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LANDFILL CLOSURE PLAN

LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

* This report was reviewed by Div. of Hydro for consistency w/ closure plans of Bureau of water. Memo to eng. SW970968.pfc 10/6/97. Plan is consistent w/ plans rec'd in Div. of Hydro.

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SECTION 1
INTRODUCTION

1.1 OBJECTIVE OF THE CLOSURE PLAN

The objective of this plan is to present the method for closure of the industrial waste landfill at the Laurens Ceramics site (the former Minnesota Mining and Manufacturing Company/General Electric Company (3M/GE) facility) in Laurens, South Carolina. Preparation of this Closure Plan was done in accordance with the Consent Agreement (No. 96-000-WP) between 3M/GE and the South Carolina Department of Health and Environmental Control (SCDHEC) dated 28 March 1997. The approach to landfill closure in this plan will be protective of human health and the environment, and will minimize the need for further maintenance or mitigation at the landfill.

1.2 SCOPE OF THE CLOSURE PLAN

The scope of this Closure Plan is to describe past operational history at the landfill, summarize existing site conditions, and present an approach to closure that will be protective of human health and the environment. This information and evaluation forms the basis for implementation of the closure method as presented in this plan.

1.3 APPROACH AND ORGANIZATION

The organization of this document reflects the approach developed for closure of the Laurens Ceramics site landfill. Specifically, the sections of this plan and associated approach are as follows:

Section 2 - Review of plant history and the operational history of the landfill.

Section 3 - Presentation of pertinent information gathered during previous investigations and studies.

Section 4 - Presentation of the method of closure.

SECTION 2
BACKGROUND

2.1 FACILITY BACKGROUND

The Laurens Ceramics site is located approximately 2 miles northwest of the town of Laurens, South Carolina on the south side of State Road 14 at the intersection with State Road 24. The plant property encompasses approximately 242 acres and its location is shown on Figure 2-1. Approximately 15 miles to the east is the Little River and approximately 1,000 ft to the south is Reedy Fork Creek.

The facility was constructed during the period 1960-1961 and began operations in 1961 as part of the American Lava Corporation, a subsidiary of 3M. Beginning in 1975, the business was operated as the Technical Ceramics Products Division of 3M. In September 1983, General Electric Ceramics, Inc. (GECI) purchased the facility. GECI sold the facility in March 1988 to AlSiMag, a subsidiary of Eagle Industries. AlSiMag is the current owner and operator of the facility.

From 1961 to 1988, the facility primarily produced textile guides, wear products, and some ceramic electrical substrates used in electrical circuitry, microprocessors, wrist watches, and computers. These ceramics generally contained various amounts of talc, alumina oxides, inorganic inert fillers, and clay. Some of the ceramic formulas also contained low concentrations of barium, including barium titanate and barium carbonate. As part of the normal production process, the ceramic formulations were molded and then ground to proper size and shape. The ceramics were then fired at high temperatures. Roughly 15% of the fired ceramics were ground further in a wet tumbler to a polished state.

1972-1983 permit sw (IWP-123)

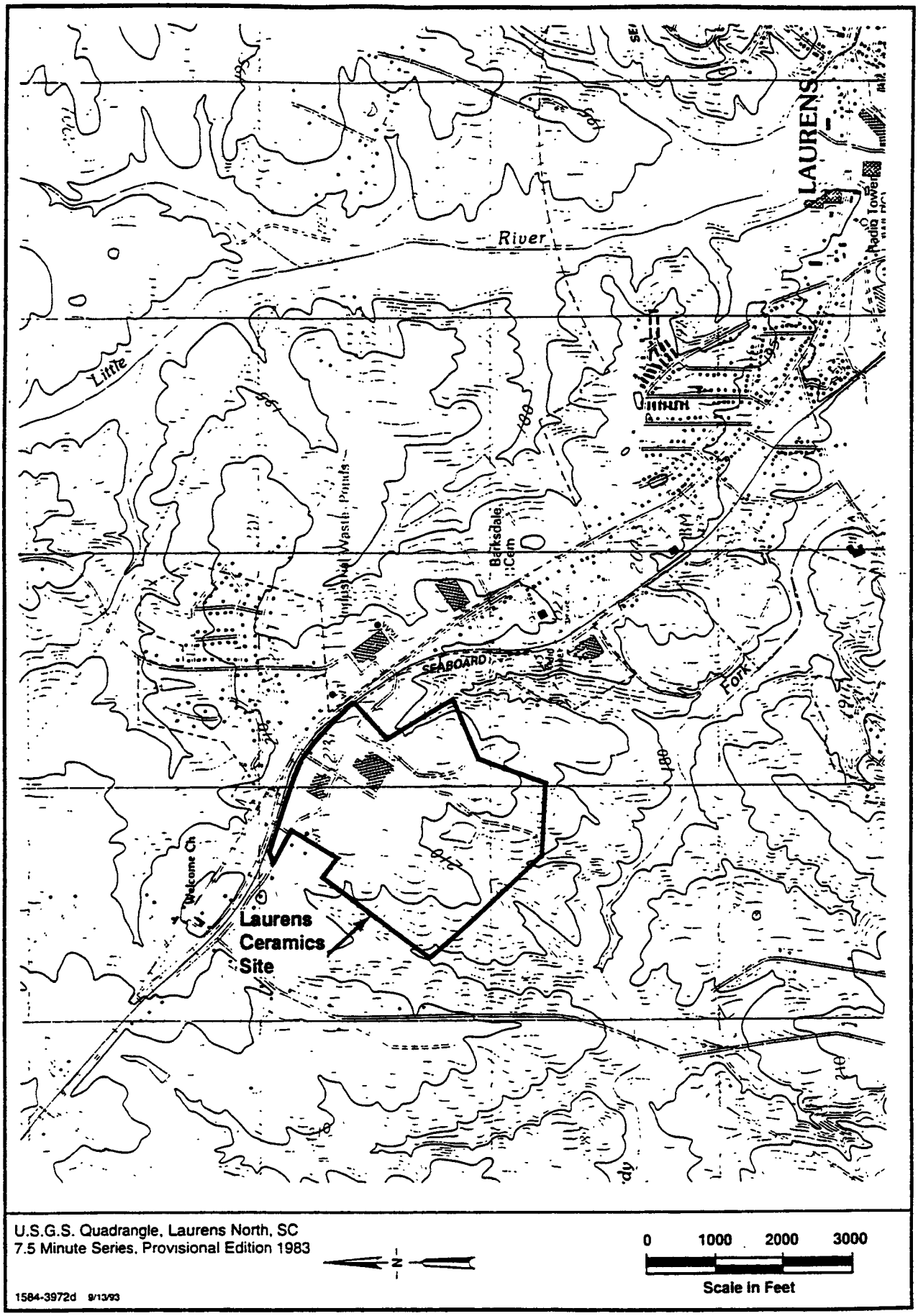

FIGURE 2-1 SITE LOCATION MAP

The manufacturing processes that occurred at the facility included body preparation, extrusion mixing, dry pressing, tape casting, glazing, grinding, and post-fire tumbling. Body preparation consisted of processing raw materials into a powder for use in forming products. Extrusion mixing was a basic forming operation which included mixing the prepared powder with water and binder materials prior to extrusion pressing and firing. Dry pressing included mixing of prepared powder with lubricants and pressing in compacting presses. Tape casting involved milling a prepared powder with solvents and casting on a mylar carrier. The glazing operation in the early years of the facility's operation used lead. In subsequent years, a water-based non-toxic glaze system was implemented. Tumbling was a post-firing process to polish and clean the parts. Solid wastes generated as a result of the processes discussed above included:

- Fire (refractory) bricks.
- Fired ceramic parts (off-spec, or otherwise unusable).
- Unfired ceramics.
- Dust collector residues.
- Wet sludge from grinding operations.
- Settling pond ceramic fines.

The manufacturing processes have occurred in two buildings at the facility. These are known as Plants 1 and 2, as shown on Figure 2-2. Plant 1 is the original ceramics production plant which began operations in the early 1960s. Plant 2 began operations in the mid-1960s.

2.2 HISTORICAL USE OF THE LANDFILL

The on-site solid industrial waste landfill is located near the western property boundary approximately 1300 feet south of Highway 14 (see Figure 2-2). The landfill was operated

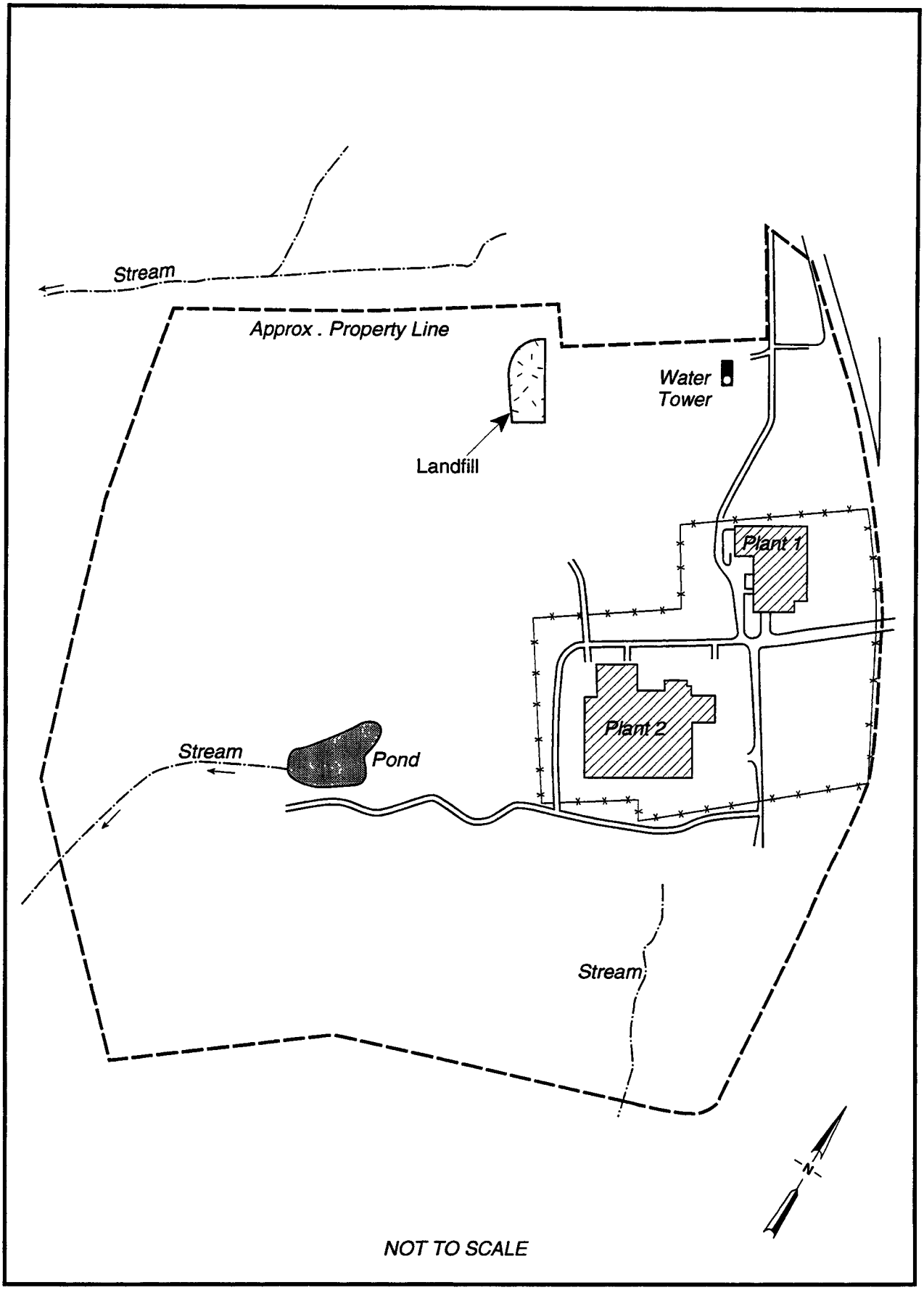

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FIGURE 2-2 PLAN OF THE LAURENS CERAMICS SITE

from 1961 through 1983. Beginning in 1972, the landfill was permitted to accept industrial wastes from the facility. From 1972 through mid-1975, the landfill operated under Permit #57 issued by the South Carolina Pollution Control Authority (SCPCA). From mid-1975 until disposal ceased, the landfill operated under Permit #IWP-123 issued by SCDHEC.

As depicted on Figure 2-3, the landfill area is approximately 2 acres, with wastes encountered up to a maximum depth of approximately 10 feet below ground surface (bgs) and a waste thickness ranging from several inches to 9 feet. The location and distribution of wastes within the landfill is variable since one portion of the landfill was operated as a progressive bank landfill while in another portion wastes were deposited into a trench. Review of the chronology depicted by aerial photography suggests that waste disposal was occurring in 1964 in the progressive bank (northwest portion of the landfill), and appeared to cease in this area before 1980. In the progressive bank portion, waste materials were sequentially deposited over the northwest bank such that the landfill footprint was extended in that direction. In the trench portion, a trench approximately 9 feet in depth was filled. In the 1981 aerial photo, waste disposal in the southeast portion of the trench was distinctly visible. Waste disposal in the trench continued until 1983. Based on observations made during the field investigations, it is estimated that approximately 13,000 cubic yards of waste material were deposited in the landfill during the period it operated.

Generally, 1 to 2 feet of clayey soil with sparse vegetation is currently covering the landfill, although there is an exposed portion on the western boundary (progressive bank portion). Drainage of surface run-off is not well defined and generally follows topography which slopes to the northwest. A small drainage ditch leads from the northwest side of the landfill area and ultimately drains to an unnamed tributary of Reedy Fork Creek. The landfill area is surrounded by a 6 foot chain link fence topped with barbed wire.

MW09
MW10
Progressive
Bank Area
MW45
MW44
MW19
MW20
Approximate Area of
Waste Removal from
1983 Excavation
MW17
MW18
MW25
710
MW22
MW21
720
Approximate Extent of
Waste Material
POWER LINE

WESTON
MANAGERS DESIGNERS CONSULTANTS

SITE MAP

Legend

- Approximate 1983 Excavation Area
- Monitor Well
- Fence
- Power Line
- 710 — Topographic Contour
- Approximate Former Trench Area
- Approximate Extent of Waste

Topographic Contour Interval 2 feet.

Figure 2-3

Landfill Features
Laurens Ceramics
Laurens, South Carolina

N

Scale In Feet
0 25 50

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The chemical and physical makeup of the material disposed in the landfill has changed over time due to changes in product formulations, changes in procedures, and changes in environmental regulations. From 1972 through early 1981 the following materials were disposed in the landfill under the permit in effect at the time:

- Fired and unfired ceramics.
- Fire brick from furnaces.
- Construction debris.
- Dust collection fines.
- Settling pond fines.
- Paper/wood/cardboard.

Based on information from plant documents and interviews with plant personnel, there was no solvent disposal in the landfill. Some investigations in the vicinity of the landfill have focused on solvents, specifically PCE and TCE. Analysis of the samples collected during test pitting in 1992 showed PCE concentrations less than 0.2 mg/kg in 9 of 10 samples collected. The highest PCE concentration detected (19 mg/kg) had a leachable concentration of only 0.0032 mg/L, several orders of magnitude less than the regulatory criteria (0.7 mg/L). During the 1994 excavation of 10 test pits, VOCs were not detected in the headspace analysis of waste materials. Composition of waste materials is further discussed in Section 3.

With the promulgation of solid and hazardous wastes regulations, waste disposal procedures at the facility were changed. In March 1981, based on preliminary waste analysis using EP Toxicity testing, plant personnel were instructed to segregate wastes resulting from the manufacture of ceramics in which barium-containing raw materials were used. The barium compounds in these raw materials were carbonates, silicates, zirconates, and titanates. The procedure for management of these segregated materials identified disposal at an off-site hazardous waste landfill. In May 1981, SCDHEC was

notified of the past disposal activities, and the intent to dispose these segregated materials off-site. In June 1981 the U.S. Environmental Protection Agency (USEPA) was also notified of disposal activities at the Laurens facility by filing pursuant to §103(C) of CERCLA. In addition to these materials, dust collector fines were also disposed of in the landfill after such materials had been tested in March of 1981 (EP Tox, 1.8 mg/L barium). In 1982, approximately 500 cubic yards of pond sludge were excavated from Plant 2, Pond 1 and placed into the landfill trench. EP Toxicity testing of the pond sludge showed barium levels of 17 and 25 mg/L, a lead level of 0.08 mg/L and no detectable levels of cadmium. The disposal of these sediments in the on-site landfill was approved by SCDHEC in September 1982.

In late 1983, the facility performed additional testing of the dust collector fines originating from the steatite manufacturing process. Subsequent analysis of the fines from this process using EP Toxicity testing indicated a concentration of 580 mg/L barium in the fines sampled. As a result of the sample results, the facility excavated approximately 220 tons of waste from the northwest portion of the trench in the landfill where disposal had been taking place. DHEC was notified of this removal. Samples of the excavated waste materials were tested for EP Toxicity and showed leachable barium concentrations ranging from 300 to 600 mg/L. The excavated materials were managed as hazardous waste and transported to the Chemical Waste Management hazardous waste facility in Emelle, Alabama. Based upon a review of the air permit for the steatite manufacturing process(submitted to SCDHEC in February 1982), it is estimated that there was an average dust pick-up rate of 44 tons per year (based on 10 lb/hr and assuming 24 hr/day operation). Based on this estimate it appears that the excavation of 220 tons would have removed the fines which could have been produced from the steatite process since the amount excavated represents approximately two times (2x) the amount of fines which could have been produced from the steatite manufacturing process from 1980 to 1983. The excavation area was backfilled, graded, and seeded. Following the excavation of the materials, further sampling was conducted to determine if the excavation was complete. EP Toxicity analysis of samples from the base of the trench

showed barium levels consistent with background concentration (0.6 mg/L) indicating the excavation was complete, and also that barium had not migrated. Subsequent groundwater sampling results have further confirmed that groundwater has not been impacted by barium (see Subsection 3.3).

Following, the December 1983 excavation activities, waste disposal activities in the landfill were ceased.

SECTION 3

SITE CONDITIONS

Since 1988, numerous environmental assessments have been conducted to characterize conditions at the Site. These investigations addressed components across the entire plant site, which included the landfill. The following section provides a brief chronology of activities, and a summary of the data collected at the landfill. The data summarized provides physical and chemical characterization of waste materials in the landfill, and characterization of groundwater and surface water quality.

3.1 SITE INVESTIGATION SUMMARY

This subsection presents a brief chronology of the field programs conducted in the landfill area. Table 3-1 outlines sampling activities at the landfill and associated analytical parameters.

3.1.1 Phase I Preliminary Environmental Assessment 1988

Law Environmental, Inc. (LAW) conducted a Phase I Preliminary Environmental Assessment (PEA) investigation in 1988 in support of the property transfer to AlSiMag. The scope of the PEA associated with the landfill included:

- Installation, sampling and water level measurement of 4 groundwater monitor wells.
- A geophysical survey.
- Waste sampling and analysis.

VOC's were detected in groundwater and the initial findings were documented in the *Preliminary Environmental Assessment Report* dated August 1988.

Table 3-1
Chronological Summary of Sampling Activities at the Landfill
Laurens Ceramics Site
Laurens, South Carolina

Date	Sampling Effort	Analytical Parameters	Description
1988 (LAW)			
1988	Geophysical Survey	NA	Conducted magnetometer and EM-31 survey
May	Groundwater Sampling	Metals and VOCs	Comprehensive groundwater sampling event
June	Waste Characterization	Metals and VOCs	Analyzed 3 surficial samples of exposed waste materials
June	Groundwater Sampling	Metals and VOCs	Confirmation sampling
September	Residential Supply Well Sampling	VOCs, Pesticides, PCBs, Metals & BNAs	Residential Supply well (Henderson) serving a Trailer Park
December	Groundwater Sampling	Metals and VOCs	Comprehensive Groundwater Sampling
1989 (LAW)			
June	Waste Characterization	EP Toxicity metals	Analyzed 3 surficial samples of exposed waste materials (in same location as June 1988 sampling)
August	Soil Gas Sampling	VOCs	Soil gas samples collected and analyzed using PETREX tubes
August	Sediment Sampling	Lead and Barium	Two surface sediment samples were composited from ditch immediately downgradient of landfill.
1989	Groundwater Sampling	VOCs	Complete round (MW1-53) of groundwater sampling and analysis
1989	Groundwater Sampling	Metals	Sampled recently installed wells (MW42-53) and analyzed for Total Barium, Lead and Arsenic
1991 (WESTON)			
September/October	Surface Water Sampling	VOCs	Initial surface water sampling
September	Groundwater sampling	VOCs and total metals	Complete round of groundwater sampling (MW1-54)
1992 (WESTON)			
February	Landfill Trench Characterization	VOCs, total metals & TCLP	12 test pits were excavated.
February	Surface Water Sampling	VOCs	Quarterly surface water sampling
March/April	Groundwater sampling	Metals	Resampled wells near the landfill for total metals
March/April	Groundwater sampling	VOCs	Sampled recently installed wells (MW55-60 & MW63)
May, August, November	Surface Water Sampling	VOCs	Quarterly surface water sampling
1993 (WESTON)			
February, May, August, October	Surface Water Sampling	VOCs	Quarterly surface water sampling
1994 (WESTON)			
January-March	Landfill Characterization	Headspace analysis	10 test pits excavated.
March	Groundwater sampling	VOCs, Metals, Cations, Anions, & Nutrients	Comprehensive groundwater sampling event
March, June, September, December	Surface Water Sampling	VOCs	Quarterly surface water sampling
1995 (WESTON)			
January	Groundwater sampling	VOCs	Sampled 2 sentinel wells near the landfill
February, May, November	Surface Water Sampling	VOCs	Quarterly surface water sampling
May 1995	Residential supply well sampling	VOCs	Sampled and analyzed groundwater from 6 residential supply wells near the landfill
May 1995	Groundwater sampling	VOCs, Metals, Cations, Anions, Nutrients, Tritium	Comprehensive groundwater sampling event
August, November	Groundwater sampling	VOCs	Sampled 2 sentinel wells near the landfill
1996 (WESTON)			
March	Groundwater sampling	VOCs	Sampled 2 sentinel wells near the landfill
March , November	Surface Water Sampling	VOCs	Semiannual Surface water sampling

3.1.2 Phase II Assessment 1988-1991

Based on the results of the PEA, a second phase of activities was implemented to further evaluate the significance of PEA results. The Phase II scope associated with the landfill included:

- Installation of 8 groundwater monitor wells.
- Sampling and analysis of waste, sediment, and groundwater.

The results of the landfill waste analysis showed that while barium was present in the waste, it was not leachable. Analysis of sediments in the drainage ditch northwest of the landfill showed a barium concentration above background levels, but an order of magnitude less than the waste material. Groundwater results were similar to those seen during the PEA. The results of these investigations were documented in the *Phase II Assessment Report* dated April 13, 1990.

3.1.3 Supplemental Investigations 1991-Present

Since 1991, numerous additional investigations have been conducted to characterize landfill materials, soil, groundwater and surface water quality at the Site The first supplemental investigation was conducted in the Fall of 1991 to provide current data on the spatial extent of VOCs and metal constituents in the surface water and groundwater at the facility. The resulting information was presented in the *Supplemental Investigation Work Plan* dated December 1991.

The Work Plan summarized existing site data, presented the current conceptual site model, provided a scope of work for additional investigative tasks to support site remedial planning, and further site characterization. These additional site characterization activities at the landfill area included groundwater sampling and excavation of test pits in

the landfill to physically and chemically characterize waste materials. These data served as the basis for numerous subsequent investigations.

Activities conducted in the landfill area during the subsequent investigations have been summarized in Table 3-1 and include the following:

- Sampling, and analysis of waste materials and soils from test pits excavated within the landfill.
- Installation of six additional monitor wells at the landfill.
- Multiple groundwater and surface water sampling and analysis programs, and water level monitoring events.
- Sampling and analysis of select residential supply wells within 1/2 mile of the landfill.

3.2 WASTE CHARACTERIZATION

3.2.1 Physical Characterization

During the PEA, several tasks were conducted to physically characterize the waste and define the landfill boundaries including a site reconnaissance, a geophysical investigation consisting of magnetometer and EM-31 conductivity surveys, and sampling of waste materials.

During the PEA site reconnaissance, it was reported that the northwestern toe of the landfill was exposed. An empty crushed drum, bricks, lumber, ceramic powder and other debris were visible. Also, small fired ceramic pieces were observed in the small drainage ditch located near the northwestern toe of the landfill.

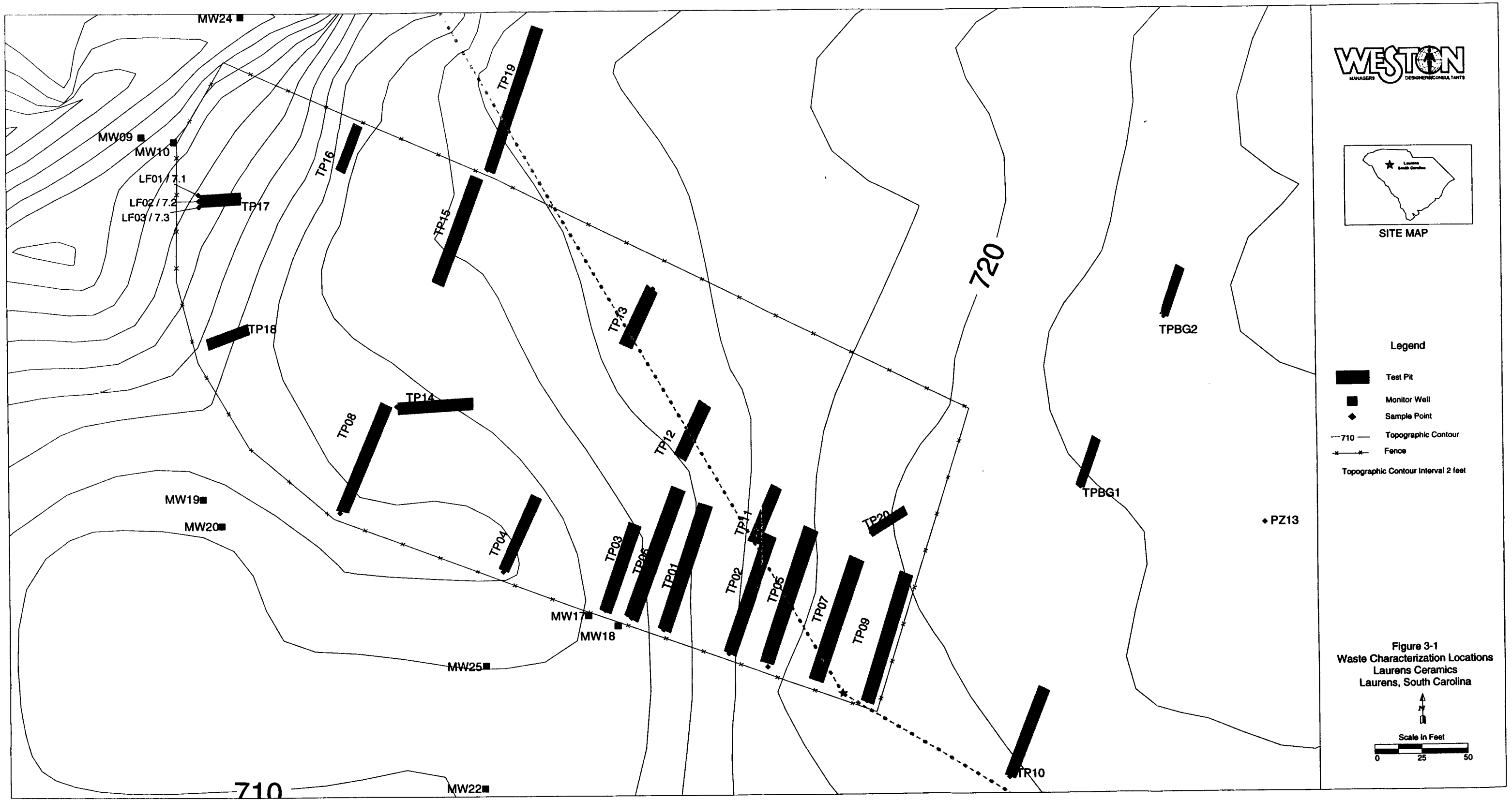
The magnetometer survey conducted as part of the PEA detected an area of magnetic anomalies which were interpreted as buried objects in the landfill. An overhead utility

line was noted to have produced electrical interference, obscuring the landfill boundary definition. Data analysis indicated the presence of a large magnetic anomaly trending SW to NE across the landfill which corresponds to the location of the overhead utility line. In addition, several small magnetic anomalies were identified within the landfill. These small anomalies were suggested to potentially represent isolated metal pipes.

During the follow up investigation in February 1992, two background test pits (TPBG1 and TPBG2) and ten test pits (TP1 to TP10) were excavated in the general area of the former disposal trench (located in the southwestern portion of the landfill). These test pits were constructed to confirm the location of the former trench, to investigate the contents and orientation of the trench and nearby magnetic anomalies previously identified in the PEA, and to collect samples of the waste material and underlying soils. Figure 3-1 indicates the location of these test pits. The descriptions of soils and waste materials and cross sections illustrating materials encountered at the test pit locations are presented in Appendix A. Waste materials encountered included:

- A dry powdery and moist waste material (ceramic fines).
- Fired ceramic pieces.
- Miscellaneous construction materials (including bricks, rebar, wood, metal piping, sheet metal, wires, and steel beams).

The results of the test pit excavations conducted in 1992 confirmed the location of the former disposal trench along the southwestern portion of the landfill (along a line extending southeast to northwest). Some limited fine ceramic waste material was encountered in the southeastern portion of the former trench. In the northwestern portion of the former trench, the backfill soils from the 1983 excavation and removal of waste materials were encountered.



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In the southeast portion of the former trench 1-2 feet of clayey soil was generally encountered as cover material at the surface of each test pit. The cover soils of the former trench were underlain by fine ceramic waste material with a thickness ranging from several inches to 9 feet. The waste thickness appeared to reach its deepest point along the central axis of the trench (i.e., the axis running SE to NW). The majority of the test pit excavations also uncovered miscellaneous scrap metal (including rebar, metal piping, steel beams, wires, etc.) at the edge of the former trench. The locations of these scrap metals roughly correspond to areas of geophysical anomalies reported in 1988.

During the Spring of 1994, an additional ten test pits (TP11 to TP20) were excavated in other areas of the landfill exclusive of the trench (i.e., progressive bank and northern portions) to further characterize waste materials and investigate the remaining isolated magnetic anomalies previously reported. Figure 3-1 indicates the location of these test pits.

The materials encountered during the 1994 test pitting were predominantly ceramic brick, cinder block, scrap wood, scrap metal, and soil fill. Several test pits encountered some localized areas of thin dry waste material (ceramic fines). No elevated VOC readings were detected during routine monitoring of the waste material, fill soils, and underlying soils. The summary logs and cross sections of test pits TP11 to TP20 are presented in Appendix A.

Results of the ten test pits excavated in the Spring of 1994 also identified miscellaneous scrap metal in the majority of the excavations. Many of these locations roughly correspond to the areas of geophysical anomalies identified previously, which were not located under an overhead utility line.

3.2.2 Chemical Waste Characterization

In 1988, three surficial samples of exposed waste materials were collected from the northwestern toe of the landfill (part of the progressive bank portion) at sample locations 7.1 to 7.3 (see Figure 3-1) and analyzed for total metals. In 1989, during the Phase II investigation, additional waste material samples at locations LF1 to LF3 were taken at the same locations as 7.1 to 7.3 and analyzed for metals via the EP toxicity test. A composite sediment sample was obtained from a drainage ditch at the base of the landfill and analyzed for total lead and barium. The analytical results for these samples are presented on Table 3-2.

During the 1992 excavation of the test pits in the former trench, 5 samples were submitted for TCLP analysis and 13 samples were analyzed for total metals and VOCs. The analytical results for these samples are presented on Table 3-2.

In summary, the results from the 8 locations where total and leachable barium testing was performed show that while barium was present, it was not leachable above the RCRA regulatory level except in one sample. The testing results also show that while PCE was present, it was present below 0.2 mg/kg in 9 of 10 samples, and it was not leachable above the RCRA standard for identifying a characteristic waste in any sample.

3.3 GROUNDWATER AND SURFACE WATER

Since 1988, 19 monitor wells have been installed in the landfill area; the location of these wells is depicted on Figure 3-2. A review of the historical groundwater quality data, reveals the following:

TABLE 3-2
Summary of Landfill Soil and Waste Sampling[1]
Laurens Ceramics Site

				PCE			Barium		
Location	Sample Type	Depth	Date	Total (mg/kg)	Leachate[2] (mg/L)	Regulatory Limit (mg/L)	Total (mg/kg)	Leachate[2] (mg/L)	Regulatory Limit (mg/L)
7.1A	Surficial	NS	1988				9300		
7.1B	Surficial	NS	1988				81		
7.1C	Surficial	NS	1988				9500		
LF-1	Waste material	NS	1989					ND[3]	100
LF-2	Waste material	NS	1989					ND[3]	100
LF-3	Waste material	NS	1989					ND[3]	100
TP1	Waste material	3.5	1992	19	0.0032	0.7	17300	11.7	100
TP2	Trench base	13	1992	0.098	ND	0.7	32.1	0.483	100
TP3	Soil fill	9	1992	0.0026			ND		
TP4	Trench base	11	1992	0.0035			74.2		
TP5	Waste material	3	1992	0.04	ND	0.7	9440	504	100
TP6	Trench base	8	1992	0.11	ND	0.7	131	1.79	100
TP7	Trench base	5	1992	0.14	ND	0.7	ND	0.535	100
TP8	Soil fill	4	1992	ND			63.8		
TP9	Trench base	9	1992	0.033			ND		
TP10	Trench base	3.5	1992	0.0015			ND		
TPBG	Background	2	1992	ND			ND		
TPBG	Background	3.5	1992	ND			142		
TPBG	Background	6	1992	ND			ND		

NOTES:

NS - Not specified.
Blanks indicate analysis was not performed.
1 - A complete summary of all analytes is presented in Appendix B.
2 - Leachate analysis by TCLP procedure, unless otherwise noted.
3 - Leachate analysis by EP Toxicity prodecure.

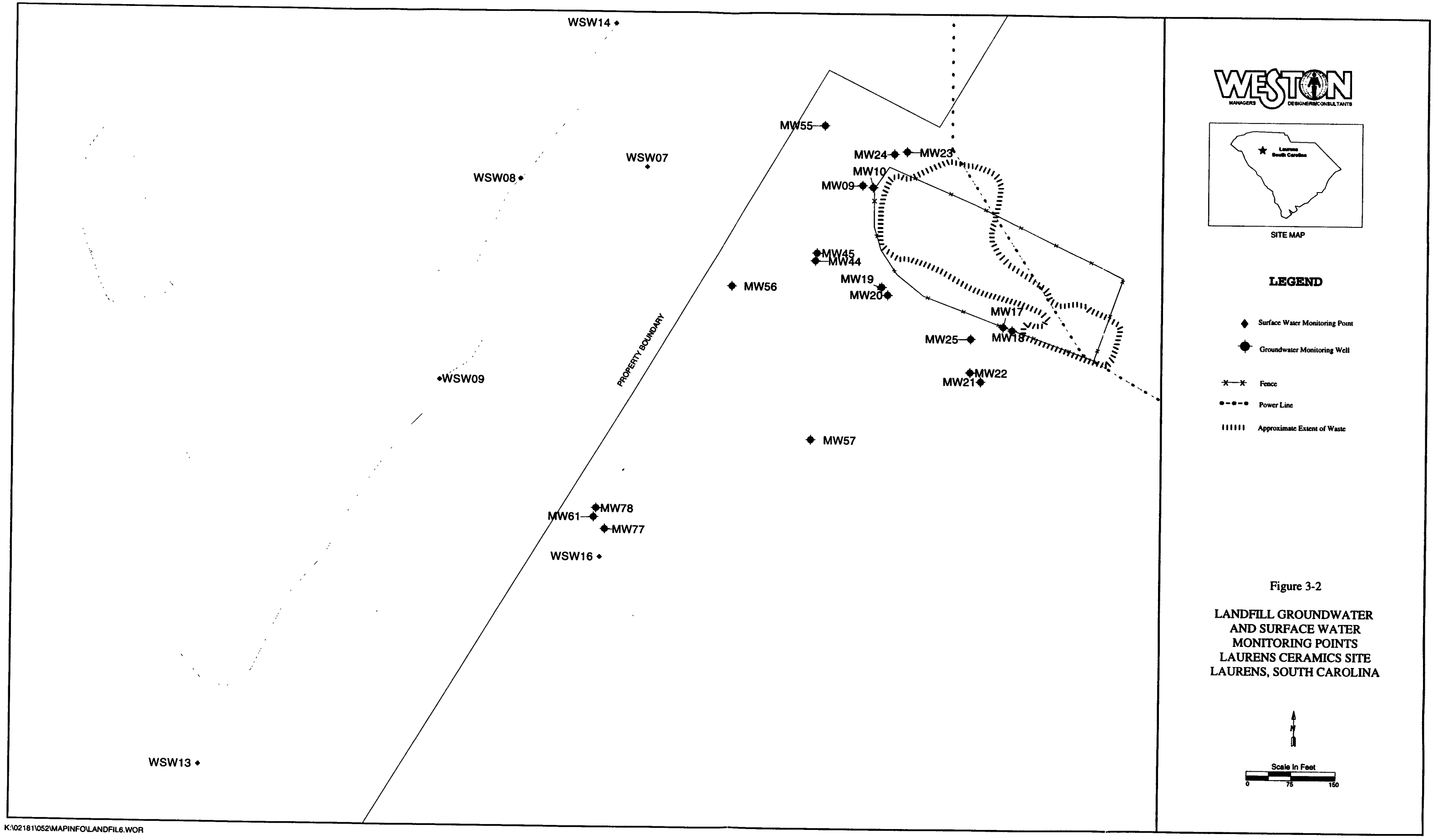

Figure 3-2

LANDFILL GROUNDWATER
AND SURFACE WATER
MONITORING POINTS
LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

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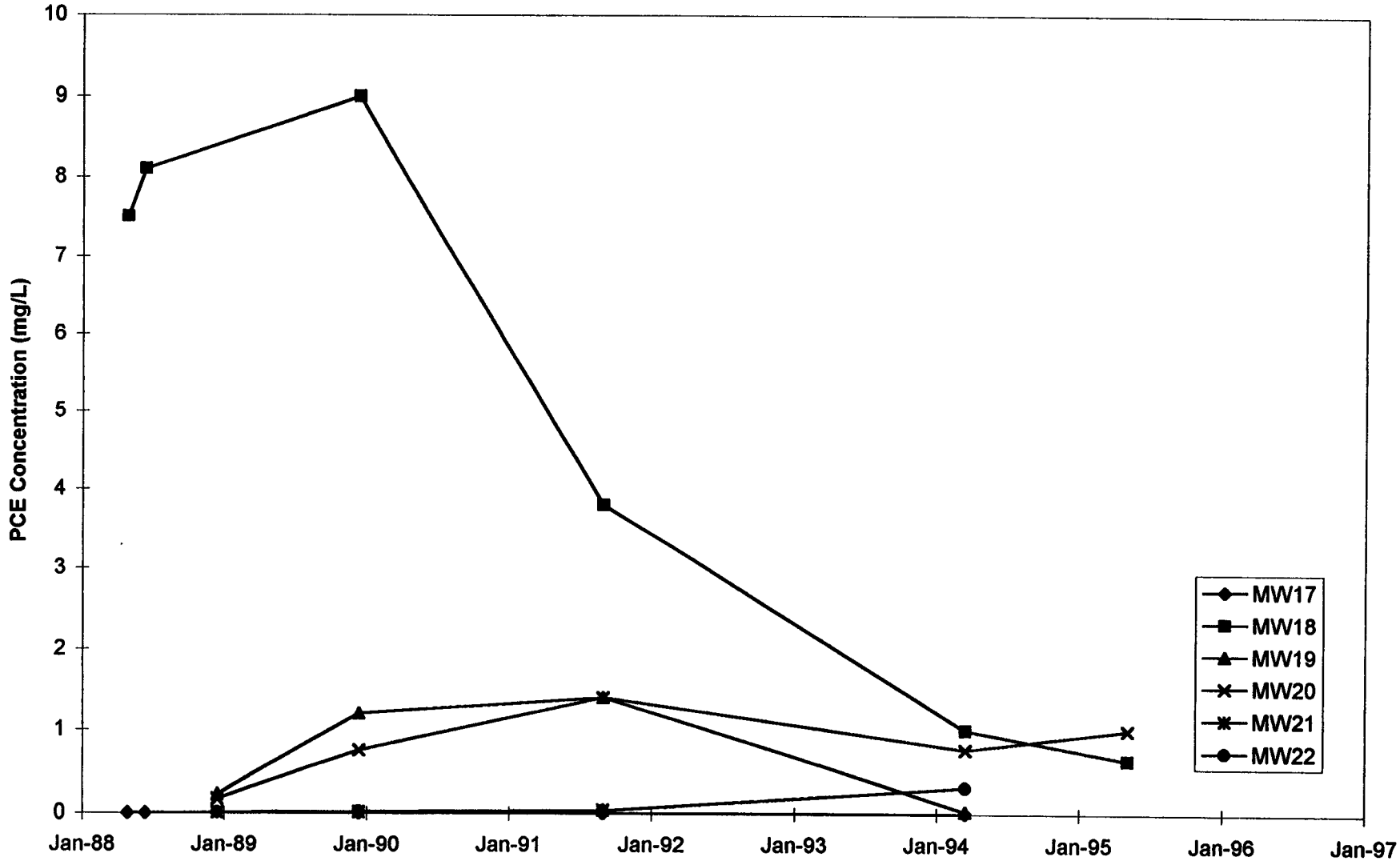
- Groundwater flows in a southwesterly direction.
- Metals, including barium, are not migrating from the landfill into groundwater. This is evidenced by the latest groundwater quality data. Historical groundwater quality data is presented in Appendix B.
- VOCs, including PCE, are present in groundwater upgradient and downgradient of the landfill.
- The data indicates that the landfill is not acting as a source of VOCs. As shown on Figure 3-3, the concentrations of PCE has been decreasing since 1991, especially at MW18 (at the downgradient landfill boundary) where the PCE concentrations have decreased from approximately 9 mg/L in 1990 to approximately 0.6 mg/L in 1995. A similar decrease has also been observed in downgradient well MW19 where PCE has decreased from 1.4 mg/l in 1988 to 0.026 mg/L in 1994. The PCE concentrations at other downgradient wells is remaining relatively constant.

Most of the surface water runoff from the landfill is collected at the drainage ditch that extends from the northwestern toe of the landfill (near MW09 and MW10) to a small (0 to 2 gpm) spring (surface discharge of groundwater) located approximately 300 feet to the west of the landfill (see Figure 3-2). The spring flows into the unnamed tributary of Reedy Fork Creek.

Since 1991, the surface water locations to the west have been sampled on numerous occasions. Quarterly sampling and analysis of surface waters on or immediately adjacent to the Site was initiated in August 1992. In November 1995, semiannual sampling of surface water stations was adopted. Six surface water sampling points (WSW07, WSW08, WSW09, WSW13, WSW14, and WSW16) have been used to monitor the effect of runoff from the landfill and surface discharge of groundwater (see Figure 3-2). In the unnamed tributary, no water quality impacts are observed. The exception to this is WSW16. This monitoring point coincides with the surface discharge of groundwater at a spring and the VOC concentrations observed are similar to groundwater quality in this

FIGURE 3-3
Temporal Analysis of PCE Concentrations



area. This is expected because the spring at WSW16 is a surface discharge of groundwater. The complete analytical results from these locations are presented in Appendix C. The analytical data demonstrate that surface water runoff from the landfill is not a concern. The following summarizes the analytical data collected at these surface water locations:

Location	PCE		Barium (total)	
	Frequency of Detection	Range of Detection (ug/L)	Frequency of Detection	Range of Detection (mg/L)
WSW07	2/14	ND-1.9	1/1	0.05
WSW08	1/15	ND-14	NA	NA
WSW09	1/18	ND-1.8	0/1	ND
WSW13	1/15	ND-6.1	0/1	ND
WSW14	0/13	ND	0/1	ND
WSW16	3/3	13-54	NA	NA

NOTES:

ND - Not detected above detection limit.

NA - Not analyzed.

SECTION 4
CLOSURE PLAN

4.1 INTRODUCTION

The on-site landfill has not been used for disposal of waste since 1983. In addition a significant amount of waste was excavated and sent for off-site disposal in 1983. It has been covered with soil of varying thickness and vegetation has emerged over the area. In order to continue to protect human health and the environment, and to provide long-term integrity of closure and improved environmental management, a plan for enhanced final closure of the landfill has been developed.

Based on a review of the site conditions, DHEC Regulatory Guidance for landfill closure, and the closure activities previously approved by the DHEC and implemented for the wastewater ponds at Plants 1 and 2 (WESTON, 1995), WESTON has developed this plan for final closure of the landfill. The key components of the closure activities are as follows:

- Site preparation activities to remove surface and deep-rooted vegetation, and setup work facilities (access roads, etc.).
- Consolidation of materials into a uniform footprint for the landfill.
- Slope regrading.
- Grading to achieve positive drainage contours.
- Stabilization of any remaining sediment materials in the former trench.
- Installation of a cover system that includes a geosynthetic clay liner cap (GCL), and soil cover.
- Restoration activities including surface grading to control surface water run-on and run-off, and re-installation of a fence around the perimeter of the landfill.

- Revegetation of disturbed areas.

4.2 METHODOLOGY

Based on the results of the site conditions investigation, the landfill is not an on-going source of VOCs or barium to groundwater or surface water. As a result, the preferred approach for long term management of the landfill is in-place closure and improvement to the existing cover. The existing cover will be improved to minimize maintenance needs, provide positive drainage and reduce infiltration. The in-place closure approach for the landfill will closely follow the methodology that was successfully implemented for the on-site wastewater ponds at Plants 1 and 2, and approved by DHEC.

Test trenching performed during the site investigation indicated that most of the former trench was backfilled with soil. However, any localized areas or pockets of sediments/fines in the trench area will be stabilized using the same Portland Cement recipe that was used successfully on the sediments associated with the on-site wastewater pond closure. This stabilization will provide the following:

- Consistency with the methodology used previously for the approved pond sediment closure and;
- Chemical stabilization and immobilization of any residual barium that might be associated with any sediment-type wastes remaining in the trench.

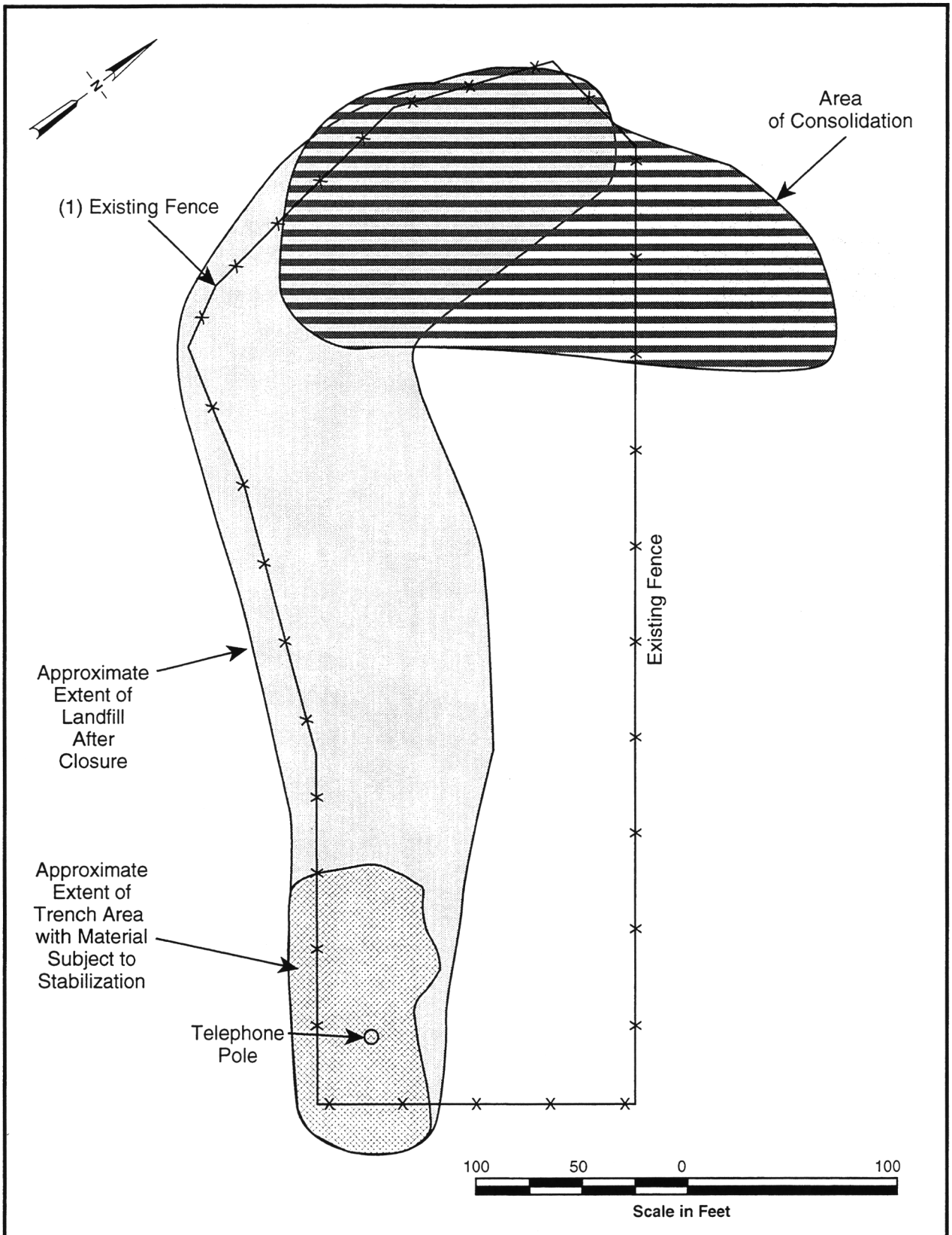
Based on the pond closure experience, it is expected that a stabilization recipe of 15 weight percent Portland Cement Type 1 (PCI) will be used.

Based on the operational history of the landfill (see Section 2), and the results of previous field work, there are locations within the current landfill footprint that have only near-surface, thin layers of fine ceramic waste material. To provide a more uniform final footprint and cover system, these small waste areas will be consolidated into the central

portion of the landfill. Further, relocation of materials from the steep slope area at the northern end of the landfill (progressive bank portion) may be necessary to reduce this slope and improve stability of the final cover system. These materials will be consolidated in the central portion of the landfill to provide the fill needed to improve contours and achieve positive, controlled drainage. It is estimated that 500 to 1,000 yd^3 will be consolidated from the progressive bank portion and other areas of the landfill. These consolidation and rough grading activities are depicted on Figure 4-1.

The design of the final cover system will be the same as the one used for the previous closure of the on-site wastewater ponds. This cap system design was previously reviewed and approved by the solid waste/landfill group at DHEC. The following are the key design specifications of the cover system:

- Grading: The landfill regrading will allow for positive drainage away from the landfill cover, provide stable slopes and aesthetically conform, to the extent possible, to the natural terrain.
- Sub-base: Prepared sub-base suitable for placement of the cap.
- Cap: A GCL, with a permeability of approximately 5×10^{-9} cm/sec, will be placed over the prepared sub-base.
- Soil Cover: 18 inches of clean soil will be placed over the GCL. This soil will provide protection for the cap and a physical barrier over the waste to prevent direct contact or impact to surface water run-off.
- Topsoil: A 6" thick top layer of soil will be provided which will be suitable for revegetation and establishment of vegetable cover.
- Vegetation: Grasses, such as rye, fescue, bermuda or other low maintenance type grass will be seeded to provide a vegetative cover.



(1) Existing fence to be relocated around final boundary of landfill

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FIGURE 4-1 LANDFILL CLOSURE ACTIVITIES

A cross-section of the cover system is presented in Figure 4-2.

4.3 GROUNDWATER MONITORING

Following completion of the capping and closure activities, groundwater downgradient of the landfill will be monitored annually. Groundwater samples will be collected from the shallow wells MW-18 and MW-20 and analyzed for soluble metals and VOCs. Analytical results will be provided to SCDHEC.

It should be noted that as part of the Consent Agreement, a Landfill Groundwater Assessment is planned. During this assessment, the groundwater monitoring program for the landfill will be reviewed and re-evaluated in the context of the site wide groundwater assessment. A final groundwater monitoring program for the landfill will be proposed at that time.

4.4 SUMMARY

This approach for in-place closure of the landfill offers the following advantages:

- The cap design was previously reviewed and approved by DHEC for the pond closure.
- The use of the GCL cap as part of the final cover system will significantly reduce infiltration compared to the current soil cover.
- Consolidation of materials into the central portion of the landfill will improve contours and allow positive drainage, optimize coverage of the cap system, create a smaller, more uniform landfill footprint and improve slope stability.

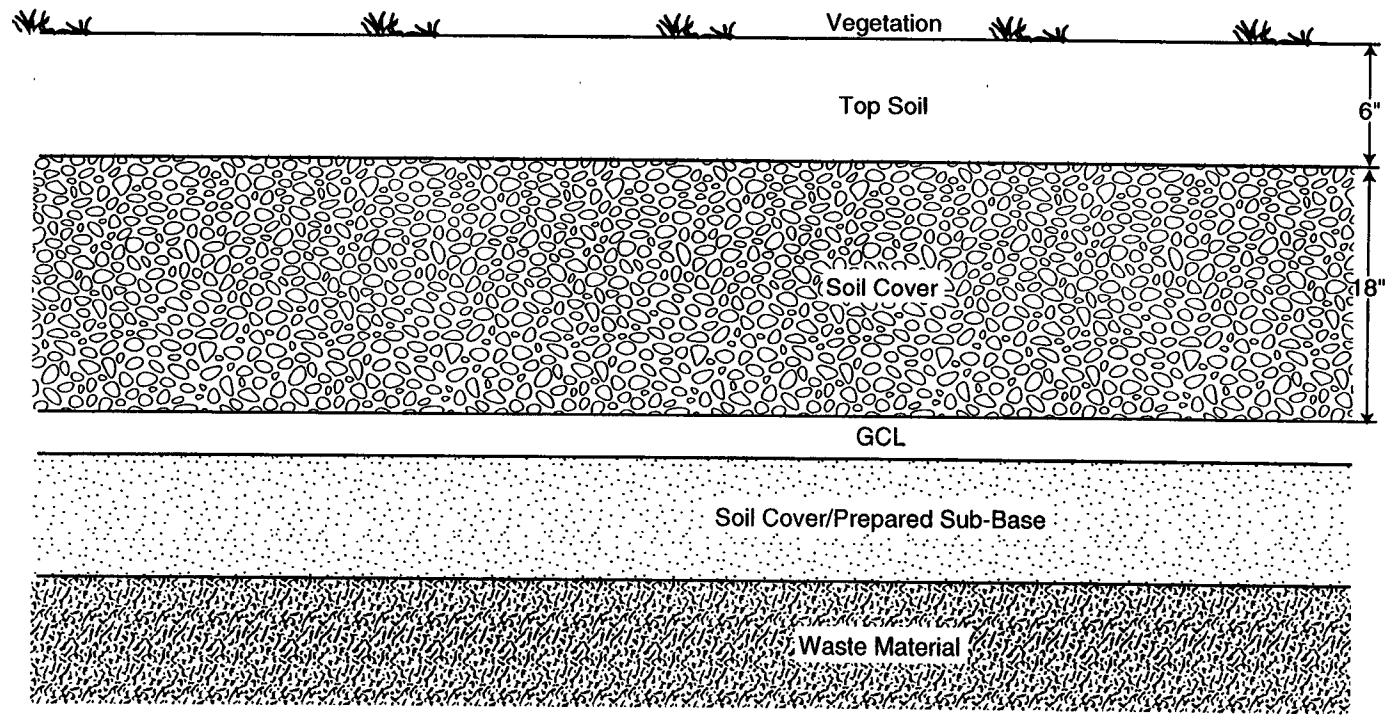

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FIGURE 4-2 LANDFILL COVER CROSS SECTION

- In-place stabilization of remaining sediment type wastes in the trench area will further immobilize any barium that is present. This adds an additional level of protection to the closure even though groundwater, surface water, and waste analysis indicate that barium has not been migrating from the waste materials.

- The closure methodology is consistent with the approach employed successfully for closure of the on-site wastewater ponds.

4.5 SCHEDULE

In accordance with the provisions of the Consent Agreement, the closure planning and scheduling activities will begin within 30 days of SCDHEC approval of this plan. Closure activities will be completed within 120 days of commencement of field construction.

4.6 CLOSURE CERTIFICATION

Within 60 days of completion of closure of the landfill, a certification of closure, prepared by a registered professional engineer, will be submitted to SCDHEC via registered mail indicating that the landfill has been closed in accordance with this plan. The engineer or designated representative will be present during the activities related to closure of the landfill. The engineer will review the data for the certification of closure. The following information will be maintained as part of closure documentation:

- Approved closure plan.
- Date that closure activities commenced.
- The identification of the primary contact for the closure activities, including name, address and telephone number.
- Documentation of any deviation from the closure plan, including letters or correspondence from SCDHEC approving modifications to the plan.

- Daily inspection or field summary reports documenting closure events.
- Field notes of inspections, sample collection, etc.
- Records of any stabilization activities.
- Records and test results for any samples collected as part of the closure activities.
- Documentation of sampling and test methods.

APPENDIX A

LANDFILL TEST PIT DESCRIPTIONS AND CROSS-SECTIONS

GENERALIZED SUMMARY OF TEST PIT RESULTS - FEBRUARY 1992
LAURENS CERAMICS FACILITY
LAURENS, SC

Test Pit #	Depth (Ft)	OVA Headspace	Material
TP-1	0-2	BG	Fill: sandy clay
	2-7	45-100	Fill: Waste material comprised primarily of moist white waste material. Concrete waste and metal piping were detected in the eastern portion of the test pit. Note waste materials were detected 2-7 ft bgs next to fence and in northeastern portion of the test pit. A two foot thisck zone of moist white/gray waste materials were also encountered at approximately 8-10 feet bgs under the loose soil fill. Waste adjacent to fence was sampled at 3.5 feet deep. Sample consisted of moist gray and white ceramic fines.
	7-11	45	Natural Soil: silty sand
TP-2	0-2	BG	Fill: sandy Clay
	2-9	12	Fill: Waste material: moist white/gray/brown fines. White waste material mixed with concrete asphalt, metal piping and plastic trash bags were encountered in the northeastern portion of the excavation.
	9-13	5-12	Natural Soils: clayey sands.
TP-3	0-7	BG	Fill: clayey sand
	7-15	BG-1	Natural soil: silty sands
TP-4	0-5	BG	Fill: clayey fine sand
	5-11	2-6	Fill: Clayey sand. Concrete and asphalt debris were encountered in the northeastern portion of the test pit.
TP-5	0-1.5	BG	Fill: clayey sand
	1.5-4	BG-7	Fill: Moist bluegreen and gray waste ,material; including concrete and rebar and fired ceramics which became more abundant in a northeastern direction. Sampled at 3 feet. Sample consisted of moist bluegreen and gray waste material.
	4-7	BG-4	Natural Soil: clayey sandy silt
TP-6	0-7	BG	Fill: clayey silty sand. A 1-2 foot thick zone of dry white waste material and misc. construction materials encountered in the northeastern edge of the test pit.
	7-12	2	Natural Soil: Silty sand
TP-7	0-1.5	BG	Fill: silty clayey sand
	1.5-4.5	BG-4	Fill: Moist bluegreen and gray ceramic fines. Dry white and gray waste material including metal piping, concrete and rebar were encountered in the northeastern edge of the test pit.
	4.5-11	BG-6	Natural Soil: Clayey silt
TP-8	0-6	BG	Fill: clayey sand. In the western edge of the test pit a dry powdery ceramic fines with brick and concrete waste was encountered
	6-8	1	Natural soil. Clayey silt
TP-9	0-3	BG-2	Fill: clayey silty sand
	3-7	BG-2	Fill: Moist bluegreen and white fine ceramic material. A dry white fine ceramic waste material with concrete and asphalt debris was encountered in the northeastern portion of the test pit.
	7-9	BG-4	Natural Soil: Clayey sand
TP-10	0-1	BG	Fill: clayey sand including small chunks of small moist white and gray ceramic fine material.
	1-4	BG-1	Natural Soil: Clayey sand

GENERALIZED SUMMARY OF TEST PIT RESULTS - FEBRUARY 1992
LAURENS CERAMICS FACILITY
LAURENS, SC
(Continued)

Test Pit #	Depth (Ft)	OVA Headspace	Material
TPBG-1	0-1	BG	Natural Soil: Redbrown clayey silt with a thin layer of organic material at the surface.
	1-3	BG	Natural Soil: Redbrown clayey silt.
	3-4	BG	Natural Soil: Redbrown clayey silt with trace quartz gravel.
	4-6	BG	Natural Soil: Redbrown and white clayey silty sand with trace quartz gravel
TPBG-2	0-1	BG	Natural Soil: Redbrown clayey silt with a thin layer of organic material at the surface.
	1-3	BG	Natural Soil: Redbrown clayey silt. Sampled at 2 ft.
	3-4	BG	Natural Soil: Redbrown clayey silt with trace quartz gravel. Sampled at 3.5 ft.
	4-6	BG	Natural Soil: Redbrown and white clayey silty sand with trace quartz gravel. Sampled at 6 ft.

Note: BG indicates OVA measurement at background levels.

GENERALIZED SUMMARY OF TEST PIT RESULTS - SPRING 1994
LAURENS CERAMICS FACILITY
LAURENS, SC

Test Pit #	Depth (Ft)	Material
TP-11	0-2	Fill: clayey silts and silty clays
	2-6	Natural soil: clayey silt
		Note: small amount of dry white fine waste material and construction debris occurred in the SW corner of excavation
TP-12	0-1	Fill: Clayey sand
	1-6	Natural soil: clayey silts
		Note: 4 inch seam of dry white fine ceramic material occurred in the SW corner of excavation
TP-13	0-6	Natural soil: silty sands underlain by fine sandy clays
TP-14	0-3	Fill: fine sandy clay
	3-6	From SW to NE White and pink dry fine waste material with construction debris including sheet metal, wires, fired ceramics, drum lid, and ceramic brick trending Into clayey silty fill with wood waste
	6-7	Natural soil with abundant root remnants trending towards the surface in NE direction.
	7-10	Natural soil sandy clays trending towards the surface in NE direction
TP-15	0-2	Fill: silty clay and clayey silt
	2-4	Fill: ceramic brick, wood waste in soil matrix (note fill became thinner as progress in NE direction)
	4-6	Natural soil: clayey silts
TP-16	0-0.5	Fill: clayey silts and silty clays
	0.5 - 3.5	Fill: ceramic brick, scrap metal, dry white fine ceramic material (becomes thinner in NE direction)
	3.5-6	Natural soil: clayey silt
TP-17	0-1	Fill: silty clay and clayey silt
	1-6	Fill: ceramic bricks, plastic, ceramic powder, occasional scrap metal
	6-7.5	Fill: scrap concrete, cinder blocks
	7.5-10	Natural soil: clayey silt
TP-18	0-0.5	Fill: clayey silt
	0.5 -8	Fill: building material scraps, scrap metal, ceramic bricks, pond sediment, and cinder blocks
	8-9	Natural soil: clayey silt (water seep at 7 ft)
TP-19	0-1	Fill: clayey silt
	1-1.5	Fill: Dry white fine ceramic material (thins out completely in NE direction)
	1.5-3	Natural soil: clayey silt
TP-20	0-1	Fill: clayey silt
	1-1.5	Fill: building material scraps, scrap metal, ceramic bricks
	1.5-4	Natural soil: clayey silt

Note: headspace screening of soil/waste samples indicated all measurements were at background levels.

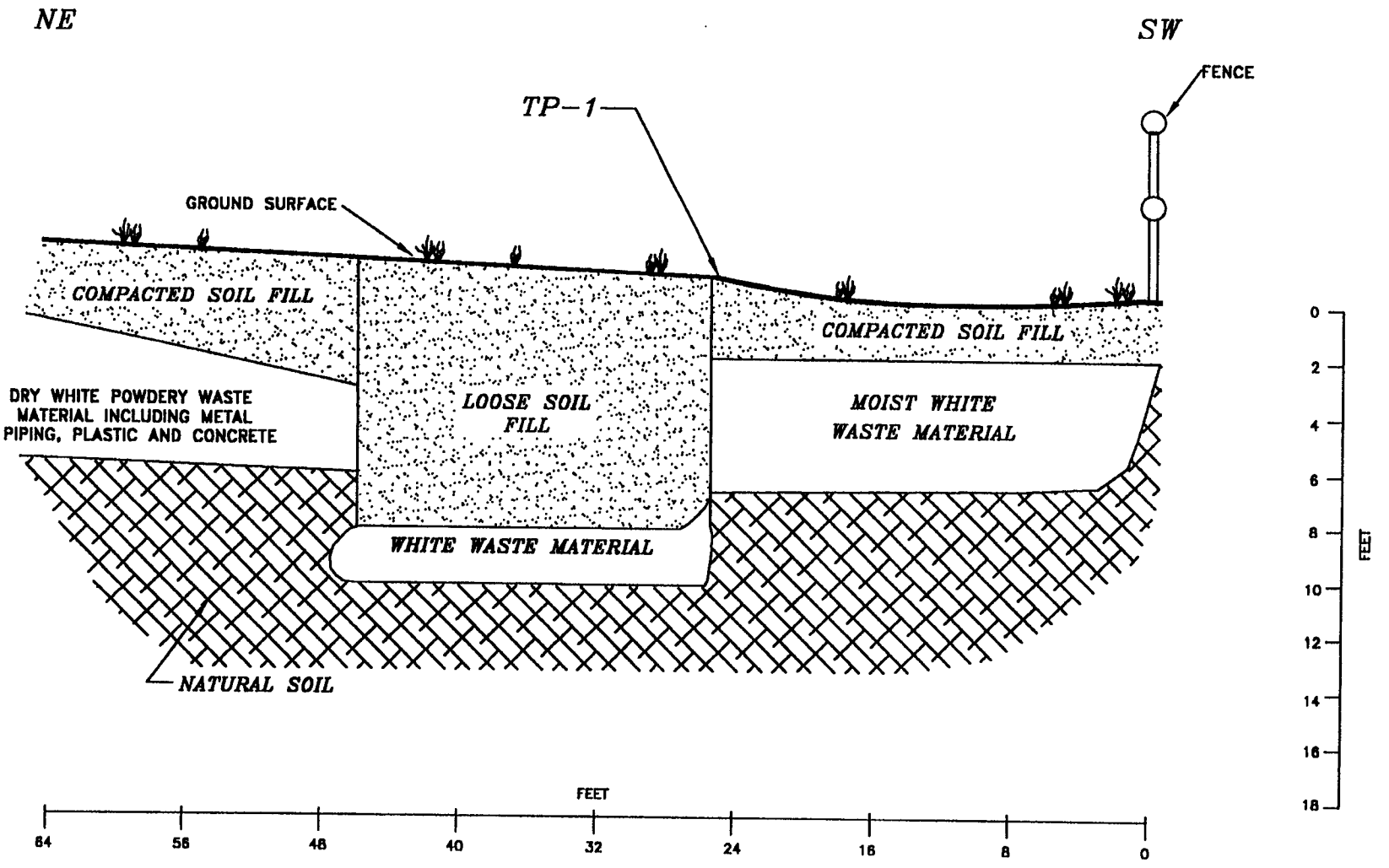

FIGURE:	WESTON	LANDFILL INVESTIGATION TEST PIT CROSS SECTION TEST PIT 1 LAURENS CERAMICS SITE LAURENS, SOUTH CAROLINA
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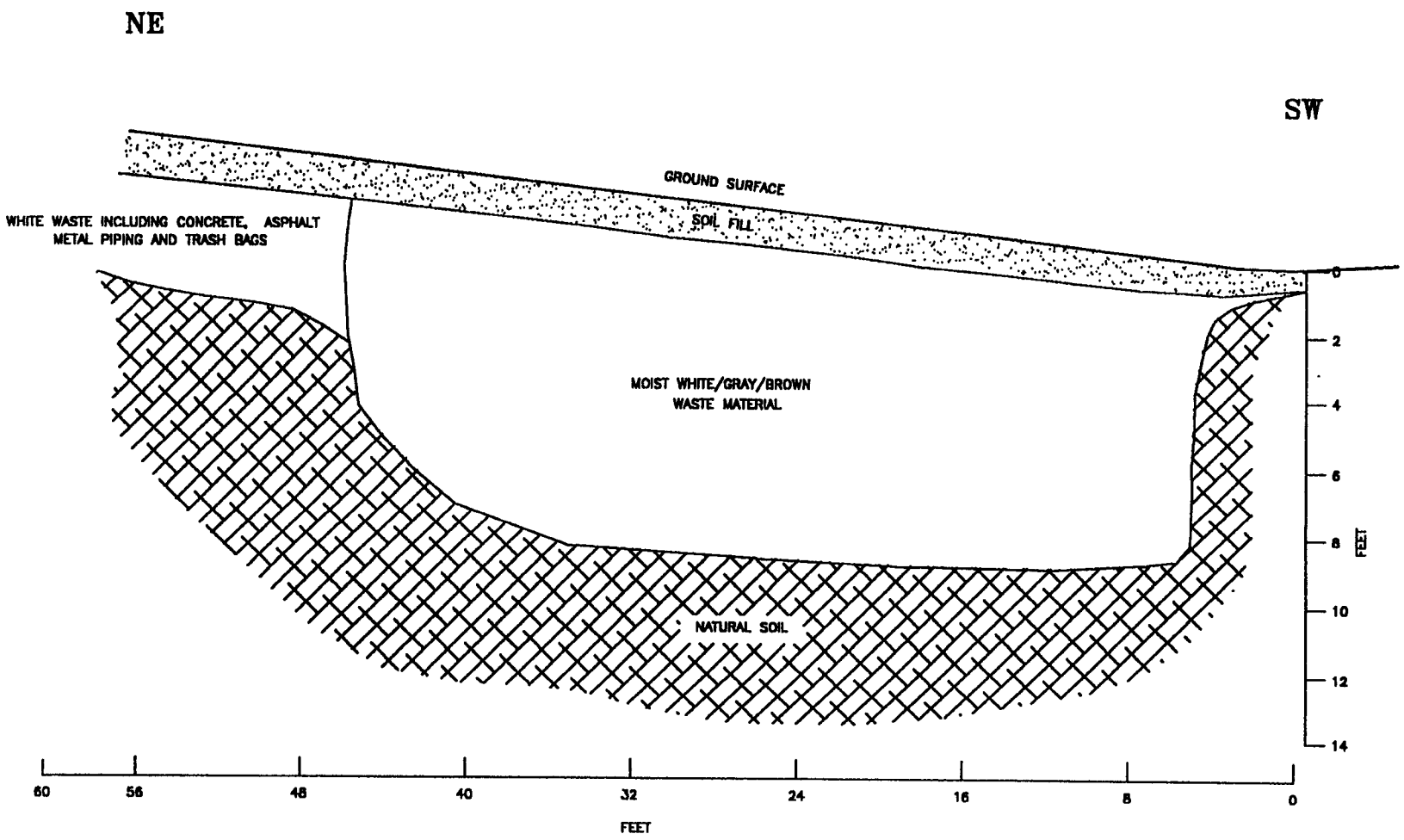

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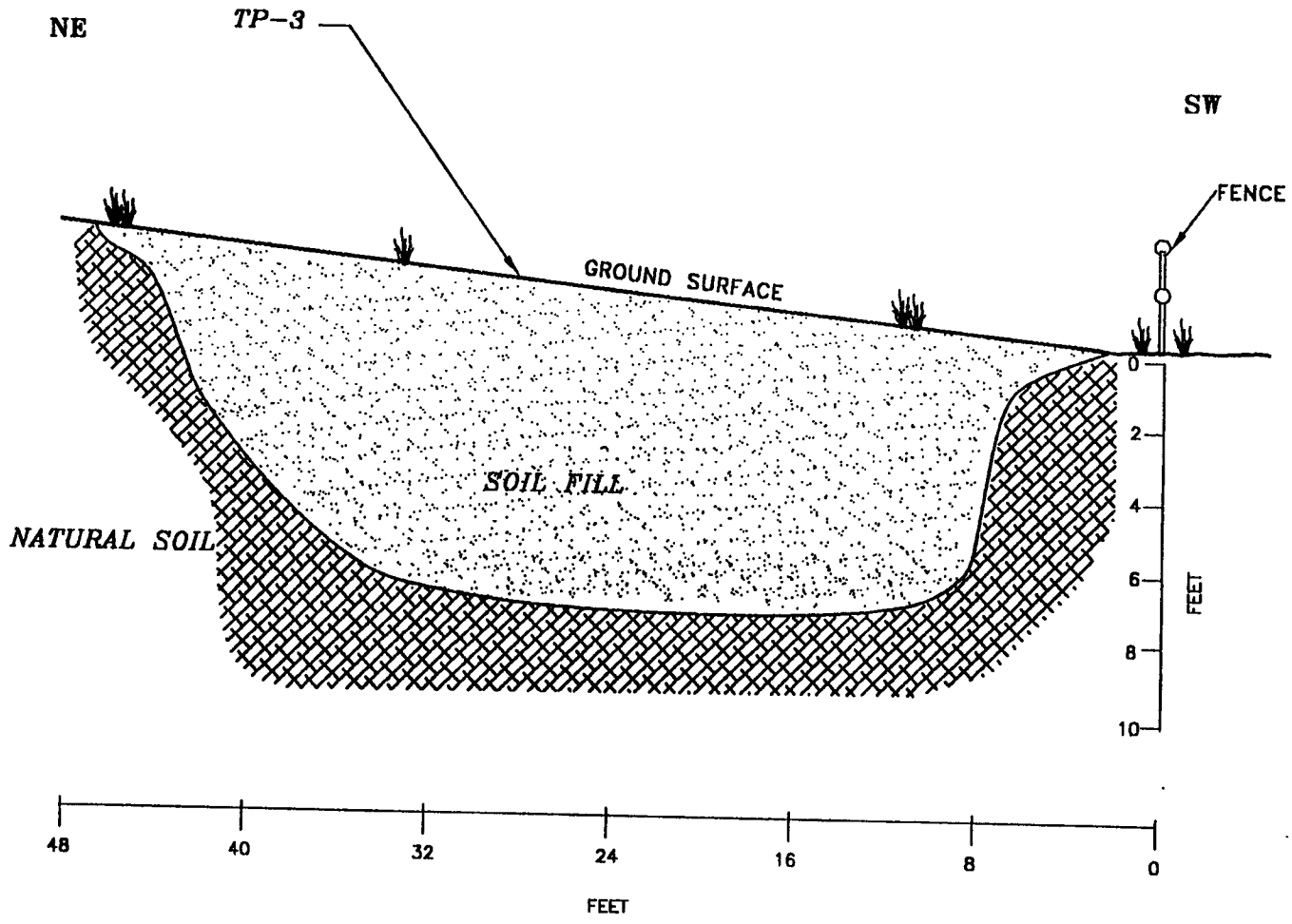

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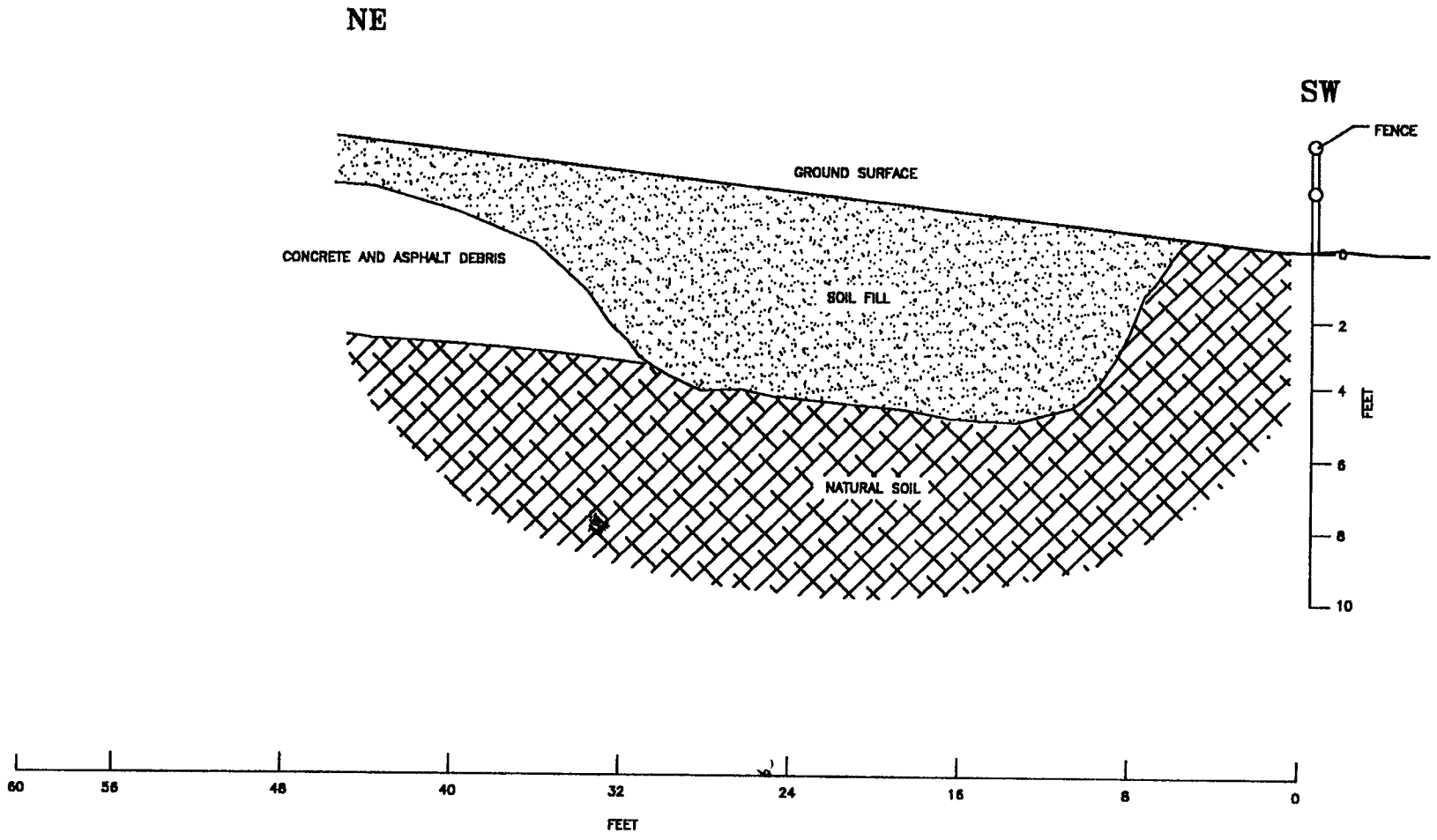

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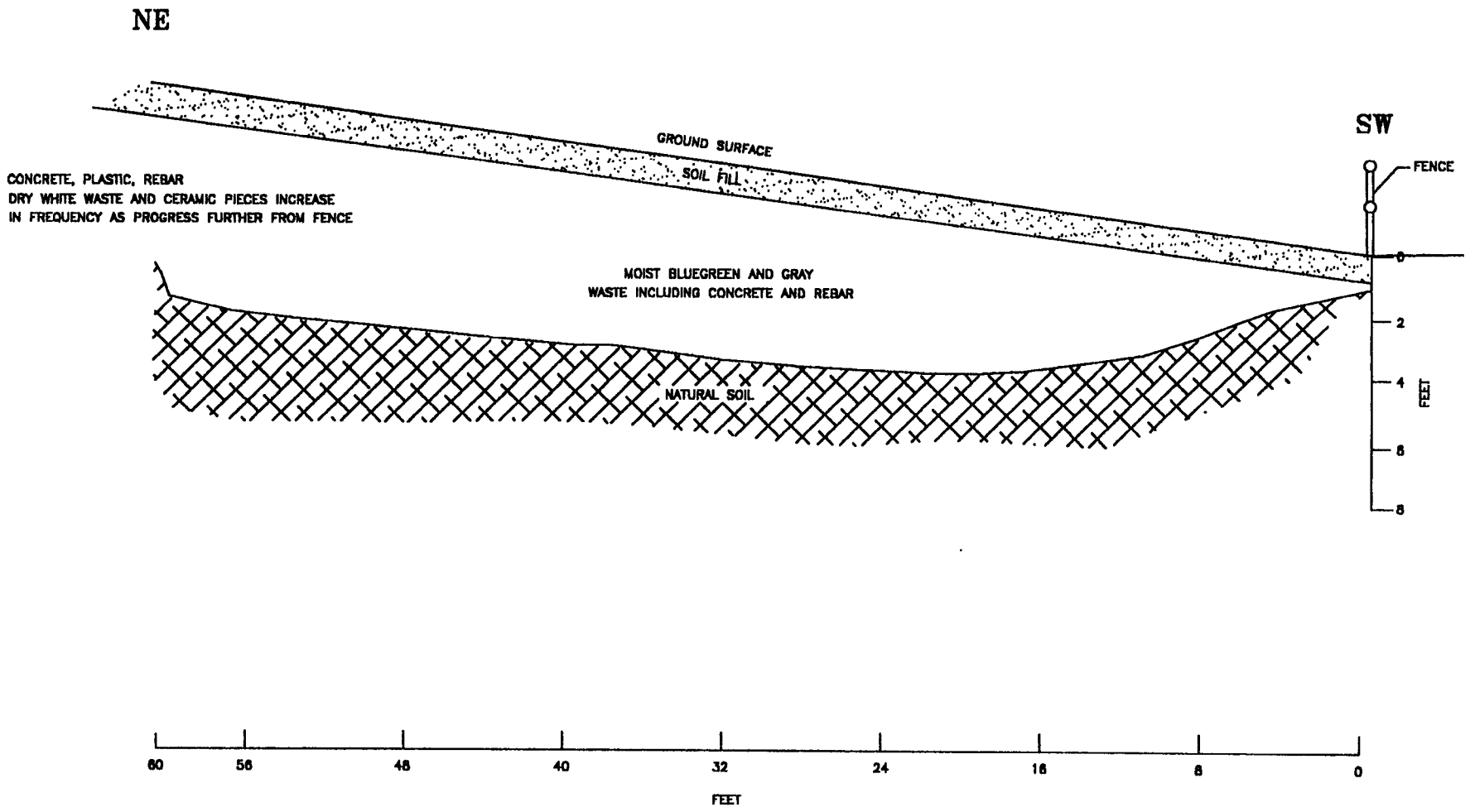

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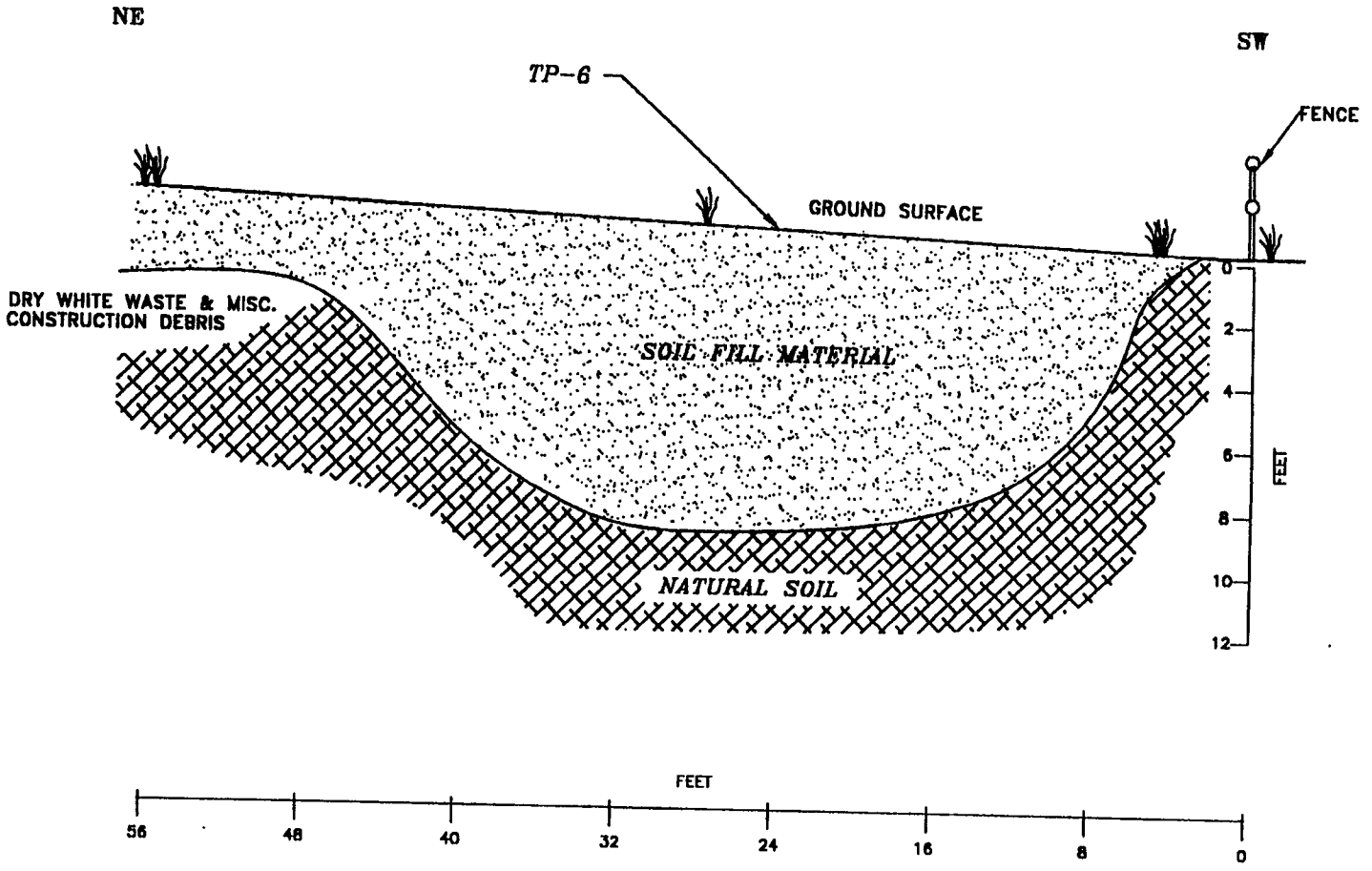

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FIGURE:	WESTON	LANDFILL INVESTIGATION TEST PIT CROSS SECTION TEST PIT 6 LAURENS CERAMICS SITE LAURENS, SOUTH CAROLINA
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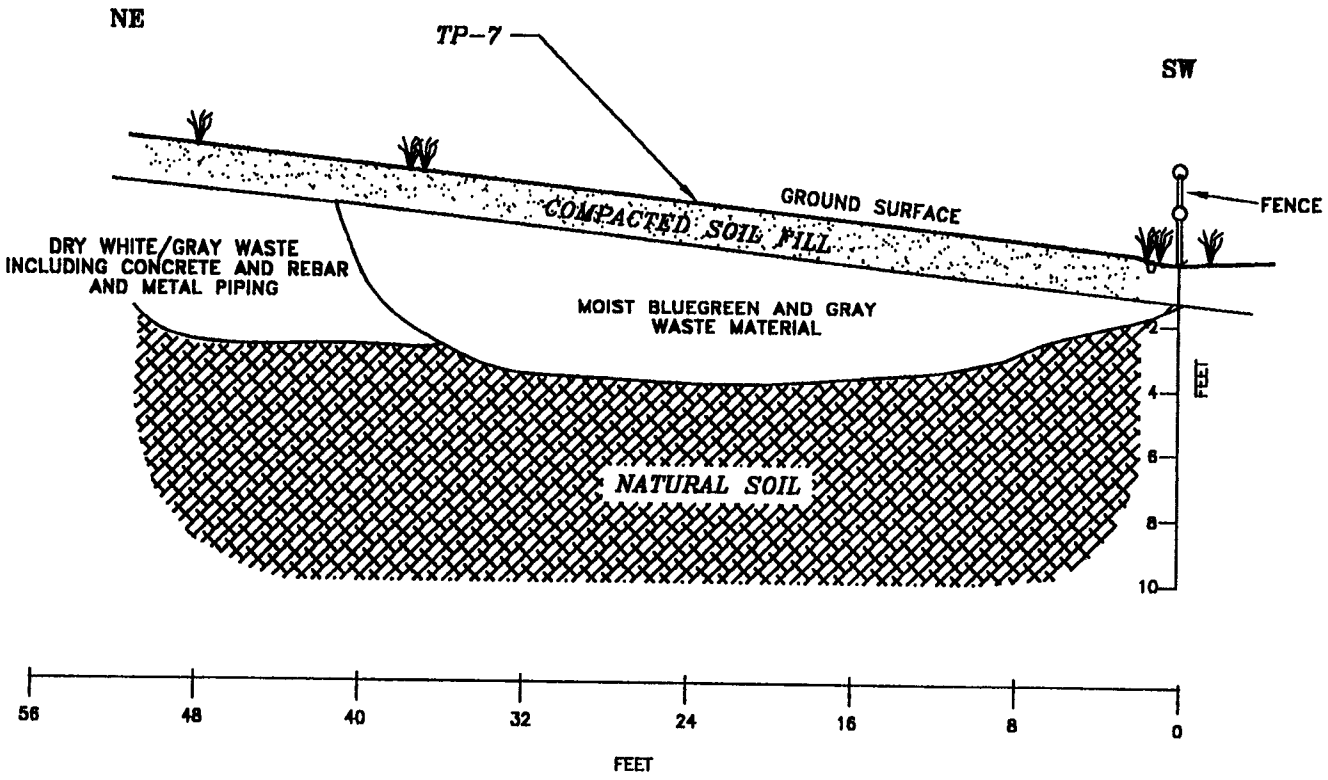

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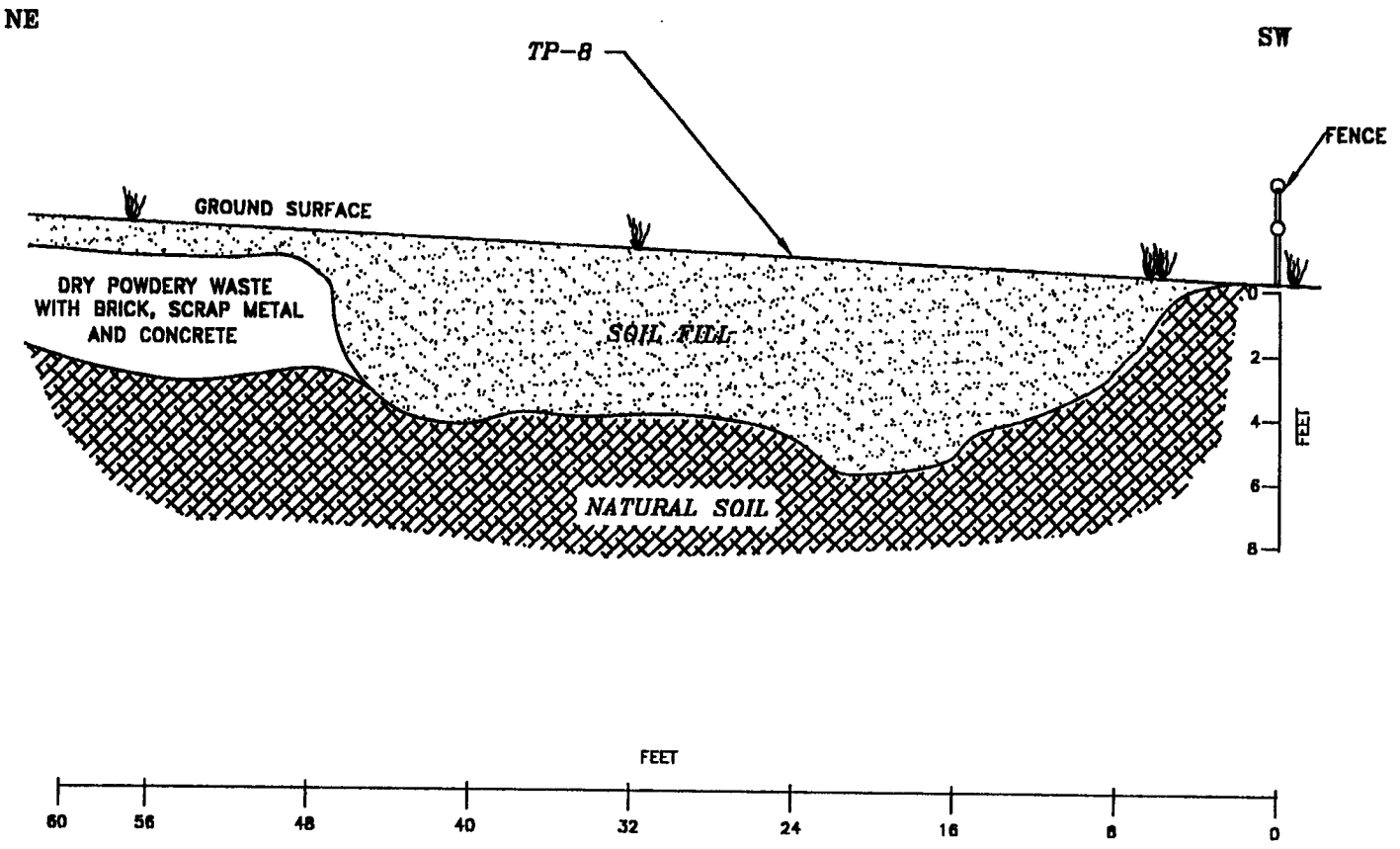

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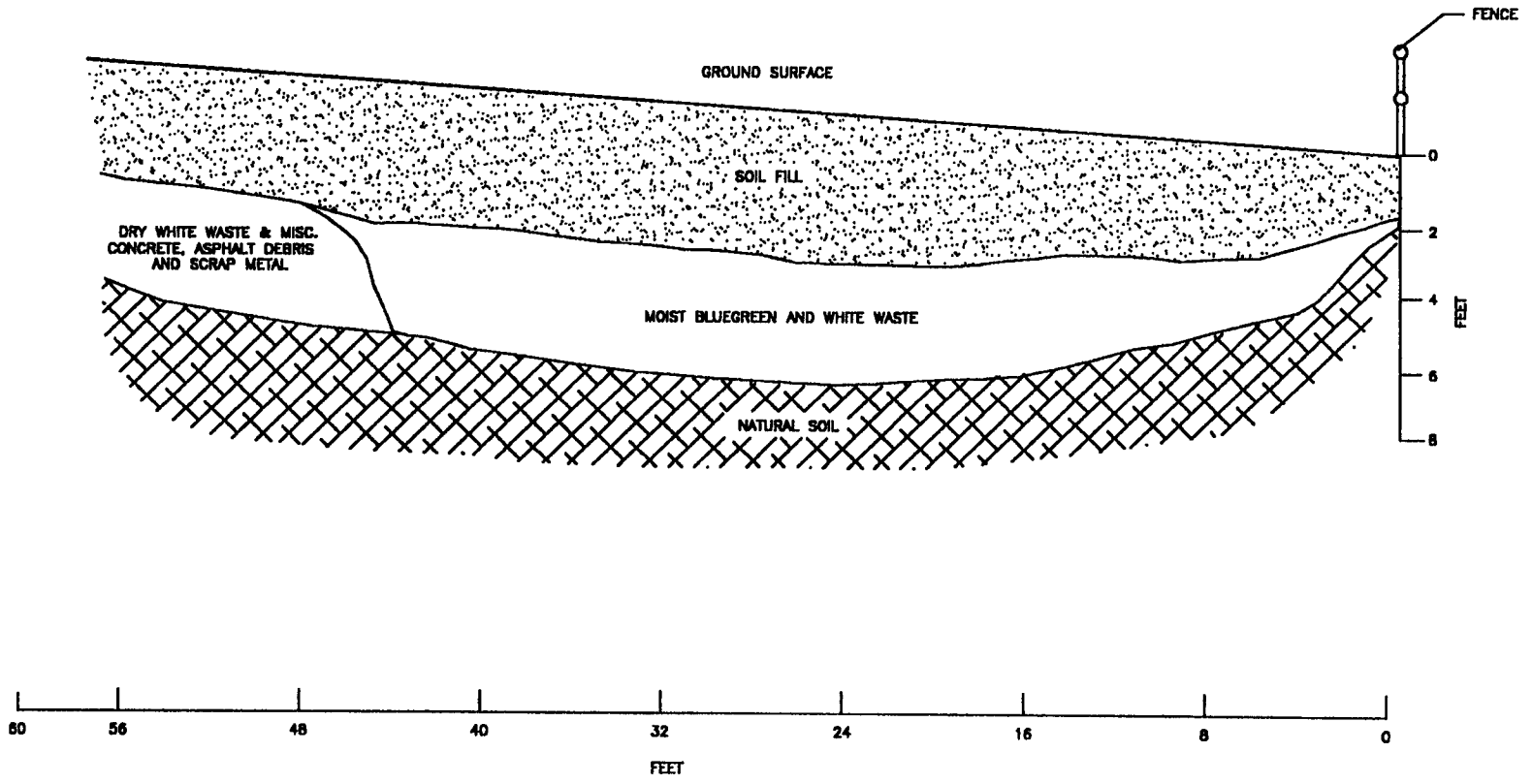

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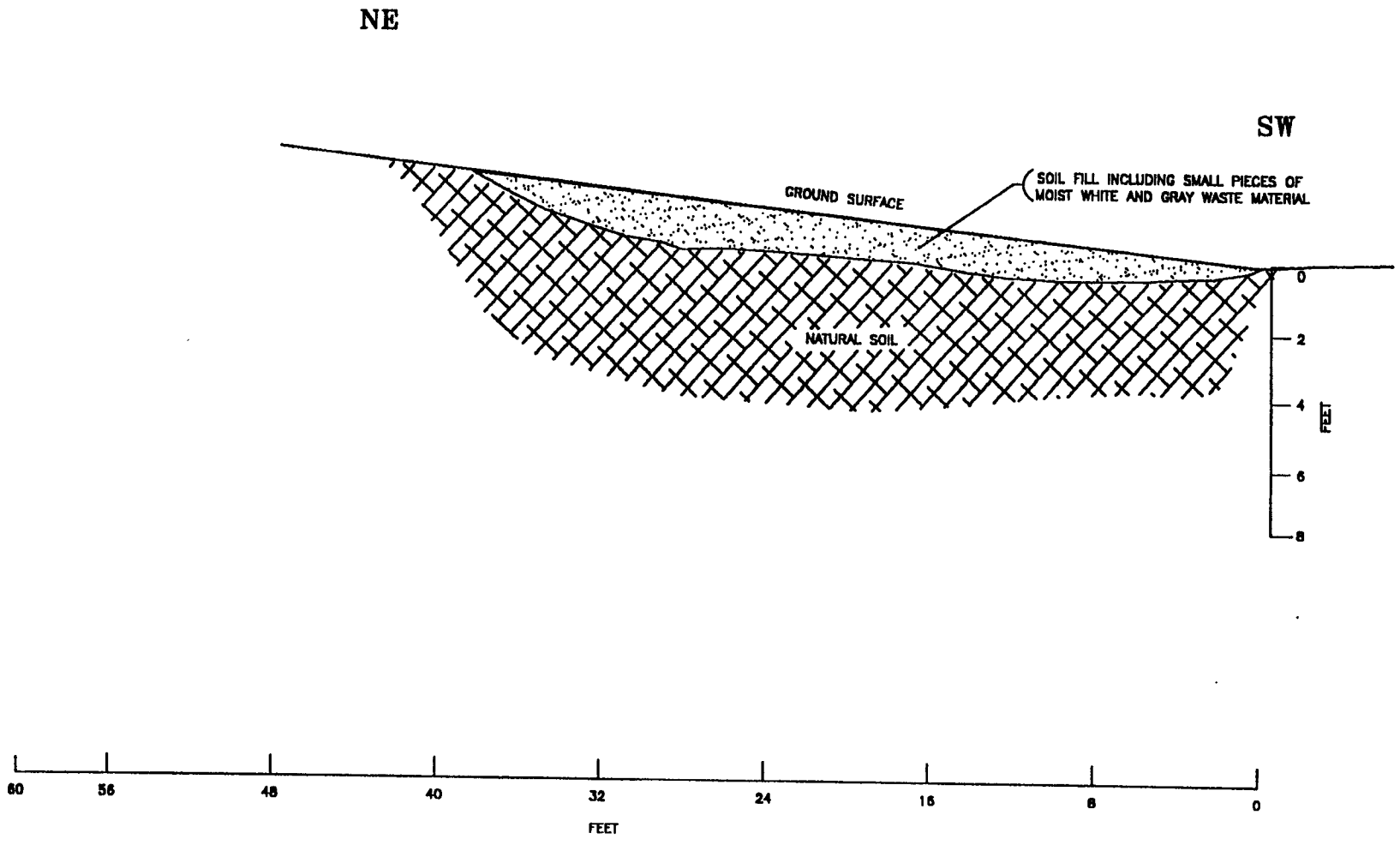

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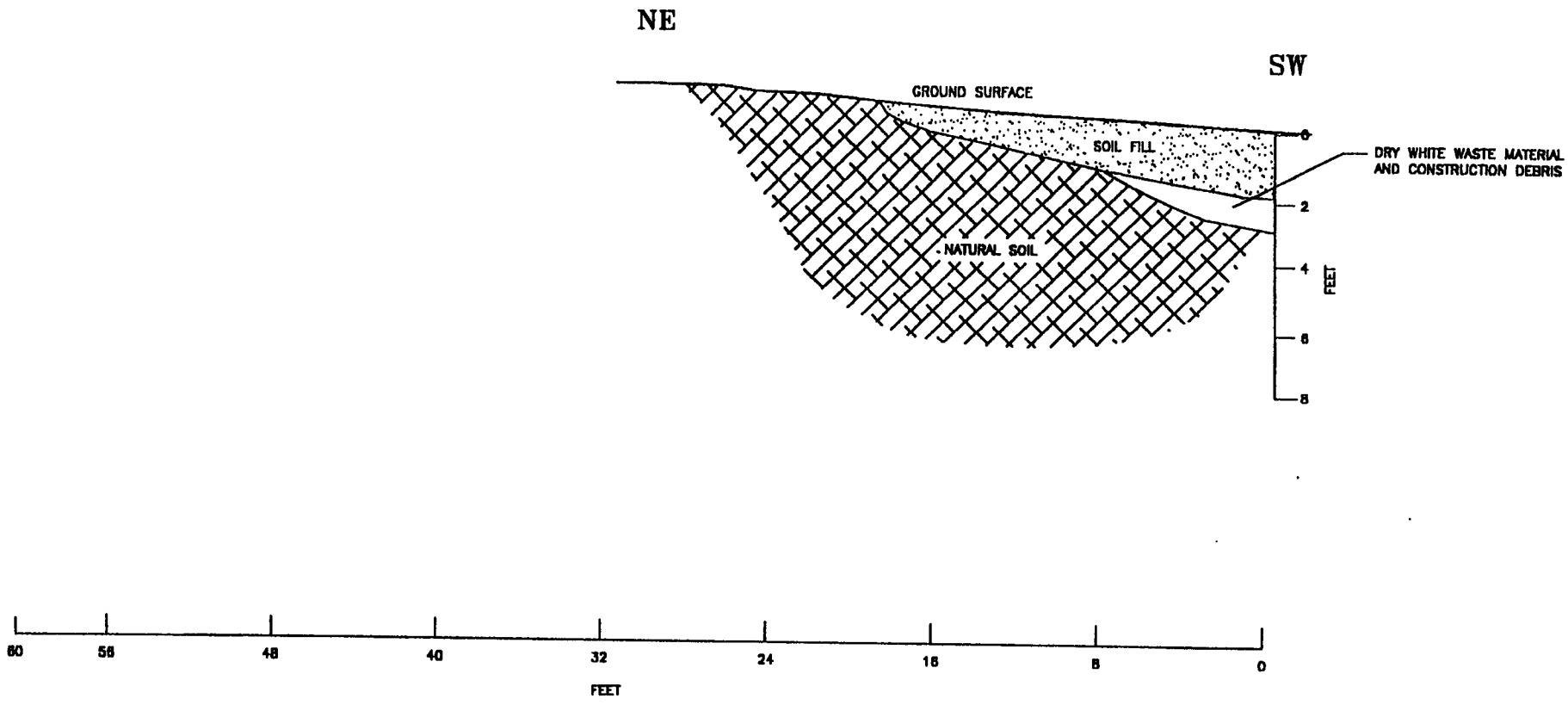

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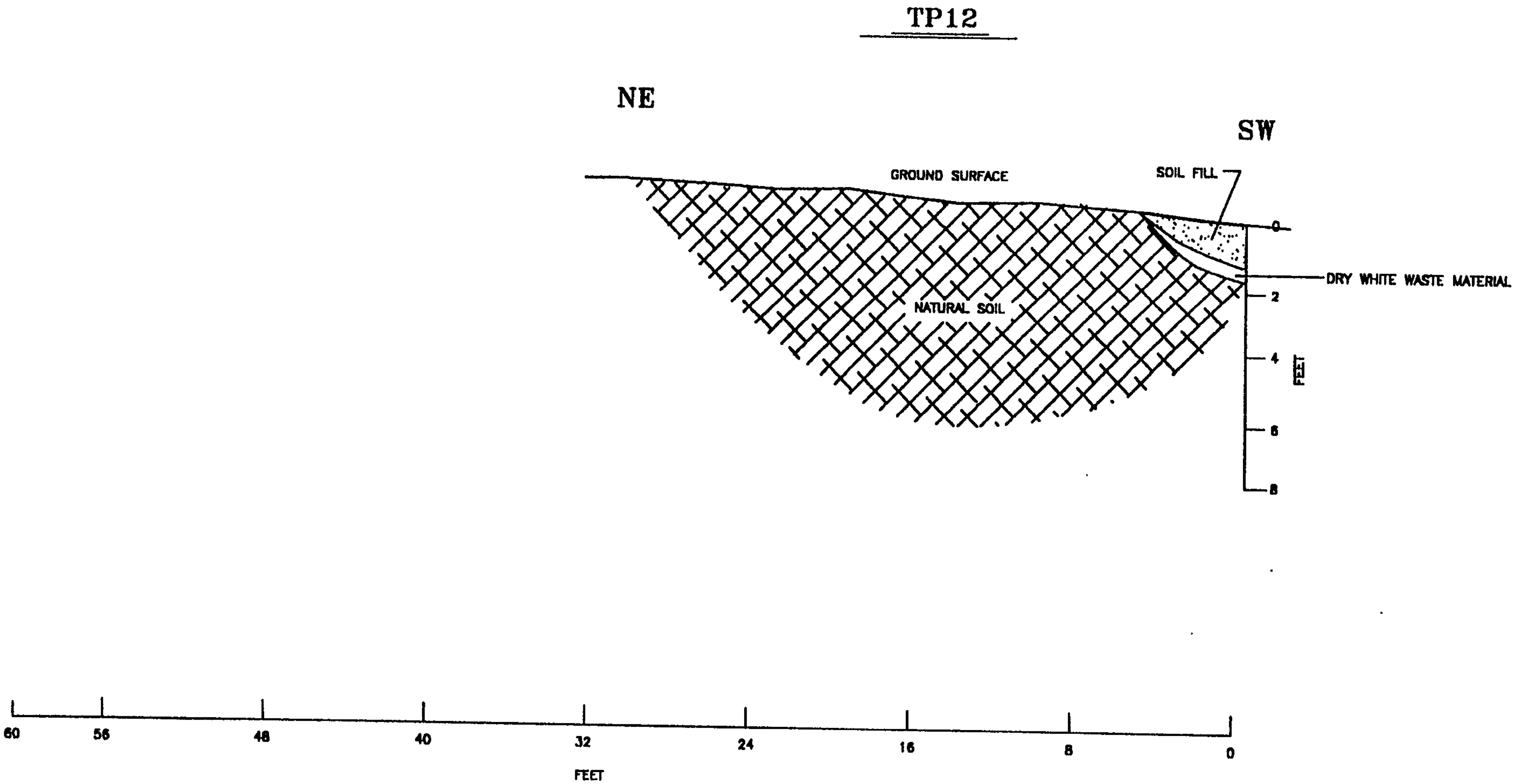

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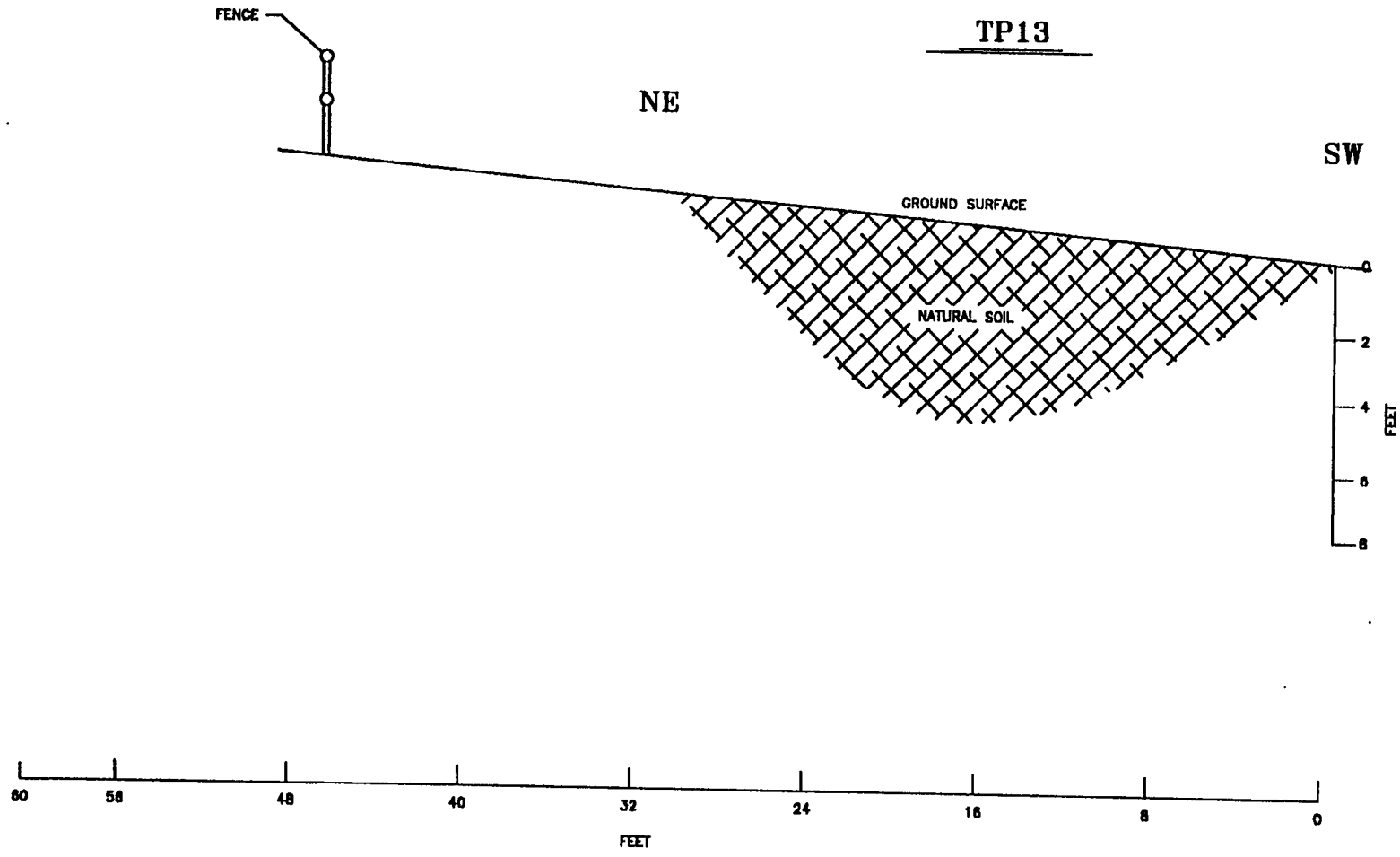

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FIGURE:	WESTON MANAGERS CONSULTANTS	LANDFILL INVESTIGATION TEST PIT CROSS SECTION TEST PIT 13 LAURENS CERAMICS SITE LAURENS, SOUTH CAROLINA
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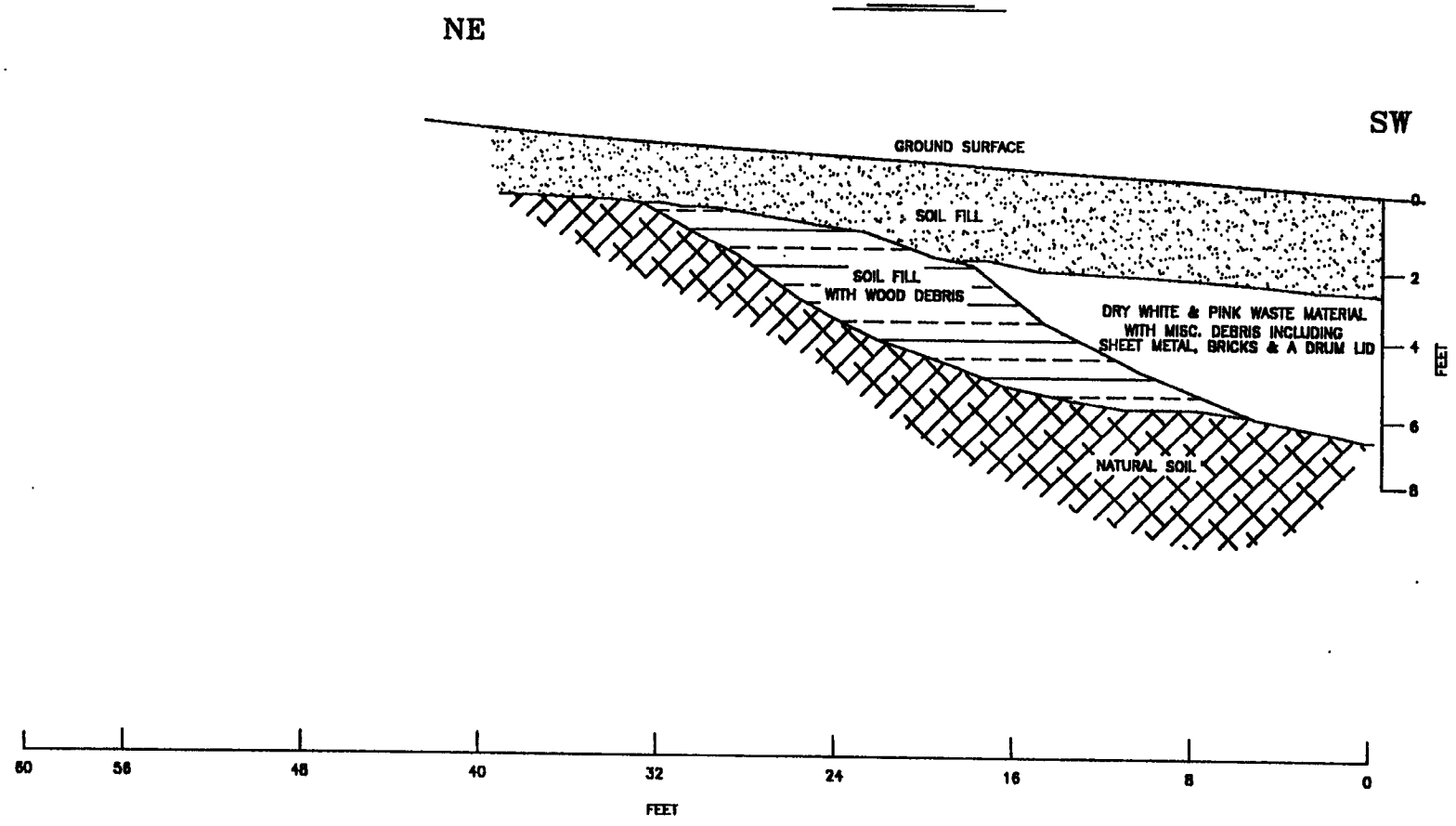

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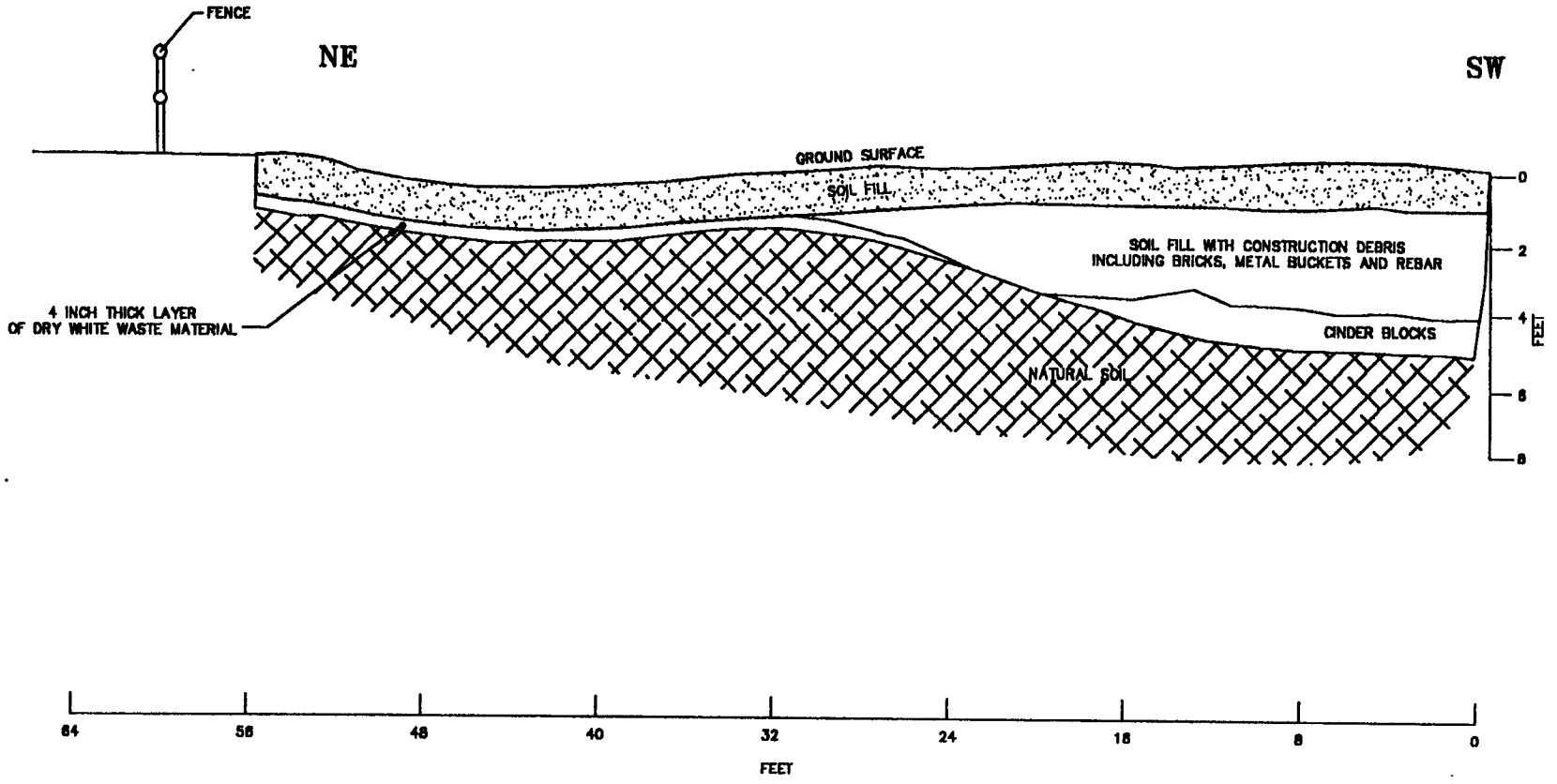

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FIGURE:	WESTON MANAGEMENT CONSULTANTS	LANDFILL INVESTIGATION TEST PIT CROSS SECTION TEST PIT 15 LAURENS CERAMICS SITE LAURENS, SOUTH CAROLINA
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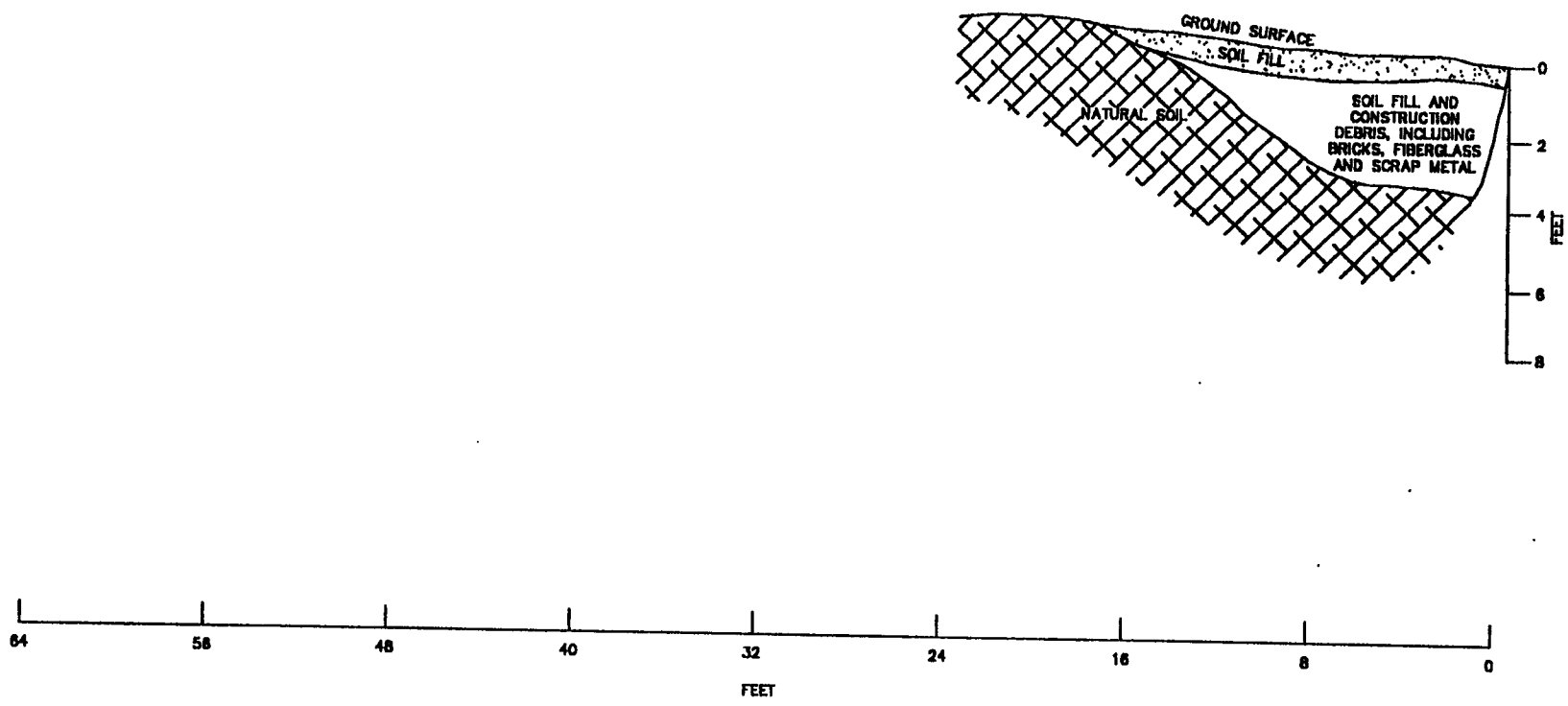

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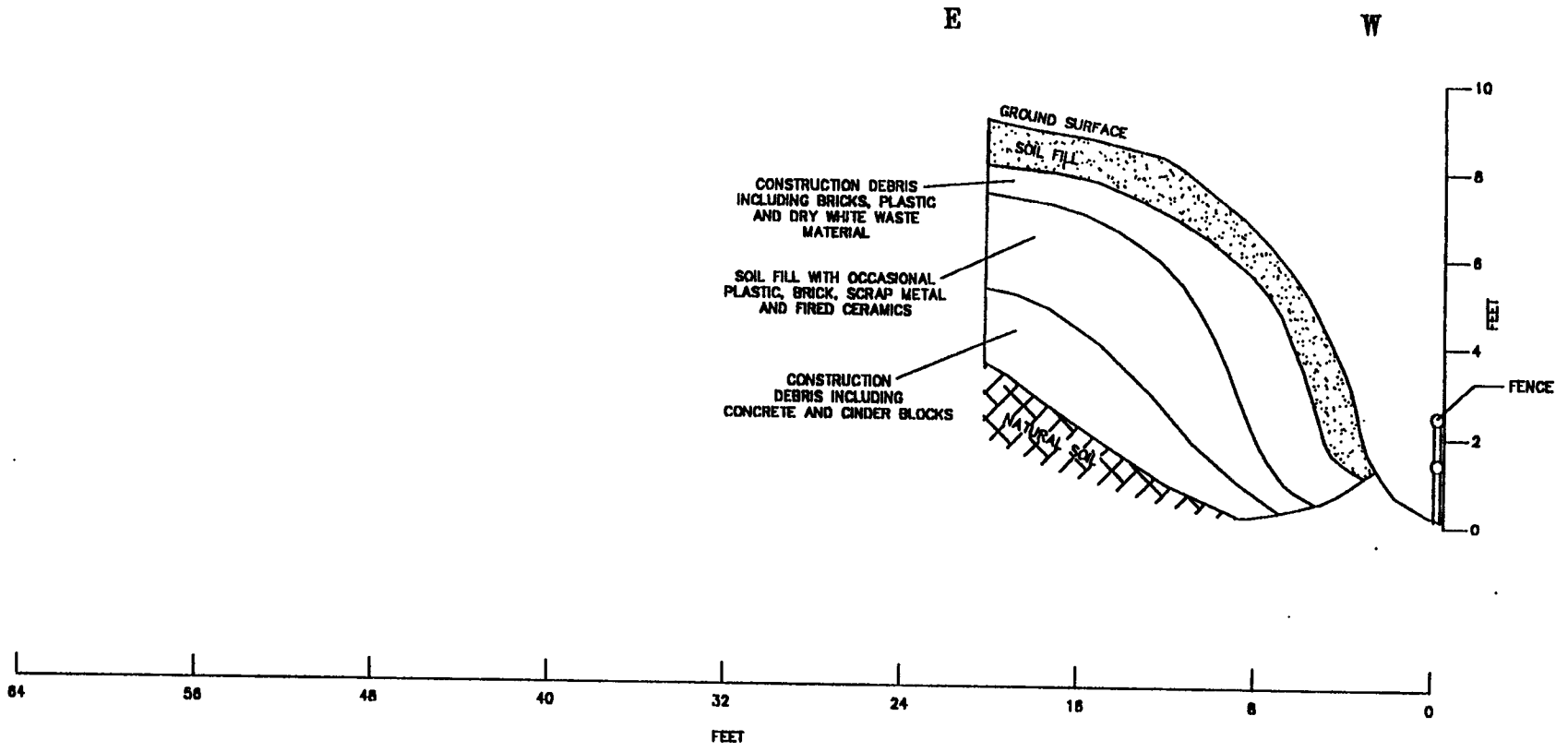

FIGURE:	WESTON MANAGERS CONSULTANTS	LANDFILL INVESTIGATION TEST PIT CROSS SECTION TEST PIT 17 LAURENS CERAMICS SITE LAURENS, SOUTH CAROLINA
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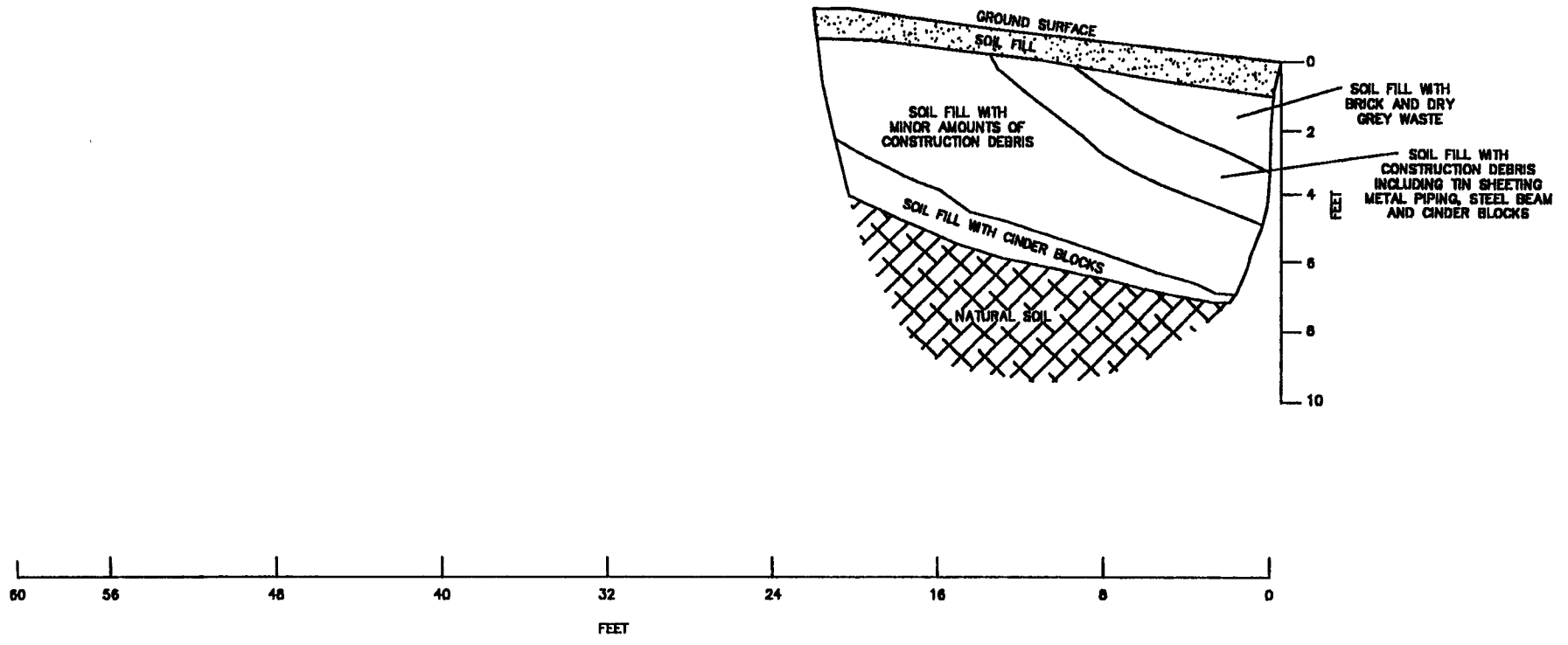

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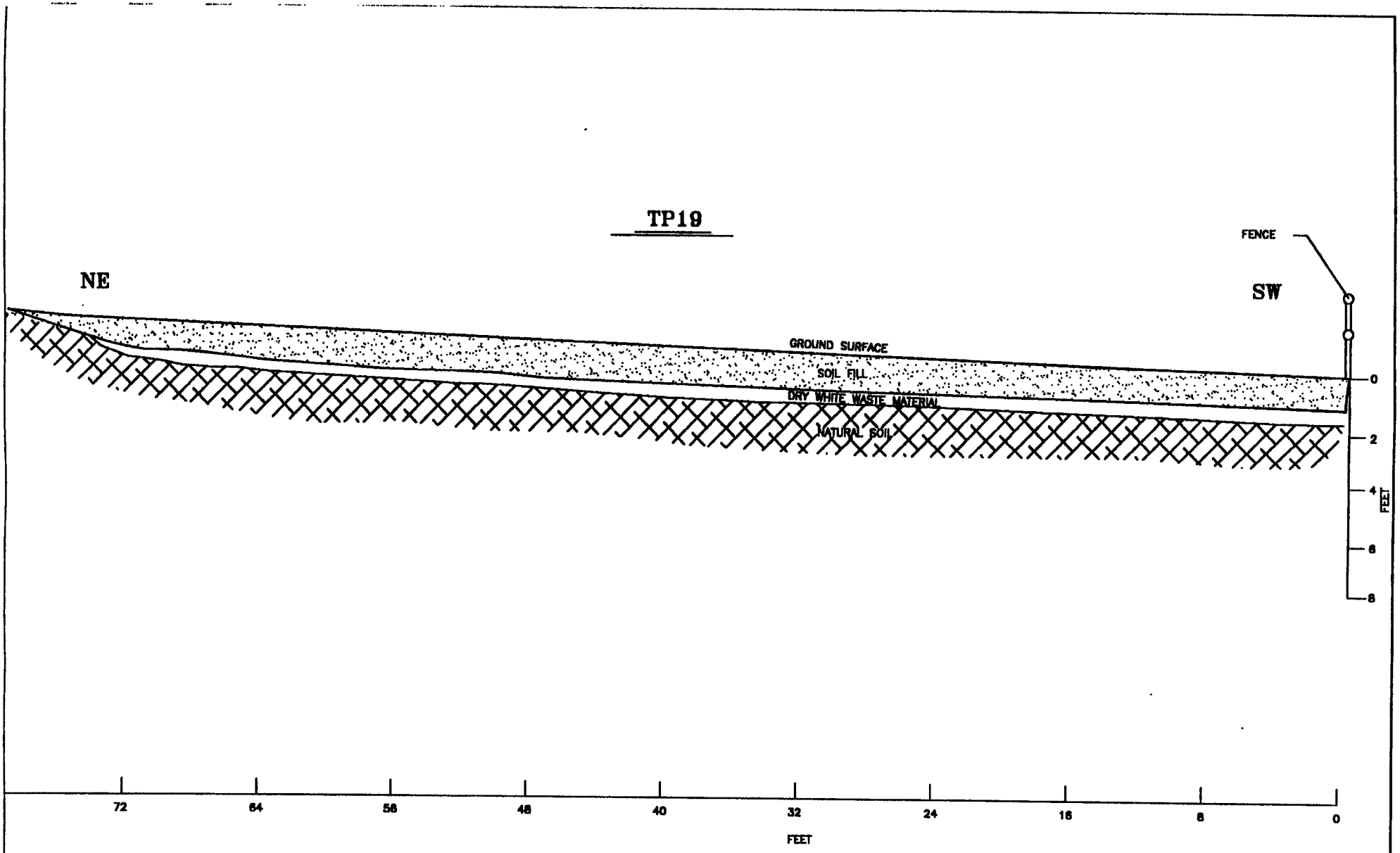

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FIGURE:	WESTON MANAGERS CONSULTANTS	LANDFILL INVESTIGATION TEST PIT CROSS SECTION TEST PIT 19 LAURENS CERAMICS SITE LAURENS, SOUTH CAROLINA
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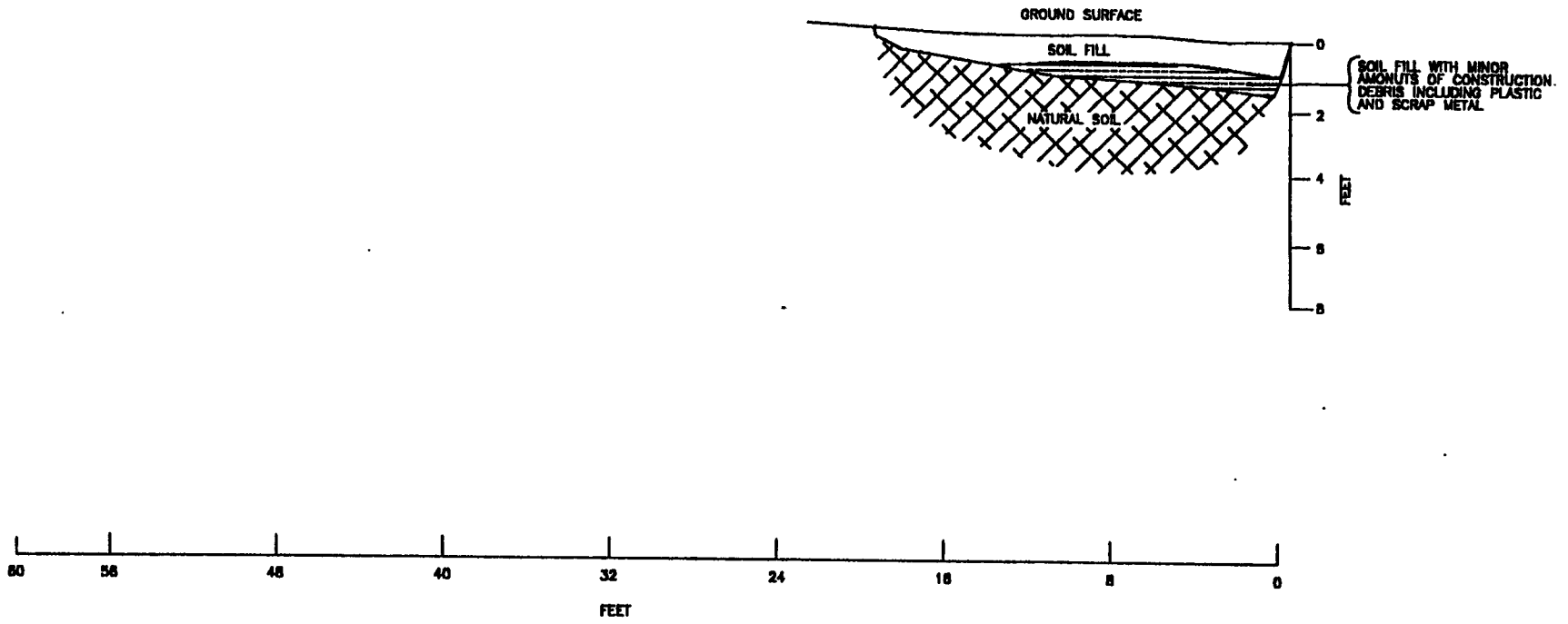

FIGURE:	WESTON
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REVISION NO.1	DRAWN BY.

LANDFILL INVESTIGATION
TEST PIT CROSS SECTION
TEST PIT 20
LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

APPENDIX B

GROUNDWATER QUALITY DATA

SUMMARY OF PURGEABLE HALOCARBONS/AROMATICS REPORTED ABOVE DETECTION LIMITS
LANDFILL
MONITOR WELLS SAMPLED SEPTEMBER 1991/APRIL 1992
LAURENS CERAMICS SITE, LAURENS, SOUTH CAROLINA

PARAMETER*	LOCATION															
	MW9	MW10	MW17	MW18	MW19	MW20	MW21	MW22	MW23	MW24	MW25	MW44	MW45	MW-55	MW-56	MW-57
Chloroethane	ND	ND	ND	4.0	2.3	7.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	7.2	39	8.1	ND	ND	5.4	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	5.5	11	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	6.5	200	7.3	12	2.4	16	ND	ND	ND	ND	ND	ND	ND	26
1,1-Dichloroethane	ND	ND	4.2	120	58	120	ND	6.9	ND	ND	1.7	ND	ND	ND	ND	34
1,2-Dichloroethane	ND	ND	ND	ND	1.1	1.6	ND	20	ND	ND	ND	ND	ND	ND	ND	5.3
Trans-1,2-Dichloroethene	ND	ND	5.1	2,200	420	510	9.3	4.8	ND	ND	15	2.8	1.3	ND	ND	220
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	2.2	310	4.7	13	5.4	7.0	ND	ND	ND	ND	ND	ND	ND	12
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	2.7	150	47	51	4.8	4.4	ND	ND	1.5	1.8	ND	ND	ND	23
Tetrachloroethene	ND	3.8	1.2	3,800	1,400	1,400	39	35	ND	ND	6.6	19	5.5	ND	1.6	130
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	3.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene (Total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* U.S. EPA Method Nos. 8010/8020.
ND indicates not detected above laboratory analytical detection limits.
All values in micrograms per liter (ug/L).

MW-1 through MW-54 sampled September 5-19, 1991.
MW-55 through MW-60, and MW-63 sampled April 1992.

INORGANIC DATA SUMMARY, TOTAL METALS
MONITOR WELLS SAMPLED MARCH 23 THROUGH APRIL 2, 1992
LANDFILL
LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

Parameter	Downgradient Wells																Upgradient Wells	
	MW09	MW10	MW17	MW18	MW19	MW20	MW21	MW22	MW23	MW24	MW25	MW44	MW45	MW55	MW56	MW57	MW40	MW41
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aluminum	555 (ND)	ND	13500 (ND)	1920 (ND)	ND	ND	1690 (ND)	600	ND	ND	ND	ND	ND	602 (ND)	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	ND	ND	316	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	5920	ND	ND	ND	5580	ND	ND	5030	ND	ND	19400	ND	ND	ND	ND	8760	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	ND	ND	103 (ND)	14.8	ND	ND	19.0	15.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	833 (ND)	ND	18100 (ND)	3890 (ND)	ND	ND	4580 (ND)	840 (ND)	ND	ND	ND	ND	138	794 (ND)	102	227	ND	130
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	0.39	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	57.5 (39.4)	160 (148)	731 (520)	286 (286)	428 (411)	6440 (6100)	78.1 (ND)	21.2 (ND)	187 (167)	ND	ND	ND	ND	52.8 (41.0)	46.1	94.0 (81.7)	ND	ND
Nickel	ND	ND	68.4	ND	ND	40.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	ND	ND	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	54.8	40.5	ND	22.3	20.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

All values in micrograms per liter (μg/L).
ND indicates not detected above laboratory analytical detection limits.
(#) indicates the resulting concentration (μg/L) from analysis of an additional sample which was filtered through a 0.45 micron filter.

SUMMARY OF PURGEABLE HALOCARBONS/AROMATICS REPORTED ABOVE DETECTION LIMITS*
MONITOR WELLS SAMPLED SPRING 1994
LANDFILL
LAURENS CERAMICS SITE
LAURENS, SC

PARAMETER (µg/L)	Location											
	MW17[A]	MW18[A]	MW19[A]	MW20[A]	MW22[A]	MW25	MW44[A]	MW45	MW55	MW56	MW57[A]	MW61[A]
Chloroethane	ND	4.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	15	0.54J	1.6	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	8.2	360	1.9	4.0	24	ND	ND	ND	ND	ND	ND	6.9
1,1-Dichloroethane	48	200	10	22	ND	ND	ND	ND	ND	ND	ND	18
1,2-Dichloroethane	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	2.8	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	7.8	0.61J	1.5	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	38E	8100E	423E	1,900E	420	28E	34	ND	ND	ND	350	210
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	21	460	21	1.1	27	1.2	0.51J	5.9	ND	ND	9.7	2.9
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	3.5	81	6.2	13	69	ND	9.2	ND	ND	ND	34J	80
Tetrachloroethene	7.5	1,000	26	760	310	7.3	130	1.6	ND	ND	69	310
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	0.54J	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	3.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene (Total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND indicates analyte was not detected at or above the analytical detection limits.
E indicates the range of calibration curve was exceeded; therefore, the results are estimated.
J indicates estimated value, analyte was detected below analytical detection limit.
Monitor wells were sampled March 22-30, 1994.
[A] - Original analysis performed within holding time, subsequent dilutions/analyses performed past holding times.

METALS DATA SUMMARY - LANDFILL
MONITOR WELLS SAMPLED SPRING 1994
LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

PARAMETER (mg/L)	Location												
	MW17	MW18	MW18TOT	MW19	MW20	MW22	MW25	MW44	MW45	MW55	MW56	MW57	MW61
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aluminum	ND	ND	0.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.055	0.053	0.054	0.069	0.13	0.074	ND	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	2.8	0.13	0.20	6.0	2.7	4.6	19.2	0.15	4.3	3.7	3.7	5.5	4.4
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	0.38	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	ND	ND	0.41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	ND	ND	ND	ND	ND	ND	4.2	ND	ND	ND	ND	ND	ND
Magnesium	3.3	2.1	2.0	4.8	2.7	3.0	4.4	0.96	2.6	1.6	1.4	3.2	2.6
Manganese	0.50	0.041	0.042	0.77	6.1	0.014	0.012	ND	ND	ND	ND	0.012	0.052
Sodium	1.2	3.4	3.2	3.6	3.2	1.6	5.7	1.5	3.6	4.0	4.1	3.4	3.1
Nickel	ND	ND	ND	ND	0.055	ND	ND	ND	ND	ND	ND	ND	ND
Lead	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND	0.0092	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ND	0.024	0.020	ND	0.031	ND	ND	ND	ND	ND	ND	ND	ND

All samples have been filtered through 0.45 micron filter, except those labeled as "TOT".
ND indicates analyte was not detected at or above the analytical detection limit.
Monitor wells were sampled March 22-30, 1994.
Samples were analyzed at WESTON's laboratory.

ANALYTICAL DATA SUMMARY
MONITOR WELLS SAMPLED SPRING 1994
LANDFILL
LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

PARAMETER	Location												
	MW17	MW18	MW18TOT	MW19	MW20	MW22	MW25	MW44	MW45	MW55	MW56	MW57	MW61
Alkalinity	24.0	ND	NA	34.0	27.0	24.0	66.0	ND	25.0	14.0	19.0	29.0	24.0
BOD 5 Day	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloride	ND	5.3	NA	4.9	5.0	ND	ND	2.0	2.1	ND	ND	ND	ND
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoride	ND	0.11	NA	ND	ND	ND	0.11	ND	ND	ND	0.20	ND	ND
Hardness	20.8	ND	ND	31.0	16.7	21.1	66.2	ND	19.4	16.1	13.0	24.0	19.0
Nitrate, as N	0.21	0.20	NA	0.38	0.30	0.40	ND	0.20	0.35	0.80	0.42	0.41	ND
TKN	ND	ND	NA	1.7	ND	0.85	ND	ND	ND	ND	ND	ND	0.85
Total Organic Carbon	ND	ND	NA	2.0	2.0	ND	ND	ND	ND	ND	ND	ND	ND
Sulfide	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfate	5.6	ND	NA	ND	ND	ND	7.7	7.4	ND	ND	7.0	7.8	5.5
Total Dissolved Solids	76	30	NA	84	62	52	120	36	66	98	70	80	62
Total Organic Halogens	0.071	4.1	NA	0.42	0.32	0.66	ND	0.084	0.011	0.011	0.035	0.22	0.30
Total Suspended Solids	190	ND	NA	8	14	ND	21	30	ND	81	34	18	110
Fecal Coliform Bacteria	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NA indicates not analyzed.
ND indicates analyte was not detected at or above analytical detection limit.
All values in milligrams per liter (mg/L) except fecal coliform bacteria (colonies/100 ml).
Monitor wells were sampled March 22-30, 1994.
Samples were analyzed at WESTON's laboratory.

FIELD PARAMETERS
MONITOR WELLS SAMPLED SPRING, 1994
LANDFILL
LAURENS CERAMICS SITE
LAURENS, SC

FIELD PARAMETER	LOCATION											
	MW-17	MW-18	MW-19	MW-20	MW-22	MW-25	MW-44	MW-45	MW-55	MW-56	MW-57	MW-61
Dissolved Oxygen (mg/L)	2.0	4.0	3.2	3.0	3.0	6.0	7.8	4.5	5.5	6.0	5.0	5.5
Eh (mv)	212	262	324	291	192	208	254	264	239	207	178	172
Temperature (°C)	17.3	17.2	17.5	17.3	18.5	19.9	16.8	17.0	17.2	16.2	16.4	15.6
pH	5.75	5.80	5.7	5.60	6.67	8.4	5.32	5.9	6.9	6.87	7.0	6.96
Specific Conductance (mS)	0.054	0.034	0.097	0.080	0.059	0.163	0.027	0.064	0.054	0.051	0.073	0.065
Turbidity (NTU)	70	3	NA	NA	5	1.28	19.3	12.0	155	49	17	150

NA indicates not analyzed.
Monitor wells were sampled March 22 - 30, 1994.
Parameters were measured in the field prior to sampling.

PURGEABLE HALOCARBONS/AROMATICS REPORTED ABOVE DETECTION LIMITS
MONITOR WELLS SAMPLED SPRING 1995
LANDFILL
LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

PARAMETER (µg/L)	LOCATION								
	MW18	MW20	MW25	MW55	MW56	MW57	MW61	MW77	MW78
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	13 J	ND	0.97 J	ND	ND	ND	ND	ND	ND
Vinyl Chloride	25	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	160	ND	2.6	ND	ND	26	2.6 J	6.1 J	ND
1,1-Dichloroethane	120	7.6	1.2	ND	ND	24	9.3	22	17
1,2-Dichloroethane	ND	ND	ND	ND	ND	2.9	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	1.2	ND	ND	ND
cis-1,2-Dichloroethene	4,600	88	10	ND	ND	140	62	140	130
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	170	3.6 J	ND	ND	ND	14	ND	ND	ND
Trichloroethene	51	20	1.2	ND	ND	20	14	26	36
Tetrachloroethene	630	1,000	11	ND	0.66 J	92	120	250	270
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	150 J	ND	ND	ND	ND	1.1	ND	ND	ND
Methane	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND indicates analyte was not detected at or above the analytical detection limit.
J indicates estimated value, analyte was detected below analytical detection limit.
Monitor wells were sampled May 8-23, 1995.
Methane was analyzed at Southwest Research Institute. All other samples were analyzed at WESTON's laboratory.

METALS DATA SUMMARY
MONITOR WELLS SAMPLED SPRING 1995
LANDFILL
LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

Parameter	Location								
	MW18	MW20	MW25	MW55	MW56	MW57	MW61	MW77	MW78
Aluminum	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.063	0.11	ND	ND	ND	ND	ND	ND	ND
Calcium	0.22	1.7	15.9	3.6	3.5	5.2	3.7	10.1	6.8
Iron	0.046	ND	ND	ND	ND	ND	ND	0.092	0.059
Iron (Fe^{2+})	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron (Fe^{3+})	ND	ND	ND	ND	ND	ND	ND	0.070	ND
Potassium	ND	ND	3.9	ND	ND	ND	ND	2.6	2.0
Magnesium	2.4	2.0	3.8	1.6	1.3	3.1	2.3	4.2	3.4
Manganese	0.10	3.3	ND	ND	ND	ND	ND	0.017	0.015
Sodium	3.7	2.7	5.1	3.8	3.8	3.1	2.9	4.8	4.3

All samples have been filtered through 0.45 micron filter.
ND indicates analyte was not detected at or above the analytical detection limit.
Monitor wells were sampled May 8-23, 1995.
Iron (Fe^{2+}) and Iron (Fe^{3+}) were analyzed at Southwest Research Institute.
All other samples were analyzed at WESTON's laboratory.

ANALYTICAL DATA SUMMARY
MONITOR WELLS SAMPLED SPRING 1995
LANDFILL
LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

Parameter (mg/L)	Location								
	MW18	MW20	MW25	MW55	MW56	MW57	MW61	MW77	MW78
Alkalinity	ND	20.9	64.8	23.0	25.1	29.3	18.8	43.9	41.8
BOD 5 Day	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloride	9.3	3.8	ND	ND	ND	ND	ND	2.1	ND
Fluoride	ND	ND	0.10	ND	ND	ND	ND	ND	ND
Hardness	10.4	12.3	55.4	15.4	14.2	25.6	18.6	42.6	31.1
Ammonia, as Nitrogen	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, as N	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate, as N	0.35	0.39	ND	0.82	0.44	0.44	ND	ND	0.13
Total Organic Carbon	1.4	ND	ND	ND	ND	ND	ND	ND	ND
Sulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulfate	5.3	ND	8.0	6.2	ND	7.0	8.6	10.1	6.4
Total Dissolved Solids	18	44	94	76	36	56	68	96	94
Carbon Dioxide (free)	NC	107	0.11	33	50	37	119	59	113

ND indicates analyte was not detected at or above analytical detection limit.
NC indicates not calculated due to low pH (< 5).
Monitor wells were sampled May 8-23, 1995.
Samples were analyzed at WESTON's laboratory.
Carbon dioxide was calculated from analytical results provided by Weston's laboratory.

DRAFT
TRITIUM DATA SUMMARY
Monitor Wells Sampled Spring 1995
Landfill
Laurens Ceramics Site
Laurens, South Carolina

Location	Tritium (T.U.)	Detection Limit (T.U.)
MW18	20.0	0.7
MW20	18.4	0.7
MW25	0.9	0.8
MW55	11.3	0.7
MW56	11.7	0.7
MW57	8.0	0.7
MW61	19.6	0.6
MW77	15.8	0.6
MW78	19.2	0.8

Surface waters were sampled May 8-23, 1995.
All samples were analyzed at University of Georgia's Isotope Laboratory.

APPENDIX C
SURFACE WATER QUALITY DATA

Summary of Volatile Organic Compounds
in Surface Water Samples
Landfill
Laurens Ceramics Site
Laurens, South Carolina

Sample Location: / Date:	WSW07 9/20/91	WSW07 10/11/91	WSW07 8/19/92	WSW07 11/17/92	WSW07 2/17/93	WSW07 5/7/93	WSW07 8/10/93	WSW07 10/27/93	WSW07 3/31/94	WSW07 6/29/94	WSW07 9/16/94	WSW07 12/1/94
1,1,1-Trichloroethane	ND	ND	ND	ND	0.3 J	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	ND
Methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	70	ND	ND	ND	3.7 B	ND	ND	ND	ND	ND	0.78 JB	ND
MIBK (4-methyl-2-pentanone)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
Tetrachloroethene	ND	ND	ND	ND	1.3	ND	ND	ND	ND	1.9	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	0.44 J	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

All results reported in micrograms per liter.
ND = Not detected.
NA = Not analyzed.
J = estimated value, analyte was detected below analytical detection limit.
B = Compound was also detected in blank.
Concentration detected and reported by laboratory.

Summary of Volatile Organic Compounds
in Surface Water Samples
Landfill
Laurens Ceramics Site
Laurens, South Carolina

Sample Location:	WSW07	WSW07	WSW08	WSW08	WSW08	WSW08	WSW08	WSW08	WSW08	WSW08	WSW08	WSW08
Date:	2/1/95	5/24/95	9/20/91	10/11/91	2/8/92	5/18/92	8/19/92	11/17/92	2/17/93	5/7/93	8/10/93	10/27/93
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	0.22 J	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	NA	43	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	ND	0.56 J	ND	4.6	ND	ND	ND	ND	3.6 B	ND	ND	ND
MIBK (4-methyl-2-pentanone)	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	0.77 J	ND	ND	ND	14	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	1.3	ND	ND	ND	ND	NA	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

All results reported in micrograms per liter.
ND = Not detected.
NA = Not analyzed.
J = estimated value, analyte was detected below analytical detection limit.
B = Compound was also detected in blank.
Concentraction detected and reported by laboratory.

Summary of Volatile Organic Compounds
in Surface Water Samples
Landfill
Laurens Ceramics Site
Laurens, South Carolina

Sample Location:	WSW08	WSW08	WSW08	WSW08	WSW08	WSW09	WSW09	WSW09	WSW09	WSW09	WSW09	WSW09
Date:	3/31/94	6/29/94	9/16/94	12/1/94	2/1/95	9/20/91	10/11/91	2/8/92	5/18/92	8/19/92	11/17/92	2/17/93
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	NA	ND	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA
Methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	ND	1 B	1 B	ND	ND	48	ND	ND	ND	ND	ND	0.86 JB
MIBK (4-methyl-2-pentanone)	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ND	ND	ND	ND	ND	1.8	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

All results reported in micrograms per liter.
ND = Not detected.
NA = Not analyzed.
J = estimated value, analyte was detected below analytical detection limit.
B = Compound was also detected in blank.
Concentraction detected and reported by laboratory.

Summary of Volatile Organic Compounds
in Surface Water Samples
Landfill
Laurens Ceramics Site
Laurens, South Carolina

Sample Location:	WSW09	WSW09	WSW09	WSW09	WSW09	WSW09	WSW09	WSW09	WSW09	WSW09	WSW09	WSW13
Date:	5/7/93	8/10/93	10/27/93	3/31/94	6/29/94	9/16/94	12/1/94	2/1/95	5/24/95	11/28/95	8/14/96	10/11/91
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	NA
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	NA	NA	NA	NA	ND	NA	ND	ND	ND	ND	ND	NA
Methane	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA
Methylene Chloride	ND	ND	ND	ND	ND	1.1 B	ND	ND	ND	1.1 B	ND	ND
MIBK (4-methyl-2-pentanone)	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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NA = Not analyzed.
J = estimated value, analyte was detected below analytical detection limit.
B = Compound was also detected in blank.
Concentraction detected and reported by laboratory.

Summary of Volatile Organic Compounds
in Surface Water Samples
Landfill
Laurens Ceramics Site
Laurens, South Carolina

Sample Location:	WSW13	WSW13	WSW13	WSW13	WSW13	WSW13	WSW13	WSW13	WSW13	WSW13	WSW13	WSW13
Date:	8/19/92	11/17/92	2/17/93	5/7/93	8/10/93	10/27/93	3/31/94	6/29/94	9/16/94	12/1/94	2/1/95	5/24/95
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	1.9	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	3.1	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	1.5 B	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	NA	NA	NA	NA	NA	NA	NA	ND	NA	ND	ND	ND
Methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	1.1 B	ND	ND	ND
MIBK (4-methyl-2-pentanone)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA
Tetrachloroethene	ND	ND	ND	ND	6.1	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

All results reported in micrograms per liter.
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NA = Not analyzed.
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B = Compound was also detected in blank.
Concentraction detected and reported by laboratory.

Summary of Volatile Organic Compounds
in Surface Water Samples
Landfill
Laurens Ceramics Site
Laurens, South Carolina

Sample Location:	WSW13	WSW13	WSW14	WSW14	WSW14	WSW14	WSW14	WSW14	WSW14	WSW14	WSW14	WSW14
Date:	11/28/95	8/14/96	10/11/91	8/19/92	11/17/92	2/17/93	5/7/93	8/10/93	10/27/93	3/31/94	6/29/94	9/16/94
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	0.32 J	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA
Methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	1.1 B	ND	ND	ND	ND	0.83 JB	ND	ND	ND	ND	ND	1.1 B
MIBK (4-methyl-2-pentanone)	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

All results reported in micrograms per liter.
ND = Not detected.
NA = Not analyzed.
J = estimated value, analyte was detected below analytical detection limit.
B = Compound was also detected in blank.
Concentraction detected and reported by laboratory.

Summary of Volatile Organic Compounds
in Surface Water Samples
Landfill
Laurens Ceramics Site
Laurens, South Carolina

Sample Location:	WSW14	WSW14	WSW14	WSW16	WSW16	WSW16
Date:	12/1/94	2/1/95	5/24/95	5/1/95	11/28/95	8/14/96
1,1,1-Trichloroethane	ND	ND	ND	1.3	1.6	0.53
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	11	11	4.6
1,1-Dichloroethene	ND	ND	ND	ND	2.4	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	56	51	31
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND	ND	ND
Methane	NA	NA	70	NA	NA	ND
Methylene Chloride	ND	ND	0.54 J	ND	ND	ND
MIBK (4-methyl-2-pentanone)	ND	ND	NA	NA	NA	ND
Tetrachloroethene	ND	ND	ND	54	48	13
Toluene	ND	ND	2.7	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	6.9	8.3	2.4
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	0.68 J	0.76 J	0.78
Xylene	ND	ND	ND	ND	ND	ND

All results reported in micrograms per liter.
ND = Not detected.
NA = Not analyzed.
J = estimated value, analyte was detected below analytical detection limit.
B = Compound was also detected in blank.
Concentraction detected and reported by laboratory.

METALS DATA SUMMARY
MAY 24, 1994
SURFACE WATER SAMPLING EVENT
LANDFILL
LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

Parameter (mg/L)	Location			
	WSW07	WSW09	WSW13	WSW14
Aluminum	ND	0.62	0.56	0.41
Barium	0.052	ND	ND	ND
Calcium	2.8	2.1	3.4	0.50
Iron	1.2	1.1	1.4	1.1
Iron (Fe^{2+})	0.185	0.734	0.721	0.654
Iron (Fe^{3+})	0.945	0.446	0.959	0.696
Potassium	ND	ND	ND	ND
Magnesium	1.6	1.1	1.9	0.63
Manganese	0.061	0.016	0.052	0.030
Sodium	2.0	2.6	3.0	1.0

ND indicates analyte was not detected at or above the analytical detection limit.
Iron (Fe^{2+}) and Iron (Fe^{3+}) were analyzed at Southwest Research Institute.
All other samples were analyzed at Weston's laboratory.

ANALYTICAL DATA SUMMARY
MAY 24, 1995
SURFACE WATER SAMPLING EVENT
LANDFILL
LAURENS CERAMICS SITE
LAURENS, SOUTH CAROLINA

Parameter (mg/L)	Location			
	WSW07	WSW09	WSW13	WSW14
Alkalinity	ND	10.3	26.8	ND
BOD 5 Day	ND	ND	ND	ND
Chloride	2.6	2.5	2.7	2.3
Fluoride	ND	ND	0.10	0.10
Hardness	13.6	ND	16.4	ND
Ammonia, as Nitrogen	ND	ND	0.81	ND
Nitrite, as N	ND	ND	ND	ND
Nitrate, as N	ND	0.18	0.17	0.11
Total Organic Carbon	1.3	2.6	2.9	1.6
Sulfide	ND	ND	ND	ND
Sulfate	7.6	ND	ND	ND
Total Dissolved Solids	60	70	90	43
Carbon Dioxide (free)	37	21	38	NC

ND indicates analyte was not detected at or above analytical detection limit.
NC indicates not calculated due to low pH (<5).
Samples were analyzed at WESTON's laboratory.
Carbon dioxide was calculated from analytical results provided by Weston's laboratory.

DRAFT
TRITIUM DATA SUMMARY
Surface Water Spring 1995
Landfill
Laurens Ceramics Site
Laurens, South Carolina

Location	Tritium (T.U.)	Detection Limit (T.U.)
WSW07	16.9	0.4
WSW09	26.8	0.4
WSW13	17.2	0.4
WSW14	26.0	0.7

Surface waters were sampled May 8-23, 1995.
All samples were analyzed at University of Georgia's Isotope Laboratory.