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FINAL REPORT

May 29, 2008

Ms. Marilyn Long, P.G.
Texas Commission on Environmental Quality
Remediation Division
Superfund Cleanup Section (MC-136)
P. O. Box 13087
Austin, Texas 78711-3087

Re: Final Source Area Conceptual Site Model
11600 Jones Road Area (Former Bell Dry Cleaner)
Jones Road Superfund Site (SUP075)
Houston, Texas

Dear Ms. Long:

Shaw Environmental, Inc. (Shaw) is pleased to present the Texas Commission on Environmental Quality (TCEQ) this Final Source Area Conceptual Site Model (CSM) prepared for the site referenced above. The work was approved in TCEQ Work Order 153-0061, Amendment 2, dated December 28, 2007, and completed under TCEQ Work Order 201-0003, Amendment 0, dated March 25, 2008.

Purpose

The purpose of the work as described in the original approved Work Order was defined as follows: "The purpose of this Work Order is to authorize TCEQ Contractor/Engineer, Shaw E&I, to prepare a CSM for understanding the contamination source area (11600 Jones Road) geology". The scope of work was described as follows: "The Contractor/Engineer shall prepare a CSM to understand the source area geology. The work includes co-relation of well logs and hand entry of the data to cross section electric logs; review and edit CSM per modeler and relative to the preparation of pilot scale treatability study work plan; preparation of block diagram (fence diagram) from source area subsurface data; and conversion of paper well logs to electronic format suitable for CSM model manipulation. Contractor/Engineer shall set up ShawView for future upload of gINT (a software program) data from CSM".

Conceptual Site Model Construction

Shaw prepared a site map showing all previous points of investigation in the study area (Figure 1); prepared three stratigraphic cross sections (Figures 2, 3, and 4); one fence diagram (Figure 5); and one type log (Figure 6). Geologic logs and CPT data were entered into gINT (Vision 7.0) for preparation of the cross

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sections. Geologic logs prepared while drilling monitor wells using hollow-stem-auger (HSA) and direct push technology (DPT) drilling methods were compared to logs prepared using CPT drilling methods. The geologic logs were prepared by site geologists, and the resultant stratigraphic interpretation appeared to be variable, compared to the CPT data, which was highly consistent. Therefore, CPT logs were used as the primary correlation tool to define the subsurface geology at the site, excluding the boring log from deep boring RS-1, which had a total depth of 107 feet below ground surface, the deepest available record of geology in the source area. Figure 6 presents a type log prepared with a geologic log from monitor well MW-8, and a log from CPT-12, which were installed in the same locations. Figure 6 shows the relationship of geologic materials recorded by site geologists to typical CPT data. A comparison of the CPT friction to tip resistance data for each location indicated that the results were nearly identical. Therefore, in order to simplify the cross sections' visual appearance, only the tip resistance was used for correlating geologic units. Northing and easting coordinates for each of the data points were estimated from a site map prepared using Geographic Information System (GIS) data. The Source Area CSM focused on a roughly circular area with an approximate diameter of 600 feet, which corresponds to an area of 0.01 square miles.

Perchloroethylene (PCE) concentrations in soil and water are represented by small colored dots and triangles on the cross sections and fence diagram as either green, yellow, or red depending upon the PCE concentration:

- Green – PCE < 0.5 parts per billion (ppb)
- Yellow – PCE ≥ 0.5 ppb to ≤ 5.0 ppb
- Red – PCE > 5.0 ppb

Since water samples were collected during the installation of CPT borings and monitor wells, and soil samples were collected only during the installation of DPT borings and monitor wells, the soil and groundwater PCE concentrations were projected onto the cross sections and fence diagram from nearby sample points. Soil and groundwater analytical data used for this investigation were collected during the period between August and October 2003 during installation of monitor wells and CPT/DPT soil borings.

Shallow Subsurface Geology

The CSM indicates that the subsurface geology was deposited in a fluvial depositional environment, as shown by discontinuous silt and sand units deposited under high to medium energy flow regimes, and thick clay units deposited under low energy flow regimes. The site is generally underlain by high plasticity clay (CH) from the ground surface to a depth of approximately 20 feet below ground surface (bgs). An interbedded zone consisting of sand (SP), silt (ML), and silty clay (CL) underlies the high plasticity clay, and extends from a depth of approximately 20 feet to 35 feet bgs. The interbedded zone appears to be laterally continuous in the study area. High plasticity clay underlies the interbedded zone, and extends from a depth of approximately 35 feet to 60 feet bgs. The high plasticity clay includes randomly distributed discontinuous sand lenses comprising less than ten percent of the high plasticity clay zone. A thick, major sand (SP) unit was encountered while installing soil boring RS-1, which extended from a depth of approximately 60 feet to 107 feet bgs (107 feet is the total depth of RS-1). Not shown in this CSM are at least six additional major sand units that underlie the site to a depth of approximately 430 feet, which is the maximum depth of investigation achieved while installing regional monitor well MW-17. These sand units comprise most of the

water-bearing units of the Chicot Aquifer. Other major sand units below the Chicot Aquifer (not encountered during drilling but documented in public records) comprise the Evangeline Aquifer.

PCE Distribution

Figures 2 through 4 show PCE concentrations in groundwater that are generally associated with PCE concentrations detected in soil, and soil and groundwater impacted by PCE that is generally located in the vicinity of the former Bell Dry Cleaner facility. Soils directly below the former Bell Dry Cleaner facility are shown in a fence diagram (Figure 5), and most soil samples collected in the area contained PCE concentrations greater than 5 ppb. However, PCE concentrations in shallow soil and groundwater decrease in a radial manner from the facility and in most cases are below the practical laboratory quantitation limit (detection limit) near the Source Area CSM Boundary (Figure 1). Some shallow lateral and downward vertical movement (down-gradient movement) of PCE is indicated by concentrations greater than 5 ppb detected in groundwater samples collected from monitor well MW-07 (CPT-32) located across Barely Lane. Relatively short vertical migration in shallow surface soils and groundwater is contrasted by deep vertical migration of PCE within soil samples collected from soil boring RS-1 (Figure 3), indicating that PCE has migrated primarily downward in the immediate area of the facility and has impacted the first major water-bearing sand unit, and likely others below it as supported by routine quarterly groundwater monitoring in the Jones Road area.

This source area CSM will be utilized by Shaw to characterize the site and prepare a remedial investigation report. The source area CSM will also be used to understand the site geology for groundwater model development, prepare a pilot study work plan for chemical oxidation and bio-enhancement remediation of the source area, and baseline risk assessment for the site. A regional CSM is currently under construction, and will detail the regional geology at deeper intervals of investigation. The source area CSM and regional CSM will be used together to further define the Jones Road geology and contaminant migration pathways.

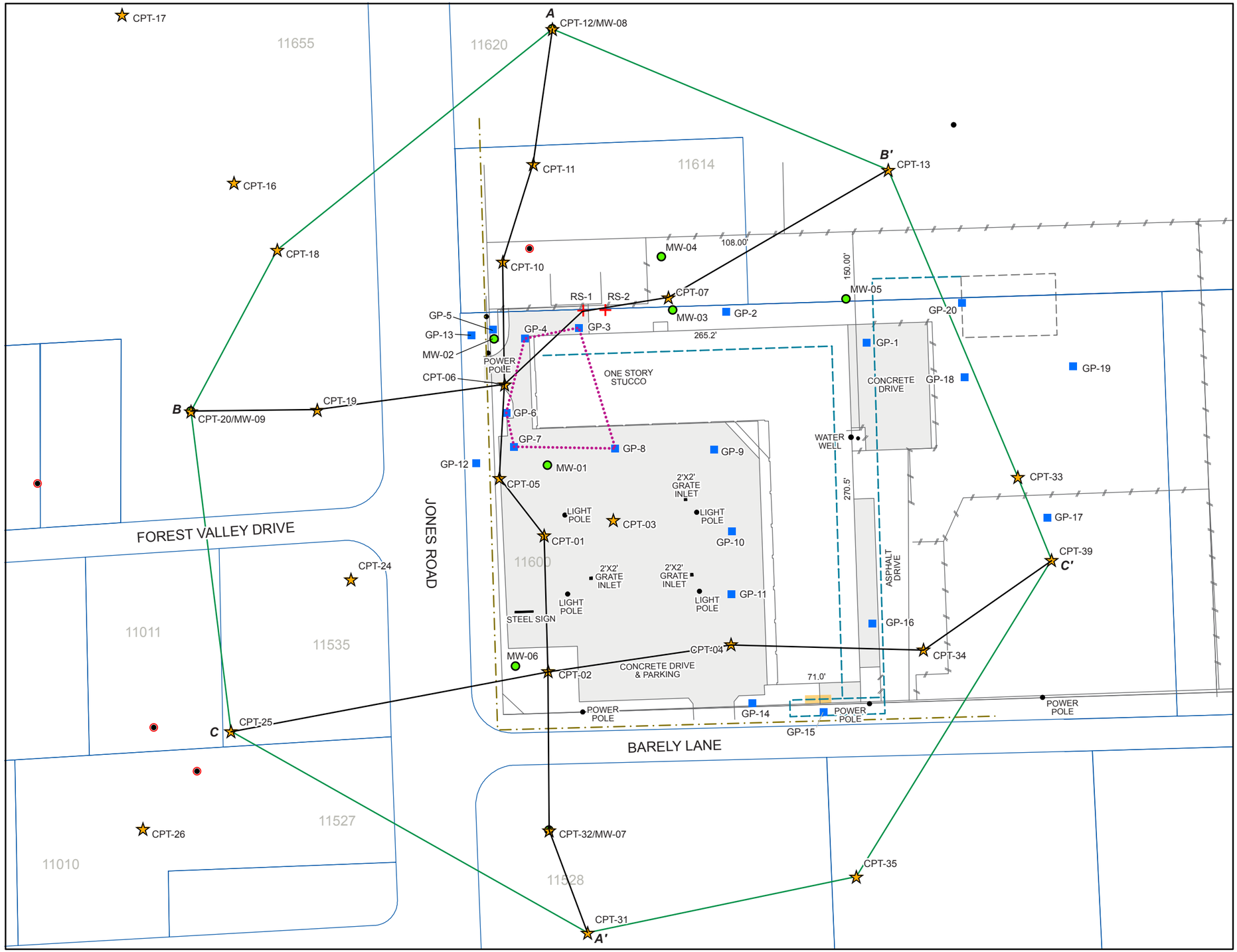
If you have any questions, or need additional information, please do not hesitate to call me at (713) 996-4571.

Sincerely,
Shaw Environmental, Inc.

Russell S. Perry, P.G.
Project Director

RSP/mfa
Attachments: Figure 1 – Source Area Conceptual Site Model Study Area
Figure 2 – Stratigraphic Cross Section A-A'
Figure 3 – Stratigraphic Cross Section B-B'
Figure 4 – Stratigraphic Cross Section C-C'
Figure 5 – Fence Diagram – Area Below the Former Bell Dry Cleaner Facility
Figure 6 – Type Log - MW-8/CPT-12 Well Log

Figures



131429.0200 B1

(from the Texas Commission on Environmental Quality)

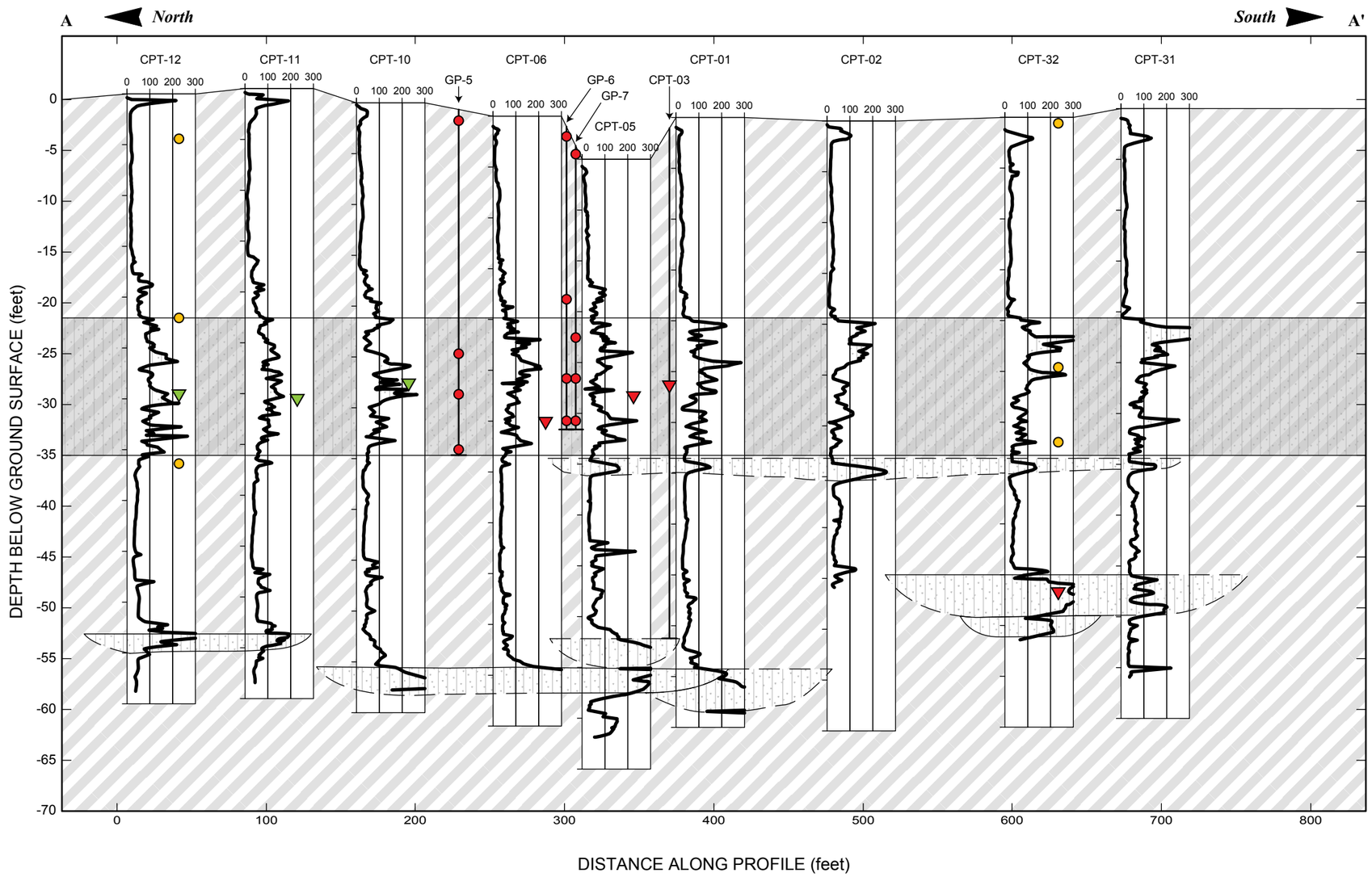
EXPLANATION

- CPT location
- Well without filtration system
- Monitoring well
- Wells with filtration system installed (2006 data)
- Approximate Chicot Rotosonic well location 2006
- Geoprobe location
- 11600 Property number
- Property boundary
- Source Area CSM boundary (Approximately 0.011 sq miles)
- Ditch
- Fence
- Sewer line (approximate location)
- Septic field
- Cross section baseline
- Fence diagram baseline
- Concrete
- Septic tank and pump
- CPT Cone Penetration Test
- CSM Conceptual Site Model
- GP Geoprobe ®

N

0 75 FT
SCALE

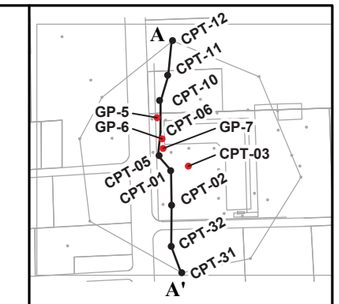
Figure 1
Source Area Conceptual Site Model
Jones Road Superfund Site
Houston, Texas



N

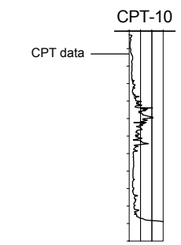
Lithology Graphics

- USCS Sand (SP)
- USCS High Plasticity Clay (CH)
- USCS Low Plasticity Clay (CL)
- USCS Silt (ML)
- Interbedded Sand (SP), Silt (ML), and Silty Clay (CL)
- Tip Resistance (TSF)
- Lithology Boundary
- Approximate Lithology Boundary
- CPT Cone Penetration Test (analytical data from 8-9/2003)
- GP Geoprobe® (analytical data from 10/2003)
- PCE Concentration > 5 ppb In Soil
- PCE Concentration ≥ 0.5 ppb to ≤ 5 ppb In Soil
- PCE Concentration < 0.5 ppb In Soil
- PCE Concentration > 5 ppb In Groundwater
- PCE Concentration ≥ 0.5 ppb to ≤ 5 ppb In Groundwater
- PCE Concentration < 0.5 ppb In Groundwater



Site Map Scale 1 inch equals 440 feet

Explanation



0 184.5

Horizontal Scale (feet)

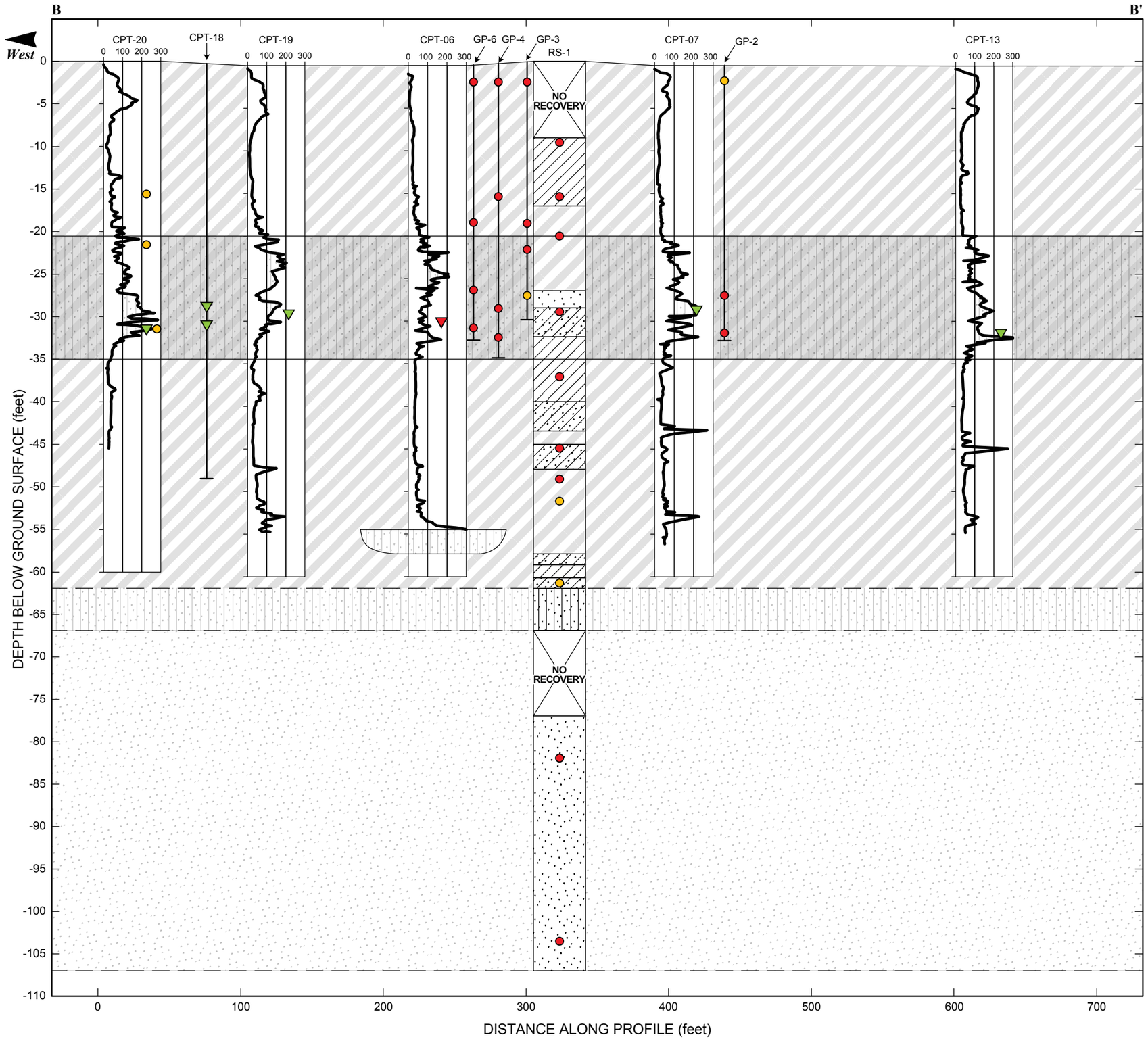
Vertical Exaggeration: 3.5x

Figure 2
Stratigraphic Cross Section A-A'
North-South Baseline

Jones Road Superfund Site
Houston TX

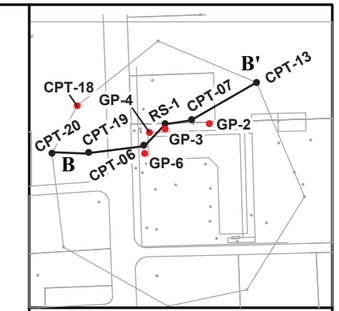
JOB NUMBER	PLATE NUMBER
131429	Plate A-1

131429.0200 B3



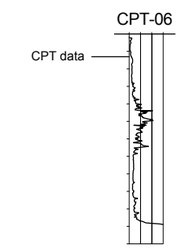
Lithology Graphics

- USCS Sand (SP)
- USCS High Plasticity Clay (CH)
- USCS Low Plasticity Clay (CL)
- USCS Clayey Sand (SC)
- USCS Silty Sand (SM)
- Interbedded Sand (SP), Silt (ML), and Silty Clay (CL)
- Tip Resistance (TSF)
- Lithology Boundary
- Approximate Lithology Boundary
- CPT Cone Penetration Test (analytical data from 8-9/2003)
- GP Geoprobe® (analytical data from 10/2003)
- RS Rotosonic (analytical data from 7/2006)
- PCE Concentration > 5 ppb In Soil
- PCE Concentration ≥ 0.5 ppb to ≤ 5 ppb In Soil
- PCE Concentration < 0.5 ppb In Soil
- PCE Concentration > 5 ppb In Groundwater
- PCE Concentration ≥ 0.5 ppb to ≤ 5 ppb In Groundwater
- PCE Concentration < 0.5 ppb In Groundwater



Site Map Scale 1 inch equals 385 feet

Explanation



0 162

Horizontal Scale (feet)

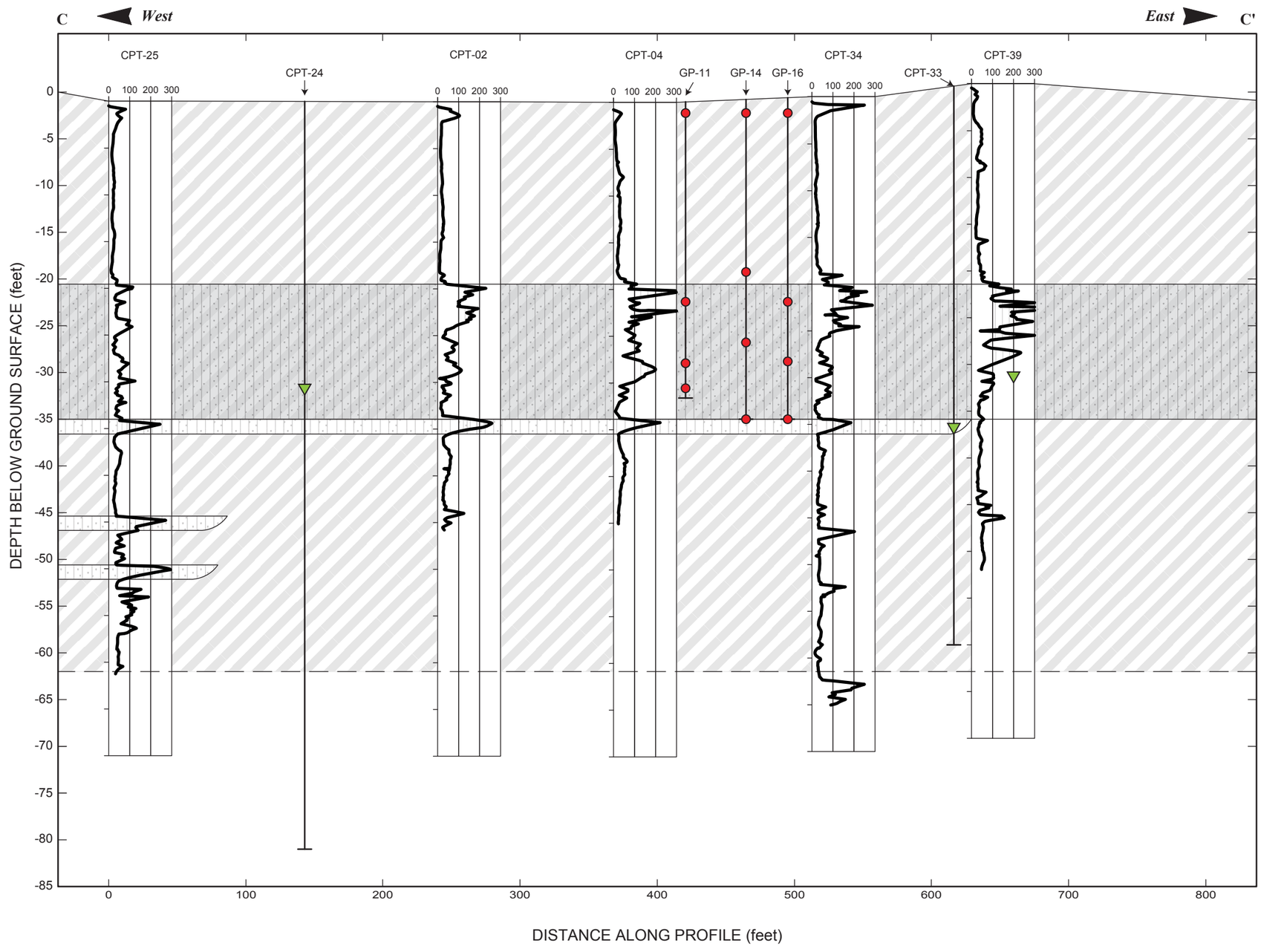
Vertical Exaggeration: 3.5x

Figure 3
Stratigraphic Cross Section B-B'
West-East Baseline

Jones Road Superfund Site
Houston TX

JOB NUMBER	PLATE NUMBER
131429	Plate A-2

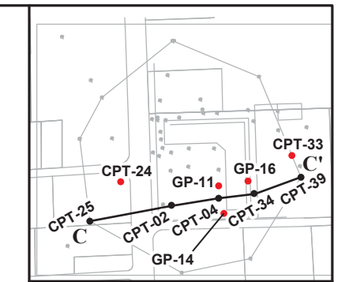
131429.0200 B2



N

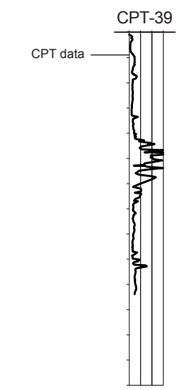
Lithology Graphics

- USCS Sand (SP)
- USCS High Plasticity Clay (CH)
- USCS Low Plasticity Clay (CL)
- USCS Silt (ML)
- Interbedded Sand (SP), Silt (ML), and Silty Clay (CL)
- Tip Resistance (TSF)
- Lithology Boundary
- Approximate Lithology Boundary
- CPT Cone Penetration Test (analytical data from 8-9/2003)
- GP Geoprobe® (analytical data from 10/2003)
- PCE Concentration > 5 ppb In Soil
- PCE Concentration ≥ 0.5 ppb to ≤ 5 ppb In Soil
- PCE Concentration < 0.5 ppb In Soil
- PCE Concentration > 5 ppb In Groundwater
- PCE Concentration ≥ 0.5 ppb to ≤ 5 ppb In Groundwater
- PCE Concentration < 0.5 ppb In Groundwater



Site Map Scale 1 inch equals 440 feet

Explanation



0 184.5

Horizontal Scale (feet)

Vertical Exaggeration: 3.5x

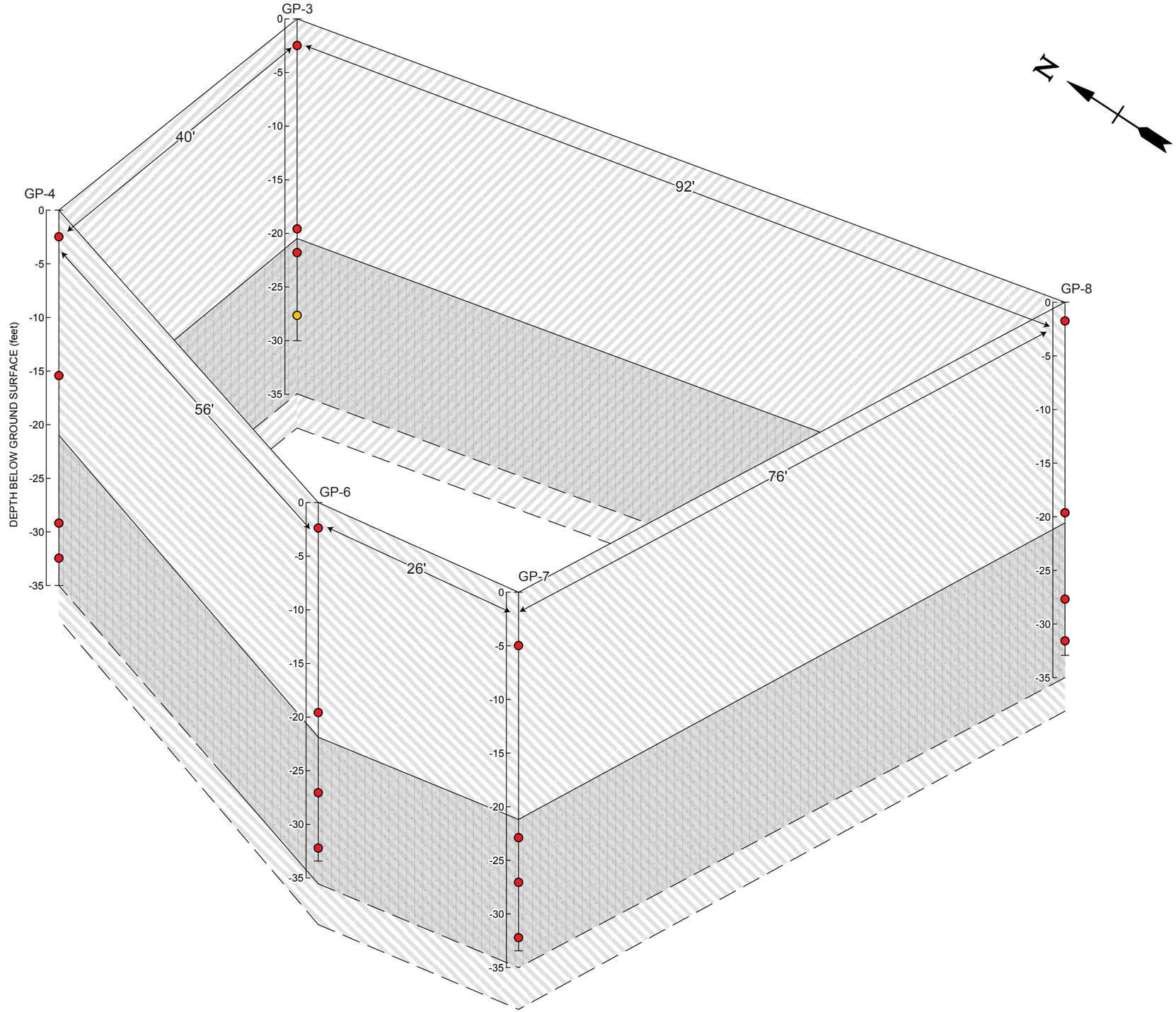
Figure 4
Stratigraphic Cross Section C-C'
West-East Baseline

Shaw

Jones Road Superfund Site
Houston TX

JOB NUMBER	PLATE NUMBER
131429	Plate A-3

131429.0200 B4



Site Map Scale 1 inch equals 440 feet

Lithology Graphics

- USCS High Plasticity Clay (CH)
- Interbedded zone as identified in CPT investigation
- Lithology Boundary
- Approximate Lithology Boundary
- GP Geoprobe® (analytical data from 10/2003)
- PCE Concentration > 5 ppb In Soil
- PCE Concentration ≥ 0.5 ppb to ≤ 5 ppb In Soil
- PCE Concentration < 0.5 ppb In Soil

Vertical Scale: 1" = 10'

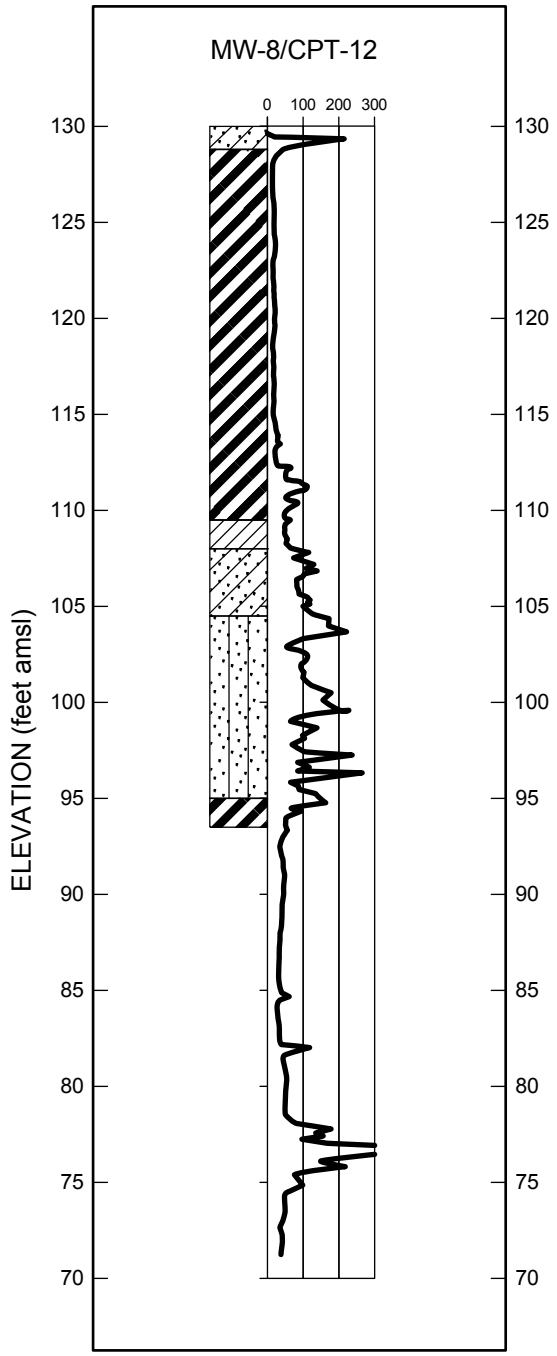
Figure 5
Fence Diagram of Source Area Conceptual Site Model

Shaw

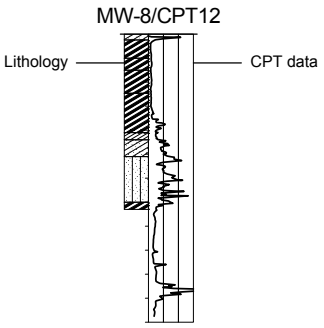
Jones Road
Superfund Site
Houston TX

JOB NUMBER	PLATE NUMBER
131429	Plate A-6

131429.0200 B5



Explanation



Lithology Graphics

- USCS Sand (SP)
- USCS High Plasticity Clay (CH)
- USCS Low Plasticity Clay (CL)
- USCS Silt (ML)
- USCS Clayey Sand (SC)
- USCS Silty Sand (SM)

- Tip Resistance (TSF)
- Lithology Boundary
- Approximate Lithology Boundary
- CPT Cone Penetration Test
- amsl above mean seal level

Figure 6
MW-8/CPT12
Well Log

Jones Road
Superfund Site
Houston TX

JOB NUMBER	PLATE NUMBER
128885	Plate A-4

131429.0200 A1