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RESULTS OF CHARACTERIZATION TRENCHING IN THE OPERABLE UNIT 2 (OU 2) SOUTH FIELD AREA 2

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South Field Area 2

NOVEMBER 24, 1992

TABLE OF CONTENTS

PAGE

SUMMARY OF TRENCHING RESULTS:
OU 2 SOUTH FIELD AREA 2 (SFD-2) 3

1.0 FIELD ACTIVITIES 3, 4

1.1 Trench Excavation 4
1.1.1 Trench No. 1 4
1.1.2 Trench No. 2 4

1.2 Soil Sampling and Field Screening 4
Table 1.1 5

1.3 Soil/Media Classification and Documentation 5

1.4 Groundwater Sample Collection 6

2.0 RESULTS 6

2.1 Trench No. 1 6
2.1.1 Waste Characterization 6
2.1.2 Soils 6, 10
Figure 2.1 7
Figure 2.2 8
Figure 2.3 9

2.2 Trench No. 2 10
2.2.1 Waste Characterization 10
2.2.2 Soils 10

3.0 DISCUSSION AND CONCLUSIONS 10

3.1 Type and Horizontal/Vertical Extent of SFD-2 Wastes 10

3.2 SFD-2 Geology and Hydrogeology 10, 13
Figure 2.4 11
Figure 2.5 12

3.3 Horizontal/Vertical Extent of Soil Contaminants 13

SUMMARY OF TRENCHING RESULTS:

OU 2 SOUTH FIELD AREA 2 (SFD-2)

On July 29, 1992, the excavation of a trench began in the South Field Area 2, which is located north of the Inactive Flyash Pile. This activity was conducted to characterize the three buried parallel trenches identified in a 1954 aerial photograph. The 100-foot long by 15-foot deep trench was completed on July 30, 1992, with no evidence of the three suspect trenches. The lithology consisted of the natural occurring clays and silts found in the glacial till for the Southwestern Ohio region, and appeared undisturbed. The overlying soil horizon appeared normal and also undisturbed. Groundwater was encountered at a depth of between 12 to 15 feet, in a "channel sand", 15 to 20 feet east of the western-most point of the trench. At approximately 40 feet east of the western-most point, and at a depth of approximately 2 feet, an electrical conduit was uncovered. The 2.5 foot conduit was apparently scrap. Nothing else was uncovered in this trench. On July 31, 1992, it was determined that the completed trench may have been north of the suspect trenches. A further review of the existing photographs was conducted and an extensive field investigation was performed. On completion of the review and investigation, it was decided to excavate another trench 75 feet south of the initial trench.

The second excavation was initiated and completed on August 4, 1992. This trench was 100 feet long and 12 feet deep. The lithology and soil horizon was identical to the first trench, and groundwater was encountered in the "channel sand" at approximately the same expected location as the first trench. A large concrete block, approximately 2 x 3 x 1 foot, was uncovered at a depth of 6 inches and 40 feet east of the western-most point of the trench. At the completion of this second trench, no evidence of the three suspect trenches was encountered.

Field instrumentation surveys of both trenches did not show evidence of contamination.

Based on the above evidence, the three suspect trenches identified in the 1954 aerial photo were probably shallow, backfilled and covered with a layer of soil approximately 2 to 3 feet thick. This soil layer was in place long enough to develop a natural soil profile, thus obscuring evidence associated with the 1954 trenching activity. In addition, the planting and subsequent removal of pine trees from this area probably further masked any prior surface disturbance. The evidence also suggests these trenches may have been excavated as part of equipment training activity rather than waste or debris disposal related.

1.0 *FIELD ACTIVITIES*

All field activities were performed in accordance with the Production Area and Other Additional Suspect Areas (PASA) Work Plan Addendum, dated October 4, 1989. A total of two trenches were completed, using a track-mounted backhoe, within the SFD-2 to a maximum total depth of 12 to 15 feet below surface grade. Soil samples were collected from each end and the midpoint of each trench, at 5-foot intervals from the surface to the total depth of each trench. The soil samples were field-screened for volatile organic vapors and radiological activities using a photoionization detection device (PID) and a beta/gamma pancake frisker, respectively. Biased soil samples were submitted for laboratory determinations of radiological and chemical constituents. A geologist was present during trench excavation activities to classify soil types,

record PID and beta/gamma readings and document the nature and distribution of the fill materials.

1.1 TRENCH EXCAVATION

A total of two trenches were completed to an approximate total depth of 12 to 15 feet below surface grade within the SFD-2 boundaries using a track-mounted backhoe equipped with a 24-inch wide bucket. Each trench was oriented east-west in areas corresponding to suspect north-south trending trenches identified by a 1954 aerial photograph. The approximate total length of each trench was 100 feet.

1.1.1 TRENCH NO. 1

Trench excavation activities were completed on July 30, 1992 for this trench. Trench No. 1 was oriented approximately at the center of a cleared area within the SFD-2 tree farm. The entire trench was excavated to an approximate total depth of 15 feet.

1.1.2 TRENCH NO. 2

Trench excavation activities were completed on August 4, 1992 for this trench. Trench No. 2 was oriented approximately 50 feet south and parallel to Trench No. 1. The entire trench was excavated to an approximate total depth of 12 feet below surface grade.

1.2 SOIL SAMPLING AND FIELD SCREENING

Soil samples were collected from each end and the center of Trench No. 1 and from the western end and center of Trench No. 2 at 5-foot intervals from the surface to the total depth. The samples were obtained from the backhoe bucket and retained in 4-ounce glass jars. Each sample was field-screened using a beta/gamma pancake frisker device and then sealed with an aluminum foil lid. The sample was then submitted to direct sunlight for a period of at least 15 minutes for equilibrium of the volatile organic compounds prior to field-screen analyses using a PID (HNu Model HW-101). The samples were then stored for subsequent visual inspection and classification by the site geologist. The results of the field screening analyses were documented in field logbooks and on the RI/FS Visual Classification of Soils records.

Biased soil samples were collected at Trench No. 1 and submitted for laboratory determinations of radiological and chemical constituents. Table 1.1 provides details concerning samples submitted for laboratory analyses.

TABLE 1.1
Soil Samples Submitted for Laboratory Analyses

SAMPLE NO.	DEPTH/AREA	PID/RAD*	ANALYSIS REQUESTED
4713	0'/West End	18.0/60	Full Radiological
4714	10'/West End	6.8/60	Full Radiological
4715	5'/West End	11.0/60	HSL Full List
4716	0'/Center	18.0/50	Full Radiological
4719	15'/Center	8.6/40	Full Radiological
4720	0'/East End	15.2/40	Full Radiological
4721	5'/East End	16.2/40	HSL Full List
4722	10'/East End	6.8/40	Full Radiological

*NOTE: PID and RAD (beta/gamma activities) values are in parts per million (ppm) and counts per minute (cpm), respectively.

1.3 SOIL/MEDIA CLASSIFICATION AND DOCUMENTATION

A geologist was present to visually inspect and classify soils and waste media encountered during trench excavation activities. The geologist documented the type and relative thicknesses of soil strata, and type and extent of waste media, if present, contained within the soil units. In addition, the geologist was responsible for visual characterizations for the soil samples collected during trench excavation activities. Visual classification of soil samples included a description of the soil's relative consistency, color and sediment content (e.g., sand, silty clay, clay, etc.).

The relative consistency of the soil was determined using a Pocket Penetrometer^R, which estimates the unconfined compressive strength in units of tons per square foot. The tip of the Pocket Penetrometer^R device was inserted into the soil sample to a depth of approximately .25 inches (marked by a scribed line on the tip's shaft). The force required to insert the tip to the prescribed depth (unconfined compressive strength) was indicated on a spring-loaded graduated shaft. The measured unconfined compressive strength was then compared to tabulated values to determine the relative consistency.

The soil color was determined using a Munsel Soil Color Chart, which contains a variety of distinct hues, values and chromas. Each distinct hue, value and chroma combination correlates to a descriptive designator. For example, a hue of 10YR, value of 4, and a chroma of 6 (10 YR 4/6) corresponds to a dark yellowish brown color designation.

1.4 GROUNDWATER SAMPLE COLLECTION

Groundwater samples could not be collected due the relatively rapid slumping of the trench walls during excavation activities.

2.0 *RESULTS*

This section provides the results of the trench excavation activities conducted for the SFD-2. In general, the trenches were void of waste materials. The only evidence of waste materials was electrical wiring conduits within the upper 12 inches of soil at the center of Trench No. 1 and a concrete boulder within the upper 12 inches of soil at Trench No. 2.

A total of four distinct lithologic units were encountered during trench excavation activities. The units, in order of increasing depth, are as follows:

- *UNIT 1*
  1 to 3.5 feet of soft to medium stiff, yellowish brown sandy clay, which thins towards the east and southeast.

- *UNIT 2*
  3.5 to 7 feet of very soft to stiff, mottled yellow brown and gray sandy clays and silty clays.

- *UNIT 3*
  3.5 to 4.5 feet of stiff, gray sandy silt.

- *UNIT 5*
  4 to 5 feet of very soft yellowish brown gravelly sands (western end) and dark gray silty clays and silty sands.

Figure 2.1 illustrates the geologic environment of the SFD-2 trench excavation areas.

2.1 TRENCH NO. 1

2.1.1 WASTE CHARACTERIZATION

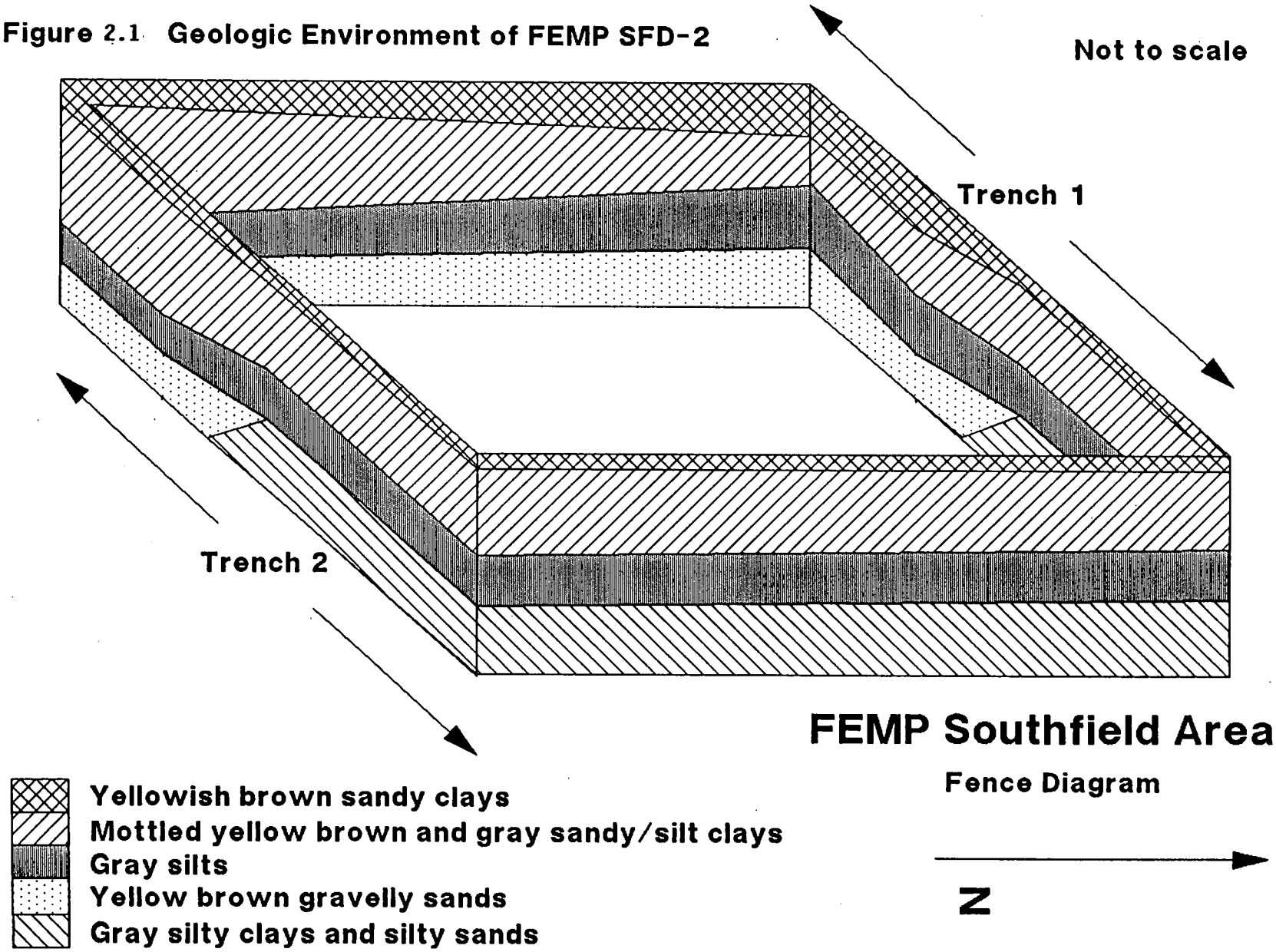
In general, Trench No. 1 was void of any waste materials. The only evidence of any waste materials was electrical wiring conduit within the upper 12 inches of soil at the center of the trench.

2.1.2 SOILS

Soil Units 1 through 4 were observed during trench excavation activities as illustrated by Figure 2.2.

The results of field screening analyses and visual characterizations for soil samples collected from Trench No. 1 are provided by Figure 2.3. In general, the soil samples exhibited beta/gamma activities of 40 to 60 cpm and volatile organic vapor

Figure 2.1 Geologic Environment of FEMP SFD-2



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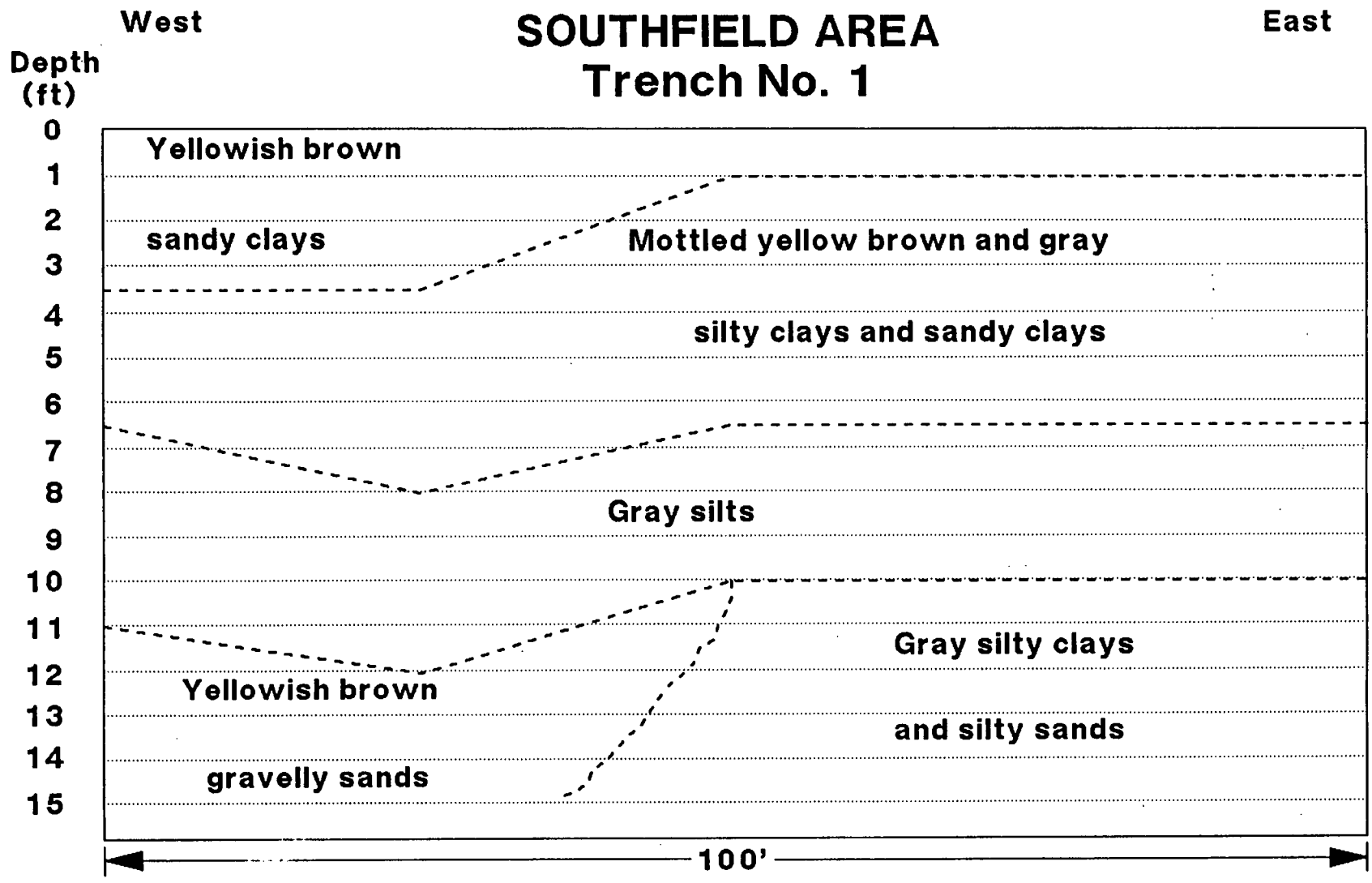

Figure 2.2 Geologic Profile for Trench No. 1.

SOUTHFIELD AREA
Trench No. 1

Depth (ft)	West			East
0	PID = 18.0 ppm b/g = 60 cpm	Soft, dark brown sandy clay (10 YR 4/3)	PID = 18.0 ppm b/g = 50 cpm	Med. stiff, dark yellowish brown sandy clay (10 YR 4/4) PID = 15.2 ppm b/g = 40 cpm
1				
2				
3				
4				
5	PID = 11.0 ppm b/g = 60 cpm	Very soft, brownish yellow sandy/silty clay (10 YR 6/8)	PID = 15.0 ppm b/g = 40 cpm	Stiff, brownish yellow sandy/silty clay (10 YR 6/8) PID = 16.2 ppm b/g = 40 cpm
6				
7				
8				
9				
10	PID = 6.8 ppm b/g = 60 cpm	Stiff, gray sandy silt (10 YR 6/1)	PID = 11.0 ppm b/g = 40 cpm	Stiff, gray sandy silt (10 YR 6/1) PID = 6.8 ppm b/g = 40 cpm
11				
12				
13				
14				
15	PID = 22.0 ppm b/g = 60 cpm	Very soft, yellowish brown gravelly sand (10 YR 5/8)	PID = 8.6 ppm b/g = 40 cpm	

100'

Figure 2.3 Soil Characterization Results for Trench No. 1.

concentrations of 6.8 to 22 ppm. The upper 12 feet of soil was found to have relative consistencies of very soft to stiff; while the soils from 12 to 15 feet in depth had relative consistencies of very soft.

2.2 TRENCH NO. 2

2.2.1 WASTE CHARACTERIZATION

In general, Trench No. 2 was void of any waste materials. The only evidence of waste materials was a concrete boulder within the upper 12 inches of soil at the center of the trench.

2.2.2 SOILS

Soil Units 1 through 4 were observed during trench excavation activities as illustrated by Figure 2.4.

The results of field screening analyses and visual characterizations for soil samples collected from Trench No. 2 are provided by Figure 2.5. In general, the soil samples exhibited beta/gamma activities of 50 cpm and volatile organic vapor concentrations of 8 to 11 ppm. The upper 12 feet of soil was found to have relative consistencies of very soft to stiff.

3.0 *DISCUSSION AND CONCLUSIONS*

The trench excavation activities were conducted to provide data for: 1) the type and horizontal/vertical delineation of wastes deposited within the SFD-2, 2) SFD-2 geologic and hydrogeologic characterizations, and 3) horizontal and vertical delineation of qualitative and quantitative concentrations of radiological and volatile organic constituents in the soils. The following subsections provide the conclusions, based on results of trench excavation activities, associated with these data objectives.

3.1 TYPE AND HORIZONTAL/VERTICAL EXTENT OF SFD-2 WASTES

The soils associated with the SFD-2 trenches were void of waste materials. The only evidence of waste materials was electrical wiring conduits within the upper 12 inches of soil at the center of Trench No. 1 and a concrete boulder within the upper 12 inches of soil at Trench No. 2.

3.2 SFD-2 GEOLOGY AND HYDROGEOLOGY

A total of four distinct lithologic units were encountered during trench excavation activities. The units, in order of increasing depth, are as follows:

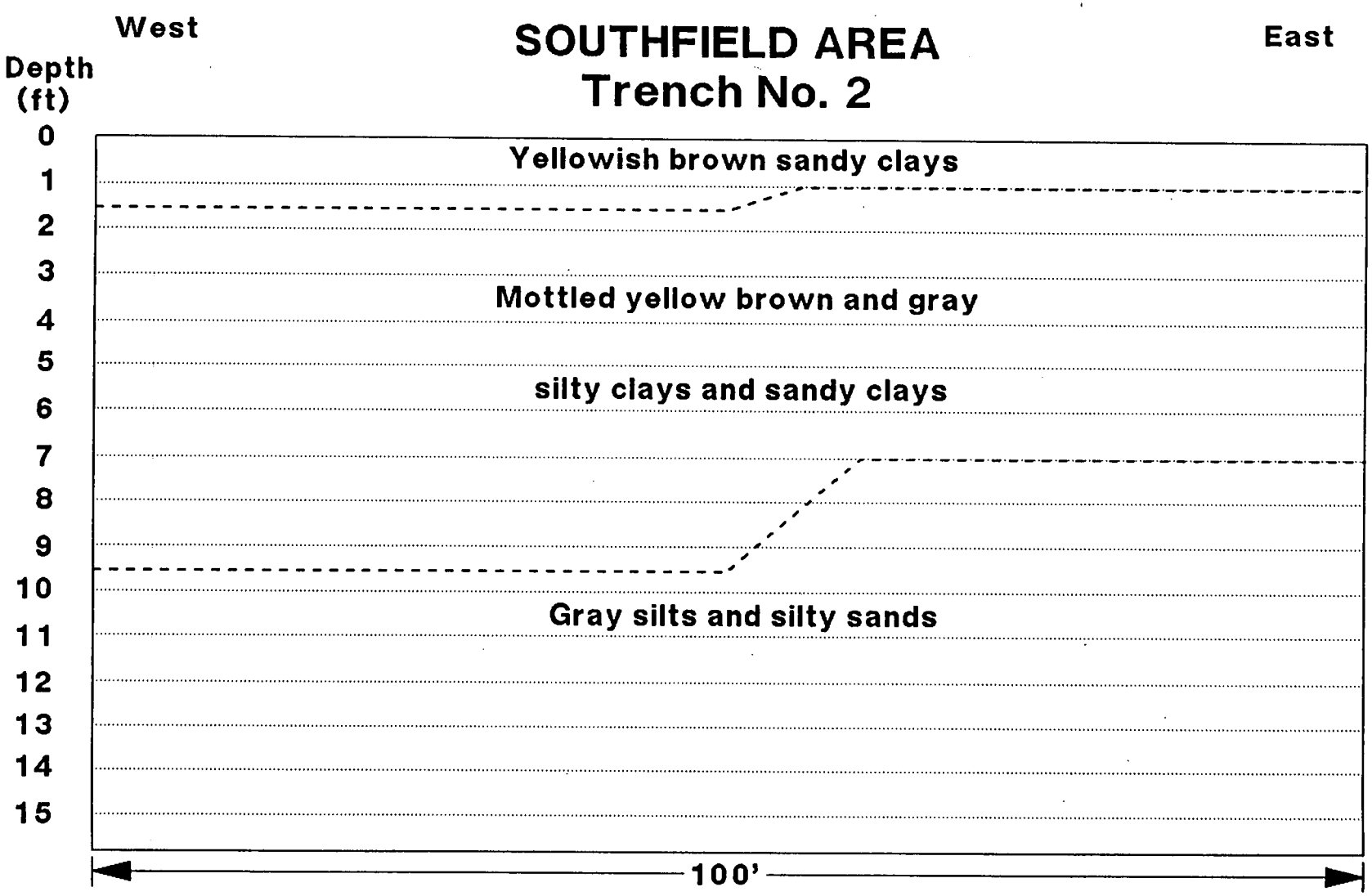

Figure 2.4 Geologic Profile for Trench No. 2.

SOUTHFIELD AREA
Trench No. 2

West — East

Depth (ft)					
0	PID = 9.8 ppm b/g = 50 cpm	Soft, dark brown sandy clay (10 YR 4/3)	PID = 10.0 ppm b/g = 50 cpm	Med. stiff, dark yellowish brown sandy clay (10 YR 4/4)	
1					
2					
3					
4					
5	PID = 8.0 ppm b/g = 50 cpm	Very soft, brownish yellow sandy/silty clay (10 YR 6/8)	PID = 9.8 ppm b/g = 50 cpm	Stiff, brownish yellow sandy/silty clay (10 YR 6/8)	
6					
7					
8					
9					
10	PID = 11.0 ppm b/g = 50 cpm	Stiff, gray sandy silt (10 YR 6/1)	PID = 8.0 ppm b/g = 50 cpm	Stiff, gray sandy silt (10 YR 6/1)	
11					
12					
13					
14					
15					

100'

Figure 2.5 Soil Characterization Results for Trench No. 2.

- *UNIT 1*
  1 to 3.5 feet of soft to medium stiff, yellowish brown sandy clay, which thins towards the east and southeast.

- *UNIT 2*
  3.5 to 7 feet of very soft to stiff, mottled yellow brown and gray sandy clays and silty clays.

- *UNIT 3*
  3.5 to 4.5 feet of stiff, gray sandy silt.

- *UNIT 4*
  4 to 5 feet of very soft yellowish brown gravelly sands (western end) and dark gray silty clays and silty sands.

The following perched water zones were encountered during trench excavation activities:

- The western end and center of Trench No. 1 at a depth of approximately 11 feet below surface grade.

- The western end and center of Trench No. 2 at a depth of approximately 10 feet below surface grade.

Groundwater samples could not be obtained due to the relatively rapid slumping of the trench excavation walls, which resulted in the formation of a sand-water slurry or complete burial of the trench base.

3.3 HORIZONTAL/VERTICAL EXTENT OF SOIL CONTAMINANTS

In general, beta/gamma activities in soils were at or near background contaminant levels.

Volatile organic vapor readings of approximately 5 to 20 parts per million above background, and 6 to 9 parts per million above background were detected in soils associated with Trench No. 1 and Trench No. 2, respectively.

The remainder of this section will be completed as an addendum when the analytical results are received.