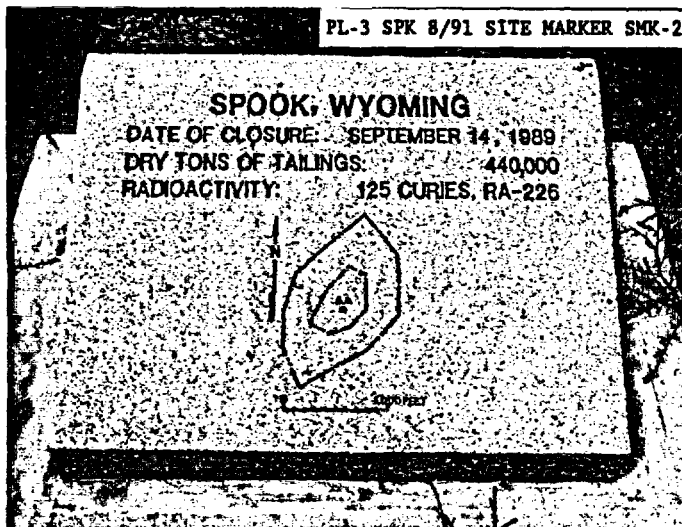
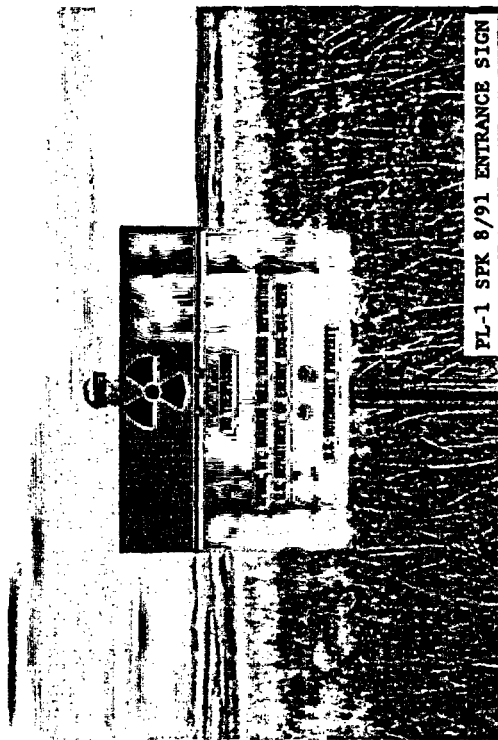
Date of Inspection: August 19, 1991

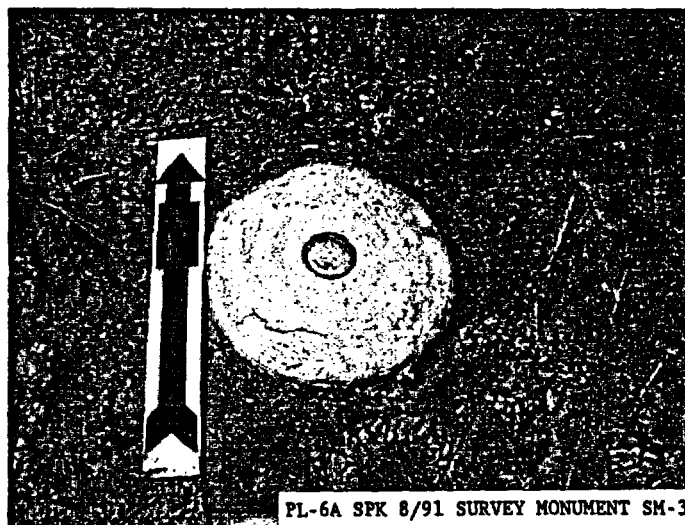
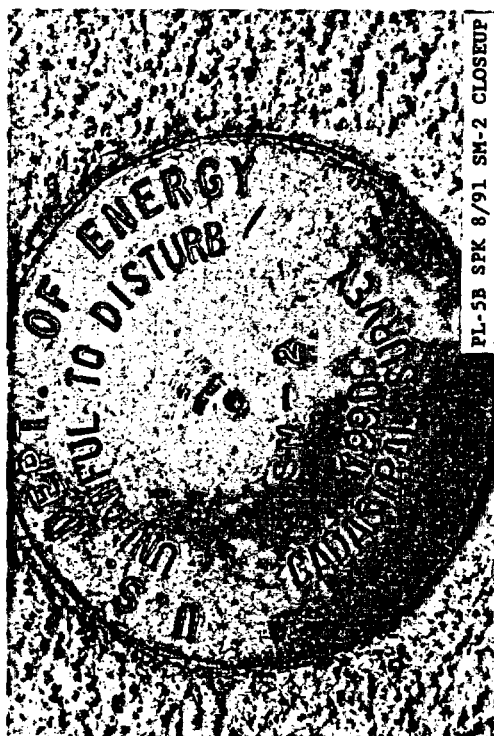
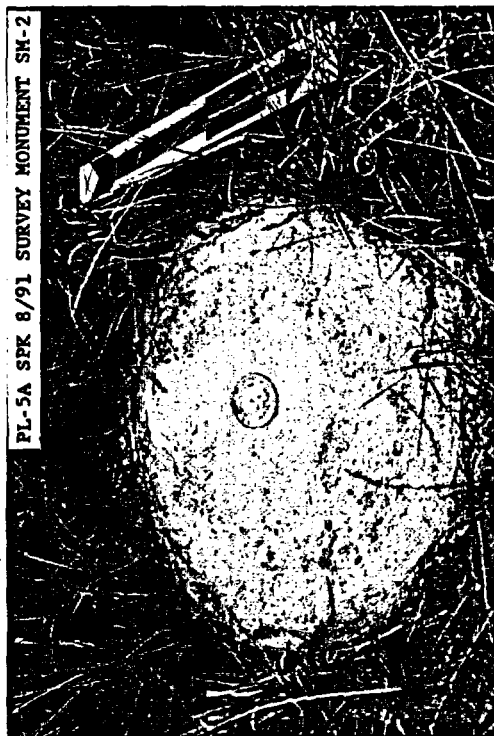
Time of Day: From 3:00 p.m. to 6:00 p.m.

Photographer's Location No. <sup>a</sup>	Azimuth <sup>b</sup>	Photo Description/Remarks
1	090	Entrance sign
2	000	Site marker SMK-1; southern edge of embankment.
3	000	Site marker SMK-2; northern edge of embankment.
4A		Survey monument SM-1; near entrance.
4B		Same as PL-4A; detail.
5A		Survey monument; SM-2; north of embankment.
5B		Same as PL-5A; detail.
6A		Survey monument SM-3; east of embankment.
6B		Same as PL-6A; detail.
7		Boundary monument BM-1.
8		Boundary monument BM-2.
9		Boundary monument BM-3.
10		Boundary monument BM-4.
11		Boundary monument BM-5.
12A		Boundary monument BM-6.
12B	000	Panorama from location of BM-6; view N.
12C	045	Panorama from location of BM-6; view NE.
12D	090	Panorama from location of BM-6; view E.
12E	135	Panorama from location of BM-6; view SE.
12F	180	Panorama from location of BM-6; view S.
13		Boundary monument BM-7.
14		Boundary monument BM-8.
15		Erosion channel; BM-2 bears 020°, 150 ft.
16		Erosion channel; SM-3 bears 160°, 90 ft.
17	240	Back view to BM-8; BM-1 in foreground.
18A		Erosion channel; BM-1 bears 312°, 275 ft.
18B		Same as PL-18A, closeup
19	325	Back view to BM-1; BM-2 in foreground
20	000	Back view toward BM-2.
21	050	Back view to BM-4 and BM-3.
22	270	Abandoned borehole at BM-5.
23	020	Foreward view to BM-8 from BM-7.
24	180	Back view to BM-6 from BM-7.
25		Erosion channel barrier (see Figure 2-2).
26		Erosion channel SE of PL-25 (see Figure 2-2).
27	250	Two UMTRA wells and polyvinyl chloride pipe.

<sup>a</sup>Photo location number; see Plate 1 for photo locations.

<sup>b</sup>Declination angle of 12.5° E.



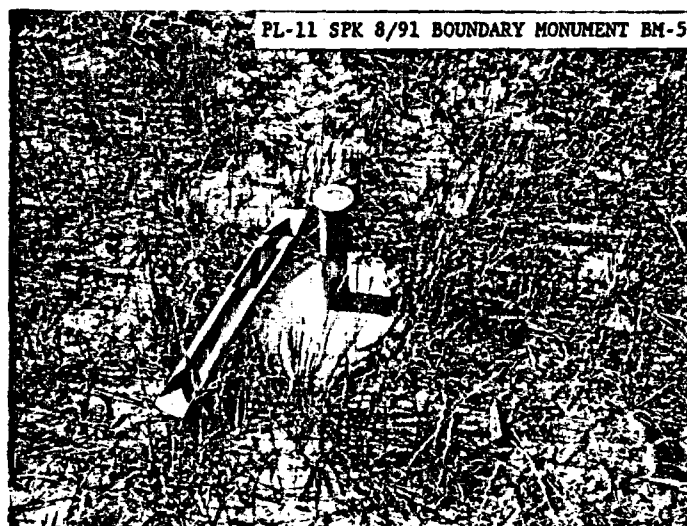




PL-8 SPK 8/91 BOUNDARY MONUMENT BM-2



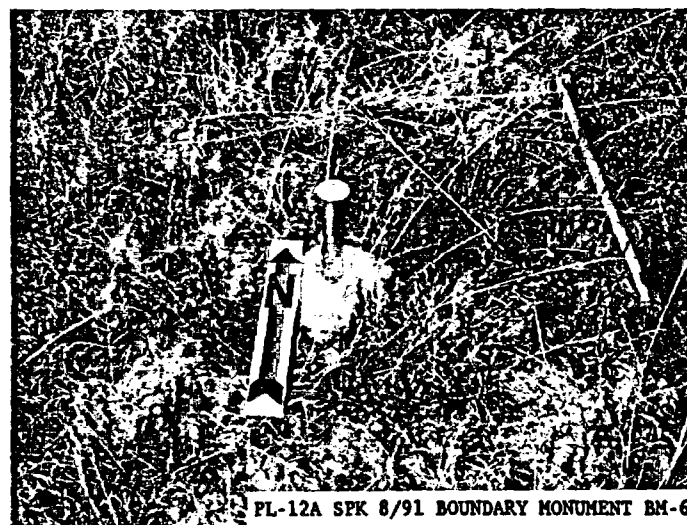
PL-10 SPK 8/91 BOUNDARY MONUMENT BM-4



PL-11 SPK 8/91 BOUNDARY MONUMENT BM-5

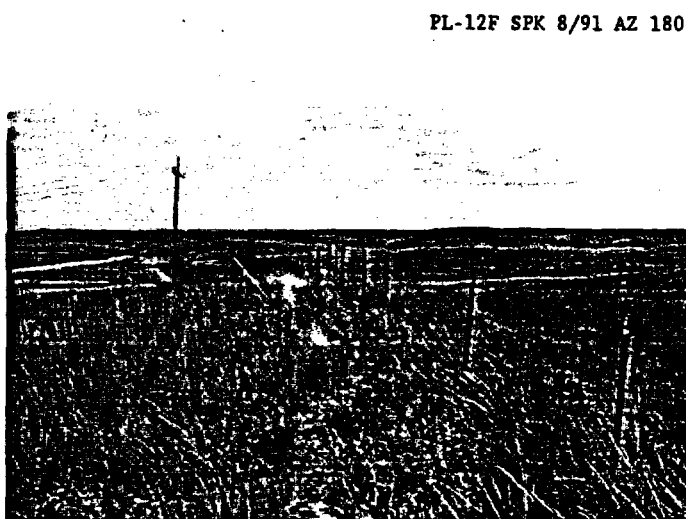
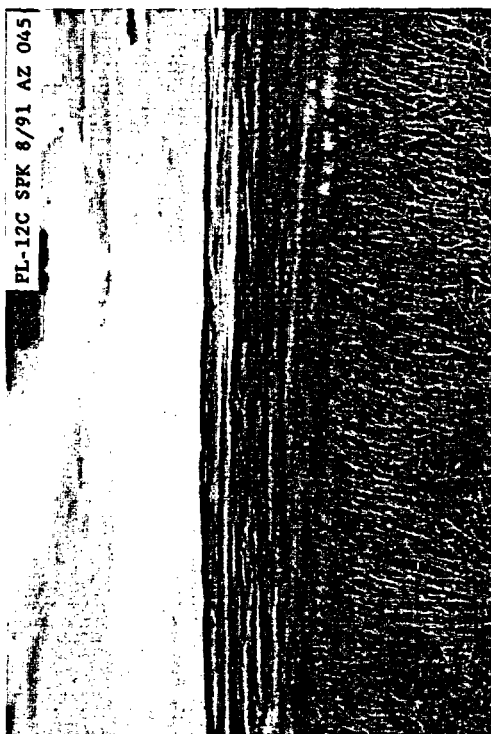
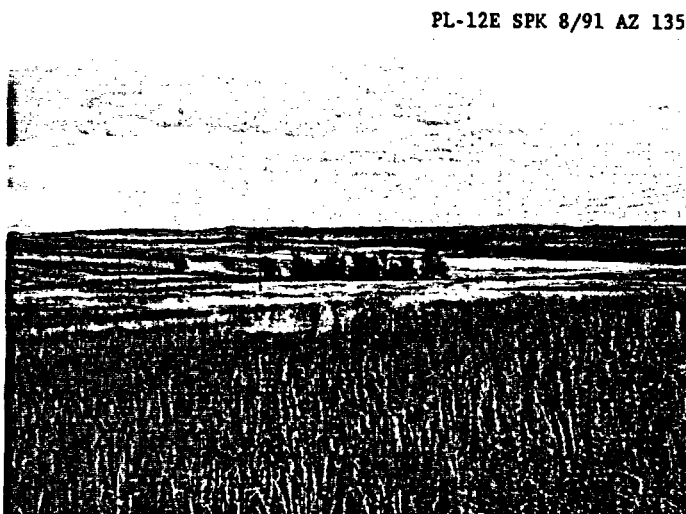
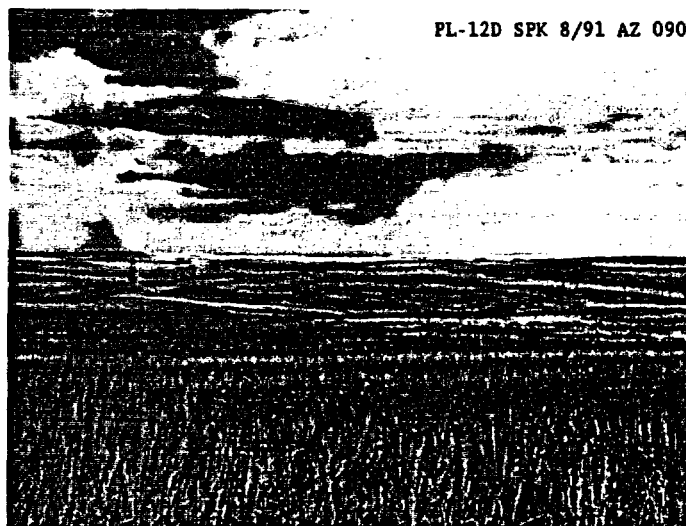


PL-9 SPK 8/91 BOUNDARY MONUMENT BM-3



PL-12A SPK 8/91 BOUNDARY MONUMENT BM-6

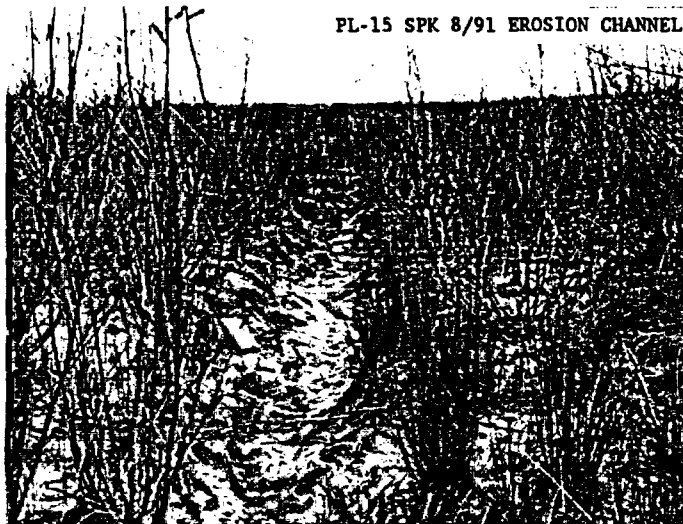




PL-13 SPK 8/91 BOUNDARY MONUMENT BM-7



PL-15 SPK 8/91 EROSION CHANNEL



PL-16 SPK 8/91 EROSION CHANNEL



PL-17 SPK 8/91 AZ 240 to BM-8



PL-14 SPK 8/91 BOUNDARY MONUMENT BM-8



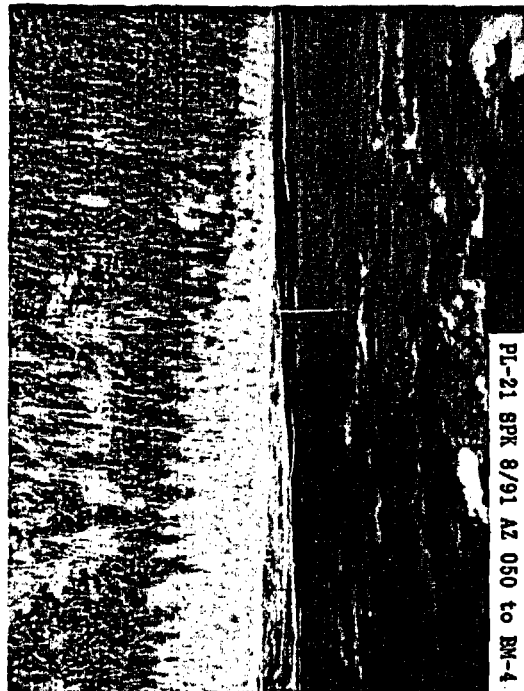
POLY PG 3 1/2 x 5 1/4 . HOLDS 10 PRINTS  
printz STOCK #210-76 U.S.A./762



PL-18B SPK 8/91 EROSION CHANNEL CLOSEUP



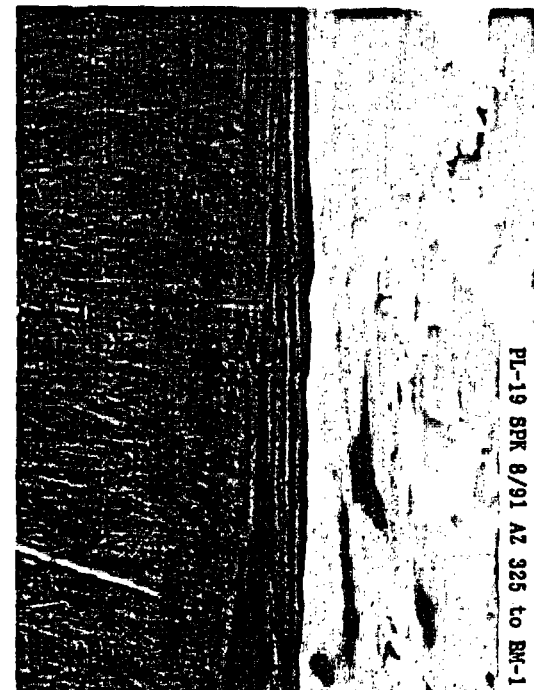
PL-18A SPK 8/91 EROSION CHANNEL



PL-21 SPK 8/91 AZ 050 to BM-4



PL-20 SPK 8/91 AZ 000 to BM-2



PL-19 SPK 8/91 AZ 325 to BM-1

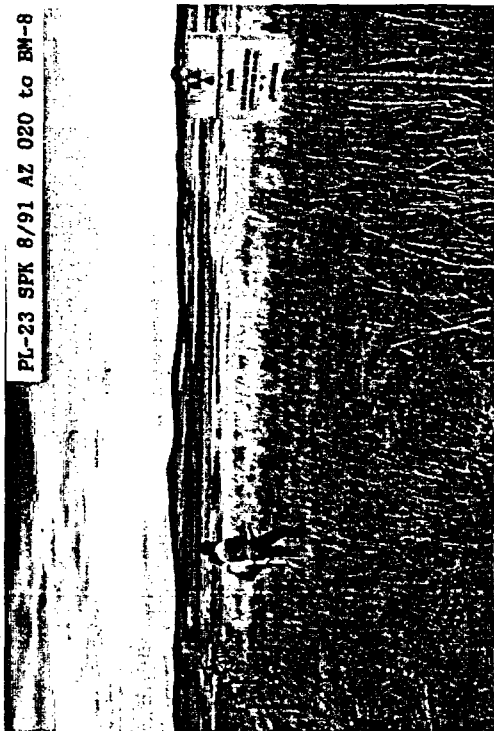
PL-24 SPK 8/91 AZ 180 to BM-6



PL-25 SPK 8/91 EROSION CONTROL BARRIER

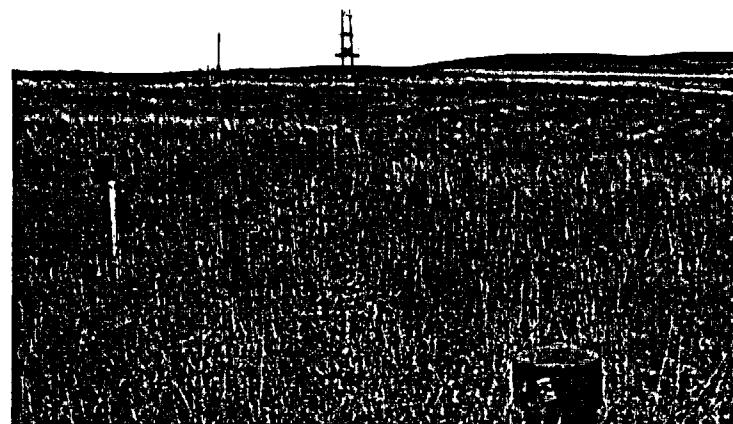


PL-26 SPK 8/91 EROSION CHANNEL

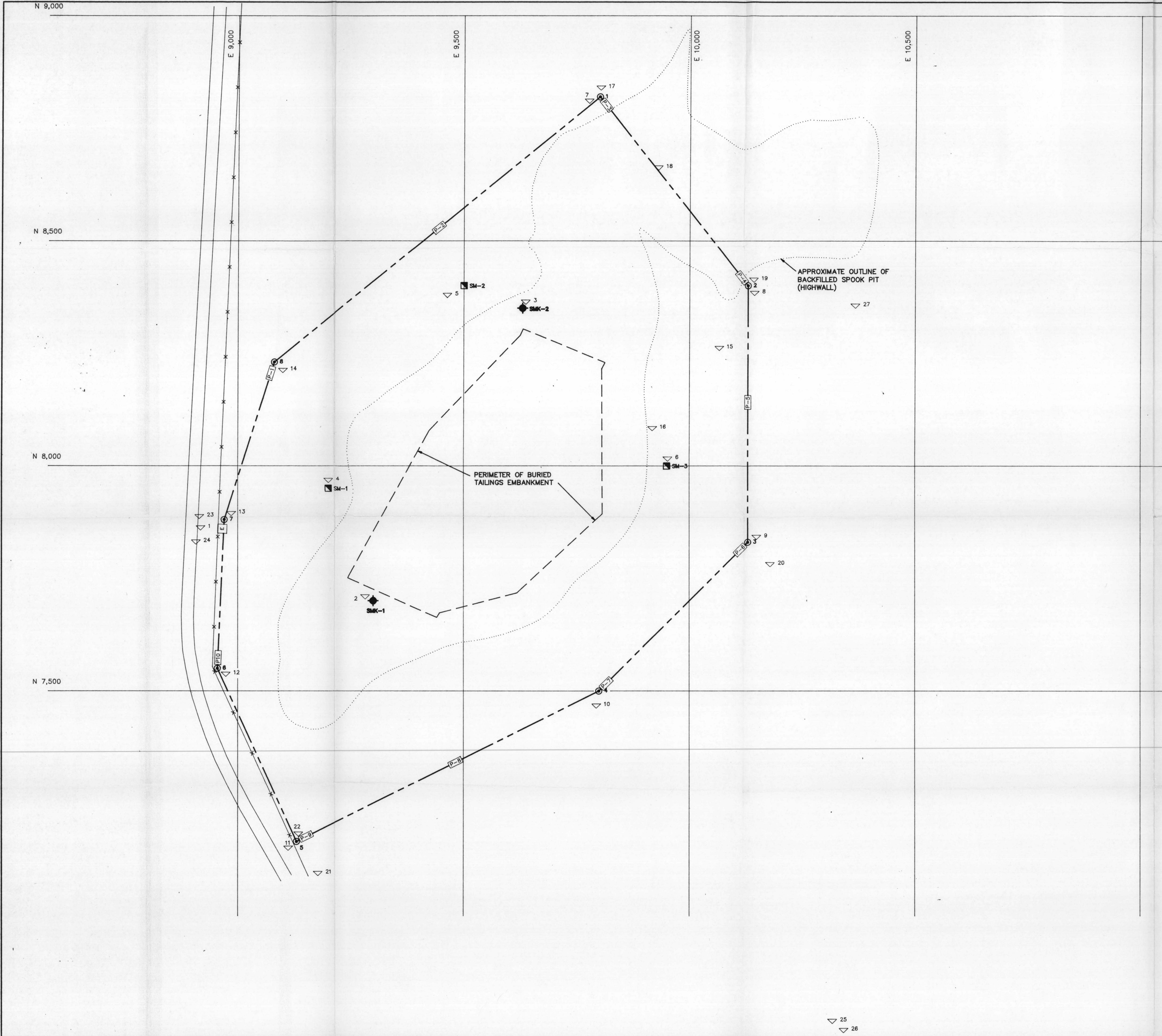


PL-23 SPK 8/91 AZ 020 to BM-8

PL-27 SPK 8/91 UMTRA WELLS & PVC PIPE







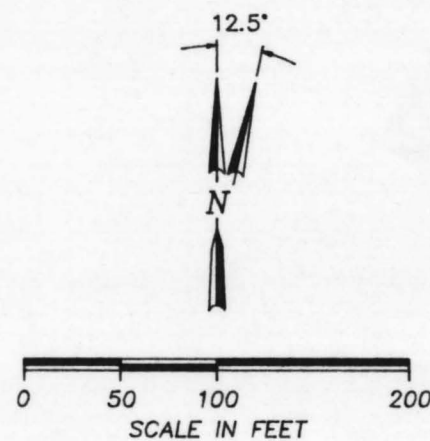
NOTES:

1. THE CONSTRUCTION GRID COORDINATES SHOWN ARE BASED ON THE PROJECT SURVEY CONTROL POINT (N10,000.00,E10,000.00) LOCATED AT THE NORTHEAST CORNER OF SECTION 28, T38N, R73W, 6TH PRINCIPAL MERIDIAN, CONVERSE COUNTY, WYOMING.
2. THE LOCATION OF THE MONUMENTS AND MARKERS IS BASED ON THE DRAFT SURVEILLANCE AND MAINTENANCE PLAN BY JACOBS ENGINEERING GROUP, INC., DATED AUGUST 1989.
3. THE COORDINATES OF THE SURVEY MONUMENTS, BOUNDARY MONUMENTS AND SITE MARKERS ARE GIVEN IN TABLE 01055-1, SECTION 01055 OF THE SUBCONTRACT SPECIFICATION.
4. THE MONUMENTS AND MARKERS SHALL BE TIED TO THE USGS TRIANGULATION CONTROL NETWORK AND THE WYOMING EAST ZONE COORDINATE SYSTEM AS DIRECTED IN PARAGRAPH 3.1.C.1 OF SECTION 01055 OF THE SUBCONTRACT SPECIFICATION.
5. THIS DRAWING IS BASED ON DRAWING NUMBER SPK-PS-10-0301 OF THE SPOOK SITE, SPOOK, WYOMING. THE ORIGINAL DRAWING WAS PRODUCED BY MORRISON-KNUDSEN ENGINEERS INC. FOR THE DEPARTMENT OF ENERGY UMTRA PROJECT OFFICE.

SI  
APERTURE  
CARD

EXPLANATION

- 1 SURVEY MONUMENT
- 2 BOUNDARY MONUMENT
- SMK-1 SITE MARKER
- 130 PHOTOGRAPH LOCATION (WITH NUMBER)\*
- PROPERTY BOUNDARY
- PERMANENT FENCE
- PERIMETER SIGN
- ENTRANCE SIGN



\* PHOTO LOCATIONS #25 AND #26 WILL BE FOUND ON FIGURE 2-2 IN TEXT OF THE REPORT.

1991 PRELICENSING INSPECTION  
SPOOK, WYOMING, DISPOSAL SITE,  
AUGUST 19, 1991

9301210332

NO.	DATE	REVISIONS	DWN.	CKD.	SUB.	NO.	DATE	REVISIONS	DWN.	CKD.	SUB.
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECTS OFFICE, COLORADO											
PLATE 1 SPOOK WYOMING, INSPECTION DRAWING 1991 PRELICENSING INSPECTION											
PROJECT NO. ENG-111-0007-00-000 DWG. NO. E0091400 SHT. 1 OF 1											
CN Geotech, Inc.											

D-04