Site-Wide Investigation
Release Site Characterization Study

Bethlehem Steel Corporation
Sparrows Point Division
Maryland

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1 Introduction

This Site-Wide Investigation Release Site Characterization Study (RSC Study) has been completed as part of the corrective measures work outlined in the Consent Decree (Civil Action JFM-97-558) entered into by Bethlehem Steel Corporation (BSC), the Environmental Protection Agency (EPA) Region III, and the Maryland Department of the Environment (MDE). The RSC Study presents results of site investigations that were described in three Release Site Characterization Planning Memoranda, as referenced in Section 1.4, submitted to and approved by EPA Region III and MDE in May through July 2001.

The RSC Study was designed to focus on five Special Study Areas (SSAs) at the Bethlehem Steel Corporation (BSC) facility in Sparrows Point, Maryland (Figure 1-1). The five SSAs are consistent with the area-specific characterizations required in Attachment B.3 of the Consent Decree and further described as follows:

- **SSAs 1 and 2.** Humphrey Impoundment and Tin Mill Canal/Finishing Mills Areas (HT): The site is defined as the limits of the filled Humphrey Impoundment, the Tin Mill Canal and its immediate shoreline, and the area including and immediately surrounding the Finishing Mills. This area represents two SSAs (Humphrey Impoundment and Tin Mill Canal/Finishing Mills Area) that have contiguous boundaries between them. These SSAs were combined into one area for the purpose of this study because of their proximity.
- **SSA 3.** Coke Oven Area (CO): The site is defined as the area of the former Coke Ovens and Coal Chemical Plants.
- **SSA 4.** Coke Point Landfill (CP): The site is defined by the edge of the Coke Point Landfill and the area within that boundary.
- **SSA 5.** Greys Landfill (GL): The site is defined by the edge of the Greys Landfill and the area within that boundary.

Additional information on the facility background, SSAs, geologic setting, and occurrence and movement of groundwater at the facility may be found in reports submitted to BSC entitled *Description of Current Conditions* (January 1998) and *Site-Wide Investigation Groundwater Study Report* (December 2001) (see Section 1.4). The following sections provide further details concerning the scope and procedures completed for the RSC Study and the results of the studies.

1.1 Geologic Investigations

1.1.1 General

The purpose of the geologic investigation was to define the stratigraphy of the upper 100 feet to 120 feet of subsurface materials for each of the five SSAs. To achieve this purpose, research was conducted to identify and document existing lithologic information of the subsurface at the SSAs and a drilling program was conducted to provide additional data on the lithology of subsurface geologic materials underlying each SSA. The lithologic data then were used to develop multiple cross sections of the stratigraphy of each site. Additionally, lithologic data also were used to develop SSA-specific maps of selected geologic features.

1.1.2 Boreholes

Soil borings were completed using continuous-flight hollow-stem augers with an inside diameter of either 3.25 inches or 4.25 inches. The total depth of the boring was determined during drilling activities on the basis of split-spoon samples. Total depth for each shallow, water-table boring was based on the position of the water-table interface, and the depth of the deeper borings was based on lithology. The split spoons were collected following the ASTM D 1586 standard. Each sampler was lowered to the bottom of the hole through the hollow-stem augers and driven 24 inches in four 6-inch increments using a 140-pound weight ("hammer") dropped from a height of 30 inches. The number of hammer blows for each 6-inch interval was counted and recorded. Once removed from the hole, the samplers were carefully split open so that the contents could be examined. Blow counts and lithologic data are included in the boring logs in the appendixes referenced in Section 2.

1.1.3 CPT Analysis Sites

The cone penetrometer testing (CPT) approach for obtaining lithologic data was used at selected locations at the SSA sites. Besides providing lithologic data, CPT analysis provides pore-pressure data that are not obtained when standard drilling methods are employed. Lithologic data were supplemented with hollow-stem-auger drilling data in areas where subsurface anthropogenic fill would inhibit CPT penetration.

Previous analysis of CPT results documented in the *Site-Wide Investigation Groundwater Study Report* demonstrated a good correlation between the CPT-determined classifications and visual classifications of lithology. The CPT data are provided in Appendixes 2.1-A, 2.2-A, 2.3-A, and 2.4-A.

1.2 Groundwater Investigations

1.2.1 General

The purpose of the groundwater investigations was to define the occurrence, movement, and quality of groundwater within the upper groundwater system at the SSAs. The upper groundwater system is defined in this study as the shallow, unconfined water-table zone and the confined water-bearing zone that occurs at intermediate depths (about -20 feet to about -50 feet in elevation.) To achieve this purpose, several field efforts were conducted: piezometers were installed, dissipation tests were performed, water levels were measured, and groundwater was sampled and analyzed.

Piezometers were installed to provide facilities for obtaining water-level measurements and collecting samples for analysis. Dissipation tests provided estimates of the hydraulic conductivities of fine-grained materials in the subsurface. Water-level data were used to define horizontal and vertical groundwater-flow gradients. Groundwater samples provided information on the chemical quality of groundwater at the sites.

1.2.2 Piezometer Installation

Eighty-nine piezometers were installed at the facility during the RSC Study. A total of sixty-nine 2-inch-diameter piezometers were installed at the facility using continuous-flight hollow-stem auger drilling with an inside diameter of 3.25 inches or 4.25 inches. Thirteen of these 2-inch piezometers were set in the intermediate water-bearing strata, and the remaining fifty-six 2-inch piezometers were set within the water-table unit. The completion depths for these piezometers were based on strata identified from split-spoon samples.

The remaining 20 piezometers were 0.5 inches in diameter and were installed in the intermediate water-bearing sands. The completion depth of each piezometer was determined using the data collected during the CPT sounding. The 0.5-inch piezometers were installed using a Geoprobe® rig. The construction details of the piezometers for each SSA are provided immediately following Table A-1 in Appendix A.

The 2-inch-diameter piezometers were constructed inside the hollow-stem augers. A Schedule 40 polyvinyl chloride (PVC), 0.020-inch-slot-size screen (with a bottom cap) and appropriate casing length were joined watertight and were lowered down through the inside of the augers to the bottom of the borehole. Five-foot screens were utilized for piezometers set in the intermediate water-bearing strata, and 10-foot screens were employed for piezometers set in the water-table unit. A primary sand pack consisting of #2 Millersville clean quartz sand was installed to a depth of between 2 feet and 4 feet above the top of the screen interval. A bentonite seal at least 1.5 feet thick was placed on top of the sand pack and followed by a thick bentonite slurry. The slurry was poured to within 0.5-inch of the top of the PVC piezometer casing. The piezometers were finished at land surface with either a flush-mount or steel riser protective casing within concrete pads.

The 0.5-inch-diameter piezometers were installed with a hollow, 1.75-inch-diameter rod and sacrificial tip that was pushed into the ground to the desired depth. The piezometer, which consisted of a 0.5-inch-inside-diameter PVC riser and a prepacked PVC screen was inserted into the hollow rods. Screen lengths varied from 3 feet to 11 feet. One foot of clean glass beads (equivalent to a fine-grained sand pack) was placed above the prepacked screen. A bentonite-grout slurry was pumped from the top of the glass beads to the ground surface. The 0.5-inch piezometers were finished at land surface with either a flush-mount or steel riser protective casing.

The piezometers were developed after at least 24 hours after installation to allow the grout to set. The piezometers were developed using a surge block and a centrifugal or submersible pump or by manual bailing methods.

Table A-1 (Appendix A) also contains the construction information for piezometers installed for other investigations but used in the RSC Study for water-level measuring and/or groundwater sampling.

1.2.3 Water-Level Measurements

Water levels were measured in piezometers installed at the site to determine the configurations of the water table and potentiometric surfaces and to estimate the directions of groundwater flow, both horizontally and vertically. Synoptic monitoring of groundwater levels was completed in October, November, and December 2001 and March 2002. The measurements were completed on a site-wide basis in a piezometer network that included piezometers installed at the facility prior to 2000, piezometers installed in 2000 as part of the Groundwater Study, and piezometers installed during the RSC Study. In each monitoring round, measurements were made in 4 hours or less during the lowest tidal elevations of the day to minimize the tidal influence on the results. The tidal influence on the site is described in detail in the *Site-Wide Investigation Groundwater Study Report*. Data for the water–level measurements are presented in the appendices referenced in Section 2.

The depth to water was measured using an electric water-level probe from a surveyed reference point at each well. Depth-to-water measurements were subsequently converted to elevations in NAVD88. Contour maps were prepared for the SSAs for the water table and intermediate water bearing sands. A kriging algorithm in Golden Software's SURFER™ version 6.0 was used to develop the contours from the water-level data. Contour lines from SURFER™ were then imported into ArcView3.2 and draped over the SSA maps.

The elevation of the surface water of Bear Creek, Jones Creek, Old Road Bay, and the Patapsco River has been defined in this study to be –1.25 feet NAVD88. This datum represents mean low water for the surface-water bodies and provides consistency with the synoptic groundwater measurements taken at low tide periods. The elevation of the surface water in Tin Mill Canal is about -1 foot from the vicinity of the water-treatment plant at the western end of the canal to where the canal turns to the north, about -0.5 feet to where it turns back toward the east, and about 0 feet for the remainder of the length of the canal.

1.2.4 Dissipation Tests

Time-series pore-pressure data or dissipation tests were completed during a pause in the advancement of the CPT soundings. Dissipation tests provide estimates of hydraulic conductivity of subsurface materials. Twenty-two dissipation tests were performed at the facility during the RSC. Complete dissipation test results and parameters for the Groundwater Study and the RSC are included in the appendices referenced in Section 2.

1.3 Chemical Analysis

1.3.1 Groundwater Sampling

Groundwater samples were collected between November 27 and December 20, 2001, generally using low-flow peristaltic pumps after stabilization of field parameters in accordance with standard procedures outlined in the approved *Special Study Area Release Site Characterization Data Collection Quality Assurance Plan,* June 2001 (DCQAP). The field parameters collected for these events were pH, conductivity, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity. In piezometers that did not contain enough water to utilize a peristaltic pump, disposable Teflon® bailers were employed to obtain the groundwater sample. When a disposable Teflon® bailer was used, field parameters were not measured prior to sampling. Rather, the water level in the piezometer was allowed to recover after the piezometer was purged dry, and the samples then were collected.

The sample naming convention was chosen to include the area sampled, the location and depth of the well, and the date sampled. For example, for the sample named

TM13-PZM007-01D, TM13 is the location (Tin Mill Canal piezometer 13), PZ is for piezometer, M007 refers to the bottom elevation of the screen interval ("M" and "P" refer to minus and plus, respectively, in reference to the NAVD 88 datum), 007 is the bottom elevation of the screen interval, 01 is for the year, and D is for the (fourth) quarter of the year.

1.3.2 Chemical Analysis Methodology

The groundwater samples were analyzed for subset lists of: 1) Appendix IX parameters, 2) a preliminary list of chemicals of potential interest (COPI) and, 3) common cation parameters as outlined in the planning memoranda. Further details of the chemical analysis methodologies employed are as follows:

- The majority of samples were analyzed for the preliminary COPI list, which consists of compounds that might be expected to be present at any of the five SSAs at Sparrows Point. The compounds were selected based upon process knowledge at Sparrows Point, material safety data sheets (MSDSs), and information from the Hazardous Substance Data Base (HSDB) at the Toxnet web site of the National Library of Medicine.

- Slightly more than 10 percent of the samples were analyzed for a subset of the Appendix IX list, which consisted of Appendix IX compounds except for dioxins/furans, pesticides, and herbicides. The excluded compounds are not and were not manufactured or used in processing, or produced as byproducts at Sparrows Point. The purpose of the Appendix IX analysis was to satisfy a requirement in Attachment B of the Consent Decree.

- The piezometers installed in this study were sampled for common cations: calcium, iron, magnesium, manganese, potassium, and sodium. The cation data were collected to examine common ion signatures at similar depths and/or lithological units.

Table 1-1 presents the preliminary COPI and Appendix IX subset lists. The compounds are ordered by analysis group and laboratory analysis method. Compounds excluded from the preliminary COPI list are shown with their major uses as justification for exclusion.

1.3.3 Validation Methods

The samples were collected and analyzed by Severn Trent Laboratories, Pittsburgh, PA (STL-Pitt). The analytical protocol and data validation were performed in accordance with the approved DCQAP.

The laboratory data packages consist of the highest level of document deliverables and include instrument printouts, bench logs, and other raw data. The data packages were validated by an independent subcontracted data validation specialist (Environmental Data Quality, Inc.) following EPA Region III modifications to the National Functional Guidelines. The field quality-control samples (trip blanks, equipment blanks, and duplicates) as well as the required number of laboratory quality control measures (method blanks, lab control samples, surrogates, and internal standards) were analyzed with the samples and used by the validator to test the quality of the results. The full data validation reports are provided in Appendix C.

Qualifiers have been placed beside the measured concentrations to describe conditions of the reported data. The qualifiers are:

- U—The compound was not detected above the reporting limit given.
- UJ—The compound was not detected above the reporting limit, but the reporting limit is considered estimated.
- UL—The compound was not detected above the reporting limit, but the reporting limit is considered biased low.
- J—The concentration was estimated, usually because the compound was detected below the reporting limit but above the level that can be detected by the laboratory instrument.
- K—The concentration is biased high (i.e., the true concentration may be lower).
- L—The concentration is biased low (i.e., the true concentration may be higher).
- B—A similar level of concentration was detected in an associated blank sample, and, therefore, the detected amount might be from a source other than the field sample. The result is usually treated as a nondetect in toxicity or risk assessments.
- R—The result has been declared unusable by the validator because the associated quality control measures have been grossly exceeded.

1.4 References

Description of Current Conditions, Bethlehem Steel Corporation, Sparrows Point, Maryland. Prepared for Bethlehem Steel Corporation, Sparrows Point Division, Maryland, by Rust Environmental & Infrastructure. January 1998.

Release Site Planning Memorandum—Coke Point Landfill and Coke Oven Area. Prepared for Bethlehem Steel Corporation, Sparrows Point Division, Maryland, by CH2M HILL. July 2001.

Release Site Planning Memorandum—Greys Landfill. Prepared for Bethlehem Steel Corporation, Sparrows Point Division, Maryland, by CH2M HILL. September 2001.

Release Site Planning Memorandum—Humphrey Impoundment and Tin Mill Canal/Finishing Mills Areas. Prepared for Bethlehem Steel Corporation, Sparrows Point Division, Maryland, by CH2M HILL. May 2001.

Site-Wide Investigation Groundwater Study Report. Prepared for Bethlehem Steel Corporation, Sparrows Point Division, Maryland, by CH2M HILL. December 2001.

Special Study Area Release Site Characterization Data Collection Quality Assurance Plan Prepared for Bethlehem Steel Corporation, Sparrows Point Division, Maryland, by CH2M HILL. June 2001.

Table 1-1
Analytical Parameter Lists for Appendix IX and COPI Analyses
Bethlehem Steel Corporation - Sparrows Point Facility

Appendix IX Parameters	Abbreviated Appendix IX	Preliminary COPI List	Comments (Source: Toxnet)
Volatiles (SW846-8260B)			
1,1,1,2-Tetrachloroethane	Yes	Yes	
1,1,1-Trichloroethane	Yes	Yes	
1,1,2,2-Tetrachloroethane	Yes	Yes	
1,1,2-Trichloroethane	Yes	Yes	
1,1-Dichloroethane	Yes	Yes	
1,1-Dichloroethene	Yes	Yes	
1,2,3-Trichloropropane	Yes	**No**	used in resin/fiber mfg
1,2-Dibromo-3-chloropropane	Yes	**No**	used as pineapple fumigant
1,2-Dibromoethane (EDB)	Yes	**No**	used as fumigant & lead scavanger
1,2-Dichloroethane	Yes	Yes	
1,2-Dichloropropane	Yes	Yes	
1,4-Dioxane	Yes	**No**	used in dyes/fibers/adhesives mfg
2-Butanone (Methyl ethyl ketone)	Yes	Yes	
2-Chloro-1,3-butadiene (Chloroprene)	Yes	**No**	used in neoprene mfg
2-Hexanone	Yes	Yes	
3-Chloropropene (Allyl chloride)	Yes	**No**	used in adhesives/pharmaceutical mfg
4-Methyl-2-pentanone (MIBK)	Yes	Yes	
Acetone	Yes	Yes	
Acetonitrile	Yes	**No**	used in rubber/fibers/perfume mfg
Acrolein	Yes	**No**	used as pesticide/aquatic herbicide
Acrylonitrile	Yes	**No**	used in adhesives/coatings mfg
Benzene	Yes	Yes	
Bromodichloromethane	Yes	**No**	used as fumigant & aerosol
Bromoform	Yes	Yes	
Bromomethane	Yes	**No**	used as fumigant & aerosol
Carbon disulfide	Yes	Yes	
Carbon tetrachloride	Yes	Yes	
Chlorobenzene	Yes	Yes	
Chloroethane	Yes	Yes	
Chloroform	Yes	Yes	
Chloromethane	Yes	**No**	used in rubber/pesticide/herbicide mfg
cis-1,3-Dichloropropene	Yes	Yes	
Dibromochloromethane	Yes	**No**	produced during chlorination of water
Dibromomethane	Yes	**No**	used in pesticide mfg & fire extinguishers
Dichlorodifluoromethane	Yes	**No**	used as chilling agent & in aerosols
Ethylbenzene	Yes	Yes	
Ethylmethacrylate	Yes	**No**	used in resins/coatings mfg
Iodomethane	Yes	**No**	used as electronics etching agent
Isobutyl alcohol	Yes	**No**	used in adhesive/perfume/flavoring mfg
Methacrylonitrile	Yes	**No**	used in amide/amine/nitrile mfg
Methylene chloride	Yes	Yes	
Methylmethacrylate	Yes	**No**	used in plexiglas/lucite mfg
Propionitrile	Yes	**No**	used in chemical mfg
Styrene	Yes	**No**	used in rubber/resins mfg
Tetrachloroethene	Yes	Yes	
Toluene	Yes	Yes	
trans-1,2-Dichloroethene	Yes	Yes	
trans-1,3-Dichloropropene	Yes	Yes	

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Appendix IX Parameters	Abbreviated Appendix IX	Preliminary COPI List	Comments (Source: Toxnet)
trans-1,4-Dichloro-2-butene	Yes	**No**	used in butadiene/heptane mfg
Trichloroethene	Yes	Yes	
Trichlorofluoromethane	Yes	**No**	used as chilling agent & in aerosols
Vinyl acetate	Yes	**No**	used in resins/coatings mfg
Vinyl chloride	Yes	Yes	
Xylenes (total)	Yes	Yes	
Semivolatiles (SW846-8270)			
1,2,4,5-Tetrachlorobenzene	Yes	**No**	used as pesticide/herbicide
1,2,4-Trichlorobenzene	Yes	Yes	
1,2-Dichlorobenzene	Yes	Yes	
1,3,5-Trinitrobenzene	Yes	**No**	used in rubber mfg
1,3-Dichlorobenzene	Yes	Yes	
1,3-Dinitrobenzene	Yes	**No**	use in aniline mfg
1,4-Dichlorobenzene	Yes	Yes	
1,4-Naphthoquinone	Yes	**No**	used in rubber mfg & as algicide
1,4-Phenylenediamine	Yes	**No**	used in dyeing furs
1-Naphthylamine	Yes	**No**	used in pesticide/herbicide mfg
2,3,4,6-Tetrachlorophenol	Yes	**No**	used as slimicide & wood preservative
2,4,5-Trichlorophenol	Yes	Yes	
2,4,6-Trichlorophenol	Yes	Yes	
2,4-Dichlorophenol	Yes	Yes	
2,4-Dimethylphenol	Yes	Yes	
2,4-Dinitrophenol	Yes	Yes	
2,4-Dinitrotoluene	Yes	Yes	
2,6-Dichlorophenol	Yes	**No**	used as sex pheromone in tick pesticide
2,6-Dinitrotoluene	Yes	Yes	
2-Acetylaminofluorene	Yes	**No**	used in cancer research
2-Chloronaphthalene	Yes	Yes	
2-Chlorophenol	Yes	Yes	
2-Methylnaphthalene	Yes	Yes	
2-Methylphenol (o-cresol)	Yes	Yes	
2-Naphthylamine	Yes	**No**	used in rubber/dye mfg
2-Nitroaniline	Yes	**No**	used in dye/pharmaceutical mfg
2-Nitrophenol	Yes	Yes	
2-Picoline	Yes	**No**	used in dyes/resins/pharmaceutical mfg
3,3'-Dichlorobenzidine	Yes	Yes	
3,3-Dimethylbenzidine	Yes	Yes	
3-Methylcholanthrene	Yes	**No**	used in cancer research
3-Methylphenol	Yes	Yes	
3-Nitroaniline	Yes	**No**	used in dye mfg
4 Methylphenol (p cresol)	Yes	Yes	
4,6-Dinitro-2-methylphenol	Yes	Yes	
4-Aminobiphenyl	Yes	**No**	used in rubber/dye mfg
4-Bromophenyl phenyl ether	Yes	Yes	
4-Chloro-3-methylphenol	Yes	Yes	
4-Chloroaniline	Yes	**No**	used in dye mfg
4-Chlorophenyl phenyl ether	Yes	Yes	
4-Nitroaniline	Yes	**No**	used in dye mfg
4-Nitrophenol	Yes	Yes	

Table 1-1
Analytical Parameter Lists for Appendix IX and COPI Analyses
Bethlehem Steel Corporation - Sparrows Point Facility

Appendix IX Parameters	Abbreviated Appendix IX	Preliminary COPI List	Comments (Source: Toxnet)
4-Nitroquinoline-1-oxide	Yes	**No**	used as research chemical
5-Nitro-o-toluidine	Yes	**No**	used in dye mfg
7,12-Dimethylbenz(a)anthracene	Yes	**No**	used as research chemical
a,a-Dimethylphenethylamine	Yes	**No**	used as medication
Acenaphthene	Yes	Yes	
Acenaphthylene	Yes	Yes	
Acetophenone	Yes	**No**	used in perfumes/flavorings mfg
Aniline	Yes	**No**	used in dyes/perfumes/pesticide mfg
Anthracene	Yes	Yes	
Aramite	Yes	**No**	used as miticide
Benzo(a)anthracene	Yes	Yes	
Benzo(a)pyrene	Yes	Yes	
Benzo(b)fluoranthene	Yes	Yes	
Benzo(ghi)perylene	Yes	Yes	
Benzo(k)fluoranthene	Yes	Yes	
Benzyl alcohol	Yes	**No**	used in perfumes/flavorings mfg
Bis(2-chloroethoxy)methane	Yes	Yes	
Bis(2-chloroethyl)ether	Yes	Yes	
Bis(2-chloroisopropyl)ether	Yes	Yes	
Bis(2-ethylhexyl)phthalate	Yes	Yes	
Butyl benzyl phthalate	Yes	Yes	
Chrysene	Yes	Yes	
Dibenz(a,h)anthracene	Yes	Yes	
Dibenzofuran	Yes	Yes	
Diethyl phthalate	Yes	Yes	
Dimethyl phthalate	Yes	Yes	
Di-n-butyl phthalate	Yes	Yes	
Di-n-octyl phthalate	Yes	Yes	
Dinoseb	Yes	**No**	used as pesticide/herbicide
Diphenylamine	Yes	**No**	used in dyes/pharmaceutical mfg
Ethyl methane sulfonate	Yes	**No**	used in cancer research
Fluoranthene	Yes	Yes	
Fluorene	Yes	Yes	
Hexachlorobenzene	Yes	Yes	
Hexachlorobutadiene	Yes	Yes	
Hexachlorocyclopentadiene	Yes	Yes	
Hexachloroethane	Yes	Yes	
Hexachlorophene	Yes	**No**	used as antibacterial agent
Hexachloropropene	Yes	**No**	used in uranium tetrachloride mfg
Indeno(1,2,3-cd)pyrene	Yes	Yes	
Isophorone	Yes	Yes	
Isosafrole	Yes	**No**	used in perfumes/flavorings mfg
Methapyrilene	Yes	**No**	used as medication
Methyl methane sulfonate	Yes	**No**	used as research chemical
Naphthalene	Yes	Yes	
Nitrobenzene	Yes	Yes	
n-Nitrosodiethylamine	Yes	**No**	used as plastics stabilizer
n-Nitrosodimethylamine	Yes	**No**	used as nematocide & in rocket propellant
n-Nitrosodi-n-butylamine	Yes	**No**	component of rubber leachates

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Appendix IX Parameters	Abbreviated Appendix IX	Preliminary COPI List	Comments (Source: Toxnet)
n-Nitroso-di-n-propylamine	Yes	**No**	used as research chemical
n-Nitrosodiphenylamine	Yes	**No**	used in rubber mfg
n-Nitrosomethylethylamine	Yes	**No**	component of cigarette smoke
n-Nitrosomorpholine	Yes	**No**	
n-Nitrosopiperidine	Yes	**No**	component of cigarette smoke
n-Nitrosopyrolidine	Yes	**No**	component of cigarette smoke
o-Toluidine	Yes	**No**	used in dyes/inks mfg
p-Dimethylaminoazobenzene	Yes	**No**	used in photosensitive polymer/film mfg
Pentachlorobenzene	Yes	**No**	used in pesticide mfg
Pentachloroethane	Yes	Yes	
Pentachloronitrobenzene	Yes	**No**	used as pesticide & seed treatment
Pentachlorophenol	Yes	Yes	
Phenacetin	Yes	**No**	used as medication
Phenanthrene	Yes	Yes	
Phenol	Yes	Yes	
Pronamide	Yes	**No**	used as herbicide
Pyrene	Yes	Yes	
Pyridine	Yes	Yes	
Safrole	Yes	**No**	used in soaps/perfumes
Organochlorine Pesticides (SW846-8081) [except as noted]			
4,4'-DDD	**No**	**No**	used as pesticide
4,4'-DDE	**No**	**No**	used as pesticide
4,4'-DDT	**No**	**No**	used as pesticide
Aldrin	**No**	**No**	used as pesticide
alpha-BHC	**No**	**No**	used as pesticide
beta-BHC	**No**	**No**	used as pesticide
Chlordane	**No**	**No**	used as pesticide
Chlorobenzilate (Method 8270C)	**No**	**No**	used as pesticide
delta-BHC	**No**	**No**	used as pesticide
Diallate (Method 8270C)	**No**	**No**	used as pesticide
Dieldrin	**No**	**No**	used as pesticide
Endosulfan I	**No**	**No**	used as pesticide
Endosulfan II	**No**	**No**	used as pesticide
Endosulfan sulfate	**No**	**No**	used as pesticide
Endrin	**No**	**No**	used as pesticide
Endrin aldehyde	**No**	**No**	used as pesticide
gamma-BHC (Lindane)	**No**	**No**	used as pesticide
Heptachlor	**No**	**No**	used as pesticide
Heptachlor epoxide	**No**	**No**	used as pesticide
Isodrin (Method 8270C)	**No**	**No**	used as pesticide
Kepone (Method 8270C)	**No**	**No**	used as pesticide
Methoxychlor	**No**	**No**	used as pesticide
Toxaphene	**No**	**No**	used as pesticide
Organophosphorous Pesticides (SW846-8270C)			
Dimethoate	**No**	**No**	used as pesticide
Disulfoton	**No**	**No**	used as pesticide
Famphur	**No**	**No**	used as pesticide
Parathion ethyl	**No**	**No**	used as pesticide
Parathion methyl	**No**	**No**	used as pesticide

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Bethlehem Steel Corporation - Sparrows Point Facility

Appendix IX Parameters	Abbreviated Appendix IX	Preliminary COPI List	Comments (Source: Toxnet)
Phorate	**No**	**No**	used as pesticide
Sulfotepp	**No**	**No**	used as pesticide
Thioazin	**No**	**No**	used as pesticide
o,o,o-Triethylphosphorothioate	**No**	**No**	used as pesticide
Herbicides (SW846-8150)			
2,4-D	**No**	**No**	used as herbicide
2,4,5-TP (Silvex)	**No**	**No**	used as herbicide
2,4,5-T	**No**	**No**	used as herbicide
PCBs (SW846-8082)			
Aroclor 1016	Yes	Yes	
Aroclor 1221	Yes	Yes	
Aroclor 1232	Yes	Yes	
Aroclor 1242	Yes	Yes	
Aroclor 1248	Yes	Yes	
Aroclor 1254	Yes	Yes	
Aroclor 1260	Yes	Yes	
Dioxins/Furans (SW846-8280)			
PCDDs	**No**	**No**	not associated with iron/steel making
PCDFs	**No**	**No**	not associated with iron/steel making
RCRA metals (SW846-6010B) [except as noted]			
Antimony (Sb)	Yes	Yes	
Arsenic (As)	Yes	Yes	
Barium (Ba)	Yes	Yes	
Beryllium (Be)	Yes	Yes	
Cadmium (Cd)	Yes	Yes	
Chromium (Cr)	Yes	Yes	
Cobalt (Co)	Yes	Yes	
Copper (Cu)	Yes	Yes	
Lead (Pb)	Yes	Yes	
Mercury (Hg) (7470/7471)	Yes	Yes	
Nickel (Ni)	Yes	Yes	
Selenium (Se)	Yes	Yes	
Silver (Ag)	Yes	Yes	
Thallium (Tl)	Yes	Yes	
Tin (Sn)	Yes	Yes	
Vanadium (V)	Yes	Yes	
Zinc (Zn)	Yes	Yes	
Other Inorganics [methods as noted]			
Cyanide (Method 9012A)	Yes	Yes	
Sulfide (Method 9034)	Yes	Yes	

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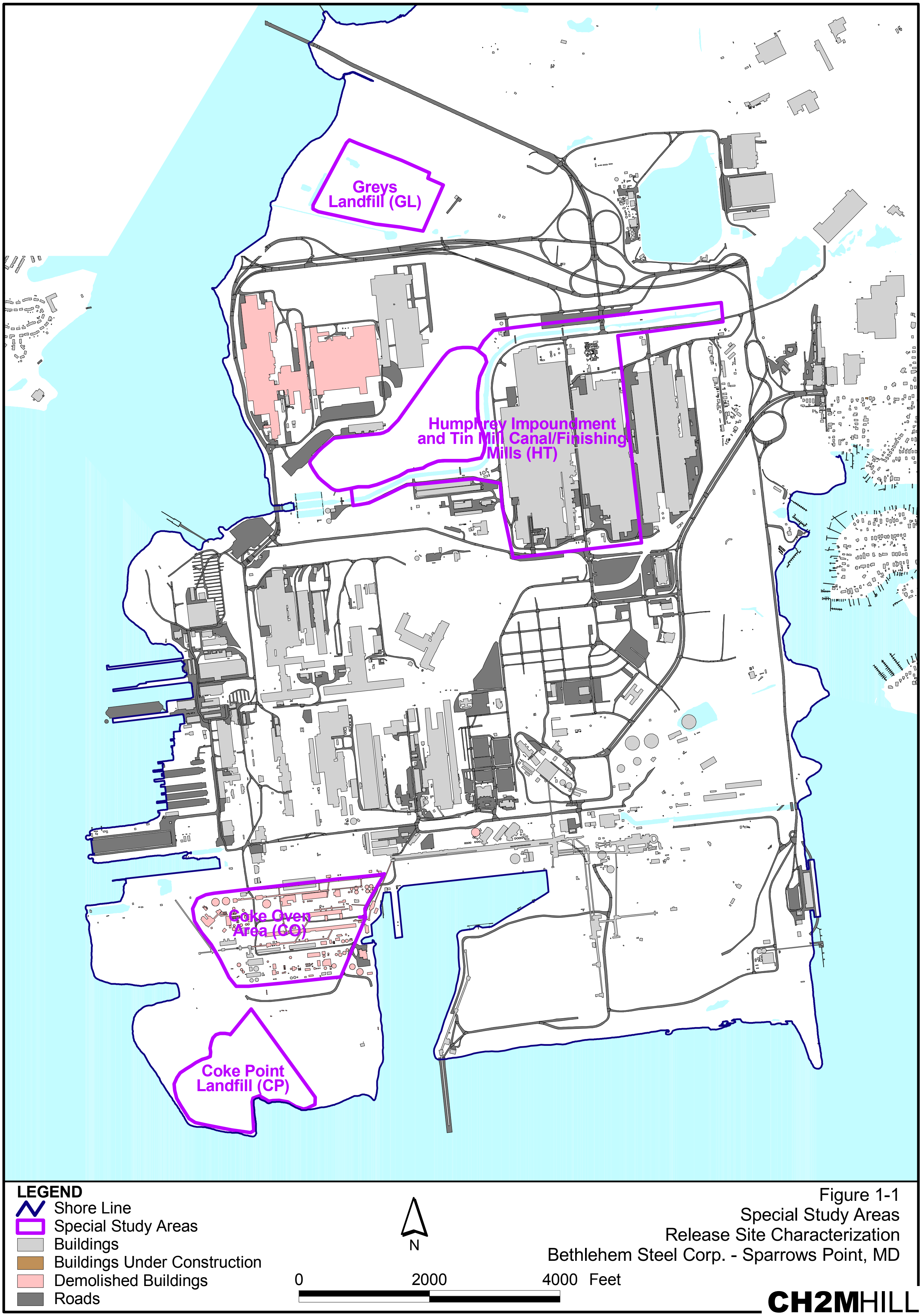

Figure 1-1
Special Study Areas
Release Site Characterization
Bethlehem Steel Corp. - Sparrows Point, MD

2 Study Area Investigations

2.1 Humphrey Impoundment and Tin Mill Canal/Finishing Mills Areas (HT SSA)

2.1.1 Site-Specific Activities

2.1.1.1 Geologic Investigations

The geologic model of the HT SSA was based on geologic information obtained from drilling and CPT analysis at several locations. Both borings and CPT analysis were performed during the RSC Study. In addition, information obtained from the Site-Wide Investigation Groundwater Study was used. Finally, geologic information from previous environmental and geotechnical investigations performed at the site was used where data gaps appeared to exist. The locations of all sources of geologic information are provided in Figure 2.1-1.

Soil Borings. Sixteen soil borings were completed in the HT SSA during installation of shallow piezometers for the RSC Study. Each soil boring was completed within the shallow, water-table zone. Three split-spoon soil samples were taken at each boring location with the exception of the shallow boring at location FM01, where only two split-spoon samples were recovered. Split-spoon samples were recovered to provide lithologic descriptions of the screened interval of the piezometers.

Borings designated HC-5, SW06-PZM052, SW08-PZM053, and B-3 and those with designations beginning with "CMC," "TM-GB," or "FM-GB" in Figure 2.1-1 were performed during previous investigations at the site.

Boring logs for the HT SSA are located in Appendix 2.1-A.

CPT Analysis Sites. There were 15 locations where CPT analysis was used during the RSC Study to obtain subsurface lithological information in the area surrounding the HT SSA. The CPT analysis achieved varying depths, ranging from 50 feet below ground surface (bgs) at FM01 to 97 feet bgs at TM06.

CPT locations designated FM04-CPT, HI01-CPT, HI06-CPT, HI07-CPT, SW03-CPT, SW04-CPT, TM05-CPT, and TM15-CPT were performed during the Site-Wide Investigation Groundwater Study.

The CPT logs for the HT SSA are located in Appendix 2.1-A.

2.1.1.2 Groundwater Investigations

Piezometer Network. Figure 2.1-2 shows the HT SSA piezometer network utilized for groundwater investigations conducted for the RSC Study. As shown on the figure, this network includes 31 piezometers installed during the RSC Study, 41 piezometers installed during 2000, and six piezometers installed before 2000 in the vicinity of the SSA. In addition, several older piezometers around the former Rod & Wire Mill were used for water-level measurements. Piezometer construction for the site is detailed in Table A-1, in Appendix A.

Fifteen 2-inch-diameter water-table piezometers were installed in the HT SSA at locations depicted in Figure 2.1-1. The 2-inch piezometers were screened within the water-table unit with bottom elevations ranging from -2 feet at FM02-PZM002 to -7 feet at several of the water-table piezometers around the Tin Mill Canal and are screened within the slag and anthropogenic fill material overlying the site.

Sixteen 0.5-inch-diameter piezometers were installed at depths that correlate to intermediate water-bearing sands underlying the slag. Each screen installed in the HT SSA was prepacked and ranged in length from 3 feet to 11 feet. The bottom of the screens range in elevation from -69 feet at TM05-PZM069 to -24 feet at FM05-PZM024.

Water-Level Measurements. There were four rounds of water-level measurements taken on a site-wide basis that included piezometers in the HT SSA. Measurements were taken on October 16, November 20, and December 18, 2001, and on March 19, 2002. Data for the measurements associated with the HT SSA are presented in Table A-2, in Appendix A.

Dissipation Testing. In conjunction with the CPT analysis, dissipation-test results were obtained in 15 subsurface intervals where CPT analyses were undertaken during the RSC Study. These were combined with data obtained during the Groundwater Study and are provided in Table 2.1-1; the results from the RSC Study are shaded. Dissipation test results and parameters for the HT SSA from the RSC Study are included in Appendix B.

2.1.1.3 Chemical Analysis

Groundwater sampling for the HT SSA took place between November 27 and December 4, 2001. A total of 49 groundwater samples were taken for the area. Samples were collected from five locations at the Finishing Mills (at two depths each), four locations at Humphrey Impoundment (two depths each), and 17 locations near Tin Mill Canal (at one, two, or three depths) as shown in Figure 2.1-2. Five of the locations along the north side of the canal also were used to assess Humphrey Impoundment and four locations along the south side of the canal also were used to assess the Finishing Mills.

Table 2.1-2 lists the locations and depths and type of analysis for each of the 49 samples that were collected. Three locations (TM08, TM09, and TM13) at two depths each were chosen for Appendix IX analysis. The other samples were analyzed for the preliminary COPI list. Seven trip blanks, seven equipment blanks, and six field duplicates were collected by the field team for this SSA.

2.1.2 Site Characterization

2.1.2.1 Geologic Results

The upper 100 feet to 120 feet of the subsurface material underlying the HT SSA comprises a sequence of unconsolidated materials (from shallowest to deepest): slag and other anthropogenic-fill materials; interbedded clay, silt, and sand layers of low to moderate density (Talbot Formation); and clay and sand units of high density (Patapsco Formation). Figure 2.1-3 shows locations of four cross sections within the HT SSA that illustrate the vertical distribution of the unconsolidated materials. Figures 2.1-4 through 2.1-7 show the cross sections themselves. The character of the unconsolidated materials is summarized below.

Slag. The slag and other fill materials were deposited on the original land surface and in adjoining surface-water bodies during the development of the Sparrows Point peninsula. The slag and fill materials are primarily characterized as gravelly, silty sand.

The slag at the site varies in thickness from 0 feet in the vicinity of the Finishing Mills to almost 40 feet as shown in Figure 2.1-8. The greatest thickness of slag is found in the former channel of Humphrey Creek, which was filled in with the material; Figure 2.1-8 includes the estimated shoreline of this former channel. The zone of thickest slag is oriented approximately east–west through the center of the site.

Cross section A–A′ (Figure 2.1-4) is oriented north to south across the former Humphrey Creek valley. The cross section extends outside of the former creek valley to the north and south and shows slag varying from 0 feet to about 10 feet in thickness over most of the site but about 30 feet thick within the former valley at boring FM-GB705.

Cross section B–B′ (Figure 2.1-5) is oriented west to east from boring HC-5 near Bear Creek to boring SW06-PZM053 located near Jones Creek. The cross section begins to the west within the former channel of Humphrey Creek and, therefore, exhibits slag thicknesses on the order of 20 feet to 40 feet. As the cross section moves to the east, it leaves the former stream channel; hence, the slag thins to less than 10 feet at borings FM02-CPT and FM04-CPT and to 0 feet at FM-GB789 and FM-GB282.

Cross section C–C′ (Figure 2.1-6) is oriented north to south across the former valley of Humphrey Creek. The thickness of slag varies from about 10 feet in the north (at boring CMC-B1) to about 40 feet at boring TM04-CPT. The former creek valley extends further to the south than shown in the cross section. The cross section crosses the former creek valley further downstream than does cross section A–A′ (Figure 2.1-4), so the slag is thicker at this cross section.

Cross section D–D′ (Figure 2.1-7) is oriented northwest to southeast across the former creek valley. The mouth of the former creek is to the west of the cross section; hence, the valley was narrower here than to the west, as shown in Figure 2.1-6. It also was not as deep, so the greatest thickness of slag here is only about 30 feet. The cross section extends well outside of the former creek valley to the northwest and southeast and shows slag only about 3 feet to 5 feet thick over most of the site.

Talbot Formation. The interbedded clay, silt, and sand layers of low to moderate density are associated with the Pleistocene Talbot Formation, which is of marine origin deposited as a rising sea level flooded the lower Susquehanna River valley. The deposits also include organic clay. The Talbot Formation was deposited unconformably on the upper surface of the Cretaceous Patapsco Formation that had been eroded by the ancestral Susquehanna River.

The top of the Talbot deposits begins at the bottom of the slag and the bottom of the deposits is defined as the top of the Patapsco Formation. The top of the Patapsco Formation is defined as the depth at which higher split-spoon blow counts (i.e., significantly denser soil materials characterized by blow counts in the tens per foot to over 100 per foot), high resistance to a CPT boring (characterized by tip resistance of several hundreds of tons per square foot), and perhaps red- to brown-colored or white sand or clay are encountered.

Cross section A–A′ (Figure 2.1-4) shows the slag immediately underlain by clay and silt along the length of the cross section. Several sand and clay units of the Talbot are interbedded along this cross section.

Cross section B–B′ (Figure 2.1-5) also shows the interbedded nature of the sand, silt, and clay units within the Talbot Formation. Along this cross section, the slag generally is underlain by silt and clay. A sand unit is located at an elevation starting at about -40 feet to -50 feet and underlies the entire cross section to a depth beyond the limits of the available borings. Above this sand are shallower sand units, such as the one in the central part of the cross section at an elevation of about -30 feet to -40 feet, that appear to be connected with the lower sand in the vicinity of borings FM02-CPT and FM-GB282. Other smaller units of sand, clay, or silt can be seen in the cross section.

Cross section C–C′ (Figure 2.1-6) also shows clay and silt immediately underlying the slag except in the northern part of the cross section (at borings CMC-B1 and CMC-B14), where slag appears to lie directly upon an underlying sand unit. The thick sand seen in Figure 2.1-5 at elevations below about -50 feet also can be seen in the central and southern parts of the cross section. Other sand, silt, and clay units are interbedded in the Talbot Formation. The sand unit located in the southern part of the cross section at elevations between about -40 feet and -50 feet is connected with the sand unit at a similar elevation shown in the eastern part of the cross section in Figure 2.1-5.

Cross section D–D′ (Figure 2.1-7) shows the slag immediately underlain by clay or silt along most of the cross section. There are some exceptions, such as at boring FM-GB1184. The sand unit shown below an elevation of about -25 feet in the northwestern part of the cross section connects with the thick sand extending upward to contact the slag in the northern part of the cross section in Figure 2.1-4. This same sand contains interbedded units to the southeast along the cross section but generally correlates with the sands that occur below elevations of about -30 feet in the eastern part of cross section B–B′ (Figure 2.1-5).

In summary, clay and silt units of the Talbot Formation underlie the slag across most of the site. A sand unit then underlies the clay and silt units starting at an elevation of about -30 feet, deepening and becoming more interbedded with clay and silt layers in the southern part of the site. In general, the sand units appear to be connected laterally and, to a lesser extent, vertically at the site.

Patapsco Formation. The Cretaceous age Patapsco Formation is composed of clay and sand units of high density underlying the Talbot. The contact between the Talbot and the Cretaceous-age strata is unconformable. The Cretaceous-Pleistocene unconformity is a regional feature of the Atlantic coastal plain and was caused by such factors as rapid sea-level transgression. The upper surface of the Patapsco Formation was likely further eroded by the ancestral Susquehanna River, allowing for thick deposits of marine material in the paleochannels.

The higher density of the materials in the Patapsco Formation are easily discernible from the soft plastic clays and reworked sands of the overlying Talbot. The clay units of the Patapsco Formation are red- to brown-colored, brittle, stiff, and finer-grained than the overlying clay.

Moreover, the sands are distinguishable from those of the overlying strata by their greater density (which is indicated by greater blow counts.) In many of the split-spoon samples taken of the Patapsco sand, there appears to be a fine matrix of clayey material binding the sand together.

The sand and clay units of the Patapsco are distinguished from those of the overlying Talbot Formation because their greater density and, possibly, finer-grained nature may restrict the movement of groundwater. The estimated elevation of the top of the Patapsco is shown in Figure 2.1-9. In general, the top of the unit is at an elevation of about –50 feet to -70 feet under most of the site but drops to an elevation of about -90 feet to -100 feet in the central part of the site.

2.1.2.2 Groundwater Results

Graphical presentations of the groundwater contour maps for the HT SSA resulting from the data taken in December are presented in Figures 2.1-10 and 2.1-11. These figures include contour maps for the unconfined water table zone and the potentiometric surface of the underlying intermediate sand zone. Note that the maps provided in Figures 2.1-10 and 2.1-11 are taken from the facility-wide maps provided in Figures A-1 and A-2, respectively, in Appendix A.

The following discussion refers to the maps of the water table and of the potentiometric surface of the major sand unit and to water levels noted in cross sections A–A′ through D-D′ (Figures 2.1-4 through 2.1-7.)

Figure 2.1-10 shows the water table for the HT SSA on December 18, 2001. Water levels measured at other times during the RSC Study and during the Site-Wide Investigation Groundwater Study show a similar configuration. Note that the elevation of the local surface-water bodies (i.e., Bear Creek and Jones Creek) is at -1.25 feet, according to the datum used in the investigation. The elevation of the surface water in Tin Mill Canal is about -1 foot from the vicinity of the water-treatment plant at the western end of the canal to where the canal turns to the north, about -0.5 foot to where it turns back toward the east, and about 0 feet for the remainder of the length of the canal.

In general, the water table slopes toward Tin Mill Canal over most of the site. This flow pattern indicates that shallow groundwater discharges into the canal. There is a divide in the water table that runs approximately east-northeast to south-southwest through the Finishing Mills; this divide generally conforms to a low ridge in the original land at Sparrows Point. Shallow groundwater southeast of the divide flows toward Jones Creek. This flow pattern includes a small part of the site in the southeast corner of the Finishing Mills.

A water level of -1.31 feet was measured at piezometer HI05-PZM012 in December 2001. In October, the measurement was -1.63 feet. The reason for this low water level is uncertain. Past measurements at this location (reported for January through June 2001 measured during the Site-Wide Investigation Groundwater Study) were on the order of 0.59 foot to 0.82 foot. It is possible that the low water level is associated with sampling the piezometer in November 2001, the drought that occurred during 2001, the fine-grained sludge waste material in which the piezometer is screened, and perhaps localized hydrogeologic conditions that limit recharge to the vicinity of this piezometer. No other piezometer in the area showed this behavior.

Figure 2.1-11 shows the potentiometric surface defined on December 18, 2001, by piezometers screened in sand units at elevations on the order of -26 to -62 feet. As discussed in Section 2.1.2.1, these sand units appear generally to be connected horizontally and, to a lesser degree, vertically. Groundwater in these sand units appears to flow southward from the area north of the site and northward within the site to converge on the thick zone of sand running approximately west to east through the site. The groundwater then primarily moves westward toward Bear Creek, with a lesser amount of groundwater flowing eastward toward Jones Creek.

Cross sections A–A′ through D–D′ (Figures 2.1-4 through 2.1-7) show water levels at different depths in the subsurface at different locations on and near the site. In general, water levels decline with depth across most of the site, which would be expected as water infiltrates from the surface, reaches the water table, and moves downward into the confined groundwater system, depending on the hydraulic conductivity of the local stratigraphy. Exceptions to this can be seen at some locations near Tin Mill Canal, where groundwater from the water table zone moves laterally and upward into the canal.

In cross section B–B′ (Figure 2.1-5), water levels at TM02-CPT at elevations of about -10 feet and -30 feet are similar (-0.51 foot vs. -0.52 foot) because both piezometers at these elevations are screened either in slag or in material just below the slag. With a water level in Tin Mill Canal of about -1 foot, apparently groundwater throughout the slag discharges into the canal at this location. At TM04-CPT, the deep-slag piezometer (at an elevation of about -30 feet) has a water level (-0.04-foot) somewhat higher than that in the water-table piezometer (-0.86-foot), which is at an elevation of about 10 feet. Again, this indicates discharge of groundwater from the slag into the canal.

At deeper intervals at these two locations, water levels are lower than in or near the deep slag unit, indicating the potential for groundwater to move downward into the underlying sand units. The extent to which groundwater actually does this depends upon the transmissive capabilities of the intervening clay and silt layers. These layers have vertical hydraulic conductivities on the order of 5.0E-05 feet per day (ft/day) to 5.0E-04 feet/day (Table 2.1-1), suggesting that vertical flow is limited where the clay and silt units form continuous confining layers. The fact that the water levels generally drop with depth also indicates resistance to vertical groundwater flow.

Similar relationships can be seen along the other cross sections (Figures 2.1-4, 2.1-6, and 2.1-7). For example, in cross section D–D′ (Figure 2.1-7), the shallow piezometers (at elevations of about -5 feet) at locations TM08-CPT and TM09-CPT show water levels of -0.01 foot, whereas the elevation of the water in the canal is about -0.5 foot; this indicates flow from the slag directly into the canal. Water levels in piezometers screened in deeper intervals show lower water levels, again indicating the potential for groundwater to move downward from the shallow units into the deeper units, limited by the lateral extent of the silt and clay units.

In summary, the water table typically occurs in the slag at the site. The configuration of the water table indicates that shallow groundwater flows predominantly into Tin Mill Canal.

Groundwater in the deeper slag also flows into the canal. Below the slag, however, groundwater apparently moves vertically downward into the underlying sand units, although the presence of clay and silt layers resists the flow. In the deeper sand units, groundwater mainly moves southward from north of the site and northward within the site to a zone of thick sand oriented approximately west to east below the Finishing Mills, then either westward or eastward to local bounding streams. Groundwater from within this sand unit does not appear to discharge upwards into Tin Mill Canal.

2.1.2.3 Chemical Analysis

Table 2.1-3 summarizes detected results for field samples. Duplicate results have been included for locations where this quality control procedure was conducted. The qualifying letters appearing beside the concentrations are explained in Section 1.3.3. Blank spaces in the table indicate that the compound was not detected. The concentrations found by the validator to be affected by blank contamination are considered to be not detected and therefore are also indicated by blank spaces. Results rejected by the validator for poor surrogate recoveries are qualified by “R.” “NA” indicates that this chemical was not analyzed for because it was not part of the compound list assigned to the sample.

The complete analytical results are presented in Table 2.1-B (Appendix 2.1-B). The table shows all results for all locations in the HT SSA for all compounds in each sample collected during the RSC sampling event of late November and early December 2001. The detected results are shaded for easier identification.

There was one anomaly associated with the sampling effort: one of the coolers did not arrive at the laboratory on the date expected. These samples were declared unusable for breach of custody, and the entire sample was recollected. The portion of the original samples slated for volatile analysis, however, had been shipped separately that day, and the cooler had arrived on time and intact, so the laboratory had proceeded with the analysis. Therefore, there are two sets of volatile results that are not true duplicates because they were collected on different days. The results for the collection date of November 28, 2001, have been given an “A” in the sample designation in Table 2.1-B to distinguish it; both results are shown on the results tables. The samples are TM13-PZM007A-01D, TM13-PZM046A-01D, TM09-PZM047A-01D, TM02-PZM009A-01D, and HI02-PZM006A-01D. For the detected results in Table 2.1-3, the two results for the volatiles have been combined, and the maximum concentration was used.

The data validation reports for the HT SSA indicate that the UJ qualifier was applied to several semivolatile compounds for low internal-standard-area counts that may be due to the presence of matrix interferences. An R qualifier was applied to three volatile compounds because of very low relative response factors. The major ion data were reported without qualification.

Blank contamination occurred for beryllium in this area. The results affected by blank contamination are qualified with a “B” in Table 2.1-B. Sample results affected by blank contamination are usually considered not detected.

Duplicate results for the metals or inorganic fraction at times exceeded the precision control limits for zinc. The guidance does not require qualification, but the validator noted the variation. When choosing the conservative approach, the maximum value is usually reported. Other qualifiers are self-explanatory, but if more detail is needed, the complete data validation reports are available on the compact disk in Appendix C.

Chemical analysis results for the groundwater show volatile organic compounds and semivolatile organic compounds (Figure 2.1-12) and COPI list metals (Figure 2.1-13) above detectable limits. The most significant concentrations of volatile and semivolatile compounds detected in the shallow groundwater were at piezometers TM04-PZM006 and TM09-PZM007. Piezometer TM04-PZM006 showed a concentration of benzene at 1,400 micrograms per liter (µg/L), and piezometer TM09-PZM007 showed a concentration of 4-methylphenol at 1,300 µg/L. Metal were detected throughout the SSA. No PCB compounds were detected in the shallow groundwater except for Aroclor-1248, which was detected at 1.3 µg/L in piezometer HI05-PZM012. Samples analyzed for abbreviated Appendix IX parameters showed one compound present that was not included on the COPI list: the sample from piezometer TM13-PZM007 showed an estimated concentration of allyl chloride (0.88 J µg/L).

Chemical analysis showed that the concentrations of volatile organic compounds, semivolatile organic compounds, and metals within the groundwater of the intermediate sand zone (Figures 2.1-12 and 2.1-13) were less than those within the shallow groundwater table; exceptions include increases in concentrations of 4-methylphenol at TM09-PZM047 (4,100 µg/L) and 1,1-dichloroethane at FM03-PZM026 (1,900 µg/L). Benzene was detected in the intermediate sand zone in piezometer TM04-PZM056 at a concentration of 130 µg/L. PCB compounds were not detected in any of the samples. There were no compounds detected in the Appendix IX samples that do not appear on the COPI list

2.1.2.4 Site Conceptual Model

This section provides a summary and synthesis of the geologic, hydrogeologic, and chemical results of the investigation for HT SSA. Figure 2.1-14 is a schematic diagram showing the general geology and movement of groundwater and site-related contamination at the site.

The site is immediately underlain primarily by slag of a granular nature. The slag is thickest in the former valley of Humphrey Creek. Clay and silt units of the Talbot Formation underlie the slag over most of the site, and these units are in themselves underlain by sand that primarily is associated with the Talbot Formation but that may also be in contact with sand units from the underlying Patapsco Formation. Some sand lenses are interbedded in the fine-grained parts of the Talbot Formation, and several thick clay and silt lenses occur in the sand units.

Shallow groundwater at the site primarily moves laterally to discharge into Tin Mill Canal. In parts of the site distant from the canal and in deeper parts of the site near the Canal, groundwater also has the potential to move downward into the underlying sand units. From there, it moves to either Bear Creek to the west or to Jones Creek to the east.

Table 2.1-1
Dissipation - Test Results for Fine - Grained Materials
Humphrey Impoundment and Tin Mill Canal/Finishing Mills Areas Release Site Characterizatior
Bethlehem Steel Corporation - Sparrows Point Facility

Borehole Identification and Depth (ft)	Soil Description	*t* (sec)	K_h/K_v	Horizontal Hydraulic Conductivity (K_h)	Vertical Hydraulic Conductivity (K_v)
				ft/day	ft/day
FM-04					
14.9	Clayey silt to silty clay	557	1.2	1.8E-03	1.5E-03
TM11					
24.1	Sensitive fine grained	650	1.2	2.1E-04	1.8E-04
FM01					
28.4	Sensitive fine grained	260	3	6.2E-04	2.1E-04
TM-15					
31.0	Clay	736	3	5.8E-04	1.9E-04
HI-06					
33.0	Clayey silt to silty clay	1253	3	4.6E-04	1.5E-04
FM05					
34.1	Silty clay to clay	310	3	3.9E-04	1.3E-04
TM13					
34.6	Organic material	700	3	2.5E-03	8.2E-04
TM03					
35.8	Silty clay to clay	570	3	1.2E-03	4.0E-04
FM03					
37.1	Clay	380	3	3.2E-04	1.1E-04
FM05					
37.2	Silty clay to clay	385	3	1.6E-03	5.4E-04
FM-04					
37.6	Sandy silt to clayey silt	362	3	2.2E-04	7.4E-05
TM06					
37.6	Clayey silt to silty clay	275	3	1.4E-03	4.6E-04
TM02					
40.7	Clayey silt to silty clay	265	3	4.5E-04	1.5E-04
FM03					
41.7	Clay	435	3	1.4E-03	4.8E-04
TM07					
42.3	Sandy silt to clayey silt	440	3	7.1E-04	2.4E-04
TM-15					
48.2	Clayey silt to silty clay	652	3	1.1E-03	3.5E-04
TM04					
51.3	Silty clay to clay	690	3	1.4E-04	4.6E-05
TM02					
53.6	Clayey silt to silty clay	590	3	1.4E-04	4.5E-05
TM-15					
65.5	Clayey silt to silty clay	700	3	7.0E-04	2.3E-04
TM06					
63.6	Sandy silt to clayey silt	45	3	3.2E-03	1.1E-03
TM08					
63.8	Sandy silt to clayey silt	370	3	2.7E-04	8.8E-05

Note

t = time until pre-specified pore-pressure dissipation was reached.

Includes data collected during the Groundwater Study; shaded tests were performed during the RSC Study

All calculations for the RSC Study tests are presented in Appendix B.

Table 2.1-2
Sample Analysis
Humphrey Impoundment and Tin Mill Canal/Finishing Mills Release Site Characterization
Bethelehem Steel Corporation - Sparrows Point Facility

Location	Water-Bearing Unit	Sample ID	Appendix IX List	COPI List	Date Sampled
Humphrey Impoundment					
HI02-PZM006	Water Table	HI02-PZM006-01D		X	12/04/01
HI02-PZM032	Int. Sands	HI02-PZM032-01D	X		12/04/01
HI04-PZM034	Int. Sands	HI04-PZM034-01D		X	11/27/01
HI04-PZM006	Water Table	HI04-PZM006-01D		X	11/27/01
HI05-PZM046	Int. Sands	HI05-PZM046-01D		X	11/26/01
HI05-PZM012	Water Table	HI05-PZM012-01D		X	11/27/01
HI07-PZM032	Int. Sands	HI07-PZM032-01D		X	11/28/01
HI07-PZM005	Water Table	HI07-PZM005-01D		X	11/28/01
Tin Mill Canal and Humphrey Impoundment					
TM02-PZM009	Water Table	TM02-PZM009-01D		X	12/04/01
TM02-PZM028	Deep Slag	TM02-PZM028-01D		X	11/28/01
TM02-PZM062	Int. Sands	TM02-PZM062-01D		X	11/28/01
TM04-PZM056	Int. Sands	TM04-PZM056-01D		X	12/03/01
TM04-PZM006	Water Table	TM04-PZM006-01D		X	12/03/01
TM04-PZM028	Deep Slag	TM04-PZM028-01D		X	12/03/01
TM06-PZM034	Int. Sands	TM06-PZM034-01D		X	12/03/01
TM06-PZM008	Water Table	TM06-PZM008-01D		X	12/03/01
TM08-PZM038	Int. Sands	TM08-PZM038-01D	X		11/27/01
TM08-PZM007	Water Table	TM08-PZM007-01D	X		11/27/01
TM10-PZM007	Water Table	TM10-PZM007-01D		X	11/27/01
Tin Mill Canal					
TM03-PZM037	Int. Sands	TM03-PZM037-01D		X	11/30/01
TM03-PZM004	Water Table	TM03-PZM004-01D		X	11/30/01
TM05-PZM040	Int. Sands	TM05-PZM040-01D		X	12/03/01
TM05-PZM005	Water Table	TM05-PZM005-01D		X	12/03/01
TM07-PZM045	Int. Sands	TM07-PZM045-01D		X	12/03/01
TM07-PZM005	Water Table	TM07-PZM005-01D		X	12/03/01
TM12-PZM006	Water Table	TM12-PZM006-01D		X	11/28/01
TM14-PZM005	Water Table	TM14-PZM005-01D		X	11/29/01
TM16-PZM007	Water Table	TM16-PZM007-01D		X	11/29/01
TM17-PZM005	Water Table	TM17-PZM005-01D		X	11/29/01
TM18-PZM005	Water Table	TM18-PZM005-01D		X	11/29/01
Tin Mill Canal and Finishing Mill					
TM09-PZM047	Int. Sands	TM09-PZM047-01D	X		12/04/01
TM09-PZM007	Water Table	TM09-PZM007-01D	X		11/28/01
TM11-PZM034	Int. Sands	TM11-PZM034-01D		X	11/27/01
TM11-PZM007	Water Table	TM11-PZM007-01D		X	11/27/01
TM13-PZM046	Int. Sands	TM13-PZM046-01D	X		12/04/01

Table 2.1-2
Sample Analysis
Humphrey Impoundment and Tin Mill Canal/Finishing Mills Release Site Characterization
Bethelehem Steel Corporation - Sparrows Point Facility

Location	Water-Bearing Unit	Sample ID	Appendix IX List	COPI List	Date Sampled
TM13-PZM007	Water Table	TM13-PZM007-01D	X		12/04/01
TM15-PZM031	Int. Sands	TM15-PZM031-01D		X	12/06/01
TM15-PZM007	Water Table	TM15-PZM007-01D		X	11/30/01
TM15-PZM011	Deep Slag	TM15-PZM011-01D		X	11/30/01
Finishing Mill					
FM01-PZM041	Int. Sands	FM01-PZM041-01D		X	11/29/01
FM01-PZM003	Water Table	FM01-PZM003-01D		X	11/29/01
FM02-PZM033	Int. Sands	FM02-PZM033-01D		X	11/30/01
FM02-PZM002	Water Table	FM02-PZM002-01D		X	11/30/01
FM03-PZM026	Int. Sands	FM03-PZM026-01D		X	12/04/01
FM03-PZM005	Water Table	FM03-PZM005-01D		X	12/05/01
FM04-PZM037	Int. Sands	FM04-PZM037-01D		X	11/29/01
FM04-PZM010	Water Table	FM04-PZM010-01D		X	11/29/01
FM05-PZM024	Int. Sands	FM05-PZM024-01D		X	11/29/01
FM05-PZM004	Water Table	FM05-PZM004-01D		X	11/29/01

Table 2.1-3
Detected Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	FM01-PZM003	FM01-PZM041		FM02-PZM002	FM02-PZM033	FM03-PZM005	FM03-PZM026	FM04-PZM010	FM04-PZM037	FM05-PZM004	FM05-PZM024	HI02-PZM006	HI02-PZM032	HI04-PZM006	HI04-PZM034	HI05-PZM012	HI05-PZM046	
Sample ID			DUPLICATE															DUPLICATE
Sample Date	11/29/01	11/29/01	11/29/01	11/30/01	11/30/01	12/05/01	12/04/01	11/29/01	11/29/01	11/29/01	11/29/01	12/04/01	12/04/01	11/27/01	11/27/01	11/27/01	11/26/01	11/26/01
Chemical Name																		
Volatile Organic Compounds (UG/L)																		
1,1,1-Trichloroethane						3.8												
1,1-Dichloroethane						8.5	1,900	1.4										
1,1-Dichloroethene						0.5 J	470						3.2					
1,2-Dichloroethane						0.38 J												
2-Butanone												1.2 J						
4-Methyl-2-pentanone				0.41 J														
Acetone				2.5 J		3.1 J						6.3 J		9.4 J		4.3 J		
Allyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene				2.3		0.35 J				1.7		1.2				1.3		
Carbon disulfide										0.79 J		1.2						
Chloroform	31					2.7												
Ethylbenzene				0.44 J														
Methylene chloride						0.64 J							0.71 J	0.73 J	1.1 J	0.91 J		
Tetrachloroethene																		
Toluene				0.83 J		0.35 J				0.62 J		0.67 J		5.9		0.39 J		
Trichloroethene													0.32 J					
Vinyl chloride																		
Xylene, total				3.3						0.75 J		0.97 J				0.78 J		
Semivolatile Organic Compounds (UG/L)																		
1,2-Dichlorobenzene																		
2,4-Dimethylphenol												32	2.6 J			14		
2-Chlorophenol																		
2-Methylnaphthalene										3.6 J		1.4 J						
2-Methylphenol												1.1 J						
4-Methylphenol												10	2.2 J	2.5 J		3.8 J		
Acenaphthene										0.95 J		1.5 J		1.2 J				
Acenaphthylene																		
Anthracene																		
Benzo(a)anthracene																		
Benzo(a)pyrene																		
Benzo(b)fluoranthene																		
Benzo(g,h,i)perylene																		
Benzo(k)fluoranthene																		
Chrysene																		
Dibenz(a,h)anthracene																		
Dibenzofuran										1.3 J		0.74 J						
Diethylphthalate																		
Fluoranthene	0.73 J									1.5 J						0.65 J		
Fluorene										1.8 J		1.3 J						
Indeno(1,2,3-cd)pyrene																		
Naphthalene	0.59 J			3.7 J						320	4.5 J	7.3 J		0.89 J		1 J		
Pentachlorophenol																		
Phenanthrene	0.98 J			1.4 J						3.6 J		1.1 J		0.85 J				
Phenol				3.4 J								2.6 J						
Pyrene										1 J								
Pyridine																		
bis(2-Ethylhexyl)phthalate														12				
Pesticide/Polychlorinated Biphenyls (UG/L)																		
Aroclor-1248																1.3		
Total Metals (UG/L)																		
Antimony												4.5 J						
Arsenic	4.2 J	26.6	26.4	4 J	4 J	3 J			6.4 J	12.1	3.2 J		44.7	3.9 J	11.7	10.8	43.8	40.8

NA - Not analyzed
J - Estimated value
K - Value biased high
L - Value biased low
Blank contamination considered not detected

R - Unreliable result
U - Not detected
UJ - Not detected, estimated
UL - Not detected, low bias

Table 2.1-3
Detected Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	FM01-PZM003	FM01-PZM041		FM02-PZM002	FM02-PZM033	FM03-PZM005	FM03-PZM026	FM04-PZM010	FM04-PZM037	FM05-PZM004	FM05-PZM024	HI02-PZM006	HI02-PZM032	HI04-PZM006	HI04-PZM034	HI05-PZM012	HI05-PZM046	
Sample ID			DUPLICATE															DUPLICATE
Sample Date	11/29/01	11/29/01	11/29/01	11/30/01	11/30/01	12/05/01	12/04/01	11/29/01	11/29/01	11/29/01	11/29/01	12/04/01	12/04/01	11/27/01	11/27/01	11/27/01	11/26/01	11/26/01
Chemical Name																		
Barium	19.8 J	608	608		156 J	23.2 J		139 J	145 J	24.8 J	95.4 J	33.4 J		144 J	106 J	12.6 J	195 J	178 J
Beryllium						7.3												
Cadmium						3.6 J	3.3 J											
Chromium	21.7	1.3 J	1.4 J	6		14.3			1.4 J	3.1 J	1.9 J			79.5	5.2	234	8.6	3.1 J
Cobalt	1.1 J			112		58	305				1.7 J		1.8 J			16.1 J		
Copper	20.6 J					54.5										48.7		
Lead	50.5			4.6		7.5			2 J		1.9 J			36.5		53.7		
Mercury												R	0.054 L	0.069 J				0.074 J
Nickel	2.5 J			193		277	111			3.9 J		2.9 J	3 J			63.5	5.3 J	3.6 J
Selenium											4 J							
Silver					0.95 J	1.5 J		0.87 J								1.3 J		0.83 J
Thallium			6.7 J														6.1 J	
Tin		33.5 J		30 J										240		1,190		
Vanadium	368			11.5 J		14.3 J	48.9 J	4 J	10.3 J	20 J	9.7 J	182	9.5 J	8.9 J		13.6 J	6.9 J	2.7 J
Zinc	121			392		1,920	3,610			14.8 J				175	11.4 J	271	96.1	63.3
Common Cations (UG/L)																		
Calcium	51,200	140,000	139,000	NA	39,300	NA	120,000	NA	NA	110,000	23,800	103,000	28,400	NA	40,900	NA	NA	NA
Iron	3,880	60,100	60,000	NA	69,600	NA	316,000 L	NA	NA	1,780	39,600		28,100 L	NA	51,900	NA	NA	NA
Magnesium	1,030 J	81,300	80,900	NA	23,800	NA	103,000	NA	NA	508 J	13,400		29,400	NA	30,600	NA	NA	NA
Mangenese	297	390	392	NA	5,170	NA	17,300	NA	NA	41.8	2,370		1,770	NA	6,480	NA	NA	NA
Potassium	5,300	27,100	26,900	NA	2,360 J	NA	4,600 J	NA	NA	28,600	2,840 J	43,100 J	5,870	NA	2,970 J	NA	NA	NA
Sodium	26,800	359,000	361,000	NA	71,600	NA	217,000	NA	NA	441,000	58,900	68,300	305,000	NA	125,000	NA	NA	NA
Wet Chemistry (MG/L)																		
Amenable cyanide		0.028 J	0.03 J	0.016 K	0.025 K	0.0052 J	0.027 J	0.024 J	0.013 J	3.3 J	0.19 J	5 J	0.018 J	0.33	0.028	0.2	0.003	0.005
Bicarbonate	150	146	150	NA	163	NA	98.9	NA	NA	26.8	103	16.5	177	NA	105	NA	NA	NA
Chloride	1,190	1,180	1,190	NA	83.4	NA	287	NA	NA	674	135	85.6	292	NA	286	NA	NA	NA
Sulfate				NA	118	NA	1,250	NA	NA	307	47.6	198	275	NA	40.9	NA	NA	NA
Sulfide							1		4.3				1					
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed
J - Estimated value
K - Value biased high
L - Value biased low
Blank contamination considered not detected

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U - Not detected
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Table 2.1-3
Detected Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	HI07-PZM005	HI07-PZM032	TM02-PZM009	TM02-PZM028		TM02-PZM062	TM03-PZM004	TM03-PZM037	TM04-PZM006	TM04-PZM028	TM04-PZM056	TM05-PZM005	TM05-PZM040	TM06-PZM008	TM06-PZM034	TM07-PZM005	
Sample ID					DUPLICATE												DUPLICATE
Sample Date	11/28/01	11/28/01	12/04/01	11/28/01	11/28/01	11/28/01	11/30/01	11/30/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01
Chemical Name																	
Volatile Organic Compounds (UG/L)																	
1,1,1-Trichloroethane																	
1,1-Dichloroethane									2.3							1.7	1.7
1,1-Dichloroethene																	
1,2-Dichloroethane																	
2-Butanone		1.2 J				1.4 J											
4-Methyl-2-pentanone			1.2 J														
Acetone		5.8 J		5.3 J	3.6 J	6.7 J	2.7 J		3.2 J								
Allyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	25	71	2.8	6.1	5.8	2.7		0.31 J	1,400	1,200	130	2		0.29 J			
Carbon disulfide																	
Chloroform							30										
Ethylbenzene	0.43 J	1	0.27 J	0.56 J	0.48 J				24	28 J	1.3 J	0.25 J					
Methylene chloride																0.5 J	
Tetrachloroethene																	
Toluene	7.9	22	2.8	5.2	4.6	2.1			9.9	24 J		0.71 J					
Trichloroethene			0.36 J	1	1	2											
Vinyl chloride									3.6								
Xylene, total	9.4	27	2 J	9.8	8.8	3.7			47	86 J	5.2 J	1.5 J					
Semivolatile Organic Compounds (UG/																	
1,2-Dichlorobenzene																	
2,4-Dimethylphenol	22	240	79	180	170	45	3.6 J		51	41	4.4 J						
2-Chlorophenol																	
2-Methylnaphthalene	2.4 J	20	1.3 J	11	11	3.5 J	38		1.2 J	1.9 J		3.4 J					
2-Methylphenol	0.94 J	5.1 J	4.5 J	5.2 J	5.2 J	2 J	1.5 J		0.91 J								
4-Methylphenol	10	100	77	85	77	27	8.3 J										
Acenaphthene	0.85 J	2.4 J	2.2 J	2.8 J	2.6 J	1.7 J	7.1 J			1.2 J		1.7 J	3 J	2.1 J			
Acenaphthylene	1.2 J	2.9 J		1.3 J	1.2 J	1 J	18		1.3 J	1.8 J		1.5 J					
Anthracene							12										
Benzo(a)anthracene							10										
Benzo(a)pyrene							7.5 J										
Benzo(b)fluoranthene							7.8 J										
Benzo(g,h,i)perylene							6.7 J										
Benzo(k)fluoranthene							6.8 J										
Chrysene							11										
Dibenz(a,h)anthracene							2.3 J										
Dibenzofuran	0.91 J	2.7 J	1 J	3.6 J	3.3 J	1.8 J	36			0.72 J		1.7 J					
Diethylphthalate																	
Fluoranthene	1 J	0.82 J		1.5 J	1.4 J	1.4 J	34	1.1 J				1 J		0.82 J			
Fluorene	1.2 J	4.5 J	1.5 J	3.6 J	3.5 J	2.1 J	34	0.62 J		1.1 J		2.5 J		1.1 J			
Indeno(1,2,3-cd)pyrene							6.5 J										
Naphthalene	40	240	20	150	150	41	240	2.7 J	200	150	20	48	7.1 J			0.6 J	0.77 J
Pentachlorophenol																	
Phenanthrene	3 J	5.7 J	3.8 J	7.8 J	7.6 J	5.1 J	75	2.5 J	0.86 J	1.2 J		5.3 J	2.2 J	0.79 J			
Phenol	4.8 J	30		8 J	7.7 J	29	6.9 J		2.1 J	3.6 J	9.6 J						
Pyrene							27										
Pyridine	4.1 J	16 J															
bis(2-Ethylhexyl)phthalate																	
Pesticide/Polychlorinated Biphenyls (U																	
Aroclor-1248																	
Total Metals (UG/L)																	
Antimony												4.7 J				4.1	
Arsenic			3.6 J	3.2 J		15.4	7.4 J	30.5	2.1 J	2.2 J		4.1 J	3.6 J	2.9 J	16.7	3.1 J	3 J

NA - Not analyzed
J - Estimated value
K - Value biased high
L - Value biased low
Blank contamination considered not detected

R - Unreliable result
U - Not detected
UJ - Not detected, estimated
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Table 2.1-3
Detected Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	HI07-PZM005	HI07-PZM032	TM02-PZM009	TM02-PZM028		TM02-PZM062	TM03-PZM004	TM03-PZM037	TM04-PZM006	TM04-PZM028	TM04-PZM056	TM05-PZM005	TM05-PZM040	TM06-PZM008	TM06-PZM034	TM07-PZM005	
Sample ID					DUPLICATE												DUPLICATE
Sample Date	11/28/01	11/28/01	12/04/01	11/28/01	11/28/01	11/28/01	11/30/01	11/30/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01
Chemical Name																	
Barium	137 J	102 J	92.4 J	117 J	116 J	125 J		158 J	41 J	28.9 J	601	18.3 J	240	38.4 J	55.2 J	55.3 J	55.5 J
Beryllium																	
Cadmium							4.1 J				0.74 J				1.1 J		
Chromium	5.3				1.7 J	2.4 J	30.5	5.1			6.4	1.2 J	2.7 J				
Cobalt					1.9 J		1.6 J							0.88 J	8.8 J		
Copper							28										
Lead	4.8						232					2.3 J					
Mercury											0.06 L					0.72 L	
Nickel	5.1 J	10.5 J	13.5 J	14.6 J	15.9 J	3.8 J	5.4 J		8.5 J	6 J				3.7 J	7.3 J		
Selenium			5.5										3.8 J	4.6 J		6.7	
Silver							0.75 J	1.1 J									
Thallium											13.2				36.5		
Tin								39.4 J				28.9 J					
Vanadium	36.7 J	60.2	75.4	24.9 J	29.6 J	19.5 J	63.4	2.9 J	15.8 J	5.5 J	23.7 J	1,110	8.7 J	12.3 J	31.4 J	133	131
Zinc	14.2 J						293		2.5 J	3.6 J	3.3 J				8.1 J		1.9 J
Common Cations (UG/L)																	
Calcium	NA	159,000	281,000	NA	NA	114,000	89,900	71,400	NA	NA	121,000	NA	NA	NA	96,000		
Iron	NA	829	52.4 L	NA	NA	7,500	13,400	75,700	NA	NA	119,000 L	NA	NA	NA	216,000 L	NA	NA
Magnesium	NA	2,410 J	15.9 J	NA	NA	28,400	885 J	68,400	NA	NA	105,000	NA	NA	NA	197,000	NA	NA
Mangenese	NA	105	0.8 B	NA	NA	329	496	2,870	NA	NA	6,260	NA	NA	NA	9,130	NA	NA
Potassium	NA	48,100	81,800	NA	NA	40,100	28,600	22,000	NA	NA	25,800	NA	NA	NA	27,700	NA	NA
Sodium	NA	131,000	236,000	NA	NA	396,000	48,100	550,000	NA	NA	909,000	NA	NA	NA	1,220,000	NA	NA
Wet Chemistry (MG/L)																	
Amenable cyanide	0.45 J	1.5 J	3.7 J	7.6 J	6.3 J	0.43 J	2.3 J	0.014 K	1.9 J	2.6 J	0.13 J	0.009 K	0.043 K	2.6 J	0.029 J	0.91 J	0.89 J
Bicarbonate	NA		5	NA	NA	138		200	NA	NA	163	NA	NA	NA	249	NA	NA
Chloride	NA	225	278	NA	NA	867	83.4	1,130	NA	NA	1,900	NA	NA	NA	2,160	NA	NA
Sulfate	NA	37.4	575	NA	NA	60.2	138	186	NA	NA	38.6	NA	NA	NA	701	NA	NA
Sulfide			2.8						1	1	1	2		1	1	1	1
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed
J - Estimated value
K - Value biased high
L - Value biased low
Blank contamination considered not detected

R - Unreliable result
U - Not detected
UJ - Not detected, estimated
UL - Not detected, low bias

Table 2.1-3
Detected Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM07-PZM045	TM08-PZM007	TM08-PZM038		TM09-PZM007	TM09-PZM047	TM10-PZM007	TM11-PZM007	TM11-PZM034	TM12-PZM006	TM13-PZM007	TM13-PZM046	TM14-PZM005	TM15-PZM007	TM15-PZM011	
Sample ID				DUPLICATE												DUPLICATE
Sample Date	12/03/01	11/27/01	11/27/01	11/27/01	11/28/01	12/04/01	11/27/01	11/27/01	11/27/01	11/28/01	12/04/01	12/04/01	11/29/01	11/30/01	11/30/01	11/30/01
Chemical Name																
Volatile Organic Compounds (UG/L)																
1,1,1-Trichloroethane																
1,1-Dichloroethane							0.31 J									
1,1-Dichloroethene																
1,2-Dichloroethane																
2-Butanone														8.5	1.3 J	8.8
4-Methyl-2-pentanone														1.6 J		1.8 J
Acetone			3.2 J	3.1 J		10					3.7 J			37	7.8 J	38
Allyl chloride	NA						NA	NA	NA	NA	0.88 J		NA	NA	NA	NA
Benzene					4.5	0.38 J	0.55 J			0.35 J	4.5		0.53 J	1.5	4.3	1.4
Carbon disulfide								0.51 J						1.2		1.3
Chloroform													0.4 J			
Ethylbenzene							0.44 J								0.23 J	
Methylene chloride								0.97 J	0.5 J							
Tetrachloroethene							0.72 J									
Toluene					1.3		1.2				1.3		0.31 J	0.42 J	1.2	0.41 J
Trichloroethene							0.68 J									
Vinyl chloride																
Xylene, total					1.9 J		2.6 J				1.8 J				1.3 J	
Semivolatile Organic Compounds (UG/																
1,2-Dichlorobenzene							3.2 J									
2,4-Dimethylphenol		5.2 J	160	140	1,300	1,900					6 J		9.3 J	5.9 J	15	12
2-Chlorophenol															0.7 J	0.73 J
2-Methylnaphthalene					0.63 J		1.9 J			1.1 J	8.8 J		1.9 J	20	1.5 J	1.7 J
2-Methylphenol			3.2 J	3.1 J	37	120					0.75 J			3.3 J	7.5 J	8 J
4-Methylphenol		4 J	41	40	1,300	4,100					14		2.7 J	12	48	46
Acenaphthene					1.2 J		2.9 J				1.2 J		1.8 J	15	1.7 J	1.9 J
Acenaphthylene										1.3 J	2 J			4 J		
Anthracene							0.82 J			0.84 J				1.2 J		
Benzo(a)anthracene																
Benzo(a)pyrene																
Benzo(b)fluoranthene																
Benzo(g,h,i)perylene																
Benzo(k)fluoranthene																
Chrysene																
Dibenz(a,h)anthracene																
Dibenzofuran					0.63 J		1.6 J			1.5 J	2.2 J		1.6 J	8.7 J		0.8 J
Diethylphthalate					0.62 J											
Fluoranthene							1.8 J			2.1 J	1.4 J		0.82 J	1.2 J		
Fluorene					1.5 J		2.1 J			2.6 J	3 J		2.2 J	9.6 J	1.2 J	1.2 J
Indeno(1,2,3-cd)pyrene																
Naphthalene			1.3 J	3.2 J			12	4.8 J		7 J	330	3.5 J	11	89	14	16
Pentachlorophenol													2.5 J			
Phenanthrene		0.6 J			2.2 J		5 J	0.82 J		5.4 J	5.8 J		4.1 J	10	2 J	2 J
Phenol		1.5 J	11	10	520	9,800								29	220	210
Pyrene							1.2 J			1.6 J						
Pyridine																
bis(2-Ethylhexyl)phthalate		5.7 J														
Pesticide/Polychlorinated Biphenyls (U																
Aroclor-1248																
Total Metals (UG/L)																
Antimony																
Arsenic	7.8 J	6.8 J	8.4 J	7 J	8.3 J			2.6 J	12.7	2.5 J		12	5.5 J	6.5 J	12.1	13

NA - Not analyzed
J - Estimated value
K - Value biased high
L - Value biased low
Blank contamination considered not detected

R - Unreliable result
U - Not detected
UJ - Not detected, estimated
UL - Not detected, low bias

Table 2.1-3
Detected Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM07-PZM045	TM08-PZM007	TM08-PZM038		TM09-PZM007	TM09-PZM047	TM10-PZM007	TM11-PZM007	TM11-PZM034	TM12-PZM006	TM13-PZM007	TM13-PZM046	TM14-PZM005	TM15-PZM007	TM15-PZM011	
Sample ID				DUPLICATE												DUPLICATE
Sample Date	12/03/01	11/27/01	11/27/01	11/27/01	11/28/01	12/04/01	11/27/01	11/27/01	11/27/01	11/28/01	12/04/01	12/04/01	11/29/01	11/30/01	11/30/01	11/30/01
Chemical Name																
Barium	90.4 J	79.2 J	611	603	69.6 J	315	90.9 J	62.1 J	243	62.3 J	61.8 J	126 J	52.6 J			
Beryllium																
Cadmium		0.72														
Chromium		161	1.4 J	4.6 J	55.2		12.7	2.3 J	1.2 J							
Cobalt	8.2 J	2.1 J	1.3 J	1.4 J	4 J	0.87 J						6.5 J				
Copper		30			19.2 J											
Lead		27			42.1		11				3.8					
Mercury		0.09 L	R	R	0.076 L	R					R	R				
Nickel	6.7 J	13 J		2.8 J	5.2 J		2.6 J							3.8 J	8 J	9.5 J
Selenium		5.6			5.4	3.3 J								6.4		4.3 J
Silver																
Thallium	16.6															
Tin		363														
Vanadium	24.4 J	26.4 J	10.6 J	9.3 J	107		802	25.8 J		401	141		65.6	318	33.5 J	33.8 J
Zinc	3.5 J	246	4.3 J	7.3 J	188		34.2									
Common Cations (UG/L)																
Calcium		NA	193,000	197,000	87,100	151,000	179,000	NA	109,000	NA	203,000	76,000	NA	NA	NA	NA
Iron	NA	NA	37,500 J	37,500 J	6,620 J	87,000 J	1,570	NA	56,100	NA	235 J	68,000 J			NA	NA
Magnesium	NA	NA	76,400	73,500	806 J	94,000	548 J	NA	87,400	NA		70,800			NA	NA
Mangenese	NA	NA	275 L	276 L	374 L	2,770 L	295	NA	4,110	NA	20.7 L	3,700 L			NA	NA
Potassium	NA	NA	56,200 J	54,200 J	50,500 J	28,700 J	23,500	NA	31,000	NA	47,900 J	10,200 J	NA	NA	NA	NA
Sodium	NA	NA	714,000	711,000	133,000	842,000	76,900	NA	693,000	NA	225,000	694,000	NA	NA	NA	NA
Wet Chemistry (MG/L)																
Amenable cyanide	0.006 J	0.2	4.7	2.6	6.5 J	0.055 J	0.86	2.4	0.014	0.015 J	6.6 J		3.6 J	10.4 K	22.8 K	22.9 K
Bicarbonate	NA	NA	157	154		173		NA	243	NA	37.1	86.5	NA	NA	NA	NA
Chloride	NA	NA	1,740	1,710	194	1,770	127	NA	1,070	NA	411	1,360	NA	NA	NA	NA
Sulfate	NA	NA	171	188	146	202	288	NA	48.2	NA	350	135	NA	NA	NA	NA
Sulfide	1	3.3		2.6												
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 2.1-3
Detected Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM15-PZM031		TM16-PZM007		TM17-PZM005		TM18-PZM005	
Sample ID								
Sample Date	12/06/01		11/29/01		11/29/01		11/29/01	
Chemical Name								
Volatile Organic Compounds (UG/L)								
1,1,1-Trichloroethane								
1,1-Dichloroethane								
1,1-Dichloroethene								
1,2-Dichloroethane								
2-Butanone								
4-Methyl-2-pentanone					0.34	J		
Acetone	6.3	J	3.2	J	2.9	J		
Allyl chloride	NA		NA		NA		NA	
Benzene			1.6					
Carbon disulfide			0.88	J				
Chloroform								
Ethylbenzene			0.34	J				
Methylene chloride	0.49	J						
Tetrachloroethene								
Toluene			2					
Trichloroethene								
Vinyl chloride								
Xylene, total	1.5	J	3.4					
Semivolatile Organic Compounds (UG/								
1,2-Dichlorobenzene	NA							
2,4-Dimethylphenol	NA		14					
2-Chlorophenol	NA							
2-Methylnaphthalene	NA						1.2	J
2-Methylphenol	NA		0.98	J				
4-Methylphenol	NA		6.2	J				
Acenaphthene	NA		1.2	J			0.91	J
Acenaphthylene	NA							
Anthracene	NA							
Benzo(a)anthracene	NA							
Benzo(a)pyrene	NA							
Benzo(b)fluoranthene	NA							
Benzo(g,h,i)perylene	NA							
Benzo(k)fluoranthene	NA							
Chrysene	NA							
Dibenz(a,h)anthracene	NA							
Dibenzofuran	NA						0.56	J
Diethylphthalate	NA							
Fluoranthene	NA						0.85	J
Fluorene	NA		0.95	J			0.74	J
Indeno(1,2,3-cd)pyrene	NA							
Naphthalene	NA		3.5	J			12	
Pentachlorophenol	NA							
Phenanthrene	NA		2	J	1	J	2	J
Phenol	NA		2.6	J				
Pyrene	NA							
Pyridine	NA							
bis(2-Ethylhexyl)phthalate	NA						17	
Pesticide/Polychlorinated Biphenyls (U								
Aroclor-1248								
Total Metals (UG/L)								
Antimony	NA				4.2	J		
Arsenic	NA		4.5	J	12			

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Blank contamination considered not detected

R - Unreliable result
U - Not detected
UJ - Not detected, estimated
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Table 2.1-3
Detected Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM15-PZM031		TM16-PZM007		TM17-PZM005		TM18-PZM005	
Sample ID								
Sample Date	12/06/01		11/29/01		11/29/01		11/29/01	
Chemical Name								
Barium	NA		30.1	J	261		53.5	J
Beryllium	NA							
Cadmium	NA							
Chromium	NA		16.8				2.2	J
Cobalt	NA				1.5	J		
Copper	NA							
Lead	NA		3.5					
Mercury	NA							
Nickel	NA		10.6	J	3.1	J	2.8	J
Selenium	NA							
Silver	NA				1.6	J		
Thallium	NA							
Tin	NA				35.3	J		
Vanadium	NA		85.9		21.5	J	3.2	J
Zinc	NA		13.6	J	13.4	J	12.2	J
Common Cations (UG/L)								
Calcium	NA		NA		NA		NA	
Iron	NA		NA		NA		NA	
Magnesium	NA		NA		NA		NA	
Mangenese	NA		NA		NA		NA	
Potassium	NA		NA		NA		NA	
Sodium	NA		NA		NA		NA	
Wet Chemistry (MG/L)								
Amenable cyanide	NA		8.6	J	0.12	J	1.2	J
Bicarbonate	NA		NA		NA		NA	
Chloride	NA		NA		NA		NA	
Sulfate	NA		NA		NA		NA	
Sulfide	NA							
Total dissolved solids (TDS)	NA		NA		NA		NA	

NA - Not analyzed
J - Estimated value
K - Value biased high
L - Value biased low
Blank contamination considered not detected

R - Unreliable result
U - Not detected
UJ - Not detected, estimated
UL - Not detected, low bias

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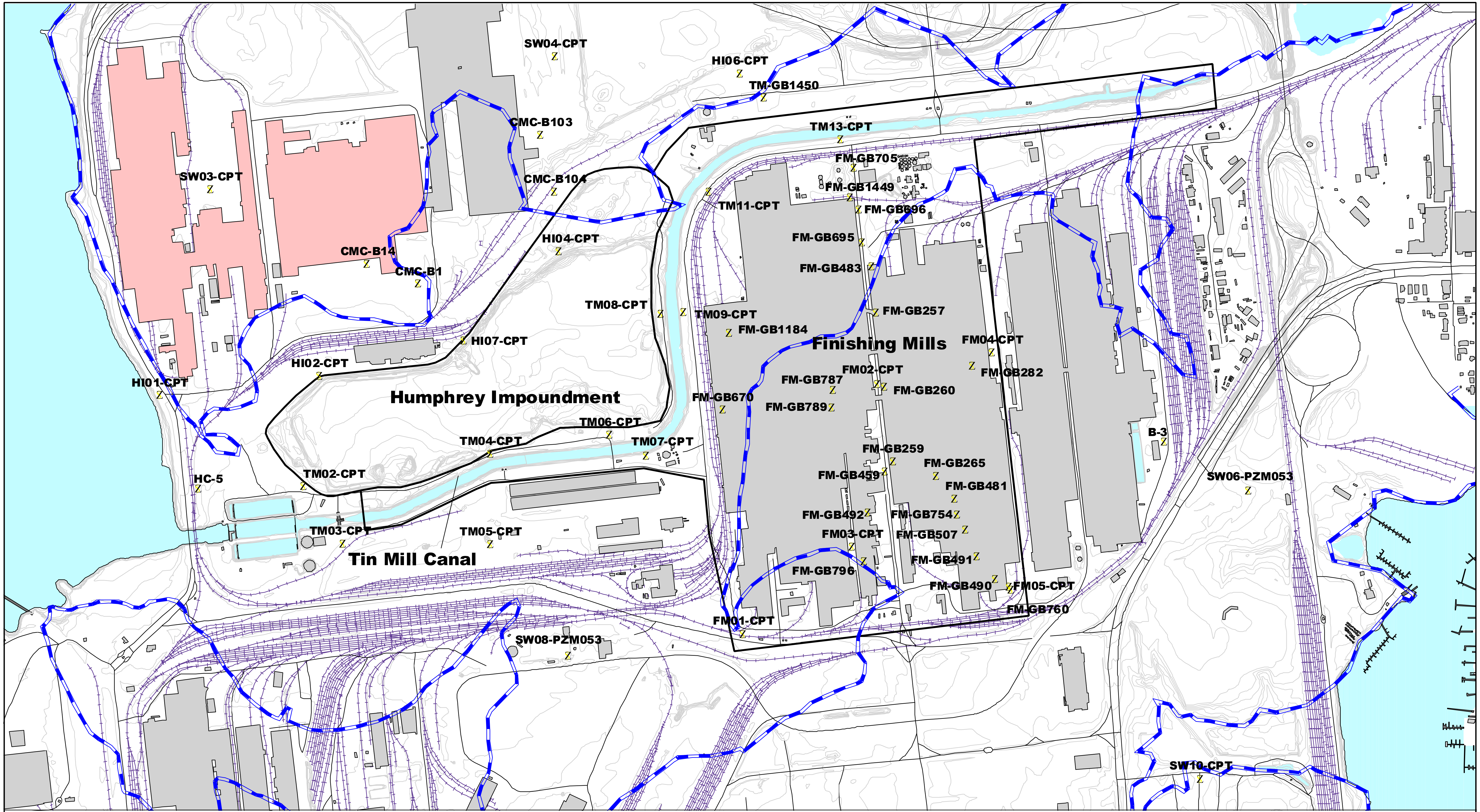

LEGEND

- Z Geologic Investigation Boring Location
- ▭ Special Study Area
- ▭ Water Body
- ■ Dam/Pier/Boat Ramp/Dry Dock
- ■ Existing Buildings
- ■ Demolished Buildings
- ╱╲ Original 1917 Shore Line
- ╱╲ Roads
- ╱╲ Railroads
- ╱╲ Contours (2' Interval)

N

0 400 800 Feet

Figure 2.1-1
Geologic Investigation Locations
Humphrey Impoundment and Tin Mill Canal/Finishing Mills
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

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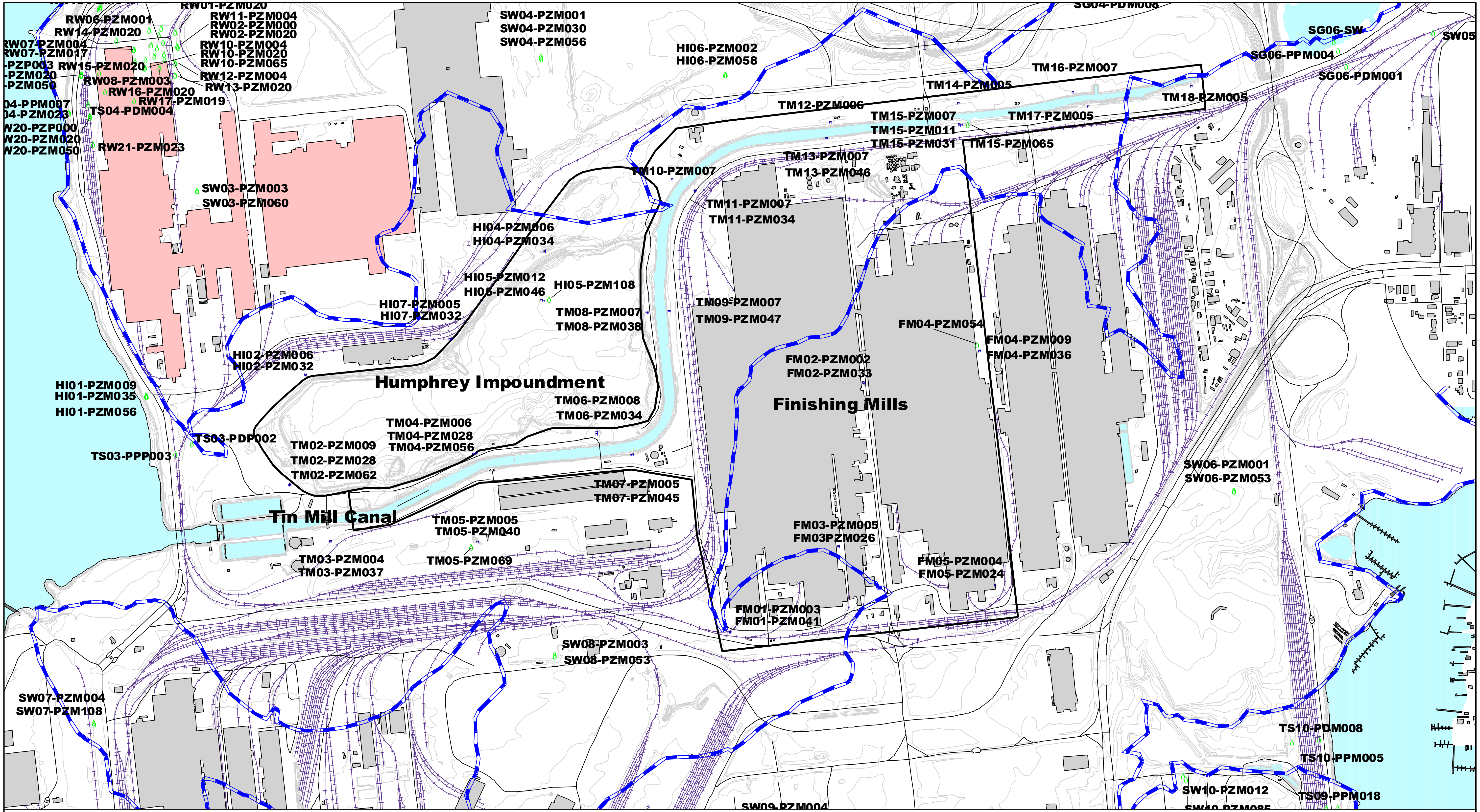

LEGEND

ᵛ Piezometer Location (Groundwater Sampling and Water Level Measurement)

ð Piezometer Location (Water Level Measurement Only)

☐ Special Study Area

🟦 Water Body

■ Dam/Pier/Boat Ramp/Dry Dock

▨ Existing Buildings

🟥 Demolished Buildings

Original 1917 Shore Line

Roads

Railroads

Contours (2' Interval)

N

0 400 800 Feet

Figure 2.1-2
Piezometer Network Locations
Humphrey Impoundment and Tin Mill Canal/Finishing Mills
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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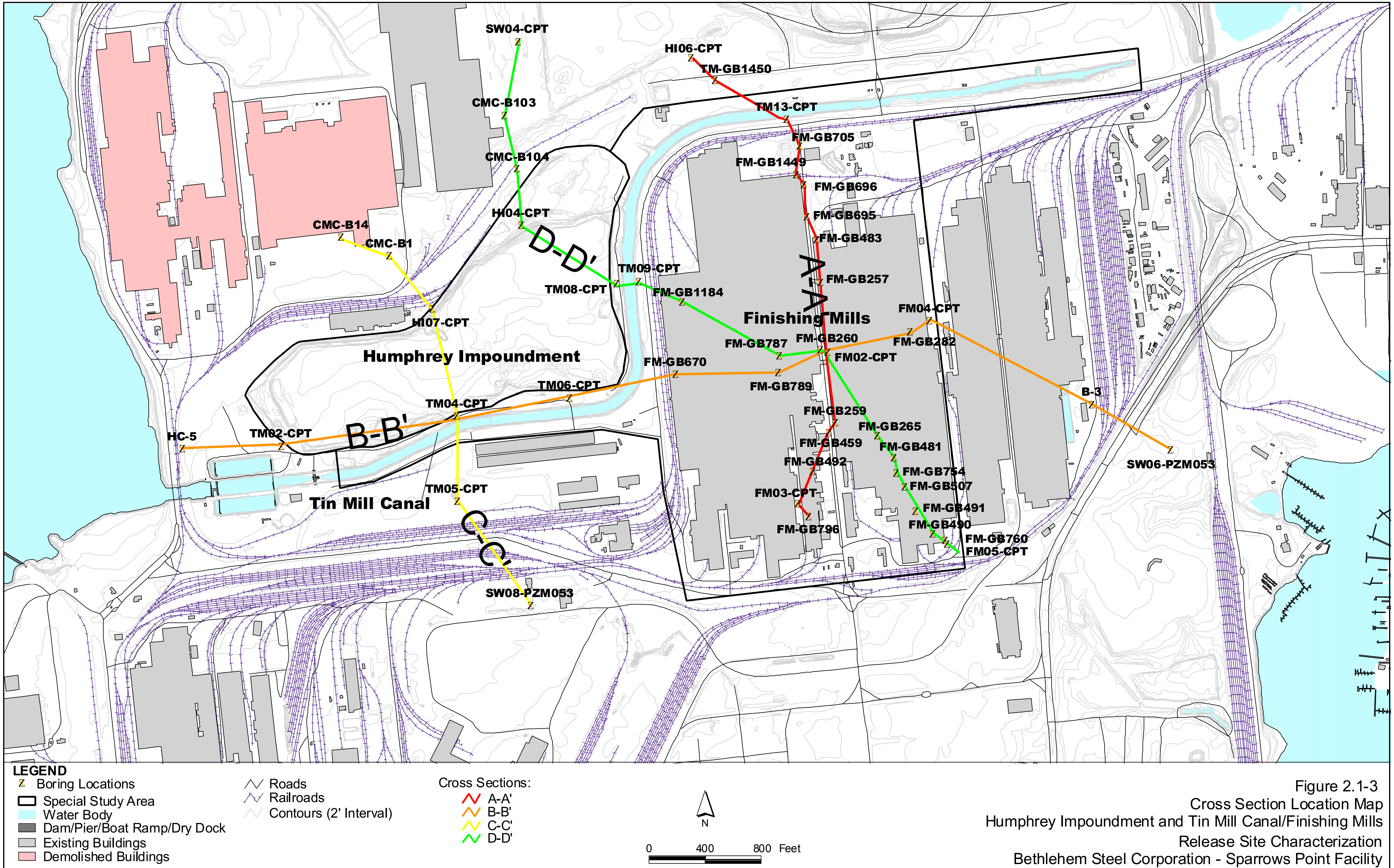

Figure 2.1-3
Cross Section Location Map
Humphrey Impoundment and Tin Mill Canal/Finishing Mills
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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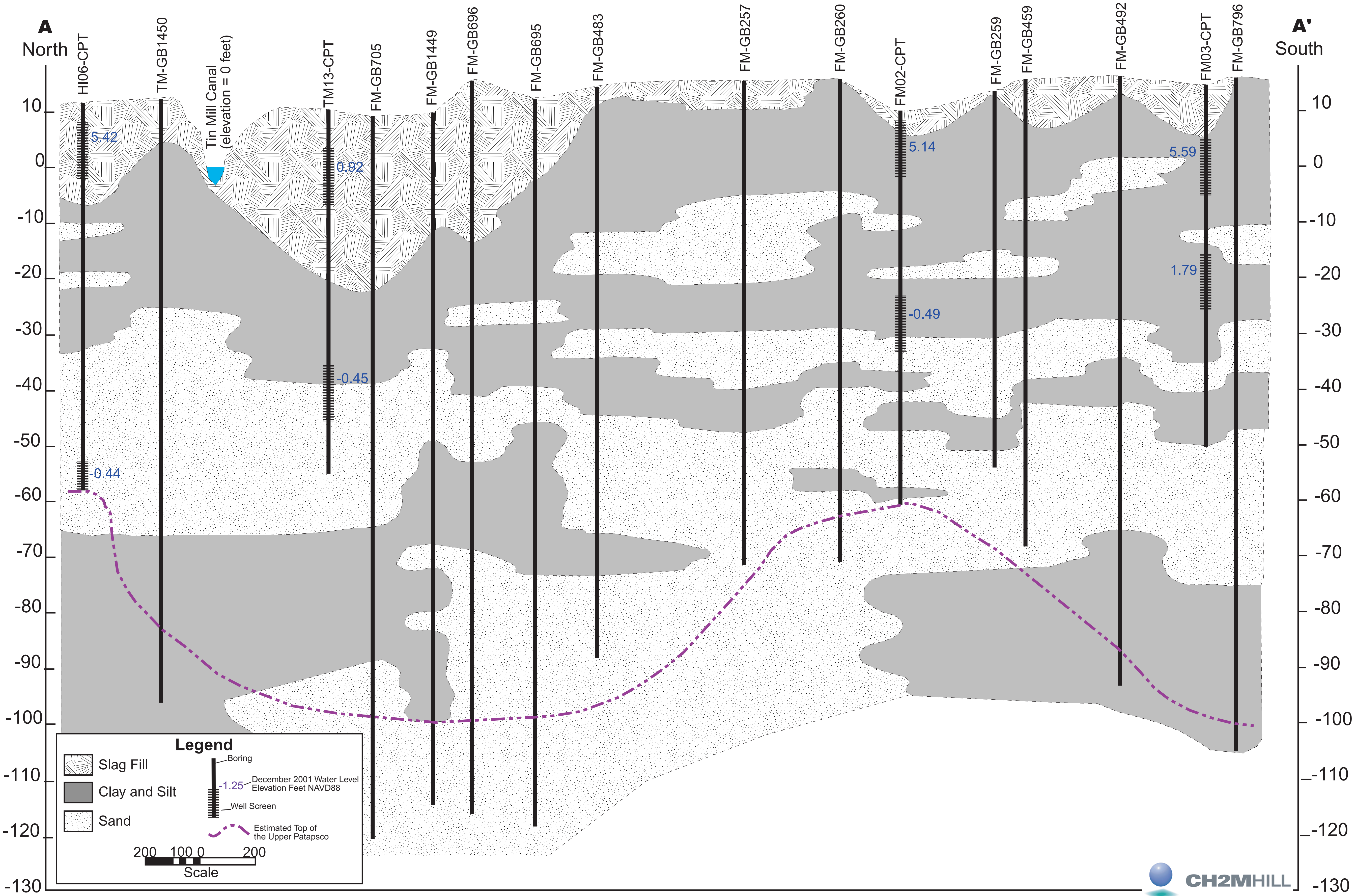
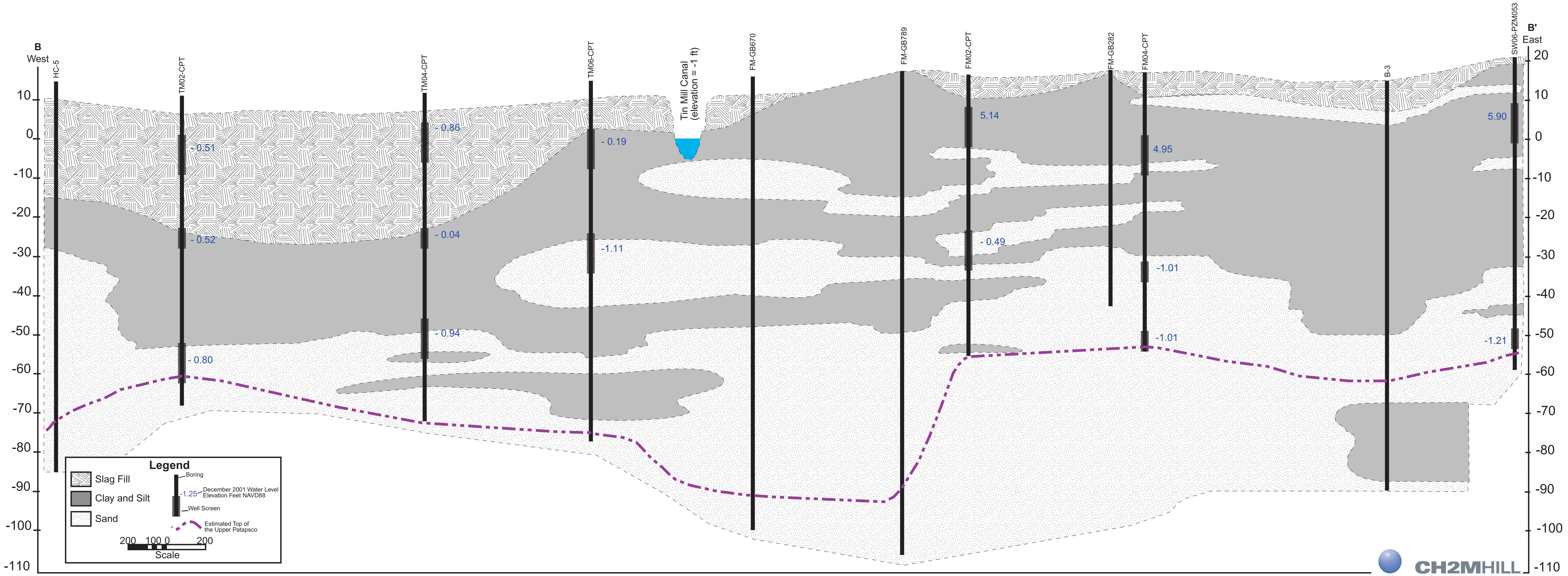


Note: Tin Mill Canal Not to Scale

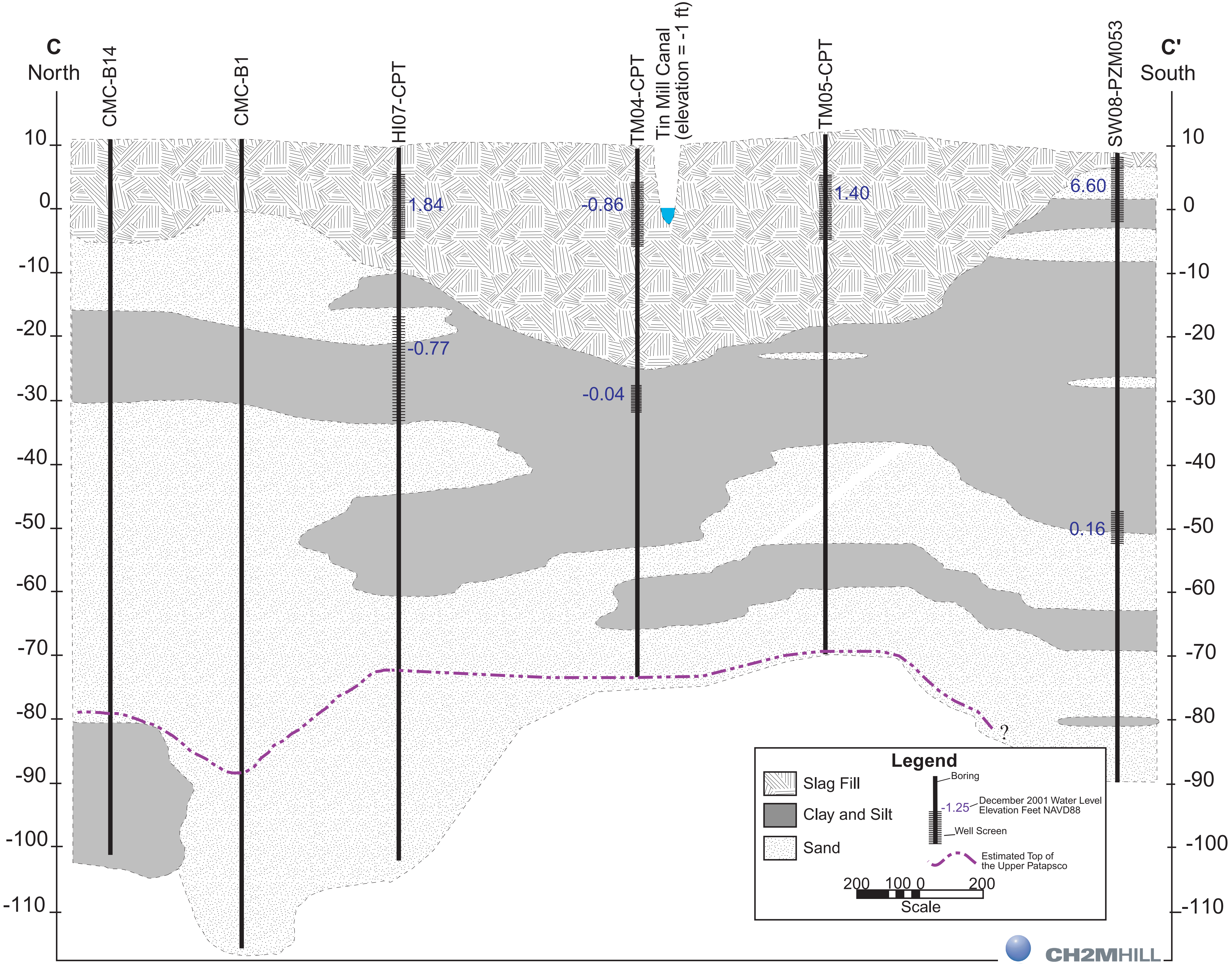
Figure 2.1-4
Section A-A'
Humphrey Impoundment and Tin Mill Canal/Finishing Mills Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility



Note: Tin Mill Canal Not to Scale

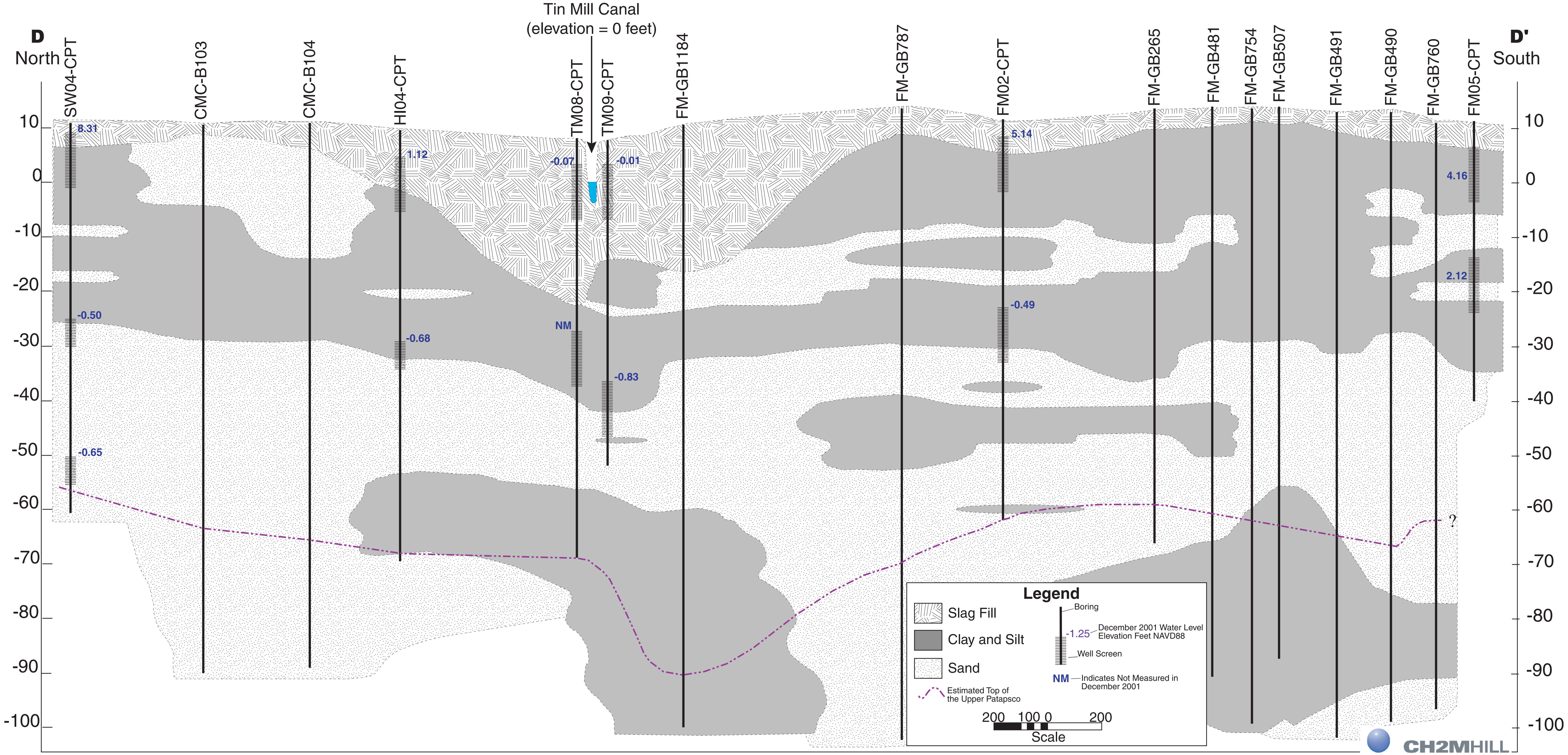
CH2MHILL

Figure 2.1-5
Section B-B'
Humphrey Impoundment and Tin Mill Canal/Finishing Mills Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility



Note: Tin Mill Canal Not to Scale

Figure 2.1-6
Section C-C'
Humphrey Impoundment and Tin Mill Canal/Finishing Mills Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility



Note: Tin Mill Canal Not to Scale

Figure 2.1-7
Section D-D'
Humphrey Impoundment and Tin Mill Canal/Finishing Mills Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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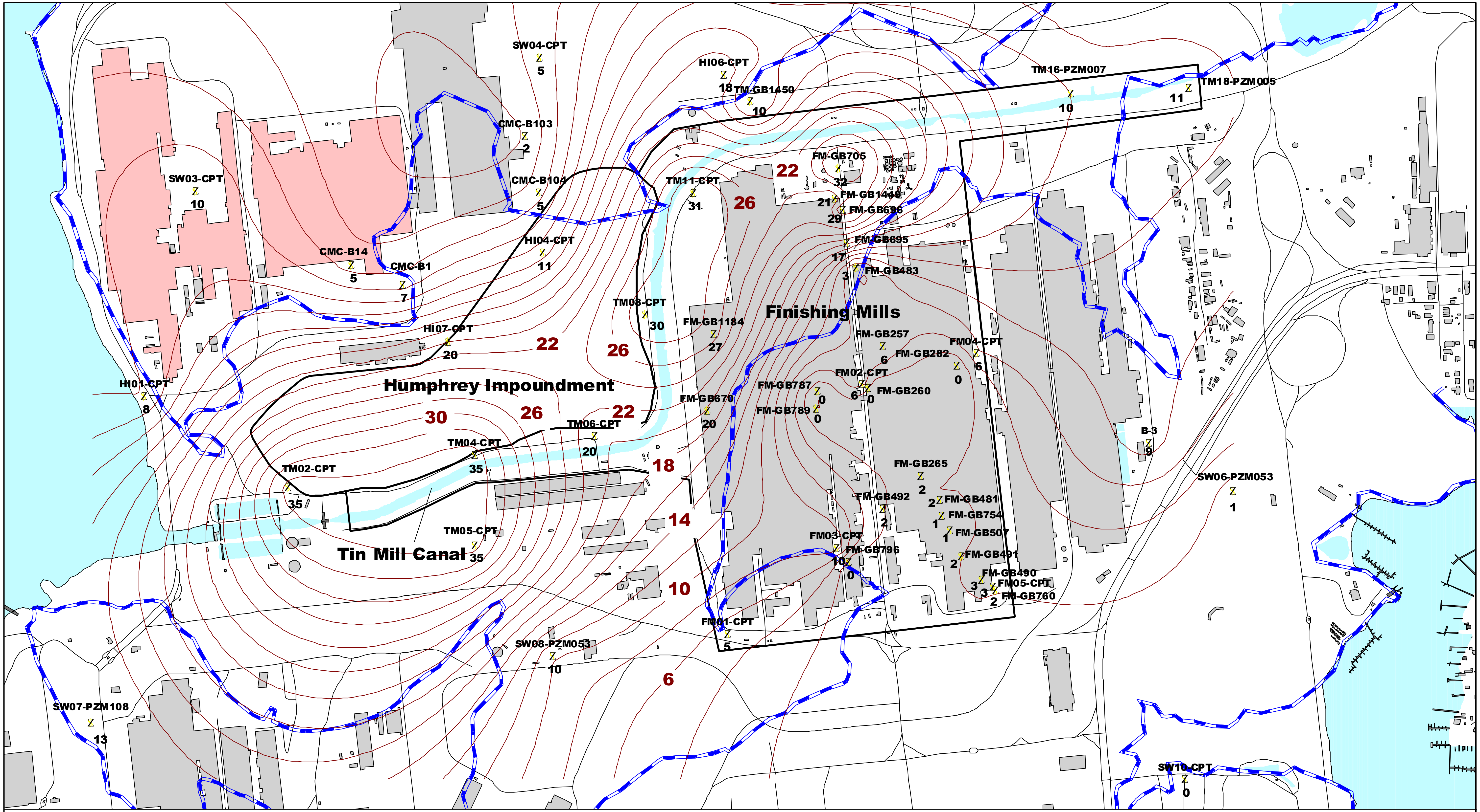

LEGEND
- Z Boring Location
- ╱╲ Slag Thickness (2 ft. Contour Interval)
- ▭ Special Study Area
- 🟦 Water Body
- ■ Dam/Pier/Boat Ramp/Dry Dock
- ▨ Existing Buildings
- 🟥 Demolished Buildings
- ╱╲ Original 1917 Shore Line
- ╱╲ Roads
- ╱╲ Railroads
- ╱╲ Contours (2' Interval)

Figure 2.1-8
Thickness of Slag
Humphrey Impoundment and Tin Mill Canal/Finishing Mills
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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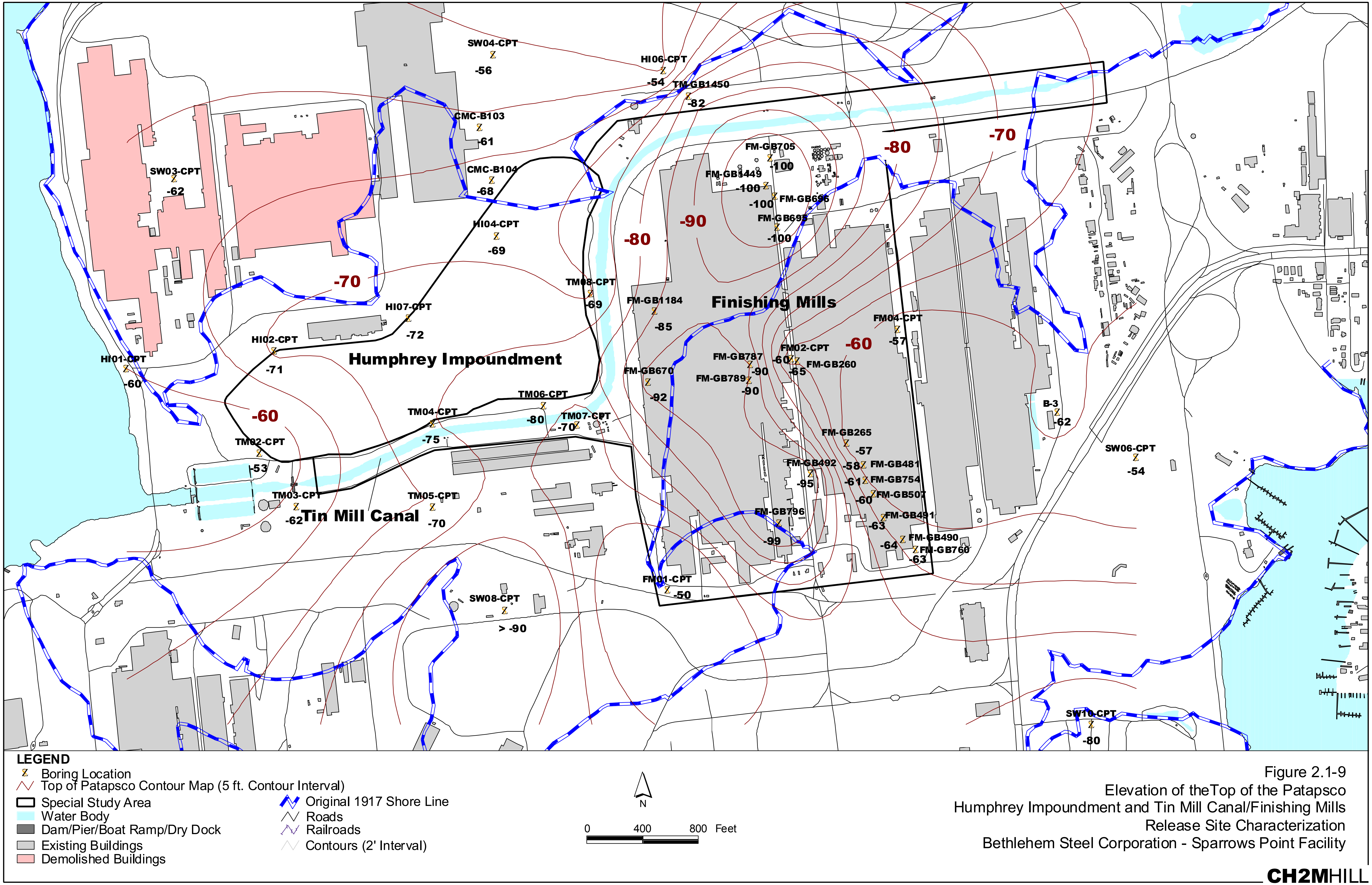

Figure 2.1-9
Elevation of the Top of the Patapsco
Humphrey Impoundment and Tin Mill Canal/Finishing Mills
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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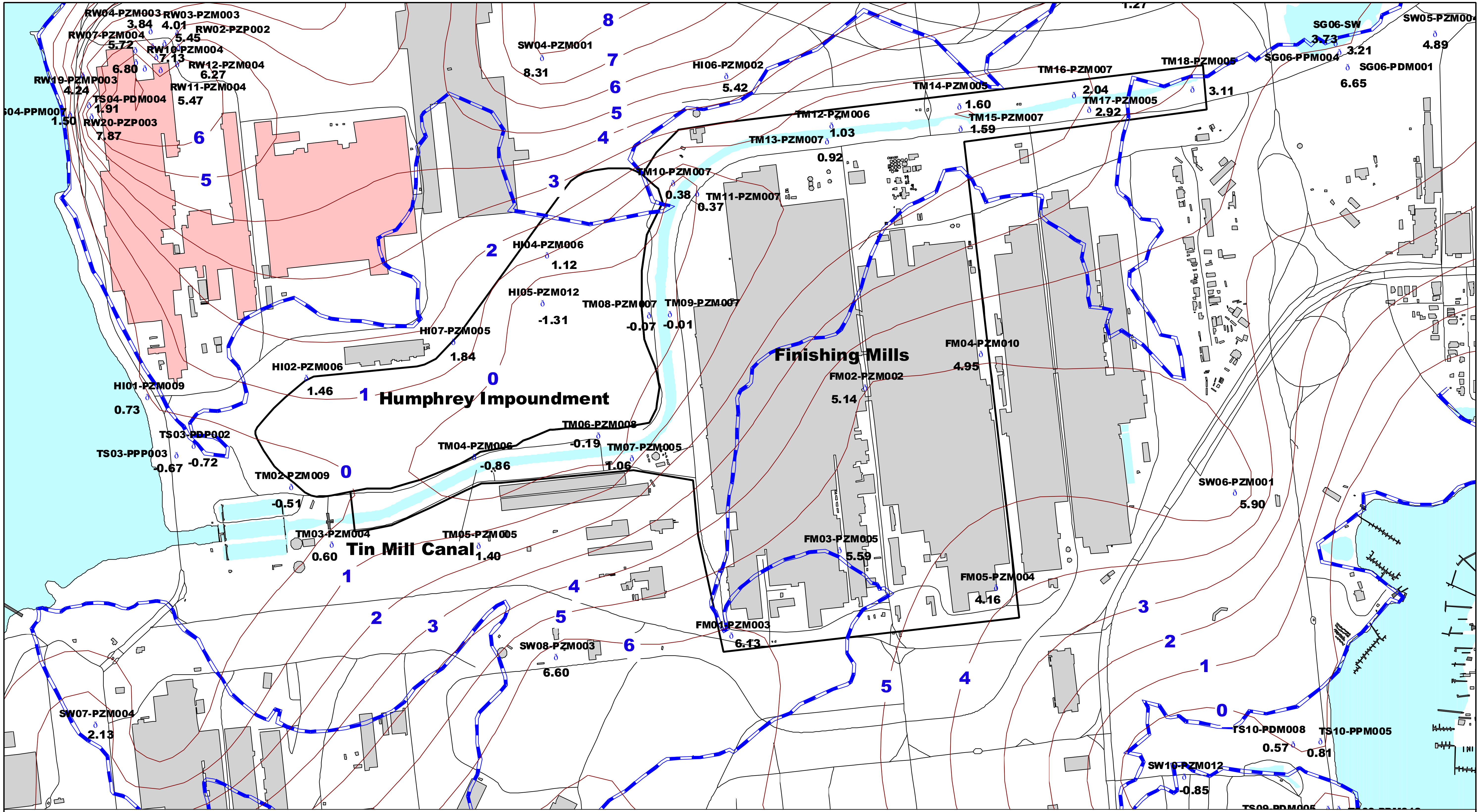

LEGEND

- ♁ Water Table Piezometer
- ╱╲ Water Level Contour (1 Ft. Contour)
- ☐ Special Study Area
- ▭ Water Body
- ■ Dam/Pier/Boat Ramp/Dry Dock
- ▨ Existing Buildings
- ▨ Demolished Buildings
- ╱╲ Original 1917 Shore Line
- ╱╲ Roads
- ╱╲ Railroads

N

0 300 600 Feet

Note: Surface elevation of Bear Creek, Patapsco River, Old Road Bay, and Jones Creek is -1.25 feet NAVD

Figure 2.1-10

Water Level Elevations - December 18, 2001, Water Table
Humphrey Impoundment and Tin Mill Canal/Finishing Mills
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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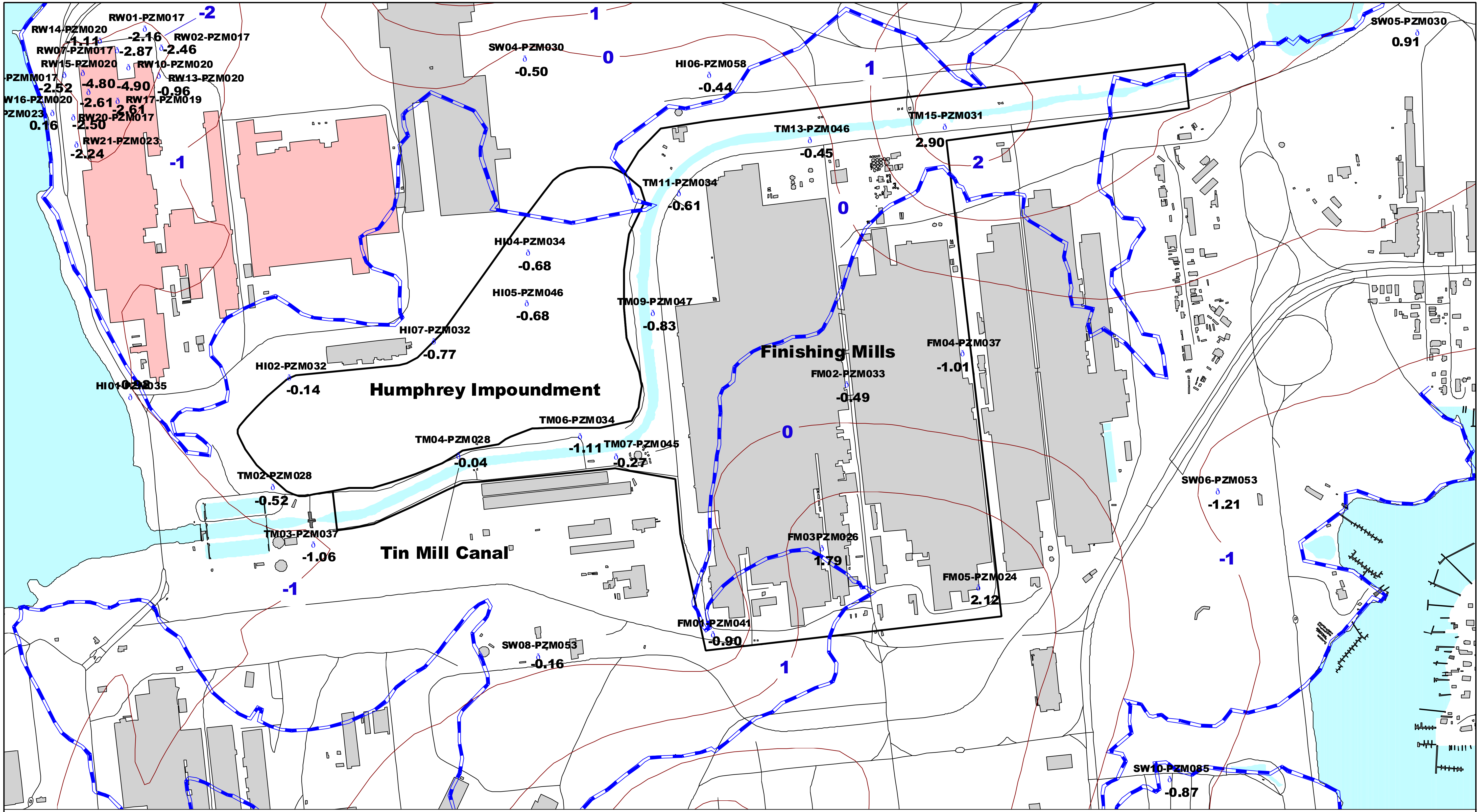

LEGEND

ð Deeper Sand Piezometer

╱╲ Deeper Sand Water Level Contour (1 Ft. Contour)

▭ Special Study Area

🟦 Water Body

■ Dam/Pier/Boat Ramp/Dry Dock

▨ Existing Buildings

🟥 Demolished Buildings

Original 1917 Shore Line

╱╲ Roads

╱╲ Railroads

N

0 400 800 Feet

Note: Surface elevation of Bear Creek, Patapsco River, Old Road Bay, and Jones Creek is -1.25 feet NAVD

Figure 2.1-11
Water Level Elevations - December 18, 2001, Deeper Sand Piezometric Surface
Humphrey Impoundment and Tin Mill Canal/Finishing Mills
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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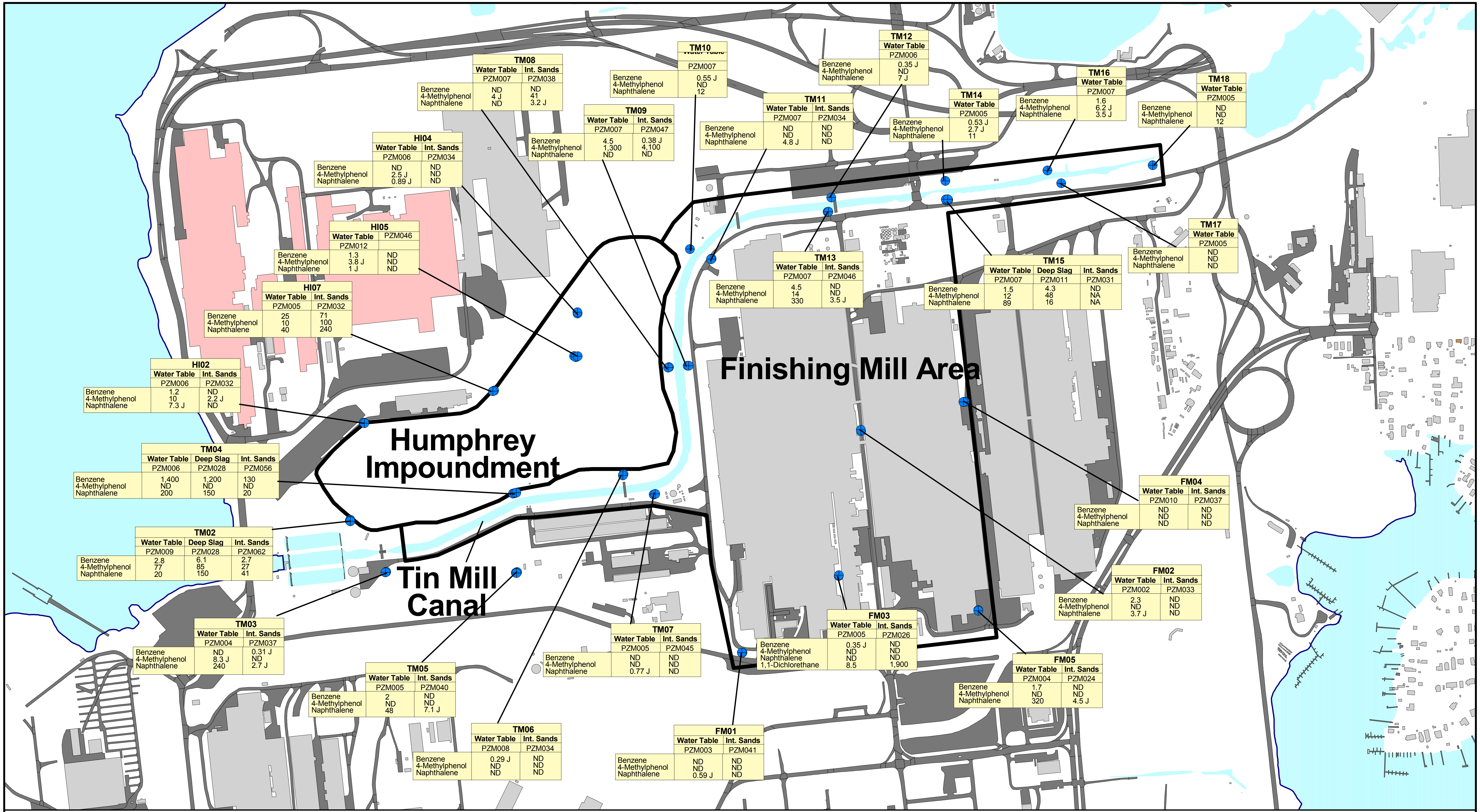

TM08

	Water Table	Int. Sands
	PZM007	PZM038
Benzene	ND	ND
4-Methylphenol	4 J	41
Naphthalene	ND	3.2 J

TM10

	Water Table
	PZM007
Benzene	0.55 J
4-Methylphenol	ND
Naphthalene	12

TM12

	Water Table
	PZM006
Benzene	0.35 J
4-Methylphenol	ND
Naphthalene	7 J

TM16

	Water Table
	PZM007
Benzene	1.6
4-Methylphenol	6.2 J
Naphthalene	3.5 J

TM18

	Water Table
	PZM005
Benzene	ND
4-Methylphenol	ND
Naphthalene	12

TM09

	Water Table	Int. Sands
	PZM007	PZM047
Benzene	4.5	0.38 J
4-Methylphenol	1,300	4,100
Naphthalene	ND	ND

TM11

	Water Table	Int. Sands
	PZM007	PZM034
Benzene	ND	ND
4-Methylphenol	ND	ND
Naphthalene	4.8 J	ND

TM14

	Water Table
	PZM005
Benzene	0.53 J
4-Methylphenol	2.7 J
Naphthalene	11

HI04

	Water Table	Int. Sands
	PZM006	PZM034
Benzene	ND	ND
4-Methylphenol	2.5 J	ND
Naphthalene	0.89 J	ND

HI05

	Water Table	PZM046
	PZM012	
Benzene	1.3	ND
4-Methylphenol	3.8 J	ND
Naphthalene	1 J	ND

TM17

	Water Table
	PZM005
Benzene	ND
4-Methylphenol	ND
Naphthalene	ND

TM13

	Water Table	Int. Sands
	PZM007	PZM046
Benzene	4.5	ND
4-Methylphenol	14	ND
Naphthalene	330	3.5 J

TM15

	Water Table	Deep Slag	Int. Sands
	PZM007	PZM011	PZM031
Benzene	1.5	4.3	ND
4-Methylphenol	12	48	NA
Naphthalene	89	16	NA

HI07

	Water Table	Int. Sands
	PZM005	PZM032
Benzene	25	71
4-Methylphenol	10	100
Naphthalene	40	240

HI02

	Water Table	Int. Sands
	PZM006	PZM032
Benzene	1.2	ND
4-Methylphenol	10	2.2 J
Naphthalene	7.3 J	ND

TM04

	Water Table	Deep Slag	Int. Sands
	PZM006	PZM028	PZM056
Benzene	1,400	1,200	130
4-Methylphenol	ND	ND	ND
Naphthalene	200	150	20

FM04

	Water Table	Int. Sands
	PZM010	PZM037
Benzene	ND	ND
4-Methylphenol	ND	ND
Naphthalene	ND	ND

TM02

	Water Table	Deep Slag	Int. Sands
	PZM009	PZM028	PZM062
Benzene	2.8	6.1	2.7
4-Methylphenol	77	85	27
Naphthalene	20	150	41

FM02

	Water Table	Int. Sands
	PZM002	PZM033
Benzene	2.3	ND
4-Methylphenol	ND	ND
Naphthalene	3.7 J	ND

TM03

	Water Table	Int. Sands
	PZM004	PZM037
Benzene	ND	0.31 J
4-Methylphenol	8.3 J	ND
Naphthalene	240	2.7 J

TM07

	Water Table	Int. Sands
	PZM005	PZM045
Benzene	ND	ND
4-Methylphenol	ND	ND
Naphthalene	0.77 J	ND

FM03

	Water Table	Int. Sands
	PZM005	PZM026
Benzene	0.35 J	ND
4-Methylphenol	ND	ND
Naphthalene	ND	ND
1,1-Dichlorethane	8.5	1,900

TM05

	Water Table	Int. Sands
	PZM005	PZM040
Benzene	2	ND
4-Methylphenol	ND	ND
Naphthalene	48	7.1 J

FM05

	Water Table	Int. Sands
	PZM004	PZM024
Benzene	1.7	ND
4-Methylphenol	ND	ND
Naphthalene	320	4.5 J

TM06

	Water Table	Int. Sands
	PZM008	PZM034
Benzene	0.29 J	ND
4-Methylphenol	ND	ND
Naphthalene	ND	ND

FM01

	Water Table	Int. Sands
	PZM003	PZM041
Benzene	ND	ND
4-Methylphenol	ND	ND
Naphthalene	0.59 J	ND

LEGEND

- ● Piezometer Locations
- Shore Line
- ▇ Roads/Paved Areas
- ▢ Buildings
- ▇ Buildings Under Construction
- ▇ Demolished Buildings
- ▇ Water Bodies

Concentrations in ug/L
J = Estimated Concentration
L = Biased Low
ND = Not Detected
NA = Not Anlayzed

N

500 0 500 1000 Feet

Figure 2.1-12
Indicator Organics - Humphrey Impoundment and
Tin Mill Canal/Finishing Mill Area
Bethlehem Steel Corp. - Sparrows Point Facility

CH2MHILL

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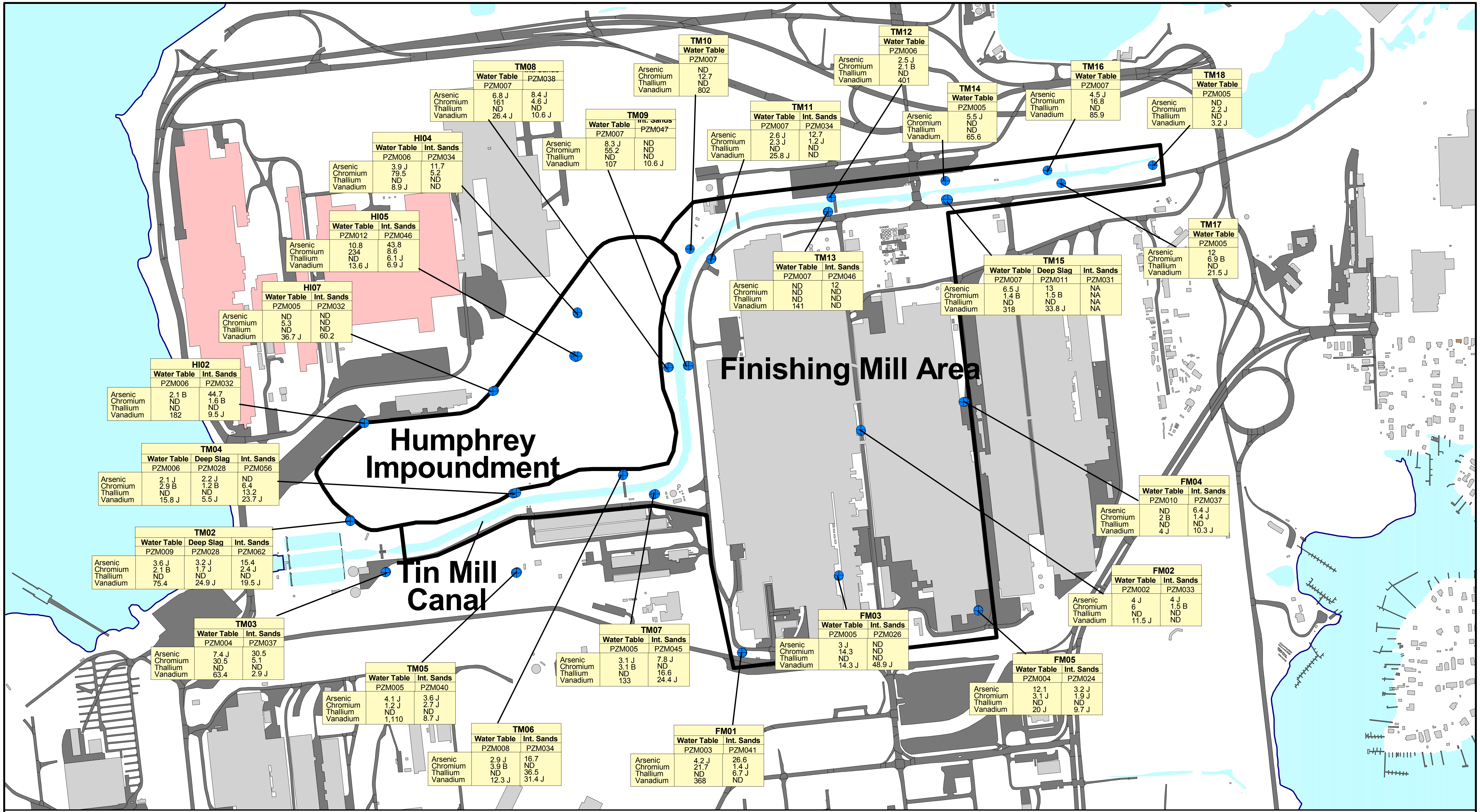

TM10

	Water Table
	PZM007
Arsenic	ND
Chromium	12.7
Thallium	ND
Vanadium	802

TM12

	Water Table
	PZM006
Arsenic	2.5 J
Chromium	2.1 B
Thallium	ND
Vanadium	401

TM08

	Water Table	Int. Sands
	PZM007	PZM038
Arsenic	6.8 J	8.4 J
Chromium	161	4.6 J
Thallium	ND	ND
Vanadium	26.4 J	10.6 J

TM16

	Water Table
	PZM007
Arsenic	4.5 J
Chromium	16.8
Thallium	ND
Vanadium	85.9

TM18

	Water Table
	PZM005
Arsenic	ND
Chromium	2.2 J
Thallium	ND
Vanadium	3.2 J

TM14

	Water Table
	PZM005
Arsenic	5.5 J
Chromium	ND
Thallium	ND
Vanadium	65.6

TM11

	Water Table	Int. Sands
	PZM007	PZM034
Arsenic	2.6 J	12.7
Chromium	2.3 J	1.2 J
Thallium	ND	ND
Vanadium	25.8 J	ND

TM09

	Water Table	Int. Sands
	PZM007	PZM047
Arsenic	8.3 J	ND
Chromium	55.2	ND
Thallium	ND	ND
Vanadium	107	10.6 J

HI04

	Water Table	Int. Sands
	PZM006	PZM034
Arsenic	3.9 J	11.7
Chromium	79.5	5.2
Thallium	ND	ND
Vanadium	8.9 J	ND

HI05

	Water Table	Int. Sands
	PZM012	PZM046
Arsenic	10.8	43.8
Chromium	234	8.6
Thallium	ND	6.1 J
Vanadium	13.6 J	6.9 J

TM17

	Water Table
	PZM005
Arsenic	12
Chromium	6.9 B
Thallium	ND
Vanadium	21.5 J

TM13

	Water Table	Int. Sands
	PZM007	PZM046
Arsenic	ND	12
Chromium	ND	ND
Thallium	ND	ND
Vanadium	141	ND

TM15

	Water Table	Deep Slag	Int. Sands
	PZM007	PZM011	PZM031
Arsenic	6.5 J	13	NA
Chromium	1.4 B	1.5 B	NA
Thallium	ND	ND	NA
Vanadium	318	33.8 J	NA

HI07

	Water Table	Int. Sands
	PZM005	PZM032
Arsenic	ND	ND
Chromium	5.3	ND
Thallium	ND	ND
Vanadium	36.7 J	60.2

HI02

	Water Table	Int. Sands
	PZM006	PZM032
Arsenic	2.1 B	44.7
Chromium	ND	1.6 B
Thallium	ND	ND
Vanadium	182	9.5 J

TM04

	Water Table	Deep Slag	Int. Sands
	PZM006	PZM028	PZM056
Arsenic	2.1 J	2.2 J	ND
Chromium	2.9 B	1.2 B	6.4
Thallium	ND	ND	13.2
Vanadium	15.8 J	5.5 J	23.7 J

FM04

	Water Table	Int. Sands
	PZM010	PZM037
Arsenic	ND	6.4 J
Chromium	2 B	1.4 J
Thallium	ND	ND
Vanadium	4 J	10.3 J

TM02

	Water Table	Deep Slag	Int. Sands
	PZM009	PZM028	PZM062
Arsenic	3.6 J	3.2 J	15.4
Chromium	2.1 B	1.7 J	2.4 J
Thallium	ND	ND	ND
Vanadium	75.4	24.9 J	19.5 J

FM02

	Water Table	Int. Sands
	PZM002	PZM033
Arsenic	4 J	4 J
Chromium	6	1.5 B
Thallium	ND	ND
Vanadium	11.5 J	ND

TM03

	Water Table	Int. Sands
	PZM004	PZM037
Arsenic	7.4 J	30.5
Chromium	30.5	5.1
Thallium	ND	ND
Vanadium	63.4	2.9 J

FM03

	Water Table	Int. Sands
	PZM005	PZM026
Arsenic	3 J	ND
Chromium	14.3	ND
Thallium	ND	ND
Vanadium	14.3 J	48.9 J

TM07

	Water Table	Int. Sands
	PZM005	PZM045
Arsenic	3.1 J	7.8 J
Chromium	3.1 B	ND
Thallium	ND	16.6
Vanadium	133	24.4 J

FM05

	Water Table	Int. Sands
	PZM004	PZM024
Arsenic	12.1	3.2 J
Chromium	3.1 J	1.9 J
Thallium	ND	ND
Vanadium	20 J	9.7 J

TM05

	Water Table	Int. Sands
	PZM005	PZM040
Arsenic	4.1 J	3.6 J
Chromium	1.2 J	2.7 J
Thallium	ND	ND
Vanadium	1,110	8.7 J

TM06

	Water Table	Int. Sands
	PZM008	PZM034
Arsenic	2.9 J	16.7
Chromium	3.9 B	ND
Thallium	ND	36.5
Vanadium	12.3 J	31.4 J

FM01

	Water Table	Int. Sands
	PZM003	PZM041
Arsenic	4.2 J	26.6
Chromium	21.7	1.4 J
Thallium	ND	6.7 J
Vanadium	368	ND

LEGEND

- ● Piezometer Locations
- Shore Line
- ▬ Roads/Paved Areas
- ▭ Buildings
- ▬ Buildings Under Construction
- ▬ Demolished Buildings
- ▬ Water Bodies

Concentrations in ug/L
J = Estimated Concentration
L = Biased Low
B = Detected in Associated Blank
ND = Not Detected
NA = Not Anlayzed

N

500 0 500 1000 Feet

Figure 2.1-13
Indicator Metals - Humphrey Impoundment and
Tin Mill Canal/Finishing Mill Area
Bethlehem Steel Corp. - Sparrows Point Facility

CH2MHILL

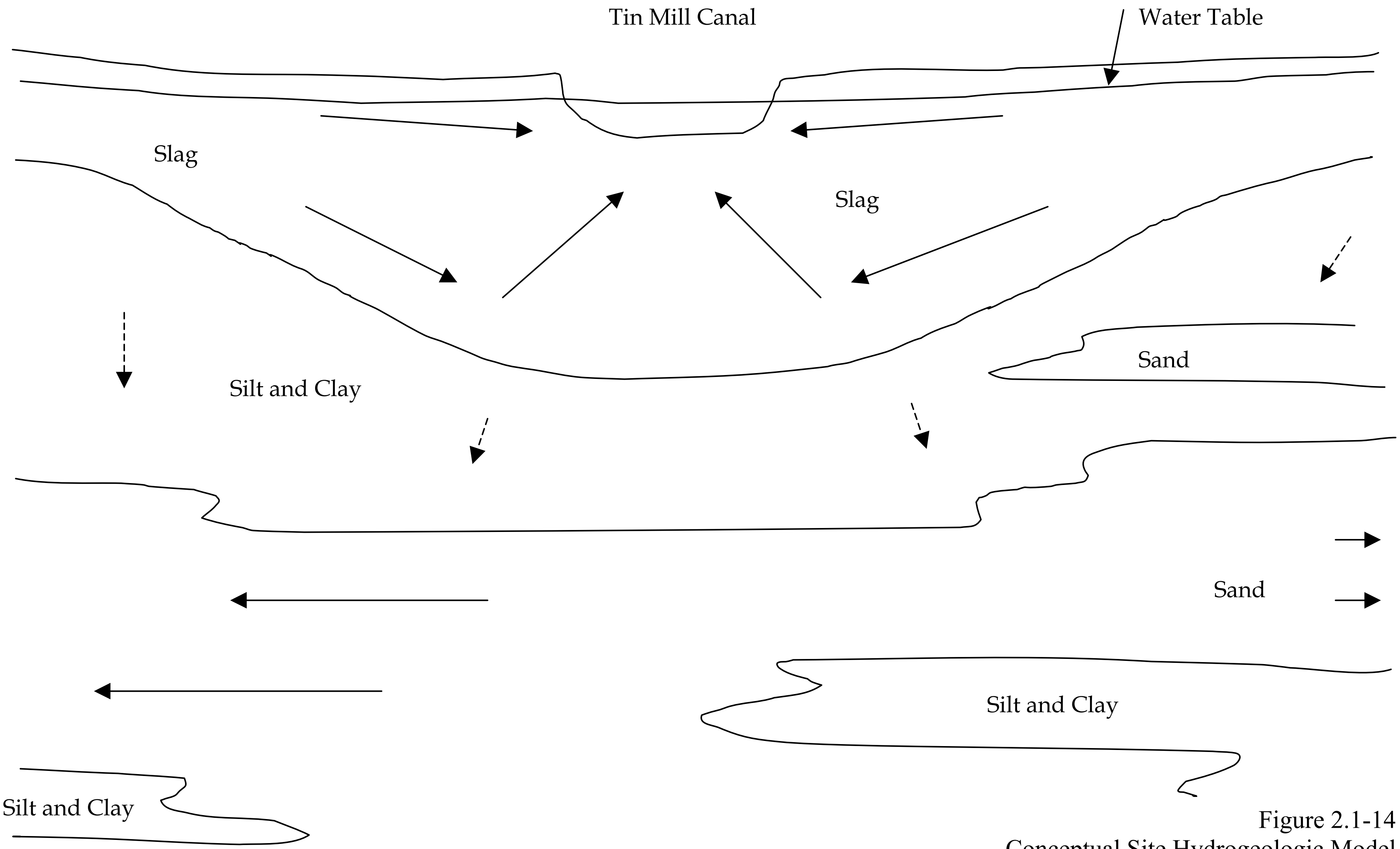

Figure 2.1-14
Conceptual Site Hydrogeologic Model
Humphrey Impoundment and Tin Mill Canal/Finishing Mills Areas
Release Site Characterization
Bethlehem Steel Corporation—Sparrows Point Facility

Boring Logs

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER HI02-PZM006

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 10/10/2001 END:10/10/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)				STANDARD PENETRATION TEST RESULTS	CORE DESCRIPTION	COMMENTS
	INTERVAL (FT)					
		RECOVERY (FT)				
			#/TYPE	6"-6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	3-5	1.4	1	6-17-19-18 (36)	(GP) Dry Sandy Slag Fill Gravel. Black Munsell = 2.5Y 2.5/1	
5						
						9.74 BGS Water Table ▼
10						
	10-12	0.2	2	8-6-5-6 (11)	(GM) Wet Silty Slag Fill Gravel. Gravel is Pale Yellow Munsell = 2.5Y 8/3 Silt is Very Dark Grayish Brown Munsell = 2.5Y 3/2	
15						
	15-17	1.8	3	6-8-8-8 (16)	(ML) Silty Clay with little Sand Greenish Black Munsell = GLEY1 2.5/1 10GY.	Bottom of boring
20						
25						

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER HI04-PZM006

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 09/26/2001 END: 09/26/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	3-5	1.4	1	3-4-4-6 (8)	(GC) Dry Clayey, Sandy Slag Fill Gravel. Olive Brown Munsell = 2.5Y 4/3	
5						
						9.74 BGS Water Table ▼
10						
	10-12	0	2	3-5-3-2 (8)	No Recovery	
15						
	15-17	1.5	3	5-1-5-8 (6)	(GC) Wet Clayey, Sandy Slag Fill Gravel. Black Munsell = GLEY1 2.5/n	Wet Treated Wood Recovered in Spoon Bottom of boring
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER TM03-PZM004

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS 9.5 BGS
START : 09/19/2001 END: 09/19/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					<u>SLAG FILL</u>, granular silty slag fill	
	3-5	1.5	1	3-9-6-19 (15)	(GM) Dry Silty Gravel Slag. Black Munsell=5Y2.5/1	
5						
	8-10	1	2	10-16-18-59 (34)	(GM) Dry Silty Gravel Slag. Black Munsell=5Y2.5/1	Water Table ▼
10						
	13-15	1.2	3	9-9-8-7 (17)	(GM) Wet Silty Gravel Slag. Very dark Brown Munsell=7.5YR 2.5/3	
15						Bottom of boring
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER TM08-PZM007

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 09/26/2001 END: 9/26/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	3-5	1.5	1	8-13-9-9 (22)	[GC] Dry Sandy Clayey Slag Fill Gravel- Dark Green Grey Munsell = GLEY1 3/gy	
5						
						7.3 BGS Water Table ▼
	8-10	0.8	2	4-3-6-8 (9)	[GC] Wet Clayey Oily Slag Fill Gravel. Black Munsell = GLEY1 2.5/n	
10						
	12-14	0.75	3	12-16-7-8 (23)	[GW] Wet Oily Slag Fill Gravel. Black Munsell = GLEY1 2.5/n	Bottom of boring
15						
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER TM10-PZM007

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 09/21/2001 END:09/21/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	2-2.83	0.4	1	38-100/4	(SM) Dry Silty Sand with Slag Gravel. Black Munsell=7.5YR 2.5/1	
5						
	7-8	1.5	2	91-100/6	(SM) Damp Silty Sand with Slag Gravel. Black Munsell=5Y 2.5/1	Water table at 7.9 BGS Water Table ▼
10						
15	11-5-4-3	0.9	3	11-5-4-3 (9)	(GC) Wet Clayey Slag Gravel Dark Olive Grey Munsell=5Y3/2	Bottom of boring
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER TM11-PZM007

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 37159

END: 09/25/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	3-5	1.25	1	13-69-34-14 (103)	(SM) Wet Sand Silt Slag Gravel Olive Grey Munsell=5Y 5/2	
5						
10						
	10-12	2	2	16-9-7-7 (16)	(GM) Wet Slag Gravel With Sand, Silt and Clay. Dark Grayish Brown Munsell=10YR 4/2	Water Table ▼
15						
	15-17	2	3	9-6-14-8 (20)	(GM) Wet Slag Gravel With Sand, Silt and Clay. Dark Grayish Brown Munsell=10YR 4/2	Bottom of boring
20						
25						

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER TM12-PZM006

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel LOCATION : Sparrows Point, MD
ELEVATION : DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS : START : 09/25/2001 END: 09/25/2001 LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	3-5	1.8	1	5-14-15-20 (29)	(GP) Dry Slag Gravel with little sand Dark Red Munsell =10R3/6 and Dark Grey Munsell=2.5Y 4/1	
5						
	8-10	1	2	15-10-7-10 (17)	(GM) Wet Slag Gravel with Sand, Silt and Clay. Olive Brown Munsell=2.5Y4/4	Water Table ▼
10						
	13-15	1.2	3	9-12-6-5 (18)	(GM) Wet Slag Gravel with Sand, Silt and Clay. Black Munsell=2.5Y 5/1 and Grey Munsell= 2.5 6/1	
15						Bottom of boring
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER TM13-PZM007

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 09/24/2001 END: 09/24/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
						Looks like finely ground slag
	3-5	0.5	1	4-5-5-4 (10)	(SM) Dry Silty Sands with Trace Clay. Very Dark Grayish Brown. Munsell=10YR 3/2	
5						
	8-10	0.02	2	1-0-0-0 (0)	(SM) Damp Silty Sands with Trace Clay. Very Dark Grayish Brown. Munsell=10YR 3/2	Water Table ▼
10						
	13-15	2	3	24-66-79-35 (145)	(SC) Wet Very Stiff Clayey Sand with Silt and some Slag Gravel. Black Munsell=2.5Y 2.5/1.	
15						Bottom of boring
20						
25						

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER TM16-PZM007

SHEET 1 OF 1

SOIL BORING LOG

P

LOCATION : Sparrows Point, MD

E

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 09/24/2001 END: 09/24/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	2-4	0.5	1	13-21-26-35 (47)	(SM) Dry Silt Sand and Slag Gravel. Black Munsell=2.5Y 2.5/1	
5						
	5-7	1	2	15-15-12-13 (27)	(SM) Damp Silt Sand and Slag Gravel. Dark Olive Grey Munsell=5Y 3/2	
						Water Table ▼
10						
	13-15	1.8	3	1-2-16-13 (18)	(CL) Medium Stiff, Medium Dense Wet Clay with some silt. Penetrometer=0.5. Greenish Black Munsell=GLEY1 10GY	
15						Bottom of boring
20						
25						

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PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER TM17-PZM005

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 09/24/2001 END: 09/24/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	3-5	1.6	1	8-21-18-18 (39)	(CL) Very Stiff Dry Silty Clay. Penetrometer=3 Dark Greenish Grey Munsell=GLEY1 4/10y	
5						
						Water Table ▼
	8-10	2	2	2-3-1-3 (4)	(CL) Soft Moist Clay with Trace Silt. Penetrometer=0.25 Greenish Grey Munsell = GLEY 2 6/5BG	
10						
	12-14	2	3	1-1-1-1 (2)	(CL) Soft Moist Clay. Penetrometer ≅0.1 Greenish Grey Munsell=GLEY1 6/10Y	Bottom of boring
15						
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER TM18-PZM005

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 09/24/2001 END: 09/24/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	3-5	0.9	1	39-52-34-16 (86)	(SM) Dry Silt sand and Slag Gravel. Black Munsell=2.5Y 2.5/1	
5						
						Water Table ▼
	8-10	2	2	0-12-3-5 (15)	(CL) Medium Stiff Loose Wet Clay with Silt and Little Slag Gravel. Penetrometer= 0.5. Greenish Black Munsell=GLEY 1 2.5/1	
10						
	12-14	2	3	10-4-8-9 (12)	(SC) Wet Medium Stiff, Dense, Clayey Sand-Sandy Clay. Penetrometer=2.0-2.5 Greyish Brown Munsell=2.5Y 5/2	Bottom of boring
15						
20						
25						

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER FM01-PZM003

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 09/21/2001 END:09/21/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
5						Water Table ▼
	5-6.9	0.9	1	7-4-21-100/5 (25)	(SM) Wet Silt-Sand with Gravel Very Dark Grey Munsell= 10YR 3/Y	
10						
	10-12	2	2	4-1-1-1 (2)	(CL) Wet Very Soft Silty Clay Penetrometer=0 Dark Greenish Grey Munsell = GLey1 4/1	Clay organic in nature, fibrous material embedded in the clay. Fibrous material from a plant (possibly a phragmites). Bottom of boring
15						
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER FM03-PZM005

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 09/21/2001 END:09/21/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	3-5	0.5	1	3-4-8-10 (12)	(GC) Wet Clayey gravel slag with trace silt. Munsell=Gley2 10YR/4 4/6	Soils saturated from two days of rains. Water table determined from surrounding wells.
5						Water Table ▼
	8-10	1.4	2	3-10-28-70 (38)	(GM) Wet Silty Gravel slag with trace clay. Munsell= 2.5YR 3/2	
10						Bottom of well set at 14' BGS
	13-15	2	3	4-6-6-8 (12)	(CL) Medium stiff silty clay. Penetrometer=0.75 Munsell= Gley2 7/4	
15						Bottom of boring
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER FM05-PZM004

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 09/21/2001 END:09/21/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0					SLAG FILL, granular silty slag fill	
	1-3	1.8	1	12-9-8-6 (17)	(SC) Stiff Dense Moist Clay and Sand with Silt. Penetrometer=1.5 Olive Yellow Munsell=2.5Y 6/6	
5						
	5-7	2	2	3-5-4-6 (9)	(SC) Medium Stiff, Medium Loose Moist Clay Sand Mix. Penetrometer=0.25 Dark Olive Grey Munsell= 5Y 3/2	Water Table ▼
10						
	12-14	2	3	3-5-7-8 (12)	(OH) Damp, Dense, Medium Stiff Clay Penetrometer=2.0 Olive and Grey Munsell= 5Y6/1 &5/6	Clay exhibits a set of thin laminae of varying color Bottom of boring
15						
20						
25						

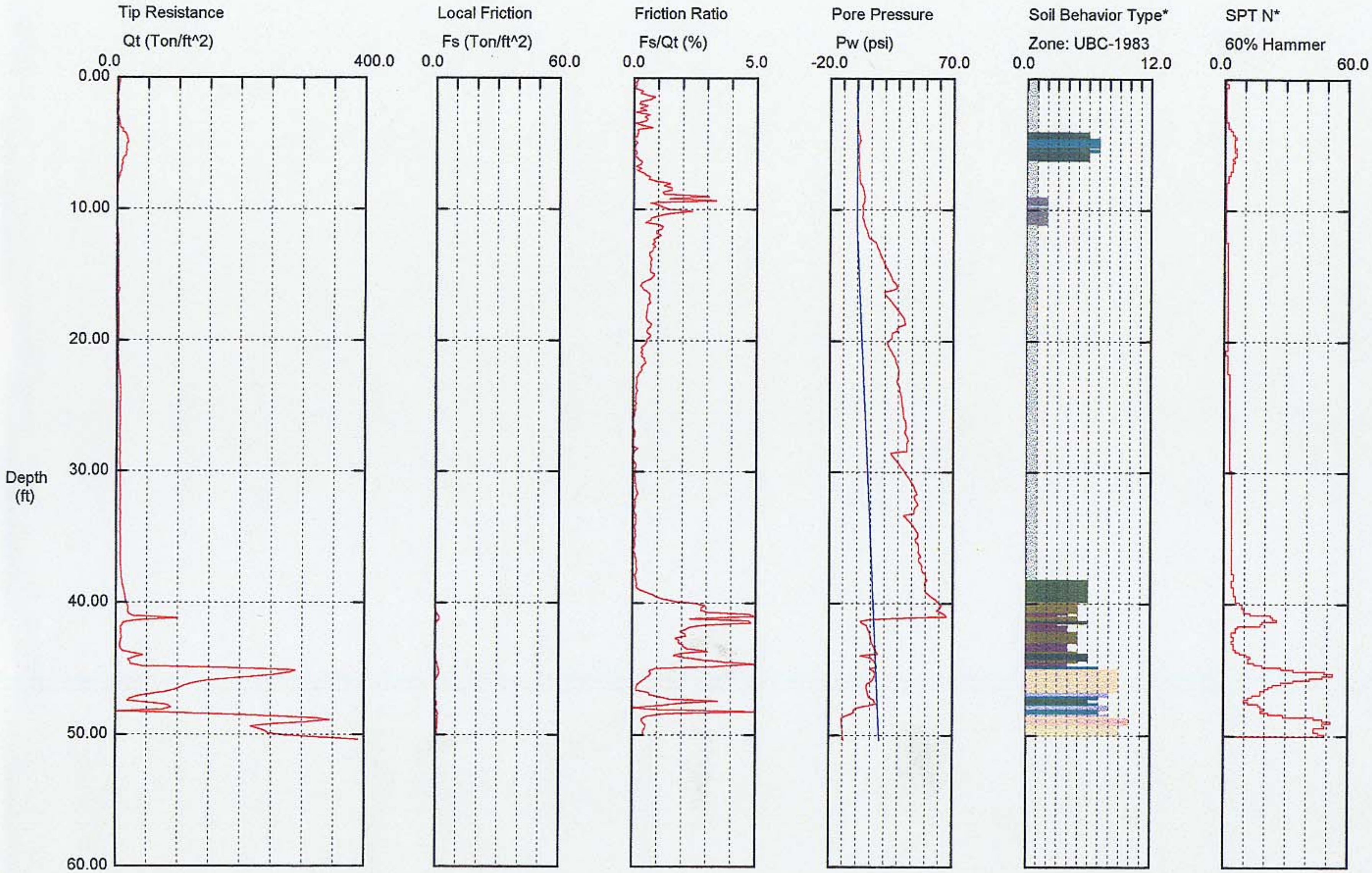
CPT Logs

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 160016
Cone Used: 416

CPT Date/Time: 09-17-01 07:49
Location: FM - 01
Job Number: BETH STEEL



Maximum Depth = 50.36 feet

Depth Increment = 0.16 feet

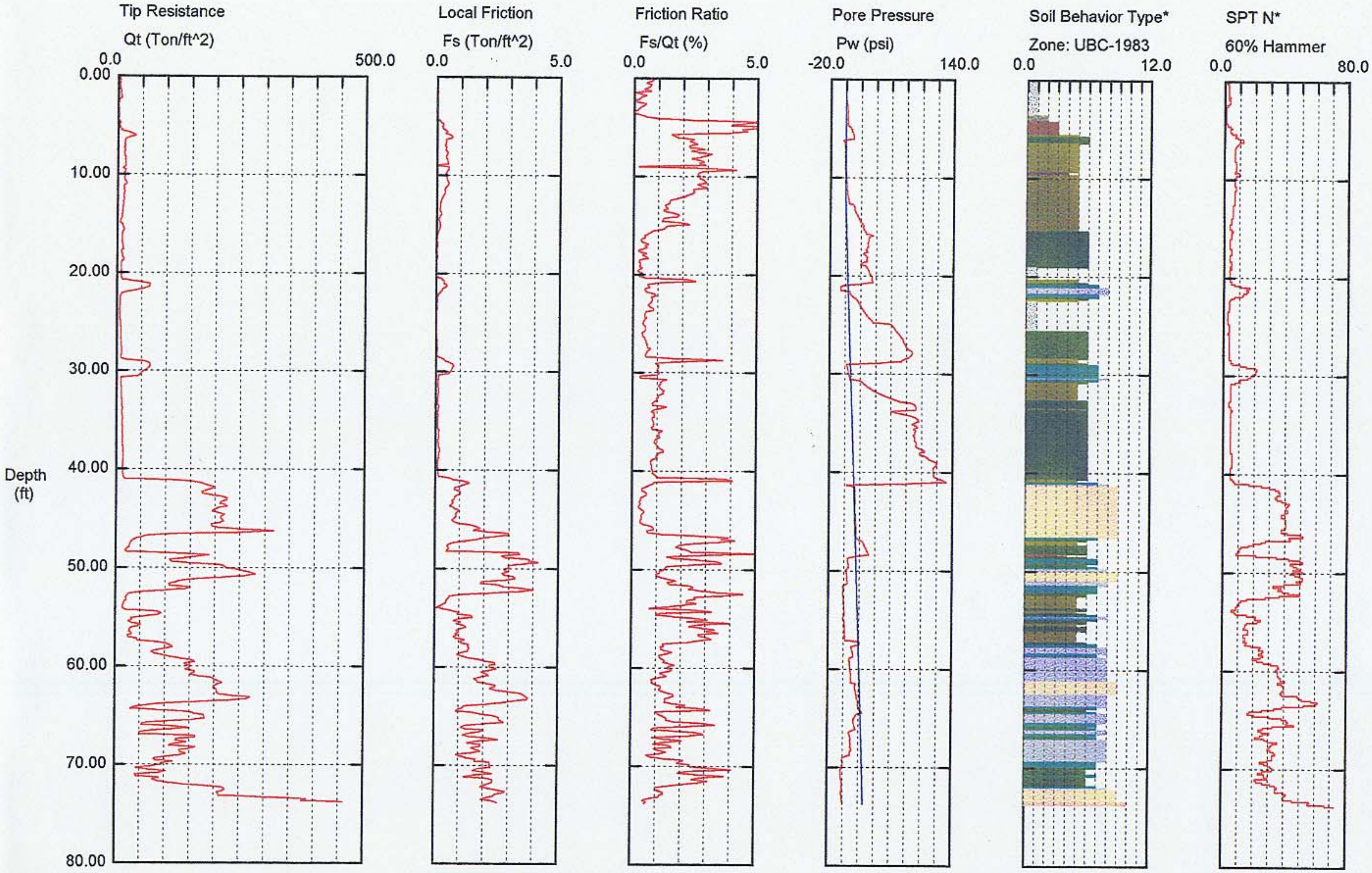
▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay
▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt
▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 160014
Cone Used: 416

CPT Date/Time: 09-15-01 08:03
Location: FM - 02
Job Number: BETH STEEL



Maximum Depth = 73.82 feet

Depth Increment = 0.16 feet

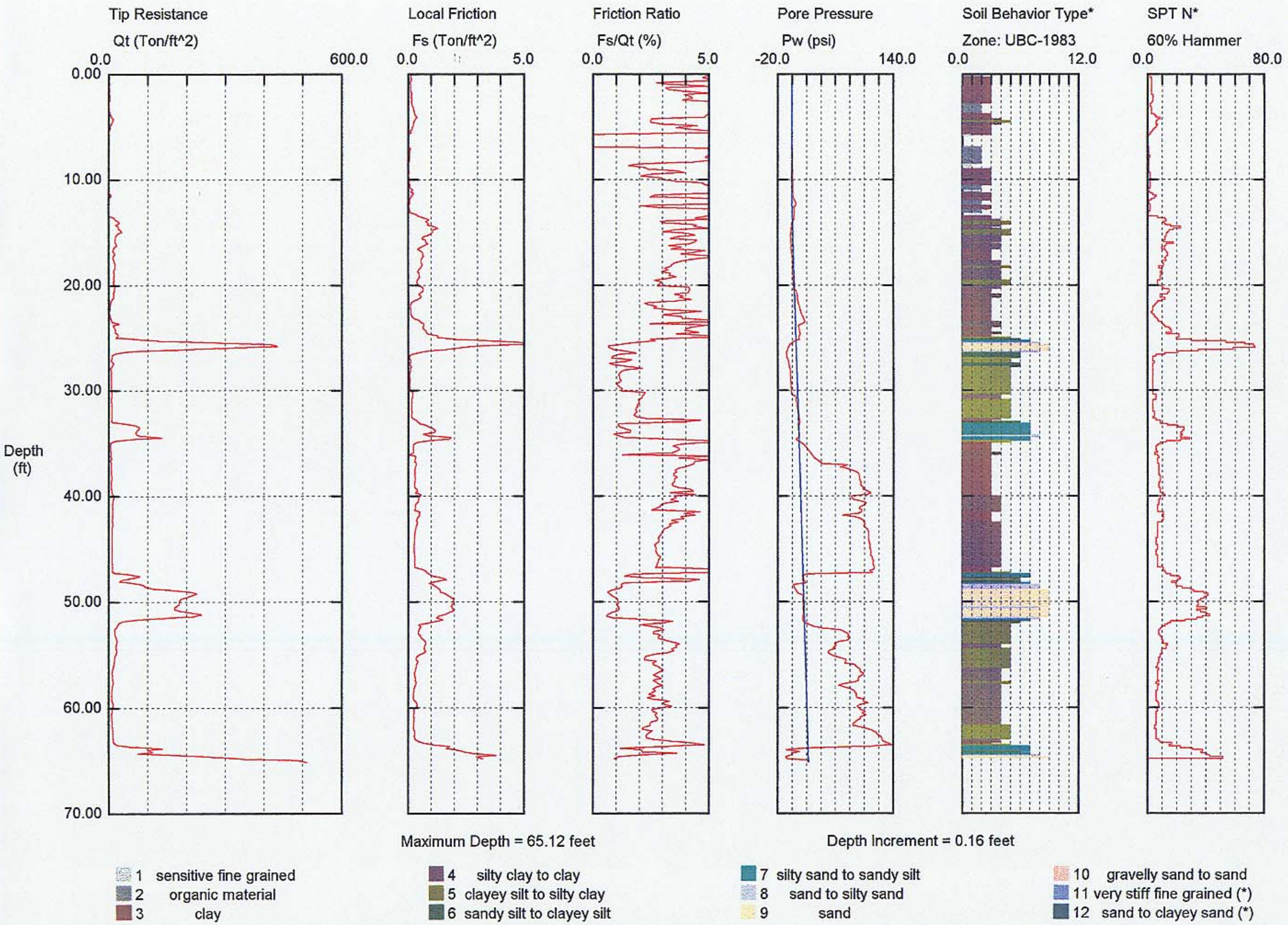
▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay
▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt
▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 160018
Cone Used: 416

CPT Date/Time: 09-17-01 11:50
Location: FM - 03
Job Number: BETH STEEL

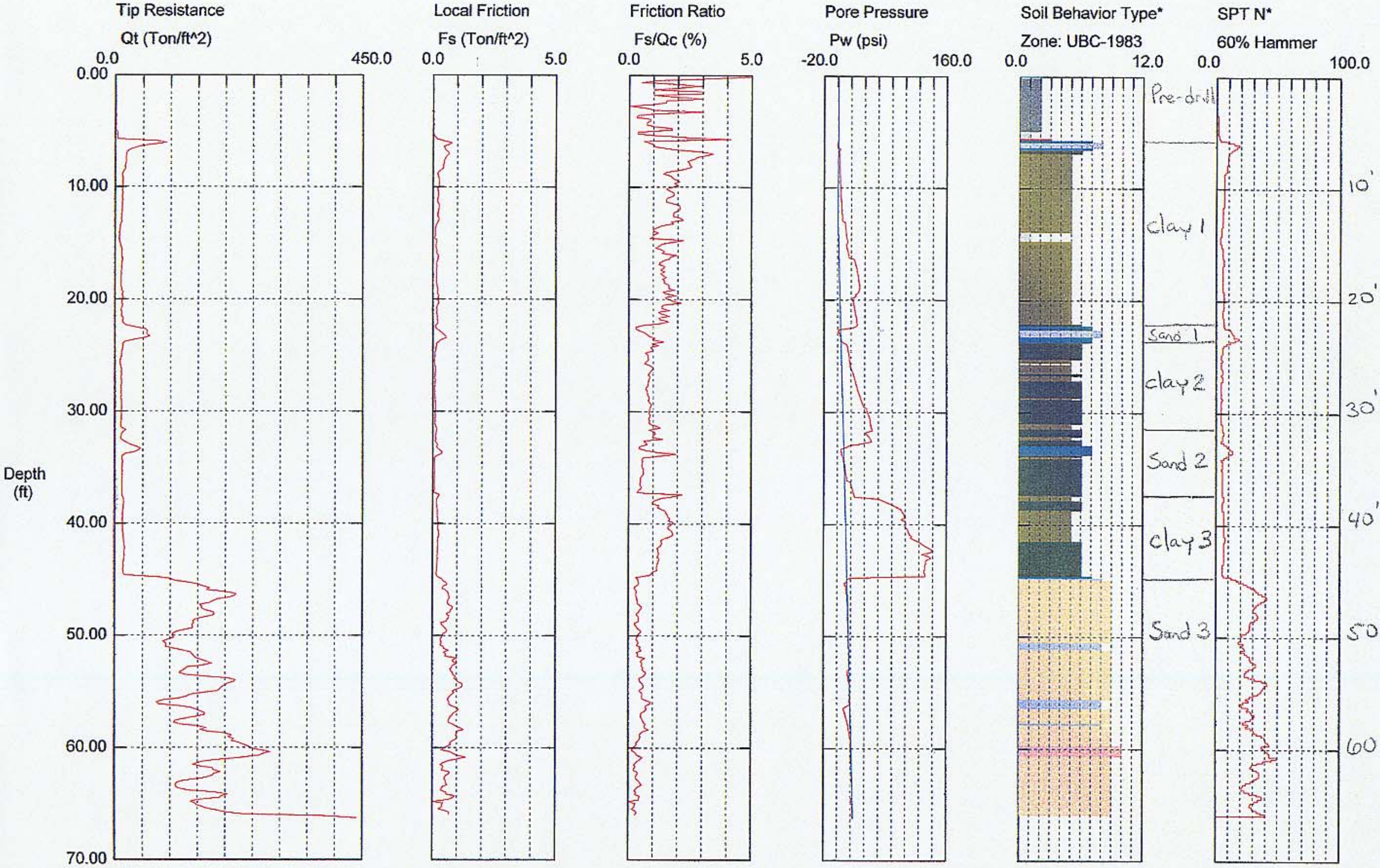


*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 139046
Cone Used: 419

CPT Date/Time: 09-21-00 10:01
Location: FM - 04A - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 66.27 feet

Depth Increment = 0.16 feet

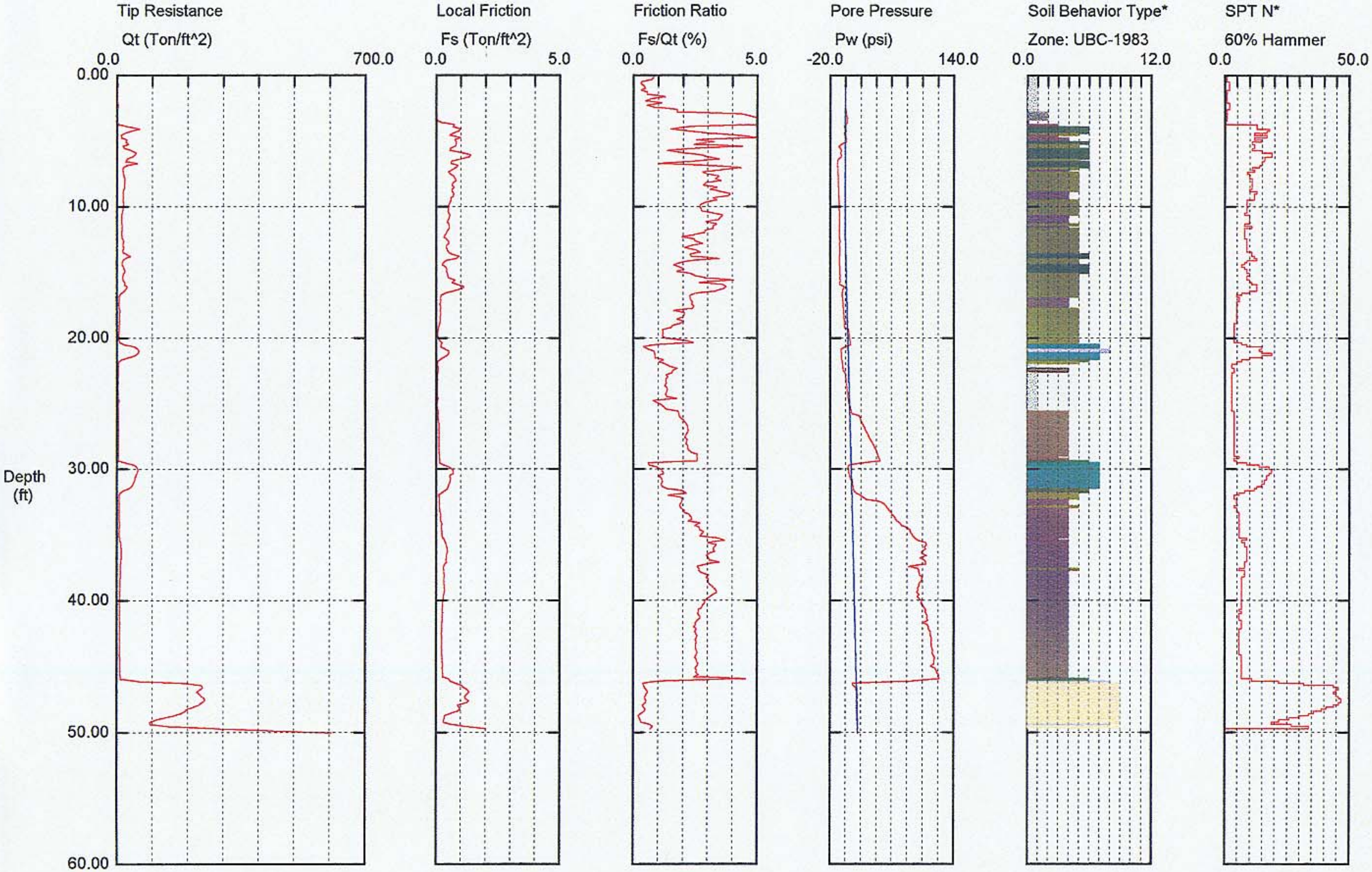
- ▨ 1 sensitive fine grained
- ▨ 2 organic material
- ▨ 3 clay
- ▨ 4 silty clay to clay
- ▨ 5 clayey silt to silty clay
- ▨ 6 sandy silt to clayey silt
- ▨ 7 silty sand to sandy silt
- ▨ 8 sand to silty sand
- ▨ 9 sand
- ▨ 10 gravelly sand to sand
- ▨ 11 very stiff fine grained (*)
- ▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 160017
Cone Used: 416

CPT Date/Time: 09-17-01 09:43
Location: FM - 05
Job Number: BETH STEEL



Maximum Depth = 50.03 feet

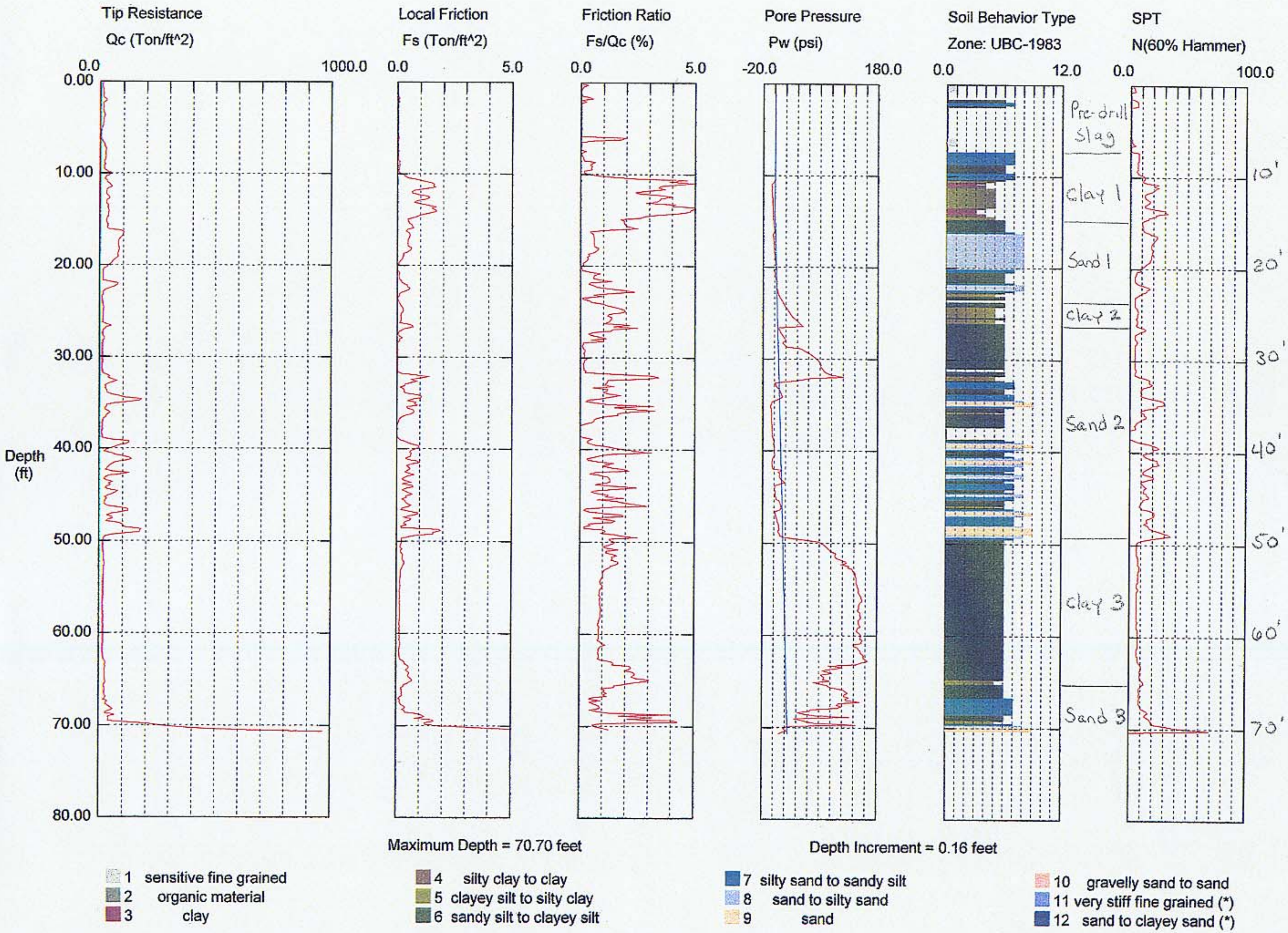
Depth Increment = 0.16 feet

▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay
▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt
▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

E2S

Operator: AL MYERS
Sounding: 139010
Cone Used: 419

CPT Date/Time: 09-05-00 12:29
Location: HI - 01 - CPT
Job Number: CH2MHILL BETH ST

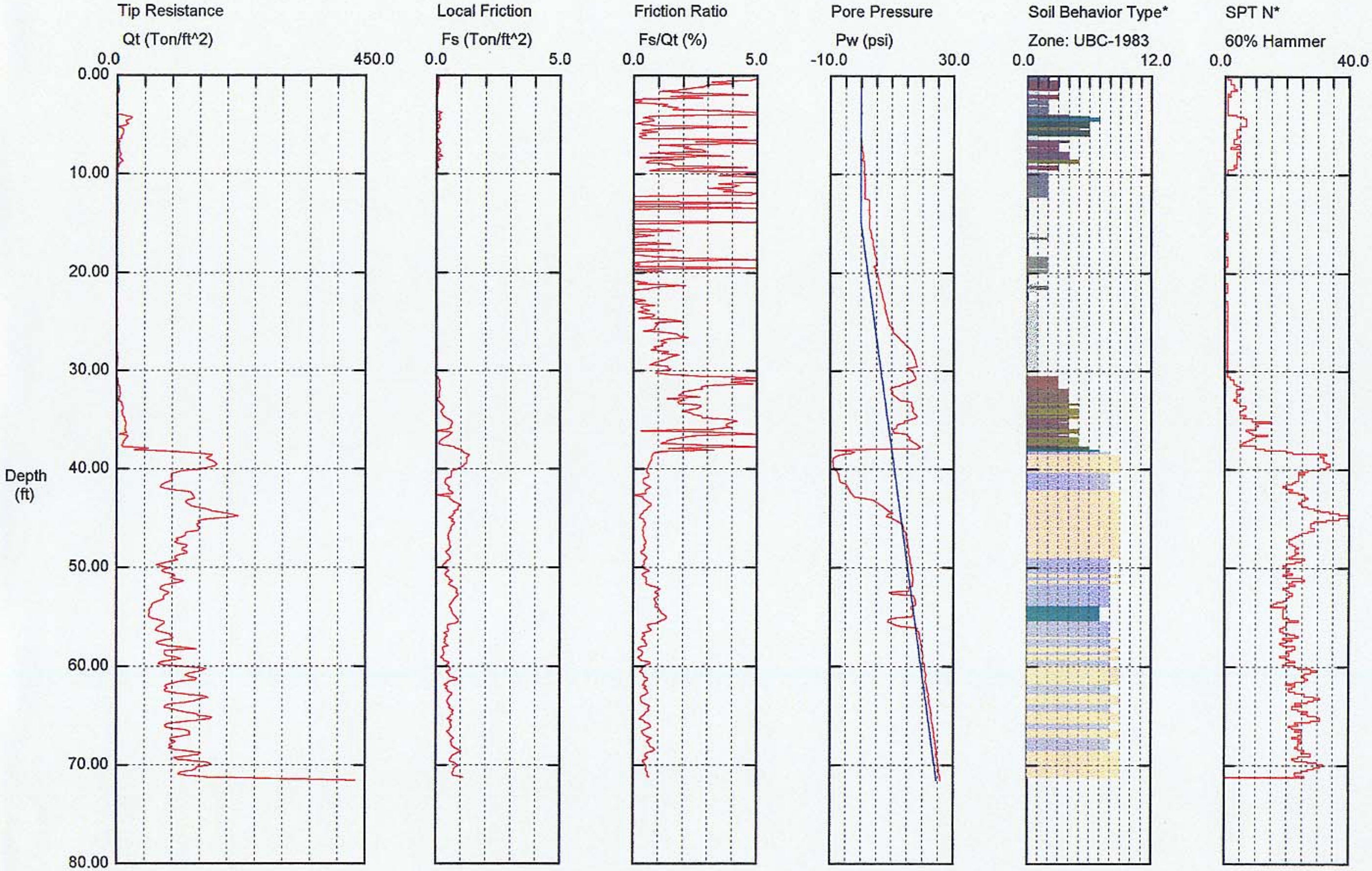


*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: DAN FINCHAM
Sounding: 160010
Cone Used: 416

CPT Date/Time: 09-13-01 07:58
Location: HI - 02
Job Number: BETH STEEL



Maximum Depth = 71.52 feet

Depth Increment = 0.16 feet

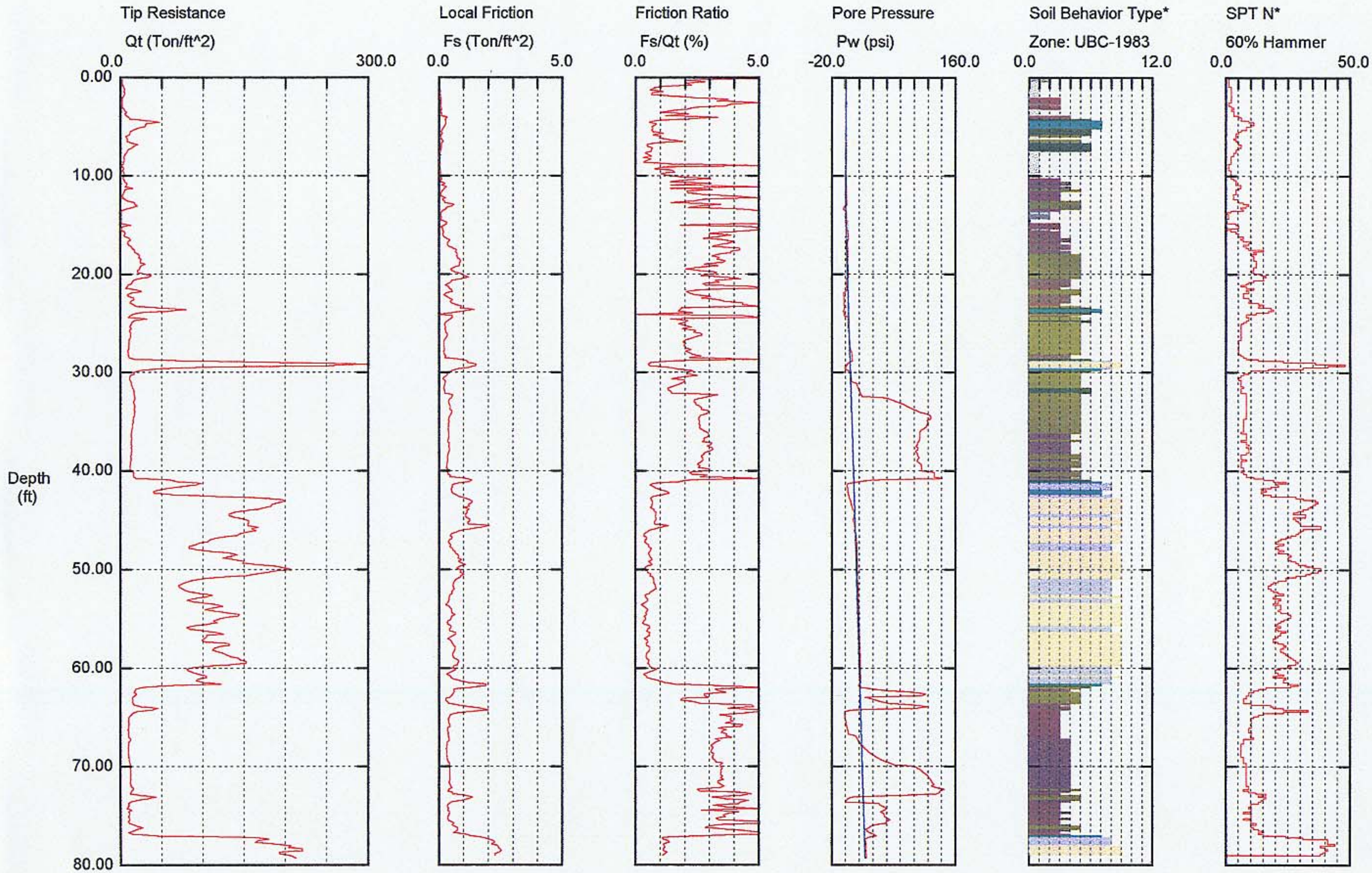
▨ 1 sensitive fine grained	▨ 4 silty clay to clay	▨ 7 silty sand to sandy silt	▨ 10 gravelly sand to sand
▨ 2 organic material	▨ 5 clayey silt to silty clay	▨ 8 sand to silty sand	▨ 11 very stiff fine grained (*)
▨ 3 clay	▨ 6 sandy silt to clayey silt	▨ 9 sand	▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Hogentogler & Co

Operator: DAN FINCHAM
Sounding: 160008
Cone Used: 416

CPT Date/Time: 09-12-01 09:55
Location: H - 104
Job Number: BETH STEEL



Maximum Depth = 79.40 feet

Depth Increment = 0.16 feet

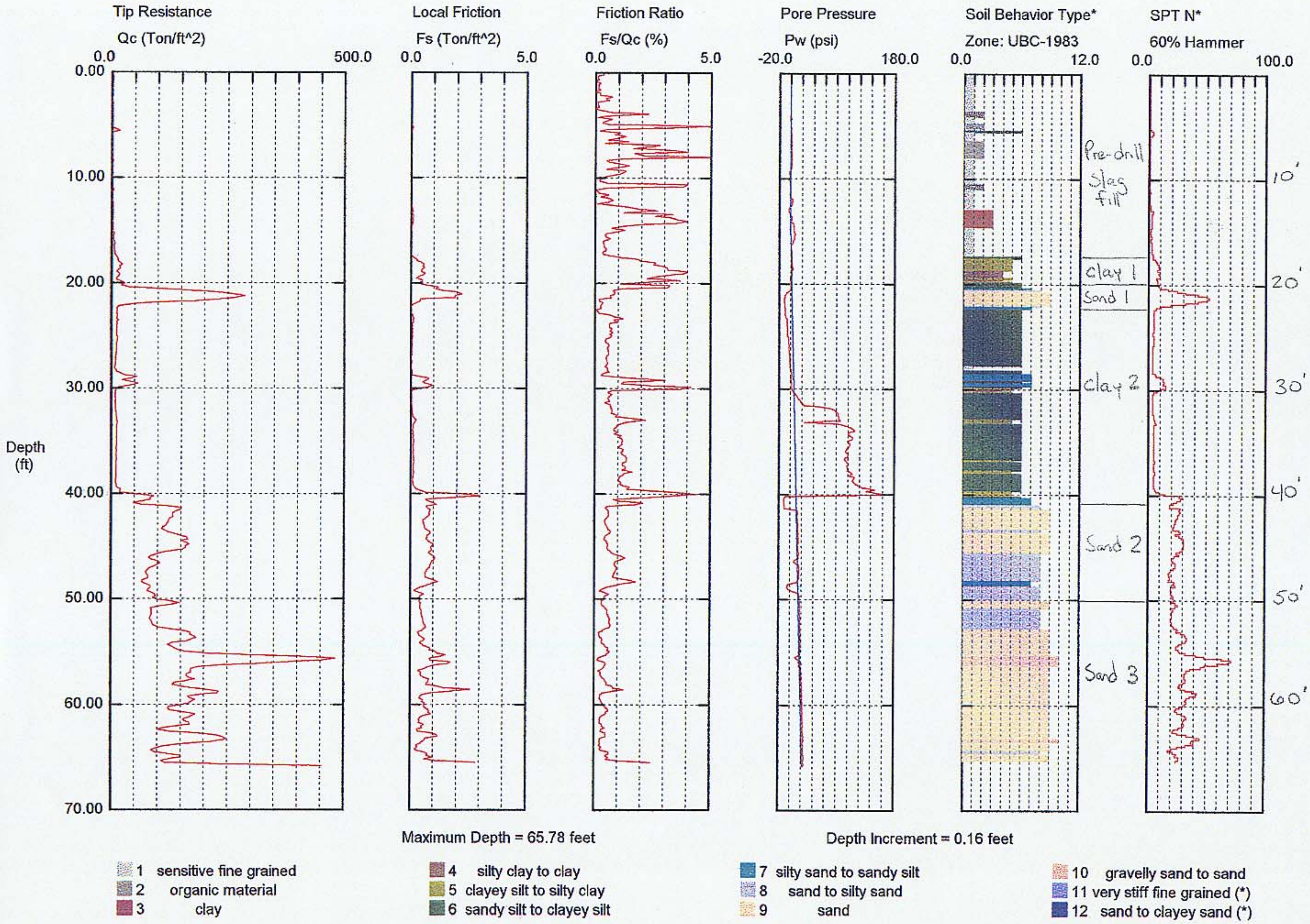
- ■ 1 sensitive fine grained
- ■ 2 organic material
- ■ 3 clay
- ■ 4 silty clay to clay
- ■ 5 clayey silt to silty clay
- ■ 6 sandy silt to clayey silt
- ■ 7 silty sand to sandy silt
- ■ 8 sand to silty sand
- ■ 9 sand
- ■ 10 gravelly sand to sand
- ■ 11 very stiff fine grained (*)
- ■ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 139003
Cone Used: 416

CPT Date/Time: 08-25-00 10:36
Location: HI - 06 - CPT
Job Number: CH2MHILL BETH ST



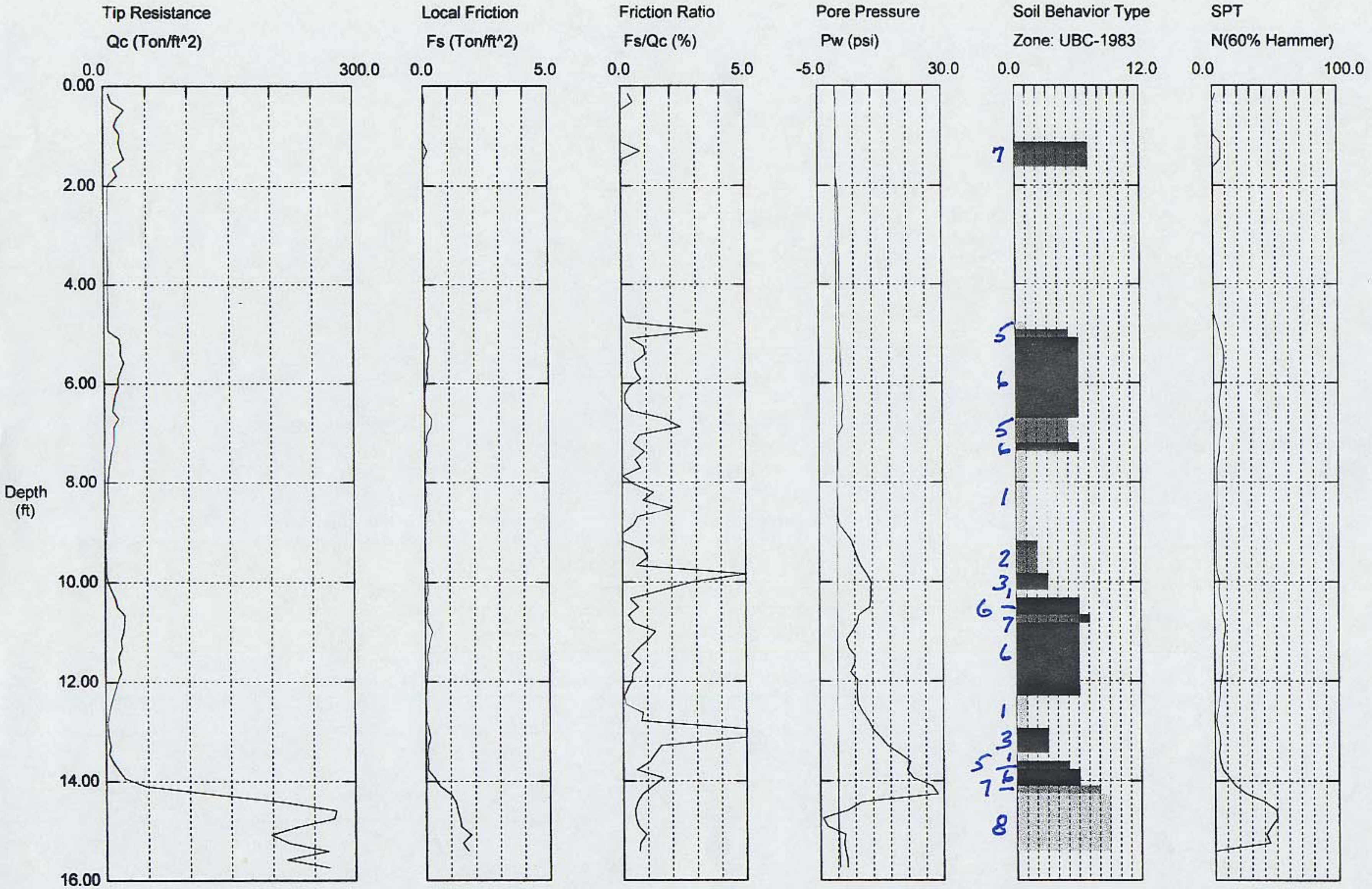
Maximum Depth = 65.78 feet

Depth Increment = 0.16 feet

E2SI

Operator: AL MYERS
Sounding: 139008
Cone Used: 419

CPT Date/Time: 09-01-00 12:45
Location: HI - 05 7 CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 15.75 feet

Depth Increment = 0.16 feet

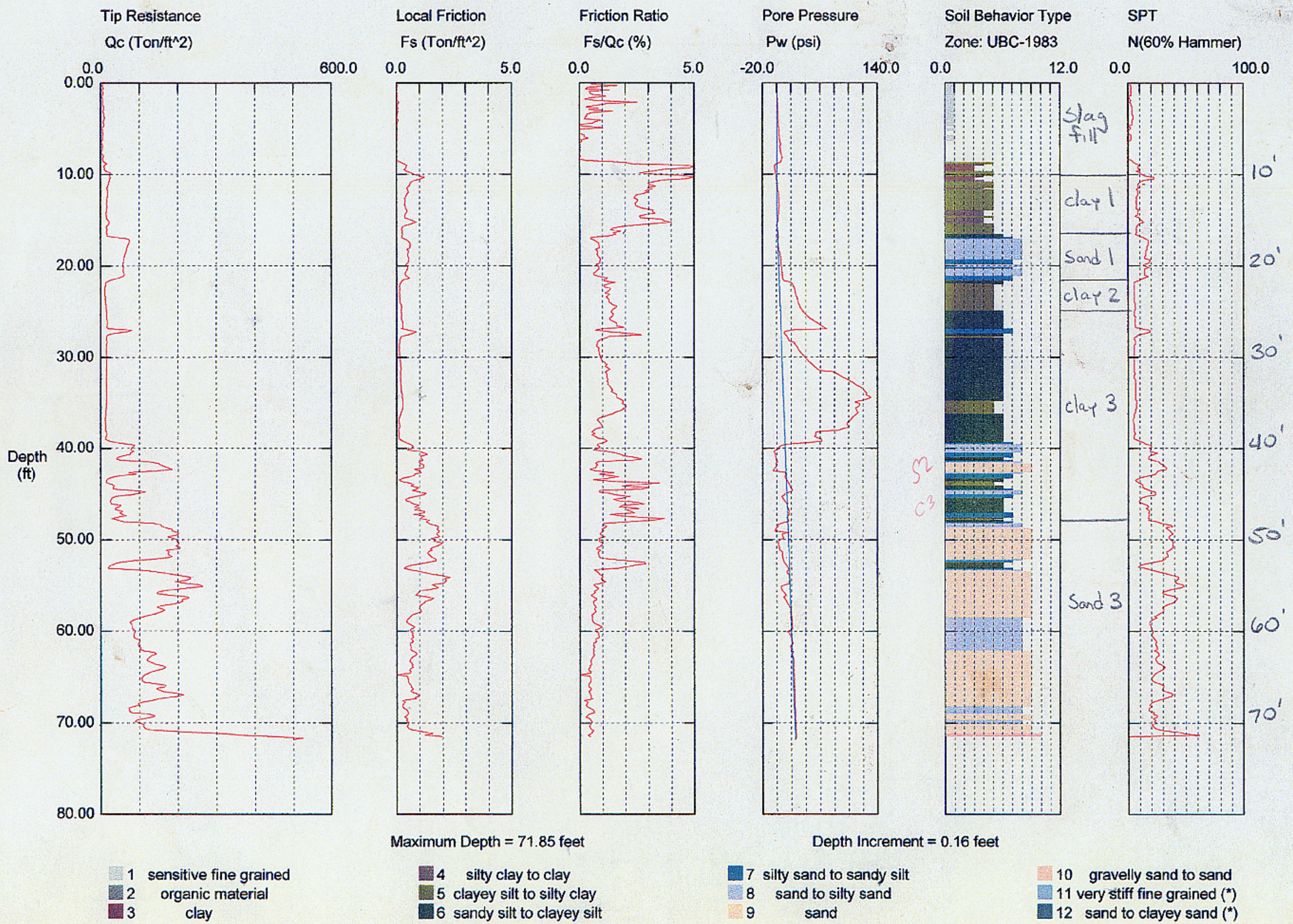
▨ 1 sensitive fine grained
■ 2 organic material
■ 3 clay
■ 4 silty clay to clay
■ 5 clayey silt to silty clay
■ 6 sandy silt to clayey silt
■ 7 silty sand to sandy silt
▨ 8 sand to silty sand
9 sand
▨ 10 gravelly sand to sand
■ 11 very stiff fine grained (*)
■ 12 sand to clayey sand (*)

8

E2S

Operator: AL MYERS
Sounding: 139009
Cone Used: 419

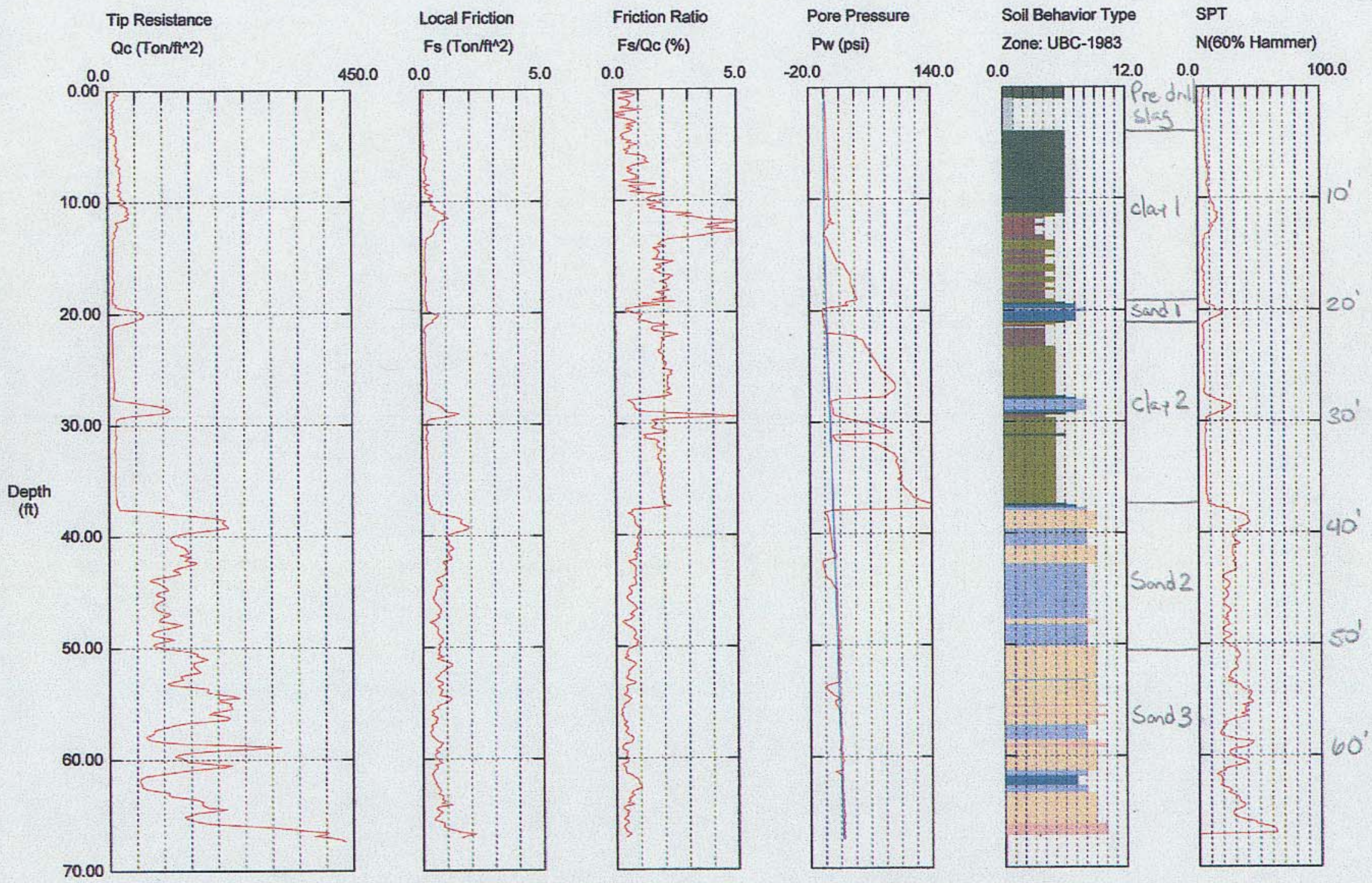
CPT Date/Time: 09-05-00 10:04
Location: SW - 03 - CPT
Job Number: CH2MHILL BETH ST



E2SI

Operator: AL MYERS
Sounding: 139005
Cone Used: 419

CPT Date/Time: 08-31-00 10:29
Location: SW - 04 - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 67.42 feet

Depth Increment = 0.16 feet

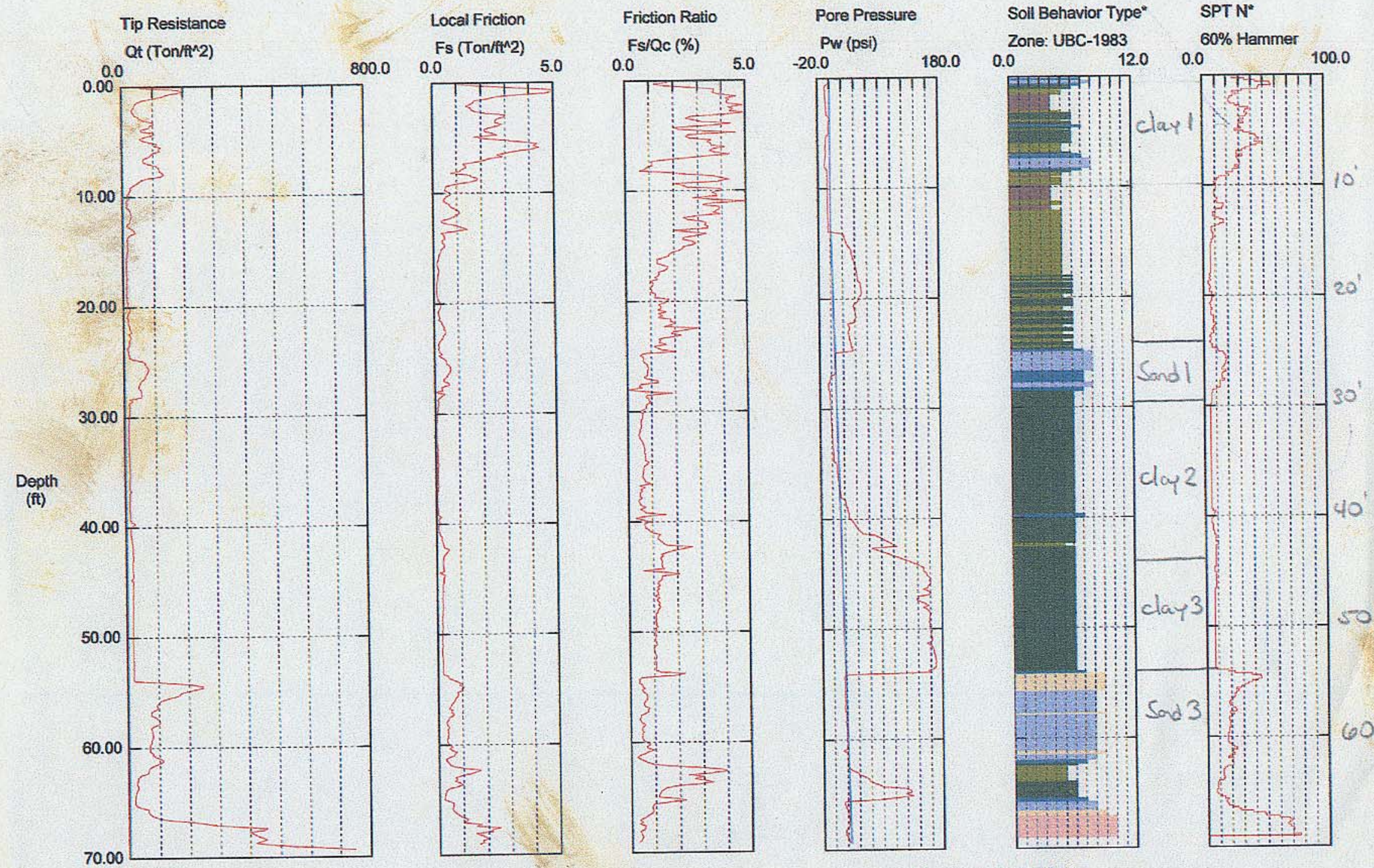
- ▨ 1 sensitive fine grained
- ▨ 2 organic material
- ▨ 3 clay
- ▨ 4 silty clay to clay
- ▨ 5 clayey silt to silty clay
- ▨ 6 sandy silt to clayey silt
- ▨ 7 silty sand to sandy silt
- ▨ 8 sand to silty sand
- ▨ 9 sand
- ▨ 10 gravelly sand to sand
- ▨ 11 very stiff fine grained (*)
- ▨ 12 sand to clayey sand (*)

*Soil behavior [illegible]nd SPT based on data from UBC-1983

E[illegible]SI

Operator: AL MYERS
Sounding: 139037
Cone Used: 419

CPT Date/Time: 09-19-00 09:37
Location: SW - 06 - CPT
Job Number: CH2MHILL BETH ST



clay 1

Sand 1

clay 2

clay 3

Sand 3

10'

20'

30'

40'

50'

60'

Maximum Depth = 69.39 feet

Depth Increment = 0.16 feet

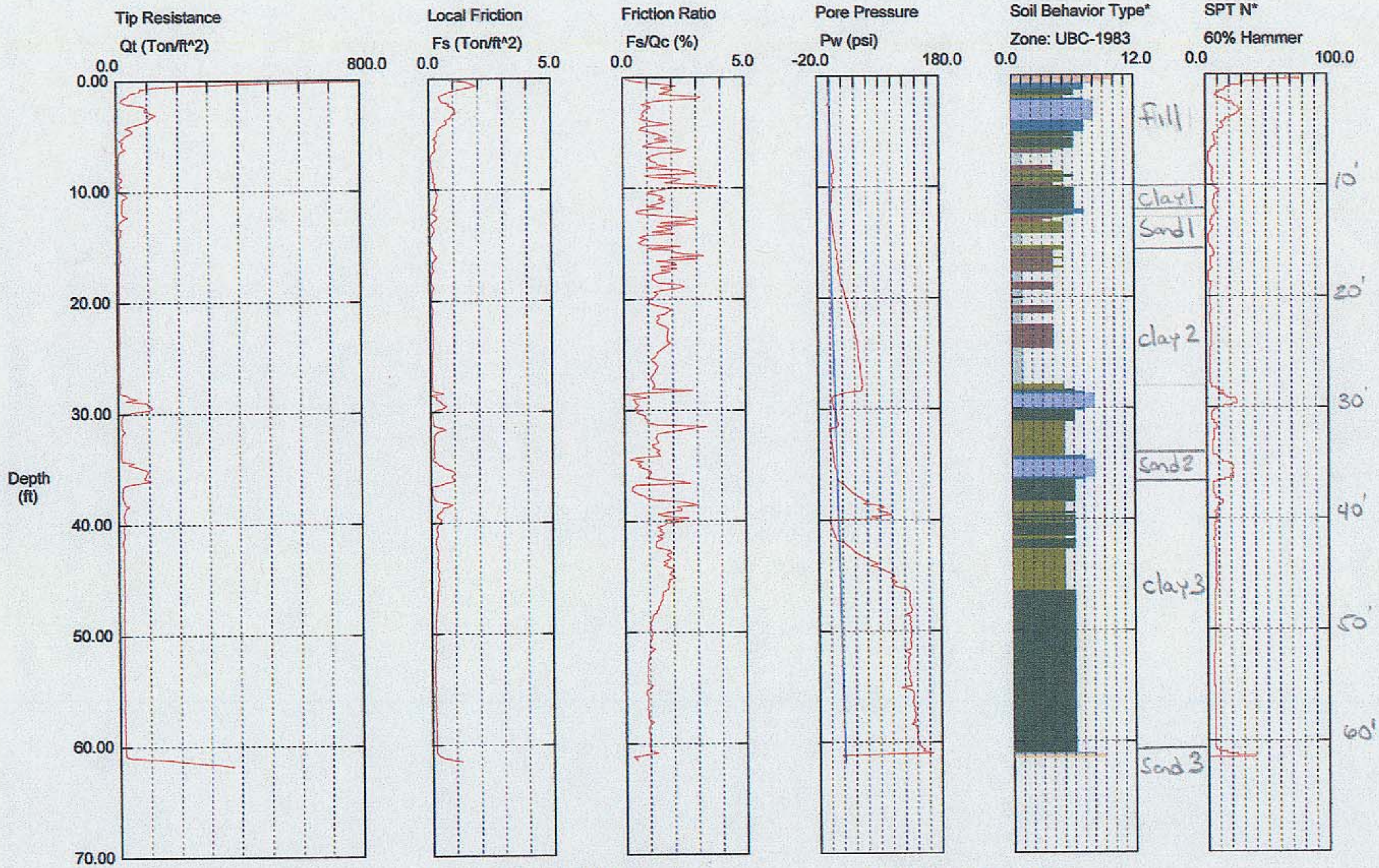
- ▨ 1 sensitive fine grained
- ▨ 2 organic material
- ▨ 3 clay
- ▨ 4 silty clay to clay
- ▨ 5 clayey silt to silty clay
- ▨ 6 sandy silt to clayey silt
- ▨ 7 silty sand to sandy silt
- ▨ 8 sand to silty sand
- ▨ 9 sand
- ▨ 10 gravelly sand to sand
- ▨ 11 very stiff fine grained (*)
- ▨ 12 sand to clayey sand (*)

*Soil behavio e and SPT based on data from UBC-1983

E SI

Operator: AL MYERS
Sounding: 139052
Cone Used: 419

CPT Date/Time: 09-26-00 14:09
Location: SW - 08 - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 61.84 feet

Depth Increment = 0.16 feet

▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay

▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt

▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand

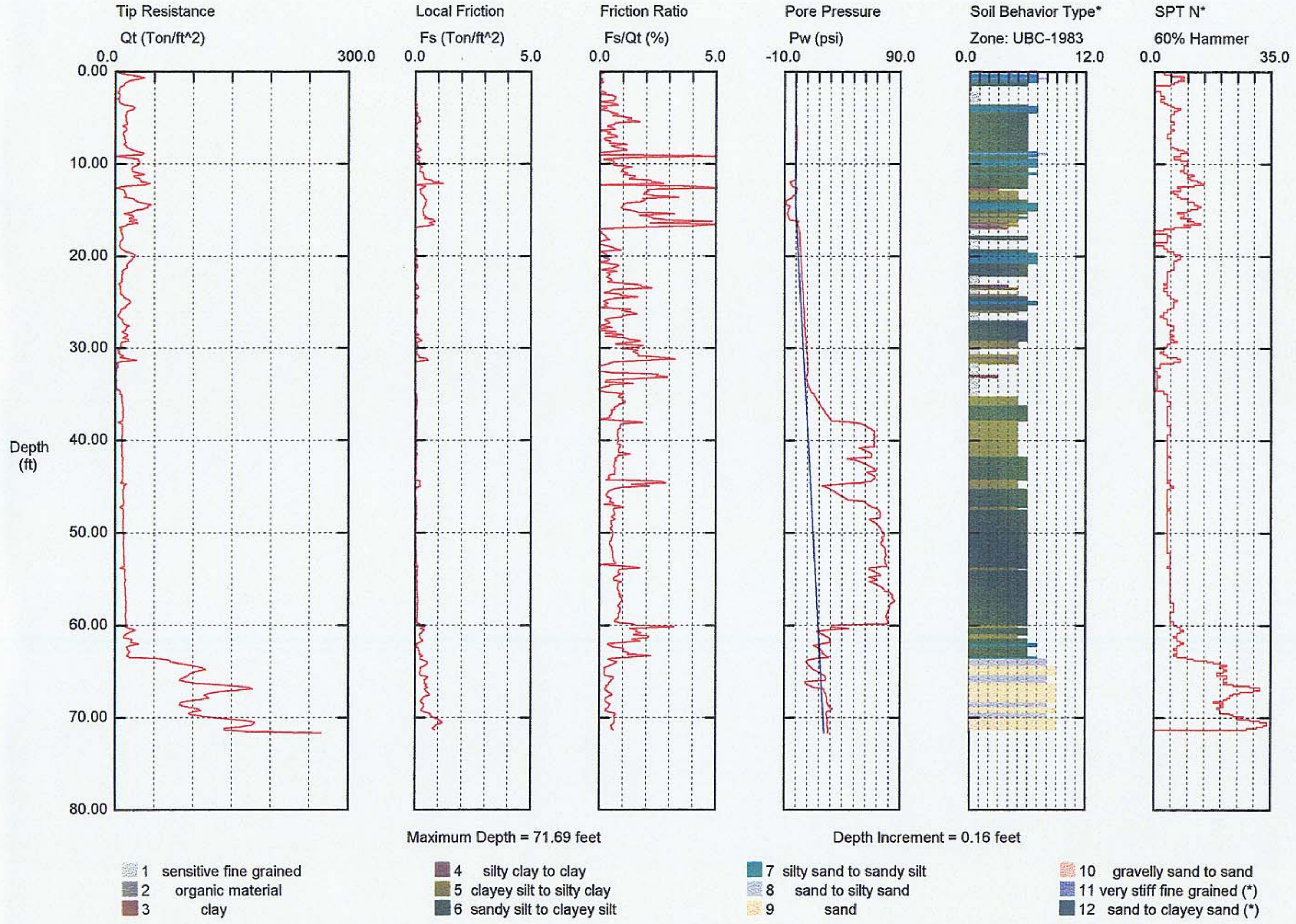
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: DAN FINCHAM
Sounding: 160012
Cone Used: 416

CPT Date/Time: 09-14-01 09:31
Location: TM - 02
Job Number: BETH STEEL

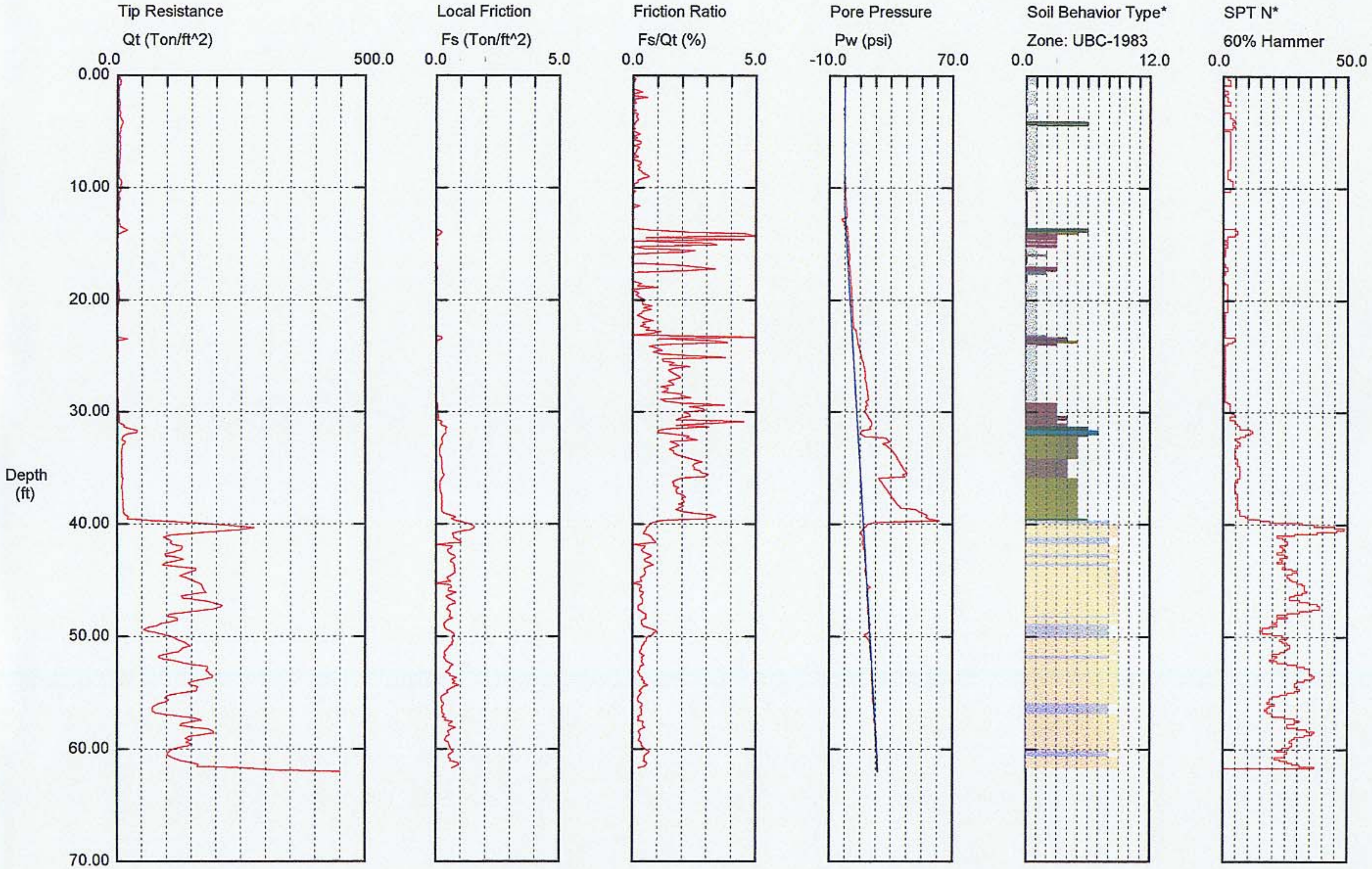


*Soil behavior type and SPT based on data from UBC-1983

E2

Operator: AL MYERS
Sounding: 160020
Cone Used: 416

CPT Date/Time: 09-18-01 10:21
Location: TM - 03
Job Number: BETH STEEL



Maximum Depth = 62.01 feet

Depth Increment = 0.16 feet

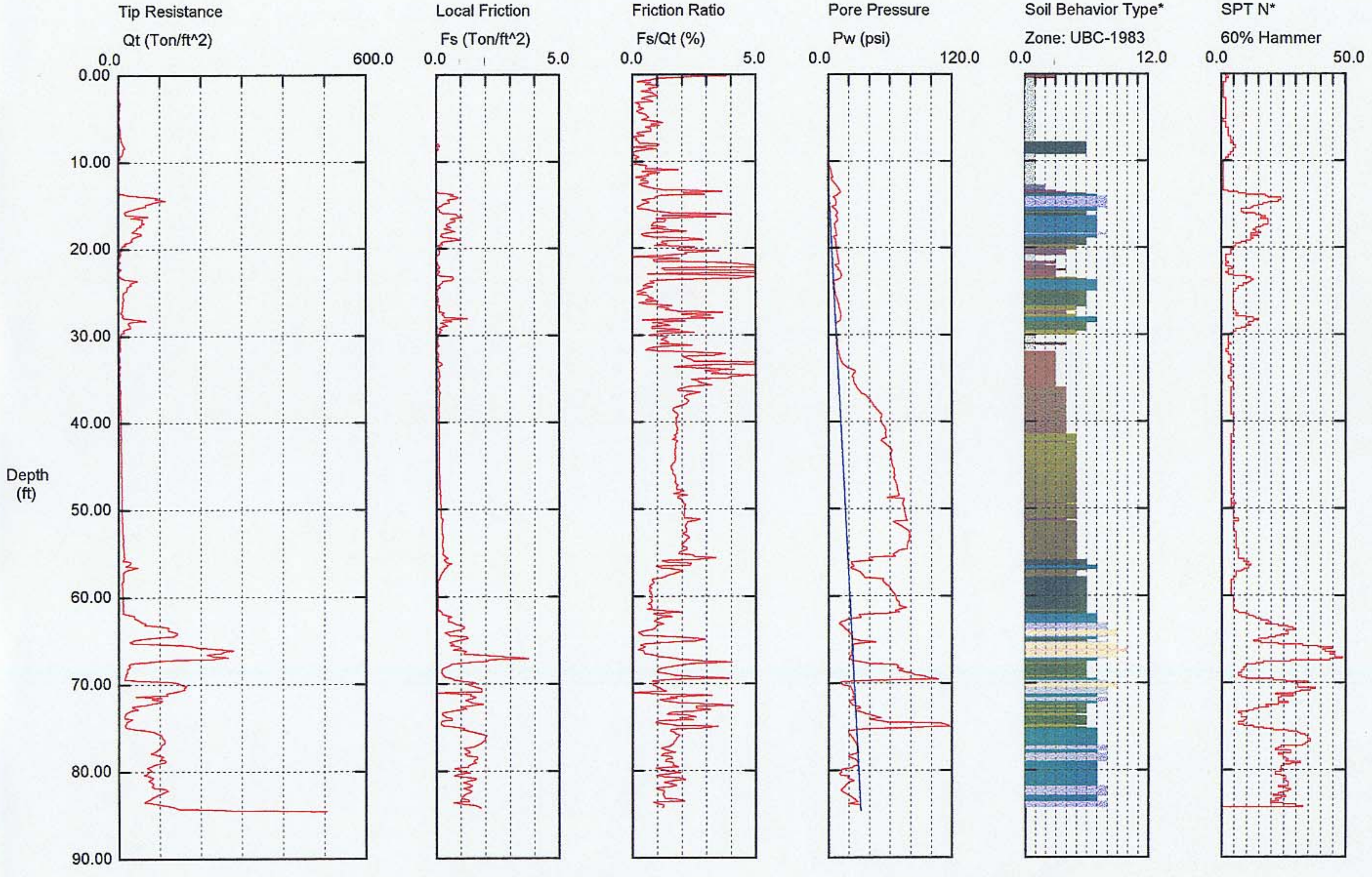
▨ 1 sensitive fine grained	▨ 4 silty clay to clay	▨ 7 silty sand to sandy silt	▨ 10 gravelly sand to sand
▨ 2 organic material	▨ 5 clayey silt to silty clay	▨ 8 sand to silty sand	▨ 11 very stiff fine grained (*)
▨ 3 clay	▨ 6 sandy silt to clayey silt	▨ 9 sand	▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2

Operator: AL MYERS
Sounding: 160019
Cone Used: 416

CPT Date/Time: 09-18-01 07:48
Location: TM - 04
Job Number: BETH STEEL



Maximum Depth = 84.65 feet

Depth Increment = 0.16 feet

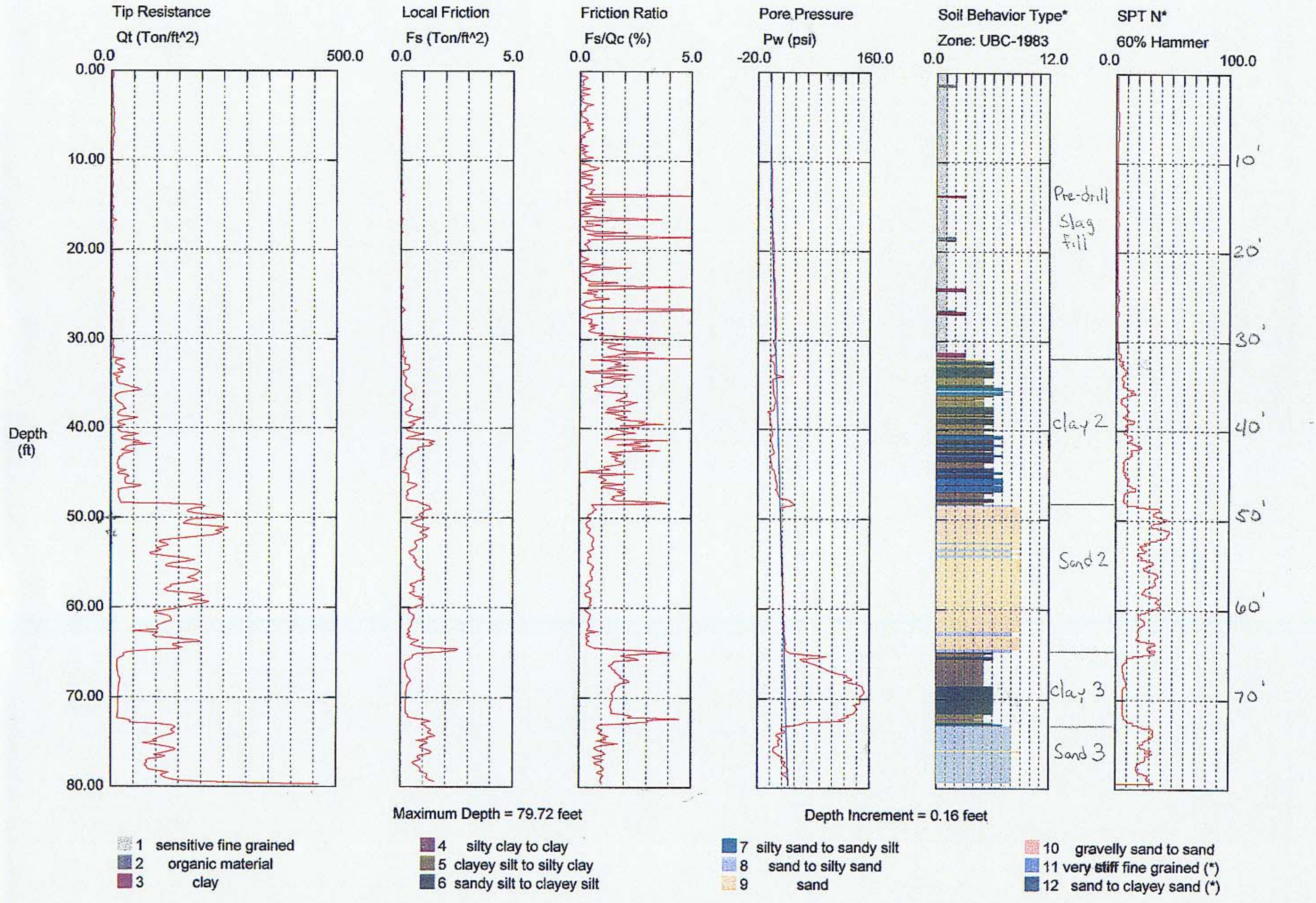
▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay
▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt
▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 139048
Cone Used: 419

CPT Date/Time: 09-22-00 11:36
Location: TM - 05 - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 79.72 feet

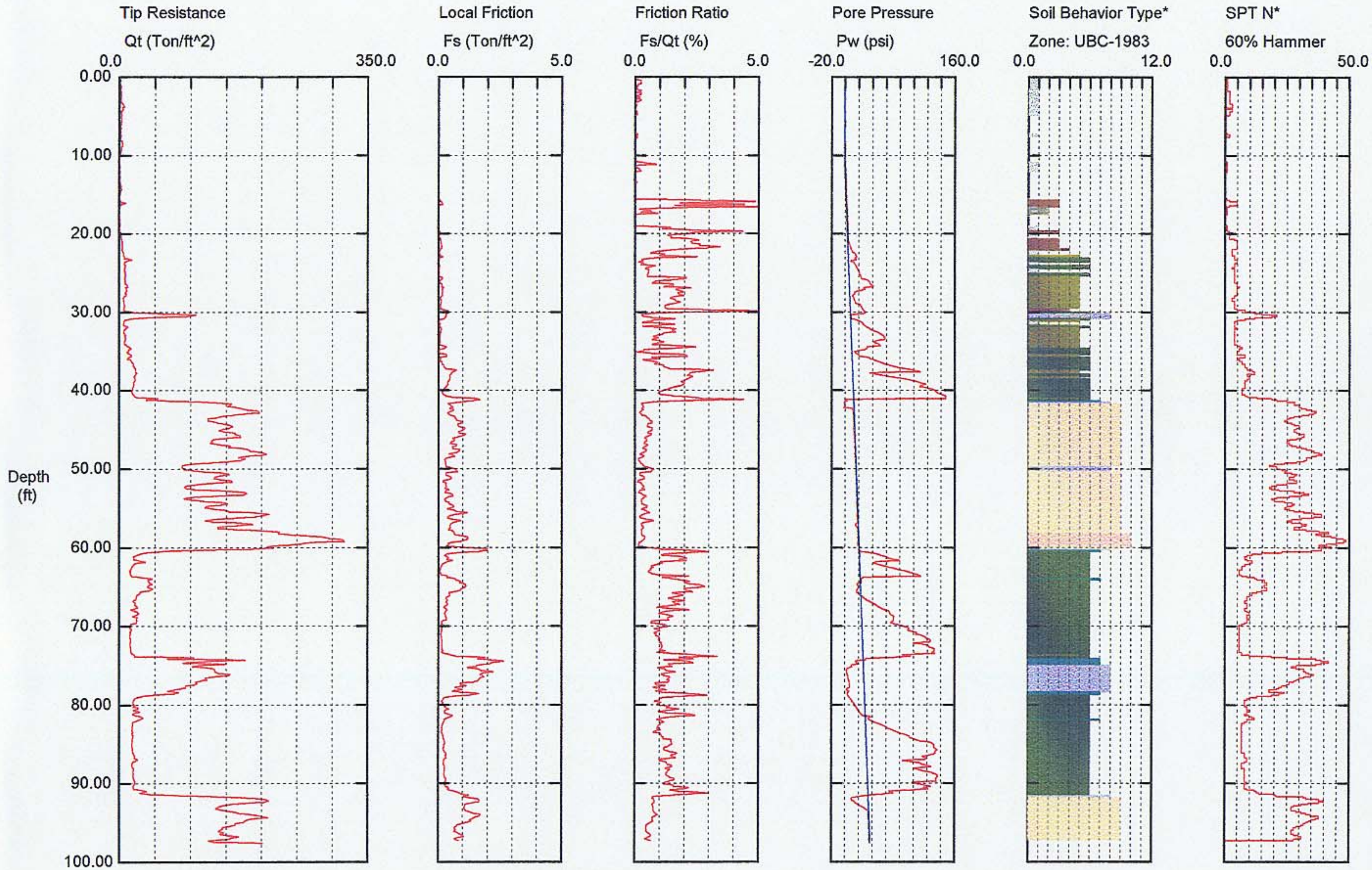
Depth Increment = 0.16 feet

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 160013
Cone Used: 416

CPT Date/Time: 09-14-01 12:17
Location: TM - 06
Job Number: BETH STEEL



Maximum Depth = 97.60 feet

Depth Increment = 0.16 feet

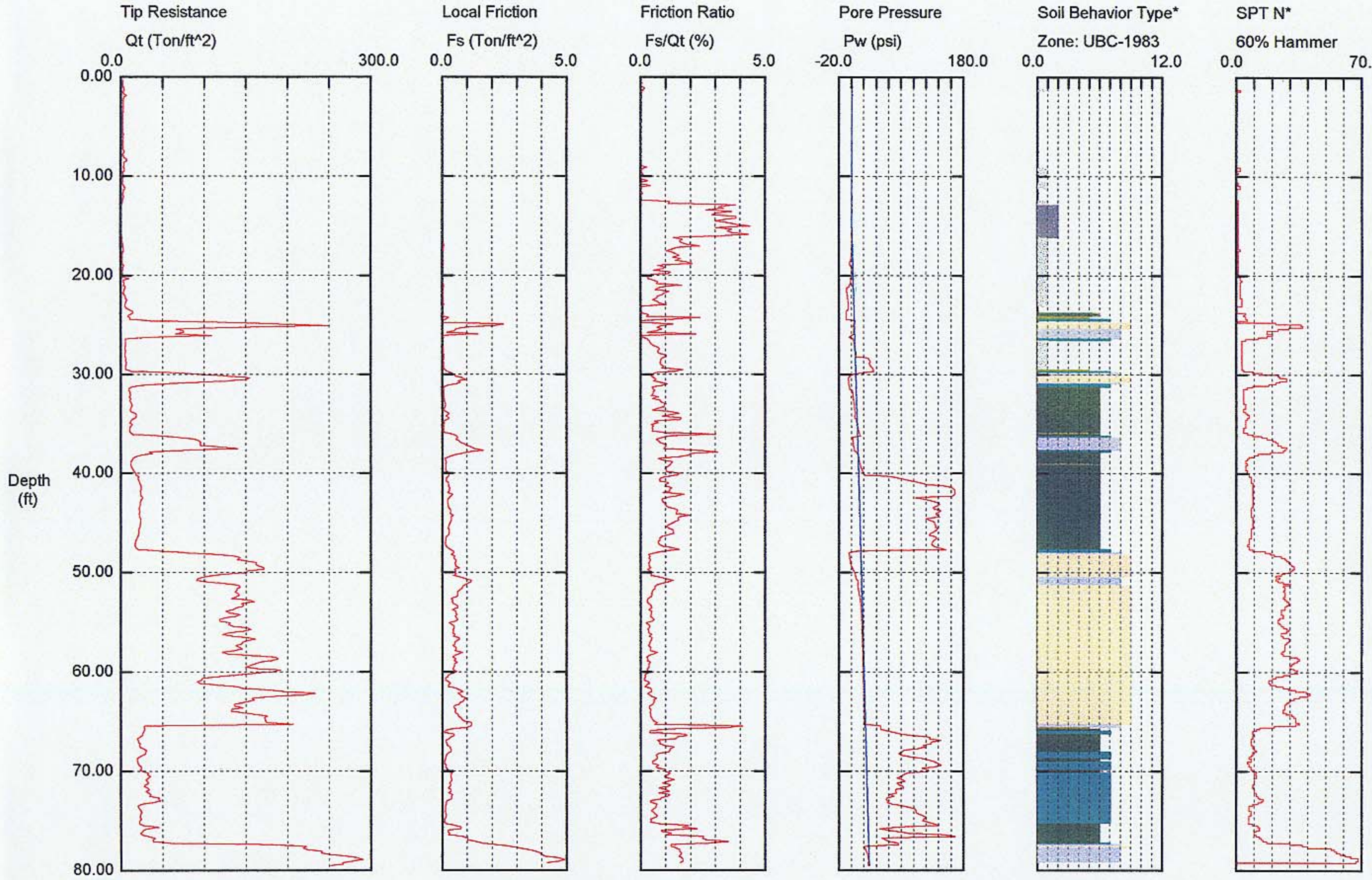
- ▨ 1 sensitive fine grained
- ▨ 2 organic material
- ▨ 3 clay
- ▨ 4 silty clay to clay
- ▨ 5 clayey silt to silty clay
- ▨ 6 sandy silt to clayey silt
- ▨ 7 silty sand to sandy silt
- ▨ 8 sand to silty sand
- ▨ 9 sand
- ▨ 10 gravelly sand to sand
- ▨ 11 very stiff fine grained (*)
- ▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Hogentog[illegible]r & Co

Operator: AL MYERS
Sounding: 160004
Cone Used: 416

CPT Date/Time: 09-11-01 14:20
Location: TM - 07
Job Number: BETH STEEL



Maximum Depth = 79.56 feet

Depth Increment = 0.16 feet

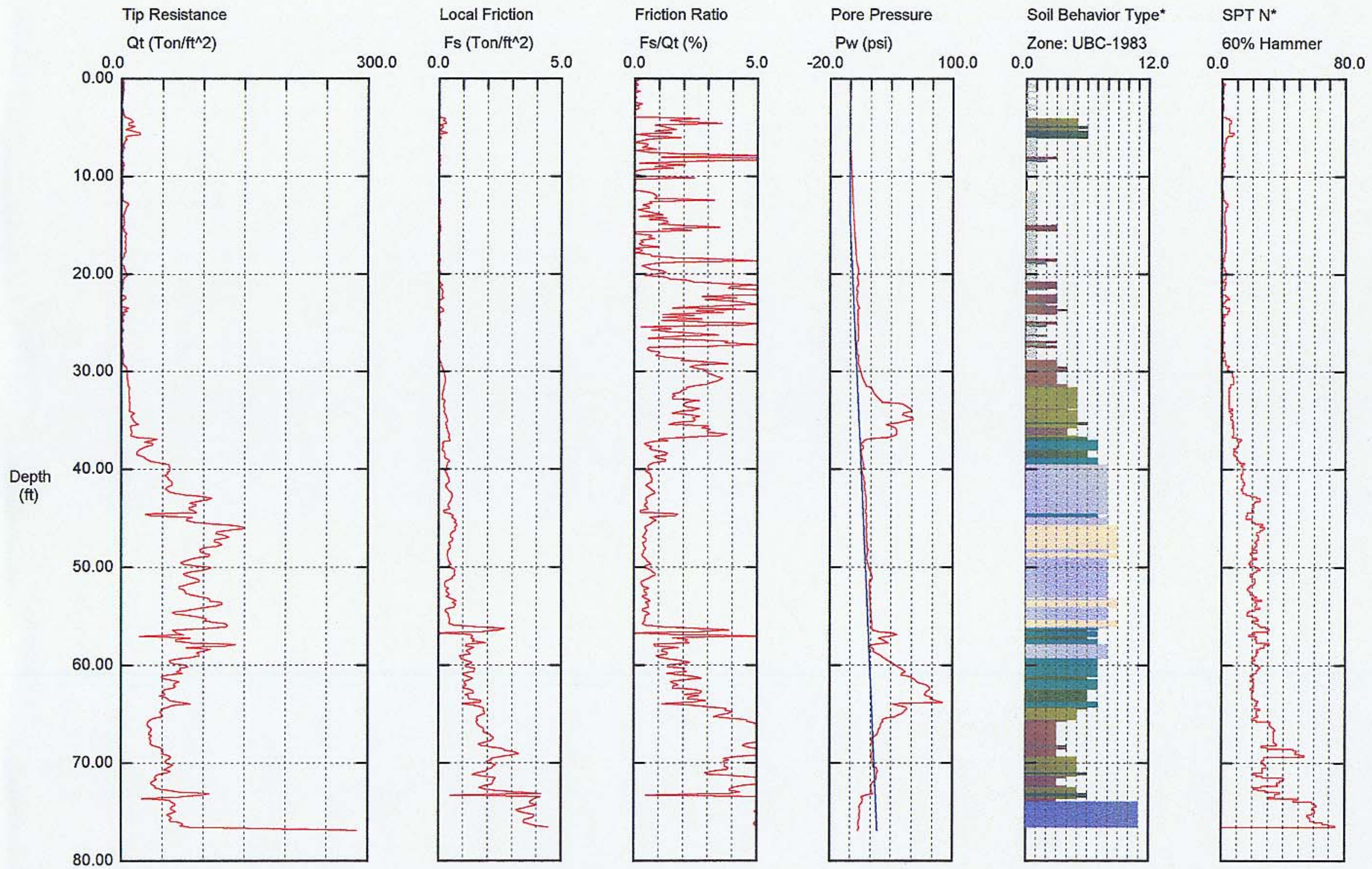
▨ 1 sensitive fine grained	▨ 4 silty clay to clay	▨ 7 silty sand to sandy silt	▨ 10 gravelly sand to sand
▨ 2 organic material	▨ 5 clayey silt to silty clay	▨ 8 sand to silty sand	▨ 11 very stiff fine grained (*)
▨ 3 clay	▨ 6 sandy silt to clayey silt	▨ 9 sand	▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: DAN FINCHAM
Sounding: 160011
Cone Used: 416

CPT Date/Time: 09-13-01 11:24
Location: TM - 08
Job Number: BETH STEEL



Maximum Depth = 76.94 feet

Depth Increment = 0.16 feet

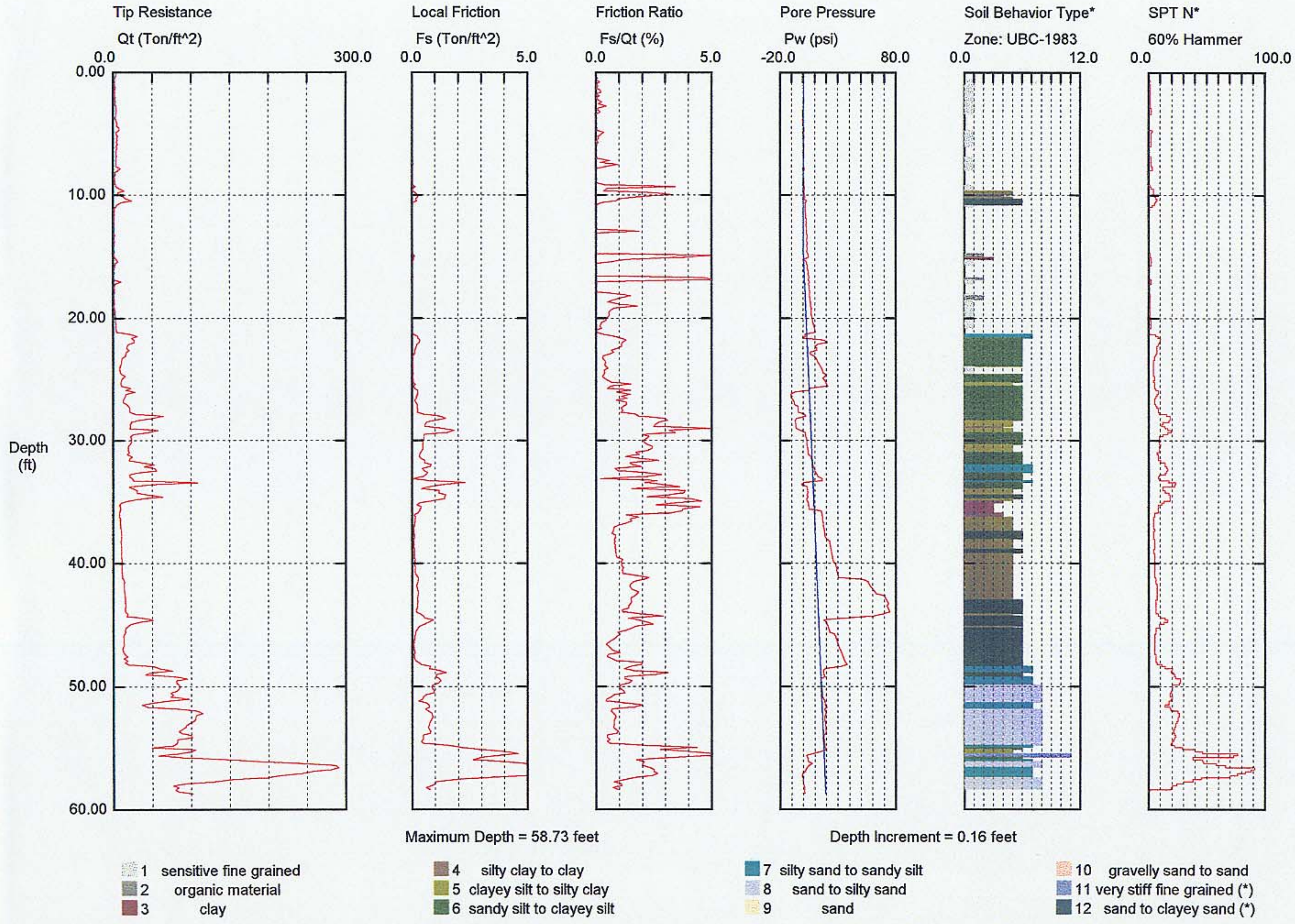
▨ 1 sensitive fine grained	▨ 4 silty clay to clay	▨ 7 silty sand to sandy silt	▨ 10 gravelly sand to sand
▨ 2 organic material	▨ 5 clayey silt to silty clay	▨ 8 sand to silty sand	▨ 11 very stiff fine grained (*)
▨ 3 clay	▨ 6 sandy silt to clayey silt	▨ 9 sand	▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Hogentogl r & Co

Operator: AL MYERS
Sounding: 160003
Cone Used: 416

CPT Date/Time: 09-11-01 11:46
Location: TM - 09
Job Number: BETH STEEL



Maximum Depth = 58.73 feet

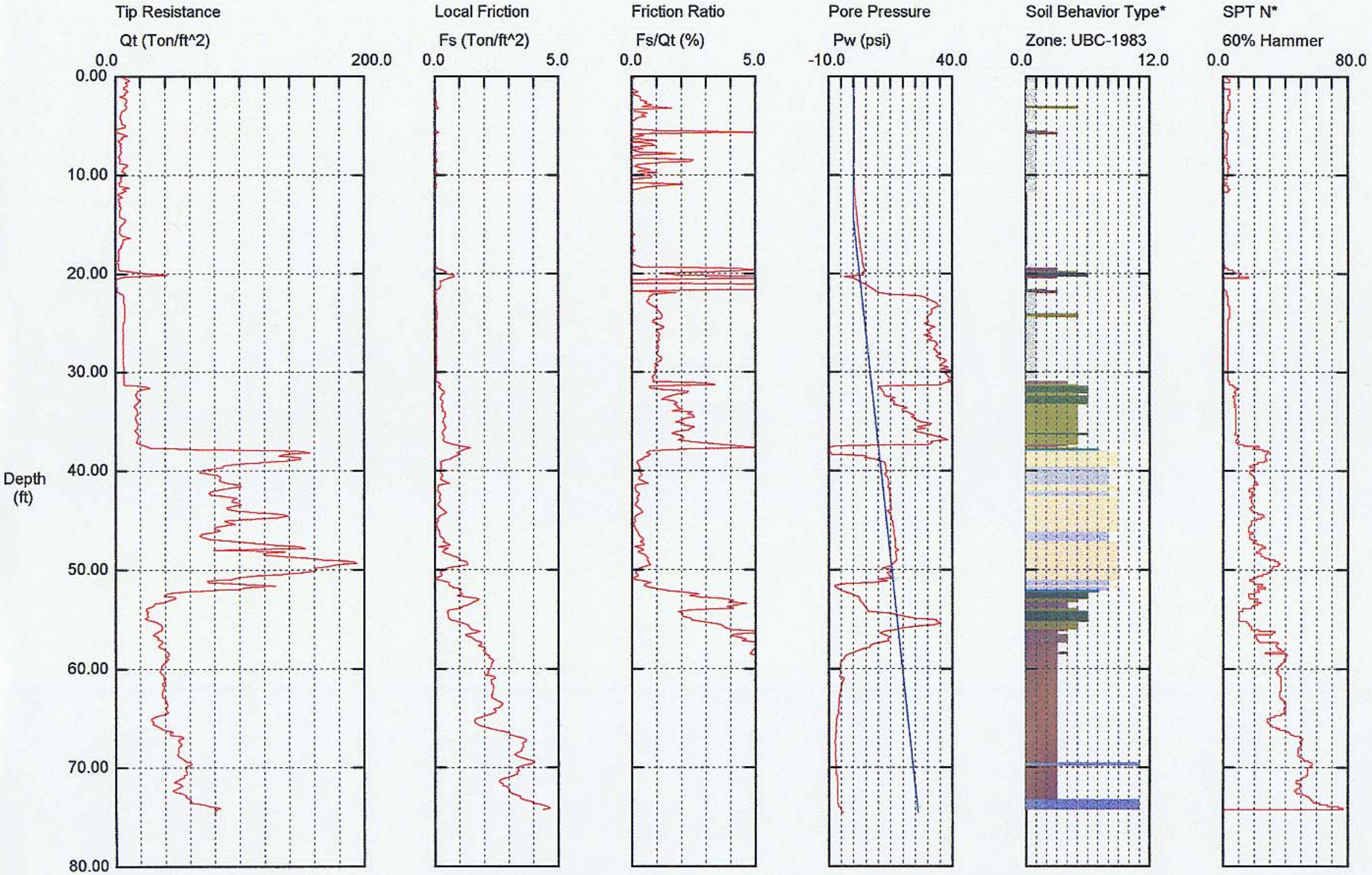
Depth Increment = 0.16 feet

*Soil behavior type and SPT based on data from UBC-1983

Hogentog[illegible]r & Co

Operator: AL MYERS
Sounding: 160002
Cone Used: 416

CPT Date/Time: 09-11-01 07:55
Location: TM - 11
Job Number: BETH STEEL



Maximum Depth = 74.64 feet

Depth Increment = 0.16 feet

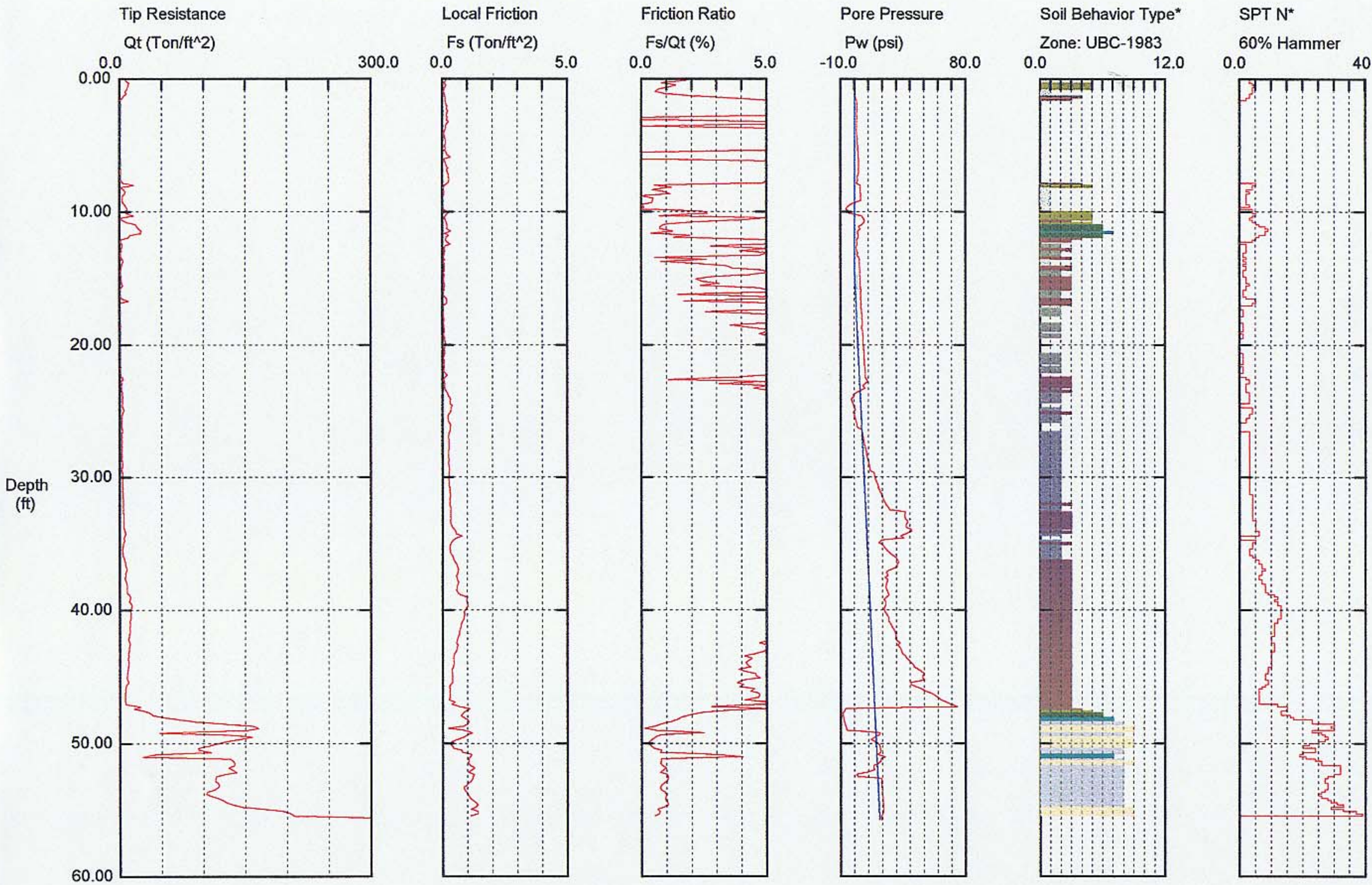
▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay
▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt
▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Hogentogler & Co

Operator: AL MYERS
Sounding: 160001
Cone Used: 416

CPT Date/Time: 09-10-01 12:04
Location: TM - 13
Job Number: BETH STEEL



Maximum Depth = 55.77 feet

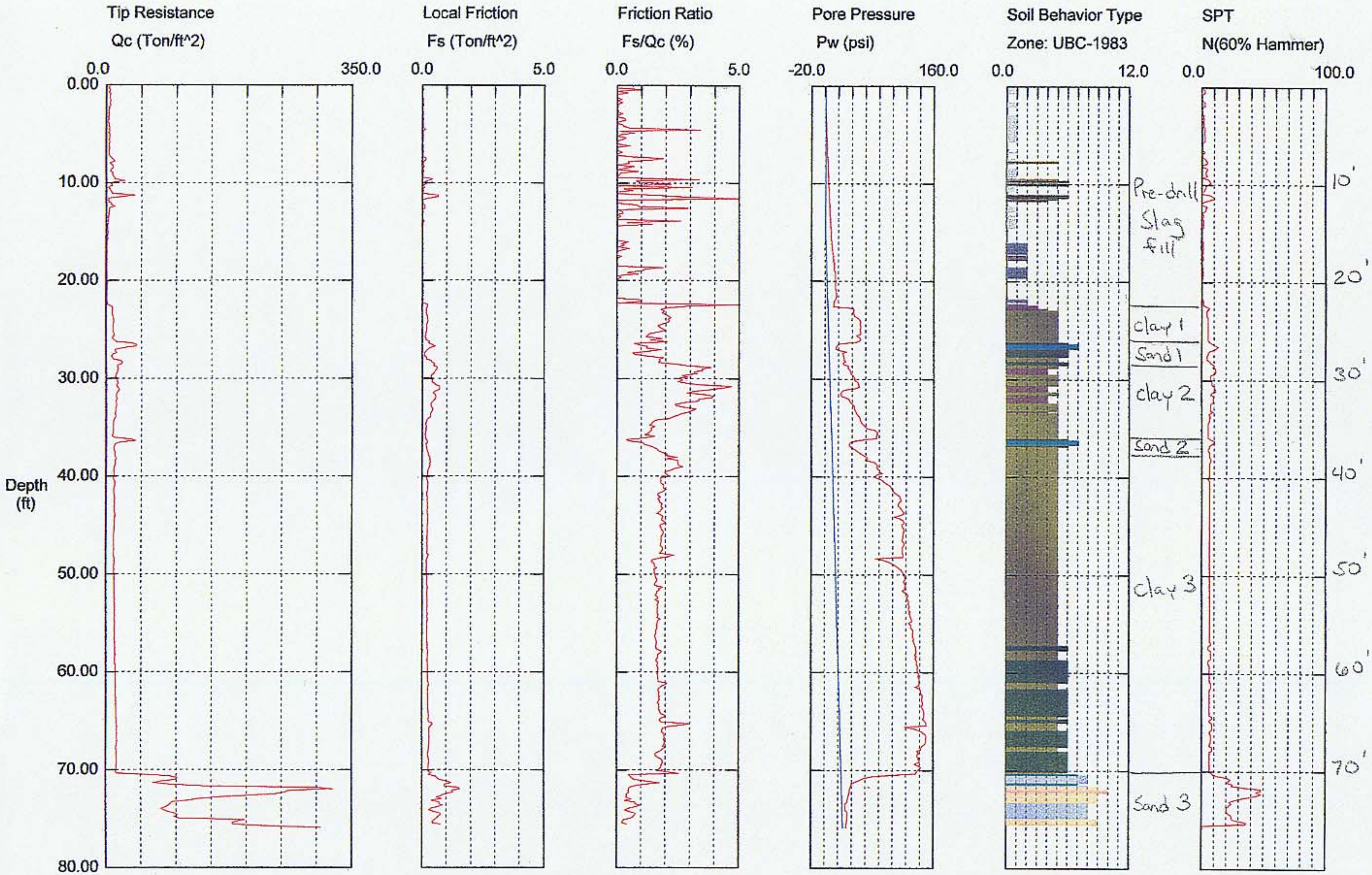
Depth Increment = 0.16 feet

▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay
▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt
▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

E2S

Operator: AL MYERS
Sounding: 139014
Cone Used: 419

CPT Date/Time: 09-11-00 11:04
Location: TM - 15 - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 75.95 feet

Depth Increment = 0.16 feet

▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay
▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt
▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

Historical Logs

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
B-3	0.00	8.50	Slag, silty, gray to black, medium dense, dry to moist	
	8.50	11.00	Silty medium to coarse sand, silty, gray, moist to wet (at 8.5’)	
	11.00	24.50	Clay, orange to brown, mottled, stiff to soft, moist	
	24.50	29.30	Silt, gray, soft, sand lense at 29’	
	29.30	65.00	Clay, gray, very soft to stiff, moist, clayey silt in zones, shell layer at 43.5’	
	65.00	83.50	Medium to coarse sand with gravel, yellow to brown, medium dense to very dense, some fine-grained sand layers	Jump in blow counts at 68.5’, back down at 78.5’
	83.50	103.50	Clay with fine sand, red to gray/white, stiff to hard	Blow counts back up and generally stay up
	103.50	105.00	Fine sand, white, very dense	
CMC-B1	0.00	10.00	Slag fill based on cuttings, no sampling	
	10.00	75.00	No sampling	
	75.00	100.00	Silty sand, micaceous, fine to medium grained, loose to medium dense , contains trace clay and some organics (wood) material in several layers	At 97.5' blowcount was 10
	100.00	126.50	Silty sand, light brown to cream, sand, fine to medium grained, hard, becomes coarser with depth	At 111' blowcount was 50
CMC-B14	0.00	15.00	Slag, black to dark brown, very loose to very dense, moist to wet	At 1' blowcount was 50
	15.00	25.00	Sandy silt, orange brown and gray, medium stiff to stiff, moist to wet	At 21.5' blowcount was 15

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	25.00	40.00	Silt, dark gray to dark brown, soft to medium stiff, contains some medium sand at base	At 31.5' blowcount was 3
	40.00	90.00	Gravelly sand, brown to light brown, fine to coarse grained sand, very loose to dense, encountered running sands in augers at several depths within this unit, contains dark brown micaceous sand at base	At 61.5' blowcount was 12
	90.00	111.50	Clay, red, orange, and gray, some silt and minor fine sand, hard, clay contains abundant gravel at 95' to 96.5'	At 110.5' blowcount was 100
CMC-B103	0.00	2.00	Slag	At 1.5' blowcount was 27
	2.00	15.00	Sandy silt, brown and gray, fine to medium grained sand, soft to very stiff, wet	At 7.0' blowcount was 9
	15.00	40.00	Silt, dark gray to dark brown, soft to medium stiff	At 36.5' blowcount was 4
	40.00	75.00	Gravelly sand, brown to light brown, loose to dense, fine to coarse grained sand	At 56.5' blowcount was 23
	75.00	101.50	Sandy silt, light brown to cream, fine to medium grained sand, hard	At 100' blowcount was 100
CMC-B104	0.00	4.00	Slag	At 1.5' blowcount was 34
	4.00	25.00	Sandy silt, orange brown and gray, fine to medium grained sand, soft to stiff, moist	At 1.5' blowcount was 34
	25.00	40.00	Silt, dark gray to dark brown, soft to stiff	At 6.5' blowcount was 10
	40.00	75.00	Gravelly sand, brown to light brown, loose to medium dense, fine to coarse grained sand, encountered running sands in augers at several depths within this unit, sands are	At 56.5' blowcount was 15

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
			micaceous at 40' and 50'	
	75.00	101.50	Sandy silt, brown, red, and white, fine sand, hard	At 100' blowcount was 100
FM-GB257	0	4	Sand	
	4	19	Clay	
	19	36	Silty sand	
	36	44	Silt	
	44	54	Gravelly sand	
	54	59	Silt	
	59	74	Silty sand	
	74	87	Sand	
FM-GB259	0.00	18.30	Clay	
	18.30	28.30	Mud	
	28.30	33.30	Silty sand	
	33.30	44.30	Mud	
	44.30	48.30	Gravelly sand	
	48.30	53.30	Sand	
	53.30	58.30	Silty sand	
	58.30	63.30	Mud	
	63.30	68.30	Silty sand	
	68.30	71.30	Sand	
FM-GB260	0.00	0.50	Sand	
	0.50	19.50	Clay	
	19.50	24.30	Silty sand	
	24.30	44.50	Mud	
	44.50	50.50	Sand	
	50.50	54.50	Mud	
	54.50	69.50	Silty sand	
	69.50	74.50	Mud	
	74.50	79.50	Silty sand	
	79.50	87.50	Sand	
FM-GB265	0.00	3.50	Cover	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	3.50	8.50	Clay	
	8.50	14.50	Silty clay	
	14.50	24.50	Mud	
	24.50	29.50	Silty sand	
	29.50	49.50	Mud	
	49.50	54.50	Gravelly sand	
	54.50	59.50	Clay	
	59.50	69.50	Silty sand	
	69.50	79.50	Sand	
FM-GB282	0.00	0.20	Cover	
	0.20	5.00	Clay	
	5.00	15.00	Gravelly clay	
	15.00	20.00	Mud	
	20.00	25.00	Silty sand	
	25.00	30.00	Mud	
	30.00	35.00	Silty sand	
	35.00	45.00	Mud	
	45.00	50.00	Silty sand	
	50.00	60.00	Gravelly sand	
FM-GB459	0.00	8.00	Slag fill	
	8.00	13.00	Clay	
	13.00	22.00	Silt	
	22.00	26.00	Silty sand	
	26.00	32.00	Silt	
	32.00	35.00	Sandy silt	
	35.00	48.00	Sand	
	48.00	54.00	Silty sand	
	54.00	57.00	Silt	
	57.00	64.00	Silty gravel	
	64.00	84.00	Silty sand	
	84.00	89.00	Sand	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
FM-GB481	0.00	13.00	Clay	
	13.00	19.00	Silt	
	19.00	24.00	Sandy silt	
	24.00	43.00	Silt	
	43.00	44.00	Silty sand	
	44.00	54.00	Silty sandy gravel	
	54.00	64.00	Silt	
	64.00	72.00	Sandy silt	
	72.00	74.00	Silty sand	
	74.00	79.00	Sandy gravel and clay	
	79.00	104.00	Clay and sand	
FM-GB483	0.00	3.00	Slag fill	
	3.00	18.00	Clay	
	18.00	23.00	Organic material	
	23.00	26.00	Silt	
	26.00	29.00	Gravelly sand	
	29.00	34.00	Sandy silt	
	34.00	44.00	Silt	
	44.00	49.00	Silty sand	
	49.00	59.00	Silt	
	59.00	81.00	Sandy silt	
	81.00	89.00	Clay and sand	
	89.00	104.00	Sand	
FM-GB490	0	6	Slag fill	
	6	14	Clay	
	14	19	Sandy silt	
	19	24	Silt	
	24	29	Sandy silt	
	29	41	Silt	
	41	44	Gravelly silt	
	44	76	Sand	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	76	112	Sand and clay	
FM-GB491	0.00	4.00	Slag fill	
	4.00	19.00	Clay	
	19.00	44.00	Silt	
	44.00	51.00	Silty sand	
	51.00	74.00	Sand	
	74.00	106.00	Sand and clay	
	106.00	116.00	Sand	
FM-GB492	0	2	Slag fill	
	2	4	Clay	
	4	9	Gravelly clay	
	9	14	Silty clay	
	14	19	Sandy silt	
	19	43	Silt	
	43	50	Silty sand	
	50	59	Silt	
	59	66	Sandy silt	
	66	82	Silty sand	
	82	109	Clay	
FM-GB507	0	3	Slag fill	
	3	15	Gravelly clay	
	15	43	Silt	
	43	47	Silty gravel	
	47	69	Silty sand	
	69	73	Clay	
	73	89	Silty sandy clay	
	89	103	Clay	
FM-GB670	0.00	18.00	Slag fill	
	18.00	21.00	Clay	
	21.00	32.00	Silty clayey sand	
	32.00	44.00	Clayey silt and shells	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	44.00	57.00	Sandy silty gravel	
	57.00	60.00	Clayey silt and shells	
	60.00	70.00	Sandy silt	
	70.00	75.00	Sand and clay	
	75.00	86.00	Gravelly sand	
	86.00	115.00	Sand and clay	
FM-GB695	0.00	14.00	Slag fill	
	14.00	28.00	Silt	
	28.00	34.00	Clay	
	34.00	37.00	Silty sand	
	37.00	49.00	Silt	
	49.00	52.00	Sandy silt	
	52.00	55.00	Gravelly silt	
	55.00	60.00	Clay	
	60.00	83.00	Silt	
	83.00	105.00	Silty sand	
	105.00	111.00	Sand	
	111.00	118.00	Gravelly sand	
	118.00	121.00	Clay	
	121.00	123.00	Silty sand	
	123.00	129.00	Silty gravel	
FM-GB696	0.00	29.00	Slag fill	
	29.00	33.00	Silt	
	33.00	39.00	Clay	
	39.00	43.00	Sand	
	43.00	56.00	Silt	
	56.00	68.00	Sandy gravel	
	68.00	84.00	Silt	
	84.00	106.00	Sand and clay	
	106.00	117.00	Gravelly sand	
	117.00	131.00	Sand and clay	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
FM-GB705	0.00	31.80	Slag fill	
	31.80	47.80	Silt	
	47.80	59.80	Gravelly sand	
	59.80	64.80	Sand	
	64.80	69.80	Sandy gravel	
	69.80	74.80	Silty sand	
	74.80	77.80	Silt	
	77.80	84.80	Silty clay	
	84.80	92.80	Silt	
	92.80	98.80	Clay	
	98.80	102.80	Silty sand	
	102.80	107.80	Sand	
	107.80	114.80	Clay	
	114.80	121.80	Silty clay	
FM-GB754	0.00	13.00	Slag fill	
	13.00	45.00	Silt and sand	
	45.00	58.00	Silt, gravel and sand	
	58.00	73.00	Sandy silt	
	73.00	78.00	Clay and sand	
	78.00	83.00	Gravelly clay	
	83.00	113.00	Clay and sand	
FM-GB760	0.00	3.40	Slag fill	
	3.40	17.90	Clay	
	17.90	46.90	Silt and sand	
	46.90	51.90	Sand and silt, little gravel	
	51.90	83.90	Sand, gravel, some silt	
	83.90	88.90	Sand and clay	
	88.90	102.40	Clay and sand	
	102.40	108.90	Gravel, sand and clay	
FM-GB787	0	8	Slag fill	
	8	15	Clay	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	15	23	Silt	
	23	25	Sandy gravel	
	25	30	Silt	
	30	32	Sand	
	32	44	Silt	
	44	53	Sandy gravel	
	53	67	Silt	
	67	107	Sand	
	107	117	Sand and clay	
FM-GB789	0.00	18.00	Clay	
	18.00	32.00	Silt	
	32.00	36.00	Silty sand	
	36.00	47.00	Silt	
	47.00	53.00	Gravel, sand and clay	
	53.00	64.00	Clay	
	64.00	69.00	Silty clay	
	69.00	84.00	Sand and some clay	
	84.00	92.00	Sand	
	92.00	103.00	Silty sand	
	103.00	116.00	Sand	
	116.00	123.00	Sandy gravel	
FM-GB796	0.00	9.00	Clay	
	9.00	13.00	Silty clay	
	13.00	17.00	Clay	
	17.00	26.00	Silty clay	
	26.00	32.00	Silty sand	
	32.00	42.00	Silt	
	42.00	45.00	Silty sand	
	45.00	52.00	Sandy clayey silt	
	52.00	62.00	Clayey silt	
	62.00	65.00	Sand	

Boring No.	**Top Depth**	**Bottom Depth**	**Lithology**	**Comments**
	65.00	77.00	Sandy silt	
	77.00	82.00	Silty sand	
	82.00	89.00	Sand and clay	
	89.00	108.00	Clay	
	108.00	120.00	Silt	
FM-GB1184	0.00	7.00	Slag fill	
	7.00	11.00	Clay	
	11.00	27.00	Slag fill	
	27.00	34.00	Silty sand	
	34.00	43.00	Clay	
	43.00	56.00	Sand and clay	
	56.00	62.00	Sand	
	62.00	67.00	Sand and clay	
	67.00	71.00	Sand	
	71.00	111.00	Clay, trace sand	
FM-GB1449	0.00	20.60	Slag fill	
	20.60	26.60	Clay	
	26.60	31.60	Silt	
	31.60	41.60	Clay	
	41.60	55.60	Clayey sand	
	55.60	77.60	Silt	
	77.60	81.60	Clayey sand	
	81.60	87.60	Silt	
	87.60	91.60	Clayey silt	
	91.60	107.60	Clay	
	107.60	122.60	Clayey sand	
HC-5	0.00	24.50	Slag	
	24.50	28.50	Silty Sand	
	28.50	43.50	Silty Clay	
	43.50	84.00	Sand & Gravel	
	84.00	100.00	Fine Sand	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
TM-GB1450	0	7.4	Slag fill	
	7.4	16.8	Silt	
	16.8	30.8	Clay	
	30.8	37.8	Silt	
	37.8	58.8	Silty Sand	
	58.8	78.8	Sandy	
	78.8	108.8	Clay	

Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	FM01-PZM003	FM01-PZM041		FM02-PZM002	FM02-PZM033	FM03-PZM005	FM03-PZM026	FM04-PZM010	FM04-PZM037	FM05-PZM004	FM05-PZM024	HI02-PZM006		HI02-PZM032		HI04-PZM006	HI04-PZM034	HI05-PZM012
Sample ID	FM01-PZM003-01D	FM01-PZM041-01D	FM01-PZM041-01D DUP	FM02-PZM002-01D	FM02-PZM033-01D	FM03-PZM005-01D	FM03-PZM026-01D	FM04-PZM010-01D	FM04-PZM037-01D	FM05-PZM004-01D	FM05-PZM024-01D	HI02-PZM006-01D	HI02-PZM006A-01D	HI02-PZM032A 01D	HI02-PZM032-01D	HI04-PZM006-01D	HI04-PZM034-01D	HI05-PZM012-01D
Sample Date	11/29/01	11/29/01	11/29/01	11/30/01	11/30/01	12/05/01	12/04/01	11/29/01	11/29/01	11/29/01	11/29/01	12/04/01	12/04/01	11/28/01	12/04/01	11/27/01	11/27/01	11/27/01
Chemical Name																		
Volatile Organic Compounds (UG/L)																		
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	3.8	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	8.5	1,900	1.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	0.5 J	470	1 U	1 U	1 U	1 U	1 U	1 U	3.2	2.4	1 U	1 U	1 U
1,2,3-Trichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	0.38 J	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dioxane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	200 R	NA	NA	NA	NA
2-Butanone	5 U	5 U	5 U	5 U	5 U	5 U	380 U	5 U	5 U	5 U	5 U	5 U	1.2 J	5 U	5 U	5 U	5 U	5 U
2-Chloro-1,3-butadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
2-Hexanone	5 U	5 U	5 U	5 U	5 U	5 U	380 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	0.41 J	5 U	5 U	380 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	10 U	10 U	10 U	2.5 J	10 U	3.1 J	750 U	10 U	10 U	10 U	10 U	5.2 J	6.3 J	10 U	10 U	9.4 J	10 U	4.3 J
Acetonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	NA	NA	NA	NA
Acrolein	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	NA	NA	NA	NA
Acrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 R	NA	NA	NA	NA
Allyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Benzene	1 U	1 U	1 U	2.3	1 U	0.35 J	75 U	1 U	1 U	1.7	1 U	1.2	0.77 J	1 U	1 U	1 U	1 U	1.3
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 R	NA	NA	NA	NA
Carbon disulfide	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	0.79 J	1 U	1 U	1.2	1 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	2 U	2 U	2 U	2 U	2 U	2 UJ	150 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chloroform	31	1 U	1 U	1 U	1 U	2.7	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Dibromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Dichlorodifluoromethane(Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U	NA	NA	NA	NA
Ethyl methacrylate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Ethylbenzene	1 U	1 U	1 U	0.44 J	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Iodomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Isobutanol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	40 U	NA	NA	NA	NA
Methacrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Methyl methacrylate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Methylene chloride	2 U	2 U	2 U	2 U	2 U	0.64 J	150 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.71 J	0.73 J	1.1 J	0.91 J
Propionitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 R	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	1 U	0.83 J	1 U	0.35 J	75 U	1 U	1 U	0.62 J	1 U	0.47 J	0.67 J	1 U	1 U	5.9	1 U	0.39 J
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	0.32 J	0.32 J	1 U	1 U	1 U
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U	NA	NA	NA	NA
Vinyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Vinyl chloride	2 U	2 U	2 U	2 U	2 U	2 U	150 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Xylene, total	3 U	3 U	3 U	3.3	3 U	3 U	220 U	3 U	3 U	0.75 J	3 U	3 U	0.97 J	3 U	3 U	3 U	3 U	0.78 J
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	75 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

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Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	FM01-PZM003	FM01-PZM041		FM02-PZM002	FM02-PZM033	FM03-PZM005	FM03-PZM026	FM04-PZM010	FM04-PZM037	FM05-PZM004	FM05-PZM024	HI02-PZM006		HI02-PZM032		HI04-PZM006	HI04-PZM034	HI05-PZM012
Sample ID	FM01-PZM003-01D	FM01-PZM041-01D	FM01-PZM041-01D DUP	FM02-PZM002-01D	FM02-PZM033-01D	FM03-PZM005-01D	FM03-PZM026-01D	FM04-PZM010-01D	FM04-PZM037-01D	FM05-PZM004-01D	FM05-PZM024-01D	HI02-PZM006-01D	HI02-PZM006A-01D	HI02-PZM032A 01D	HI02-PZM032-01D	HI04-PZM006-01D	HI04-PZM034-01D	HI05-PZM012-01D
Sample Date	11/29/01	11/29/01	11/29/01	11/30/01	11/30/01	12/05/01	12/04/01	11/29/01	11/29/01	11/29/01	11/29/01	12/04/01	12/04/01	11/28/01	12/04/01	11/27/01	11/27/01	11/27/01
Chemical Name																		
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA
Semivolatile Organic Compounds (UG/L)																		
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
1,4-Naphthoquinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
1-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	10 U	NA	10 U	20 U	20 U	20 U	20 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
2,4,5-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	32	NA	2.6 J	10 U	10 U	10 U	14
2,4-Dinitrophenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
2,6-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
2-Acetylaminofluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
2-Methyl-5-nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
2-Methylaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
2-Methylnaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	3.6 J	10 U	1.4 J	NA	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1.1 J	NA	10 U	10 U	10 U	10 U	10 U
2-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
2-Picoline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
3,3'-Dichlorobenzidine	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U
3,3'-Dimethylbenzidine	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U
3-Methylcholanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
4,6-Dinitro-2-methylphenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U
4-Aminobiphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10	NA	2.2 J	10 U	2.5 J	10 U	3.8 J
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
4-Nitrophenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100 U	100 U	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
Acenaphthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.95 J	10 U	1.5 J	NA	10 U	10 U	1.2 J	10 U	10 U
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
Aniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
Anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Aramite	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U

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Bethlehem Steel Corporation - Sparrows Point Facility

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Sample ID	FM01-PZM003-01D	FM01-PZM041-01D	FM01-PZM041-01D DUP	FM02-PZM002-01D	FM02-PZM033-01D	FM03-PZM005-01D	FM03-PZM026-01D	FM04-PZM010-01D	FM04-PZM037-01D	FM05-PZM004-01D	FM05-PZM024-01D	HI02-PZM006-01D	HI02-PZM006A-01D	HI02-PZM032A 01D	HI02-PZM032-01D	HI04-PZM006-01D	HI04-PZM034-01D	HI05-PZM012-01D
Sample Date	11/29/01	11/29/01	11/29/01	11/30/01	11/30/01	12/05/01	12/04/01	11/29/01	11/29/01	11/29/01	11/29/01	12/04/01	12/04/01	11/28/01	12/04/01	11/27/01	11/27/01	11/27/01
Chemical Name																		
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1.3 J	10 U	0.74 J	NA	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Dimethyl phthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
Diphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
Ethyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
Fluoranthene	0.73 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1.5 J	10 U	10 U	NA	10 U	10 U	10 U	10 U	0.65 J
Fluorene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1.8 J	10 U	1.3 J	NA	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Hexachloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100 U	100 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Isosafrole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
Methyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
N-Nitrosomorpholine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
N-Nitrosopiperidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
Naphthalene	0.59 J	10 U	10 U	3.7 J	10 U	10 U	10 U	10 U	10 U	320	4.5 J	7.3 J	NA	10 U	10 U	0.89 J	10 U	1 J
Nitrobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Pentachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
Pentachloroethane	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
Pentachlorophenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U
Phenacetin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
Phenanthrene	0.98 J	10 U	10 U	1.4 J	10 U	10 U	10 U	10 U	10 U	3.6 J	10 U	1.1 J	NA	10 U	10 U	0.85 J	10 U	10 U
Phenol	10 U	10 U	10 U	3.4 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2.6 J	NA	10 U	10 U	10 U	10 U	10 U
Pronamide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
Pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 J	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Pyridine	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	NA	20 U	20 U	20 U	20 U	20 U
Safrole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
a,a-Dimethylphenethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	NA	NA	NA
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	12	10 U	10 U
n-Nitroso-di-n-butylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
n-Nitroso-n-methylethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
n-Nitrosodiethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
n-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA
n-Nitrosopyrrolidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	NA	NA

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Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	FM01-PZM003	FM01-PZM041		FM02-PZM002	FM02-PZM033	FM03-PZM005	FM03-PZM026	FM04-PZM010	FM04-PZM037	FM05-PZM004	FM05-PZM024	HI02-PZM006		HI02-PZM032		HI04-PZM006	HI04-PZM034	HI05-PZM012
Sample ID	FM01-PZM003-01D	FM01-PZM041-01D	FM01-PZM041-01D DUP	FM02-PZM002-01D	FM02-PZM033-01D	FM03-PZM005-01D	FM03-PZM026-01D	FM04-PZM010-01D	FM04-PZM037-01D	FM05-PZM004-01D	FM05-PZM024-01D	HI02-PZM006-01D	HI02-PZM006A-01D	HI02-PZM032A 01D	HI02-PZM032-01D	HI04-PZM006-01D	HI04-PZM034-01D	HI05-PZM012-01D
Sample Date	11/29/01	11/29/01	11/29/01	11/30/01	11/30/01	12/05/01	12/04/01	11/29/01	11/29/01	11/29/01	11/29/01	12/04/01	12/04/01	11/28/01	12/04/01	11/27/01	11/27/01	11/27/01
Chemical Name																		
p-Dimethylaminoazobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	20 U	NA	NA	NA
p-Phenylenediamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	200 U	200 U	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)																		
Aroclor-1016	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U
Aroclor-1221	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U
Aroclor-1232	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U
Aroclor-1242	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U
Aroclor-1248	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1.3
Aroclor-1254	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U
Aroclor-1260	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U
Total Metals (UG/L)																		
Antimony	5.6 B	4.1 U	4.1 U	4.8 B	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.5 J	NA	NA	4.1 U	4.1 U	4.1 U	4.1 U
Arsenic	4.2 J	26.6	26.4	4 J	4 J	3 J	2 U	2 U	6.4 J	12.1	3.2 J	2.1 B	NA	NA	44.7	3.9 J	11.7	10.8
Barium	19.8 J	608	608	33.7 B	156 J	23.2 J	56.2 B	139 J	145 J	24.8 J	95.4 J	33.4 J	NA	NA	40.2 B	144 J	106 J	12.6 J
Beryllium	2.1 B	2.3 B	2.1 B	2.5 B	2 B	7.3	1.8 B	1.1 B	1.8 B	3 B	0.86 B	0.83 B	NA	NA	1.1 B	1.1 B	2 B	2.6 B
Cadmium	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	3.6 J	3.3 J	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	NA	NA	0.63 U	0.63 U	0.63 U	0.63 U
Chromium	21.7	1.3 J	1.4 J	6	1.5 B	14.3	1.1 U	2 B	1.4 J	3.1 J	1.9 J	1.1 U	NA	NA	1.6 B	79.5	5.2	234
Cobalt	1.1 J	0.86 U	0.86 U	112	0.86 U	58	305	0.86 U	0.86 U	0.86 U	1.7 J	0.86 U	NA	NA	1.8 J	4.4 B	0.86 U	16.1 J
Copper	20.6 J	0.77 U	0.77 U	1.1 B	0.77 U	54.5	0.77 U	0.77 U	0.77 U	8.9 B	0.77 U	3.9 B	NA	NA	0.77 U	22.7 B	6.5 B	48.7
Lead	50.5	1.8 U	1.8 U	4.6	2.7 B	7.5	1.8 U	1.8 U	2 J	3 B	1.9 J	1.8 U	NA	NA	1.8 U	36.5	2 B	53.7
Mercury	0.054 U	0.054 U	0.054 B	0.063 B	0.054 U	0.054 U	0.054 UL	0.054 U	0.063 B	0.054 U	0.054 U	0.054 R	NA	NA	0.054 L	0.069 J	0.054 U	0.13 B
Nickel	2.5 J	2.4 U	2.4 U	193	2.4 U	277	111	2.4 U	2.4 U	3.9 J	2.4 U	2.9 J	NA	NA	3 J	8 B	2.4 U	63.5
Selenium	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	16 U	6.4 U	3.4 B	3.2 U	3.2 U	4 J	3.2 U	NA	NA	3.2 U	3.2 U	3.2 U	3.2 U
Silver	0.75 U	0.75 U	0.75 U	0.75 U	0.95 J	1.5 J	0.75 U	0.87 J	0.75 U	0.75 U	0.75 U	1.1 B	NA	NA	0.75 U	0.75 U	0.75 U	1.3 J
Thallium	5.7 U	5.7 U	6.7 J	5.7 U	5.7 U	28.7 U	11.5 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	NA	NA	5.7 U	5.7 U	5.7 U	5.7 U
Tin	28.8 U	33.5 J	28.8 U	30 J	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	NA	NA	28.8 U	240	28.8 U	1,190
Vanadium	368	1.5 U	1.5 U	11.5 J	1.5 U	14.3 J	48.9 J	4 J	10.3 J	20 J	9.7 J	182	NA	NA	9.5 J	8.9 J	1.5 U	13.6 J
Zinc	121	1.9 B	1.5 U	392	1.5 U	1,920	3,610	9.7 B	3.3 B	14.8 J	2.6 B	2.1 B	NA	NA	4.4 B	175	11.4 J	271
Common Cations (UG/L)																		
Calcium	51,200	140,000	139,000	NA	39,300	NA	120,000	NA	NA	110,000	23,800	103,000	NA	NA	28,400	NA	40,900	NA
Iron	3,880	60,100	60,000	NA	69,600	NA	316,000 L	NA	NA	1,780	39,600	45 U	NA	NA	28,100 L	NA	51,900	NA
Magnesium	1,030 J	81,300	80,900	NA	23,800	NA	103,000	NA	NA	508 J	13,400	39.6 B	NA	NA	29,400	NA	30,600	NA
Manganese	297	390	392	NA	5,170	NA	17,300	NA	NA	41.8	2,370	0.65 B	NA	NA	1,770	NA	6,480	NA
Potassium	5,300	27,100	26,900	NA	2,360 J	NA	4,600 J	NA	NA	28,600	2,840 J	43,100 J	NA	NA	5,870	NA	2,970 J	NA
Sodium	26,800	359,000	361,000	NA	71,600	NA	217,000	NA	NA	441,000	58,900	68,300	NA	NA	305,000	NA	125,000	NA
Wet Chemistry (MG/L)																		
Amenable cyanide	0.004 B	0.028 J	0.03 J	0.016 K	0.025 K	0.0052 J	0.027 J	0.024 J	0.013 J	3.3 J	0.19 J	5 J	NA	0.031 J	0.018 J	0.33	0.028	0.2
Bicarbonate	150	146	150	NA	163	NA	98.9	NA	NA	26.8	103	16.5	NA	NA	177	NA	105	NA
Chloride	1,190	1,180	1,190	NA	83.4	NA	287	NA	NA	674	135	85.6	NA	NA	292	NA	286	NA
Sulfate	1 U	1 U	1 U	NA	118	NA	1,250	NA	NA	307	47.6	198	NA	NA	275	NA	40.9	NA
Sulfide	1 U	1 U	1 U	1 U	1 U	1 U	1	1 U	4.3	1 U	1 U	1 U	NA	1 U	1	1 U	1 U	1 U
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed
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J - Value is estimated
K - Value biased high
L - Value biased low

R - Unreliable result
U - Not detected
UJ - Not detected; estimated DL
UL - Not detected, low DL

Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	HI05-PZM046		HI07-PZM005	HI07-PZM032	TM02-PZM009		TM02-PZM028		TM02-PZM062	TM03-PZM004	TM03-PZM037	TM04-PZM006	TM04-PZM028	TM04-PZM056	TM05-PZM005	TM05-PZM040	TM06-PZM008	TM06-PZM034
Sample ID	HI05-PZM046-01D	HI05-PZM046-01D DUP	HI07-PZM005-01D	HI07-PZM032-01D	TM02-PZM009-01D	TM02-PZM009A-01D	TM02-PZM028-01D	TM02-PZM028 01D DUP	TM02-PZM062-01D	TM03-PZM004-01D	TM03-PZM037-01D	TM04-PZM006-01D	TM04-PZM028-01D	TM04-PZM056-01D	TM05-PZM005-01D	TM05-PZM040-01D	TM06-PZM008-01D	TM06-PZM034-01D
Sample Date	11/26/01	11/26/01	11/28/01	11/28/01	12/04/01	12/04/01	11/28/01	11/28/01	11/28/01	11/30/01	11/30/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01
Chemical Name																		
Volatile Organic Compounds (UG/L)																		
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.3	50 U	5 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
1,4-Dioxane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	5 U	5 U	5 U	1.2 J	5 U	5 U	5 U	5 U	1.4 J	5 U	5 U	5 U	250 U	25 U	5 U	5 U	5 U	5 U
2-Chloro-1,3-butadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	250 U	25 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	1.2 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	250 U	25 U	5 U	5 U	5 U	5 U
Acetone	10 U	10 U	10 U	5.8 J	7.1 B	10 U	5.3 J	3.6 J	6.7 J	2.7 J	10 U	3.2 J	500 U	50 U	10 U	10 U	10 U	10 U
Acetonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrolein	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Allyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1 U	1 U	25	71	2.8	2.1	6.1	5.8	2.7	1 U	0.31 J	1,400	1,200	130	2	1 U	0.29 J	1 U
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
Chloroethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 UJ	100 UJ	10 UJ	2 U	2 U	2 UJ	2 UJ
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	30	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane(Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methacrylate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	1 U	1 U	0.43 J	1	0.27 J	0.26 J	0.56 J	0.48 J	1 U	1 U	1 U	24	28 J	1.3 J	0.25 J	1 U	1 U	1 U
Iodomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isobutanol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methacrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl methacrylate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	2 U	0.72 B	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	100 U	10 U	2 U	2 U	2 U	2 U
Propionitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	7.9	22	2.8	2.4	5.2	4.6	2.1	1 U	1 U	9.9	24 J	5 U	0.71 J	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 U	0.36 J	0.29 J	1	1	2	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	3.6	100 U	10 U	2 U	2 U	2 U	2 U
Xylene, total	3 U	3 U	9.4	27	2 J	1.9 J	9.8	8.8	3.7	3 U	3 U	47	86 J	5.2 J	1.5 J	3 U	3 U	3 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U	5 U	1 U	1 U	1 U	1 U

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Sample ID	HI05-PZM046-01D	HI05-PZM046-01D DUP	HI07-PZM005-01D	HI07-PZM032-01D	TM02-PZM009-01D	TM02-PZM009A-01D	TM02-PZM028-01D	TM02-PZM028 01D DUP	TM02-PZM062-01D	TM03-PZM004-01D	TM03-PZM037-01D	TM04-PZM006-01D	TM04-PZM028-01D	TM04-PZM056-01D	TM05-PZM005-01D	TM05-PZM040-01D	TM06-PZM008-01D	TM06-PZM034-01D
Sample Date	11/26/01	11/26/01	11/28/01	11/28/01	12/04/01	12/04/01	11/28/01	11/28/01	11/28/01	11/30/01	11/30/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01
Chemical Name																		
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (U																		
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Naphthoquinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	20 U	20 U	20 U	20 U	20 U	NA	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	22	240	79	NA	180	170	45	3.6 J	10 U	51	41	4.4 J	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Acetylaminofluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methyl-5-nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	10 U	10 U	2.4 J	20	1.3 J	NA	11	11	3.5 J	38	10 U	1.2 J	1.9 J	10 U	3.4 J	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	0.94 J	5.1 J	4.5 J	NA	5.2 J	5.2 J	2 J	1.5 J	10 U	0.91 J	10 U	10 U	10 U	10 U	10 U	10 U
2-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Picoline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
3,3'-Dimethylbenzidine	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
3-Methylcholanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
4-Aminobiphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	10	100	77	NA	85	77	27	8.3 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	10 U	10 U	0.85 J	2.4 J	2.2 J	NA	2.8 J	2.6 J	1.7 J	7.1 J	10 U	10 U	1.2 J	10 U	1.7 J	3 J	2.1 J	10 U
Acenaphthylene	10 U	10 U	1.2 J	2.9 J	10 U	NA	1.3 J	1.2 J	1 J	18	10 U	1.3 J	1.8 J	10 U	1.5 J	10 U	10 U	10 U
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	10 U	10 U	10 U	10 U	10 U	NA	1.3 J	1.1 J	10 U	12	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Aramite	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

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Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	HI05-PZM046		HI07-PZM005	HI07-PZM032	TM02-PZM009		TM02-PZM028		TM02-PZM062	TM03-PZM004	TM03-PZM037	TM04-PZM006	TM04-PZM028	TM04-PZM056	TM05-PZM005	TM05-PZM040	TM06-PZM008	TM06-PZM034
Sample ID	HI05-PZM046-01D	HI05-PZM046-01D DUP	HI07-PZM005-01D	HI07-PZM032-01D	TM02-PZM009-01D	TM02-PZM009A-01D	TM02-PZM028-01D	TM02-PZM028 01D DUP	TM02-PZM062-01D	TM03-PZM004-01D	TM03-PZM037-01D	TM04-PZM006-01D	TM04-PZM028-01D	TM04-PZM056-01D	TM05-PZM005-01D	TM05-PZM040-01D	TM06-PZM008-01D	TM06-PZM034-01D
Sample Date	11/26/01	11/26/01	11/28/01	11/28/01	12/04/01	12/04/01	11/28/01	11/28/01	11/28/01	11/30/01	11/30/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01
Chemical Name																		
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 U	NA	10 UJ	10 UJ	10 U	7.5 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 U	NA	10 UJ	10 UJ	10 U	7.8 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U	NA	10 UJ	10 UJ	10 U	6.7 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	NA	10 UJ	10 UJ	10 U	6.8 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	11	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	NA	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	NA	10 UJ	10 UJ	10 U	2.3 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	0.91 J	2.7 J	1 J	NA	3.6 J	3.3 J	1.8 J	36	10 U	10 U	0.72 J	10 U	1.7 J	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dimethyl phthalate	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	10 U	10 U	1 J	0.82 J	10 U	NA	1.5 J	1.4 J	1.4 J	34	1.1 J	10 U	10 U	10 U	1 J	10 U	0.82 J	10 U
Fluorene	10 U	10 U	1.2 J	4.5 J	1.5 J	NA	3.6 J	3.5 J	2.1 J	34	0.62 J	10 U	1.1 J	10 U	2.5 J	10 U	1.1 J	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	10 U	10 U	NA	10 UJ	10 UJ	10 U	6.5 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isosafrole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosomorpholine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosopiperidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	10 U	10 U	40	240	20	NA	150	150	41	240	2.7 J	200	150	20	48	7.1 J	10 U	10 U
Nitrobenzene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachloroethane	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	50 U	50 U	50 U	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Phenacetin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	10 U	10 U	3 J	5.7 J	3.8 J	NA	7.8 J	7.6 J	5.1 J	75	2.5 J	0.86 J	1.2 J	10 U	5.3 J	2.2 J	0.79 J	10 U
Phenol	10 U	10 U	4.8 J	30	10 U	NA	8 J	7.7 J	29	6.9 J	10 U	2.1 J	3.6 J	9.6 J	10 U	10 U	10 U	10 U
Pronamide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	27	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyridine	20 U	20 U	4.1 J	16 J	20 U	NA	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Safrole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
a,a-Dimethylphenethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
n-Nitroso-di-n-butylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-n-methylethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosopyrrolidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	HI05-PZM046		HI07-PZM005	HI07-PZM032	TM02-PZM009		TM02-PZM028		TM02-PZM062	TM03-PZM004	TM03-PZM037	TM04-PZM006	TM04-PZM028	TM04-PZM056	TM05-PZM005	TM05-PZM040	TM06-PZM008	TM06-PZM034
Sample ID	HI05-PZM046-01D	HI05-PZM046-01D DUP	HI07-PZM005-01D	HI07-PZM032-01D	TM02-PZM009-01D	TM02-PZM009A-01D	TM02-PZM028-01D	TM02-PZM028 01D DUP	TM02-PZM062-01D	TM03-PZM004-01D	TM03-PZM037-01D	TM04-PZM006-01D	TM04-PZM028-01D	TM04-PZM056-01D	TM05-PZM005-01D	TM05-PZM040-01D	TM06-PZM008-01D	TM06-PZM034-01D
Sample Date	11/26/01	11/26/01	11/28/01	11/28/01	12/04/01	12/04/01	11/28/01	11/28/01	11/28/01	11/30/01	11/30/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01	12/03/01
Chemical Name																		
p-Dimethylaminoazobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Phenylenediamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls																		
Aroclor-1016	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1221	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1232	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1242	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1248	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1254	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1260	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Total Metals (UG/L)																		
Antimony	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	NA	4.1 U	4.1 U	4.1 U	4.2 B	4.1 U	4.1 U	4.1 U	4.1 U	4.7 J	4.2 B	4.1 U	4.1 U
Arsenic	43.8	40.8	2 U	2 U	3.6 J	NA	3.2 J	2 U	15.4	7.4 J	30.5	2.1 J	2.2 J	2 U	4.1 J	3.6 J	2.9 J	16.7
Barium	195 J	178 J	137 J	102 J	92.4 J	NA	117 J	116 J	125 J	30.5 B	158 J	41 J	28.9 J	601	18.3 J	240	38.4 J	55.2 J
Beryllium	2.3 B	1.6 B	2.9 B	2.6 B	1.8 B	NA	2.2 B	3 B	3.4 B	1.6 B	2.3 B	1.3 B	1.2 B	1.5 B	3.7 B	2.6 B	1.3 B	1.4 B
Cadmium	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	NA	0.63 U	0.63 U	0.63 U	4.1 J	0.63 U	0.63 U	0.63 U	0.74 J	0.63 U	0.63 U	0.63 U	1.1 J
Chromium	8.6	3.1 J	5.3	1.1 U	2.1 B	NA	1.1 U	1.7 J	2.4 J	30.5	5.1	2.9 B	1.2 B	6.4	1.2 J	2.7 J	3.9 B	1.1 U
Cobalt	5.5 B	3.9 B	0.86 U	0.86 U	0.86 U	NA	0.86 U	1.9 J	0.86 U	1.6 J	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.88 J	8.8 J
Copper	5.4 B	4.3 B	7.5 B	6.2 B	0.77 U	NA	7 B	7.3 B	6.8 B	28	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U
Lead	3.3 B	2.1 B	4.8	1.8 U	2.2 B	NA	1.8 U	1.8 U	1.8 U	232	1.8 U	1.8 U	1.8 U	1.8 U	2.3 J	1.8 U	2.4 B	1.8 U
Mercury	0.054 U	0.074 J	0.054 U	0.16 B	0.054 UL	NA	0.054 U	0.054 U	0.054 U	0.23 B	0.054 U	0.054 UL	0.054 UL	0.06 L	0.054 U	0.061 B	0.054 UL	0.054 UL
Nickel	5.3 J	3.6 J	5.1 J	10.5 J	13.5 J	NA	14.6 J	15.9 J	3.8 J	5.4 J	2.4 U	8.5 J	6 J	2.9 B	2.4 U	2.4 U	3.7 J	7.3 J
Selenium	3.2 U	3.2 U	3.2 U	3.2 U	5.5	NA	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.8 J	4.6 J	3.2 U
Silver	0.75 U	0.83 J	0.75 U	0.75 U	0.75 U	NA	0.75 U	0.75 U	0.75 U	0.75 J	1.1 J	1.3 B	0.75 U	0.75 U	0.75 U	0.75 U	2.1 B	0.75 U
Thallium	6.1 J	5.7 U	5.7 U	5.7 U	5.7 U	NA	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	13.2	5.7 U	5.7 U	5.7 U	36.5
Tin	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	NA	28.8 U	28.8 U	28.8 U	28.8 U	39.4 J	28.8 U	28.8 U	28.8 U	28.9 J	28.8 U	28.8 U	28.8 U
Vanadium	6.9 J	2.7 J	36.7 J	60.2	75.4	NA	24.9 J	29.6 J	19.5 J	63.4	2.9 J	15.8 J	5.5 J	23.7 J	1,110	8.7 J	12.3 J	31.4 J
Zinc	96.1	63.3	14.2 J	1.5 U	1.5 U	NA	6.2 B	3.3 B	4 B	293	4.3 B	2.5 J	3.6 J	3.3 J	1.5 B	2.6 B	1.5 U	8.1 J
Common Cations (UG/L)																		
Calcium	NA	NA	NA	159,000	281,000	NA	NA	NA	114,000	89,900	71,400	NA	NA	121,000	NA	NA	NA	96,000
Iron	NA	NA	NA	829	52.4 L	NA	NA	NA	7,500	13,400	75,700	NA	NA	119,000 L	NA	NA	NA	216,000 L
Magnesium	NA	NA	NA	2,410 J	15.9 J	NA	NA	NA	28,400	885 J	68,400	NA	NA	105,000	NA	NA	NA	197,000
Manganese	NA	NA	NA	105	0.8 B	NA	NA	NA	329	496	2,870	NA	NA	6,260	NA	NA	NA	9,130
Potassium	NA	NA	NA	48,100	81,800	NA	NA	NA	40,100	28,600	22,000	NA	NA	25,800	NA	NA	NA	27,700
Sodium	NA	NA	NA	131,000	236,000	NA	NA	NA	396,000	48,100	550,000	NA	NA	909,000	NA	NA	NA	1,220,000
Wet Chemistry (MG/L)																		
Amenable cyanide	0.003	0.005	0.45 J	1.5 J	3.7 J	NA	7.6 J	6.3 J	0.43 J	2.3 J	0.014 K	1.9 J	2.6 J	0.13 J	0.009 K	0.043 K	2.6 J	0.029 J
Bicarbonate	NA	NA	NA	5 U	5	NA	NA	NA	138	5 U	200	NA	NA	163	NA	NA	NA	249
Chloride	NA	NA	NA	225	278	NA	NA	NA	867	83.4	1,130	NA	NA	1,900	NA	NA	NA	2,160
Sulfate	NA	NA	NA	37.4	575	NA	NA	NA	60.2	138	186	NA	NA	38.6	NA	NA	NA	701
Sulfide	1 U	1 U	1 U	1 U	2.8	NA	1 U	1 U	1 U	1 U	1 U	1	1	1	2	1 U	1	1
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed	R - Unreliable result
B - Detected in blank	U - Not detected
J - Value is estimated	UJ - Not detected; estimated DL
K - Value biased high	UL - Not detected, low DL
L - Value biased low	

Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM07-PZM005		TM07-PZM045	TM08-PZM007	TM08-PZM038		TM09-PZM007	TM09-PZM047		TM10-PZM007	TM11-PZM007	TM11-PZM034	TM12-PZM006	TM13-PZM007		TM13-PZM046		TM14-PZM005	TM15-PZM007
Sample ID	TM07-PZM005-01D	TM07-PZM005-01D DUP	TM07-PZM045-01D	TM08-PZM007-01D	TM08-PZM038-01D	TM08-PZM038-01D DUP	TM09-PZM007-01D	TM09-PZM047A-01D	TM09-PZM047-01D	TM10-PZM007-01D	TM11-PZM007-01D	TM11-PZM034-01D	TM12-PZM006-01D	TM13-PZM007A-01D	TM13-PZM007-01D	TM13-PZM046A-01D	TM13-PZM046-01D	TM14-PZM005-01D	TM15-PZM007-01D
Sample Date	12/03/01	12/03/01	12/03/01	11/27/01	11/27/01	11/27/01	11/28/01	11/28/01	12/04/01	11/27/01	11/27/01	11/27/01	11/28/01	11/28/01	12/04/01	11/28/01	12/04/01	11/29/01	11/30/01
Chemical Name																			
Volatile Organic Compounds (UG/L)																			
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1.7	1.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.31 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
1,2-Dibromoethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dioxane	NA	NA	NA	200 R	200 R	200 R	200 R	200 R	200 R	NA	NA	NA	NA	200 R	200 R	200 R	200 R	NA	NA
2-Butanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	8.5
2-Chloro-1,3-butadiene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
2-Hexanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.6 J
Acetone	10 U	10 U	10 U	10 U	3.2 J	3.1 J	4.5 B	7.2 B	10	10 U	10 U	10 U	10 U	4.4 B	3.7 J	10 U	10 U	10 U	37
Acetonitrile	NA	NA	NA	20 U	20 U	20 U	20 U	20 U	20 U	NA	NA	NA	NA	20 U	20 U	20 U	20 U	NA	NA
Acrolein	NA	NA	NA	20 U	20 U	20 U	20 U	20 U	20 U	NA	NA	NA	NA	20 U	20 U	20 U	20 U	NA	NA
Acrylonitrile	NA	NA	NA	20 R	20 R	20 R	20 R	20 R	20 R	NA	NA	NA	NA	20 R	20 R	20 R	20 R	NA	NA
Allyl chloride	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	0.88 J	1 U	1 U	NA	NA
Benzene	1 U	1 U	1 U	1 U	1 U	1 U	4.5	1 U	0.38 J	0.55 J	1 U	1 U	0.35 J	4.5	3.2	1 U	1 U	0.53 J	1.5
Bromodichloromethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NA	NA	NA	2 U	2 U	2 U	2 R	2 R	2 U	NA	NA	NA	NA	2 R	2 U	2 R	2 U	NA	NA
Carbon disulfide	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.51 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.2
Carbon tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	2 UJ	2 UJ	2 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.4 J	1 U
Chloromethane	NA	NA	NA	2 U	2 U	2 U	2 U	2 U	2 U	NA	NA	NA	NA	2 U	2 U	2 U	2 U	NA	NA
Dibromochloromethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
Dibromomethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
Dichlorodifluoromethane(Freon-12)	NA	NA	NA	2 U	2 U	2 U	2 U	2 U	2 U	NA	NA	NA	NA	2 U	2 U	2 U	2 U	NA	NA
Ethyl methacrylate	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
Ethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.44 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Iodomethane	NA	NA	NA	1 UJ	1 UJ	1 UJ	1 U	1 U	1 R	NA	NA	NA	NA	1 U	1 R	1 U	1 R	NA	NA
Isobutanol	NA	NA	NA	40 U	40 U	40 U	40 U	40 U	40 U	NA	NA	NA	NA	40 U	40 U	40 U	40 U	NA	NA
Methacrylonitrile	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
Methyl methacrylate	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
Methylene chloride	0.5 J	2 U	2 U	2 U	0.85 B	0.7 B	2 U	2 U	2 U	2 U	0.97 J	0.5 J	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Propionitrile	NA	NA	NA	2 R	2 R	2 R	2 R	2 R	2 R	NA	NA	NA	NA	2 R	2 R	2 R	2 R	NA	NA
Styrene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.72 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1.3	1 U	1 U	1.2	1 U	1 U	1 U	1.3	0.91 J	1 U	1 U	0.31 J	0.42 J
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.68 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane(Freon-11)	NA	NA	NA	2 U	2 U	2 U	2 U	2 U	2 U	NA	NA	NA	NA	2 U	2 U	2 U	2 U	NA	NA
Vinyl acetate	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
Vinyl chloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Xylene, total	3 U	3 U	3 U	3 U	3 U	3 U	1.9 J	3 U	3 U	2.6 J	3 U	3 U	3 U	1.8 J	0.88 J	3 U	3 U	3 U	3 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

NA - Not analyzed
B - Detected in blank
J - Value is estimated
K - Value biased high
L - Value biased low

R - Unreliable result
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Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM07-PZM005		TM07-PZM045	TM08-PZM007	TM08-PZM038		TM09-PZM007	TM09-PZM047		TM10-PZM007	TM11-PZM007	TM11-PZM034	TM12-PZM006	TM13-PZM007		TM13-PZM046		TM14-PZM005	TM15-PZM007
Sample ID	TM07-PZM005-01D	TM07-PZM005-01D DUP	TM07-PZM045-01D	TM08-PZM007-01D	TM08-PZM038-01D	TM08-PZM038-01D DUP	TM09-PZM007-01D	TM09-PZM047A-01D	TM09-PZM047-01D	TM10-PZM007-01D	TM11-PZM007-01D	TM11-PZM034-01D	TM12-PZM006-01D	TM13-PZM007A-01D	TM13-PZM007-01D	TM13-PZM046A-01D	TM13-PZM046-01D	TM14-PZM005-01D	TM15-PZM007-01D
Sample Date	12/03/01	12/03/01	12/03/01	11/27/01	11/27/01	11/27/01	11/28/01	11/28/01	12/04/01	11/27/01	11/27/01	11/27/01	11/28/01	11/28/01	12/04/01	11/28/01	12/04/01	11/29/01	11/30/01
Chemical Name																			
trans-1,4-Dichloro-2-butene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA
Semivolatile Organic Compounds (U																			
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	3.2 J	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
1,3,5-Trinitrobenzene	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
1,3-Dinitrobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
1,4-Naphthoquinone	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
1-Naphthylamine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
2,2'-Oxybis(1-chloropropane)	20 U	20 U	20 U	10 U	10 U	10 U	10 U	NA	50 U	20 U	20 U	20 U	20 U	NA	10 U	NA	10 U	20 U	20 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
2,4,5-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	5.2 J	160	140	1,300	NA	1,900	10 U	10 U	10 U	10 U	NA	6 J	NA	10 U	9.3 J	5.9 J
2,4-Dinitrophenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	250 U	50 U	50 U	50 U	50 U	NA	50 U	NA	50 U	50 U	50 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
2,6-Dichlorophenol	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
2-Acetylaminofluorene	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
2-Methyl-5-nitroaniline	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
2-Methylaniline	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
2-Methylnaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	0.63 J	NA	50 U	1.9 J	10 U	10 U	1.1 J	NA	8.8 J	NA	10 U	1.9 J	20
2-Methylphenol	10 U	10 U	10 U	10 U	3.2 J	3.1 J	37	NA	120	10 U	10 U	10 U	10 U	NA	0.75 J	NA	10 U	10 U	3.3 J
2-Naphthylamine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
2-Nitroaniline	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
2-Picoline	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
3,3'-Dichlorobenzidine	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	250 U	50 U	50 U	50 U	50 U	NA	50 U	NA	50 U	50 U	50 U
3,3'-Dimethylbenzidine	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	250 U	50 U	50 U	50 U	50 U	NA	50 U	NA	50 U	50 U	50 U
3-Methylcholanthrene	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
3-Nitroaniline	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
4,6-Dinitro-2-methylphenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	250 U	50 U	50 U	50 U	50 U	NA	50 U	NA	50 U	50 U	50 U
4-Aminobiphenyl	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
4-Chloroaniline	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	10 U	4 J	41	40	1,300	NA	4,100	10 U	10 U	10 U	10 U	NA	14	NA	10 U	2.7 J	12
4-Nitroaniline	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
4-Nitrophenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	250 U	50 U	50 U	50 U	50 U	NA	50 U	NA	50 U	50 U	50 U
4-Nitroquinoline-1-oxide	NA	NA	NA	100 U	100 U	100 U	100 U	NA	500 U	NA	NA	NA	NA	NA	100 U	NA	100 U	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
Acenaphthene	10 U	10 U	10 U	10 U	10 U	10 U	1.2 J	NA	50 U	2.9 J	10 U	10 U	10 U	NA	1.2 J	NA	10 U	1.8 J	15
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	1.3 J	NA	2 J	NA	10 U	10 U	4 J
Acetophenone	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
Aniline	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
Anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	0.82 J	10 U	10 U	0.84 J	NA	10 U	NA	10 U	10 U	1.2 J
Aramite	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U

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R - Unreliable result
U - Not detected
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Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM07-PZM005		TM07-PZM045	TM08-PZM007	TM08-PZM038		TM09-PZM007	TM09-PZM047		TM10-PZM007	TM11-PZM007	TM11-PZM034	TM12-PZM006	TM13-PZM007		TM13-PZM046		TM14-PZM005	TM15-PZM007
Sample ID	TM07-PZM005-01D	TM07-PZM005-01D DUP	TM07-PZM045-01D	TM08-PZM007-01D	TM08-PZM038-01D	TM08-PZM038-01D DUP	TM09-PZM007-01D	TM09-PZM047A-01D	TM09-PZM047-01D	TM10-PZM007-01D	TM11-PZM007-01D	TM11-PZM034-01D	TM12-PZM006-01D	TM13-PZM007A-01D	TM13-PZM007-01D	TM13-PZM046A-01D	TM13-PZM046-01D	TM14-PZM005-01D	TM15-PZM007-01D
Sample Date	12/03/01	12/03/01	12/03/01	11/27/01	11/27/01	11/27/01	11/28/01	11/28/01	12/04/01	11/27/01	11/27/01	11/27/01	11/28/01	11/28/01	12/04/01	11/28/01	12/04/01	11/29/01	11/30/01
Chemical Name																			
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Benzyl alcohol	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Dibenz(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U	10 U	10 U	10 U	0.63 J	NA	50 U	1.6 J	10 U	10 U	1.5 J	NA	2.2 J	NA	10 U	1.6 J	8.7 J
Diethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	0.62 J	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Dimethyl phthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Dinoseb	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
Diphenylamine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
Ethyl methanesulfonate	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
Fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	1.8 J	10 U	10 U	2.1 J	NA	1.4 J	NA	10 U	0.82 J	1.2 J
Fluorene	10 U	10 U	10 U	10 U	10 U	10 U	1.5 J	NA	50 U	2.1 J	10 U	10 U	2.6 J	NA	3 J	NA	10 U	2.2 J	9.6 J
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Hexachlorocyclopentadiene	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	250 U	50 U	50 U	50 U	50 U	NA	50 U	NA	50 U	50 U	50 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Hexachloropropene	NA	NA	NA	100 U	100 U	100 U	100 U	NA	500 U	NA	NA	NA	NA	NA	100 U	NA	100 U	NA	NA
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Isosafrole	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
Methapyrilene	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
Methyl methanesulfonate	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
N-Nitrosomorpholine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
N-Nitrosopiperidine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
Naphthalene	0.6 J	0.77 J	10 U	10 U	1.3 J	3.2 J	10 U	NA	50 U	12	4.8 J	10 U	7 J	NA	330	NA	3.5 J	11	89
Nitrobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
Pentachlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
Pentachloroethane	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	250 U	50 U	50 U	50 U	50 U	NA	50 U	NA	50 U	50 U	50 U
Pentachloronitrobenzene	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
Pentachlorophenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	250 U	50 U	50 U	50 U	50 U	NA	50 U	NA	50 U	2.5 J	50 U
Phenacetin	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
Phenanthrene	10 U	10 U	10 U	0.6 J	10 U	10 U	2.2 J	NA	50 U	5 J	0.82 J	10 U	5.4 J	NA	5.8 J	NA	10 U	4.1 J	10
Phenol	10 U	10 U	10 U	1.5 J	11	10	520	NA	9,800	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	29
Pronamide	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
Pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	1.2 J	10 U	10 U	1.6 J	NA	10 U	NA	10 U	10 U	10 U
Pyridine	20 U	20 U	20 U	20 U	20 U	20 U	20 U	NA	100 U	20 U	20 U	20 U	20 U	NA	20 U	NA	20 U	20 U	20 U
Safrole	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
a,a-Dimethylphenethylamine	NA	NA	NA	50 U	50 U	50 U	50 U	NA	250 U	NA	NA	NA	NA	NA	50 U	NA	50 U	NA	NA
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	5.7 J	10 U	10 U	10 U	NA	50 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U
n-Nitroso-di-n-butylamine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
n-Nitroso-di-n-propylamine	10 U	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
n-Nitroso-n-methylethylamine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
n-Nitrosodiethylamine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
n-Nitrosodimethylamine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA
n-Nitrosopyrrolidine	NA	NA	NA	10 U	10 U	10 U	10 U	NA	50 U	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA

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Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM07-PZM005		TM07-PZM045	TM08-PZM007	TM08-PZM038		TM09-PZM007	TM09-PZM047		TM10-PZM007	TM11-PZM007	TM11-PZM034	TM12-PZM006	TM13-PZM007		TM13-PZM046		TM14-PZM005	TM15-PZM007
Sample ID	TM07-PZM005-01D	TM07-PZM005-01D DUP	TM07-PZM045-01D	TM08-PZM007-01D	TM08-PZM038-01D	TM08-PZM038-01D DUP	TM09-PZM007-01D	TM09-PZM047A-01D	TM09-PZM047-01D	TM10-PZM007-01D	TM11-PZM007-01D	TM11-PZM034-01D	TM12-PZM006-01D	TM13-PZM007A-01D	TM13-PZM007-01D	TM13-PZM046A-01D	TM13-PZM046-01D	TM14-PZM005-01D	TM15-PZM007-01D
Sample Date	12/03/01	12/03/01	12/03/01	11/27/01	11/27/01	11/27/01	11/28/01	11/28/01	12/04/01	11/27/01	11/27/01	11/27/01	11/28/01	11/28/01	12/04/01	11/28/01	12/04/01	11/29/01	11/30/01
Chemical Name																			
p-Dimethylaminoazobenzene	NA	NA	NA	20 U	20 U	20 U	20 U	NA	100 U	NA	NA	NA	NA	NA	20 U	NA	20 U	NA	NA
p-Phenylenediamine	NA	NA	NA	200 U	200 U	200 U	200 U	NA	1,000 U	NA	NA	NA	NA	NA	200 U	NA	200 U	NA	NA
Pesticide/Polychlorinated Biphenyls																			
Aroclor-1016	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	1 U	1 U	1 U
Aroclor-1221	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	1 U	1 U	1 U
Aroclor-1232	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	1 U	1 U	1 U
Aroclor-1242	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	1 U	1 U	1 U
Aroclor-1248	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	1 U	1 U	1 U
Aroclor-1254	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	1 U	1 U	1 U
Aroclor-1260	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	1 U	1 U	1 U
Total Metals (UG/L)																			
Antimony	4.1	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	NA	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	NA	4.1 U	NA	4.1 U	4.1 U	5.4 B
Arsenic	3.1 J	3 J	7.8 J	6.8 J	8.4 J	7 J	8.3 J	NA	2 U	2 U	2.6 J	12.7	2.5 J	NA	2 U	NA	12	5.5 J	6.5 J
Barium	55.3 J	55.5 J	90.4 J	79.2 J	611	603	69.6 J	NA	315	90.9 J	62.1 J	243	62.3 J	NA	61.8 J	NA	126 J	52.6 J	43.7 B
Beryllium	1.8 B	2.2 B	1.2 B	2.4 B	2.7 B	3 B	4 B	NA	1 B	3 B	2.4 B	2.8 B	3.5 B	NA	2.9 B	NA	3.9 B	1.6 B	2.8 B
Cadmium	0.63 U	0.63 U	0.63 U	0.72	0.63 U	0.63 U	0.63 U	NA	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	NA	0.63 U	NA	0.63 U	0.63 U	0.63 U
Chromium	2.8 B	3.1 B	1.1 U	161	1.4 J	4.6 J	55.2	NA	1.1 U	12.7	2.3 J	1.2 J	2.1 B	NA	1.1 U	NA	1.1 U	1.1 U	1.4 B
Cobalt	0.86 U	0.86 U	8.2 J	2.1 J	1.3 J	1.4 J	4 J	NA	0.87 J	0.86 U	0.86 U	5.2 B	0.86 U	NA	0.86 U	NA	6.5 J	0.86 U	0.86 U
Copper	0.77 U	0.77 U	0.77 U	30	3.4 B	4.2 B	19.2 J	NA	2.5 B	9.2 B	6.5 B	4.7 B	6.6 B	NA	4 B	NA	2.1 B	0.77 U	0.77 U
Lead	2 B	1.8 U	1.8 U	27	1.8 U	1.8 U	42.1	NA	1.8 U	11	1.8 U	1.8 U	1.8 U	NA	3.8	NA	1.8 U	1.9 B	1.9 B
Mercury	0.72 L	0.054 UL	0.054 UL	0.09 L	0.054 R	0.054 R	0.076 L	NA	0.054 R	0.054 U	0.065 B	0.054 U	0.054 U	NA	0.054 R	NA	0.054 R	0.054 U	0.054 U
Nickel	2.4 U	2.4 U	6.7 J	13 J	2.4 U	2.8 J	5.2 J	NA	2.4 U	2.6 J	2.4 U	2.4 U	2.4 U	NA	2.4 U	NA	2.4 U	2.4 U	3.8 J
Selenium	6.7	3.2 U	3.2 U	5.6	3.2 U	3.2 U	5.4	NA	3.3 J	3.2 U	3.2 U	3.2 U	3.2 U	NA	3.2 U	NA	3.2 U	3.2 U	6.4
Silver	1.2 B	0.95 B	0.75 U	1.1 B	0.75 U	0.75 U	0.89 B	NA	0.86 B	0.75 U	0.75 U	0.75 U	0.75 U	NA	0.75 U	NA	0.82 B	0.75 U	0.75 U
Thallium	5.7 U	5.7 U	16.6	5.7 U	5.7 U	5.7 U	5.7 U	NA	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	NA	5.7 U	NA	5.7 U	5.7 U	5.7 U
Tin	28.8 U	28.8 U	28.8 U	363	28.8 U	28.8 U	28.8 U	NA	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	NA	28.8 U	NA	28.8 U	28.8 U	28.8 U
Vanadium	133	131	24.4 J	26.4 J	10.6 J	9.3 J	107	NA	11.6 B	802	25.8 J	1.5 U	401	NA	141	NA	8.1 B	65.6	318
Zinc	1.5 U	1.9 J	3.5 J	246	4.3 J	7.3 J	188	NA	2.4 B	34.2	3.7 B	2.7 B	2.2 B	NA	6 B	NA	4.9 B	2.1 B	4.1 B
Common Cations (UG/L)																			
Calcium	NA	NA	NA	NA	193,000	197,000	87,100	NA	151,000	179,000	NA	109,000	NA	NA	203,000	NA	76,000	NA	NA
Iron	NA	NA	NA	NA	37,500 J	37,500 J	6,620 J	NA	87,000 J	1,570	NA	56,100	NA	NA	235 J	NA	68,000 J	NA	NA
Magnesium	NA	NA	NA	NA	76,400	73,500	806 J	NA	94,000	548 J	NA	87,400	NA	NA	45.4 B	NA	70,800	NA	NA
Manganese	NA	NA	NA	NA	275 L	276 L	374 L	NA	2,770 L	295	NA	4,110	NA	NA	20.7 L	NA	3,700 L	NA	NA
Potassium	NA	NA	NA	NA	56,200 J	54,200 J	50,500 J	NA	28,700 J	23,500	NA	31,000	NA	NA	47,900 J	NA	10,200 J	NA	NA
Sodium	NA	NA	NA	NA	714,000	711,000	133,000	NA	842,000	76,900	NA	693,000	NA	NA	225,000	NA	694,000	NA	NA
Wet Chemistry (MG/L)																			
Amenable cyanide	0.91 J	0.89 J	0.006 J	0.2	4.7	2.6	6.5 J	NA	0.055 J	0.86	2.4	0.014	0.015 J	NA	6.6 J	NA	0.006 B	3.6 J	10.4 K
Bicarbonate	NA	NA	NA	NA	157	154	5 U	NA	173	5 U	NA	243	NA	NA	37.1	NA	86.5	NA	NA
Chloride	NA	NA	NA	NA	1,740	1,710	194	NA	1,770	127	NA	1,070	NA	NA	411	NA	1,360	NA	NA
Sulfate	NA	NA	NA	NA	171	188	146	NA	202	288	NA	48.2	NA	NA	350	NA	135	NA	NA
Sulfide	1	1	1	3.3	1 U	2.6	1 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	1 U	1 U	1 U
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM15-PZM011				TM15-PZM031		TM16-PZM007		TM17-PZM005		TM18-PZM005	
Sample ID	TM15-PZM011-01D		TM15-PZM011-01D DUP		TM15-PZM031-01D		TM16-PZM007-01D		TM17-PZM005-01D		TM18-PZM005-01D	
Sample Date	11/30/01		11/30/01		12/06/01		11/29/01		11/29/01		11/29/01	
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1,2-Tetrachloroethane	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichloropropane	NA		NA		NA		NA		NA		NA	
1,2-Dibromo-3-chloropropane	NA		NA		NA		NA		NA		NA	
1,2-Dibromoethane	NA		NA		NA		NA		NA		NA	
1,2-Dichloroethane	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	NA		NA		NA		NA		NA		NA	
2-Butanone	1.3	J	8.8		5	U	5	U	5	U	5	U
2-Chloro-1,3-butadiene	NA		NA		NA		NA		NA		NA	
2-Hexanone	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	5	U	1.8	J	5	U	5	U	0.34	J	5	U
Acetone	7.8	J	38		6.3	J	3.2	J	2.9	J	10	U
Acetonitrile	NA		NA		NA		NA		NA		NA	
Acrolein	NA		NA		NA		NA		NA		NA	
Acrylonitrile	NA		NA		NA		NA		NA		NA	
Allyl chloride	NA		NA		NA		NA		NA		NA	
Benzene	4.3		1.4		1	U	1.6		1	U	1	U
Bromodichloromethane	NA		NA		NA		NA		NA		NA	
Bromoform	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	NA		NA		NA		NA		NA		NA	
Carbon disulfide	1	U	1.3		1	U	0.88	J	1	U	1	U
Carbon tetrachloride	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	2	U	2	U	2	U	2	U	2	U	2	U
Chloroform	1	U	1	U	1	U	1	U	1	U	1	U
Chloromethane	NA		NA		NA		NA		NA		NA	
Dibromochloromethane	NA		NA		NA		NA		NA		NA	
Dibromomethane	NA		NA		NA		NA		NA		NA	
Dichlorodifluoromethane(Freon-12)	NA		NA		NA		NA		NA		NA	
Ethyl methacrylate	NA		NA		NA		NA		NA		NA	
Ethylbenzene	0.23	J	1	U	1	U	0.34	J	1	U	1	U
Iodomethane	NA		NA		NA		NA		NA		NA	
Isobutanol	NA		NA		NA		NA		NA		NA	
Methacrylonitrile	NA		NA		NA		NA		NA		NA	
Methyl methacrylate	NA		NA		NA		NA		NA		NA	
Methylene chloride	2	U	2	U	0.49	J	2	U	2	U	2	U
Propionitrile	NA		NA		NA		NA		NA		NA	
Styrene	NA		NA		NA		NA		NA		NA	
Tetrachloroethene	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1.2		0.41	J	1	U	2		1	U	1	U
Trichloroethene	1	U	1	U	1	U	1	U	1	U	1	U
Trichlorofluoromethane(Freon-11)	NA		NA		NA		NA		NA		NA	
Vinyl acetate	NA		NA		NA		NA		NA		NA	
Vinyl chloride	2	U	2	U	2	U	2	U	2	U	2	U
Xylene, total	1.3	J	3	U	1.5	J	3.4		3	U	3	U
cis-1,3-Dichloropropene	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	1	U	1	U	1	U	1	U	1	U	1	U

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Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM15-PZM011				TM15-PZM031		TM16-PZM007		TM17-PZM005		TM18-PZM005	
Sample ID	TM15-PZM011-01D		TM15-PZM011-01D DUP		TM15-PZM031-01D		TM16-PZM007-01D		TM17-PZM005-01D		TM18-PZM005-01D	
Sample Date	11/30/01		11/30/01		12/06/01		11/29/01		11/29/01		11/29/01	
Chemical Name												
trans-1,4-Dichloro-2-butene	NA		NA		NA		NA		NA		NA	
Semivolatile Organic Compounds (U												
1,2,4,5-Tetrachlorobenzene	NA		NA		NA		NA		NA		NA	
1,2,4-Trichlorobenzene	10	U	10	U	NA		10	U	10	U	10	U
1,2-Dichlorobenzene	10	U	10	U	NA		10	U	10	U	10	U
1,3,5-Trinitrobenzene	NA		NA		NA		NA		NA		NA	
1,3-Dichlorobenzene	10	U	10	U	NA		10	U	10	U	10	U
1,3-Dinitrobenzene	NA		NA		NA		NA		NA		NA	
1,4-Dichlorobenzene	10	U	10	U	NA		10	U	10	U	10	U
1,4-Naphthoquinone	NA		NA		NA		NA		NA		NA	
1-Naphthylamine	NA		NA		NA		NA		NA		NA	
2,2'-Oxybis(1-chloropropane)	20	U	20	U	NA		20	U	20	U	20	U
2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
2,4,5-Trichlorophenol	10	U	10	U	NA		10	U	10	U	10	U
2,4,6-Trichlorophenol	10	U	10	U	NA		10	U	10	U	10	U
2,4-Dichlorophenol	10	U	10	U	NA		10	U	10	U	10	U
2,4-Dimethylphenol	15		12		NA		14		10	U	10	U
2,4-Dinitrophenol	50	U	50	U	NA		50	U	50	U	50	U
2,4-Dinitrotoluene	10	U	10	U	NA		10	U	10	U	10	U
2,6-Dichlorophenol	NA		NA		NA		NA		NA		NA	
2,6-Dinitrotoluene	10	U	10	U	NA		10	U	10	U	10	U
2-Acetylaminofluorene	NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	10	U	10	U	NA		10	U	10	U	10	U
2-Chlorophenol	0.7	J	0.73	J	NA		10	U	10	U	10	U
2-Methyl-5-nitroaniline	NA		NA		NA		NA		NA		NA	
2-Methylaniline	NA		NA		NA		NA		NA		NA	
2-Methylnaphthalene	1.5	J	1.7	J	NA		10	U	10	U	1.2	J
2-Methylphenol	7.5	J	8	J	NA		0.98	J	10	U	10	U
2-Naphthylamine	NA		NA		NA		NA		NA		NA	
2-Nitroaniline	NA		NA		NA		NA		NA		NA	
2-Nitrophenol	10	U	10	U	NA		10	U	10	U	10	U
2-Picoline	NA		NA		NA		NA		NA		NA	
3,3'-Dichlorobenzidine	50	U	50	U	NA		50	U	50	U	50	U
3,3'-Dimethylbenzidine	50	U	50	U	NA		50	U	50	U	50	U
3-Methylcholanthrene	NA		NA		NA		NA		NA		NA	
3-Nitroaniline	NA		NA		NA		NA		NA		NA	
4,6-Dinitro-2-methylphenol	50	U	50	U	NA		50	U	50	U	50	U
4-Aminobiphenyl	NA		NA		NA		NA		NA		NA	
4-Bromophenyl-phenylether	10	U	10	U	NA		10	U	10	U	10	U
4-Chloro-3-methylphenol	10	U	10	U	NA		10	U	10	U	10	U
4-Chloroaniline	NA		NA		NA		NA		NA		NA	
4-Chlorophenyl-phenylether	10	U	10	U	NA		10	U	10	U	10	U
4-Methylphenol	48		46		NA		6.2	J	10	U	10	U
4-Nitroaniline	NA		NA		NA		NA		NA		NA	
4-Nitrophenol	50	U	50	U	NA		50	U	50	U	50	U
4-Nitroquinoline-1-oxide	NA		NA		NA		NA		NA		NA	
7,12-Dimethylbenz(a)anthracene	NA		NA		NA		NA		NA		NA	
Acenaphthene	1.7	J	1.9	J	NA		1.2	J	10	U	0.91	J
Acenaphthylene	10	U	10	U	NA		10	U	10	U	10	U
Acetophenone	NA		NA		NA		NA		NA		NA	
Aniline	NA		NA		NA		NA		NA		NA	
Anthracene	10	U	10	U	NA		10	U	10	U	10	U
Aramite	NA		NA		NA		NA		NA		NA	
Benzo(a)anthracene	10	U	10	U	NA		10	U	10	U	10	U

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Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM15-PZM011				TM15-PZM031		TM16-PZM007		TM17-PZM005		TM18-PZM005	
Sample ID	TM15-PZM011-01D		TM15-PZM011-01D DUP		TM15-PZM031-01D		TM16-PZM007-01D		TM17-PZM005-01D		TM18-PZM005-01D	
Sample Date	11/30/01		11/30/01		12/06/01		11/29/01		11/29/01		11/29/01	
Chemical Name												
Benzo(a)pyrene	10	U	10	U	NA		10	U	10	U	10	U
Benzo(b)fluoranthene	10	U	10	U	NA		10	U	10	U	10	U
Benzo(g,h,i)perylene	10	U	10	U	NA		10	U	10	U	10	U
Benzo(k)fluoranthene	10	U	10	U	NA		10	U	10	U	10	U
Benzyl alcohol	NA		NA		NA		NA		NA		NA	
Butylbenzylphthalate	10	U	10	U	NA		10	U	10	U	10	U
Chrysene	10	U	10	U	NA		10	U	10	U	10	U
Di-n-butylphthalate	10	U	10	U	NA		10	U	10	U	10	U
Di-n-octylphthalate	10	U	10	U	NA		10	U	10	U	10	U
Dibenz(a,h)anthracene	10	U	10	U	NA		10	U	10	U	10	U
Dibenzofuran	10	U	0.8	J	NA		10	U	10	U	0.56	J
Diethylphthalate	10	U	10	U	NA		10	U	10	U	10	U
Dimethyl phthalate	10	U	10	U	NA		10	U	10	U	10	U
Dinoseb	NA		NA		NA		NA		NA		NA	
Diphenylamine	NA		NA		NA		NA		NA		NA	
Ethyl methanesulfonate	NA		NA		NA		NA		NA		NA	
Fluoranthene	10	U	10	U	NA		10	U	10	U	0.85	J
Fluorene	1.2	J	1.2	J	NA		0.95	J	10	U	0.74	J
Hexachlorobenzene	10	U	10	U	NA		10	U	10	U	10	U
Hexachlorobutadiene	10	U	10	U	NA		10	U	10	U	10	U
Hexachlorocyclopentadiene	50	U	50	U	NA		50	U	50	U	50	U
Hexachloroethane	10	U	10	U	NA		10	U	10	U	10	U
Hexachloropropene	NA		NA		NA		NA		NA		NA	
Indeno(1,2,3-cd)pyrene	10	U	10	U	NA		10	U	10	U	10	U
Isophorone	10	U	10	U	NA		10	U	10	U	10	U
Isosafrole	NA		NA		NA		NA		NA		NA	
Methapyrilene	NA		NA		NA		NA		NA		NA	
Methyl methanesulfonate	NA		NA		NA		NA		NA		NA	
N-Nitrosomorpholine	NA		NA		NA		NA		NA		NA	
N-Nitrosopiperidine	NA		NA		NA		NA		NA		NA	
Naphthalene	14		16		NA		3.5	J	10	U	12	
Nitrobenzene	10	U	10	U	NA		10	U	10	U	10	U
Pentachlorobenzene	NA		NA		NA		NA		NA		NA	
Pentachloroethane	50	U	50	U	NA		50	U	50	U	50	U
Pentachloronitrobenzene	NA		NA		NA		NA		NA		NA	
Pentachlorophenol	50	U	50	U	NA		50	U	50	U	50	U
Phenacetin	NA		NA		NA		NA		NA		NA	
Phenanthrene	2	J	2	J	NA		2	J	1	J	2	J
Phenol	220		210		NA		2.6	J	10	U	10	U
Pronamide	NA		NA		NA		NA		NA		NA	
Pyrene	10	U	10	U	NA		10	U	10	U	10	U
Pyridine	20	U	20	U	NA		20	U	20	U	20	U
Safrole	NA		NA		NA		NA		NA		NA	
a,a-Dimethylphenethylamine	NA		NA		NA		NA		NA		NA	
bis(2-Chloroethoxy)methane	10	U	10	U	NA		10	U	10	U	10	U
bis(2-Chloroethyl)ether	10	U	10	U	NA		10	U	10	U	10	U
bis(2-Ethylhexyl)phthalate	10	U	10	U	NA		10	U	10	U	17	
n-Nitroso-di-n-butylamine	NA		NA		NA		NA		NA		NA	
n-Nitroso-di-n-propylamine	NA		NA		NA		NA		NA		NA	
n-Nitroso-n-methylethylamine	NA		NA		NA		NA		NA		NA	
n-Nitrosodiethylamine	NA		NA		NA		NA		NA		NA	
n-Nitrosodimethylamine	NA		NA		NA		NA		NA		NA	
n-Nitrosodiphenylamine	NA		NA		NA		NA		NA		NA	
n-Nitrosopyrrolidine	NA		NA		NA		NA		NA		NA	

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Table 2.1-B
All Results
Humphrey Impoundment and Tin Mill Canal/Finishing Mill Areas Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	TM15-PZM011				TM15-PZM031		TM16-PZM007		TM17-PZM005		TM18-PZM005	
Sample ID	TM15-PZM011-01D		TM15-PZM011-01D DUP		TM15-PZM031-01D		TM16-PZM007-01D		TM17-PZM005-01D		TM18-PZM005-01D	
Sample Date	11/30/01		11/30/01		12/06/01		11/29/01		11/29/01		11/29/01	
Chemical Name												
p-Dimethylaminoazobenzene	NA		NA		NA		NA		NA		NA	
p-Phenylenediamine	NA		NA		NA		NA		NA		NA	
Pesticide/Polychlorinated Biphenyls												
Aroclor-1016	1	U	1	U	NA		1	U	1	U	1	U
Aroclor-1221	1	U	1	U	NA		1	U	1	U	1	U
Aroclor-1232	1	U	1	U	NA		1	U	1	U	1	U
Aroclor-1242	1	U	1	U	NA		1	U	1	U	1	U
Aroclor-1248	1	U	1	U	NA		1	U	1	U	1	U
Aroclor-1254	1	U	1	U	NA		1	U	1	U	1	U
Aroclor-1260	1	U	1	U	NA		1	U	1	U	1	U
Total Metals (UG/L)												
Antimony	4.6	B	4.1	U	NA		4.1	U	4.2	J	4.1	U
Arsenic	12.1		13		NA		4.5	J	12		2	U
Barium	63.9	B	65.9	B	NA		30.1	J	261		53.5	J
Beryllium	1.9	B	2.4	B	NA		2.6	B	1.2	B	1.4	B
Cadmium	0.63	U	0.63	U	NA		0.63	U	0.63	U	0.63	U
Chromium	1.2	B	1.5	B	NA		16.8		6.9	B	2.2	J
Cobalt	0.86	U	0.86	U	NA		0.86	U	1.5	J	9.2	B
Copper	0.77	U	0.77	U	NA		7.3	B	0.77	U	0.77	U
Lead	1.8	U	1.8	U	NA		3.5		3.5	B	7.2	B
Mercury	0.055	B	0.075	B	NA		0.084	B	0.054	U	0.054	U
Nickel	8	J	9.5	J	NA		10.6	J	3.1	J	2.8	J
Selenium	3.2	U	4.3	J	NA		3.2	U	3.2	U	3.2	U
Silver	0.75	U	0.75	U	NA		0.75	U	1.6	J	0.75	U
Thallium	5.7	U	5.7	U	NA		5.7	U	5.7	U	5.7	U
Tin	28.8	U	28.8	U	NA		28.8	U	35.3	J	28.8	U
Vanadium	33.5	J	33.8	J	NA		85.9		21.5	J	3.2	J
Zinc	2	B	2	B	NA		13.6	J	13.4	J	12.2	J
Common Cations (UG/L)												
Calcium	NA		NA		NA		NA		NA		NA	
Iron	NA		NA		NA		NA		NA		NA	
Magnesium	NA		NA		NA		NA		NA		NA	
Manganese	NA		NA		NA		NA		NA		NA	
Potassium	NA		NA		NA		NA		NA		NA	
Sodium	NA		NA		NA		NA		NA		NA	
Wet Chemistry (MG/L)												
Amenable cyanide	22.8	K	22.9	K	NA		8.6	J	0.12	J	1.2	J
Bicarbonate	NA		NA		NA		NA		NA		NA	
Chloride	NA		NA		NA		NA		NA		NA	
Sulfate	NA		NA		NA		NA		NA		NA	
Sulfide	1	U	1	U	NA		1	U	1	U	1	U
Total dissolved solids (TDS)	NA		NA		NA		NA		NA		NA	

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2.2 Coke Oven Area (CO SSA)

2.2.1 Site-Specific Activities

2.2.1.1 Geologic Investigations

The geologic model of the CO SSA was based on geologic information obtained from drilling and CPT analysis at several locations. Soil borings were performed during the RSC Study. In addition, information obtained from the Site-Wide Investigation Groundwater Study was used. Finally, geologic information from previous environmental and geotechnical investigations performed at the site was used where data gaps appeared to exist. The locations of all sources of geologic information are provided in Figure 2.2-1.

Soil Borings. Twenty-seven soil borings were completed in the CO SSA during the RSC Study. Twenty-two of the soil borings were completed in conjunction with installation of shallow piezometers located within the shallow water-table zone. Three split-spoon soil samples were taken at these locations except for the shallow borings at CO02, CO13, and CO26. At boring location CO02 only one split-spoon sample was taken. At shallow location CO13 no split-spoon sample was taken because shallow depth samples were obtained during the boring activities at the deeper boring 5 feet away. At shallow location CO26 four split-spoon samples were collected.

Five deeper soil borings were completed in the CO SSA using the hollow-stem auger rig. At location CO02, 13 2-foot-long split-spoon samples were obtained to a depth of 47 feet bgs. At CO04 and CO06, 15 split-spoon samples were obtained to a depth of 57 feet bgs. At CO07, 14 split-spoon samples and two Shelby tubes were collected to a depth of 60 feet. At CO13, 22 split-spoon samples and one Shelby tube were collected to a depth of 62 feet. Results of tests conducted to define physical characteristics of the soils recovered from the Shelby tubes, including grain size analyses, permeability, and bulk density are located in Appendix 2.2-A.

In addition to the hollow-stem auger borings, one rotary sonic boring was completed at CO11. By using the rotary sonic drill rig, continuous samples were obtained at CO11 from 0 to 77 feet bgs.

Boring CP02-PZM026 in the CP SSA also was used in evaluating the geology at the CO SSA; the log for this boring can be found in Appendix 2.3-A.

The borings designated SW18-PZM114 and SW17-PZM113 and those with designations beginning with "#" (e.g., #590) and "CO-GB" in Figure 2.2-1 were performed during previous investigations at the site.

Boring logs for the soil borings are included in Appendix 2.2-A.

CPT Analysis Sites. No CPT analyses were done on this site during the RSC. However, one CPT boring (CO10) was completed within the CO SSA and CPT borings SW13-CPT and SW14-CPT were completed outside of the SSA for the Site-Wide Investigation Groundwater Study. The CPT logs are provided in Appendix 2.2-A. In addition, the CPT log from CP03-CPT for the CP SSA was used in evaluating the geology at the CO SSA; the log for this CPT can be found in Appendix 2.3-A.

2.2.1.2 Groundwater Investigations

Piezometer Network. Figure 2.2-2 shows the CO SSA piezometer network utilized for groundwater investigations conducted for the RSC Study. As shown on the figure, this network includes 27 piezometers that were installed during the RSC Study and 20 piezometers installed during 2000. Table A-1 in Appendix A presents the construction details for the piezometer network.

Twenty-seven 2-inch-diameter piezometers were installed in the area within and surrounding the CO SSA at locations depicted on Figure 2.2-1. Twenty-two piezometers were screened within the water-table unit with bottom elevations between -4 feet and -8 feet. The water-table piezometers on the site have 10-foot-long screens located within the slag and anthropogenic fill material overlying the site; an exception is piezometer CO06-PZM008, which has a 5-foot screen.

Five piezometers located in the CO SSA were screened at depths that correlate to intermediate water-bearing sands underlying the slag. Screens installed in the intermediate water-bearing sands are 5 feet long with bottom elevations between -30 feet and -48 feet.

Water-Level Measurements. Two rounds of water-level measurements were taken in the area surrounding the CO SSA; these measurements, taken on December 18, 2001, and March 19, 2002, are presented in Table A-2 in Appendix A.

2.2.1.3 Chemical Analysis

Groundwater sampling for the CO SSA took place on December 19 and 20, 2001. Samples were collected from 26 locations, and nine of these locations were sampled at two depths. The sampling locations are shown in Figure 2.2-2.

Table 2.2-1 lists the locations, depths, and type of analysis for each of the 35 samples. Two locations (CO02 and CO13) at two depths each and one location (CO05) at one depth were chosen for Appendix IX analysis. The other samples were analyzed for the preliminary COPI list. Three trip blanks, five equipment blanks, and four field duplicates were collected by the field team for this study area.

2.2.2 Site Characterization

2.2.2.1 Geologic Results

Most of CO SSA lies beyond the natural (i.e., pre-1916) shoreline of the Sparrows Point peninsula. Slag and other anthropogenic fill materials were deposited over tidally influenced shallow marine sediments during construction. The upper 100 feet to 120 feet of the subsurface material underlying the CO SSA is a sequence of unconsolidated materials comprising, from shallowest to deepest, slag and anthropogenic-fill materials followed by silty clays with discontinuous sand lenses of low to medium density dominating the areas underlying and adjacent to the original shoreline. The low-density material thins to the west and south of the original shoreline and is chiefly underlain by a relatively thin layer of unconsolidated sands and low and medium dense clays, followed by sand units of high density. Figure 2.2-3 shows the locations of five cross sections that present the vertical distribution of the unconsolidated materials. Figures 2.2-4 through 2.2-8 show the cross sections. The character of these materials is summarized below.

Slag. The greatest thickness of slag underlying the CO SSA is found seaward of the original, natural shoreline. The slag thickness, consequently, depends on the original depth of water (i.e., the bathymetry) around the Sparrows Point peninsula. The slag at the site varies in thickness from less than 10 feet in the northeastern part of the SSA to about 30 feet in the east-central part of the SSA, as shown in Figure 2.2-9. The figure includes the estimated location of the original shoreline.

Cross section A–A′ (Figure 2.2-4) is oriented north to south near the turning basin from boring SW14-PZM099 to boring CO13-PZM030. The cross section begins to the northeast, landward of the former shoreline and, therefore, the slag becomes thicker as the cross section moves to the south. The slag profile indicates that the section crosses an irregular low at CO10-PZM090. As the section moves south out of the low, it travels over a former bathymetric high and the slag thins to less than 10 feet at boring #349. Further south along the section, the slag thickens to nearly 20 feet at borings CO-GB625 and CO13-PZM030.

Cross section B–B′ (Figure 2.2-5) is oriented west to east and is located south of the original shoreline, across the CO SSA from near Bear Creek (Patapsco River) at boring SW17-PZM113 east to CO10-PZM090 near the turning basin. The slag thickness remains fairly constant at about 20 feet, thinning locally at boring #409 to approximately 10 feet. At the eastern end of the section, in the low at CO10-PZM090, the slag thickens to over 30 feet.

Cross section C–C′ (Figure 2.2-6) is oriented northwest to southeast, crossing the original shoreline as the section traces a line south. Crossing landward from SW13-CPT, the slag thins from 20 feet to 10 feet. As cross section C–C′ traces a line seaward of the original shoreline, the slag begins to thicken steadily, mimicking the original bathymetry and reaching a maximum thickness of 35 feet at SW18-PZM114.

Cross section D–D′ (Figure 2.2-7) is oriented north to south near the Patapsco River. The cross section runs parallel of the original shoreline between boring #590, where the slag is approximately 20 feet thick, and boring #425, where the slag thickness lessens to approximately 15 feet. From boring #425 south to CP02-CPT, as the cross section continues south further away from the original shoreline, the slag thickens steadily from 15 feet to about 30 feet.

Cross section E–E′ (Figure 2.2-8) is oriented west to east across the CO SSA from, north of cross section B–B′. At the western extent of the cross section, boring CO-GB438 is seaward of the original shoreline and has a slag thickness of approximately 20 feet. The depth of the slag continues to decline as the cross section traces a line east. At boring location CO-GB662, located landward of the original shoreline, the slag thickness is about 12 feet. The depth of the slag increases at CO-GB26 as the line crosses a low spot in the underlying topography and declines again to about 10 feet at CO06-PZM039. Adjacent to the turning basin, beyond the original shoreline, the slag thickness is about 20 feet.

Talbot Formation. The sediment directly underlying the slag in the northeast portion of the CO SSA is soft marine clay with silt and shell fragments present. The interbedded gray shelly clay, silt, and white shelly sand layers of low to moderate density are associated with the Talbot Formation.

The thickness of the Talbot ranges from 5 feet to nearly 100 feet. Interbedded in the silty clay are largely discontinuous sand lenses derived from the reworking of the older Cretaceous-age Patapsco Formation. The sand lenses differ from the unaltered Patapsco Formation's sands in that the reworked sands include shell fragments and are less dense then the original material. The bottom of the Talbot deposits is defined as the depth at which higher split-spoon blow counts, high resistance to a CPT boring, and/or red- to brown-colored or white sand or clay indicate the top of the Patapsco Formation.

The north-to-south cross section A–A′ shows the thickness of the clay and interbedded sands to decrease as the section traces a line south. The thickness of the Talbot is nearly 70 feet at the topographic low near CO10-PZM090 and about 110 feet to the north at CO-GB579. Furthest south at CO13-PZM030, the deposit is largely made up of sands and is only about 20 feet in thickness.

In west-east cross section B–B′ (Figure 2.2-5) at SW17-PZM113, a 30-foot-thick layer of Talbot sands directly underlies the slag. Six hundred feet east, at boring #409, the vertical extent of the Talbot decreases to under 20 feet. Further east the Talbot deepens once again, and the slag is directly underlain by between 12 and 40 feet of clay.

Directly underlying the slag along cross section C–C′ (Figure 2.2-6), between SW13-CPT and CO13-PZM030, is a nearly continuous layer of clay thinning to the south. The clay ranges in thickness from 10 feet near CO04-PZM048 to approximately 25 feet at CO-GB473. The clay has pinched out completely north of SW18-PZM114. The clay is directly underlain by sand throughout the cross section.

Along much of the north-south cross section D–D′ (Figure 2.2-7), the clay is discontinuous and the slag is immediately underlain primarily by sand. A clay layer occurs extensively along the cross section below this sand.

In the westernmost part of west-east cross section E–E′ (Figure 2.2-8), sand underlies the slag. Elsewhere, clay and silt underlie the slag.

In summary, sandier material is more apparent further from the original shoreline. The Talbot has a greater amount of clay underlying the northeastern part of the CO SSA. In general, the sand lenses appear to be connected laterally and, to a lesser extent, vertically at the site.

Patapsco Formation. The nature of the Patapsco Formation has been previously discussed in Section 2.1.2.1 and does not require a further generalized discussion here. This section will include only discussions of individual features of the Patapsco Formation as those features appear underlying CO SSA.

The sand and clay units of the Patapsco are distinguished from those of the overlying Talbot Formation because their greater density and, possibly, finer-grained nature may restrict the movement of groundwater. Examination of the boring log records indicates that the surface of the Patapsco has an in-filled paleochannel incised into its surface, as shown in Figure 2.2-10. The channel underlies the northeast CO SSA, where the top of the Patapsco is at an elevation of –90 to –102 feet.

Underlying parts of the CO SSA, the top of the Patapsco is 5 feet to 10 feet below the bottom of the slag at an elevation of about – 20 feet. However, the Patapsco does not appear to be in direct contact with the anthropogenic material.

2.2.2.2 Groundwater Results

Results of the water levels taken on March 19, 2002, for the CO SSA are presented in Figures 2.2-11 and 2.2-12. The data from March were used rather than those from December because more data were available from the March round. These figures include contour maps for the unconfined water table zone and the potentiometric surface of the underlying intermediate sand zone. Note that the maps provided in Figures 2.2-11 and 2.2-12 are taken from the facility-wide maps provided in Figures A-3 and A-4, respectively, in Appendix A.

The following discussion refers to the maps of the water table and of the potentiometric surface of the sands underlying the site, and to water levels noted in cross sections A–A′ through E–E′ (Figures 2.2-4 through 2.2-8, respectively.)

Figure 2.2-11 shows the water table on March 19, 2002. Water levels measured at other times show a similar configuration. Note that the elevation of the local surface-water bodies (i.e., Patapsco River, Bear Creek, and Old Road Bay) is -1.25 feet.

In general, the water table at the CO SSA slopes toward the surrounding surface-water bodies. Thus, the shallow groundwater discharges directly into the surrounding surface-water bodies. The water table slopes sharply as it approaches the original shoreline of Sparrows Point. South of the original shoreline, the slope of the water table decreases. There is a divide in the water table that runs approximately northeast to southwest through the CO SSA. Shallow groundwater southeast of the divide flows toward Old Road Bay while northwest of the divide, groundwater flows into the Patapsco River.

The elevation of the water level in CO03-PZM005 was 9.85 feet on March 19, 2002, and also had a high water level when measured in December 2001. No other piezometer in the area shows a similar high water level. The reason for this elevated water level is uncertain but it is likely that the piezometer was installed in or near a former structure that restricts groundwater drainage and promotes an artificial groundwater mound in this area. Therefore, the water level in this piezometer was not used when contouring the elevation of the water table.

The vertical hydraulic conductivity of clayey silt at the CO SSA obtained from Shelby-tube analyses is 6.8E-04 feet/day (Appendix 2.2-A.) Vertical hydraulic conductivities measured by dissipation tests at two depths at CO10-PZM090 during the Site-Wide Investigation Groundwater Study were 1.1E-03 feet/day for the shallow clayey silt and 6.9E-04 feet/day for the deeper clayey silt. The low conductivities and the trend for water levels in piezometers to decline with depth indicates that there is resistance to vertical groundwater flow at the SSA.

Figure 2.2-12 shows the potentiometric surface defined on March 19, 2002, by piezometers screened in sand units at elevations between -39 feet and -53 feet. These sand units appear generally to be connected horizontally and, to a lesser degree, vertically. Groundwater in the sand units underlying the western part of the CO SSA appears to flow north from the site into an area just east of the active Graving Dock at the Baltimore Marine Industries shipyard. It is probable that the continuous pumping of groundwater to maintain the integrity of the active Graving Dock is drawing groundwater from these sand zones beneath the CO SSA into the vicinity of the Graving Dock. Reportedly, the sump at the Dock is at elevations of about –30 feet to –40 feet. Both the December 2001 and the March 2002 water-level data indicate the hydraulic head in the area as lower (at an elevation of about -2.4 feet) than that of the adjacent Bear Creek (-1.25 feet).

South and west of SW17, the hydraulic gradient of the intermediate sands slopes toward the local surface-water bodies (i.e., Bear Creek, the turning basin, or the Patapsco River.) Groundwater in the deeper sand units underlying the eastern and northeastern parts of the site flows eastward into the turning basin or southwestward across the site and toward Coke Point.

Cross sections A–A′ through E–E′ (Figures 2.2-4 through 2.2-8) show water levels at different depths in the subsurface at different locations on and near the site. In general, water levels decline with depth across most of the site, which would be expected as water infiltrates from the surface, reaches the water table, and moves downward into the confined groundwater system, depending on the hydraulic conductivity of the local stratigraphy.

In summary, shallow groundwater moves southward across the site toward Bear Creek on the west, the Patapsco River on the south, and the turning basin to the southeast. Water levels indicate that groundwater potentially moves downward into deeper sand units, although the presence of clay and silt inhibits this vertical migration. Groundwater in these units in the western and southern parts of the site moves toward the Patapsco River but under most of the site appears to move northward toward the pumping at the Baltimore Marine Industries Graving Dock.

2.2.2.3 Chemical Analysis

Table 2.2-2 summarizes the detected results for field samples. Duplicate results have been included for locations where this quality control procedure was conducted. The qualifying letters appearing beside the concentrations are explained in Section 1.3.3. Blank spaces in the table indicate that the compound was not detected. The concentrations found by the validator to be affected by blank contamination are considered to be not detected and, therefore, are also indicated by blank spaces. Results rejected by the validator are qualified by “R.” “NA” indicates that this chemical was not analyzed because it was not part of the compound list assigned to the sample.

The complete analytical results are presented in Appendix 2.2-B. The table shows all results for all locations in the CO SSA for all compounds in each sample collected during the RSC sampling event of late December 2001.

There were a few anomalies associated with the CO SSA samples:

- The samplers were given the sample-naming scheme according to the planning memorandum to identify the samples. However, when the piezometers were installed, the depths or the locations sometimes varied from the plan. Here is a list of the sample names that were recorded incorrectly on the chain of custody:

Sample ID from Plan	Sample ID Corrected
CO15-PZM015	CO15-PZM005
CO12-PZM041	CO02-PZM041
CO26-PZM008	CO26-PZM007
CO23-PZM005	CO23-PZM008
CO11-PZM008	CO11-PZM007
CO16-PZM008	CO16-PZM006
CO07-PZM005	CO07-PZM008

- Chain-of-custody forms for two piezometers (CO13-PZM030 and CO19-PZM004) are not available. It appears they were never received at the laboratory from the sampling team, and efforts to find them have not been successful. The validator used the laboratory's sample confirmation report to prove the sample identification.
- There are no results for major ions for sample CO11-PZM007, although these were requested.
- In the data validation reports for the CO, an R qualifier was applied to three volatile compounds (1,4-dioxane, acetonitrile, and isobutanol) because of very low relative response factors in three samples; they are known to be poor responders. These three compounds are part of the Appendix IX list, but are not on the COPI list. The phenol compounds in sample CO10-PZM006 were rejected owing to very poor surrogate recoveries for the acid fraction. All major ion data were reported without qualification.
- Benzene was found present at high concentrations in this area, and some samples were highly diluted in order to bring the benzene result into the calibration range for the instrument.
- Duplicate results for the metals or inorganic fraction at times exceeded the precision control limits for lead (CO15-PZM005, detected at both 331 µg/L and 3,810 µg/L) The validator found both of these results to be valid. Validation guidance does not require qualification for field duplicates because of the inherent variability in the matrix, but the validator noted the variation.

Chemical analysis results for the groundwater show that volatile organic compounds and semivolatile organic compounds (Figure 2.2-13) and COPI list metals (Figure 2.2-14) were detected throughout the CO SSA. The most significant concentrations of volatile organic compounds detected in the within the shallow groundwater, in the area of the CO SSA formerly occupied by the Benzol-Litol Plant. Analytical results for piezometer CO02-

PZM006 indicated 1,600,000 µg/L of benzene and CO18-PZM006 indicated a concentration of 1,300,000 µg/L of benzene. Of the semivolatile organic compounds, naphthalene was most commonly detected, with the most significant concentrations at CO13-PZM008 (22,000 µg/L). PCB compounds were not detected in any of the samples. Of the samples analyzed for abbreviated Appendix IX parameters, two compounds were detected that were not included in the COPI list: the samples from CO02-PZM006 showed concentrations of 2-picoline (150 J µg/L) and acetophenone (370 µg/L), and piezometer CO13-PZM008 showed an estimated concentration of 2-picoline (980 J µg/L).

Chemical analysis showed that the concentrations of volatile organic compounds, semivolatile organic compounds, and metals within the groundwater of the intermediate sand zone (Figures 2.2-13 and 2.2-14) were less than those within the shallow groundwater table; exceptions included a slight increase in the concentration of benzene at SW17-PZM038 (49,000 µg/L to 64,000 µg/L) and consistent levels of benzene and toluene detected in shallow piezometer CO08-PZM005 and intermediate piezometer CO08-PZM036. PCB compounds were not detected in any of the samples. Of the samples analyzed for the abbreviated Appendix IX parameters, three compounds were detected that were not included on the COPI list: the samples from piezometer CO02-PZM041 showed an estimated concentration of acetophenone (8.6 J µg/L), and those from piezometer CO13-PZM030 showed concentrations of styrene (39 µg/L) and 2-picoline (110 J µg/L).

Site Conceptual Model

This section provides a summary and synthesis of the geologic, hydrogeologic, and chemical results of the investigation for CO SSA. Figure 2.2-15 is a schematic diagram showing the general geology and movement of groundwater and site-related contamination at the site.

The surficial material of the site is primarily granular slag. The slag is thickest in the former low at CO10-PZM090 and thickens again south beyond the pre-1916 shoreline. Clay units and reworked sand units of the Talbot Formation underlie the slag. The sand lenses interbedded in the clays can be several feet thick and are reworked material eroded out of the older, underlying Patapsco Formation. White to red sand and brittle, dense clay of the Patapsco Formation underlie the Talbot.

Shallow groundwater at the site primarily moves laterally to discharge into Bear Creek, the turning basin, or the Patapsco River. Water levels indicate the potential for shallow groundwater to move vertically downward into the deeper sand units. Over much of the SSA, where pumping at the Baltimore Marine Industries Graving Dock has reversed the natural hydraulic gradient, deeper groundwater is being drawn toward the Graving Dock. Where the groundwater gradient is natural, water from the water bearing sands moves laterally toward Bear Creek, the turning basin, or out into the Patapsco River.

Table 2.2-1
Sample Analysis
Coke Oven Area Release Site Characterization
Bethelehem Steel Corporation - Sparrows Point Facility

Location	Water-Bearing Unit	Sample ID	Appendix IX List	COPI List	Date Sampled
CO02-PZM041	Int. Sands	CO02-PZM041-01D	X		12/19/01
CO02-PZM006	Water Table	CO02-PZM006-01D	X		12/19/01
CO03-PZM005	Water Table	CO03-PZM005-01D		X	12/19/01
CO04-PZM048	Int. Sands	CO04-PZM048-01D		X	12/19/01
CO04-PZM004	Water Table	CO04-PZM004-01D		X	12/19/01
CO05-PZM006	Water Table	CO05-PZM006-01D	X		12/20/01
CO06-PZM039	Int. Sands	CO06-PZM039-01D		X	12/20/01
CO06-PZM008	Water Table	CO06-PZM008-01D		X	12/20/01
CO07-PZM050	Int. Sands	CO07-PZM050-01D		X	12/21/01
CO07-PZM008	Water Table	CO07-PZM008-01D		X	12/21/01
CO08-PZM036	Int. Sands	CO08-PZM036-01D		X	12/19/01
CO08-PZM005	Water Table	CO08-PZM005-01D		X	12/19/01
CO09-PZM007	Water Table	CO09-PZM007-01D		X	12/20/01
CO10-PZM029	Int. Sands	CO10-PZM029-01D		X	12/19/01
CO10-PZM006	Water Table	CO10-PZM006-01D		X	12/19/01
CO11-PZM007	Water Table	CO11-PZM007-01D		X	12/21/01
CO12-PZM008	Water Table	CO12-PZM008-01D		X	12/21/01
CO13-PZM030	Int. Sands	CO13-PZM030-01D	X		12/20/01
CO13-PZM008	Water Table	CO13-PZM008-01D	X		12/20/01
CO15-PZM005	Water Table	CO15-PZM005-01D		X	12/19/01
CO16-PZM006	Water Table	CO16-PZM006-01D		X	12/21/01
CO17-PZM005	Water Table	CO17-PZM005-01D		X	12/21/01
CO18-PZM006	Water Table	CO18-PZM006-01D		X	12/21/01
CO19-PZM004	Water Table	CO19-PZM004-01D		X	12/21/01
CO20-PZM004	Water Table	CO20-PZM004-01D		X	12/20/01
CO21-PZM005	Water Table	CO21-PZM005-01D		X	12/20/01
CO22-PZM005	Water Table	CO22-PZM005-01D		X	12/20/01
CO23-PZM008	Water Table	CO23-PZM008-01D		X	12/20/01
CO24-PZM007	Water Table	CO24-PZM007-01D		X	12/21/01
CO25-PZM008	Water Table	CO25-PZM008-01D		X	12/20/01
CO26-PZM007	Water Table	CO26-PZM007-01D		X	12/20/01
SW17-PZM038	Int. Sands	SW17-PZM038-01D		X	12/19/01
SW17-PZM007	Water Table	SW17-PZM007-01D		X	12/19/01
SW18-PZM053	Int. Sands	SW18-PZM053-01D		X	12/21/01
SW18-PZM008	Water Table	SW18-PZM008-01D		X	12/21/01

Table 2.2-2
Detected Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO02-PZM006	CO02-PZM041	CO03-PZM005	CO04-PZM004	CO04-PZM048	CO05-PZM006	CO06-PZM008		CO06-PZM039	CO07-PZM008		CO07-PZM050	CO08-PZM005
Sample ID								DUPLICATE			DUPLICATE		
Sample Date	12/19/01	12/19/01	12/19/01	12/19/01	12/19/01	12/20/01	12/20/01	12/20/01	12/20/01	12/21/01	12/21/01	12/21/01	12/19/01
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1-Dichloroethene													
Acetone									6,900	13,000 J			
Benzene	1,600,000	3,900		660		2,100				42,000	40,000	810	5,500
Chlorobenzene													
Chloroform					0.35 J		14	25					
Ethylbenzene				24 J									130 J
Methylene chloride				13 J									
Styrene			NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
Toluene	230,000	560		190	0.33 J	1,700				4,900	5,100	100	4,500
Trichloroethene													
Xylene, total				240	1.7 J	1,200							2,200
Semivolatile Organic Compounds (UG/L)													
2,4-Dimethylphenol	120			330		550 J				18 J			21 J
2,4-Dinitrophenol													
2-Methylnaphthalene	11 J	5.2 J	3 J	390	120	270 J				20 J	17 J	2.6 J	63
2-Methylphenol	120		0.74 J	96		340 J				45 J	40 J	1.3 J	30 J
2-Nitrophenol													
2-Picoline	150 J							NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol													
4-Methylphenol	160		8.2 J	98		640 J				27 J	24 J	1.5 J	64
Acenaphthene		9.3 J	4.7 J	56	26 J					11 J	9.8 J	4.1 J	
Acenaphthylene			5.7 J	180	66 J								9.5 J
Acetophenone	370	8.6 J	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
Anthracene		1.6 J	2 J	17 J									
Benzo(a)anthracene			1.3 J										
Benzo(a)pyrene													
Benzo(b)fluoranthene			0.86 J										
Benzo(g,h,i)perylene			0.68 J										
Benzo(k)fluoranthene			1.1 J										
Chrysene			1.5 J										
Dibenzofuran		3.3 J	3 J	110	62 J	100 J				6.4 J	5.8 J	1.5 J	5.3 J
Diethylphthalate			1.2 J										
Fluoranthene		2.6 J	5 J	20 J	15 J							1.9 J	
Fluorene	7.2 J	4.1 J	4.6 J	93	62 J	95 J				9.3 J	8.4 J	3.4 J	
Indeno(1,2,3-cd)pyrene			0.72 J										
Isophorone													
Naphthalene	450	52	77	6,700	1,100	8,100			1.7 J	420	360	27	1,400
Phenanthrene	11 J	8.1 J	9.9 J	96	96 J	120 J			1.1 J	15 J	13 J	5.5 J	5.9 J
Phenol	250	120	2.6 J	66		370 J				47 J	39 J	5.2 J	120
Pyrene			3.5 J	11 J								1 J	
Pyridine	180 J			13 J									
Total Metals (UG/L)													
Antimony												4.1	
Arsenic	9.6 J	8.8 J	6.7 J		17.9	62.4			21.8	5.4 J	6.2 J	4.4 J	
Barium	34.6 J	137 J	56.1 J	37.9 J	128 J	40.1 J	18.5 J	17.8 J	222	32.7 J	32 J	493	209
Beryllium	3.2 J										0.73 J		
Cadmium													
Chromium	1.2 J	5.1	1.2 J		4 J					2.4 J		1.9 J	
Cobalt		2.5 J			8.6 J	2.2 J						1.6 J	

NA - Not analyzed
B - Analyte not detected above associated blank
J - Estimated value
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Analyte not detected

Table 2.2-2
Detected Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO02-PZM006		CO02-PZM041		CO03-PZM005		CO04-PZM004		CO04-PZM048		CO05-PZM006		CO06-PZM008				CO06-PZM039		CO07-PZM008				CO07-PZM050		CO08-PZM005	
Sample ID															DUPLICATE						DUPLICATE					
Sample Date	12/19/01		12/19/01		12/19/01		12/19/01		12/19/01		12/20/01		12/20/01		12/20/01		12/20/01		12/21/01		12/21/01		12/21/01		12/19/01	
Chemical Name																										
Copper					3.7	J													2.1	J						
Lead			146		11.7										2.2	J			24.9		5.9		19.1			
Mercury													0.074	J												
Nickel	4.7	J	3.7	J	2.5	J			2.8	J											4	J	5.5	J		
Selenium							5.9														3.5	J			8	
Silver	0.83	J																								
Thallium			6.6	J																						
Tin																							46.4	J		
Vanadium	17.4	J	17.7	J	5.3	J			8.3	J	78.8						14.5	J	461		427		35.2	J		
Zinc	6.2	J	325		33.9				10.5	J					16.6	J			53.4		17.9	J	67.1		1.8	J
Common Cations (UG/L)																										
Calcium	NA		95,800	J	85,000		196,000		165,000		NA		34,800		32,900		121,000		105,000		105,000		111,000		NA	
Iron	NA		28,400	J	1,530		112		72,000		NA				77.4	J	61,800		1,140		318		191,000		NA	
Magnesium	NA		23,900	J	38,000				210,000		NA		7,530		7,190		56,000		151	J			101,000		NA	
Manganese	NA		1,610	J	635		9	J	3,600		NA		54.5		50.4		1,460		74.8		21.3		6,230		NA	
Potassium	NA		54,300		35,500		22,400		34,900		NA		5,050		4,530	J	15,300		36,700		35,300	J	26,400	J	NA	
Sodium	NA		747,000		77,800		249,000		1,470,000		NA		37,900		34,500		369,000		106,000		96,400		1,160,000		NA	
Wet Chemistry (MG/L)																										
Amenable cyanide	2.3	J	0.013	J	0.13	J	1.5	J	0.005	J	4.5	J	0.021	J	0.016	J	0.029	J	3.6		5.1		0.024		0.062	J
Bicarbonate	NA		624		471				90.3		NA		60.2		60.2		213						73.1		NA	
Chloride	NA		1,060		60.9		182		2,580		NA		66		63.4		880		140		139		2,380		NA	
Sulfate	NA		16.3		23.2		476		1,000		NA		49.9		46.4		12.6		140		143		171		NA	
Sulfide																										
Total dissolved solids (TDS)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

NA - Not analyzed
B - Analyte not detected above associated blank
J - Estimated value
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Analyte not detected

Table 2.2-2
Detected Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO08-PZM036	CO09-PZM007		CO10-PZM006	CO10-PZM029	CO11-PZM007	CO12-PZM008	CO13-PZM008	CO13-PZM030	CO15-PZM005		CO16-PZM006	CO17-PZM005
Sample ID			DUPLICATE								DUPLICATE		
Sample Date	12/19/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1-Dichloroethene													
Acetone													
Benzene	5,900	190	180	100		4.4	590	960	180	98,000	110,000	200,000	200,000
Chlorobenzene													
Chloroform				1.5 J									
Ethylbenzene	150 J			1.6 J			15 J	22 J				1,200 J	
Methylene chloride								21 J					
Styrene	NA	NA	NA	NA	NA	NA	NA		39	NA	NA	NA	NA
Toluene	4,600	190	170	5.2	1 U	0.67 J	200	880	160	14,000	10,000	15,000	15,000
Trichloroethene													
Xylene, total	2,300	290	250	16			280	580	140			4,700 J	
Semivolatile Organic Compounds (UG/L)													
2,4-Dimethylphenol	17 J	120	120	R						15	21 J	32 J	27 J
2,4-Dinitrophenol				8.3 L									
2-Methylnaphthalene	35 J	100	100	18	0.59 J		110 J	2,500 J	230 J	24	38 J	23 J	49j
2-Methylphenol	49 J	120	120	R	3 J		89 J			84 J	93 J	64	53 J
2-Nitrophenol				9.6 L									
2-Picoline	NA	NA	NA	NA	NA	NA	NA	980 J	110 J	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol				38 L									
4-Methylphenol	55	200 J	220 J	R			160 J			97 J	110 J	51	110
Acenaphthene		4.9 J	4.9 J	1.3 J	0.77 J	0.56 J				7 J	8 J	11 J	9 J
Acenaphthylene		22	23					1,900 J	150 J	32	35 J		
Acetophenone	NA	NA	NA	NA	NA	NA	NA			NA	NA	NA	NA
Anthracene		4.2 J	4.6 J					660 J		7.4 J	9.1 J		
Benzo(a)anthracene								700 J		7.3 J	8.3 J		
Benzo(a)pyrene								440 J		3.6 J			
Benzo(b)fluoranthene										6.1 J	7.6 J		
Benzo(g,h,i)perylene										3.9 J	4.3 J		
Benzo(k)fluoranthene								460 J		8.4 J	3.7 J		
Chrysene								590 J		8.5 J	8.2 J		
Dibenzofuran		22	23	13				900 J	45 J	16	17 J	5.5 J	9.3 J
Diethylphthalate													
Fluoranthene		5.1 J	5.3 J	4.8 J		0.61 J		1,500 J		29	29 J	3.4 J	
Fluorene	4.3 J	23	24	13			26 J	1,100 J	44 J	19	20 J	8.3 J	18 J
Indeno(1,2,3-cd)pyrene										4.6 J	4.2 J		
Isophorone													
Naphthalene	1,400	2,000	1,800	340	38	2.1 J	2,300	22,000	3,100	1,200	1,400	230	1,600
Phenanthrene		29	31	27	0.67 J	0.62 J		2,600 J	46 J	46	48 J	10 J	21 J
Phenol	100	250 J	340 J	R		1.6 J	220 J			290	370	280	200
Pyrene		3.2 J	3.3 J					1,100 J		16	19 J		
Pyridine		31 J	29 J						230 J	62	180 J	22 J	
Total Metals (UG/L)													
Antimony				4.5 J					4.6 J	6.1 J			
Arsenic			2.7 J			8.8 J	3.9 J	7.4 J	15.5		6.7 J	5.9 J	14.7
Barium	82.6 J	45.2 J	40.7 J	55.1 J	446	19.1 J	29.1 J	43.3 J	54.6 J	107	47.8 J	84.7 J	34.6 J
Beryllium				6									
Cadmium										12.1	0.97 J	0.77 J	0.83 J
Chromium	2.4 J	5	1.2 J	4.3 J	3.9 J	4 J				43	4.1 J	41.5	16.5
Cobalt				1.8 J	1.6 J	7.2 J		1.2 J	7.4 J		0.93 J	1.2 J	

NA - Not analyzed
B - Analyte not detected above associated blank
J - Estimated value
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Analyte not detected

Table 2.2-2
Detected Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO08-PZM036	CO09-PZM007		CO10-PZM006	CO10-PZM029	CO11-PZM007	CO12-PZM008	CO13-PZM008	CO13-PZM030	CO15-PZM005		CO16-PZM006	CO17-PZM005
Sample ID			DUPLICATE								DUPLICATE		
Sample Date	12/19/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01
Chemical Name													
Copper						40.6				114	9.9 J	14.3 J	9.5 J
Lead	2 J	6	1.9 J						2.6 J	3,810	331	137	453
Mercury		0.22						0.071 J				0.063 J	
Nickel						2.5 J	2.5 J		15.7 J	18.3 J	3.1 J	6.2 J	6.7 J
Selenium		3.8 J	6.6	15.3				7.6	3.8 J		3.5 J		
Silver										2.5 J			0.95 J
Thallium	9.2 J	6.3 J			7.3 J				8 J	8.3 J	6.3 J		
Tin									28.9 J				70.5 J
Vanadium	34.7 J	601 J	558 J	2,410 J	53.4 J	45.1 J	340	1,330	17.5 J	92.2 J	8.8 J	538	43 J
Zinc	16 J	19.5 J	5.4 J		36.7	26.4			19 J	4,260	394	309	233
Common Cations (UG/L)													
Calcium	NA	167,000	165,000	NA	NA	NA	176,000	548,000	291,000	NA	NA	NA	NA
Iron	NA	1,210	389	NA	NA	NA	425	1,010	75,400	NA	NA	NA	NA
Magnesium	NA			NA	NA	NA	42.5 J	312 J	80,400	NA	NA	NA	NA
Manganese	NA	141	27.1	NA	NA	NA		6.4 J	2,280	NA	NA	NA	NA
Potassium	NA	32,800	32,500	NA	NA	NA	33,700	30,400	27,300	NA	NA	NA	NA
Sodium	NA	157,000	157,000	NA	NA	NA	127,000	98,900	1,120,000	NA	NA	NA	NA
Wet Chemistry (MG/L)													
Amenable cyanide	6.6 J	11.9 J	11.8 J	0.045 J	0.008 J	2.5	1.1	0.13 J	0.035 J	0.047 J	0.054 J	0.33	0.27
Bicarbonate	NA			NA	NA	NA			60.2	NA	NA	NA	NA
Chloride	NA	185	192	NA	NA	NA	172	118	2,290	NA	NA	NA	NA
Sulfate	NA	333	332	NA	NA	NA	460	1,590	549	NA	NA	NA	NA
Sulfide													
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed
B - Analyte not detected above associated blank
J - Estimated value
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Analyte not detected

Table 2.2-2
Detected Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO18-PZM006	CO19-PZM004	CO20-PZM004	CO21-PZM005	CO22-PZM005	CO23-PZM008	CO24-PZM007	CO25-PZM008	CO26-PZM007	SW17-PZM007	SW17-PZM038	SW18-PZM008	SW18-PZM053
Sample ID													
Sample Date	12/21/01	12/21/01	12/20/01	12/20/01	12/20/01	12/20/01	12/21/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1-Dichloroethene												66	
Acetone					9.7 J		23 J						
Benzene	1,300,000	12,000	220	0.46 J	560	610	110	3,000	500	49,000	64,000	240	20
Chlorobenzene												69	
Chloroform													
Ethylbenzene		720	4.6 J		21	8.5 J	15	690	15 J			2.8 J	
Methylene chloride					1.3 J								
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	92,000		56		11	32	46	1,900	220	8,700	8,600	120	1.4
Trichloroethene												64	
Xylene, total		660 J	42		40	76	44	980	400			62	
Semivolatile Organic Compounds (UG/L)													
2,4-Dimethylphenol	230 J		27							45 J			14 J
2,4-Dinitrophenol													
2-Methylnaphthalene		81 J	150 J	0.74 J	120 J	30 J	180 J	580 J		63		21 J	
2-Methylphenol	550		19			8.9 J		300 J		75		15 J	56
2-Nitrophenol													
2-Picoline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol													
4-Methylphenol	600		24			10 J		500 J		75		25 J	59
Acenaphthene			51		42 J	44				4.9 J	9.3 J		3.3 J
Acenaphthylene			74			43		380 J		37 J	17		4 J
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene			16	1.1 J		7.9 J							
Benzo(a)anthracene			0.87 J	2.9 J					0.93 J				
Benzo(a)pyrene				1.9 J									
Benzo(b)fluoranthene				1.9 J									
Benzo(g,h,i)perylene				1.9 J									
Benzo(k)fluoranthene				2.2 J									
Chrysene				3.2 J					0.88 J				
Dibenzofuran			84 J		80 J	52				8.5 J	11		
Diethylphthalate													
Fluoranthene			18	6 J		12 J			2.4 J				2 J
Fluorene			98 J		84 J	63				9.7 J	1.5 J		2.2 J
Indeno(1,2,3-cd)pyrene				1.7 J									
Isophorone													1.6 J
Naphthalene	190 J	4,400	1,700	2.2 J	2,600	1,300	2,500	12,000	0.86 J	2,000	28	750	18 J
Phenanthrene			140 J	4 J	95 J	89	160 J		2.7 J	9 J	6.4 J		3.2 J
Phenol	900	250 J	22			14 J	500 J	260 J		76	36	22 J	70
Pyrene			9.4 J	4.3 J		6.2 J			1.9 J				
Pyridine	1,400						7,700			42 J			13 J
Total Metals (UG/L)													
Antimony													
Arsenic	8.7 J	8.4 J	19.3	5.9 J	5.7 J	5.7 J	5.7 J	5.7 J	5.2 J		194	4.6 J	40
Barium	56.2 J	129 J	22.5 J	51.5 J	69.4 J	29.5 J	54 J	51.9 J	151 J	69.9 J	136 J	74.5 J	340
Beryllium								6.6					
Cadmium	1.8 J												
Chromium	18.3			1.4 J	1.1 J		7.5	1.3 J	6.7		1.5 J		
Cobalt	1.9 J				2.5 J		32.4 J	0.98 J			1.1 J		

NA - Not analyzed
B - Analyte not detected above associated blank
J - Estimated value
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Analyte not detected

Table 2.2-2
Detected Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO18-PZM006	CO19-PZM004	CO20-PZM004	CO21-PZM005	CO22-PZM005	CO23-PZM008	CO24-PZM007	CO25-PZM008	CO26-PZM007	SW17-PZM007	SW17-PZM038	SW18-PZM008	SW18-PZM053
Sample ID													
Sample Date	12/21/01	12/21/01	12/20/01	12/20/01	12/20/01	12/20/01	12/21/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01
Chemical Name													
Copper	26.4					1 J	3.3 J						1.2 J
Lead	522			13.7		3.4	39.2		4.5				
Mercury	0.29				0.071 J		0.086 J						0.063 J
Nickel	12.5 J	5.6 J	5.2 J	5.2 J	2.9 J	2.8 J	3 J			6.5 J		6.7 J	2.6 J
Selenium			4.7 J					7.9				3.3 J	
Silver					0.83 J								
Thallium											8.6 J		
Tin								33.1 J		48.1 J			
Vanadium	31 J	17.2 J	11.7 J	5.4 J	4.2 J	805	659	3,370	252	39.1 J	17.3 J	72.6	56.5
Zinc	1,410	4.6 J		12.5 J			37.8	14.6 J					3.1 J
Common Cations (UG/L)													
Calcium	NA	174,000	NA	253,000	33,600	NA	NA	NA	414,000	NA	NA	NA	NA
Iron	NA	491	NA	326	1,060	NA	NA	NA	974	NA	NA	NA	NA
Magnesium	NA	48,400	NA	29,700	42,900	NA	NA	NA	257 J	NA	NA	NA	NA
Manganese	NA	366	NA	757	134	NA	NA	NA	178	NA	NA	NA	NA
Potassium	NA	16,700	NA	19,900	17,700	NA	NA	NA	41,000	NA	NA	NA	NA
Sodium	NA	58,500	NA	135,000	146,000	NA	NA	NA	148,000	NA	NA	NA	NA
Wet Chemistry (MG/L)													
Amenable cyanide	0.035	10.8	0.36 J	0.021 J	4.3 J	3.4 J	0.091	0.52 J	0.15 J	5.4 J	0.066 J	1.7	0.44
Bicarbonate	NA	598	NA	129	116	NA	NA	NA	5 U	NA	NA	NA	NA
Chloride	NA	65.7	NA	142	309	NA	NA	NA	183	NA	NA	NA	NA
Sulfate	NA	119	NA	776	61.3	NA	NA	NA	683	NA	NA	NA	NA
Sulfide												5.6	
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed
B - Analyte not detected above associated blank
J - Estimated value
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Analyte not detected

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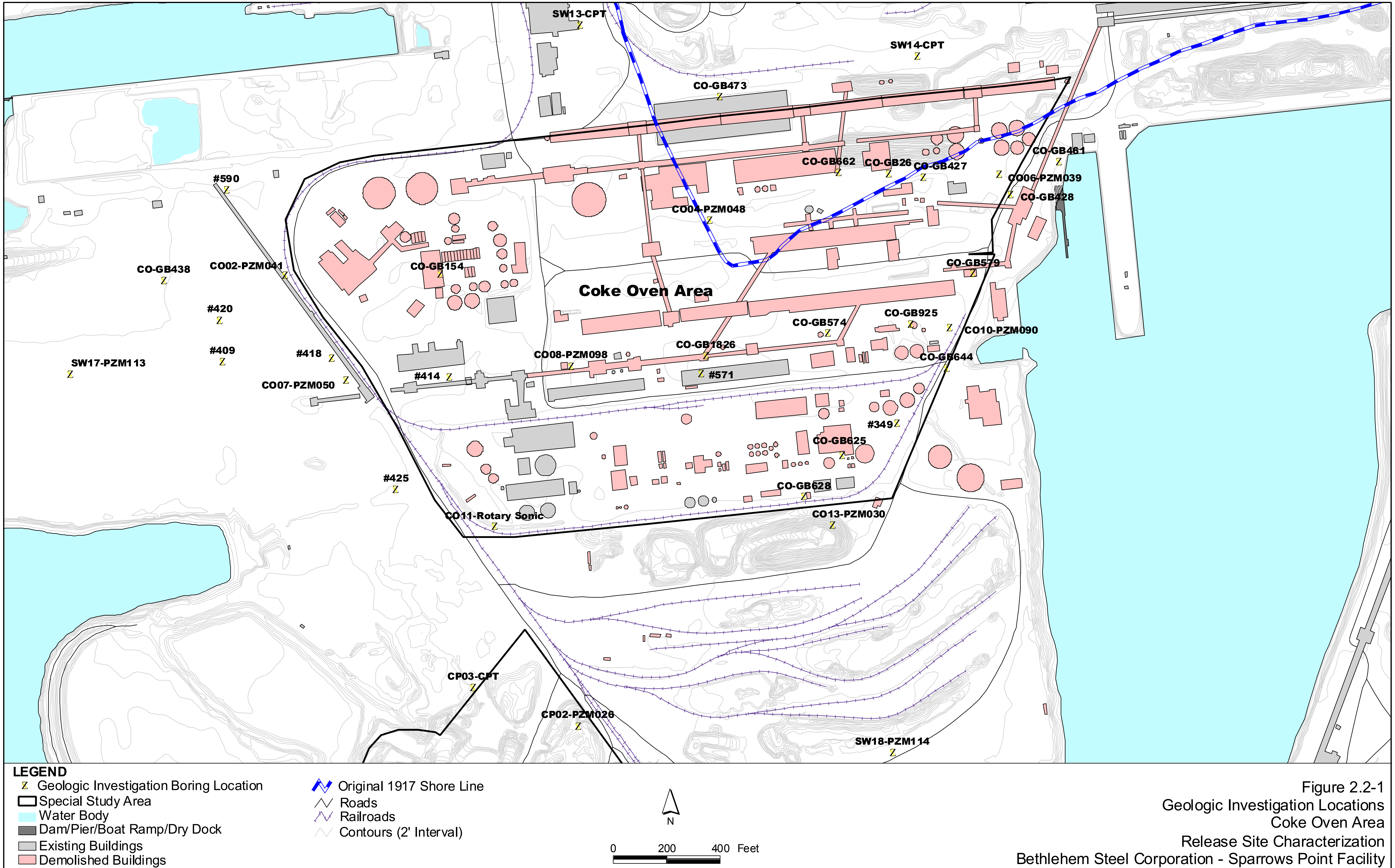

Figure 2.2-1
Geologic Investigation Locations
Coke Oven Area
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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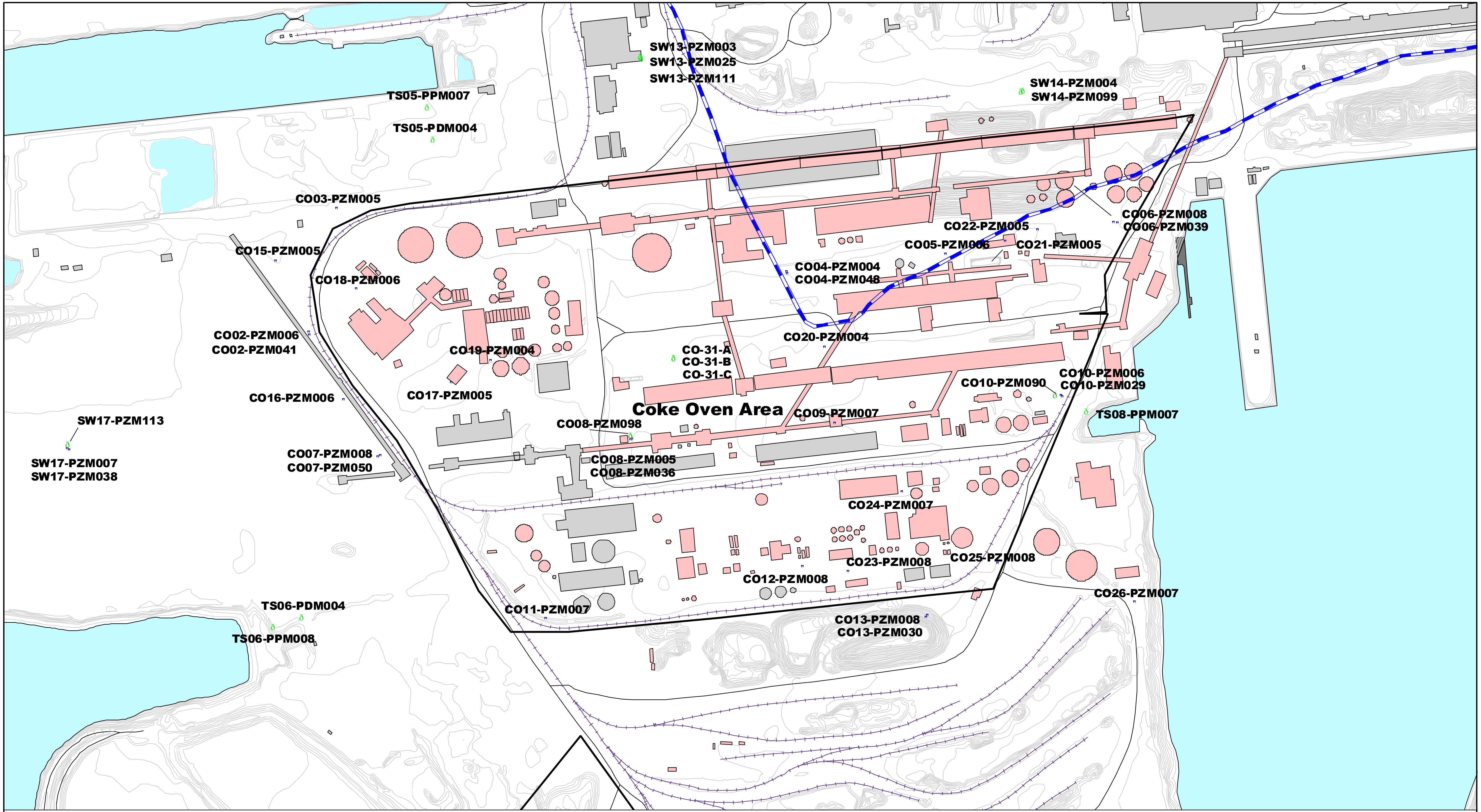

LEGEND

- Piezometer Location (Groundwater Sampling and Water Level Measurement)
- Piezometer Location (Water Level Measurement Only)
- ▭ Special Study Area
- 🟦 Water Body
- ■ Dam/Pier/Boat Ramp/Dry Dock
- ▨ Existing Buildings
- 🟥 Demolished Buildings
- Original 1917 Shore Line
- Roads
- Railroads
- Contours (2' Interval)

N

0 200 400 Feet

Figure 2.2-2
Piezometer Network Locations
Coke Oven Area
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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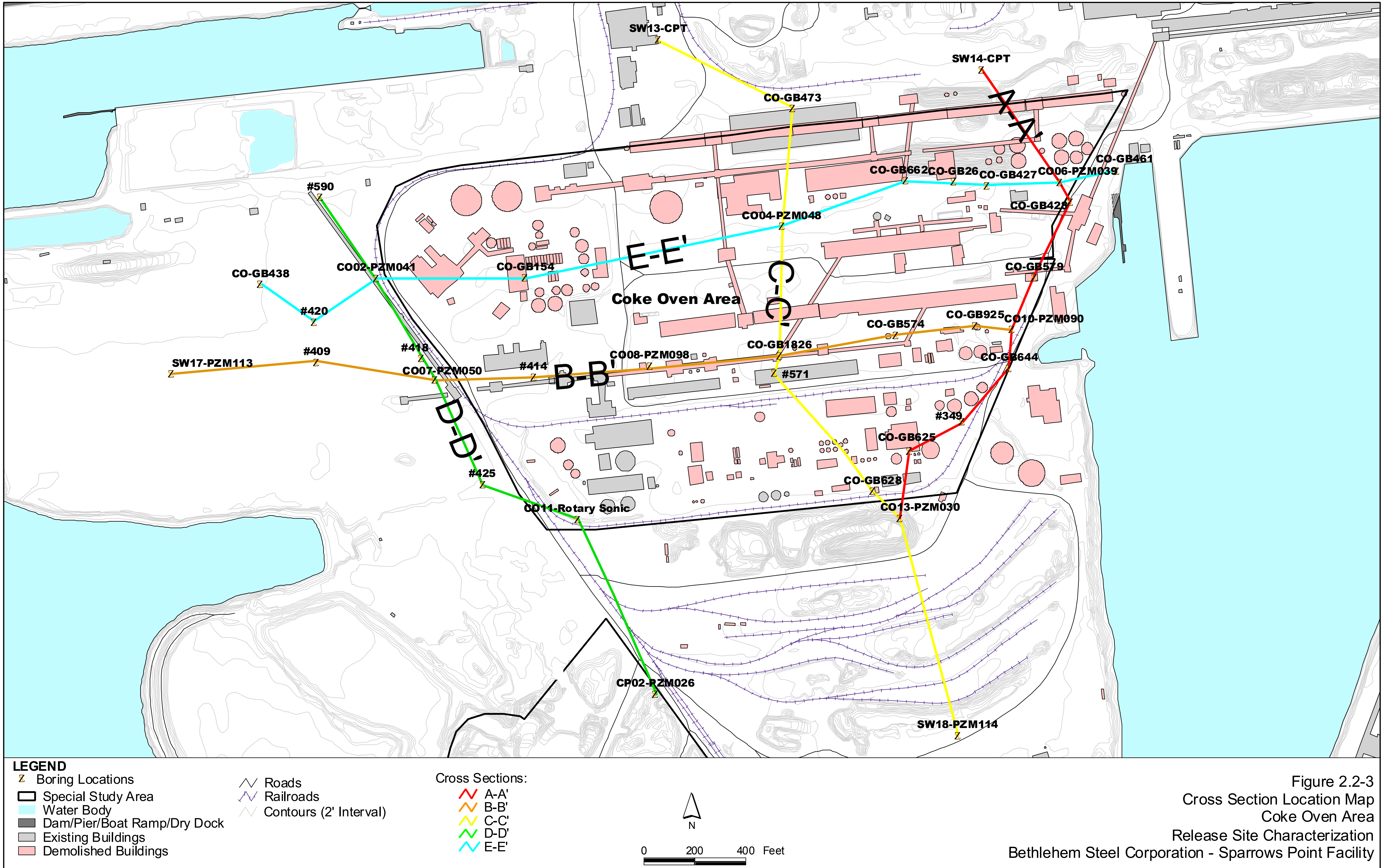

Figure 2.2-3
Cross Section Location Map
Coke Oven Area
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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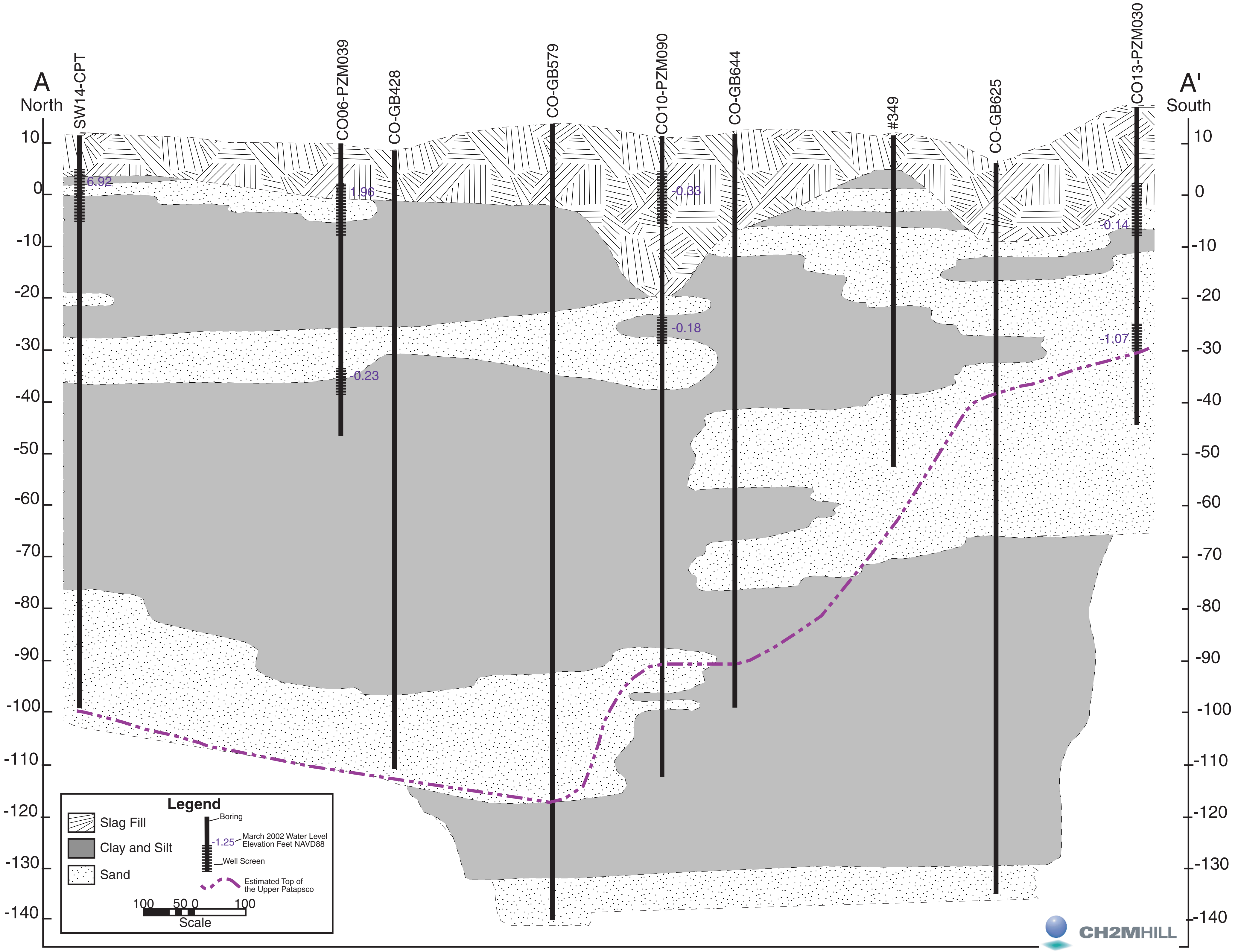

Figure 2.2-4
Section A-A'
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

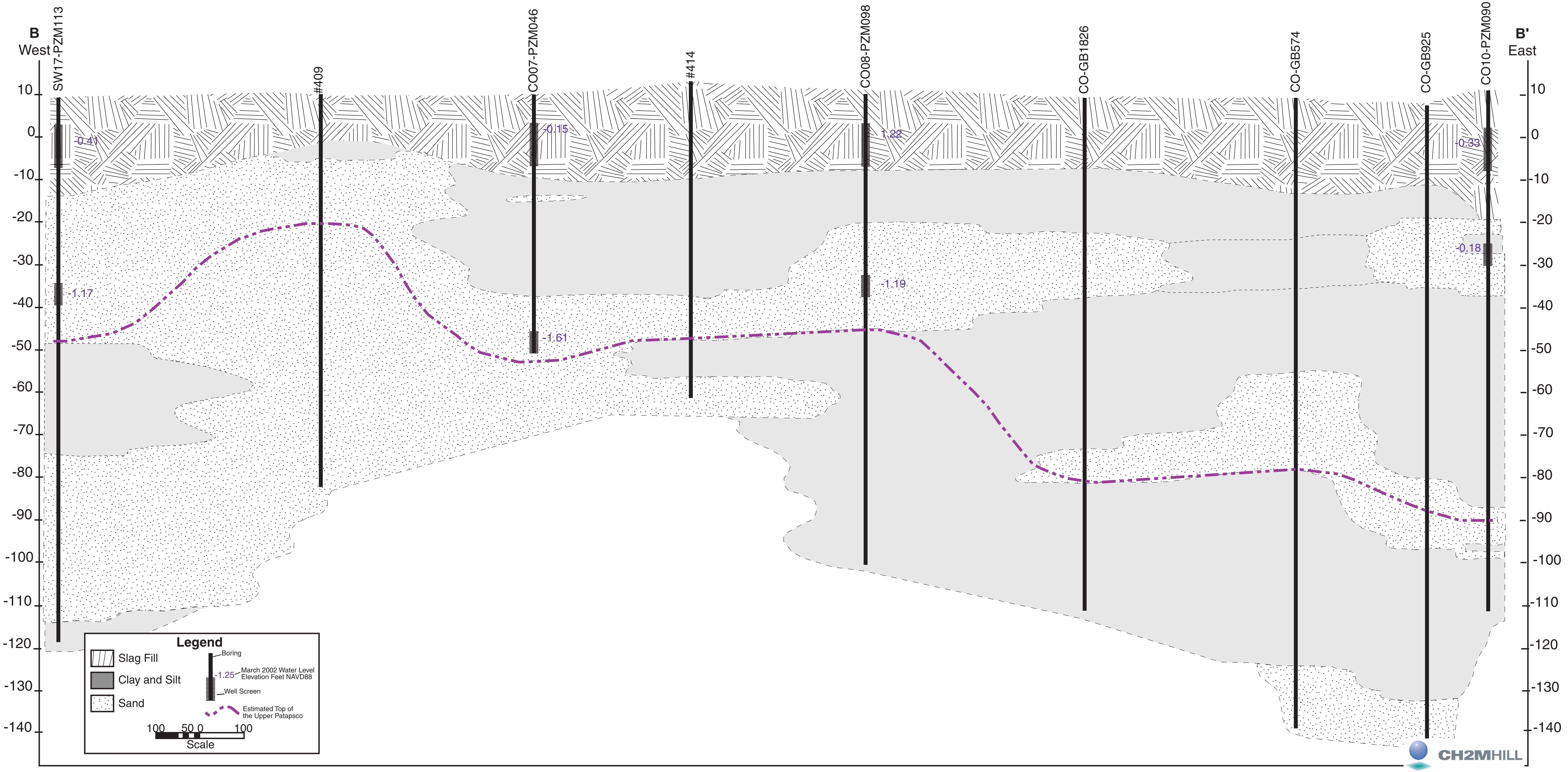

Figure 2.2-5
Section B-B'
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

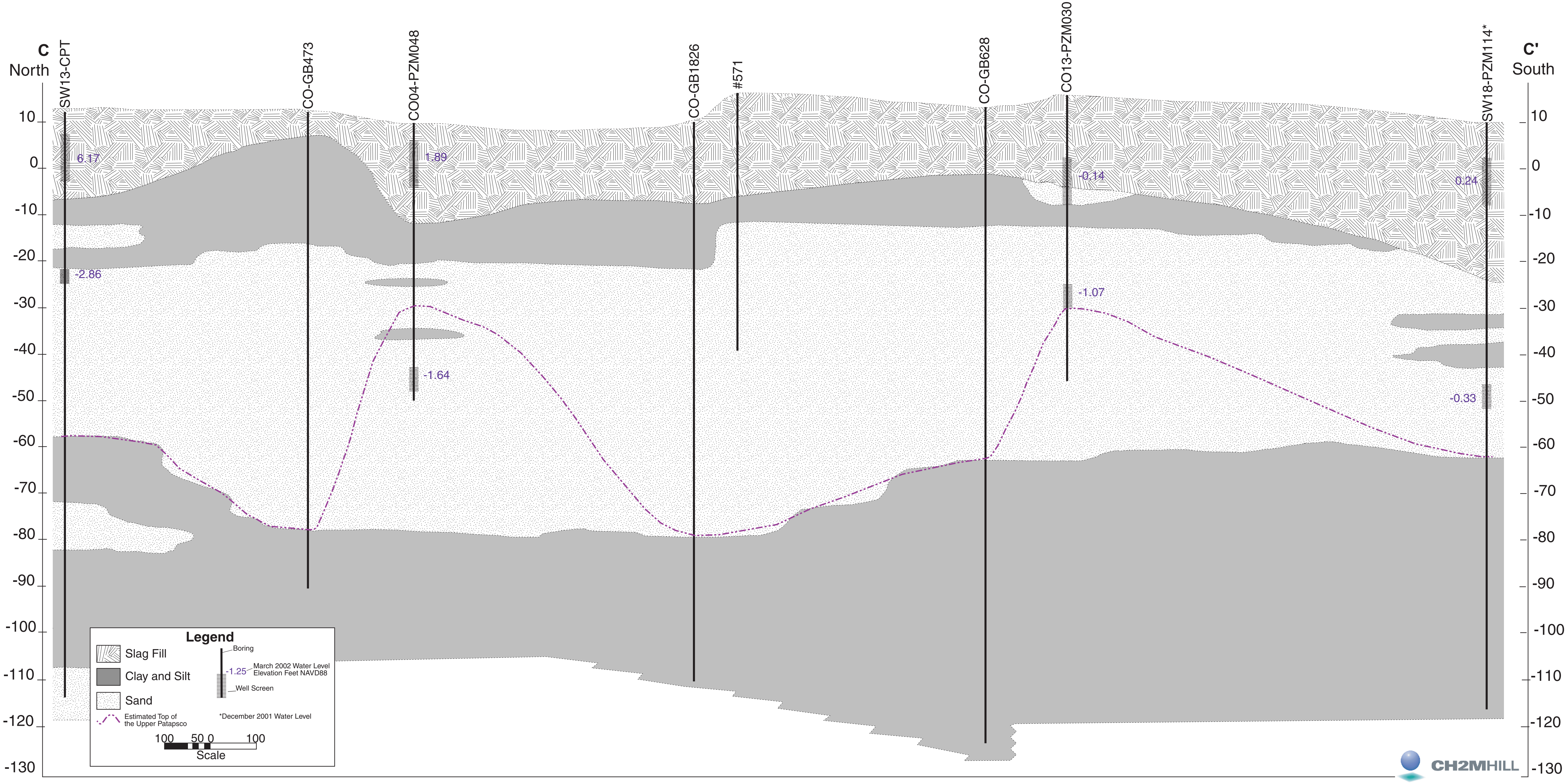

Figure 2.2-6
Section C-C'
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

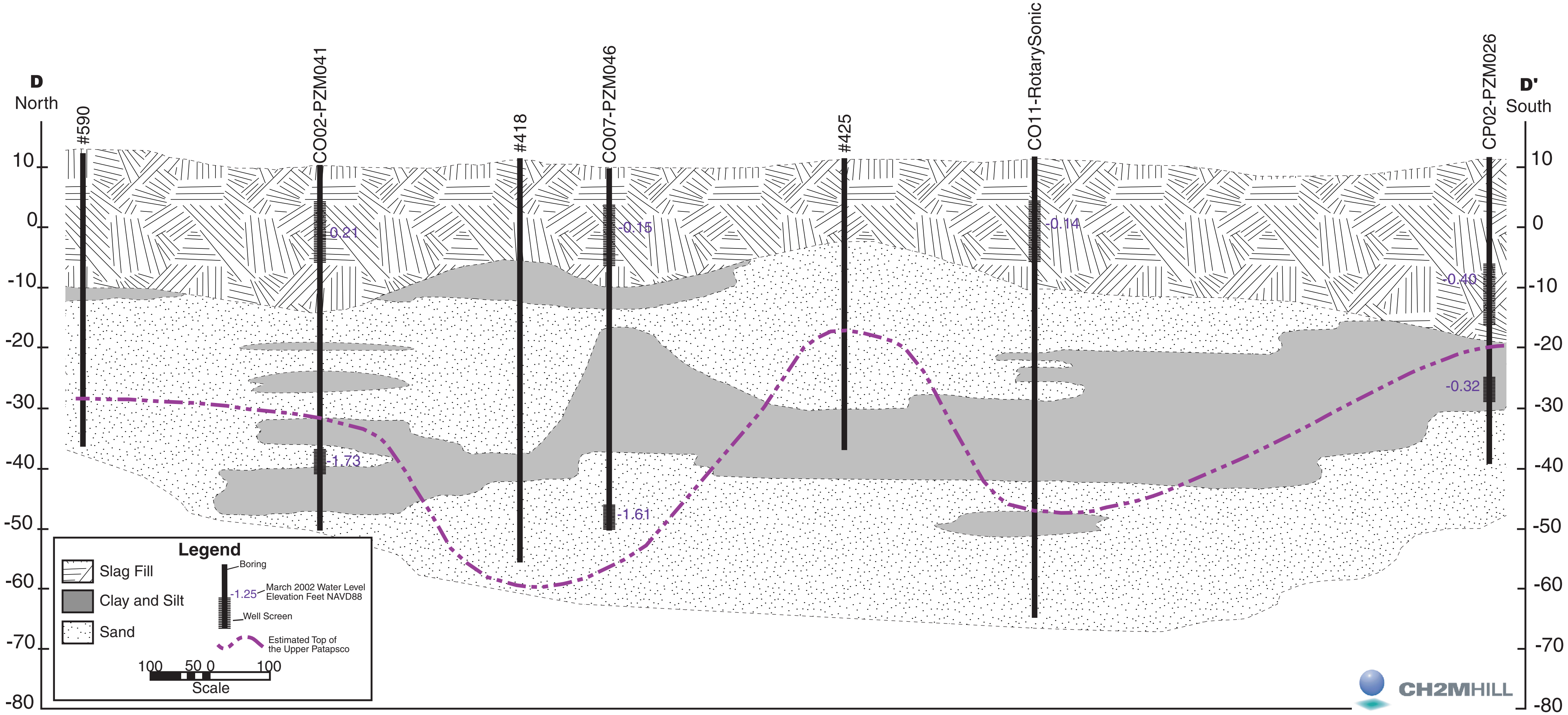

Figure 2.2-7
Section D-D'
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

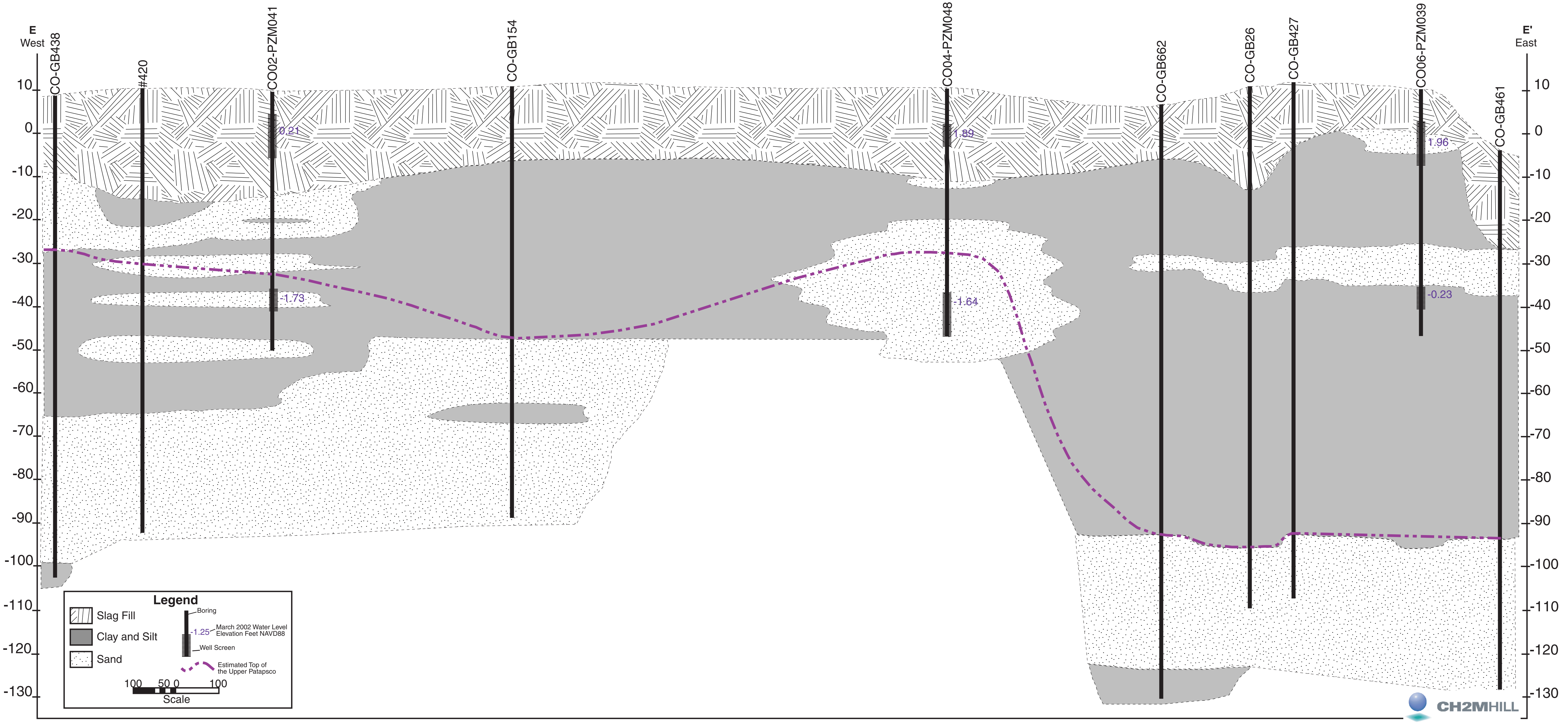

Figure 2.2-8
Section E-E'
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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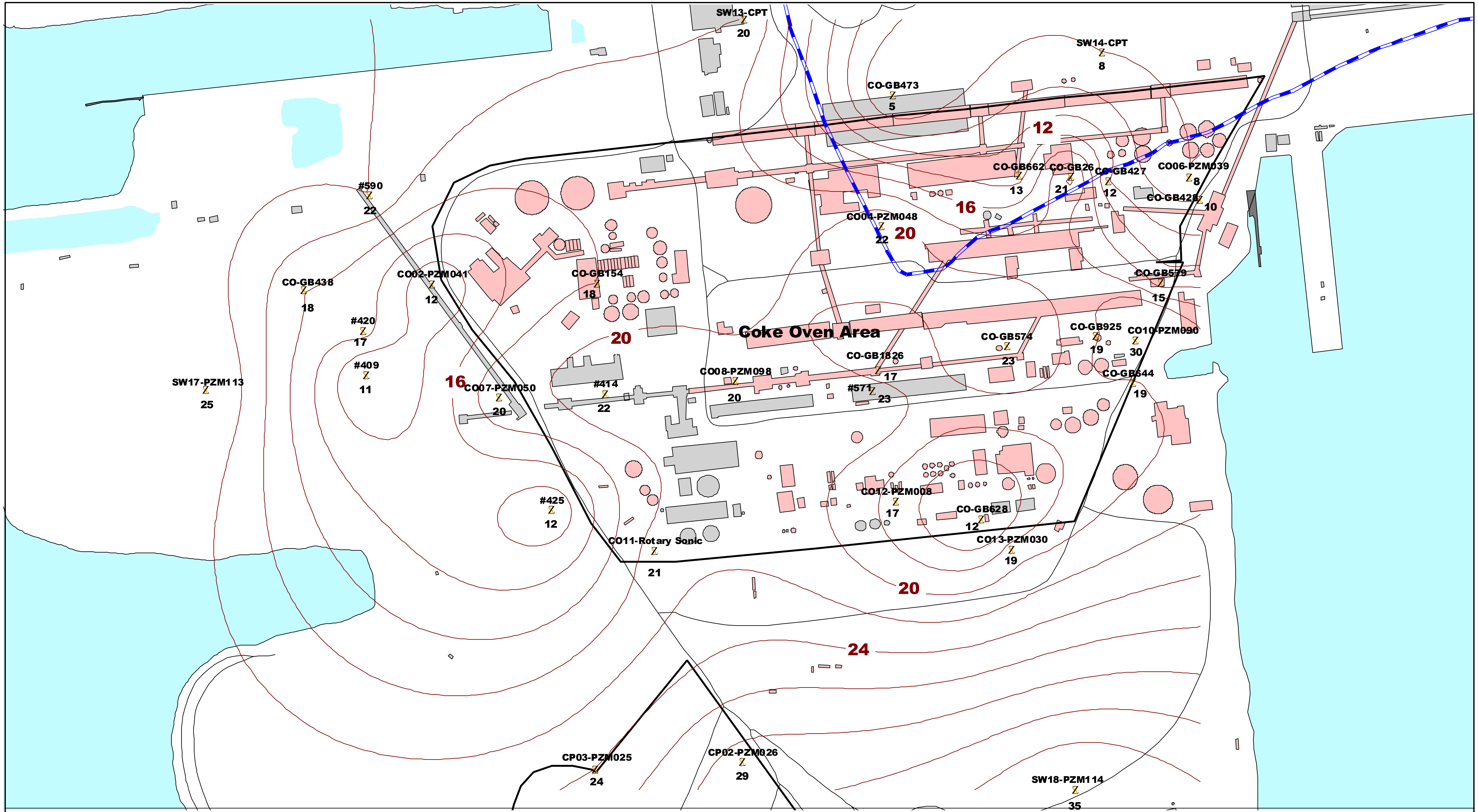

Figure 2.2-9
Thickness of Slag
Coke Oven Area
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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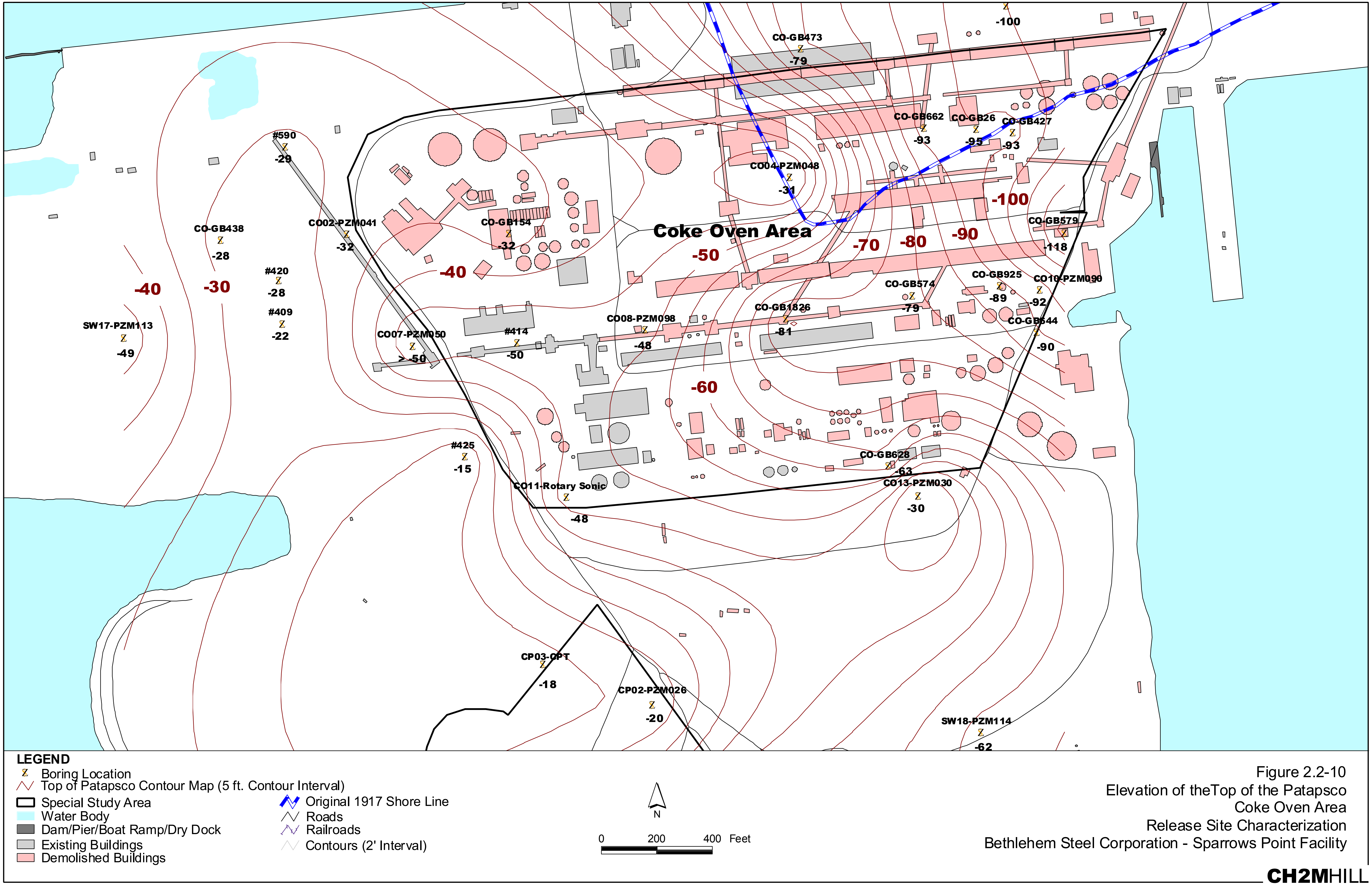

Figure 2.2-10
Elevation of theTop of the Patapsco
Coke Oven Area
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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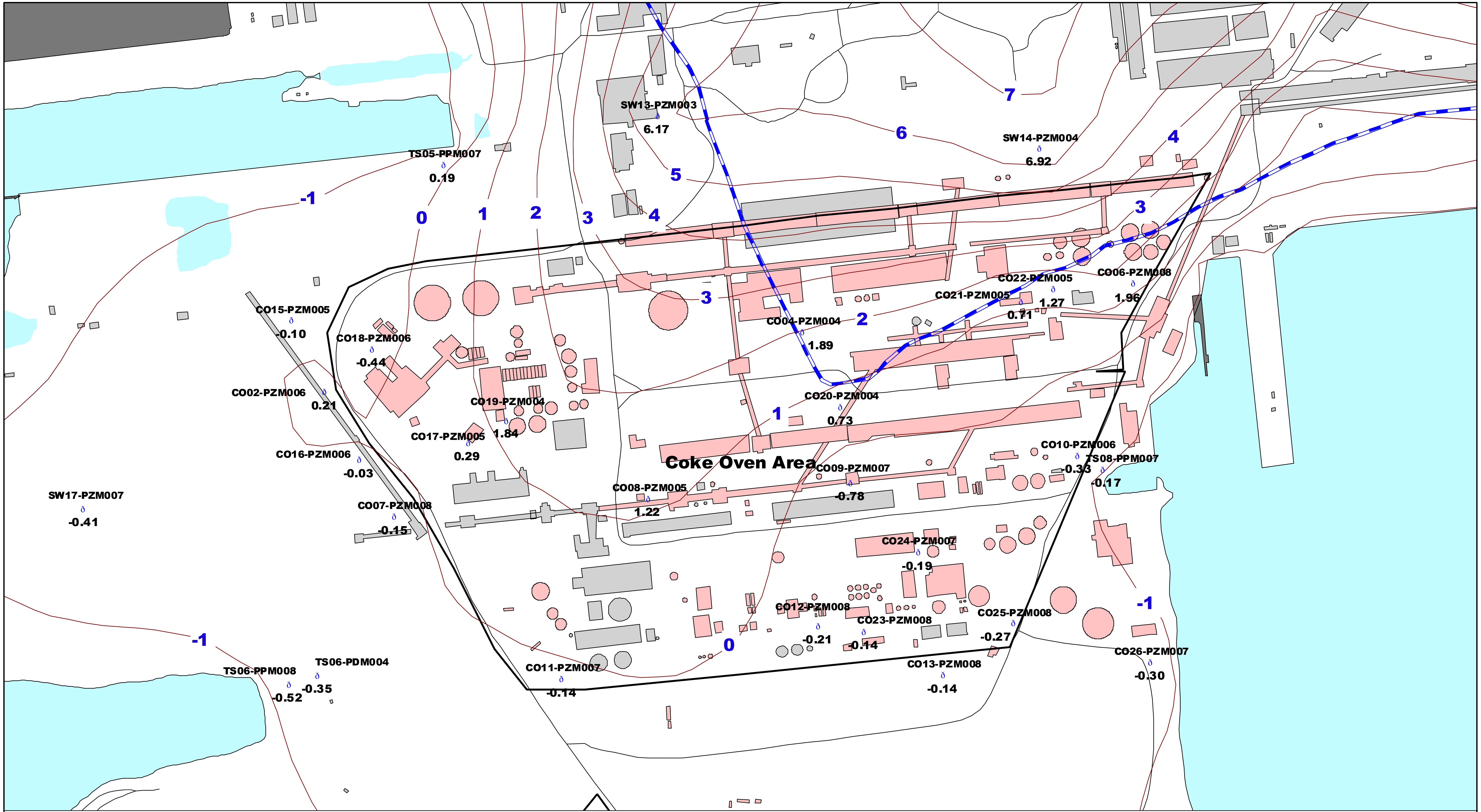

LEGEND

∂ Water Table Piezometer

╱╲ Water Level Contour (1 Ft Contour Interval)

▭ Special Study Area

▨ Water Body

■ Dam/Pier/Boat Ramp/Dry Dock

▨ Existing Buildings

▨ Demolished Buildings

╱╲ Original 1917 Shore Line

╱╲ Roads

╱╲ Railroads

Note: Surface elevation of Bear Creek, Patapsco River, Old Road Bay, and Jones Creek is -1.25 feet NAVD

N

0 200 400 Feet

Figure 2.2-11
Water Level Elevations - March 19, 2002, Water Table
Coke Oven Area

Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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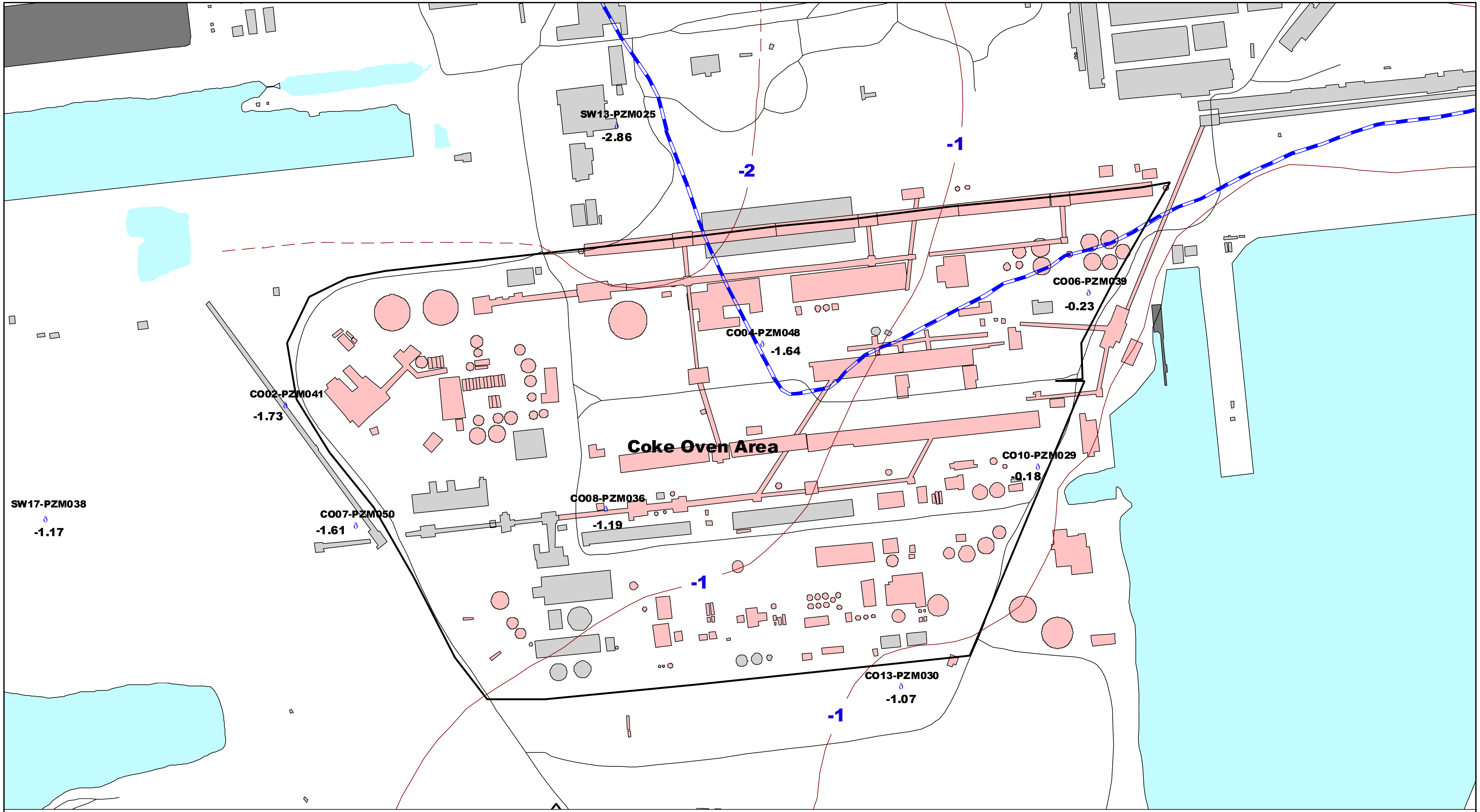

LEGEND

- ∂ Deeper Sand Piezometer
- ╱╲ Deeper Sand Water Level Contour (1 Ft. Contour)
- ☐ Special Study Area
- 🟦 Water Body
- ■ Dam/Pier/Boat Ramp/Dry Dock
- ▨ Existing Buildings
- 🟥 Demolished Buildings
- ╱╲ Original 1917 Shore Line
- ╱╲ Roads
- ╱╲ Railroads

N

0 200 400 Feet

Note: Surface elevation of Bear Creek, Patapsco River, Old Road Bay, and Jones Creek is -1.25 feet NAVD

Figure 2.2-12
Water Level Elevations - March 19, 2002, Deeper Sand Piezometric Surface
Coke Oven Area
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

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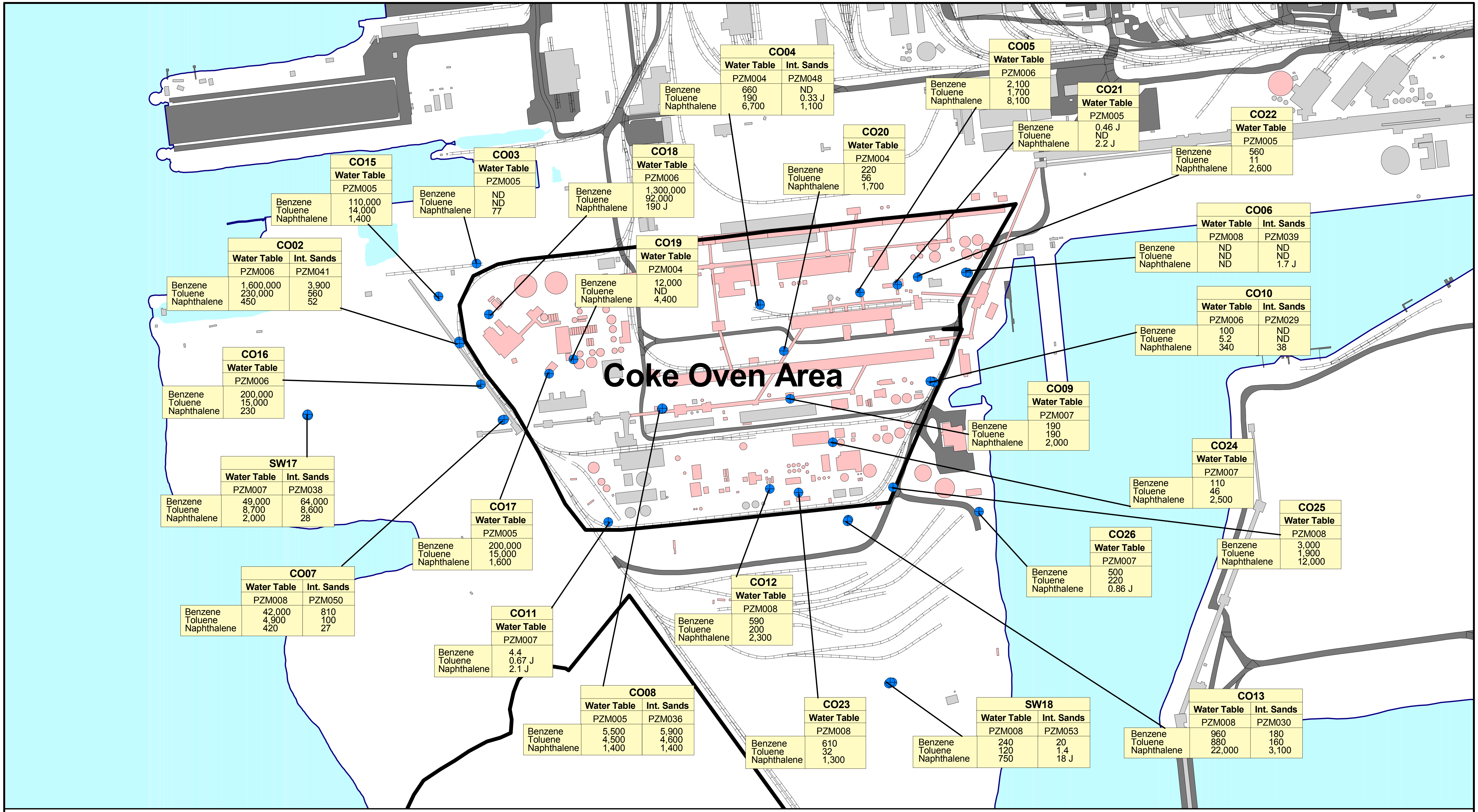

CO04

	Water Table	Int. Sands
	PZM004	PZM048
Benzene	660	ND
Toluene	190	0.33 J
Naphthalene	6,700	1,100

CO05

	Water Table
	PZM006
Benzene	2,100
Toluene	1,700
Naphthalene	8,100

CO21

	Water Table
	PZM005
Benzene	0.46 J
Toluene	ND
Naphthalene	2.2 J

CO22

	Water Table
	PZM005
Benzene	560
Toluene	11
Naphthalene	2,600

CO15

	Water Table
	PZM005
Benzene	110,000
Toluene	14,000
Naphthalene	1,400

CO03

	Water Table
	PZM005
Benzene	ND
Toluene	ND
Naphthalene	77

CO18

	Water Table
	PZM006
Benzene	1,300,000
Toluene	92,000
Naphthalene	190 J

CO20

	Water Table
	PZM004
Benzene	220
Toluene	56
Naphthalene	1,700

CO06

	Water Table	Int. Sands
	PZM008	PZM039
Benzene	ND	ND
Toluene	ND	ND
Naphthalene	ND	1.7 J

CO02

	Water Table	Int. Sands
	PZM006	PZM041
Benzene	1,600,000	3,900
Toluene	230,000	560
Naphthalene	450	52

CO19

	Water Table
	PZM004
Benzene	12,000
Toluene	ND
Naphthalene	4,400

CO10

	Water Table	Int. Sands
	PZM006	PZM029
Benzene	100	ND
Toluene	5.2	ND
Naphthalene	340	38

CO16

	Water Table
	PZM006
Benzene	200,000
Toluene	15,000
Naphthalene	230

CO09

	Water Table
	PZM007
Benzene	190
Toluene	190
Naphthalene	2,000

CO24

	Water Table
	PZM007
Benzene	110
Toluene	46
Naphthalene	2,500

SW17

	Water Table	Int. Sands
	PZM007	PZM038
Benzene	49,000	64,000
Toluene	8,700	8,600
Naphthalene	2,000	28

CO25

	Water Table
	PZM008
Benzene	3,000
Toluene	1,900
Naphthalene	12,000

CO17

	Water Table
	PZM005
Benzene	200,000
Toluene	15,000
Naphthalene	1,600

CO26

	Water Table
	PZM007
Benzene	500
Toluene	220
Naphthalene	0.86 J

CO07

	Water Table	Int. Sands
	PZM008	PZM050
Benzene	42,000	810
Toluene	4,900	100
Naphthalene	420	27

CO12

	Water Table
	PZM008
Benzene	590
Toluene	200
Naphthalene	2,300

CO11

	Water Table
	PZM007
Benzene	4.4
Toluene	0.67 J
Naphthalene	2.1 J

CO08

	Water Table	Int. Sands
	PZM005	PZM036
Benzene	5,500	5,900
Toluene	4,500	4,600
Naphthalene	1,400	1,400

CO23

	Water Table
	PZM008
Benzene	610
Toluene	32
Naphthalene	1,300

SW18

	Water Table	Int. Sands
	PZM008	PZM053
Benzene	240	20
Toluene	120	1.4
Naphthalene	750	18 J

CO13

	Water Table	Int. Sands
	PZM008	PZM030
Benzene	960	180
Toluene	880	160
Naphthalene	22,000	3,100

LEGEND

- ● Piezometer Locations
- Shore Line
- Railroads
- ▨ Roads/Paved Areas
- ▨ Buildings
- ▨ Buildings Under Construction
- ▨ Demolished Buildings
- ▨ Water Bodies

Concentrations in ug/L
J = Estimated Concentration
ND = Not Detected
NA = Not Anlayzed

Figure 2.2-13
Indicator Organics - Coke Oven Area
Bethlehem Steel Corp. - Sparrows Point Facility

CH2MHILL

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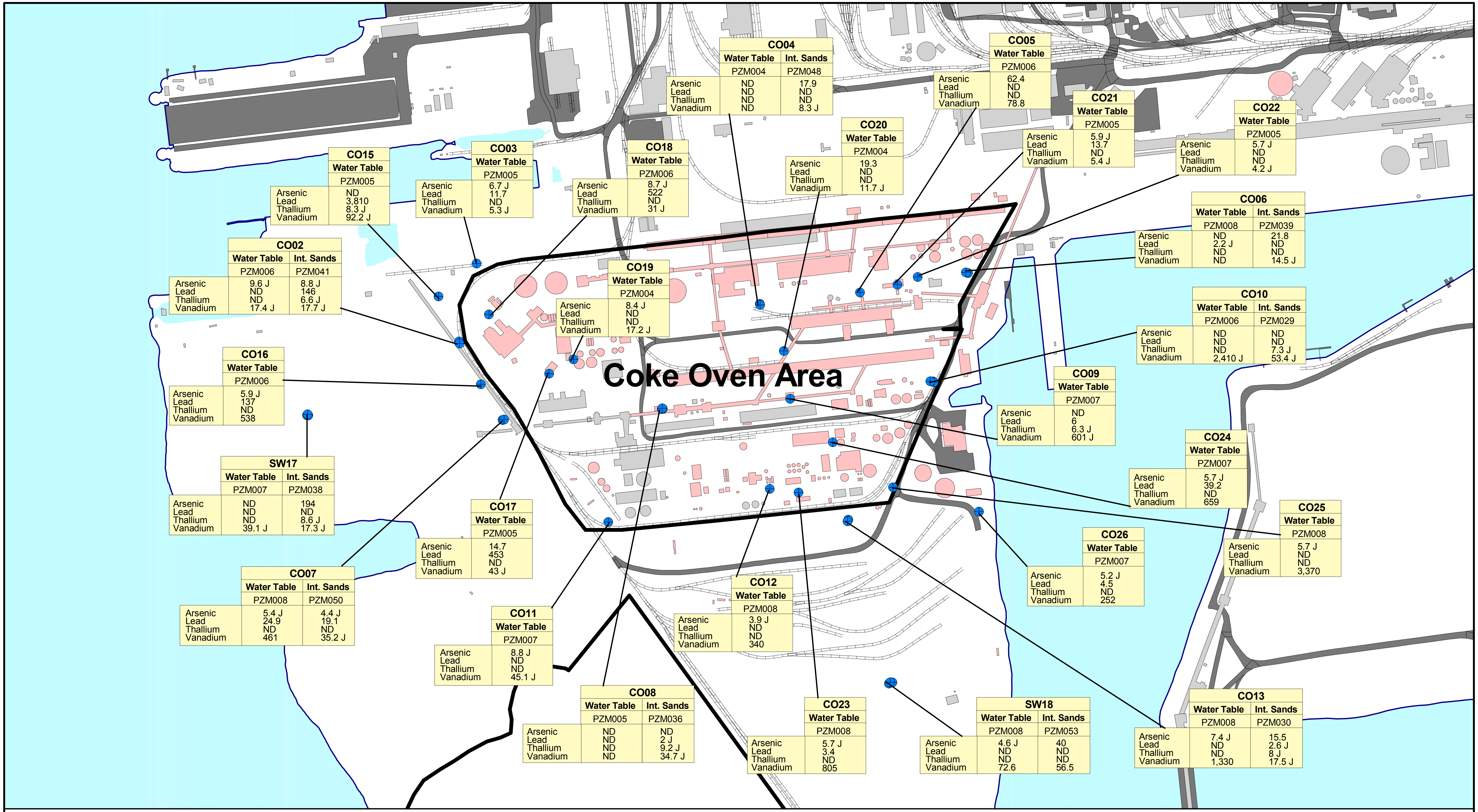

CO04

	Water Table	Int. Sands
	PZM004	PZM048
Arsenic	ND	17.9
Lead	ND	ND
Thallium	ND	ND
Vanadium	ND	8.3 J

CO05

	Water Table
	PZM006
Arsenic	62.4
Lead	ND
Thallium	ND
Vanadium	78.8

CO21

	Water Table
	PZM005
Arsenic	5.9 J
Lead	13.7
Thallium	ND
Vanadium	5.4 J

CO22

	Water Table
	PZM005
Arsenic	5.7 J
Lead	ND
Thallium	ND
Vanadium	4.2 J

CO20

	Water Table
	PZM004
Arsenic	19.3
Lead	ND
Thallium	ND
Vanadium	11.7 J

CO15

	Water Table
	PZM005
Arsenic	ND
Lead	3,810
Thallium	8.3 J
Vanadium	92.2 J

CO03

	Water Table
	PZM005
Arsenic	6.7 J
Lead	11.7
Thallium	ND
Vanadium	5.3 J

CO18

	Water Table
	PZM006
Arsenic	8.7 J
Lead	522
Thallium	ND
Vanadium	31 J

CO06

	Water Table	Int. Sands
	PZM008	PZM039
Arsenic	ND	21.8
Lead	2.2 J	ND
Thallium	ND	ND
Vanadium	ND	14.5 J

CO02

	Water Table	Int. Sands
	PZM006	PZM041
Arsenic	9.6 J	8.8 J
Lead	ND	146
Thallium	ND	6.6 J
Vanadium	17.4 J	17.7 J

CO19

	Water Table
	PZM004
Arsenic	8.4 J
Lead	ND
Thallium	ND
Vanadium	17.2 J

CO10

	Water Table	Int. Sands
	PZM006	PZM029
Arsenic	ND	ND
Lead	ND	ND
Thallium	ND	7.3 J
Vanadium	2,410 J	53.4 J

CO16

	Water Table
	PZM006
Arsenic	5.9 J
Lead	137
Thallium	ND
Vanadium	538

CO09

	Water Table
	PZM007
Arsenic	ND
Lead	6
Thallium	6.3 J
Vanadium	601 J

CO24

	Water Table
	PZM007
Arsenic	5.7 J
Lead	39.2
Thallium	ND
Vanadium	659

SW17

	Water Table	Int. Sands
	PZM007	PZM038
Arsenic	ND	194
Lead	ND	ND
Thallium	ND	8.6 J
Vanadium	39.1 J	17.3 J

CO17

	Water Table
	PZM005
Arsenic	14.7
Lead	453
Thallium	ND
Vanadium	43 J

CO25

	Water Table
	PZM008
Arsenic	5.7 J
Lead	ND
Thallium	ND
Vanadium	3,370

CO26

	Water Table
	PZM007
Arsenic	5.2 J
Lead	4.5
Thallium	ND
Vanadium	252

CO07

	Water Table	Int. Sands
	PZM008	PZM050
Arsenic	5.4 J	4.4 J
Lead	24.9	19.1
Thallium	ND	ND
Vanadium	461	35.2 J

CO12

	Water Table
	PZM008
Arsenic	3.9 J
Lead	ND
Thallium	ND
Vanadium	340

CO11

	Water Table
	PZM007
Arsenic	8.8 J
Lead	ND
Thallium	ND
Vanadium	45.1 J

CO08

	Water Table	Int. Sands
	PZM005	PZM036
Arsenic	ND	ND
Lead	ND	2 J
Thallium	ND	9.2 J
Vanadium	ND	34.7 J

CO23

	Water Table
	PZM008
Arsenic	5.7 J
Lead	3.4
Thallium	ND
Vanadium	805

SW18

	Water Table	Int. Sands
	PZM008	PZM053
Arsenic	4.6 J	40
Lead	ND	ND
Thallium	ND	ND
Vanadium	72.6	56.5

CO13

	Water Table	Int. Sands
	PZM008	PZM030
Arsenic	7.4 J	15.5
Lead	ND	2.6 J
Thallium	ND	8 J
Vanadium	1,330	17.5 J

LEGEND

- ● Piezometer Locations
- Shore Line
- Railroads
- Roads/Paved Areas
- Buildings
- Buildings Under Construction
- Demolished Buildings
- Water Bodies

Concentrations in ug/L
J = Estimated Concentration
ND = Not Detected
NA = Not Anlayzed

Figure 2.2-14
Indicator Metals - Coke Oven Area
Bethlehem Steel Corp. - Sparrows Point Facility

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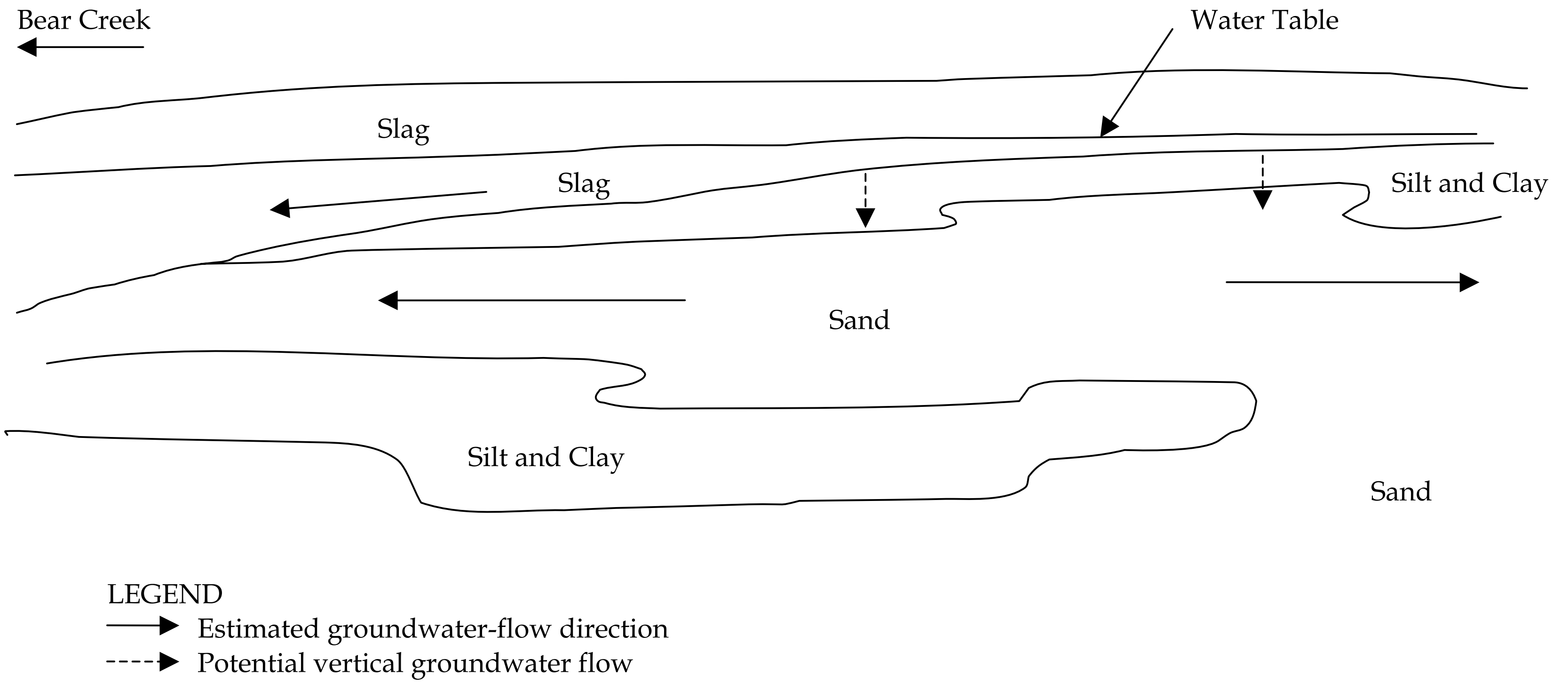


Figure 2.2-15
Conceptual Site Hydrogeologic Model
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation—Sparrows Point Facility

Boring Logs

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO02-PZM006

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 12/11/2001

END: 12/12/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					<u>SLAG FILL</u>, granular silty slag fill	
	3-5	1	1	89-100/6	(GM) Very Dense, Dry, Silty, Sandy, Gravel Slag. Munsell = Light Yellowish Brown = 2.5Y 6/4	1194 ppm Smells of BTEX Breathing Zone Tested Positive for Benzene, no other split spoons taken from bore hole
5						
10						
						Water Table ▼
15						
						Bottom of Boring ▼
20						
25						

PROJECT NUMBER 164586.01.CK.DR	**BORING NUMBER** CO02-PZM041 Sheet 1 of 2

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2Si
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 10/15/2001
END: 10/15/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
3						
19						
20	20 - 22	2	1	3-2-2-2 (4)	(GM) Wet, Loose Sandy Silty Slag Fill Gravel. Munsell = Black 2.5Y 2.5/1	PID = 4765 ppm
	22.5 - 24.5	1.5	2	WOH-1-2-18 (3)	(GM) Wet, Very loose Sandy Silty Slag Fill Gravel. Munsell = Black 2.5Y 2.5/1	PID = 462 ppm
25	25 - 27	1.5	3	9-26-27-25 (53)	(SM) Wet, Very dense Sand. Munsell = Olive Brown and Yellow 2.5Y 4/4 and 2.5Y 7/8 (ML) Silty Sandy Clayey Silt. Pen = 1.5 Munsell = Pale Yellow 2.5Y 7/4	PID = 6465 ppm
	27.5 - 29.5	1.5	4	6-17-30-61 (47)	(SM) Wet, Very dense Coarse Medium Grained Sand. Munsell = Pale Yellow 2.5Y 8/2 (CL) Wet Clay with trace sand. Pen = 0.75 Munsell = Pale Yellow 2.5Y 8/2	PID = 535 ppm
30	30 - 32	1.5	5	13-17-20-21 (37)	(SM) Wet Very Dense Sand with 0.5 " veneers of clay. Penetrometer = 0.5 Munsell = Light Gray and Red 2.5Y 7/1 10R 4/8	PID = 47 ppm
	32.5 - 34.5	2	6	15-38-50-41 (88)		PID = 108 ppm
35	35 - 37	1.5	7	19-37-22-43 (59)	(CL) Moist, Hard Sandy Clay (50/50). Penetrometer = 0.5 Munsell = Yellowish Brown 10YR 5/6	PID = 41.2 ppm
	37.5 - 39.5	1.5	8	22-20-31-30 (51)	(SM) Wet, Very Dense Medium Grained Sand. Munsell = Yellow 10YR 7/6	PID = 564 ppm
40	40 - 42	2	9	20-36-51-52 (87)		PID = 47.5 ppm

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO02-PZM041

Sheet 2 of 2

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 10/15/2001 END: 10/15/2001 LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
	47.5 - 49.5	1.8	12	31-60-82-100/2 (142)	(SP) Dry, Very Dense Fine Grained Sand With Trace Clay. Munsell = Very Pale Brown 10YR 8/2	PID = 6.0 ppm
50						
	50 - 52	2	13	13-25-41-61 (66)	(CL) Dry Very Hard Clay With Some Fine Grained Sand. Penetrometer = >5 Munsell = Very Pale Brown	PID = 0.0 ppm Bottom of Boring ▼
55						

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO03-PZM005

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2Si
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 12/12/2001
END: 12/12/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0						
	3-5	1	1	10-8-12-17 (20)	(GM) Wet, Medium Dense Silty, Sandy, Slag with pieces of Brick. Munsell = Black = 5Y 2.5/1	2.0 ppm Smells like Bubble Gum Ground is saturated
5						
10						Water Table ▼
	10-12	0.5	2	10-50/0	(GM) Wet, Very Dense Silty, Sandy, Slag. Munsell = Black = 5Y 2.5/1	1.7 ppm Smells like Bubble Gum
15						
	15-17	0.5	3	1-3-29-50/2 (32)	(GM) Wet, Dense Silty, Sandy, Slag. Munsell = Black = 5Y 2.5/1	2.1 ppm Smells like Bubble Gum Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO04-PZM004
Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 10/11/2001 END: 10/11/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3-5	0.9	1	46-37-42-100/6 (79)		PID=10.9 Dry
5					[GM] Hard Silty-Sandy Gravel Slag Light Bluish Grey Gley2 7/1 10B	
	8-10	0.51	2	80-100/1		PID=207 Water Table ▼
10					[GM] Hard Silty-Sandy Gravel Slag Light Bluish Grey Gley2 7/1 10B	
15	15-17	1.2	3	8-3-10-4 [13]	[SM] Medium Dense Wet Silty Sand Black Gley1	PID=667 Smells of Naphthalene Bottom of Boring ▼
20						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO04-PZM048
Sheet 1 of 2

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger
WATER LEVELS :
START : 10/10/2001 END: 10/10/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
20	20-22	22"	1	1-1-1-2 (2)	(CH) Very Soft moist Plastic Clay with some slag Grayish Brown 10YR 5/2 Penetrometer =0.25.	PID=6.1ppm
					(SC) Loose Clayey Sand Grayish Brown 10YR 5/2	PID=69.1
	22.5-24.5	2	2	WoH-1-3-3 (2)	(CH) Very Soft moist Plastic Clay Plastic Clay Grayish Brown 10YR 5/2 Penetrometer =0.1	
25	25-27	2	3	WoH-1-3-3 (4)	(CH) Very Soft moist Plastic Clay Plastic Clay Reddish Grey 5YR 5/2 Penetrometer =0.5	PID=10.6
	27.5-29.5	2	4	WoH--18-3 (18)	(CH) Stiff moist Plastic Clay Plastic Clay Reddish Grey 5YR 5/2 Penetrometer =0.5 Sheen at 29'	PID=51.2
30	30-32	2	5	WoH-12-5-3 (17)	(SM)Wet Loose Sitly Sand Brownish Yellow 10YR 6/8	PID=8.1
	32.5-34.5	1.5	6	7-14-17-22 (31)	(SW) Wet Medium Dense Fine Sand with trace clay Light Yellowish brown 2.5Y 6/3.	PID=39.8
35					(CH) Very Soft Wet Plastic Clay Grayish Brown 10YR 5/2 Pen=0	
	35-37	1.5	7	6-12-26-50 (38)		PID=72.3
	37.5-39.5	1.5	8	11-27-29-44 (56)	(SW)Medium dense Wet Fine Sand with trace clay Very Pale Brown 10YR 8/2	PID=28.4
40	40-42	2	9	38-68-76-64 (144)	(SW)Very dense Wet Fine Sand with trace clay Very	PID=18.7

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO04-PZM048
Sheet 2 of 2

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger
WATER LEVELS :
START : 10/10/2001 END: 10/10/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
	47.5-49.5	1	12	14-20-28-44 (48)	(SC) Medium Dense Moist Clayey Fine Sand Pale Yellow 5Y 8/2	PID=7.4
50						
	50-52	1.5	13	31-58-75-97 (128)		PID=3.5
	52.5-54	1.5	14	38-61-100/6 (161)	(SW)Very dense Wet Fine Sand with trace clay Very Pale Brown 10YR 8/2	PID=5.2
55						
	55-57	1.5	15	32-59-69-102 (128)		PID=4.3 Bottom of Boring ▼

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO05-PZM006
Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/28/2001 END: 11/28/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
5	5-7		1	58/0	NO RECOVERY	
10	9 - 11	1.5	2	6-6-6-15 (12)	(SP) Wet Medium Dense Gravely Slag Sand. Black Munsell = 2.5Y 2.5/1	81.9 ppm Water Table ▼
15	15 - 17	1.3	3	6-5-8-10 (13)	(CL) Wet Stiff Clay. Penetrometer = 0.5 Black and Greenish Grey Munsell = 2.5Y 2.5/1 and GLEY1 5/10YR	54.2 ppm Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO06-PZM008

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 11/27/2001 END: 11/27/2001 LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3-5	1	1	6-5-4-3 (9)	(ML) Dry, Loose, Silty, Gravelly Slag. Munsell = Black = 2.5Y 2.5/1	1.7 ppm
5						
10						Water Table ▼
	10-12	1	2	2-2-3-17 (5)	(SM) Wet, Loose, Silty, Sand With Little Gravel. Munsell = light Olive Brown = 2.5Y 6/4	1.2 ppm
15						
	15-17	2	3	2-2-2-3 (4)	(CL) Wet, Soft, Clay with trace Silt. Penetrometer = 0.5 Munsell = Greenish Grey = GLEY1 6/10	0.7 ppm Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO06-PZM039

Sheet 1 of 2

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 10/12/2001 END: 10/12/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)				STANDARD PENETRATION TEST RESULTS	CORE DESCRIPTION	COMMENTS
	INTERVAL (FT)					
		RECOVERY (FT)				
			#/TYPE	6"-6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
20						
	20-22	2	1	WoH-2-5-4 (7)	(CH) Medium Stiff moist sticky Plastic Clay with trace -no silt trace pieces of gravel slag. Penotrometer=1. Dark Olive Grey 5Y 3/2	PID=6.1
	22.5-24.5	2	2	2-3-3-4 (6)		PID=4.3
25	25-27	2	3	WoH-2-3-4 (5)	(CH) Medium Stiff moist sticky Plastic Clay with trace -no silt.. Penotrometer=0.5. Dark Olive Grey 5Y 3/2	PID=3
	27.5-29.5	2	4	WoH/12-3-5 (5)	(CH) Soft moist sticky Plastic Clay with trace -no silt. Penotrometer=1. Dark Olive Grey 5Y 3/2	PID=2.1
30	30-32	2	5	3-2-3-4 (5)	(CH) Medium Stiff moist sticky Plastic Clay with trace -no silt. Penotrometer=1.1. Dark Olive Grey 5Y 3/2	PID=0.4
	32.5-34.5	2	6	1-1-2-3 (3)	(CH) Soft moist sticky Plastic Clay with trace -no silt. Penotrometer=0.5. Dark Olive Grey 5Y 3/2	PID=0.5
35	35-37	2	7	WoH-16-30-30 (46)		PID=3.5
	37.5-39.5	1.2	8	5-7-12-20 (19)	(SM) Wet Medium Dense Silty Sand with trace clay. Olive Yellow 2.5Y 6/6	PID=4.3
40	40-42	2	9	14-30-31-15 (61)	(SM) Wet Dense Silty Sand with trace clay. Rusted appearance Dark Yellowish Brown 10YR5/8.	PID=2.1

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO06-PZM039

Sheet 2 of 2

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 10/12/2001 END: 10/12/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)				STANDARD PENETRATION TEST RESULTS	CORE DESCRIPTION	COMMENTS
	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	6"-6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
	47.5-49.5	2	12	WoH/12-1-2 (1)	{OH} Moist, Soft-very soft Organic Silty Clay with shell fragments. Marine Clay late Pleistocene or Early Holocene. Dark Greenish Grey Gley1 4/1 5GY	PID=0
50	50-52	2	13	WoH/12-1-3 (1)		PID=0
	52.5-54.5	2	14	WoH/12-1-2 (1)	{OH} Moist, Soft-very soft Organic Silty Clay with shell fragments. Marine Clay late Pleistocene or Early Holocene. Dark Greenish Grey Gley1 4/1 5GY	PID=0
55	55-57	2	15	WoH/12-1-3 (1)		PID=0 Bottom of Boring ▼

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO07-PZM008

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2Si
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START :
END:
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3-5	1	1	24-18-23-42 (41)	(GM) Dry, Dense, Sandy Silty Slag Gravel Fill. Munsell = Dark Reddish Grey = 10R 3/1	3.5 ppm
5						
10	10-12	1	2	18-34-17-6 (51)	(CL) Wet, Hard Gravelly, Silty Clay Fill. Penetrometer = 0.5 Munsell = Black= 2.5Y 2.5/12	Water Table ▼ 75.9 ppm
15	15-17	0.5	3	102/6	(GM) Wet, Very dense, Sandy, Silty, Gravel Slag Fill. Munsell = Very Dark Grey=2.5Y 3/1	89.5 ppm Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO07-PZM050

Sheet 1 of 2

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2Si
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 12/18/2002
END : 12/18/2002
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
5						
8						
19						
20						
	20 - 22	1	1	3-3-2-3 (5)	(CL) Wet, Medium Stiff Silty Sandy Clay. Penetrometer = 0.5 Munsell = Greenish Black GLEY1 2.5/10Y	PID = 347 ppm Smells of machine oil
	23 - 25	1.5	2	12-6-3-3 (9)	(SC) Wet Silty, Clayey, Loose Fine Grained Sand with Shell Hash. Munsell = Greenish Black GLEY1 2.5/10Y	PID = 53.9 ppm Smells of machine oil
25	25 - 27	2	3	3-2-7-10 (9)	(CL) Wet Medium Stiff Sandy Shelly Marine Clay. Penetrometer = 1 Munsell = Dark Greenish Grey GLEY1 4/10Y	PID = 6.4 ppm
	27 - 29	2	1	SHELBY TUBE	(CL) Wet Medium Stiff Sandy Shelly Marine Clay with Bits of Wood. Penetrometer = 1 Munsell = Greenish Black GLEY1 2.5/5GY	PID = 3.9 ppm
30	29 - 31	2	4	9-9-8-6 (17)	(CL) Wet Very Stiff Sandy Shelly Marine Clay. Penetrometer = 1 Munsell = Greenish Black GLEY1 2.5/10Y	PID = 6.6 ppm
	33 - 35	2	5	3-4-5-6 (9)	(CL) Wet Medium Stiff Sandy Shelly Marine Clay. Penetrometer = 1 Munsell = Greenish Black GLEY1 2.5/10Y	PID = 5.1 ppm
35	35 - 37	2	6	2-4-5-7 (9)		PID = 3.5 ppm

CH2MHILL	**PROJECT NUMBER** 164586.01.CK.DR	**BORING NUMBER** CO07-PZM050 Sheet 2 of 2

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2Si
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 12/18/2002
END: 12/18/2002
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
	42 - 44	2	8	3-3-4-5 (7)	(CL) Wet Medium Stiff Sandy Shelly Marine Clay. Penetrometer = 1 Munsell = Greenish Black GLEY1 2.5/10Y	PID = 0.6 ppm
45						
	45 - 47	2	9	3-3-3-4 (6)	(SM) WET, Loose, Silty Clayey Fine Grained Sand. Munsell = Greenish Grey GLEY 1 5/5GY	PID = 0.0 ppm
	48 - 50	2	10	3-5-4-4 (9)	(SM) WET, Loose, Silty, Clayey Fine Grained Sand. Munsell = Light yellowish Brown 2.5Y 6/3	PID = 0.0 ppm
50						
	50 - 52	2	11	2-2-3-6 (5)	(SM) WET, Loose, Silty, Clayey Fine Grained Sand. Munsell =Dark Greenish Grey GLEY1 3/5 GY	PID = 4.1 ppm
	53 - 55	2	12	1-8-24-43 (32)	(SW) WET, Dense, Fine Grained Sand. Munsell = Grey 5Y 6/1	PID = 0.0 ppm
55						
	55 - 57	0.5	13	3-3-9-33 (12)	(SM) WET, Medium Dense, Medium Grained Sand. Munsell = Light Grey 2.5Y 7/2	PID = 0.9 ppm
	58 - 60	2	14	7-14-22-20 (34)	(SM) WET, Medium Dense, Coarse Grained Sand. Munsell = Light Olive Brown 2.5Y 5/4	PID = 0.0 ppm
60						Bottom of Boring ▼
65						
70						

CH2M HILL

PROJECT NUMBE 148003.23	**BORING NUMBER**	CO08-PZM098 SHEET 1 OF 4

SOIL BORING LOG

PROJECT : Bethlehem Steel LOCATION : Sparrows Point, MD
ELEVATION : 11.55 ft (TOC) DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Mobile B-61, Hollow Stem Augers, 4.25 ID
WATER LEVELS 60.25 ft bls (12/12/2000) START : 11/06/2000 END: 11/08/2000 LOGGER : Lisa Carter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole	
					SLAG FILL, black slag fragments, with some silt	Met drillers on site at 7:00 am. Steam-cleaned augers and equipment. Moved drill rig to CO-08 at 9:00 am. Began drilling at 9:50 am. Drilled to 20' (through slag) prior to collecting first spoon sample	**SLAG FILL**
5							
10							
15							
20	20 22	2	1	3 - 1 - 2 - 1 (3)	CLAY, (CH), fat clay, stiff, light grayish brown with some organic material with some fine grained sand layers		**CLAY 1**
25	25 27	1.7	2	3 - 4 - 5 - 8 (9)	CLAYEY SILT, (ML/CL), silt 95%, very dark gray color, clay 5%, brittle		**CLAY 2**

PROJECT NUMBE 148003.23 **BORING NUMBER** CO08-PZM098
SHEET 2 OF 4

SOIL BORING LOG

PROJECT : Bethlehem Steel LOCATION : Sparrows Point, MD
ELEVATION : 11.55 ft (TOC) DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Mobile B-61, Hollow Stem Augers, 4.25 ID
WATER LEVELS 60.25 ft bls (12/12/2000) START : 11/06/2000 END: 11/08/2000 LOGGER : Lisa Carter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone \bove Hole	
	30 32	2	3	10 - 6 - 9 - 11 (15)	CLAYEY SILT, (ML/CL), silt 95%, very dark gray color, clay 5%, brittle		**CLAY 2**
					SAND, (SW), wet, fine to medium grained quartz, dark gray		
					SILTY SAND, (SM), sand 95%, silt, 5%, wet, light gray to pale brown color, fine to medium grained quartz		
35	35 37	0.9	4	40 - 50/3" (90)			
40	40 42	1.6	5	21 - 50 - 50/5" (100)			
							SAND 2
45	45 47	0.9	6	23 - 50/4" (73)			
50	50 52	0.5	7	50/5" (50)			
					SAND, (SW), wet, light gray, fine grained quartz sand		
55	55 57	2	8	17 - 39 - 31 - 46 (70)	CLAY, very dense, red		
					SILTY CLAY, (CL/ML), dense, light brownish gray		**CLAY 3**

PROJECT NUMBER 148003.23	BORING NUMBER	CO08-PZM098 SHEET 3 OF 4

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION : 11.55 ft (TOC)
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Mobile B-61, Hollow Stem Augers, 4.25 ID
WATER LEVELS 60.25 ft bls (12/12/2000)
START : 11/06/2000 END: 11/08/2000
LOGGER : Lisa Carter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole	
	60 62	1.2	9	21 - 37 - 41 - 59 (78)	SILTY CLAY, (CL/ML), dense, light brownish gray		
					CLAYEY SILT, (CL/ML), dense, mottled gray, light gray and weak red, with a layer of silty sand between 65.5 to 66 feet and 66.5 feet to 67 feet		**CLAY 3**
65	65 67	1.4	10	17 - 28 - 42 - 61 (70)			
					SILTY CLAY, (CL/ML), stiff, moist, very dark gray color		
70	70 72	1.7	11	17 - 30 - 34 - 46 (64)			
					CLAY, (CL), very stiff and dense, light gray and multicolor (olive, gray, yellow brown, weak red)		
75	75 77	1.5	12	21 - 23 - 29 - 37 (52)			**CLAY 4**
80	80 82	1.2	13	9 - 20 - 31 - 40 (51)			
85	85 87	0.3	14	13 - 21 - 35 - 46 (56)			

PROJECT NUMBER 148003.23	**BORING NUMBER** CO08-PZM098 SHEET 4 OF 4

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION : 11.55 ft (TOC)
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Mobile B-61, Hollow Stem Augers, 4.25 ID
WATER LEVELS 60.25 ft bls (12/12/2000)
START : 11/06/2000 END: 11/08/2000
LOGGER : Lisa Carter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole	
	90 92	1.5	15	15 - 31 - 50 - 50/4" (81)	CLAY, (CL), very stiff and dense, light gray and dark brown layers		
95	95 97	0.8	16	17 - 30 - 40 - 53 (70)	CLAY, (CL), very stiff and dense, weak red		
100	100 102	1.6	17	20 - 42 - 56 - 71 (98)			CLAY 4
105	105 107	1.4	18	20 - 50 - 65 - 50/4" (115)			
110	110 112	1.2	19	23 - 42 - 54 - 50/4" (96)			
115					End of Boring		

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO09-PZM007

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 11/29/2001 END: 11/29/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
5	3-5	1.5	1	40-12-20-48 (32)	(SM) Dense Coarse Grained Silty Sand With Gravel. Pale Yellow Munsell = 2.5Y 4/4 (SP) Dry Dense Coarse Grained Silty Gravely Slag Sand. Munsell = Black 2.5Y 2.5/1	0.8 ppm 2.0 ppm
10	10-12	0.5	2	52-100/4	(SP) Dry Dense Coarse Grained Silty Gravely Slag Sand. Black Munsell = 2.5Y 2.5/1	39.2 ppm Water Table ▼
15	15-17	0.75	3	10-9-16-14 (25)	(SM) Wet Medium Dense Sand Silt Gravel Mix. Black Munsell = 2.5Y 2.5/1	39.2 ppm smells like machine oil Bottom of Boring ▼
20						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO11-Rotary Sonic Test Hole
Sheet 1 of 3

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : Prosonic
DRILLING METHOD AND EQUIPMENT USED : Rotary Sonic Rig
WATER LEVELS :
START : 09/25/2001 END: 09/25/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0 5	0-7	7	0-7 1	SLAG FILL, granular silty slag fill. Munsell = Black GLEY 1 2.5/1	Exhibits Sheen and has Naphthalene Smell
10 15	7-17	10	7-17 2	SLAG FILL, granular silty slag fill. Munsell = Black GLEY 1 2.5/1	Exhibits Sheen and has Naphthalene Smell
20	17-21	10	17-27 3	SLAG FILL, granular silty slag fill. Munsell = Black GLEY 1 2.5/1	Exhibits Sheen and has Naphthalene Smell
	21-21.9			(CL) Clay With Sand and Silt. Penetrometer = 0.5 Munsell = Black GLEY 1 2.5/1	Exhibits Sheen and has Naphthalene Smell Exhibits Sheen and has Naphthalene Smell
	21.9-22.2			(SM) Silty Sand. Munsell = Black GLEY 1 2.5/1	Exhibits Sheen and has Naphthalene Smell
	22.2-22.9			(SW) Medium Sand. Munsell = Black GLEY 1 2.5/1	Exhibits Sheen and has Naphthalene Smell
	22.9-23.5			(SW) Medium - Coarse Grained Sand. Munsell = Greenish Grey GLEY 1 10Y 5/1	
	23.5-23.7			(GP) Gravel Sand Mix. Munsell = Dark Yellowish Brown 10YR 4/6	
	23.7-24.5			(SW) Medium-Coarse Sand. Munsell = Very Pale Brown 10YR 7/3	
25	24.5-27			(SW) Medium Sand. Munsell = Light Grey 2.5Y 7/2	

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO11-Rotary Sonic Test Hole
Sheet 2 of 3

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : Prosonic
DRILLING METHOD AND EQUIPMENT USED : Rotary Sonic Rig
WATER LEVELS :
START : 09/25/2001 END: 09/25/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
	33-33.4			(CL) Clay With Sand & Silt Finely Bedded. Pen =0.5 Munsell=White 2.5Y8/1	
35	33.4-35.1			(SW) Medium Grained Sand With Little - No Clay. Munsell Pale Yellow= 5Y 7/3	
	35.1-35.9			(CL) Supper Compressed Dry Tight Clay. Penetrometer >4.5 Munsell = white 2.5y 8/1	
	35.9-36.8			(SW) Medium Grained Sand. Munsell = Pale Yellow 5Y 7/4	
	36.8-37			(CL) Dry Tight Clay. Penetrometer = 4.5 Munsell = White 10YR 8/1	
	37-39.6	20	37-57 5	(SP) Medium -Fine Grained Sand. Munsell= Pale Yellow 2.5Y 7/4	
40	39.6-39.9			(CL) Loose Clay With Some Sand. Penetrometer = 0.5 Munsell = White 2.5Y 8/1	
	39.9-40.2			(SP) Fine Sand. Munsell = Pale Yellow 2.5Y 7/3	
	40.2-40.4			(SC) Clayey Sand . Munsell = Pale Yellow 2.5Y 7/4 and Dark Yellow 2.5 Y 6/6	
	40.4-41.6			(CL) Stiff Clay. Penetrometer = 3.0 Munsell = White 2.5Y 8/1	
	41.6-42			(SC) Sand Clay Mix ~50%/50% Munsell = Light Brownish Grey 2.5Y 6/3	
	42-42.9			(CL) Stiff Clay With Thin Sand Veneers. Penetrometer >5 Munsell = White 2.5Y 8/1	
	42.9-43.5			(SP) Very Fine Sand. Munsell = White 2.5Y 8/1	
	43.5-44			(SC) Interbedded Fine Sands and Clay. Munsell = White 2.5Y 8/1 and Grey 2.5Y 6/1	
	44-44.4			(CL) Clay With Some Sand. Penetrometer= 2.5 Munsell = Lt Gray 5Y 7/2	
45	44.4-45			(SC) Very Fine Sand With Some Clay. Munsell = Grey 5Y 7/1	
	45-45.5			(CL) Stiff Clay with Same Fine Sand. Penetrometer = 2.5 Munsell=White 5Y 8/1	
	45.5-45.9			(SP) Very Fine Sand. Munsell = Light Grey 2.5Y 7/2	
	45.9-47			(CL) Stiff Sandy Clay deposited in a reducing environment. Munsell = Dark Bluish Grey GLEY 2 = 4/10b	
	47-48			(CL) Stiff Plastic Clay. Penetrometer = 2.25 Munsell =Pale yellow 2.5Y 8/2	
	48-48.3			(SC) Clayey Fine Grained Sand. Munsell = Pale Yellow 2.5Y 8/3	
50	48.3-50.8			(CL) Sandy Clay ~25%/75%. Penetrometer = 0.75 Munsell = Pale Yellow 2.5Y 7/3	
	50.8-53.6			(CL) Very Stiff Clay with No Sand. Penetrometer = 2.0 Munsell = Pale Yellow 2.5 Y 7/4	
55	53.6-57			(SP) Fine Sand, Little - No Clay with trace silt. Munsell = Pale Yellow 2.5Y 8/3	
	57-59	20'	57-77 6	(SC) Clayey Medium - Fine Sand. Munsell = Pale Yellow 2.5Y7/4	
				(SP) Medium - Fine Grained Sand with Trace Clay. Munsell = Light Yellowish Brown	

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO11-Rotary Sonic Test Hole
Sheet 3 of 3

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : Prosonic
DRILLING METHOD AND EQUIPMENT USED : Rotary Sonic Rig
WATER LEVELS :
START : 09/25/2001 END: 09/25/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
	65.4-67			(SW) Medium - Coarse Sand With Trace Clay. Munsell = Light Grey 2.5Y 7/2	
	67-68.4			(SW) Medium- Coarse Grained Sand with Trace Clay. Munsell = Light Gray 2.5 Y 7/2	
	68.4-68.6			(CL) Very Sandy Clay. Penetrometer = 0.25 Munsell = White 2.5Y 8/1	
	68.6-69			(SP) Clayey Sand ~20%/80% Munsell = Pale Yellow 2.5Y 7/4	
70	69-69.6			(CL) Sandy Clay ~ 505/50% Penetrometer = 0.5 Munsell = Pale Yellow 2.5Y 8/3	
75	69.6-76.6			(SW) Fine Sand, no fines Light GREY 2.5Y 7/2	
	76.6-76.8			(CL) Sandy Clay ~ 20%/80% Penetrometer= 0.5 Munsell = Yellow 2.5Y 7/6	
	76.8-77			(SW) Fine Sand, no fines. Munsell = Pale Yellow =2.5Y 7/3	Bottom of Boring ▼

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER C011-PZM007

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2Si
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 12/07/2001
END: 12/11/2001
LOGGER : Lisa Carter
Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
5	4 - 6	1	1	21-40-100/2 (140)	(GM) Dry, Slag Fill Gravel With Silt, Fine-Medium Grained Sand. Black	PID = 5.8 ppm
10	10 - 12	0.3	2	6-4-2-1 (6)	(GM) Dry, Slag Fill Gravel With Silt, Fine-Medium Grained Sand. Black with Red Silt	PID = 1.4 ppm Water Table ▼
15						
	16 - 18	1.2	3	45-78-63-50/2 (141)	(GM) Wet, Very Dense Silty, Sandy, Slag Fill Gravel. Munsell = Black 5Y 2.5/1	PID = 24.7 ppm Smells of Fuel Oil Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO12-PZM008

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2Si
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 12/06/2001
END : 12/06/2001
LOGGER : Lisa Carter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
5	3 - 5	0.6	1	35-23/3	(GM) Dry Slag Fill Gravel With Some Fine Grained Sand. Black	PID = 8.4 ppm
10	10 - 12	0.9	2	53-150/5	(GM) Dry Slag Fill Gravel With Some Fine Grained Sand Black	PID = 33.7 Water Table ▼
15						
	17 - 19	1.4	3	4-3-3-5 (6)	(GM) Dry Slag Fill Gravel With Some Fine Grained Sand. Black (CL) Wet, Medium Stiff Silty Clay With thin Lenses of Fine Grained Sand. Penetrometer = 0.25 Munsell = Grey (with black mottling) 5Y 5/1	PID = 8.0 ppm Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO13-PZM030

Sheet 1 of 2

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START :
END:
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fil	
	3-5	0.5	1	54-100/4	(SM) Dry Very Dense Coarse Grained Silty Gravely Slag Sand. Munsell = black 25Y 25/1	2.1ppm
5						
10						
	10-12	0.5	2	6-7-7-15 (14)	(SM) Dry medium dense silty gravely sand slag. Munsell =Very Dark Grayish Brown = 10YR 4/2	0.9ppm
	12-14	0.4	3	11-24-11-9 (35)	(GM) Wet Dense silty sandy gravel slag. Munsell =Dark gray = 10YR 4/1	Water Table ▼ 4ppm
15	14-16	0.62	4	10-19-11-8 (30)	(SM) Wet Dense silty gravely slag sand. Munsell =Black = 2.5Y 2.5/1	12.4 ppm sheen
	16 - 18	0.6	5	8-7-24-22 (31)	(SM) Wet dense sandy silty gravel slag. Munsell =Black = 2.5Y 2.5/1	28.6 ppm
	18 - 20	1.5	6	5-20-16-24 (36)	(SM) Wet dense gravely silty sand slag. Munsell =Black = 2.5Y 2.5/1	9.49 ppm Exhibits Sheen and has Fuel Oil Smell
20	20 - 22	0.54	7	2-10-10-8 (20)	(SM) Wet medium dense gravely silty shelly sand. Munsell =Black = 2.5Y 2.5/1	707 ppm Exhibits Sheen and has Fuel Oil Smell
	22 - 24	1	8	19-7-3-3 (10)	(SC) Wet stiff silty sandy non plastic clay with shell fragments. Penetrometer = >4 Munsell =Dark gray= GLEY 1 4/10Y	114 ppm Exhibits Sheen and has Naphthalene Smell
	24 - 26	1	9	6-5-8-9 (13)	(CL) Wet stiff silty sandy plastic clay. Penetrometer = 1.5 Munsell = Brown = 10YR 4/3	49 ppm Exhibits Sheen and has Naphthalene Smell
	26 - 28	1.8	1	Shelby Tube	(CL) Wet silty sandy clay. Penetrometer = 1.5 Munsell = Light olive brown 2.5Y 5/6.	7.4 ppm
	28 - 30	2	10	3-5-12-7 (17)	(SM) Wet Medium Dense silty sand. Munsell = Light olive brown = 2.5Y 5/6	17 ppm
30	30 - 32	2	11	6-6-10-7 (16)	(SM) Wet Medium Dense silty fine sand. Munsell = Light yellowish brown = 2.5Y 6/3	15 ppm

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO13-PZM030
Sheet 2 of 2

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START :
END:
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
	32 - 34	1	12	8-6-7-8 (13)	(SC) Wet Medium Dense silty clayey fine sand. Munsell = Pale yellow =2.5Y 7/3	4.3 ppm
	34 - 36	1	13	3-3-4-6 (7)	(SC) Wet loose silty clayey fine sand. Munsell = Pale yellow with veneers of olive yellow 2.5Y 7/3 2.5Y 6/8	1.8 ppm
	36 - 38	1	14	5-8-9-8 (17)	(SC) Wet Medium Dense silty clayey fine sand with veneers of clay. Munsell = sand -Light olive Gray = 5Y 6/2 clay- olive yellow = 2.5Y 6/8	2.2 ppm
40	38 - 40	1.5	15	2-6-36-37 (43)	(SM) Wet Dense silty sand with some gravel. Munsell= light brownish gray= 10YR 6/2	3.3 ppm
	40 - 42	2	16	18-22-24-25 (46)	(SM) Wet Dense medium to coarse grained sand with silt and gravel. Munsell= yellow=2.5Y 7/6	2.3 ppm
	42 - 44	2	17	9-10-21-100/5 (31)	(SC) wet dense fine grained clayey sand with thin clay lenses Munsell= sand- pale yellow = 8/3, clay - white = 2.5Y 8/1	1.1 ppm
	44 - 46	1.5	18	6-11-48-100/6 (59)	(SC) Wet very dense fine grained clayey sand with thick clay lenses. Penetrometer = 1.0 Munsell= clay - white 2.5Y 8/1, sand - light yellowish brown 2.5Y 6/4	2.2 ppm
	46 - 48	1	19	21-58-107/6 (165)		2.7 ppm
50	48 - 50	2	20	6-20-57-57	(SC) Wet very dense fine grained clayey sand with thick clay lenses. Penetrometer = 1.0 Munsell=clay - white 2.5Y 8/1, sand - olive yellow 2.5Y 6/8	2.0 ppm
	55 - 57	1	21	34-98-100/5 (198)		1.3 ppm
60					(SC) Wet very dense fine grained clayey sand with thick clay lenses. Penetrometer =1.0 Munsell =clay - white 2.5Y 8/1, sand - very pale brown 10YR 8/3	
	60 - 62	1	22	38-105/6		1.2 ppm Bottom of Boring ▼

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO15-PZM005

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel LOCATION : Sparrows Point, MD

ELEVATION : DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS : START : 12/11/2001 END: 12/11/2001 LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3 - 5	1	1	5-4-4-5 (8)	(CL) Damp, Medium Stiff Silty Clay with Slag Gravel. Penetrometer = 1.5 Munsell = Dark Grey 2.5Y 4/1	PID = 33 ppm Smells of Naphthalene
5						
10						Water Table ▼
	10 - 12	1	2	12-12-17-31 (29)	(GM) Damp Medium Dense Silty, Sandy, Gravel, Slag. Munsell = Black 5Y 2.5/1	PID = 9999 ppm Smells of Naphthalene
15						
	15 - 17	0.2	3	3-4-4-5 (8)	(GM) Wet loose Silty, Sandy, Gravel, Slag. Munsell = Black 5Y 2.5/1	PID = 3891 ppm Smells of Naphthalene Bottom of Boring ▼
20						
25						

PROJECT NUMBER 164586.01.CK.DR	**BORING NUMBER** CO16-PZM006 Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel LOCATION : Sparrows Point, MD

ELEVATION : DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS : START : 12/18/2001 END: 12/18/2001 LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					<u>SLAG FILL</u>, granular silty slag fill	
	3 - 5	0.5	1	62-100/2	(GM) Dry, Very Dense Silty, Sandy, Slag Gravel. Munsell = Black 2.5Y/1	PID = 242 ppm
5						
10						
	10 - 12	0.5	2	57-100/2	(GM) Dry, Very Dense Silty, Sandy, Slag Gravel Munsell = Very dark Grey 10YR 3/1	Water Table ▼ PID = 20.2 ppm
15						
	15 - 17	1	3	14-5-11-18 (16)	(GM) Wet, Medium Dense Silty Sandy Slag Gravel. Very Dark Grey 2.5Y 3/1	PID = 633 ppm Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO17-PZM005

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 12/13/2001 END: 12/13/2001 LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3 - 5	0.1	1	50/2	(SM) Dry, Very Dense, Silty, Sandy Slag Fill. Munsell = Very Dark Grey 10YR 3/1	PID = 273 ppm
5						
10						Water Table ▼
	10 - 12	1.5	2	2-4-32-50/2 (36)	(GM) Wet, Dense, Silty, Sandy, Slag Fill Gravel. Munsell = Black 5Y 2.5/1	PID = 3971 ppm Smell Like Fuel Oil
15						
	15 - 17	1.5	3	24-16-21-19 (37)	(GM) Wet, Dense, Silty, Sandy, Slag Fill Gravel. Munsell = Black 5Y 2.5/1	PID = 664 ppm Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO18-PZM006

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2Si
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 12/13/2001
END: 12/13/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3 - 5	1	1	16-13-22-40 (35)	(GM) Dry, Medium Dense Silty, Sandy, Slag Fill Gravel. Munsell = Black 2.5Y 2.5/1	PID = 54.1 ppm Smells of Naphthalene
5						
10	10 - 12	0.1	2	26-20-8-3 (28)	(GM) Wet, Medium Dense Silty, Sandy, Slag Fill Gravel. Munsell = Black 2.5Y 2.5/1	Water Table ▼ PID = 3692 ppm Smells of Naphthalene
15	15 - 17	0.1	3	6-8-8-8 (16)	(SM) Wet, Medium Dense, Silty Medium - Coarse Grained Sand. Munsell = Black 5Y 2.5/1	PID = 9999 ppm Smells of Naphthalene Bottom of Boring ▼
20						
25						

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO19-PZM004

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 12/17/2001

END: 12/17/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3 - 5	1.3	1	6-7-8-6 (15)	(GM) Dry, Medium Dense, Sandy, Silty Slag Gravel. Munsell = Light Olive Brown 2.5Y 5/3	PID = 1.5 ppm
5						
						Water Table ▼
10						
	10 - 12	0.1	2	2-3-9-5 (12)	(GM) Wet, Medium Dense Silty Slag Gravel. Munsell = Black GLEY1 2.5/n	PID = 260 ppm
15	14 - 16	1.5	3	42-47-14-8 (61)	(GM) Wet, Very Dense, Silty Slag Gravel. Munsell = Bluish Grey GLEY2 2.5/10B	PID = 3124 ppm
						Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO20-PZM004

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 12/07/2001 END: 12/07/2001 LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					<u>SLAG FILL</u>, granular silty slag fill	
	3 - 5	0.9	1	37-36-13-9 (49)	(GM) Dry, Dense, Silty Slag Gravel Fill with Medium Grained Sand. Black	PID = 2.8 ppm
5						
10						
	10 - 12	0.9	2	5-6-5-5 (11)	(GM) Wet, Medium Dense, Silty Slag Gravel Fill with Medium Grained Sand. Black	Water Table ▼ PID = 2.2 ppm
15						
	15 - 17	1	3	5-6-7-12 (13)	(SM) Wet, Medium Dense Silty Medium Grained Sand with Pieces of Slag Gravel. Black	PID = 175 ppm Bottom of Boring ▼
20						
25						

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO21-PZM005
Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/28/2001 END: 11/28/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
						1.5 ppm
	3-5	1.5	1	28-65-38-52 (103)	(GM) Dry Very Dense Silty Slag Gravel Fill. Greenish Grey Munsell = GLEY 1 5/10YR	
5						
10						1.4 ppm
	10-12	0.6	2	5-4-4-6 (8)	(SP) Wet Loose Gravely Silty Slag Sand. Black Munsell = 2.5Y 2.5/1	Water Table ▼
15						1.5 ppm
	15-17	1.3	3	7-11-8-8 (19)	(SP) Wet Medium Dense Gravely Silty Slag Sand. Black Munsell = 2.5Y 2.5/1	Bottom of Boring ▼
20						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO22-PZM005
Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/27/2001 END:11/27/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3 - 5	1	1	12-9-20-15 (29)	(GM) Dry, medium dense, silty gravel slag. Munsell = Black= 2.5Y 6/4	8.0 ppm
5						
10						Water Table ▼
	10 - 12	1	2	9-35-58-56 (93)	(GM) Wet, very dense, silty, sandy gravel slag. Munsell= Dark Greenish Grey = GLEY 1 4/10YR	26.8 ppm smells like naphthalene
15						
	16-17	0.6	3	42-52-58-27 (110)	(GM) Wet, very dense, silty slag gravel. Munsell = Black=GLEY 1 2.5/10Y	29.3 ppm smells like naphthalene Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO23-PZM008
Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2Si
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 12/05/2001 END: 12/05/2001 LOGGER : Lisa Carter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3 - 5	0.8	1	70-105/6	(GM) Dry, Slag Fill Gravel With Large Fragments and Some Silt and Fine Grained Sand. Black	PID = 3.3 ppm
5						
10						
						Water Table ▼
	12 - 14	1.2	2	19-30-42-96 (72)	(GM) Wet, Slag Fill Gravel With Large Fragments and Some Silt and Fine Grained Sand. Black	PID = 25 ppm
15						
	17 - 19	1.5	3	8-5-5-6 (10)	(SM) Silt and Very Fine Grained Sand. Grey	PID = 71 ppm Strong Hydrocarbon Odor Bottom of Boring ▼
20						
25						

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO24-PZM007

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 12/06/2001

END: 12/06/2001

LOGGER : Lisa Carter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3 - 5	1.1	1	40-37-100/5 (137)	(GM) Dry, Silty, Sandy, Slag Fill Gravel. Black	PID = 9.5 ppm
5						
10						
	10 - 12	1.5	2	33-93-85-100/3 (178)	(GM) Dry, Silty, Sandy, Slag Fill Gravel. Black	PID = 13.8 ppm
						Water Table ▼
15						
	17 - 19	1.2	3	12-11-19-9 (30)	(GM) Wet, Silty, Sandy, Slag Fill Gravel. Black (SM) Wet, Very Fine Grained Running Sands. Grey	PID = 39 ppm Strong Hydrocarbon Odor Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO25-PZM008

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 12/04/2001

END: 12/04/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3 - 5	0.4	1	100/5	(GM) Dry Very Dense Silty Sandy Slag Fill Gravel. Munsell = Black 2.5Y 2.5/1	PID = 0.5 ppm
5						
10						
	11 - 13	1.5	2	25-28-81-100/1 (109)	(GM) Dry Very Dense Silty Sandy Slag Fill Gravel. Munsell = Black 2.5Y 2.5/1	PID = 1.7 ppm Water Table ▼
15						
	18 - 20	1	3	13-20-18-13 (38)	(GM) Wet Very Dense Silty Sandy Slag Fill Gravel. Munsell = Black 2.5Y 2.5/1	PID = 954 ppm Smells Strongly of Hydrocarbons Heavy Tarry Sheen in bottom 6" of spoon Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CO26-PZM007

Sheet 1 of 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2Si

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 12/05/2001

END: 12/05/2001

LOGGER : Lisa Carter

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3 - 5	1.3	1	43-51-47-26 (98)	(GM) Dry, Slag Gravel Fill With Large Fragments and some Fine Grained Sand and Silt. Black	PID = 2.4 ppm
5						
10						
	10 - 12	0.9	2	13-80-110-100/3 (190)	(GM) Dry, Slag Gravel Fill With Large Fragments and some Fine Grained Sand and Silt. Black	PID = 3.2 ppm
	12 - 14	0.2	3	100/2		Water Table ▼ PID = 3.3 ppm
15	14 - 16	0.9	4	19-34-39-32 (73)	(GM) Wet, Slag Gravel Fill With Large Fragments and some Fine Grained Sand and Silt. Black	PID = 5.6 ppm
	18 - 20	1.2	5	17-23-26-31 (49)	(GM) Wet, Slag Gravel Fill With Large Fragments and some Fine Grained Sand and Silt. Black	PID = 8.6 ppm
20						Bottom of Boring ▼
25						
30						

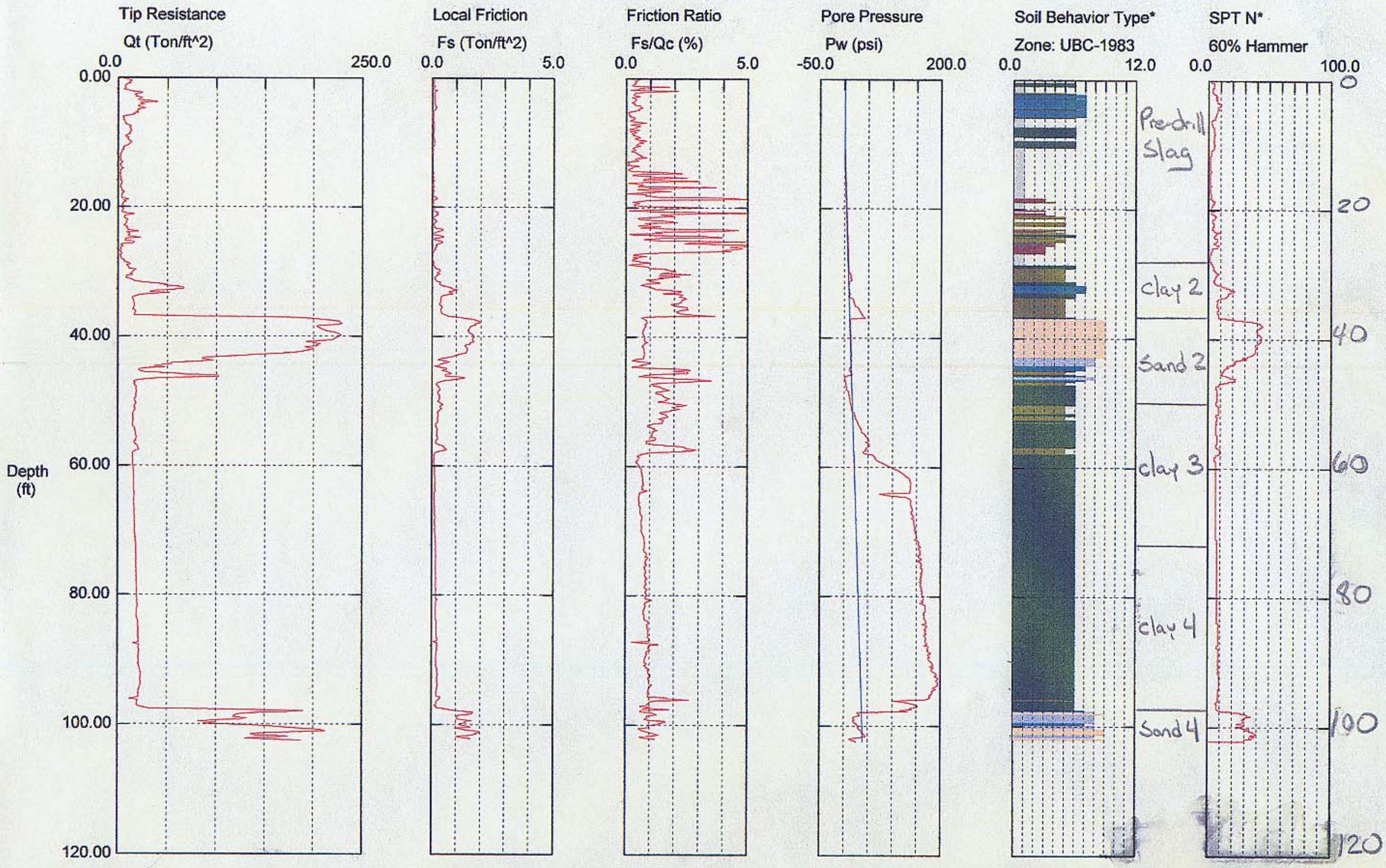
CPT Logs

*Soil behavior type and SPT based on data from UBC-1983

E2

Operator: AL MYERS
Sounding: 139049
Cone Used: 419

CPT Date/Time: 09-25-00 08:22
Location: C0 - 10 - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 102.53 feet

Depth Increment = 0.16 feet

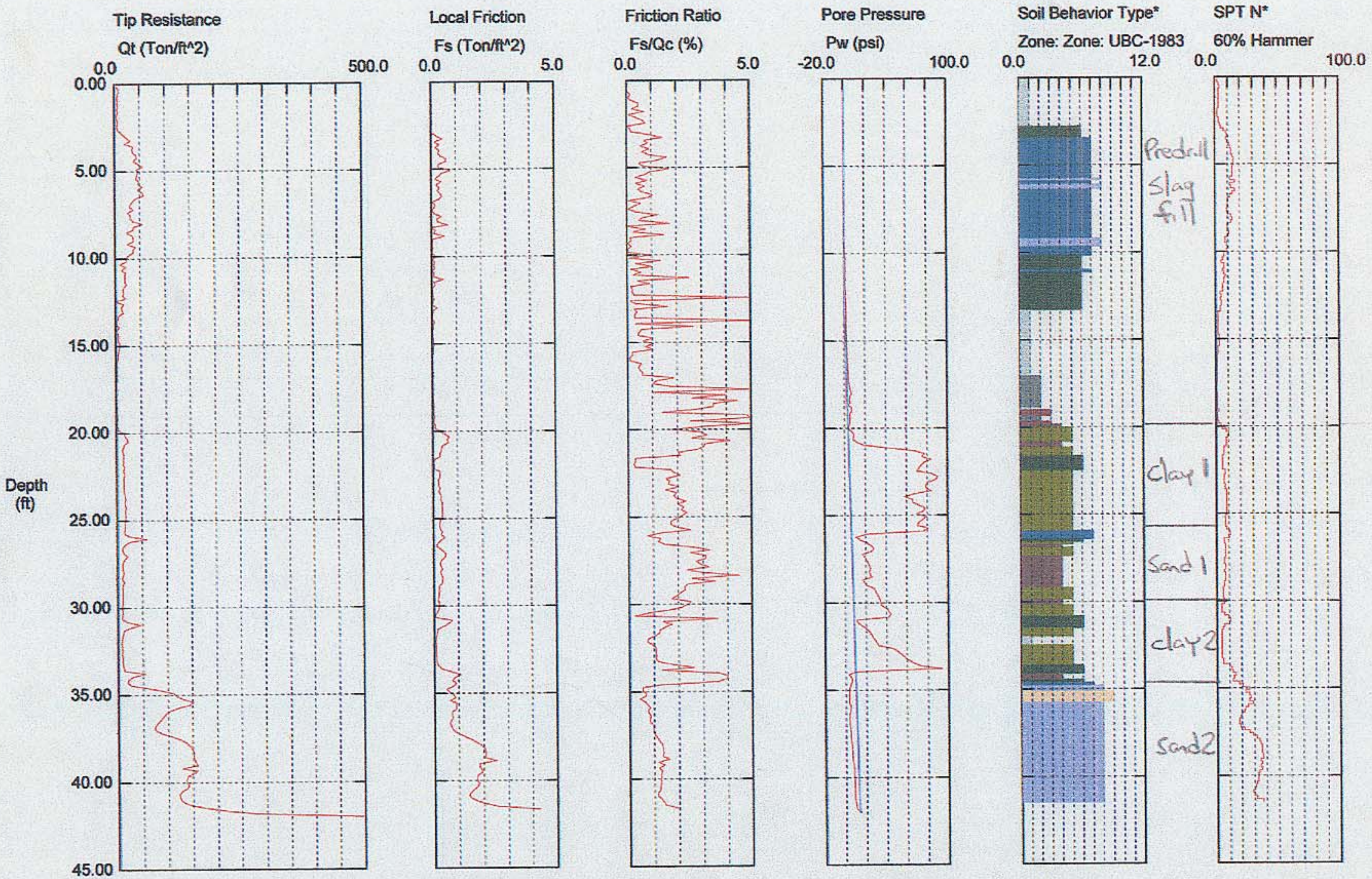
1	sensitive fine grained
2	organic material
3	clay
4	silty clay to clay
5	clayey silt to silty clay
6	sandy silt to clayey silt
7	silty sand to sandy silt
8	sand to silty sand
9	sand
10	gravelly sand to sand
11	very stiff fine grained (*)
12	sand to clayey sand (*)

*Soil behavior type and SPT based on data from Zone: UBC-1983

ESI

Operator: AL MYERS
Sounding: 139030
Cone Used: 419

CPT Date/Time: 09-15-00 10:54
Location: SW - 13 - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 41.99 feet

Depth Increment = 0.16 feet

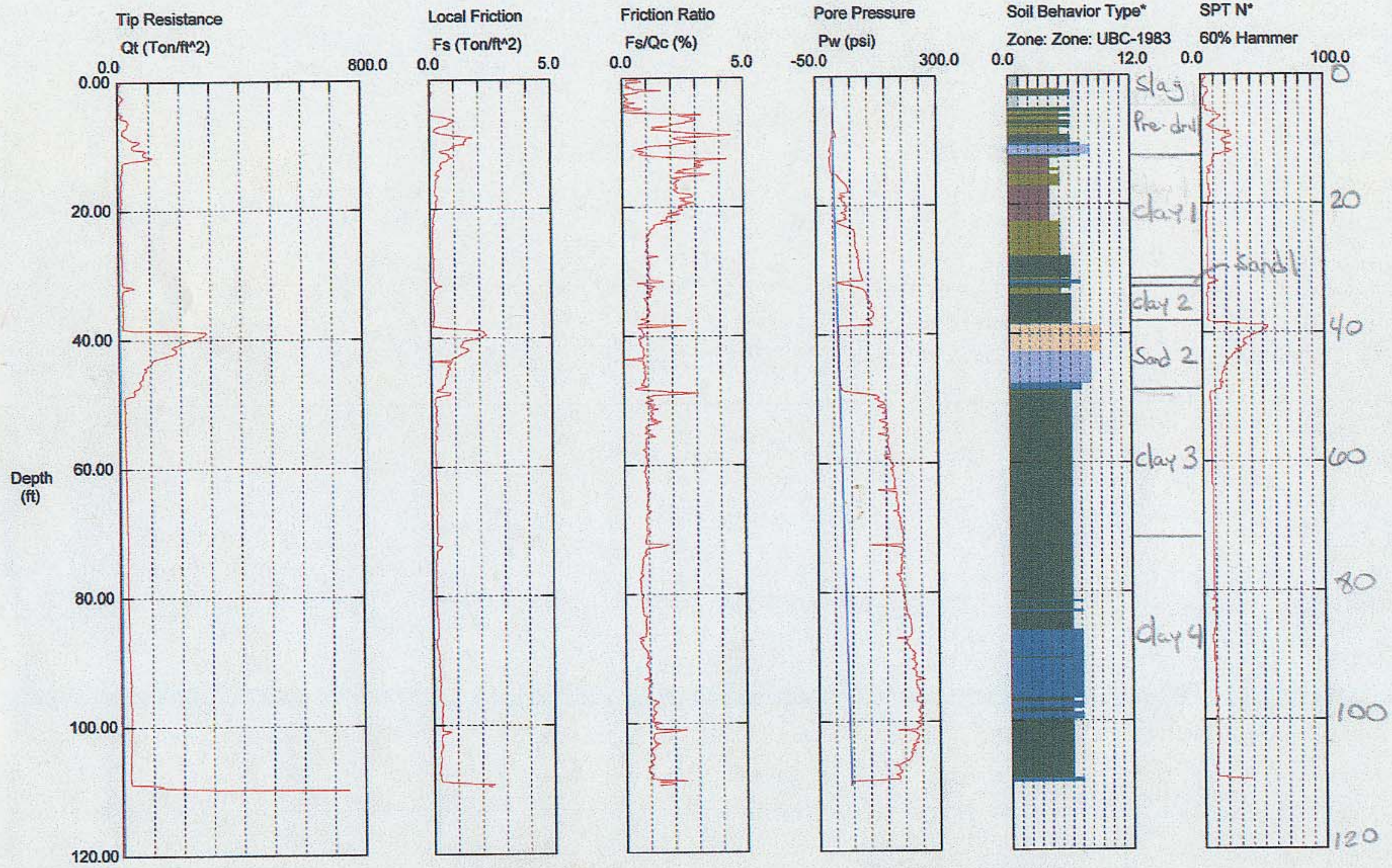
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavio e and SPT based on data from Zone: UBC-1983

E SI

Operator: AL MYERS
Sounding: 139031
Cone Used: 419

CPT Date/Time: 09-15-00 12:25
Location: SW - 14 - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 109.91 feet

Depth Increment = 0.16 feet

- 1 sensitive fine grained
- 2 organic material
- 3 clay
- 4 silty clay to clay
- 5 clayey silt to silty clay
- 6 sandy silt to clayey silt
- 7 silty sand to sandy silt
- 8 sand to silty sand
- 9 sand
- 10 gravelly sand to sand
- 11 very stiff fine grained (*)
- 12 sand to clayey sand (*)

Historical Logs

Historical Logs

Coke Oven Area

Bethlehem Steel Corporation—Sparrows Point Facility

Boring No.	**Top Depth**	**Bottom Depth**	**Lithology**	**Comments**
CO-GB26	0.00	23.00	Slag fill	
	23.00	33.00	Clay	
	33.00	40.00	River mud	
	40.00	47.00	Sand	
	47.00	107.00	River mud	
	107.00	120.00	Sand	
CO-GB154	0.00	0.25	EVS FAKE	
	0.25	0.50	EVS FAKE	
	0.50	10.00	Cinder and slag	
	10.00	18.00	Slag fill	
	18.00	50.00	Mud	
	50.00	59.00	Clay and sand	
	59.00	74.00	Sand	
	74.00	77.00	Clay and sand	
	77.00	100.00	Sand	
CO-GB427	0.00	13.00	Slag and clay	
	13.00	27.00	Clay, little sand	
	27.00	38.00	Silt	
	38.00	45.00	Sand and silt	
	45.00	104.00	Silt	
	104.00	114.00	Silt and sand	
	114.00	119.00	Sand and silt	
CO-GB428	0.00	3.00	Water	
	3.00	7.00	Top soil	
	7.00	17.00	Silt	
	17.00	22.00	Silt and some gravel	
	22.00	97.00	Silt	
	97.00	107.00	Silt and sand	
	107.00	111.00	Sand and silt	
CO-GB438	0.00	11.00	Water	
	11.00	13.00	Silt	
	13.00	27.00	Sand	

Boring No.	**Top Depth**	**Bottom Depth**	**Lithology**	**Comments**
	27.00	56.00	Silty clay	
	56.00	66.00	Clay	
	66.00	76.00	Silty clay	
	76.00	86.00	Sand	
	86.00	96.00	Silty sand	
	96.00	101.00	Sand	
CO-GB461	0.00	4.00	Slag fill	
	4.00	6.00	Cover	
	6.00	29.00	Water	
	29.00	34.00	Slag fill	
	34.00	42.00	Silty Sand	
	42.00	99.00	Silt	
	99.00	124.00	Silty Sand	
CO-GB473	0.00	6.00	Misc. fill/slag	
	6.00	17.00	Clay (gray and yellow)	
	17.00	29.00	River mud	
	29.00	34.00	Sand and silt	
	34.00	42.00	Sand	
	42.00	44.00	Sand and gravel	
	44.00	59.00	Sand and silt	
	59.00	71.00	Sand and gravel	
	71.00	92.00	Sand and silt	
	92.00	104.00	Clay	
CO-GB574	0.00	24.00	Slag fill	
	24.00	64.00	Clayey silt, little sand	
	64.00	89.00	Sand and clayey silt	
	89.00	101.00	Clayey silt, little sand	
	101.00	121.00	Clay (Red/gray)	
	121.00	133.00	Clay and sand	
	133.00	149.00	Sand and clay	
CO-GB579	0.00	17.00	Slag	
	17.00	29.00	Clay	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	29.00	36.00	Clay with clayey silt	
	36.00	48.00	Sand with clayey silt	
	48.00	106.00	Clayey silt	
	106.00	131.00	Sand and clayey silt/silty clay	
	131.00	146.00	Clay (red gray to 139' - brown gray to 146')	
	146.00	154.00	Sand with clayey silt	
CO-GB625	0.00	16.00	Slag	
	16.00	19.00	Silty sand	
	19.00	24.00	Silt	
	24.00	34.00	Silty sand	
	34.00	39.00	Silt	
	39.00	48.00	Sandy silt	
	48.00	73.00	Clay with some sand	
	73.00	134.00	Clay	
	134.00	141.00	Clay and some sand	
CO-GB628	0.00	17.00	Slag fill	
	17.00	24.00	Clay and sand	
	24.00	57.00	Silt	
	57.00	74.00	Sand and silt	
	74.00	79.00	Sand and clay	
	79.00	139.00	Clay	
CO-GB644	0.00	19.00	Slag	
	19.00	24.00	Silty sand	
	24.00	54.00	Clayey silt	
	54.00	64.00	Silty sand	
	64.00	69.00	Sandy silt	
	69.00	79.00	Clayey silt	
	79.00	89.00	Silty sand	
	89.00	111.00	Clay and sand	
CO-GB662	0.00	12.50	Slag	
	12.50	22.50	Clay	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	22.50	29.50	Sandy silt	
	29.50	34.50	Silt	
	34.50	38.00	Sandy silt	
	38.00	99.50	Mud and shell	
	99.50	109.50	Silty sand	
	109.50	119.50	Sand	
	119.50	131.50	Silty sand and clay	
	131.50	136.50	Clay	
CO-GB925	0.00	9.00	Water	
	9.00	19.00	Silt	
	19.00	23.00	Silty sand	
	23.00	36.00	Sandy silt	
	36.00	43.00	Sand and clay	
	43.00	80.00	Silt	
	80.00	88.00	Sand	
	88.00	97.00	Sand and clay	
	97.00	132.00	Clay	
	132.00	150.00	Sand and clay	
CO-GB1826	0.00	18.00	Black sand cinder and slag fill	
	18.00	32.00	Gray silt, trace of sand	
	32.00	47.50	Brown and gray fine to med. Sand, trace of silt	
	47.50	82.00	Grey sandy silty, trace of mica	
	82.00	91.00	Gray and brown fine silty sand	
	91.00	121.50	Varied colored clay with layers of fine to med. Sand	
349	0.00	0.60	Slag fill	
	0.60	1.00	Clay and silt	
	1.00	1.50	Sand	
	1.50	1.90	Clay and silt	
	1.90	30.40	Sand	
	30.40	50.20	Clay and silt	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	50.20	60.60	Sand	
409	0.00	4.00	Silt	
	4.00	9.00	Sand	Blow count: 45
	9.00	14.00	Sand	Blow count: 100
	14.00	19.00	Sand	Blow count: 200
	19.00	24.00	Sand	Blow count: 200
	24.00	29.00	Sand	Blow count: 200
	29.00	34.00	Sand	Blow count: 100
	34.00	39.00	Sand	Blow count: 60
	39.00	44.00	Sand	Blow count: 100
	44.00	49.00	Sand	Blow count: 100
	49.00	54.00	Sand and clay	Blow count: 88
	54.00	59.00	Sand and clay	Blow count: 56
	59.00	64.00	Sand and clay	Blow count: 56
	64.00	69.00	Sand	Blow count: 80
	69.00	74.00	Sand	Blow count: 36
	74.00	79.00	Sand	Blow count: 200
414	0.00	4.00	Slag fill	
	4.00	9.00	Slag fill	Blow count: 10
	9.00	14.00	Slag fill	
	14.00	22.00	Slag fill	Blow count: 14
	22.00	26.00	Silt	Blow count: 3
	26.00	29.00	Silt and slag	Blow count: 4
	29.00	34.00	Silt and slag	Blow count: 5
	34.00	39.00	Silt and slag	Blow count: 3
	39.00	44.00	Silt and slag	Blow count: 4
	44.00	50.00	Silt and gravel	Blow count: 6
	50.00	57.00	Silt and sand	Blow count: 40
	57.00	61.00	Sand	Blow count: 20
	61.00	66.00	Silt and sand	Blow count: 15
	66.00	69.00	Silt and sand	40
	69.00	74.00	Sand	110

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
418	0.00	4.00	Slag fill	
	4.00	14.00	Slag fill	Blow count: 12
	14.00	18.00	Slag fill	Blow count: 12
	18.00	24.00	Clay and sandstone	Blow count: 6
	24.00	27.00	Sandstone and sandy clay	Blow count: 32
	27.00	32.00	Sand	Blow count: 40
	32.00	39.00	Sandy clay	Blow count: 16
	39.00	44.00	Sandy clay	Blow count: 7
	44.00	49.00	Sand	Blow count: 70
	49.00	54.00	Sandy clay	Blow count: 130
	54.00	59.00	Sandy clay	Blow count: 40
	59.00	64.00	Sandy clay	Blow count: 100
	64.00	68.00	Sandy clay	Blow count: 120
420	0.00	13.00	Slag fill	
	13.00	18.00	Sandy clay	Blow count: 40
	18.00	23.00	Sand	Blow count: 80
	23.00	28.00	Sandy clay	Blow count: 25
	28.00	33.00	Sandy clay	Blow count: 200
	33.00	38.00	Sandy clay	Blow count: 48
	38.00	43.00	Sandy clay	Blow count: 25
	43.00	48.00	Sandy clay	Blow count: 32
	48.00	53.00	Sandy clay	Blow count: 36
	53.00	58.00	Sandy clay	Blow count: 60
	58.00	63.00	Sand	Blow count: 160
	63.00	69.00	Sand	Blow count: 60
	69.00	74.00	Sand	Blow count: 48
	74.00	79.00	Sandy clay	Blow count: 60
	79.00	84.00	Sandy clay	Blow count: 30
	84.00	89.00	Silty sand	Blow count: 56
425	0.00	4.00	Slag fill	Blow count: 12
	4.00	9.00	Slag fill	Blow count: 20
	9.00	14.00	Slag fill	Blow count: 15

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	14.00	22.00	Slag fill	Blow count: 4
	22.00	23.00	Slag fill	Blow count: 2 (jarred)
	23.00	29.00	White sand	Blow count: 110
	29.00	37.00	Red white sand	Blow count: 255
	37.00	42.00	Red clay	Blow count: 70
	42.00	44.00	Sandy clay	Blow count: 540
	44.00	49.00	Sandy clay	Blow count: 60
571	0.00	9.00	Slag fill	Blow count: 6
	9.00	17.00	Slag fill	Blow count: 13
	17.00	22.00	Clayey silt	Blow count: 3
	22.00	27.00	Sandy clay	Blow count: 15
	27.00	29.00	Sandy clay	Blow count: 36
	29.00	34.00	Sandy clay	Blow count: 25
	34.00	39.00	Sandy clay	Blow count: 152
	39.00	44.00	Sandy clay	Blow count: 130
	44.00	49.00	Sandy clay	Blow count: 181
590	0.00	1.00	Slag fill	
	1.00	7.00	Slag fill	Blow count: 11
	7.00	9.00	Slag fill	Blow count: 29
	9.00	14.00	Slag fill	Blow count: 12
	14.00	22.00	Slag fill	Blow count: 9
	22.00	24.00	Clayey silt	
	24.00	26.00	Sand and sandstone	Blow count: 16
	26.00	29.00	Sandstone	Blow count: 30/in.
	29.00	37.00	Sand and sandstone	Blow count: 32/in.
	37.00	41.00	White sandy clay	Blow count: 8
	41.00	44.00	White sandy clay	Blow count: 79
	44.00	49.00	Sandy clay	Blow count: 112

Shelby Tube Results

E2Si Earth Engineering & Sciences, Inc.

3401 CARLINS PARK DRIVE BALTIMORE, MARYLAND 21215 (410) 466-1400 FAX: (410) 466-7371 e-mail: e2si@erols.com

FAX COVER SHEET

DATE: 4/1/02

NO of PAGES (Including Cover Sheet): 7

TO: CH2MHILL

FAX NO.: 703-471-1508

ATTENTION: Mr. Rick Johnson

FROM: Al Myers

PROJECT NO.:

PROJECT NAME: Bethlehem Steel Corporation - Sparrows Point, MD

MESSAGE:

HARD COPY TO FOLLOW VIA MAIL: YES: ______ NO: ______

If you did not receive all pages of this fax please call 410-466-1400

CONFIDENTIALITY NOTICE

Earth Engineering & Sciences, Inc.

RESULTS OF FLEXIBLE WALL PERMEABILITY TEST
(ASTM D-5084)

Project Name : Bethlehem Steel - Sparrows Point
Tested By: A. E. Myers

Project No.: 01-192
Lab No. 01-239
File Name: co07-pzm-045

Sample Type: Dark Gray clayey Silt tr sand, tr organics
Sample ID: CO-07-PZM-045 40' TO 42'
Pemeability (k): 2.4E-07 *cm/sec*

Date Sampled: --
Date Delivered to E2Si:
Start Test Date: 20-Dec-01
Test Sample Length (L): 7.6 *cm*
Test Sample Dia. (D): 7.3 *cm*
Cross Section Area (A): 39.7 cm^2
Area of Standpipe (a): 1.0 cm^2
Cell Pressure (P): 5.0 *psi*
Lower Cap Pressure (P_1): 3.0 *psi*
Upper CapPressure (P_a): 2.0 *psi*
Gradient: 0.1 *psi/cm*

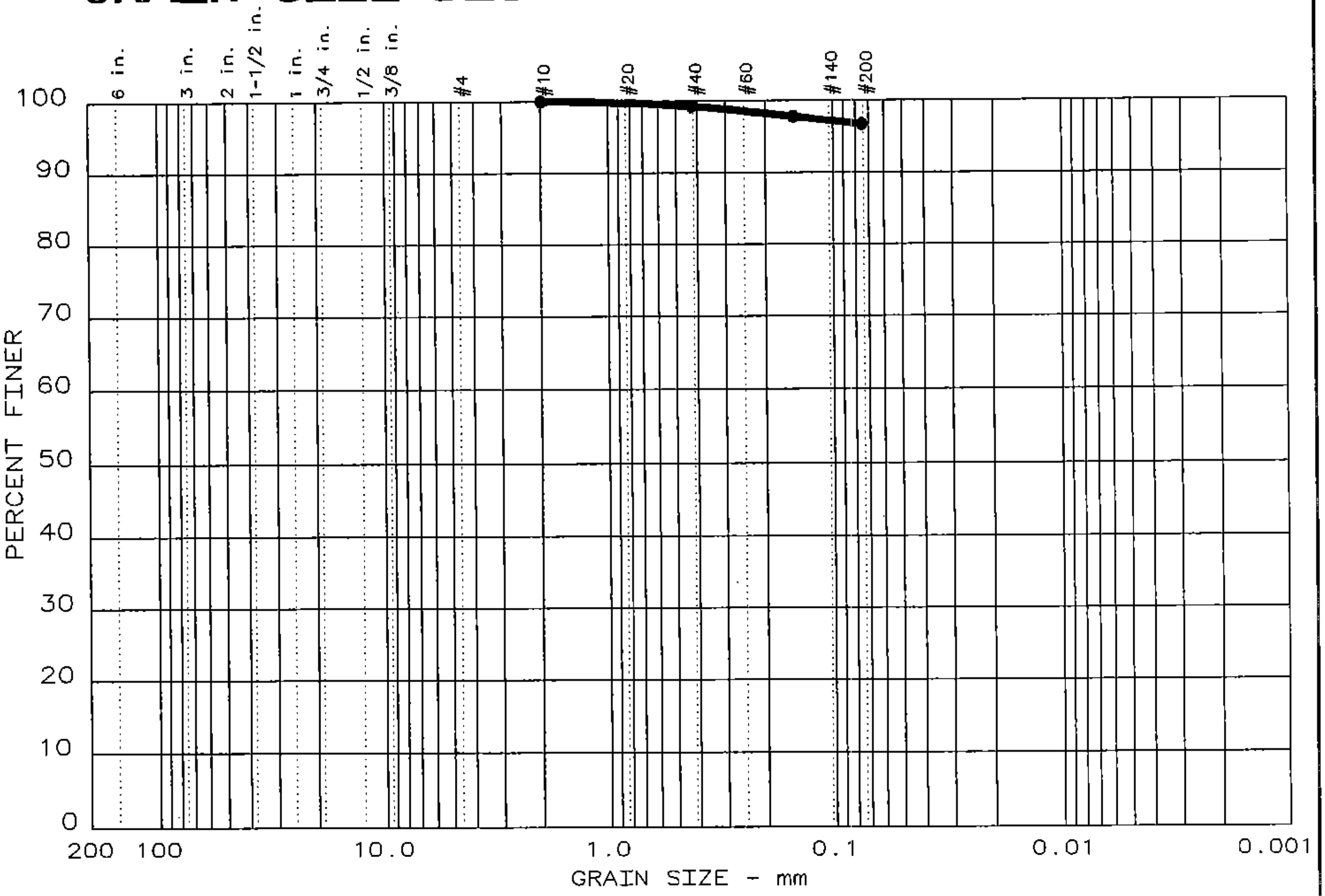
Test Completion Date: 21-Dec-01
Test Liquid: Distilled De-Aired Water
Wet Weight Before Test: 484.7 *gms*
Wet Weight After Test: *gms*
Dry Weight After Test: *gms*
Dry Density: 56.9 *pcf* *(95% of Std Proctor max dry density - remolded Sample)*
% Saturation : 100.0 %
% Moisture : 73.6 %
minus No. 200 sieve : 96.7 %
LL : 62.0
PI : 21.0

$$k = (a \times L)/(A \times T) \times \text{Ln}\left\{\frac{h_1 + p_1 - h_a - p_a}{h_2 + p_1 - h_b - p_a}\right\}$$

where:
k = hydraulic conductivity, cm/sec = 2.4E-07
a = c/s area of reservoir of permeate, cm^2 = 1.0
L = length of specimen, cm = 7.6
A = cross-sectional area of specimen, cm^2 = 39.7
time at h_1 = 0.00E+00 sec time at h_2 = 5.40E+04 sec
T = elapsed time between determination of h_1 & h_2, sec = 54000

h_1 = upper burette rdg at T_1, cc = 0.5
h_2 = upper burette rdg at T_2, cc = 4.7
h_a = lower burette rdg at T_1, cc = 49.3
h_b = lower burette rdg at T_2, cc = 45.5
$p_1 = P_1 \times 70.55$, cm = 211.7
$p_a = P_a \times 70.55$, cm = 141.1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	15	0.0	0.0	3.3	96.7	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	62	21								

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark Gray clayey Silt trace sand	MH	A-7-5(28.2)

Project No.: 01-192
Project: Bethlehem Steel - Sparrows Point, MD
● Location: Boring No. C007-PZM-045

Date: 4/1/2002

Remarks:
Depth 40.0' to 42.0'

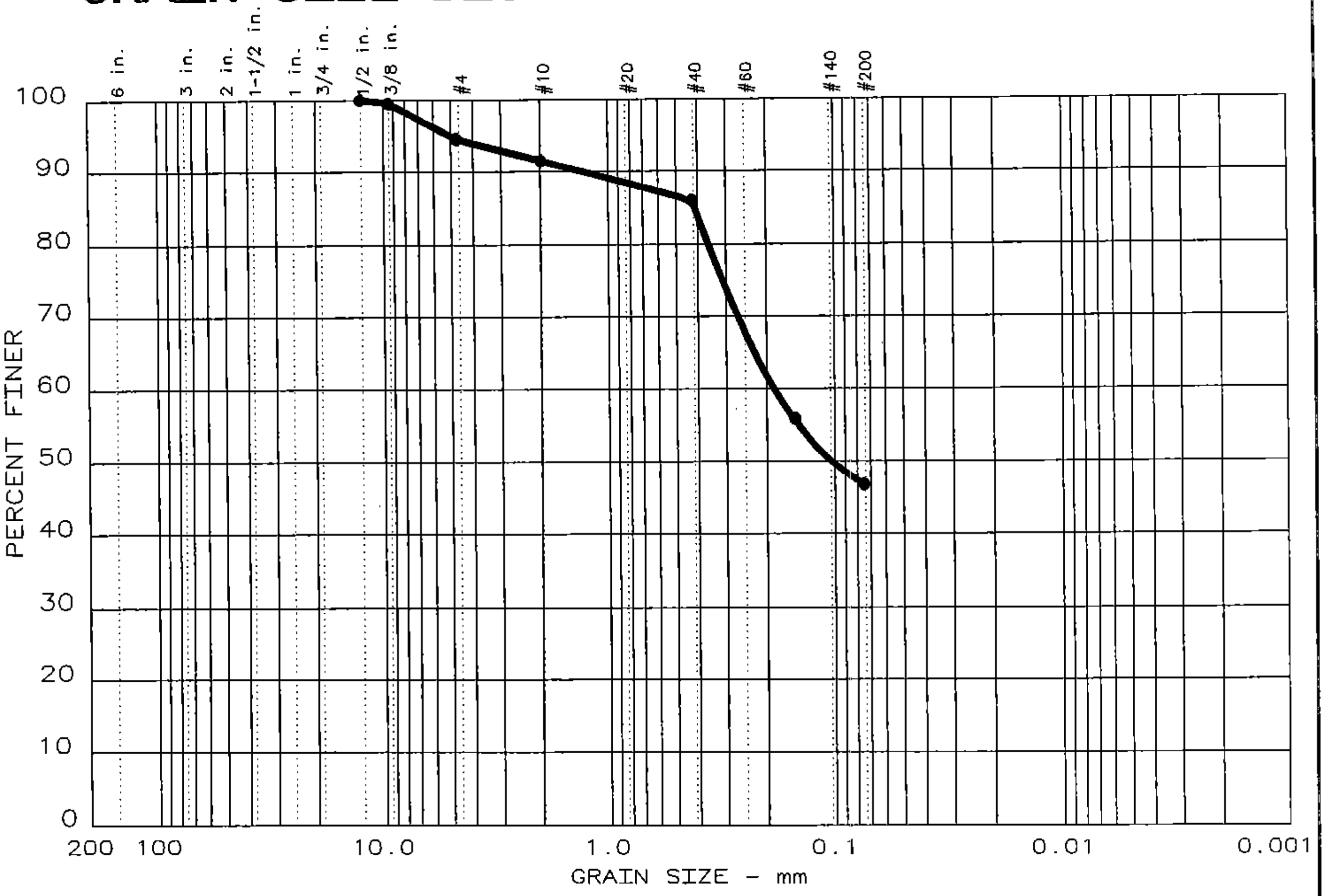
Sp. Gr. - 2.59

Figure No. ______

GRAIN SIZE DISTRIBUTION TEST REPORT

EARTH ENGINEERING & SCIENCES, INC.

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	13	0.0	5.5	47.7	46.8	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	20	6	0.41	0.18	0.10					

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark Gray Sand and fines	SC-SM	A-4 (0.0)

Project No.: 01-192
Project: Bethlehem Steel - Sparrows Point, MD
● Location: Boring No. C013-PZM-038

Date: 4/1/2002

Remarks:
Depth 26.0' to 28.0'

Sp. Gr. - 2.70

Figure No. ______

GRAIN SIZE DISTRIBUTION TEST REPORT

EARTH ENGINEERING & SCIENCES, INC.

Earth Engineering & Sciences, Inc.

RESULTS OF FLEXIBLE WALL PERMEABILITY TEST
(ASTM D-5084)

Project Name : Bethlehem Steel - Sparrows Point

Project No.: 01-192

Sample Type: Dark Gray Sand and fines
Sample ID: CO-13-PZM-038

Tested By: A. E. Myers

Lab No. 01-239
File Name: co13pzm038

Pemeability (k): 3.7E-07 *cm/sec*

Date Sampled: --
Date Delivered to E2Si:
Start Test Date: 20-Dec-01
Test Sample Length (L): 7.6 *cm*
Test Sample Dia. (D): 7.3 *cm*
Cross Section Area (A): 39.7 *cm^2*
Area of Standpipe (a): 1.0 *cm^2*
Cell Pressure (P): 5.0 *psi*
Lower Cap Pressure (P_1): 3.0 *psi*
Upper CapPressure (P_a): 2.0 *psi*
Gradient: 0.1 *psi/cm*

Test Completion Date: 21-Dec-01

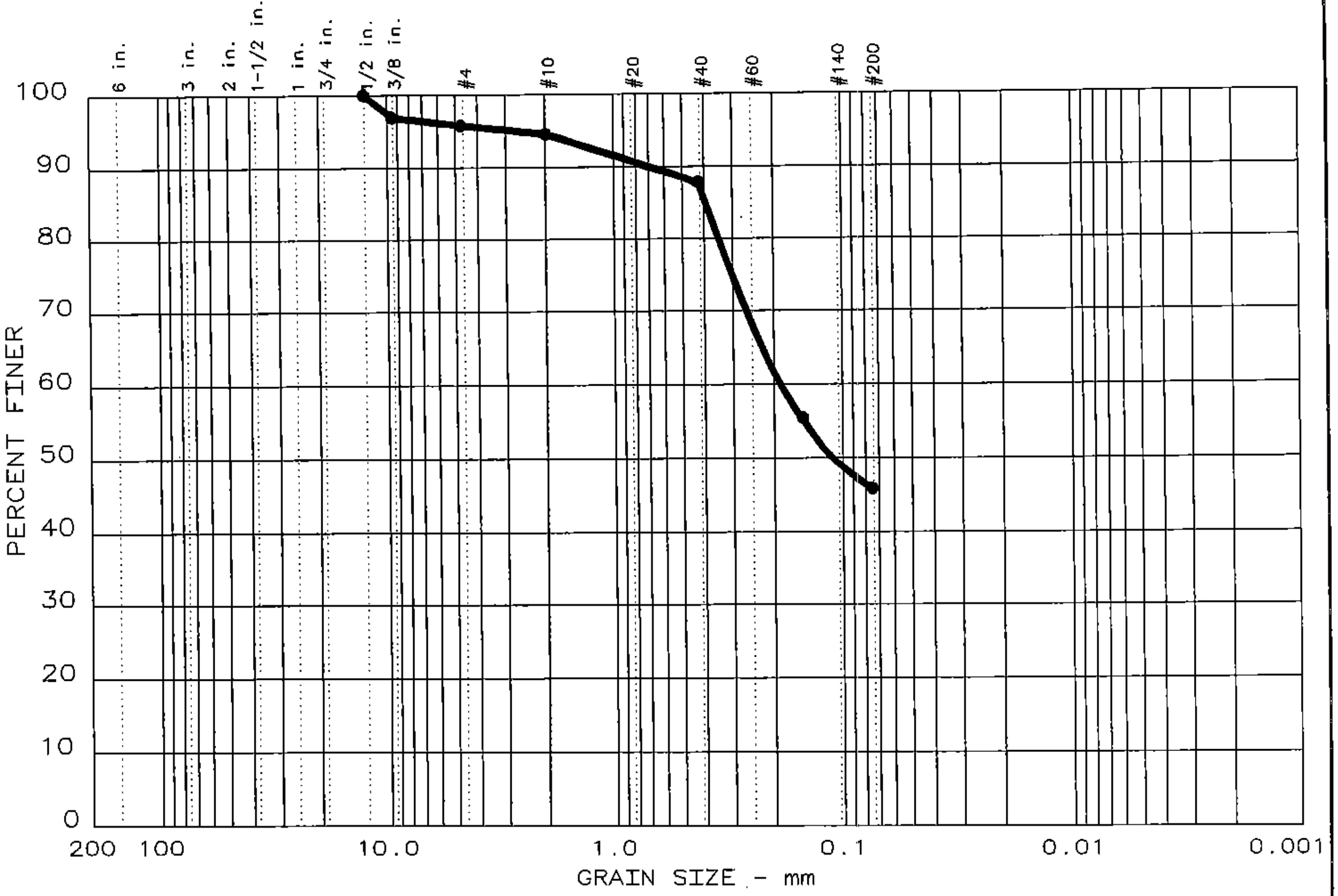
Test Liquid: Distilled De-Aired Water
Wet Weight Before Test: 653.4 *gms*
Wet Weight After Test: *gms*
Dry Weight After Test: *gms*
Dry Density: 109.0 *pcf* *(95% of Std Proctor*
% Saturation : 100.0 % *max dry density -*
% Moisture : 22.3 % *remolded Sample)*
minus No. 200 sieve : 46.8 %
LL : 20.0
PI : 6.0

$$k = (a \times L) / (A \times T) \times \text{Ln} \left\{ \frac{h_1 + p_1 - h_a - p_a}{h_2 + p_1 - h_b - p_a} \right\}$$

where:
k = hydraulic conductivity, cm/sec = 3.7E-07
a = c/s area of reservoir of permeate, cm^2 = 1.0
L = length of specimen, cm = 7.6
A = cross-sectional area of specimen, cm^2 = 39.7
time at h_1 = 0.00E+00 sec time at h_2 = 5.39E+04 sec
T = elapsed time between determination of h_1 & h_2, sec = 53880

h_1 = upper burette rdg at T_1, cc = 1
h_2 = upper burette rdg at T_2, cc = 6
h_a = lower burette rdg at T_1, cc = 49.1
h_b = lower burette rdg at T_2, cc = 42.1
p_1 = P_1 x 70.55, cm = 211.7
p_a = P_a x 70.55, cm = 141.1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	14	0.0	4.3	49.9	45.8	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●		NP	0.39	0.19	0.11					

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark Gray Sand and fines	SM	A-4 (0.0)

Project No.: 01-192
Project: Bethlehem Steel - Sparrows Point, MD
● Location: Boring No. C007-PZM-048

Date: 4/1/2002

Remarks:
Depth 27.0' to 29.0'

Sp. Gr. - 2.59

GRAIN SIZE DISTRIBUTION TEST REPORT

EARTH ENGINEERING & SCIENCES, INC.

Figure No. ______

Earth Engineering & Sciences, Inc.

RESULTS OF FLEXIBLE WALL PERMEABILITY TEST
(ASTM D-5084)

Project Name : Bethlehem Steel - Sparrows Point
Tested By: A. E. Myers

Project No.: 01-192
Lab No. 01-239
File Name: co07-pzm-048

Sample Type: Dark Gray Sand and fines with wood
Sample ID: CO-07-PZM-048 27' TO 29'
Pemeability (k): 1.9E-06 *cm/sec*

Date Sampled:	--	**Test Completion Date:**	21-Dec-01	
Date Delivered to E2Si:				
Start Test Date:	20-Dec-01	**Test Liquid:**	Distilled De-Aired Water	
Test Sample Length (L):	7.6 *cm*	**Wet Weight Before Test:**	638.5 *gms*	
Test Sample Dia. (D):	7.3 *cm*	**Wet Weight After Test:**	*gms*	
Cross Section Area (A):	39.7 cm^2	**Dry Weight After Test:**	*gms*	
Area of Standpipe (a):	1.0 cm^2	**Dry Density:**	85.6 *pcf*	*(95% of Std Proctor*
Cell Pressure (P):	5.0 *psi*	**% Saturation :**	100.0 %	*max dry density -*
Lower Cap Pressure (P_1):	3.0 *psi*	**% Moisture :**	52.2 %	*remolded Sample)*
Upper CapPressure (P_a):	2.0 *psi*	**minus No. 200 sieve :**	45.8 %	
Gradient:	0.1 *psi/cm*	**LL :**		
		PI :	NP	

$$k = (a \times L) / (A \times T) \times \text{Ln} \left\{ \frac{h_1 + p_1 - h_a - p_a}{h_2 + p_1 - h_b - p_a} \right\}$$

where:

k = hydraulic conductivity, cm/sec	=	1.9E-06	h_1 = upper burette rdg at T_1, cc	=	2.1
a = c/s area of reservoir of permeate, cm^2	=	1.0	h_2 = upper burette rdg at T_2, cc	=	27.44
L = length of specimen, cm	=	7.6	h_a = lower burette rdg at T_1, cc	=	48.6
A = cross-sectional area of specimen, cm^2	=	39.7	h_b = lower burette rdg at T_2, cc	=	24
time at h_1 = 0.00E+00 sec time at h_2	=	5.41E+04 sec	p_1 = P_1 x 70.55, cm	=	211.7
T = elapsed time between determination			p_a = P_a x 70.55, cm	=	141.1
of h_1 & h_2, sec	=	54120			

Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO02-PZM006	CO02-PZM041	CO03-PZM005	CO04-PZM004	CO04-PZM048	CO05-PZM006	CO06-PZM008		CO06-PZM039	CO07-PZM008		CO07-PZM050	CO08-PZM005	CO08-PZM036
Sample ID	CO02-PZM006-01D	CO02-PZM041-01D	CO03-PZM005-01D	CO04-PZM004-01D	CO04-PZM048-01D	CO05-PZM006-01D	CO06-PZM008-01D	CO06-PZM008-01D DUP	CO06-PZM039-01D	CO07-PZM008-01D	CO07-PZM008-01D DUP	CO07-PZM050-01D	CO08-PZM005-01D	CO08-PZM036-01D
Sample Date	12/19/01	12/19/01	12/19/01	12/19/01	12/19/01	12/20/01	12/20/01	12/20/01	12/20/01	12/21/01	12/21/01	12/21/01	12/19/01	12/19/01
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1,1,2-Tetrachloroethane	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
1,1,1-Trichloroethane	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
1,1,2,2-Tetrachloroethane	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
1,1,2-Trichloroethane	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
1,1-Dichloroethane	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
1,1-Dichloroethene	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
1,2,3-Trichloropropane	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
1,2-Dichloropropane	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
1,4-Dioxane	15,000,000 R	40,000 R	NA	NA	NA	20,000 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	380,000 U	1,000 U	5 U	120 U	5 U	500 U	5 U	5 U	500 U	10,000 U	10,000 U	200 U	1,000 U	1,000 U
2-Chloro-1,3-butadiene	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	380,000 U	1,000 U	5 U	120 U	5 U	500 U	5 U	5 U	500 U	10,000 U	10,000 U	200 U	1,000 U	1,000 U
4-Methyl-2-pentanone	380,000 U	1,000 U	5 U	120 U	5 U	500 U	5 U	5 U	500 U	10,000 U	10,000 U	200 U	1,000 U	1,000 U
Acetone	750,000 U	2,000 U	10 U	250 U	10 U	1,000 U	10 U	10 U	6,900	13,000 J	20,000 U	400 U	2,000 U	2,000 U
Acetonitrile	1,500,000 R	4,000 R	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Acrolein	1,500,000 U	4,000 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	1,500,000 U	4,000 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Allyl chloride	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1,600,000	3,900	1 U	660	0.28 B	2,100	1 U	1 U	100 U	42,000	40,000	810	5,500	5,900
Bromodichloromethane	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
Bromomethane	150,000 UJ	400 UJ	NA	NA	NA	200 U	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
Carbon tetrachloride	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
Chlorobenzene	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
Chloroethane	150,000 U	400 U	2 U	50 U	2 U	200 U	2 U	2 U	200 U	4,000 U	4,000 U	80 U	400 U	400 U
Chloroform	75,000 U	200 U	1 U	25 U	0.35 J	100 U	14	25	100 U	2,000 U	2,000 U	40 U	200 U	200 U
Chloromethane	150,000 U	400 U	NA	NA	NA	200 U	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane(Freon-12)	150,000 U	400 U	NA	NA	NA	200 U	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methacrylate	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	75,000 U	200 U	1 U	24 J	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	130 J	150 J
Iodomethane	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Isobutanol	3,000,000 R	8,000 R	NA	NA	NA	4,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Methacrylonitrile	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Methyl methacrylate	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	150,000 U	400 U	2 U	13 J	2 U	200 U	2 U	2 U	200 U	4,000 U	4,000 U	80 U	400 U	400 U
Propionitrile	150,000 U	400 U	NA	NA	NA	200 U	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
Toluene	230,000	560	1 U	190	0.33 J	1,700	1 U	1 U	100 U	4,900	5,100	100	4,500	4,600
Trichloroethene	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
Trichlorofluoromethane(Freon-11)	150,000 U	400 U	NA	NA	NA	200 U	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	150,000 U	400 U	2 U	50 U	2 U	200 U	2 U	2 U	200 U	4,000 U	4,000 U	80 U	400 U	400 U
Xylene, total	220,000 U	600 U	3 U	240	1.7 J	1,200	3 U	3 U	300 U	6,000 U	6,000 U	120 U	2,200	2,300
cis-1,3-Dichloropropene	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
trans-1,2-Dichloroethene	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
trans-1,3-Dichloropropene	75,000 U	200 U	1 U	25 U	1 U	100 U	1 U	1 U	100 U	2,000 U	2,000 U	40 U	200 U	200 U
trans-1,4-Dichloro-2-butene	75,000 U	200 U	NA	NA	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG/L)														
1,2,4,5-Tetrachlorobenzene	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U

NA - Not analyzed
B - Analyte not detected above associated blank
J - Estimated value
L - Reported value based low
R - Unreliable result

U - Analyte not detected
UJ - Not detected, estimated DL

Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO02-PZM006	CO02-PZM041	CO03-PZM005	CO04-PZM004	CO04-PZM048	CO05-PZM006	CO06-PZM008		CO06-PZM039	CO07-PZM008		CO07-PZM050	CO08-PZM005	CO08-PZM036
Sample ID	CO02-PZM006-01D	CO02-PZM041-01D	CO03-PZM005-01D	CO04-PZM004-01D	CO04-PZM048-01D	CO05-PZM006-01D	CO06-PZM008-01D	CO06-PZM008-01D DUP	CO06-PZM039-01D	CO07-PZM008-01D	CO07-PZM008-01D DUP	CO07-PZM050-01D	CO08-PZM005-01D	CO08-PZM036-01D
Sample Date	12/19/01	12/19/01	12/19/01	12/19/01	12/19/01	12/20/01	12/20/01	12/20/01	12/20/01	12/21/01	12/21/01	12/21/01	12/19/01	12/19/01
Chemical Name														
1,2-Dichlorobenzene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
1,3,5-Trinitrobenzene	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
1,3-Dinitrobenzene	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
1,4-Naphthoquinone	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
1-Naphthylamine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	100 U	20 U	20 U	100 U	200 U	2,000 U	20 U	20 U	20 U	160 U	200 U	20 U	100 U	100 U
2,3,4,6-Tetrachlorophenol	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
2,4,6-Trichlorophenol	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
2,4-Dichlorophenol	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
2,4-Dimethylphenol	120	20 U	10 U	330	100 U	550 J	10 U	10 U	10 U	18 J	100 U	10 U	21 J	17 J
2,4-Dinitrophenol	500 U	100 U	50 U	250 U	500 U	5,000 U	50 U	50 U	50 U	400 U	500 U	50 U	250 U	250 U
2,4-Dinitrotoluene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
2,6-Dichlorophenol	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
2-Acetylaminofluorene	200 U	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
2-Chlorophenol	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
2-Methyl-5-nitroaniline	200 U	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylaniline	200 U	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	11 J	5.2 J	3 J	390	120	270 J	10 U	10 U	10 U	20 J	17 J	2.6 J	63	35 J
2-Methylphenol	120	20 U	0.74 J	96	100 U	340 J	10 U	10 U	10 U	45 J	40 J	1.3 J	30 J	49 J
2-Naphthylamine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
2-Picoline	150 J	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	500 U	100 U	50 U	250 U	500 U	5,000 U	50 U	50 U	50 U	400 U	500 U	50 U	250 U	250 U
3,3'-Dimethylbenzidine	500 U	100 U	50 U	250 U	500 U	5,000 U	50 U	50 U	50 U	400 U	500 U	50 U	250 U	250 U
3-Methylcholanthrene	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	500 U	100 U	50 U	250 U	500 U	5,000 U	50 U	50 U	50 U	400 U	500 U	50 U	250 U	250 U
4-Aminobiphenyl	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
4-Chloro-3-methylphenol	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
4-Chloroaniline	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
4-Methylphenol	160	20 U	8.2 J	98	100 U	640 J	10 U	10 U	10 U	27 J	24 J	1.5 J	64	55
4-Nitroaniline	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	500 U	100 U	50 U	250 U	500 U	5,000 U	50 U	50 U	50 U	400 U	500 U	50 U	250 U	250 U
4-Nitroquinoline-1-oxide	1,000 U	200 U	NA	NA	NA	10,000 U	NA	NA	NA	NA	NA	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	200 U	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	100 U	9.3 J	4.7 J	56	26 J	1,000 U	10 U	10 U	10 U	11 J	9.8 J	4.1 J	50 U	50 U
Acenaphthylene	100 U	20 U	5.7 J	180	66 J	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	9.5 J	50 U
Acetophenone	370	8.6 J	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Aniline	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	100 U	1.6 J	2 J	17 J	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Aramite	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	100 U	20 U	1.3 J	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Benzo(a)pyrene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Benzo(b)fluoranthene	100 U	20 U	0.86 J	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Benzo(g,h,i)perylene	100 U	20 U	0.68 J	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Benzo(k)fluoranthene	100 U	20 U	1.1 J	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Benzyl alcohol	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Chrysene	100 U	20 U	1.5 J	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Di-n-butylphthalate	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Di-n-octylphthalate	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Dibenz(a,h)anthracene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U

NA - Not analyzed
B - Analyte not detected above associated blank
J - Estimated value
L - Reported value based low
R - Unreliable result

U - Analyte not detected
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Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO02-PZM006	CO02-PZM041	CO03-PZM005	CO04-PZM004	CO04-PZM048	CO05-PZM006	CO06-PZM008		CO06-PZM039	CO07-PZM008		CO07-PZM050	CO08-PZM005	CO08-PZM036
Sample ID	CO02-PZM006-01D	CO02-PZM041-01D	CO03-PZM005-01D	CO04-PZM004-01D	CO04-PZM048-01D	CO05-PZM006-01D	CO06-PZM008-01D	CO06-PZM008-01D DUP	CO06-PZM039-01D	CO07-PZM008-01D	CO07-PZM008-01D DUP	CO07-PZM050-01D	CO08-PZM005-01D	CO08-PZM036-01D
Sample Date	12/19/01	12/19/01	12/19/01	12/19/01	12/19/01	12/20/01	12/20/01	12/20/01	12/20/01	12/21/01	12/21/01	12/21/01	12/19/01	12/19/01
Chemical Name														
Dibenzofuran	100 U	3.3 J	3 J	110	62 J	100 J	10 U	10 U	10 U	6.4 J	5.8 J	1.5 J	5.3 J	50 U
Diethylphthalate	100 U	20 U	1.2 J	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Dimethyl phthalate	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Dinoseb	200 U	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Diphenylamine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methanesulfonate	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	100 U	2.6 J	5 J	20 J	15 J	1,000 U	10 U	10 U	10 U	80 U	100 U	1.9 J	50 U	50 U
Fluorene	7.2 J	4.1 J	4.6 J	93	62 J	95 J	10 U	10 U	10 U	9.3 J	8.4 J	3.4 J	50 U	4.3 J
Hexachlorobenzene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Hexachlorobutadiene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Hexachlorocyclopentadiene	500 U	100 U	50 U	250 U	500 U	5,000 U	50 U	50 U	50 U	400 U	500 U	50 U	250 U	250 U
Hexachloroethane	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Hexachloropropene	1,000 U	200 U	NA	NA	NA	10,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	100 U	20 U	0.72 J	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Isophorone	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Isosafrole	200 U	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Methapyrilene	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Methyl methanesulfonate	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosomorpholine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosopiperidine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	450	52	77	6,700	1,100	8,100	10 U	10 U	1.7 J	420	360	27	1,400	1,400
Nitrobenzene	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
Pentachlorobenzene	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Pentachloroethane	500 U	100 U	50 U	250 U	500 U	5,000 U	50 U	50 U	50 U	400 U	500 U	50 U	250 U	250 U
Pentachloronitrobenzene	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	500 U	100 U	50 U	250 U	500 U	5,000 U	50 U	50 U	50 U	400 U	500 U	50 U	250 U	250 U
Phenacetin	200 U	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	11 J	8.1 J	9.9 J	96	96 J	120 J	10 U	10 U	1.1 J	15 J	13 J	5.5 J	5.9 J	50 U
Phenol	250	120	2.6 J	66	100 U	370 J	10 U	10 U	10 U	47 J	39 J	5.2 J	120	100
Pronamide	200 U	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	100 U	20 U	3.5 J	11 J	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	1 J	50 U	50 U
Pyridine	180 J	40 U	20 U	13 J	200 U	2,000 U	20 U	20 U	20 U	160 U	200 U	20 U	100 U	100 U
Safrole	200 U	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
a,a-Dimethylphenethylamine	500 U	100 U	NA	NA	NA	5,000 U	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
bis(2-Chloroethyl)ether	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
bis(2-Ethylhexyl)phthalate	100 U	20 U	10 U	50 U	100 U	1,000 U	10 U	10 U	10 U	80 U	100 U	10 U	50 U	50 U
n-Nitroso-di-n-butylamine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	100 U	20 U	NA	NA	NA	1,000 U	10 U	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-n-methylethylamine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiethylamine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodimethylamine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosopyrrolidine	100 U	20 U	NA	NA	NA	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA
p-Dimethylaminoazobenzene	200 U	40 U	NA	NA	NA	2,000 U	NA	NA	NA	NA	NA	NA	NA	NA
p-Phenylenediamine	2,000 U	400 U	NA	NA	NA	20,000 U	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)														
Aroclor-1016	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1221	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1232	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1242	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1248	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1254	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1260	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Total Metals (UG/L)														
Antimony	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1	4.1 U	4.1 U
Arsenic	9.6 J	8.8 J	6.7 J	2 B	17.9	62.4	2 U	2 U	21.8	5.4 J	6.2 J	4.4 J	3.3 B	10.6 B
Barium	34.6 J	137 J	56.1 J	37.9 J	128 J	40.1 J	18.5 J	17.8 J	222	32.7 J	32 J	493	209	82.6 J

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Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO02-PZM006		CO02-PZM041		CO03-PZM005		CO04-PZM004		CO04-PZM048		CO05-PZM006		CO06-PZM008				CO06-PZM039		CO07-PZM008				CO07-PZM050		CO08-PZM005		CO08-PZM036	
Sample ID	CO02-PZM006-01D		CO02-PZM041-01D		CO03-PZM005-01D		CO04-PZM004-01D		CO04-PZM048-01D		CO05-PZM006-01D		CO06-PZM008-01D		CO06-PZM008-01D DUP		CO06-PZM039-01D		CO07-PZM008-01D		CO07-PZM008-01D DUP		CO07-PZM050-01D		CO08-PZM005-01D		CO08-PZM036-01D	
Sample Date	12/19/01		12/19/01		12/19/01		12/19/01		12/19/01		12/20/01		12/20/01		12/20/01		12/20/01		12/21/01		12/21/01		12/21/01		12/19/01		12/19/01	
Chemical Name																												
Beryllium	3.2	J	3.4	B	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	1	B	0.73	J	0.4	U	0.4	U	0.4	U
Cadmium	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
Chromium	1.2	J	5.1		1.2	J	1.1	U	4	J	1.1	U	1.1	U	1.1	U	1.1	U	2.4	J	1.1	U	1.9	J	1.1	U	2.4	J
Cobalt	0.86	U	2.5	J	0.86	U	0.86	U	8.6	J	2.2	J	0.86	U	0.86	U	0.86	U	0.86	U	0.86	U	1.6	J	0.86	U	0.86	U
Copper	0.77	U	0.77	U	3.7	J	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	2.1	J	0.88	B	0.96	B	0.77	U	0.77	U
Lead	1.8	U	146		11.7		1.8	U	1.8	U	1.8	U	1.8	U	2.2	J	1.8	U	24.9		5.9		19.1		1.8	U	2	J
Mercury	0.054	U	0.054	U	0.054	U	0.054	U	0.072	B	0.054	U	0.074	J	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U
Nickel	4.7	J	3.7	J	2.5	J	2.4	U	2.8	J	2.4	U	2.4	U	2.4	U	2.4	U	2.4	U	4	J	5.5	J	2.4	U	2.4	U
Selenium	3.2	U	3.2	U	3.2	U	5.9		3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.5	J	3.2	U	8		3.2	U
Silver	0.83	J	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
Thallium	5.7	U	6.6	J	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	9.2	J
Tin	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U	46.4	J	28.8	U	28.8	U
Vanadium	17.4	J	17.7	J	5.3	J	1.5	U	8.3	J	78.8		1.5	U	1.5	U	14.5	J	461		427		35.2	J	1.5	U	34.7	J
Zinc	6.2	J	325		33.9		1.5	U	10.5	J	2	B	3.2	B	16.6	J	3.9	B	53.4		17.9	J	67.1		1.8	J	16	J
Common Cations (UG/L)																												
Calcium	NA		95,800	J	85,000		196,000		165,000		NA		34,800		32,900		121,000		105,000		105,000		111,000		NA		NA	
Iron	NA		28,400	J	1,530		112		72,000		NA		45	U	77.4	J	61,800		1,140		318		191,000		NA		NA	
Magnesium	NA		23,900	J	38,000		813	B	210,000		NA		7,530		7,190		56,000		151	J	63.2	B	101,000		NA		NA	
Manganese	NA		1,610	J	635		9	J	3,600		NA		54.5		50.4		1,460		74.8		21.3		6,230		NA		NA	
Potassium	NA		54,300		35,500		22,400		34,900		NA		5,050		4,530	J	15,300		36,700		35,300	J	26,400	J	NA		NA	
Sodium	NA		747,000		77,800		249,000		1,470,000		NA		37,900		34,500		369,000		106,000		96,400		1,160,000		NA		NA	
Wet Chemistry (MG/L)																												
Amenable cyanide	2.3	J	0.013	J	0.13	J	1.5	J	0.005	J	4.5	J	0.021	J	0.016	J	0.029	J	3.6		5.1		0.024		0.062	J	6.6	J
Bicarbonate	NA		624		471		5	U	90.3		NA		60.2		60.2		213		5	U	5	U	73.1		NA		NA	
Chloride	NA		1,060		60.9		182		2,580		NA		66		63.4		880		140		139		2,380		NA		NA	
Sulfate	NA		16.3		23.2		476		1,000		NA		49.9		46.4		12.6		140		143		171		NA		NA	
Sulfide	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Total dissolved solids (TDS)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO09-PZM007		CO10-PZM006	CO10-PZM029	CO11-PZM007	CO12-PZM008	CO13-PZM008	CO13-PZM030	CO15-PZM005		CO16-PZM006	CO17-PZM005	CO18-PZM006	CO19-PZM004
Sample ID	CO09-PZM007-01D	CO09-PZM007-01D DUP	CO10-PZM006-01D	CO10-PZM029-01D	CO11-PZM007-01D	CO12-PZM008-01D	CO13-PZM008-01D	CO13-PZM030-01D	CO15-PZM005-01D	CO15-PZM005-01D DUP	CO16-PZM006-01D	CO17-PZM005-01D	CO18-PZM006-01D	CO19-PZM004-01D
Sample Date	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01	12/21/01	12/21/01
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1,1,2-Tetrachloroethane	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
1,1,1-Trichloroethane	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
1,1,2,2-Tetrachloroethane	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
1,1,2-Trichloroethane	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
1,1-Dichloroethane	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
1,1-Dichloroethene	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
1,2,3-Trichloropropane	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
1,2-Dichloropropane	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
1,4-Dioxane	NA	NA	NA	NA	NA	NA	8,000 U	2,000 R	NA	NA	NA	NA	NA	NA
2-Butanone	50 U	50 U	15 U	5 U	5 U	120 U	200 U	50 U	25,000 U	10,000 U	25,000 U	50,000 U	250,000 U	2,000 U
2-Chloro-1,3-butadiene	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
2-Hexanone	50 U	50 U	15 U	5 U	5 U	120 U	200 U	50 U	25,000 U	10,000 U	25,000 U	50,000 U	250,000 U	2,000 U
4-Methyl-2-pentanone	50 U	50 U	15 U	5 U	5 U	120 U	200 U	50 U	25,000 U	10,000 U	25,000 U	50,000 U	250,000 U	2,000 U
Acetone	100 U	100 U	19 B	10 U	2.5 B	250 U	400 U	100 U	50,000 U	20,000 U	50,000 U	100,000 U	500,000 U	4,000 U
Acetonitrile	NA	NA	NA	NA	NA	NA	800 U	200 R	NA	NA	NA	NA	NA	NA
Acrolein	NA	NA	NA	NA	NA	NA	800 U	200 U	NA	NA	NA	NA	NA	NA
Acrylonitrile	NA	NA	NA	NA	NA	NA	800 U	200 U	NA	NA	NA	NA	NA	NA
Allyl chloride	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
Benzene	190	180	100	1 U	4.4	590	960	180	98,000	110,000	200,000	200,000	1,300,000	12,000
Bromodichloromethane	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
Bromoform	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
Bromomethane	NA	NA	NA	NA	NA	NA	80 U	20 U	NA	NA	NA	NA	NA	NA
Carbon disulfide	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
Carbon tetrachloride	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
Chlorobenzene	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
Chloroethane	20 U	20 U	6 U	2 U	2 U	50 U	80 U	20 U	10,000 U	4,000 U	10,000 U	20,000 U	100,000 U	800 U
Chloroform	10 U	10 U	1.5 J	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
Chloromethane	NA	NA	NA	NA	NA	NA	80 U	20 U	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
Dibromomethane	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane(Freon-12)	NA	NA	NA	NA	NA	NA	80 U	20 U	NA	NA	NA	NA	NA	NA
Ethyl methacrylate	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
Ethylbenzene	10 U	10 U	1.6 J	1 U	1 U	15 J	22 J	10 U	5,000 U	2,000 U	1,200 J	10,000 U	50,000 U	720
Iodomethane	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
Isobutanol	NA	NA	NA	NA	NA	NA	1,600 U	400 R	NA	NA	NA	NA	NA	NA
Methacrylonitrile	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
Methyl methacrylate	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
Methylene chloride	20 U	20 U	6 U	2 U	2 U	50 U	21 J	20 U	10,000 U	4,000 U	10,000 U	20,000 U	100,000 U	800 U
Propionitrile	NA	NA	NA	NA	NA	NA	80 U	20 U	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	40 U	39	NA	NA	NA	NA	NA	NA
Tetrachloroethene	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
Toluene	190	170	5.2	1 U	0.67 J	200	880	160	14,000	10,000	15,000	15,000	92,000	400 U
Trichloroethene	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	80 U	20 U	NA	NA	NA	NA	NA	NA
Vinyl acetate	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
Vinyl chloride	20 U	20 U	6 U	2 U	2 U	50 U	80 U	20 U	10,000 U	4,000 U	10,000 U	20,000 U	100,000 U	800 U
Xylene, total	290	250	16	3 U	3 U	280	580	140	15,000 U	6,000 U	4,700 J	30,000 U	150,000 U	660 J
cis-1,3-Dichloropropene	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
trans-1,2-Dichloroethene	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
trans-1,3-Dichloropropene	10 U	10 U	3 U	1 U	1 U	25 U	40 U	10 U	5,000 U	2,000 U	5,000 U	10,000 U	50,000 U	400 U
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA	NA	40 U	10 U	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG														
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U

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Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO09-PZM007		CO10-PZM006	CO10-PZM029	CO11-PZM007	CO12-PZM008	CO13-PZM008	CO13-PZM030	CO15-PZM005		CO16-PZM006	CO17-PZM005	CO18-PZM006	CO19-PZM004
Sample ID	CO09-PZM007-01D	CO09-PZM007-01D DUP	CO10-PZM006-01D	CO10-PZM029-01D	CO11-PZM007-01D	CO12-PZM008-01D	CO13-PZM008-01D	CO13-PZM030-01D	CO15-PZM005-01D	CO15-PZM005-01D DUP	CO16-PZM006-01D	CO17-PZM005-01D	CO18-PZM006-01D	CO19-PZM004-01D
Sample Date	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01	12/21/01	12/21/01
Chemical Name														
1,2-Dichlorobenzene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
1,4-Naphthoquinone	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
1-Naphthylamine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	40 U	40 U	20 U	20 U	20 U	1,000 U	8,000 U	500 U	20 U	100 U	100 U	200 U	1,000 U	1,000 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	20 U	20 U	50 R	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
2,4,6-Trichlorophenol	20 U	20 U	50 R	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
2,4-Dichlorophenol	20 U	20 U	50 R	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
2,4-Dimethylphenol	120	120	50 R	10 U	10 U	500 U	4,000 U	500 U	15	21 J	32 J	27 J	230 J	500 U
2,4-Dinitrophenol	100 U	100 U	8.3 L	50 U	50 U	2,500 U	20,000 U	2,500 U	50 U	250 U	250 U	500 U	2,500 U	2,500 U
2,4-Dinitrotoluene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
2,6-Dichlorophenol	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
2-Acetylaminofluorene	NA	NA	NA	NA	NA	NA	8,000 U	1,000 U	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
2-Chlorophenol	20 U	20 U	50 R	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
2-Methyl-5-nitroaniline	NA	NA	NA	NA	NA	NA	8,000 U	1,000 U	NA	NA	NA	NA	NA	NA
2-Methylaniline	NA	NA	NA	NA	NA	NA	8,000 U	1,000 U	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	100	100	18	0.59 J	10 U	110 J	2,500 J	230 J	24	38 J	23 J	49 J	500 U	81 J
2-Methylphenol	120	120	50 R	3 J	10 U	89 J	4,000 U	500 U	84 J	93 J	64	53 J	550	500 U
2-Naphthylamine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
2-Nitrophenol	20 U	20 U	9.6 L	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
2-Picoline	NA	NA	NA	NA	NA	NA	980 J	110 J	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	100 U	100 U	50 U	50 U	50 U	2,500 U	20,000 U	2,500 U	50 U	250 U	250 U	500 U	2,500 U	2,500 U
3,3'-Dimethylbenzidine	100 U	100 U	50 U	50 U	50 U	2,500 U	20,000 U	2,500 U	50 U	250 U	250 U	500 U	2,500 U	2,500 U
3-Methylcholanthrene	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	100 U	100 U	38 L	50 U	50 U	2,500 U	20,000 U	2,500 U	50 U	250 U	250 U	500 U	2,500 U	2,500 U
4-Aminobiphenyl	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
4-Chloro-3-methylphenol	20 U	20 U	50 R	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
4-Chloroaniline	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
4-Methylphenol	200 J	220 J	50 R	10 U	10 U	160 J	4,000 U	500 U	97 J	110 J	51	110	600	500 U
4-Nitroaniline	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
4-Nitrophenol	100 U	100 U	250 R	50 U	50 U	2,500 U	20,000 U	2,500 U	50 U	250 U	250 U	500 U	2,500 U	2,500 U
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA	NA	40,000 U	5,000 U	NA	NA	NA	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA	NA	8,000 U	1,000 U	NA	NA	NA	NA	NA	NA
Acenaphthene	4.9 J	4.9 J	1.3 J	0.77 J	0.56 J	500 U	4,000 U	500 U	7 J	8 J	11 J	9 J	500 U	500 U
Acenaphthylene	22	23	10 U	10 U	10 U	500 U	1,900 J	150 J	32	35 J	50 U	100 U	500 U	500 U
Acetophenone	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
Aniline	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
Anthracene	4.2 J	4.6 J	10 U	10 U	10 U	500 U	660 J	500 U	7.4 J	9.1 J	50 U	100 U	500 U	500 U
Aramite	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	20 U	20 U	10 U	10 U	10 U	500 U	700 J	500 U	7.3 J	8.3 J	50 U	100 U	500 U	500 U
Benzo(a)pyrene	20 U	20 U	10 U	10 U	10 U	500 U	440 J	500 U	3.6 J	50 U	50 U	100 U	500 U	500 U
Benzo(b)fluoranthene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	6.1 J	7.6 J	50 U	100 U	500 U	500 U
Benzo(g,h,i)perylene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	3.9 J	4.3 J	50 U	100 U	500 U	500 U
Benzo(k)fluoranthene	20 U	20 U	10 U	10 U	10 U	500 U	460 J	500 U	8.4 J	3.7 J	50 U	100 U	500 U	500 U
Benzyl alcohol	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
Chrysene	20 U	20 U	10 U	10 U	10 U	500 U	590 J	500 U	8.5 J	8.2 J	50 U	100 U	500 U	500 U
Di-n-butylphthalate	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
Di-n-octylphthalate	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
Dibenz(a,h)anthracene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U

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Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO09-PZM007		CO10-PZM006	CO10-PZM029	CO11-PZM007	CO12-PZM008	CO13-PZM008	CO13-PZM030	CO15-PZM005		CO16-PZM006	CO17-PZM005	CO18-PZM006	CO19-PZM004
Sample ID	CO09-PZM007-01D	CO09-PZM007-01D DUP	CO10-PZM006-01D	CO10-PZM029-01D	CO11-PZM007-01D	CO12-PZM008-01D	CO13-PZM008-01D	CO13-PZM030-01D	CO15-PZM005-01D	CO15-PZM005-01D DUP	CO16-PZM006-01D	CO17-PZM005-01D	CO18-PZM006-01D	CO19-PZM004-01D
Sample Date	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01	12/21/01	12/21/01
Chemical Name														
Dibenzofuran	22	23	13	10 U	10 U	500 U	900 J	45 J	16	17 J	5.5 J	9.3 J	500 U	500 U
Diethylphthalate	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
Dimethyl phthalate	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
Dinoseb	NA	NA	NA	NA	NA	NA	8,000 U	1,000 U	NA	NA	NA	NA	NA	NA
Diphenylamine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
Ethyl methanesulfonate	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
Fluoranthene	5.1 J	5.3 J	4.8 J	10 U	0.61 J	500 U	1,500 J	500 U	29	29 J	3.4 J	100 U	500 U	500 U
Fluorene	23	24	13	10 U	10 U	26 J	1,100 J	44 J	19	20 J	8.3 J	18 J	500 U	500 U
Hexachlorobenzene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
Hexachlorobutadiene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
Hexachlorocyclopentadiene	100 U	100 U	50 U	50 U	50 U	2,500 U	20,000 U	2,500 U	50 U	250 U	250 U	500 U	2,500 U	2,500 U
Hexachloroethane	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
Hexachloropropene	NA	NA	NA	NA	NA	NA	40,000 U	5,000 U	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	4.6 J	4.2 J	50 U	100 U	500 U	500 U
Isophorone	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
Isosafrole	NA	NA	NA	NA	NA	NA	8,000 U	1,000 U	NA	NA	NA	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
Methyl methanesulfonate	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
N-Nitrosomorpholine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
N-Nitrosopiperidine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
Naphthalene	2,000	1,800	340	38	2.1 J	2,300	22,000	3,100	1,200	1,400	230	1,600	190 J	4,400
Nitrobenzene	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
Pentachlorobenzene	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
Pentachloroethane	100 U	100 U	50 U	50 U	50 U	2,500 U	20,000 U	2,500 U	50 U	250 U	250 U	500 U	2,500 U	2,500 U
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
Pentachlorophenol	100 U	100 U	250 R	50 U	50 U	2,500 U	20,000 U	2,500 U	50 U	250 U	250 U	500 U	2,500 U	2,500 U
Phenacetin	NA	NA	NA	NA	NA	NA	8,000 U	1,000 U	NA	NA	NA	NA	NA	NA
Phenanthrene	29	31	27	0.67 J	0.62 J	500 U	2,600 J	46 J	46	48 J	10 J	21 J	500 U	500 U
Phenol	250 J	340 J	50 R	10 U	1.6 J	220 J	4,000 U	500 U	290	370	280	200	900	250 J
Pronamide	NA	NA	NA	NA	NA	NA	8,000 U	1,000 U	NA	NA	NA	NA	NA	NA
Pyrene	3.2 J	3.3 J	10 U	10 U	10 U	500 U	1,100 J	500 U	16	19 J	50 U	100 U	500 U	500 U
Pyridine	31 J	29 J	20 U	20 U	20 U	1,000 U	8,000 U	230 J	62	180 J	22 J	200 U	1,400	1,000 U
Safrole	NA	NA	NA	NA	NA	NA	8,000 U	1,000 U	NA	NA	NA	NA	NA	NA
a,a-Dimethylphenethylamine	NA	NA	NA	NA	NA	NA	20,000 U	2,500 U	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
bis(2-Chloroethyl)ether	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
bis(2-Ethylhexyl)phthalate	20 U	20 U	10 U	10 U	10 U	500 U	4,000 U	500 U	10 U	50 U	50 U	100 U	500 U	500 U
n-Nitroso-di-n-butylamine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	10 U	NA	NA	NA	NA	NA
n-Nitroso-n-methylethylamine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
n-Nitrosodiethylamine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
n-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
n-Nitrosopyrrolidine	NA	NA	NA	NA	NA	NA	4,000 U	500 U	NA	NA	NA	NA	NA	NA
p-Dimethylaminoazobenzene	NA	NA	NA	NA	NA	NA	8,000 U	1,000 U	NA	NA	NA	NA	NA	NA
p-Phenylenediamine	NA	NA	NA	NA	NA	NA	80,000 U	10,000 U	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (														
Aroclor-1016	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1221	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1232	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1242	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1248	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1254	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1260	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Total Metals (UG/L)														
Antimony	4.1 U	4.1 U	4.5 J	4.1 U	4.1 U	4.1 U	4.1 U	4.6 J	6.1 J	4.1 U	4.1 U	4.1 U	4.1 U	7 B
Arsenic	3.8 B	2.7 J	2.6 B	8 B	8.8 J	3.9 J	7.4 J	15.5	22.9 B	6.7 J	5.9 J	14.7	8.7 J	8.4 J
Barium	45.2 J	40.7 J	55.1 J	446	19.1 J	29.1 J	43.3 J	54.6 J	107	47.8 J	84.7 J	34.6 J	56.2 J	129 J

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Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO09-PZM007		CO10-PZM006	CO10-PZM029	CO11-PZM007	CO12-PZM008	CO13-PZM008	CO13-PZM030	CO15-PZM005		CO16-PZM006	CO17-PZM005	CO18-PZM006	CO19-PZM004
Sample ID	CO09-PZM007-01D	CO09-PZM007-01D DUP	CO10-PZM006-01D	CO10-PZM029-01D	CO11-PZM007-01D	CO12-PZM008-01D	CO13-PZM008-01D	CO13-PZM030-01D	CO15-PZM005-01D	CO15-PZM005-01D DUP	CO16-PZM006-01D	CO17-PZM005-01D	CO18-PZM006-01D	CO19-PZM004-01D
Sample Date	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01	12/21/01	12/21/01
Chemical Name														
Beryllium	1.3 B	1.1 B	6	0.4 U	0.4 U	0.6 B	2.7 B	0.5 B	0.65 B	0.4 U	1.1 B	0.4 U	0.43 B	0.71 B
Cadmium	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	12.1	0.97 J	0.77 J	0.83 J	1.8 J	0.63 U
Chromium	5	1.2 J	4.3 J	3.9 J	4 J	1.1 U	1.1 U	2.2 B	43	4.1 J	41.5	16.5	18.3	2 B
Cobalt	0.86 U	0.86 U	1.8 J	1.6 J	7.2 J	0.86 U	1.2 J	7.4 J	12.1 B	0.93 J	1.2 J	0.86 U	1.9 J	0.86 U
Copper	1.3 B	0.77 U	0.77 U	1 B	40.6	0.77 U	0.77 U	0.77 U	114	9.9 J	14.3 J	9.5 J	26.4	0.77 U
Lead	6	1.9 J	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2.6 J	3,810	331	137	453	522	1.8 U
Mercury	0.22	0.19 B	0.054 U	0.073 B	0.054 U	0.054 U	0.071 J	0.054 U	0.24 B	0.075 B	0.063 J	0.054 U	0.29	0.054 U
Nickel	2.4 U	2.4 U	2.4 U	2.4 U	2.5 J	2.5 J	2.4 U	15.7 J	18.3 J	3.1 J	6.2 J	6.7 J	12.5 J	5.6 J
Selenium	3.8 J	6.6	15.3	3.2 U	3.2 U	3.2 U	7.6	3.8 J	3.2 U	3.5 J	3.2 U	3.2 U	3.2 U	3.2 U
Silver	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.5 J	0.75 U	0.75 U	0.95 J	0.75 U	0.75 U
Thallium	6.3 J	5.7 U	5.7 U	7.3 J	5.7 U	5.7 U	5.7 U	8 J	8.3 J	6.3 J	5.7 U	5.7 U	5.7 U	7.4 B
Tin	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.9 J	28.8 U	28.8 U	28.8 U	70.5 J	28.8 U	28.8 U
Vanadium	601 J	558 J	2,410 J	53.4 J	45.1 J	340	1,330	17.5 J	92.2 J	8.8 J	538	43 J	31 J	17.2 J
Zinc	19.5 J	5.4 J	1.5 U	36.7	26.4	1.5 U	2.7 B	19 J	4,260	394	309	233	1,410	4.6 J
Common Cations (UG/L)														
Calcium	167,000	165,000	NA	NA	NA	176,000	548,000	291,000	NA	NA	NA	NA	NA	174,000
Iron	1,210	389	NA	NA	NA	425	1,010	75,400	NA	NA	NA	NA	NA	491
Magnesium	247 B	56.2 B	NA	NA	NA	42.5 J	312 J	80,400	NA	NA	NA	NA	NA	48,400
Manganese	141	27.1	NA	NA	NA	1.6 B	6.4 J	2,280	NA	NA	NA	NA	NA	366
Potassium	32,800	32,500	NA	NA	NA	33,700	30,400	27,300	NA	NA	NA	NA	NA	16,700
Sodium	157,000	157,000	NA	NA	NA	127,000	98,900	1,120,000	NA	NA	NA	NA	NA	58,500
Wet Chemistry (MG/L)														
Amenable cyanide	11.9 J	11.8 J	0.045 J	0.008 J	2.5	1.1	0.13 J	0.035 J	0.047 J	0.054 J	0.33	0.27	0.035	10.8
Bicarbonate	5 U	5 U	NA	NA	NA	5 U	5 U	60.2	NA	NA	NA	NA	NA	598
Chloride	185	192	NA	NA	NA	172	118	2,290	NA	NA	NA	NA	NA	65.7
Sulfate	333	332	NA	NA	NA	460	1,590	549	NA	NA	NA	NA	NA	119
Sulfide	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO20-PZM004	CO21-PZM005	CO22-PZM005	CO23-PZM008	CO24-PZM007	CO25-PZM008	CO26-PZM007	SW17-PZM007	SW17-PZM038	SW18-PZM008	SW18-PZM053
Sample ID	CO20-PZM004-01D	CO21-PZM005-01D	CO22-PZM005-01D	CO23-PZM008-01D	CO24-PZM007-01D	CO25-PZM008-01D	CO26-PZM007-01D	SW17-PZM007-01D	SW17-PZM038-01D	SW18-PZM008-01D	SW18-PZM053-01D
Sample Date	12/20/01	12/20/01	12/20/01	12/20/01	12/21/01	12/20/01	12/20/01	12/19/01	12/19/01	12/21/01	12/21/01
Chemical Name											
Volatile Organic Compounds (UG/L)											
1,1,1,2-Tetrachloroethane	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
1,1,1-Trichloroethane	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
1,1,2,2-Tetrachloroethane	10 U	1 U	2 U	25 U	5 U	50 U	25 UJ	2,500 U	2,500 U	10 U	1 U
1,1,2-Trichloroethane	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
1,1-Dichloroethane	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
1,1-Dichloroethene	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	66	1 U
1,2,3-Trichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
1,2-Dichloropropane	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
1,4-Dioxane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	50 U	5 U	10 U	120 U	25 U	250 U	120 U	12,000 U	12,000 U	50 U	5 U
2-Chloro-1,3-butadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50 U	5 U	10 U	120 U	25 U	250 U	120 U	12,000 U	12,000 U	50 U	5 U
4-Methyl-2-pentanone	50 U	5 U	10 U	120 U	25 U	250 U	120 U	12,000 U	12,000 U	50 U	5 U
Acetone	100 U	10 U	9.7 J	250 U	23 J	500 U	250 U	25,000 U	25,000 U	100 U	10 U
Acetonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrolein	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Allyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	220	0.46 J	560	610	110	3,000	500	49,000	64,000	240	20
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
Carbon tetrachloride	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
Chlorobenzene	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	69	1 U
Chloroethane	20 U	2 U	4 U	50 U	10 U	100 U	50 U	5,000 U	5,000 U	20 U	2 U
Chloroform	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane(Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methacrylate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	4.6 J	1 U	21	8.5 J	15	690	15 J	2,500 U	2,500 U	2.8 J	1 U
Iodomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isobutanol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methacrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl methacrylate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	20 U	2 U	1.3 J	50 U	10 U	100 U	50 U	5,000 U	5,000 U	20 U	2 U
Propionitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
Toluene	56	1 U	11	32	46	1,900	220	8,700	8,600	120	1.4
Trichloroethene	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	64	1 U
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	20 U	2 U	4 U	50 U	10 U	100 U	50 U	5,000 U	5,000 U	20 U	2 U
Xylene, total	42	3 U	40	76	44	980	400	7,500 U	7,500 U	62	3 U
cis-1,3-Dichloropropene	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
trans-1,2-Dichloroethene	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
trans-1,3-Dichloropropene	10 U	1 U	2 U	25 U	5 U	50 U	25 U	2,500 U	2,500 U	10 U	1 U
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG											
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	10 U	10 U	500 U	40 U	2,000 U	2,500 U	10 U	50 U	10 U	100 U	20 U

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Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO20-PZM004		CO21-PZM005		CO22-PZM005		CO23-PZM008		CO24-PZM007		CO25-PZM008		CO26-PZM007		SW17-PZM007		SW17-PZM038		SW18-PZM008		SW18-PZM053	
Sample ID	CO20-PZM004-01D		CO21-PZM005-01D		CO22-PZM005-01D		CO23-PZM008-01D		CO24-PZM007-01D		CO25-PZM008-01D		CO26-PZM007-01D		SW17-PZM007-01D		SW17-PZM038-01D		SW18-PZM008-01D		SW18-PZM053-01D	
Sample Date	12/20/01		12/20/01		12/20/01		12/20/01		12/21/01		12/20/01		12/20/01		12/19/01		12/19/01		12/21/01		12/21/01	
Chemical Name																						
1,2-Dichlorobenzene	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
1,3,5-Trinitrobenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,3-Dichlorobenzene	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
1,3-Dinitrobenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,4-Dichlorobenzene	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
1,4-Naphthoquinone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
1-Naphthylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2,2'-Oxybis(1-chloropropane)	20	U	20	U	1,000	U	80	U	4,000	U	5,000	U	20	U	100	U	20	U	200	U	40	U
2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2,4,5-Trichlorophenol	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
2,4,6-Trichlorophenol	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
2,4-Dichlorophenol	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
2,4-Dimethylphenol	27		10	U	500	U	40	U	2,000	U	2,500	U	10	U	45	J	10	U	100	U	14	J
2,4-Dinitrophenol	50	U	50	U	2,500	U	200	U	10,000	U	12,000	U	50	U	250	U	50	U	500	U	100	U
2,4-Dinitrotoluene	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
2,6-Dichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2,6-Dinitrotoluene	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
2-Acetylaminofluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
2-Chlorophenol	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
2-Methyl-5-nitroaniline	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylaniline	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylnaphthalene	150	J	0.74	J	120	J	30	J	180	J	580	J	10	U	63		10	U	21	J	20	U
2-Methylphenol	19		10	U	500	U	8.9	J	2,000	U	300	J	10	U	75		10	U	15	J	56	
2-Naphthylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitroaniline	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitrophenol	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
2-Picoline	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
3,3'-Dichlorobenzidine	50	U	50	U	2,500	U	200	U	10,000	U	12,000	U	50	U	250	U	50	U	500	U	100	U
3,3'-Dimethylbenzidine	50	U	50	U	2,500	U	200	U	10,000	U	12,000	U	50	U	250	U	50	U	500	U	100	U
3-Methylcholanthrene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
3-Nitroaniline	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
4,6-Dinitro-2-methylphenol	50	U	50	U	2,500	U	200	U	10,000	U	12,000	U	50	U	250	U	50	U	500	U	100	U
4-Aminobiphenyl	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
4-Bromophenyl-phenylether	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
4-Chloro-3-methylphenol	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
4-Chloroaniline	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
4-Chlorophenyl-phenylether	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
4-Methylphenol	24		10	U	500	U	10	J	2,000	U	500	J	10	U	75		10	U	25	J	59	
4-Nitroaniline	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
4-Nitrophenol	50	U	50	U	2,500	U	200	U	10,000	U	12,000	U	50	U	250	U	50	U	500	U	100	U
4-Nitroquinoline-1-oxide	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
7,12-Dimethylbenz(a)anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Acenaphthene	51		10	U	42	J	44		2,000	U	2,500	U	10	U	4.9	J	9.3	J	100	U	3.3	J
Acenaphthylene	74		10	U	500	U	43		2,000	U	380	J	10	U	37	J	17		100	U	4	J
Acetophenone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Aniline	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Anthracene	16		1.1	J	500	U	7.9	J	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Aramite	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Benzo(a)anthracene	0.87	J	2.9	J	500	U	40	U	2,000	U	2,500	U	0.93	J	50	U	10	U	100	U	20	U
Benzo(a)pyrene	10	U	1.9	J	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Benzo(b)fluoranthene	10	U	1.9	J	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Benzo(g,h,i)perylene	10	U	1.9	J	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Benzo(k)fluoranthene	10	U	2.2	J	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Benzyl alcohol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Butylbenzylphthalate	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Chrysene	10	U	3.2	J	500	U	40	U	2,000	U	2,500	U	0.88	J	50	U	10	U	100	U	20	U
Di-n-butylphthalate	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Di-n-octylphthalate	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Dibenz(a,h)anthracene	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U

NA - Not analyzed
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J - Estimated value
L - Reported value based low
R - Unreliable result

U - Analyte not detected
UJ - Not detected, estimated DL

Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO20-PZM004		CO21-PZM005		CO22-PZM005		CO23-PZM008		CO24-PZM007		CO25-PZM008		CO26-PZM007		SW17-PZM007		SW17-PZM038		SW18-PZM008		SW18-PZM053	
Sample ID	CO20-PZM004-01D		CO21-PZM005-01D		CO22-PZM005-01D		CO23-PZM008-01D		CO24-PZM007-01D		CO25-PZM008-01D		CO26-PZM007-01D		SW17-PZM007-01D		SW17-PZM038-01D		SW18-PZM008-01D		SW18-PZM053-01D	
Sample Date	12/20/01		12/20/01		12/20/01		12/20/01		12/21/01		12/20/01		12/20/01		12/19/01		12/19/01		12/21/01		12/21/01	
Chemical Name																						
Dibenzofuran	84	J	10	U	80	J	52		2,000	U	2,500	U	10	U	8.5	J	11		100	U	20	U
Diethylphthalate	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Dimethyl phthalate	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Dinoseb	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Diphenylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Ethyl methanesulfonate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Fluoranthene	18		6	J	500	U	12	J	2,000	U	2,500	U	2.4	J	50	U	10	U	100	U	2	J
Fluorene	98	J	10	U	84	J	63		2,000	U	2,500	U	10	U	9.7	J	1.5	J	100	U	2.2	J
Hexachlorobenzene	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Hexachlorobutadiene	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Hexachlorocyclopentadiene	50	U	50	U	2,500	U	200	U	10,000	U	12,000	U	50	U	250	U	50	U	500	U	100	U
Hexachloroethane	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Hexachloropropene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Indeno(1,2,3-cd)pyrene	10	U	1.7	J	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Isophorone	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	1.6	J
Isosafrole	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Methapyrilene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Methyl methanesulfonate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
N-Nitrosomorpholine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
N-Nitrosopiperidine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Naphthalene	1,700		2.2	J	2,600		1,300		2,500		12,000		0.86	J	2,000		28		750		18	J
Nitrobenzene	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
Pentachlorobenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Pentachloroethane	50	U	50	U	2,500	U	200	U	10,000	U	12,000	U	50	U	250	U	50	U	500	U	100	U
Pentachloronitrobenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Pentachlorophenol	50	U	50	U	2,500	U	200	U	10,000	U	12,000	U	50	U	250	U	50	U	500	U	100	U
Phenacetin	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Phenanthrene	140	J	4	J	95	J	89		160	J	2,500	U	2.7	J	9	J	6.4	J	100	U	3.2	J
Phenol	22		10	U	500	U	14	J	500	J	260	J	10	U	76		36		22	J	70	
Pronamide	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Pyrene	9.4	J	4.3	J	500	U	6.2	J	2,000	U	2,500	U	1.9	J	50	U	10	U	100	U	20	U
Pyridine	20	U	20	U	1,000	U	80	U	7,700		5,000	U	20	U	42	J	20	U	200	U	13	J
Safrole	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
a,a-Dimethylphenethylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
bis(2-Chloroethoxy)methane	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
bis(2-Chloroethyl)ether	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
bis(2-Ethylhexyl)phthalate	10	U	10	U	500	U	40	U	2,000	U	2,500	U	10	U	50	U	10	U	100	U	20	U
n-Nitroso-di-n-butylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitroso-di-n-propylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitroso-n-methylethylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosodiethylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosodimethylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosodiphenylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosopyrrolidine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
p-Dimethylaminoazobenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
p-Phenylenediamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Pesticide/Polychlorinated Biphenyls (																						
Aroclor-1016	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1221	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1232	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1242	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1248	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1254	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1260	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Total Metals (UG/L)																						
Antimony	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U
Arsenic	19.3		5.9	J	5.7	J	5.7	J	5.7	J	5.7	J	5.2	J	2	U	194		4.6	J	40	
Barium	22.5	J	51.5	J	69.4	J	29.5	J	54	J	51.9	J	151	J	69.9	J	136	J	74.5	J	340	

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Table 2.2-B
All Results
Coke Oven Area Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CO20-PZM004		CO21-PZM005		CO22-PZM005		CO23-PZM008		CO24-PZM007		CO25-PZM008		CO26-PZM007		SW17-PZM007		SW17-PZM038		SW18-PZM008		SW18-PZM053	
Sample ID	CO20-PZM004-01D		CO21-PZM005-01D		CO22-PZM005-01D		CO23-PZM008-01D		CO24-PZM007-01D		CO25-PZM008-01D		CO26-PZM007-01D		SW17-PZM007-01D		SW17-PZM038-01D		SW18-PZM008-01D		SW18-PZM053-01D	
Sample Date	12/20/01		12/20/01		12/20/01		12/20/01		12/21/01		12/20/01		12/20/01		12/19/01		12/19/01		12/21/01		12/21/01	
Chemical Name																						
Beryllium	0.4	U	0.4	U	0.4	U	1.6	B	1.3	B	6.6		0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Cadmium	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
Chromium	1.1	U	1.4	J	1.1	J	1.1	U	7.5		1.3	J	6.7		1.1	U	1.5	J	1.1	U	1.1	U
Cobalt	0.86	U	0.86	U	2.5	J	0.86	U	32.4	J	0.98	J	0.86	U	0.86	U	1.1	J	0.86	U	0.86	U
Copper	0.77	U	1.9	B	0.77	U	1	J	3.3	J	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	1.2	J
Lead	1.8	U	13.7		1.8	U	3.4		39.2		1.8	U	4.5		1.8	U	1.8	U	1.8	U	1.8	U
Mercury	0.054	U	0.076	B	0.071	J	0.054	U	0.086	J	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.063	J
Nickel	5.2	J	5.2	J	2.9	J	2.8	J	3	J	2.4	U	2.4	U	6.5	J	2.4	U	6.7	J	2.6	J
Selenium	4.7	J	3.2	U	3.2	U	3.2	U	4.8	B	7.9		3.2	U	3.2	U	3.2	U	3.3	J	3.2	U
Silver	0.75	U	0.75	U	0.83	J	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
Thallium	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	8.6	J	5.7	U	5.7	U
Tin	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U	33.1	J	28.8	U	48.1	J	28.8	U	28.8	U	28.8	U
Vanadium	11.7	J	5.4	J	4.2	J	805		659		3,370		252		39.1	J	17.3	J	72.6		56.5	
Zinc	2.5	B	12.5	J	4.4	B	7.8	B	37.8		14.6	J	6	B	1.5	U	1.5	U	1.5	U	3.1	J
Common Cations (UG/L)																						
Calcium	NA		253,000		33,600		NA		NA		NA		414,000		NA		NA		NA		NA	
Iron	NA		326		1,060		NA		NA		NA		974		NA		NA		NA		NA	
Magnesium	NA		29,700		42,900		NA		NA		NA		257	J	NA		NA		NA		NA	U
Manganese	NA		757		134		NA		NA		NA		178		NA		NA		NA		NA	U
Potassium	NA		19,900		17,700		NA		NA		NA		41,000		NA		NA		NA		NA	
Sodium	NA		135,000		146,000		NA		NA		NA		148,000		NA		NA		NA		NA	
Wet Chemistry (MG/L)																						
Amenable cyanide	0.36	J	0.021	J	4.3	J	3.4	J	0.091		0.52	J	0.15	J	5.4	J	0.066	J	1.7		0.44	
Bicarbonate	NA		129		116		NA		NA		NA		5	U	NA		NA		NA		NA	U
Chloride	NA		142		309		NA		NA		NA		183		NA		NA		NA		NA	
Sulfate	NA		776		61.3		NA		NA		NA		683		NA		NA		NA		NA	
Sulfide	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	5.6		1	U
Total dissolved solids (TDS)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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SECTION 2

Study Area Investigations (Continued)

2.3 Coke Point Landfill (CP SSA)

2.3.1 Site-Specific Activities

Geologic Investigations

The geologic model of the CP SSA was based on geologic information obtained from drilling and CPT analysis at several locations. Soil borings were performed during the RSC Study. In addition, information obtained from the Site-Wide Investigation Groundwater Study was used. Finally, geologic information from previous environmental and geotechnical investigations performed at the site was used where data gaps appeared to exist. The locations of all sources of geologic information are provided in Figure 2.3-1.

Soil Borings. Sixteen soil borings were completed in the CP SSA during the RSC Study. Nine of the soil borings taken were within the shallow water-table zone in conjunction with the installation of shallow piezometers. Three split-spoon soil samples were taken at each shallow boring location except for shallow boring CP04, where four split spoons were recovered to provide lithologic descriptions of the screened interval of the piezometers.

Seven deeper soil borings were completed in the CP SSA during the RSC Study using hollow-stem auger methods. At CP03, CP09, and CP11, one 2-foot-long split-spoon sample was obtained at the bottom of the boring to confirm the lithology of the proposed screen depth of the borehole. At CP08 and CP14 the expected lithology was not encountered on the first spoon; thus, additional split-spoon samples were taken as the augers were advanced to greater depths.

The boring designated SW18-PZM114 and those with designations beginning with “GB” in Figure 2.3-1 were performed during previous investigations at the site.

The boring logs for the CP SSA are located in Appendix 2.3-A.

CPT Analysis Sites. No CPT analyses were done on this site during the RSC. However, several CPT borings were performed during the Site-Wide Investigation Groundwater Study and the logs are provided in Appendix 2.3-A.

2.3.1.2 Groundwater Investigations

Piezometer Network. Figure 2.3-2 shows the CP SSA piezometer network used for groundwater investigations conducted for the RSC Study. As shown on the figure, this network includes 16 piezometers that were installed during the RSC Study and 11 piezometers installed during 2000. Table A-1 in Appendix A presents the construction details for the piezometer network.

Sixteen 2-inch-diameter piezometers were installed in the CP SSA at locations depicted in Figure 2.3-2. Nine piezometers were screened within the water table with bottom elevations between -7 feet and -12 feet. All the water-table piezometers on the site have 10-foot-long screens located within the slag and anthropogenic fill material overlying the site.

Seven 2-inch-diameter piezometers located in the CP SSA are screened at depths that correlate to intermediate water-bearing sands underlying the slag. Screens installed in the intermediate water-bearing sands are 3 feet to 5 feet long with bottom elevations between -25 feet and -62 feet.

Water-Level Measurements. There were two rounds of water-level measurements taken in the area surrounding the Coke Point Landfill. Measurements were taken on December 18, 2001, and March 18, 2002, and the data are presented in Appendix A.

2.3.1.3 Chemical Analysis

Groundwater sampling for the CP SSA took place between December 5 and December 20, 2001. Samples were collected from 12 locations; 8 of these locations were sampled at two depths, and three at three depths. Table 2.3-1 lists the locations, depths, and type of analysis for each of the 22 samples. The two piezometers at CP09 (CP09-PZM047 and CP09-PZM010) were chosen for Appendix IX analysis. The other samples were analyzed for the COPI list.

Two trip blanks, two equipment blanks, and two field duplicates were collected by the field team for this study area. Results of the analyses are presented in Appendix 2.3-B

2.3.2 Site Characterization

2.3.2.1 Geologic Results

The entirety of the CP SSA lies south of the natural (pre-1916) shoreline of the Sparrows Point peninsula. Slag and other anthropogenic fill materials were deposited over tidally influenced shallow marine sediments to construct made land in this area. The upper 100 feet to 120 feet of the subsurface material underlying the CP SSA comprises a sequence of unconsolidated materials (from shallowest to deepest): slag, followed by silty clay and sand of low to medium density (Talbot Formation), followed by sand and clay units of high density (Patapsco Formation.) Figure 2.3-3 shows the locations of five cross sections that present the vertical distribution of the slag and other subsurface materials. Figures 2.3-4 through 2.3-8 show the cross sections. The character of these materials is summarized below.

Slag. The greatest thickness of slag underlying the Coke Point Landfill is found at boring CP14-CPT. The material above the typical grade of elevation about 10 feet is not included in the thickness of the slag because the material generally is not slag but either stockpiled slag material or landfilled waste. The slag thickness is dependent the original depth of the water (i.e., the bathymetry) around the Sparrows Point peninsula. The slag at the site is generally greater than 20 feet thick because much of the site occurs beyond the 20-foot original depth of the Patapsco River (Figure 2.3-9).

Cross section A–A′ (Figure 2.3-4) is oriented northwest to southeast. The coverage by the section is southwest of the original shoreline to the modern shoreline at CP14-CPT adjacent to the Patapsco River. Consequently, the slag along A–A′ becomes thicker to the southeast due to original bathymetry.

Cross section B–B′ (Figure 2.3-5) is oriented from west to east, beginning near the Patapsco River at boring CP05-PZM028 and crossing the Coke Point Landfill to end at SW18-CPT outside of the Coke Point Landfill area. The thickness of the slag is about 30 feet across the cross section.

Cross section C–C′ (Figure 2.3-6) traces the present day shoreline along the southern edge of CP SSA in a general west-to-east orientation. Slag thickness along the line varies between 30 feet and 50 feet. The cross section appears to cross a low in the original topography between CP09-CPT and GB16. Along the segment of the cross section line between CP11-CPT and CP12-CPT, the slag thins as it crosses a high in the underlying topography. At CP12-CPT, the cross section line bends east again toward CP14-CPT, crossing into a low where the slag reaches a thickness of approximately 50 feet.

Cross section D–D′ (Figure 2.3-7) is oriented from north to south, tracing a line from boring CP03-CPT to GB16 adjacent the modern Coke Point shoreline. As the section traces south, the slag thickens steadily from 20 feet. The thickness of the slag along cross section D–D′ is largely influenced by the original bathymetry.

Cross section E–E′ (Figure 2.3-8) is oriented northeast to southwest across the CP SSA from CP03-CPT south to CP09-CPT adjacent to the Patapsco River. The slag thickens from about 23 feet at CP03-CPT to about 30 feet at CP09-CPT.

Talbot Formation. The sediment directly underlying the slag of the CP SSA is silty shelly soft marine clay and sand. The interbedded gray shelly clay, silt, and white shelly sand layers of low to moderate density are associated with the Talbot Formation. The thickness of the Talbot ranges across the area from 3 feet at CP05-PZM028 to nearly 70 feet at CP09-CPT and CP11-CPT.

North-to-south cross section A–A′ (Figure 2.3-4) shows the thickness of the clay and interbedded sands to vary from 5 feet at CP03-CPT to about 40 feet at CP08-CPT, then thins to about 20 feet at CP14-CPT. Directly underlying the slag in the northern and southern extents of the section are soft silty shelly clays followed by a reworked sand. Directly underlying the slag at CP03-CPT and CP08-CPT is a sand that achieves 25 feet in thickness at the maximum vertical extent.

In west-east cross section B–B′ (Figure 2.3-5), the Talbot shows greater interbedding of sand and clay. Immediately underlying the slag at GB-17 and CP07-CPT is an 8- to 10-foot-thick lens of clay. The bottom of the clay lens has a constant elevation of -25 feet but pinches out in the northern and southern lateral extents because of erosion. Underlying the slag at CP05-PZM028, the discontinuous clay lens, and the slag further east at CP08-CPT and SW18-PZM053 is a 4-foot to 10-foot layer of sand. Near CP08-CPT, where the section passes over a former topographic low, there is an additional deposit of clay.

Directly underlying the slag along the shore (cross section C–C′ in Figure 2.3-6) from CP05-PZM028 east to CP12-CPT is a nearly continuous layer of sand ranging in thickness from 3 feet to 40 feet. At CP12-CPT, where the top of the Talbot achieves a maximum elevation of -15 feet, there is a small 2-foot-thick lens of clay overlying the sand. Near CP14-CPT, the elevation of the top of the Talbot decreases to -40 feet, and the slag is underlain by the deeper clay that seems to underlie most of the section. Interbedded with and underlying the clay are two relatively laterally extensive deposits of sand.

Along the north-south cross section D–D′ (Figure 2.3-7), the shallow clay directly underlies the slag. The clay is thickest in the north and pinches out near CP07-CPT. At GB-16, the sand directly underlies the slag at an elevation of -28 feet and subsequently underlies the clay through the remainder of the section.

Clay directly underlies the slag in much of northeast-southwest cross section E–E′ (Figure 2.3-8). The clay is 3 to 5 feet thick, except at the southernmost extent near CP09-CPT, where the clay is absent. At CP09-CPT, sand directly underlies the slag. This sand is continuous through GB18 and appears again at CP03-CPT, continuing north to the end of the cross section at CP03-CPT.

Patapsco Formation. The nature of the Patapsco Formation has been previously discussed in Section 2.1.2.1 and does not require a further generalized discussion here. This section will include only discussions of individual features of the Patapsco Formation as those features appear underlying CP SSA.

Examination of the boring log records indicates the surface of the Patapsco has an apparent paleochannel eroded into the Patapsco by the ancestral Susquehanna River, as shown in Figure 2.3-10. The paleochannel encompasses the entire southern area of the CP SSA, deepening to the south from an elevation of about -50 to about -90 feet. Nowhere is the Patapsco in direct contact with the anthropogenic material of the CP SSA.

2.3.2.2 Groundwater Results

Results of the water levels taken in December 2001 are presented in Figures 2.3-11 and 2.3-12. These figures include contour maps for the unconfined water table zone and the potentiometric surface of the underlying intermediate sand zone. Note that the maps provided in Figures 2.3-11 and 2.3-12 are taken from the facility-wide maps provided in Figures A-1 and A-2, respectively, in Appendix A. The following discussion refers to the maps of the water table and of the potentiometric surface of the sands underlying the site, and to water levels noted in cross sections A–A′ through E–E′ (Figures 2.3-4 through 2.3-8, respectively.)

Figure 2.3-11 shows the water table on December 18, 2001. Water levels measured at other times show a similar configuration. Note that the elevation of the local surface-water bodies (i.e., Patapsco River) is -1.25 feet.

In general, the water table at the CP SSA slopes toward the surrounding surface water of the Patapsco River, although there may be some radial flow from a slight water-table high in the southern part of the site. Thus, the shallow groundwater discharges directly into the surrounding tidal waters. The slope of the water table is very low.

Figure 2.3-12 shows the potentiometric surface defined on December 18, 2001, by piezometers screened in sand units at elevations between -28 and -53 feet. These sand units appear generally to be connected horizontally. Groundwater in the sand units underlying the CP SSA generally flows into the Patapsco River. However, some groundwater in the northern part of the site appears to flow northward toward the CO SSA under the influence of pumping at the Graving Dock.

Cross sections A–A′ through E–E′ (Figures 2.3-4 through 2.3-8) show water levels at different depths in the subsurface at different locations on and near the site. In general, water levels decline with depth across most of the site, which would be expected as water infiltrates from the surface, reaches the water table, and moves downward into the confined groundwater system, depending on the hydraulic conductivity of the local stratigraphy. The extent to which groundwater actually does this depends upon the transmissive capabilities of the intervening clay and silt layers. Although no values of vertical hydraulic conductivity are available for the CP SSA the fine-grained layers have similar character and, therefore, probably have the low conductivities as those present at the other SSAs. This suggests that vertical flow is limited where the clay and silt units form continuous confining layers. The fact that the water levels generally drop with depth also indicates resistance to vertical groundwater flow.

In summary, shallow groundwater moves westward and southeastward across the site toward Bear Creek, southward toward the Patapsco River on the south, and eastward toward the turning basin, with some localized radial flow from a slightly high water table in the southern part of the SSA. Water levels indicate that groundwater potentially moves downward into deeper sand units, although the presence of clay and silt resists this vertical migration. Groundwater in these units under most of the site moves toward Bear Creek, the Patapsco River, and the turning basin but under the northern part of the site some groundwater appears to move northward toward the pumping at the Baltimore Marine Industries Graving Dock.

2.3.2.3 Chemical Analysis

A summary table of detected results for field samples is presented in Table 2.3-2. Duplicate results have been included for locations where this quality control procedure was conducted. The qualifying letters appearing beside the concentrations are explained in Section 1.3.3. Blank spaces in the table indicate that the compound was not detected. The concentrations found by the validator to be affected by blank contamination are considered to be not detected and therefore are also indicated by blank spaces. Results rejected by the validator are qualified by "R." "NA" indicates that this chemical was not analyzed because it was not part of the compound list assigned to the sample.

The complete analytical results are presented in Table 2.3-B in Appendix 2.3-B. The table shows all results for all locations in the CP SSA for all compounds in each sample collected during the RSC sampling event of late December 2001. The detected results are shaded for easier identification. "NA" indicates that the chemical was not analyzed for because it was not part of the compound list assigned to the sample or, as in sample CP03-PZM008, a fraction of the requested analyses could not be analyzed due to a sampling problem.

There were a few anomalies associated with the Coke Point Landfill samples:

- The samplers were given the sample-naming scheme according to the planning memorandum to identify the samples. However, when the piezometers were installed, the depth or the locations sometimes varied from the plan. Here is a list of the sample names that were recorded incorrectly on the chain of custody:

Sample ID from Plan	Sample ID Corrected
CP03-PZM005	CP03-PZM008
CP06-PZM041	CP06-PZM009

TS07-PZM005	TS07-PPM005

- Sample CP03-PZM008 had no results for semivolatiles. The piezometer ran dry, and not enough volume could be collected for the semivolatile analysis.
- The sampling crew was unable to record field parameters for three samples (CP03-PZM008, CP06-PZM009, and CP10-PZM008). The water levels at these piezometers were too deep for the Geopump to work, so bailers were used to collect the sample volume, and with this sampling method, water could not be delivered to the flow-through cell for the field parameter readings. Also, the piezometers ran dry during the bailing process, so samples were collected as soon as enough water had reentered the piezometers to allow sampling.
- In the data validation reports for the CP SSA, an R qualifier were applied to five volatile compounds (1,4-dioxane, acrylonitrile, bromomethane, iodomethane, and isobutanol) because of very low relative response factors in the CP09 samples. These compounds are part of the Appendix IX list, but are not on the COPI list; and some are known to be poor responders. The mercury results for these samples also were rejected by the validator due to severe interferences in the matrix. There were high surrogate recoveries for the volatiles in sample CP03-PZM 008. The laboratory re-analyzed the samples and confirmed the original result, which points to the presence of interferences in the sample.
- Blank contamination was more prevalent in this area. It affected the metals fraction only and predominantly beryllium, chromium, and silver. The results affected by blank contamination are qualified with a "B" in Table 2.3-B. Sample results affected by blank contamination are usually considered not detected. Duplicate results were similar, showing good correlation between the sample and its duplicate. The major ion data were reported without qualification.

Chemical analysis results for the shallow groundwater show volatile and semivolatile organic compounds (Figure 2.3-13) above the detectable limit. Piezometer CP08-PZM008 shows concentrations for several organic compounds, notably benzene (14,000 µg/L), toluene (3,800 µg/L), and xylene (2,100 µg/L). Concentrations of COPI metals were detected throughout the CP SSA (Figure 2.3-14). In locations CP03-PZM008, CP06-PZM009, CP010-PZM008, and CP011-PZM010, the concentrations of some of the COPI metals were above 1,000 µg/L. Only one location, CP03-PZM008, showed PCB (Aroclor 1254 and 1260) concentrations at estimated values below the reporting limit of 1 µg/L. Of the samples analyzed for Appendix IX parameters, two compounds that were detected were not included in the COPI list: the sample from piezometer CP09-PZM010 showed estimated concentrations of styrene (0.36 J µg/L) and acetophenone (1.8 J µg/L).

Chemical analysis results for groundwater from the intermediate zone showed concentrations of volatile and semivolatile organic compounds to be generally less than concentrations found in the water table piezometers at the same locations (Figure 2.3-13). A notable exception is acetone, which was intermittently detected at higher concentrations in the deeper piezometers than at the water table piezometers at the same location. Concentrations of COPI metals, typically in the parts per billion range (µg/L), were found in several wells throughout the CP SSA (Figure 2.3-14). PCB compounds were not detected in any of the samples. There were no compounds detected in the Appendix IX samples that do not appear on the COPI list.-

Site Conceptual Model

This section provides a summary and synthesis of the geologic, hydrogeologic, and chemical results of the investigation for the CP SSA. Figure 2.3-15 is a schematic diagram showing the general geology and movement of groundwater and site-related contamination at the site.

The surficial material of the site is slag. The bottom of the slag achieves its deepest elevation furthest from the original shoreline. Talbot clay and reworked sand underlie the slag. The sand lenses interbedded in the clay units can be several feet thick and are reworked material eroded out of the older Patapsco Formation. White to red sand and brittle, dense clay of the Patapsco Formation underlie the Talbot Formation.

Shallow groundwater at the site moves primarily laterally to discharge into the Patapsco River. Flow from the deeper water-bearing sands of the CP SSA moves out into the Patapsco River and northward toward the pumping at the Graving Dock north of the CO SSA.

Table 2.3-1
Sample Analysis
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Location	Water-Bearing Unit	Sample ID	Appendix IX List	COPI List	Date Sampled
CP02-PZM026	Int. Sands	CP02-PZM026-01D		X	12/05/01
CP02-PZM007	Water Table	CP02-PZM007-01D		X	12/05/01
CP03-PZM025	Int. Sands	CP03-PZM025-01D		X	12/06/01
CP03-PZM008	Water Table	CP03-PZM008-01D		X	12/20/01
CP05-PZM028	Int. Sands	CP05-PZM028-01D		X	12/06/01
CP05-PZM008	Water Table	CP05-PZM008-01D		X	12/06/01
CP05-PZM019	Int. Sands	CP05-PZM019-01D		X	12/06/01
CP06-PZM009	Water Table	CP06-PZM009-01D		X	12/19/01
CP07-PZM026	Int. Sands	CP07-PZM026-01D		X	12/06/01
CP07-PZM006	Water Table	CP07-PZM006-01D		X	12/06/01
CP08-PZM034	Int. Sands	CP08-PZM034-01D		X	12/05/01
CP08-PZM008	Water Table	CP08-PZM008-01D		X	12/05/01
CP09-PZM047	Int. Sands	CP09-PZM047-01D	X		12/06/01
CP09-PZM010	Water Table	CP09-PZM010-01D	X		12/06/01
CP10-PZM008	Water Table	CP10-PZM008-01D		X	12/19/01
CP11-PZM040	Int. Sands	CP11-PZM040-01D		X	12/05/01
CP11-PZM010	Water Table	CP11-PZM010-01D		X	12/05/01
CP12-PZM052	Int. Sands	CP12-PZM052-01D		X	12/05/01
CP12-PZM012	Water Table	CP12-PZM012-01D		X	12/05/01
CP14-PZM062	Int. Sands	CP14-PZM062-01D		X	12/05/01
CP14-PZM009	Water Table	CP14-PZM009-01D		X	12/05/01
TS07-PPM005	Water Table	TS07-PPM005-01D		X	12/06/01

Table 2.3-2
Detected Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP02-PZM007	CP02-PZM026	CP03-PZM008	CP03-PZM025	CP05-PZM008	CP05-PZM019	CP05-PZM028	CP06-PZM009	CP07-PZM006	CP07-PZM026	CP08-PZM008		CP08-PZM034
Sample ID	CP02-PZM007-01D	CP02-PZM026-01D	CP03-PZM008-01D	CP03-PZM025-01D	CP05-PZM008-01D	CP05-PZM019-01D	CP05-PZM028-01D	CP06-PZM009-01D	CP07-PZM006-01D	CP07-PZM026-01D	CP08-PZM008-01D	CP08-PZM008-01D DUP	CP08-PZM034-01D
Sample Date	12/05/01	12/05/01	12/20/01	12/06/01	12/06/01	12/06/01	12/06/01	12/19/01	12/06/01	12/06/01	12/05/01	12/05/01	12/05/01
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1-Dichloroethane													
2-Butanone					9.1	7.4		53					
2-Hexanone						0.61 J		2.4 J					
4-Methyl-2-pentanone						1.2 J							
Acetone	43	100		53	69	58		220					5,600
Benzene	4.6		43 J	0.29 J	18	62	120	20	1,800	4.4	14,000	14,000	
Carbon disulfide					1.9	1.2							
Chloroform		0.36 J											
Ethylbenzene	0.37 J				0.53 J	1.3		0.61 J					
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	3.4		33 J	0.72 J	2.4	9.9	6.6	11	97	0.36 J	3,800	3,600	
Xylene, total	3.1		45 J		3.3	10		2.9 J			2,000	2,100	
Semivolatile Organic Compounds (UG/L)													
2,4-Dimethylphenol			NA		10	14 J		2.7 L	600	3.9 J	53	77 J	
2-Methylnaphthalene			NA		3.7 J	5.9 J	29 J	3.5 J			32 J	50	
2-Methylphenol			NA		3 J	4.5 J		2.9 L	20 J		38 J	49	
2-Nitrophenol			NA					R					
4-Methylphenol			NA		27	46	31 J	10 L	190	2.8 J	51	67	
Acenaphthene		1 J	NA		5 J	6.7 J	31 J	2.6 J				5.4 J	
Acenaphthylene			NA			2.8 J		1.4 J			14 J	19	
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene			NA					0.87 J			4.7 J	4.8 J	
Benzo(a)anthracene			NA										
Benzo(a)pyrene			NA										
Benzo(b)fluoranthene			NA										
Benzo(g,h,i)perylene			NA										
Benzo(k)fluoranthene			NA										
Chrysene			NA										
Dibenz(a,h)anthracene			NA										
Dibenzofuran	6 J	0.84 J	NA		1.1 J	1.6 J	11 J	2.2 J			14 J	19	
Fluoranthene	2.6 J	1.5 J	NA	0.92 J				2.1 J			4.8 J	5.3 J	
Fluorene	13		NA	1.3 J	1.2 J	2.2 J	13 J	3.6 J			20 J	24	1.3 J
Indeno(1,2,3-cd)pyrene			NA										
Naphthalene	0.85 J		NA		31	95	680	35	73 J	22	570	710	1 J
Phenanthrene	1 J		NA		1.7 J	1.9 J		8.1 J		0.97 J	27 J	32	2.1 J
Phenol			NA		58	120	450	41 L	12 J	16	20 J	16	
Pyrene	1.5 J	1.1 J	NA					2 J				3.5 J	
Pyridine	18 J		NA								82 J	140 J	
Polychlorinated Biphenyls (UG/L)													
Aroclor-1254			0.68 J										
Aroclor-1260			0.51 J										
Total Metals (UG/L)													
Antimony	4.8 J		15.5 J										
Arsenic	36.4	6.2 J	116		2.2 J	3.2 J		117	12.2	3.3 J		2.9 J	10.8
Barium	12.9 J	56.5 J	1,340	96.6 J	743	1,110	224	2,030	86.6 J	66.9 J	109 J	114 J	44.9 J
Beryllium			7.2					32.1					
Cadmium			5 J										
Chromium			1,390					6,780					

NA - Not analyzed
J - Value is estimated
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Not detected
UJ - Not detected, DL estimated
UL - Not detected, DL low

Table 2.3-2
Detected Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP02-PZM007	CP02-PZM026	CP03-PZM008	CP03-PZM025	CP05-PZM008	CP05-PZM019	CP05-PZM028	CP06-PZM009	CP07-PZM006	CP07-PZM026	CP08-PZM008		CP08-PZM034
Sample ID	CP02-PZM007-01D	CP02-PZM026-01D	CP03-PZM008-01D	CP03-PZM025-01D	CP05-PZM008-01D	CP05-PZM019-01D	CP05-PZM028-01D	CP06-PZM009-01D	CP07-PZM006-01D	CP07-PZM026-01D	CP08-PZM008-01D	CP08-PZM008-01D DUP	CP08-PZM034-01D
Sample Date	12/05/01	12/05/01	12/20/01	12/06/01	12/06/01	12/06/01	12/06/01	12/19/01	12/06/01	12/06/01	12/05/01	12/05/01	12/05/01
Chemical Name													
Cobalt	14.8 J	44.8 J	80.5	7.1 J		1.2 J		99.9		3.7 J			
Copper	23.7 J		1,550					746					
Lead			1,600					492					
Mercury			1			0.11 J	0.054 J	1.3		0.063 J			0.066 L
Nickel		5.4 J	589		9.2 J	18.2 J	9 J	306	6.8 J	2.5 J	4.3 J	3.1 J	9.5 J
Selenium	756												
Silver			2.7 J					15.9					
Thallium							7.9 J	341 J		6.5 J			
Tin			287	38.1 J									
Vanadium	230	14.5 J	1,290	6.1 J	12.2 J	9.4 J	8.2 J	10,400 J	57.5	3.1 J	52.4	57.2	140
Zinc	3.6 J	6.3 J	2,230					2,970					6.8 J
Common Cations (UG/L)													
Calcium	541,000	644,000	NA	235,000	NA	NA	NA	2,990,000	NA	NA	NA	NA	123,000
Iron		28,500 L	NA	3,500	NA	NA	NA	1,260,000	NA	NA	NA	NA	
Magnesium	37,800	99,500	NA	337,000	NA	NA	NA	729,000	NA	NA	NA	NA	272,000
Manganese	230	15,100	NA	6,360	NA	NA	NA	235,000	NA	NA	NA	NA	701
Potassium	42,100	21,200	NA	108,000	NA	NA	NA	260,000	NA	NA	NA	NA	71,100
Sodium	239,000	1,190,000	NA	1,630,000	NA	NA	NA	915,000	NA	NA	NA	NA	1,940,000
Wet Chemistry (MG/L)													
Amenable cyanide	0.022 J	0.0086 J	0.14 J	0.013 J	77.3 J	11.9 J	35.9 J	0.06 J	9.3 J	0.037 J	3.1 J	2.9 J	0.04 J
Bicarbonate	5	208	NA	191	NA	NA	NA		NA	NA	NA	NA	816
Chloride	137	721	NA	2,820	NA	NA	NA	1,120	NA	NA	NA	NA	3,090
Sulfate	1,760	1,810	NA	1,130	NA	NA	NA	113	NA	NA	NA	NA	337
Sulfide	1	1			16.4								1
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed
J - Value is estimated
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Not detected
UJ - Not detected, DL estimated
UL - Not detected, DL low

Table 2.3-2
Detected Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP09-PZM010	CP09-PZM047		CP10-PZM008	CP11-PZM010	CP11-PZM040	CP12-PZM012	CP12-PZM052	CP14-PZM009	CP14-PZM062	TS07-PPM005
Sample ID	CP09-PZM010-01D	CP09-PZM047-01D	CP09-PZM047-01D DUP	CP10-PZM008-01D	CP11-PZM010-01D	CP11-PZM040-01D	CP12-PZM012-01D	CP12-PZM052-01D	CP14-PZM009-01D	CP14-PZM062-01D	TS07-PPM005-01D
Sample Date	12/06/01	12/06/01	12/06/01	12/19/01	12/05/01	12/05/01	12/05/01	12/05/01	12/05/01	12/05/01	12/06/01
Chemical Name											
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethane					0.68 J						
2-Butanone	9			8.3 J	18						3.5 J
2-Hexanone					0.83 J						
4-Methyl-2-pentanone	1.1 J										0.74 J
Acetone	120	250	990	88 J	110	1,400	730	2,300	62 J	750	27
Benzene	15	0.65 J			62		100		46	0.43 J	180
Carbon disulfide	2.1										
Chloroform				1.9 J						0.35 J	
Ethylbenzene	0.37 J				0.95 J						2.1
Styrene	0.36 J			NA	NA	NA	NA	NA	NA	NA	NA
Toluene	3.3	0.5 J		3.2	7.8		19		4.3	0.42 J	28
Xylene, total	4.2			3.6 J	13		22		5.4 J		53
Semivolatile Organic Compounds (UG/L)											
2,4-Dimethylphenol	12			2.9 J	58				3 J		8.1 J
2-Methylnaphthalene	4.2 J			64	12 J		5.5 J		1.8 J		8.2 J
2-Methylphenol	7.3 J			3.7 J	25 J		0.9 J		4 J		2.7 J
2-Nitrophenol				27			1.5 J				
4-Methylphenol	47			23	90		4.6 J		7.2 J		17 J
Acenaphthene	3.8 J	8.8 J	6.8 J	6.9 J	4 J		0.88 J		1.2 J		
Acenaphthylene	13	1.5 J		35	8.5 J						
Acetophenone	1.8 J			NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	1.1 J	2.3 J	1.2 J	10							
Benzo(a)anthracene				4.4 J							
Benzo(a)pyrene				4 J							
Benzo(b)fluoranthene				4 J							
Benzo(g,h,i)perylene				3.5 J							
Benzo(k)fluoranthene				4.2 J							
Chrysene				4.8 J							
Dibenz(a,h)anthracene				0.84 J							
Dibenzofuran	3.2 J	4.1 J	2.3 J	35	8.6 J						
Fluoranthene	1.1 J	6.7 J	6.1 J	23	6.2 J				0.94 J		
Fluorene	4.8 J	5.1 J	2 J	33	6.7 J						
Indeno(1,2,3-cd)pyrene				3.6 J							
Naphthalene	140			430	98		68		34		100
Phenanthrene	5.6 J		0.6 J	72	29 J	1.1 J	2 J		2.6 J		
Phenol	180			430	290		14		14		21
Pyrene		3.1 J	2.9 J	14							
Pyridine	2.8 J			3.4 J	11 J				3.6 J		
Polychlorinated Biphenyls (UG/L)											
Aroclor-1254											
Aroclor-1260											
Total Metals (UG/L)											
Antimony				12.6							
Arsenic				37.5	3.1 J	5.5 J	3 J	5 J	2.5 J	8.5 J	3.5 J
Barium	887	106 J	96.2 J	3,590	1,460	57 J	135 J	29.1 J	354	35 J	428
Beryllium				4.3 J							
Cadmium				6.4							
Chromium	1.9 J	3.3 J	6	1,140							

NA - Not analyzed
J - Value is estimated
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Not detected
UJ - Not detected, DL estimated
UL - Not detected, DL low

Table 2.3-2
Detected Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP09-PZM010		CP09-PZM047				CP10-PZM008		CP11-PZM010		CP11-PZM040		CP12-PZM012		CP12-PZM052		CP14-PZM009		CP14-PZM062		TS07-PPM005	
Sample ID	CP09-PZM010-01D		CP09-PZM047-01D		CP09-PZM047-01D DUP		CP10-PZM008-01D		CP11-PZM010-01D		CP11-PZM040-01D		CP12-PZM012-01D		CP12-PZM052-01D		CP14-PZM009-01D		CP14-PZM062-01D		TS07-PPM005-01D	
Sample Date	12/06/01		12/06/01		12/06/01		12/19/01		12/05/01		12/05/01		12/05/01		12/05/01		12/05/01		12/05/01		12/06/01	
Chemical Name																						
Cobalt			2.3	J			22.8	J	1.4	J	1.7	J			1.2	J	0.95	J				
Copper							451												0.93	J		
Lead	3.3						664															
Mercury		R		R		R			0.07	J							0.071	L			0.063	J
Nickel	34.2	J			4.5	J	167		17.7	J	5.4	J	2.9	J	4.1	J	5.3	J				
Selenium																						
Silver					1.8	J	3.7	J														
Thallium											10.5											
Tin							184															
Vanadium	22.4	J	58.3		52.7		1,060	J	4.2	J	15.3	J	5.1	J	18.7	J	3.1	J	27.5	J	4	J
Zinc	3.6	J					3,590								9.6	J						
Common Cations (UG/L)																						
Calcium	NA		77,600		78,900		1,270,000		819,000		68,100		NA		127,000		882,000		147,000		NA	
Iron	NA		7,560	J	7,670	J	326,000		209		148		NA				129	L	813	L	NA	
Magnesium	NA		483,000		511,000		173,000		24.5	J	124,000		NA		274,000		225	J	44,400		NA	
Manganese	NA		976	L	838	L	30,300		7.1	J	15.1		NA		296		35.6		41.6		NA	
Potassium	NA		133,000	J	131,000	J	149,000		122,000		124,000		NA		79,400		43,200		55,200		NA	
Sodium	NA		3,460,000		3,410,000		235,000		609,000		2,970,000		NA		2,140,000		102,000		888,000		NA	
Wet Chemistry (MG/L)																						
Amenable cyanide	1.4	J					0.004	J	3.8	J	0.77	J	0.17	J	0.017	J	0.82	J	0.12	J	0.23	J
Bicarbonate	NA		2,000		2,370						216		NA		241		5		68		NA	
Chloride	NA		6,090		5,980		315		976		4,620		NA		3,830		127		1,700		NA	
Sulfate	NA		15		18.1		9.3		8.4		20.9		NA		387		131		25.4		NA	
Sulfide													2.9		1		1		2.9			
Total dissolved solids (TDS)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

NA - Not analyzed
J - Value is estimated
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Not detected
UJ - Not detected, DL estimated
UL - Not detected, DL low

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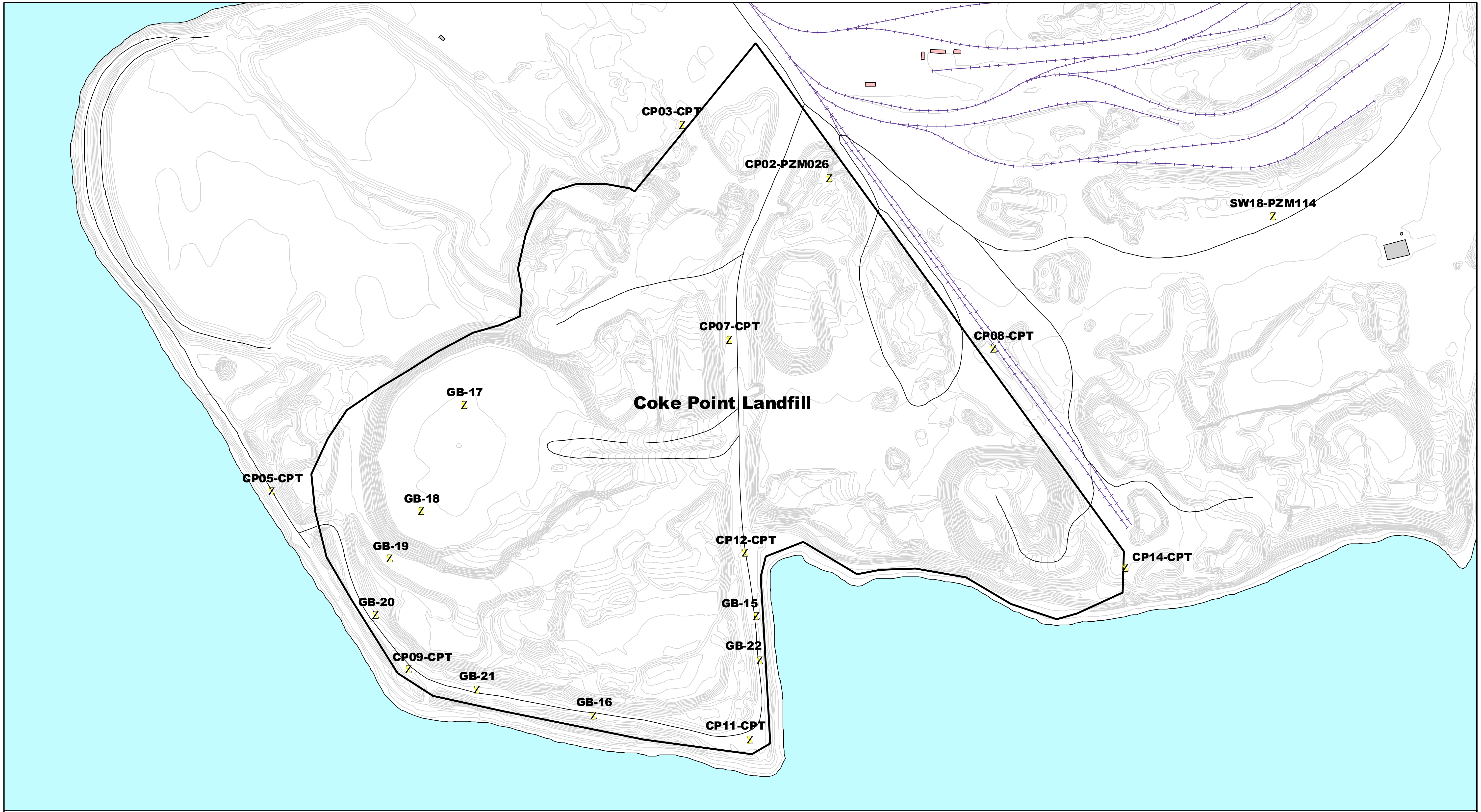

LEGEND

- Z Geologic Investigation Boring Location
- ▭ Special Study Area
- ▭ Water Body
- ■ Dam/Pier/Boat Ramp/Dry Dock
- ▭ Existing Buildings
- ▭ Demolished Buildings
- Original 1917 Shore Line
- Roads
- Railroads
- Contours (2' Interval)

N

0 200 400 Feet

Figure 2.3-1
Geologic Investigation Locations
Coke Point Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

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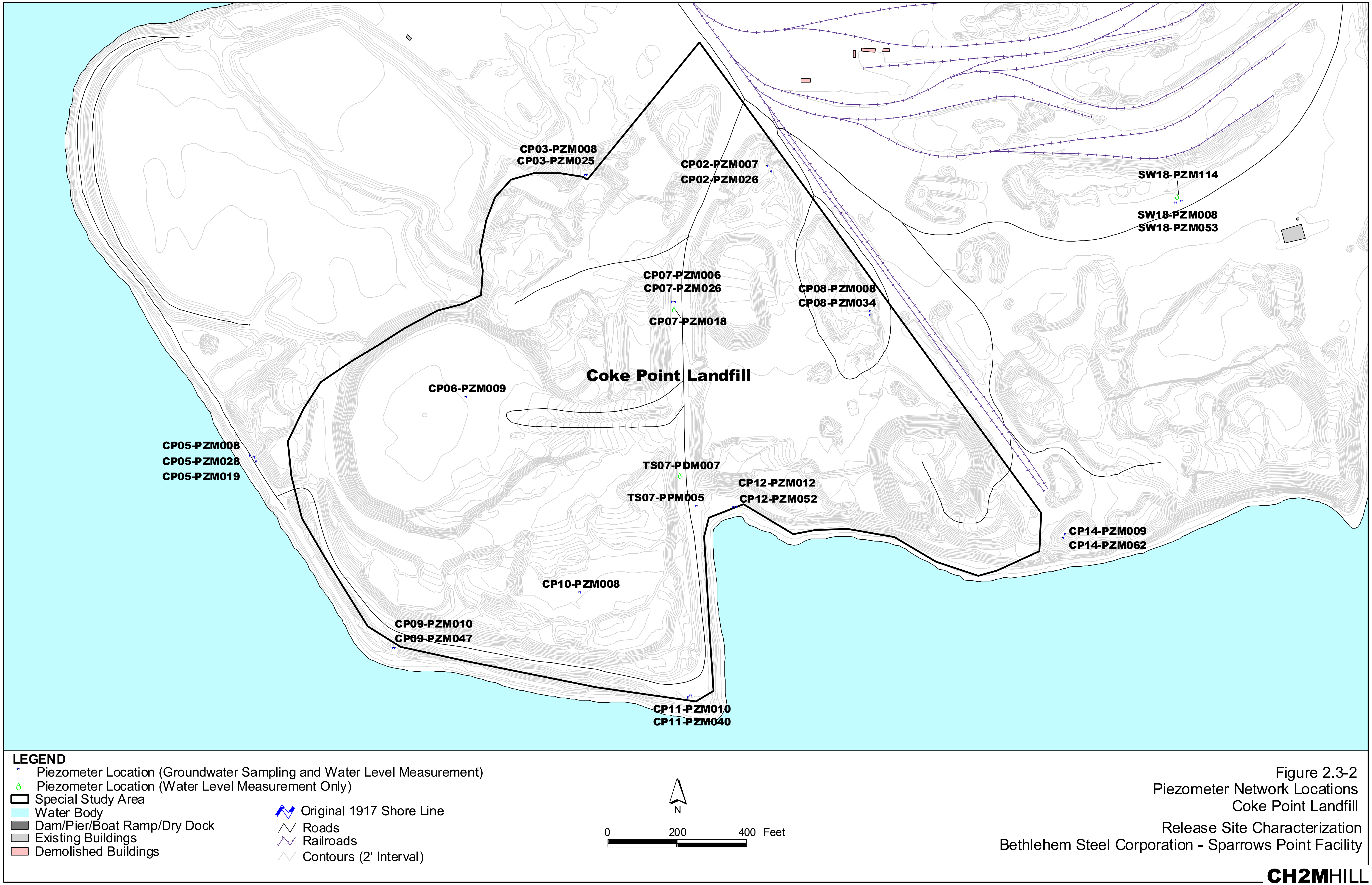

Figure 2.3-2
Piezometer Network Locations
Coke Point Landfill

Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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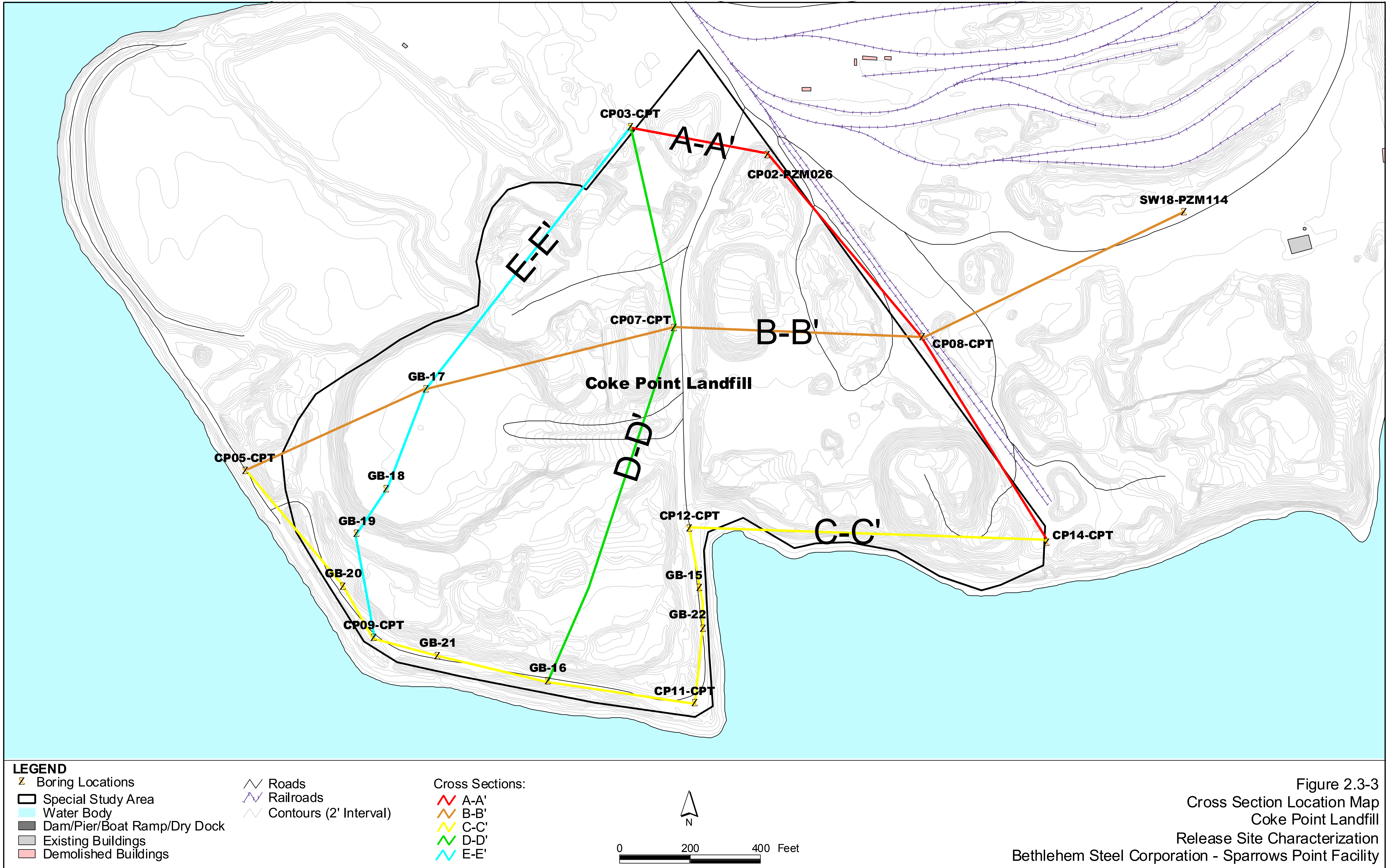

Figure 2.3-3
Cross Section Location Map
Coke Point Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

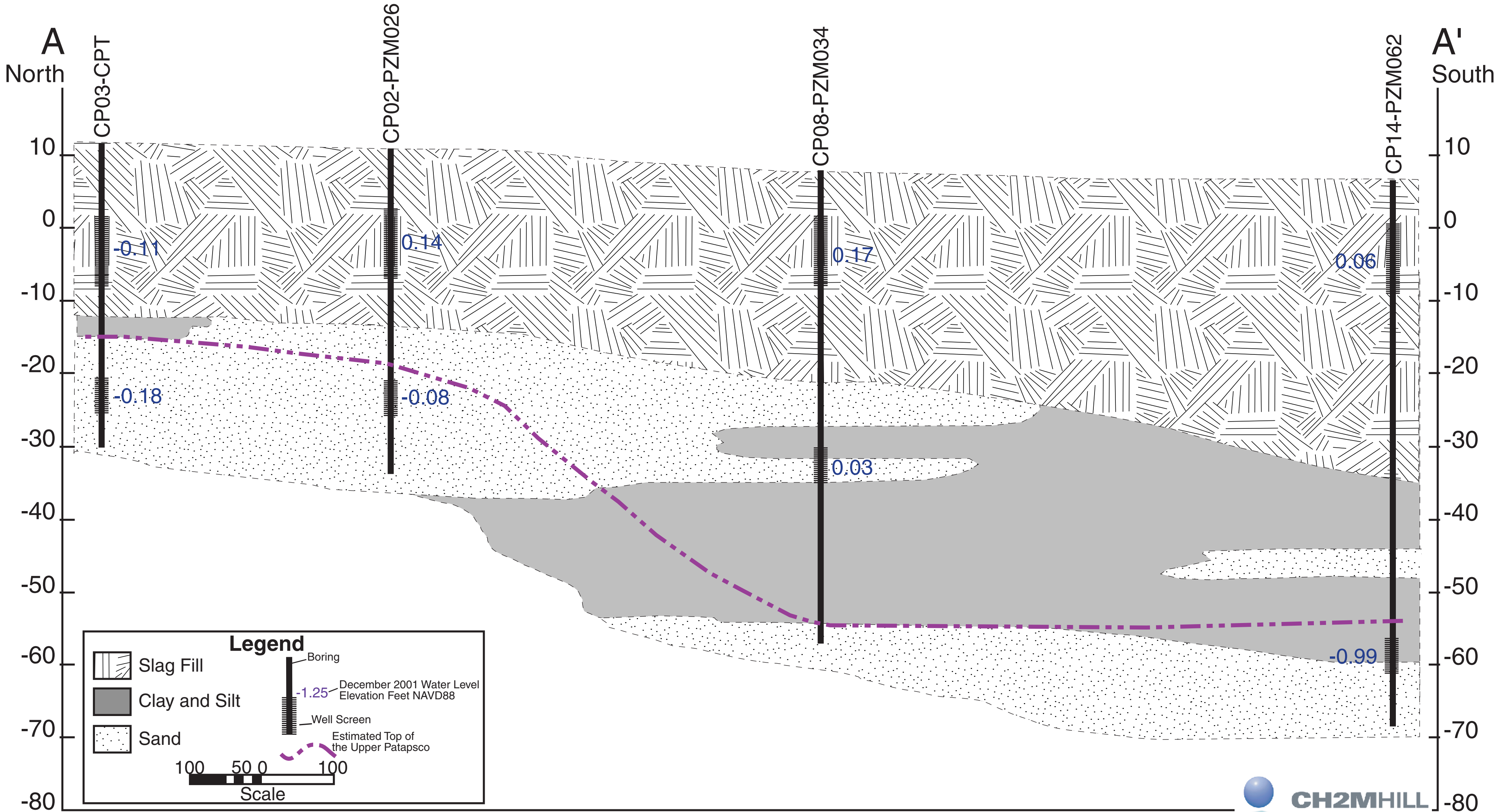

Figure 2.3-4
Section A-A'
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

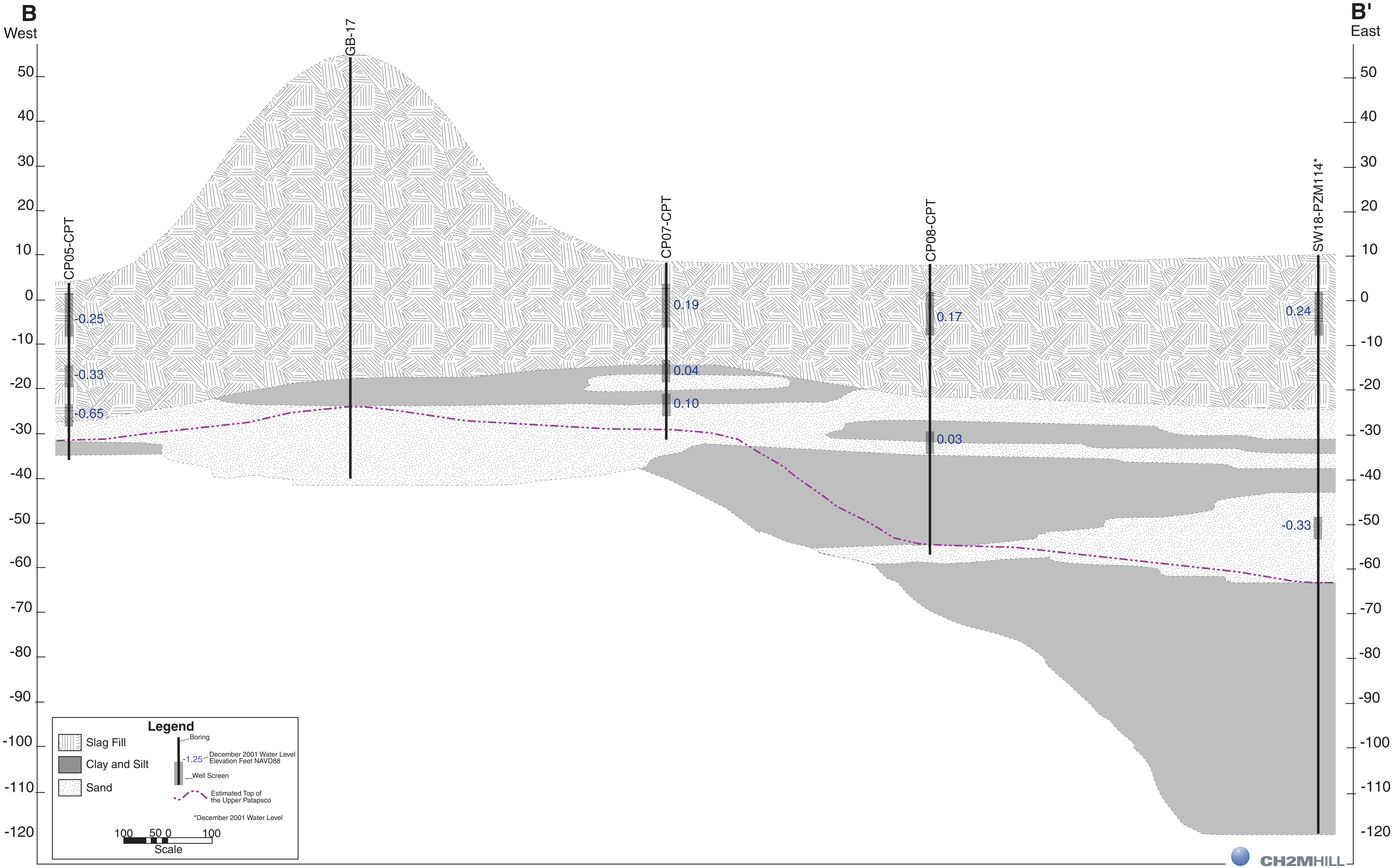

Figure 2.3-5
Section B-B'
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

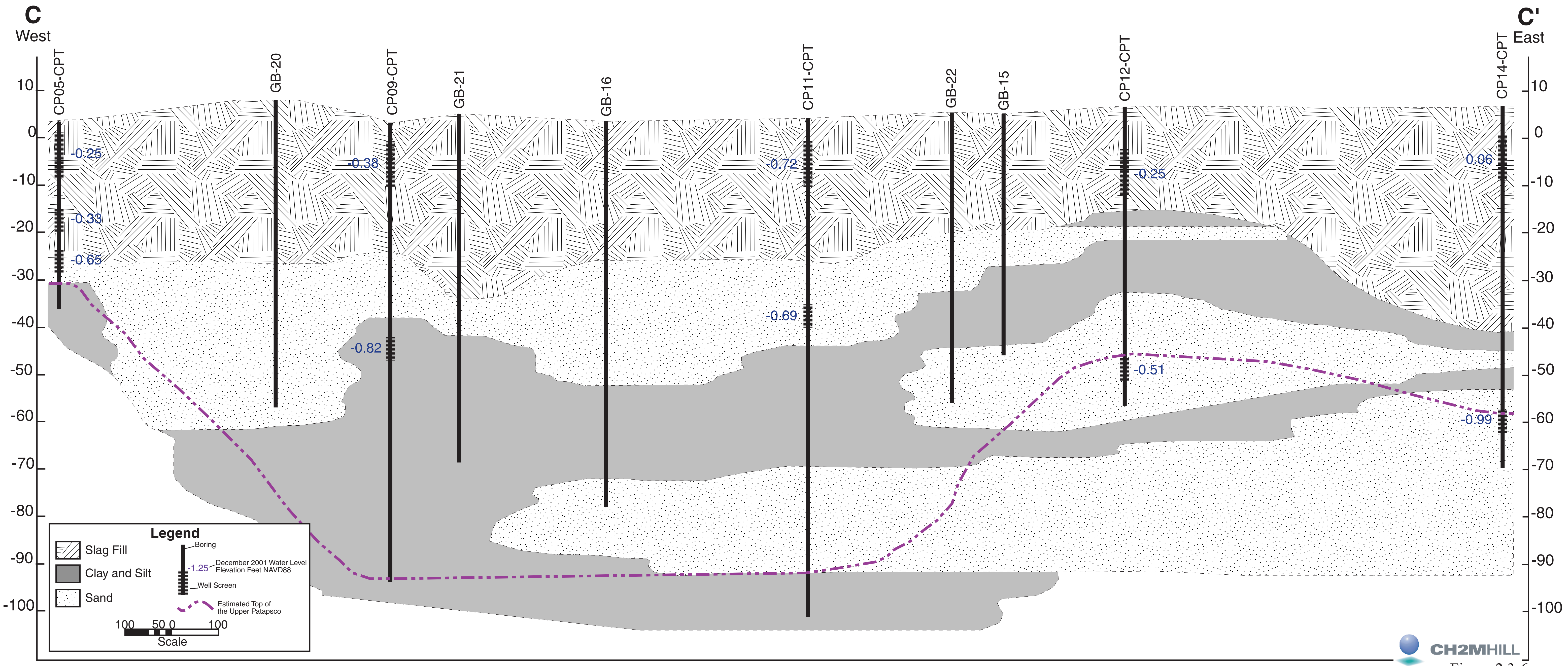

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Figure 2.3-6
Section C-C'
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

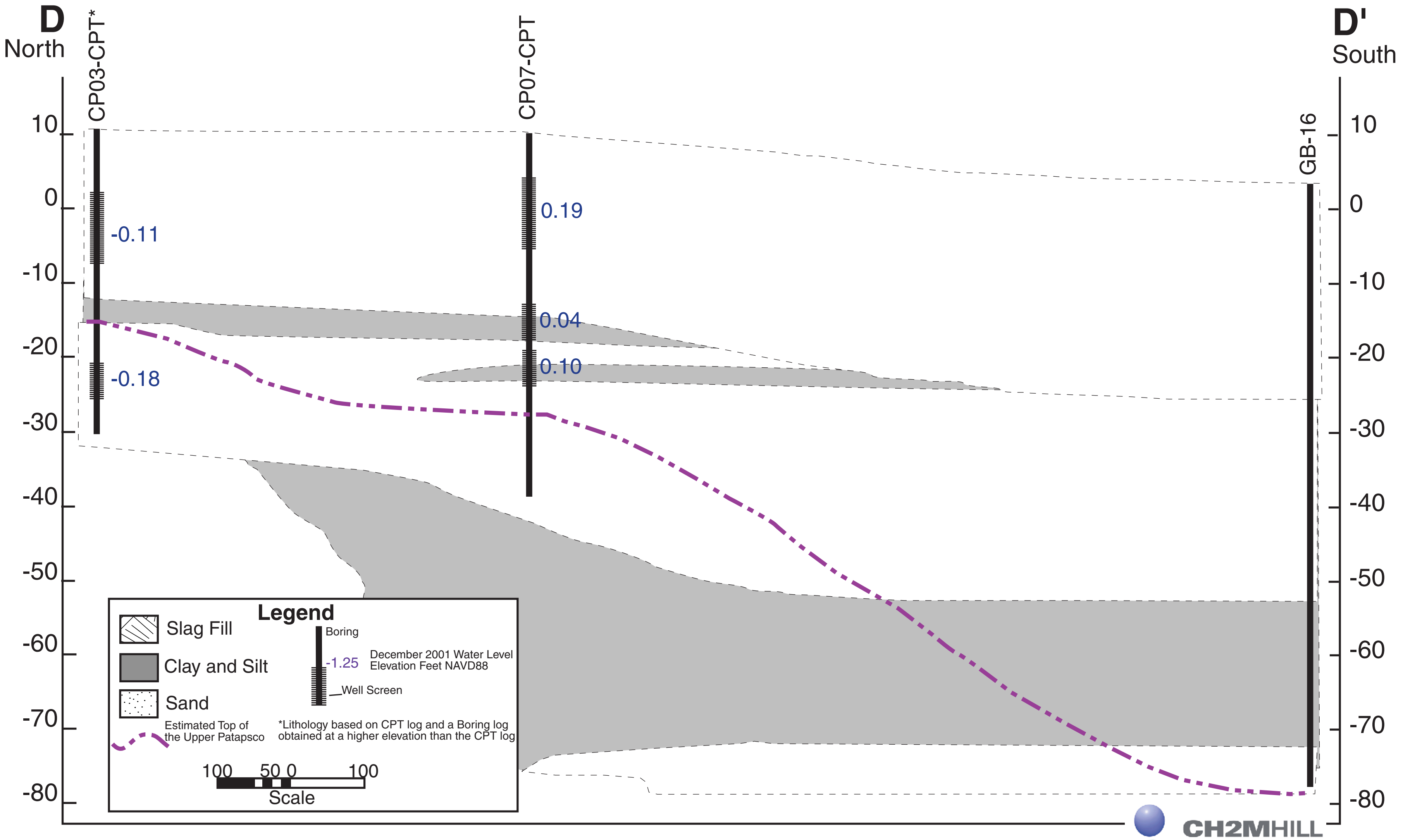

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Figure 2.3-7
Section D-D'
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

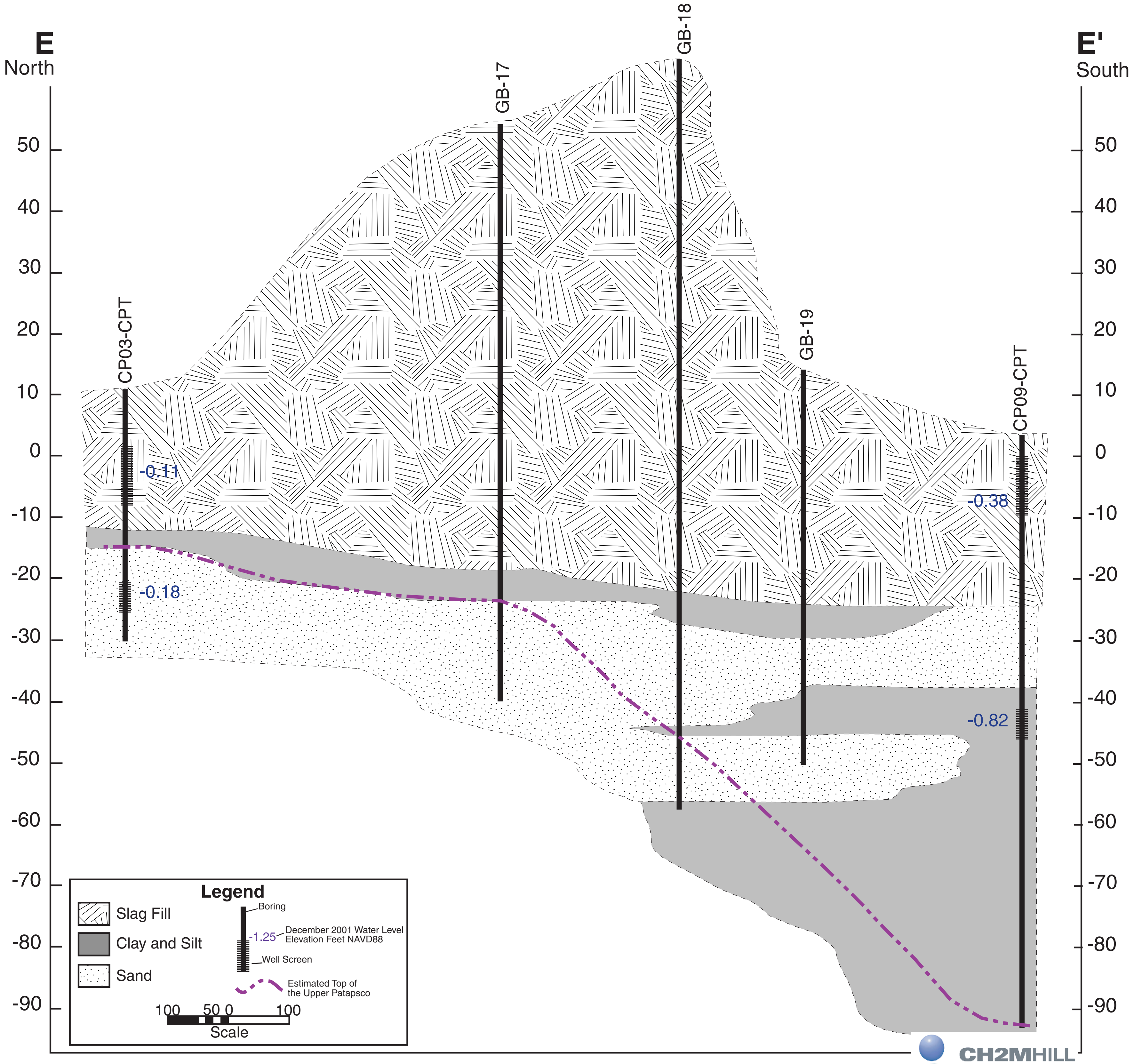

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Figure 2.3-8
Section E-E'
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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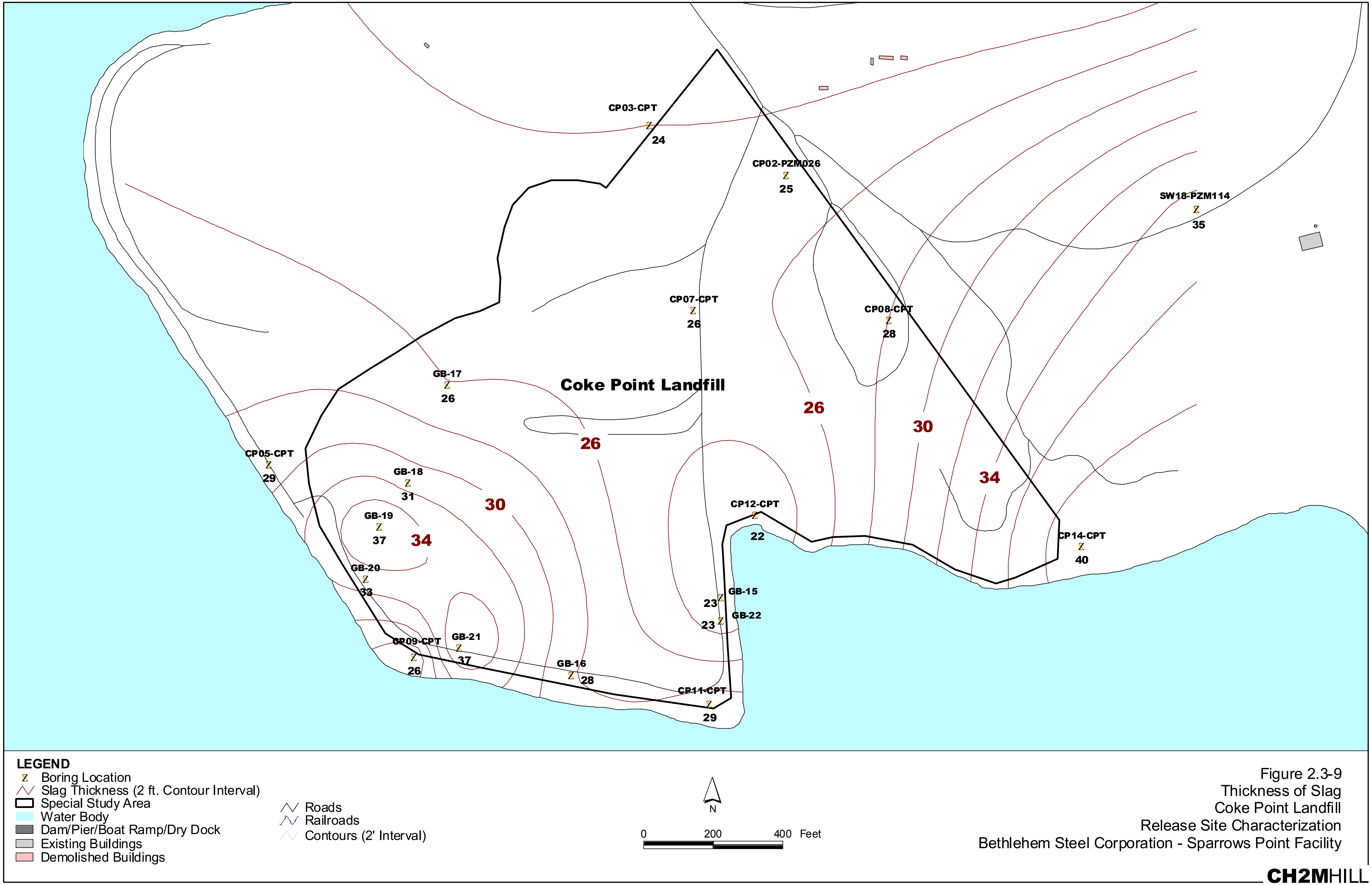
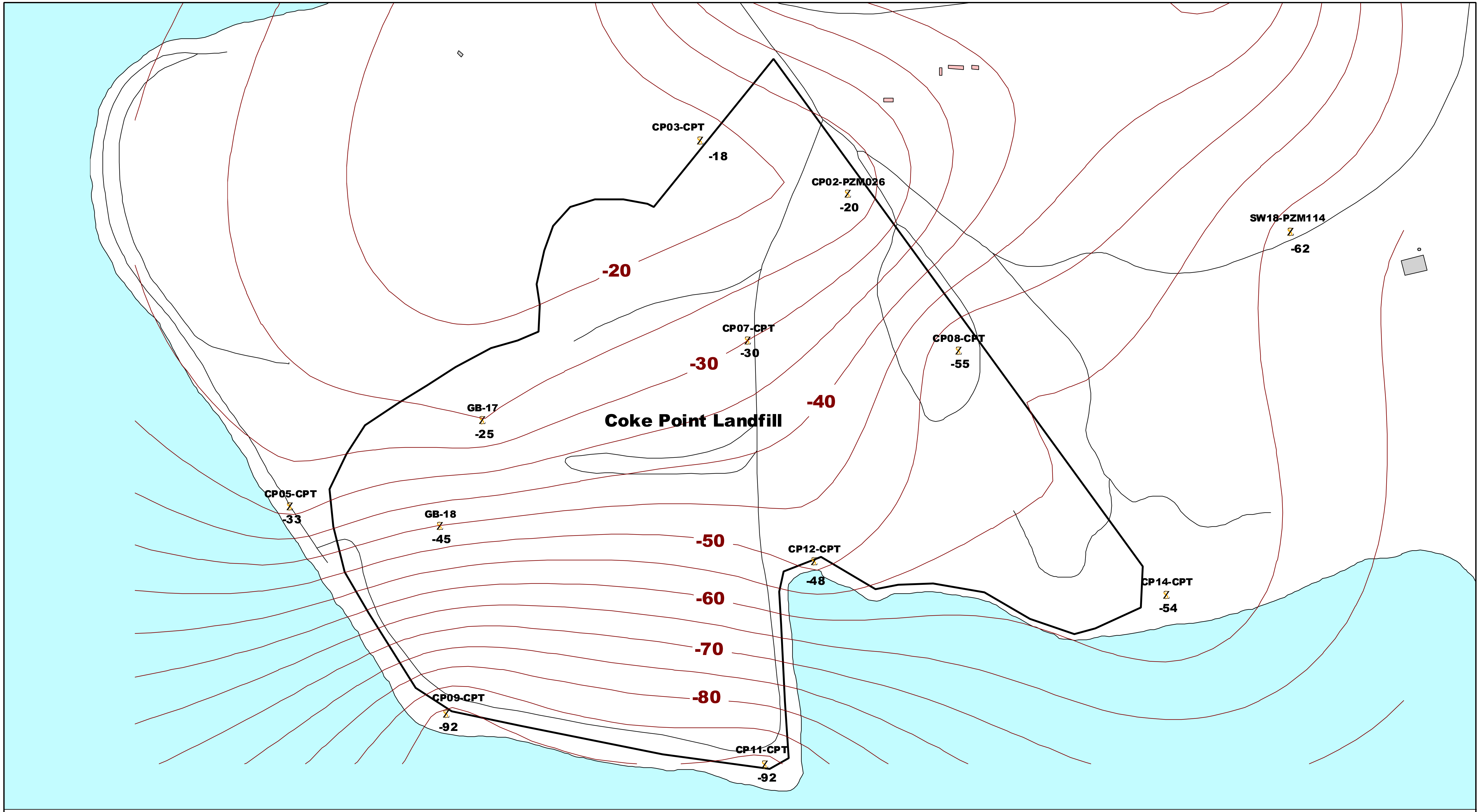


Figure 2.3-9
Thickness of Slag
Coke Point Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

File Path: c:\sparrowspt\documents\figures\rsc-figures-cdrive.apr



LEGEND
- Z Boring Location
- ╱╲ Top of Patapsco (5 ft. Contour Interval)
- ▭ Special Study Area
- ▭ Water Body
- ■ Dam/Pier/Boat Ramp/Dry Dock
- ▭ Existing Buildings
- 🟥 Demolished Buildings
- ╱╲ Roads
- ╱╲ Railroads
- ╱╲ Contours (2' Interval)

N

0 200 400 Feet

Figure 2.3-10
Elevation of theTop of the Patapsco
Coke Point Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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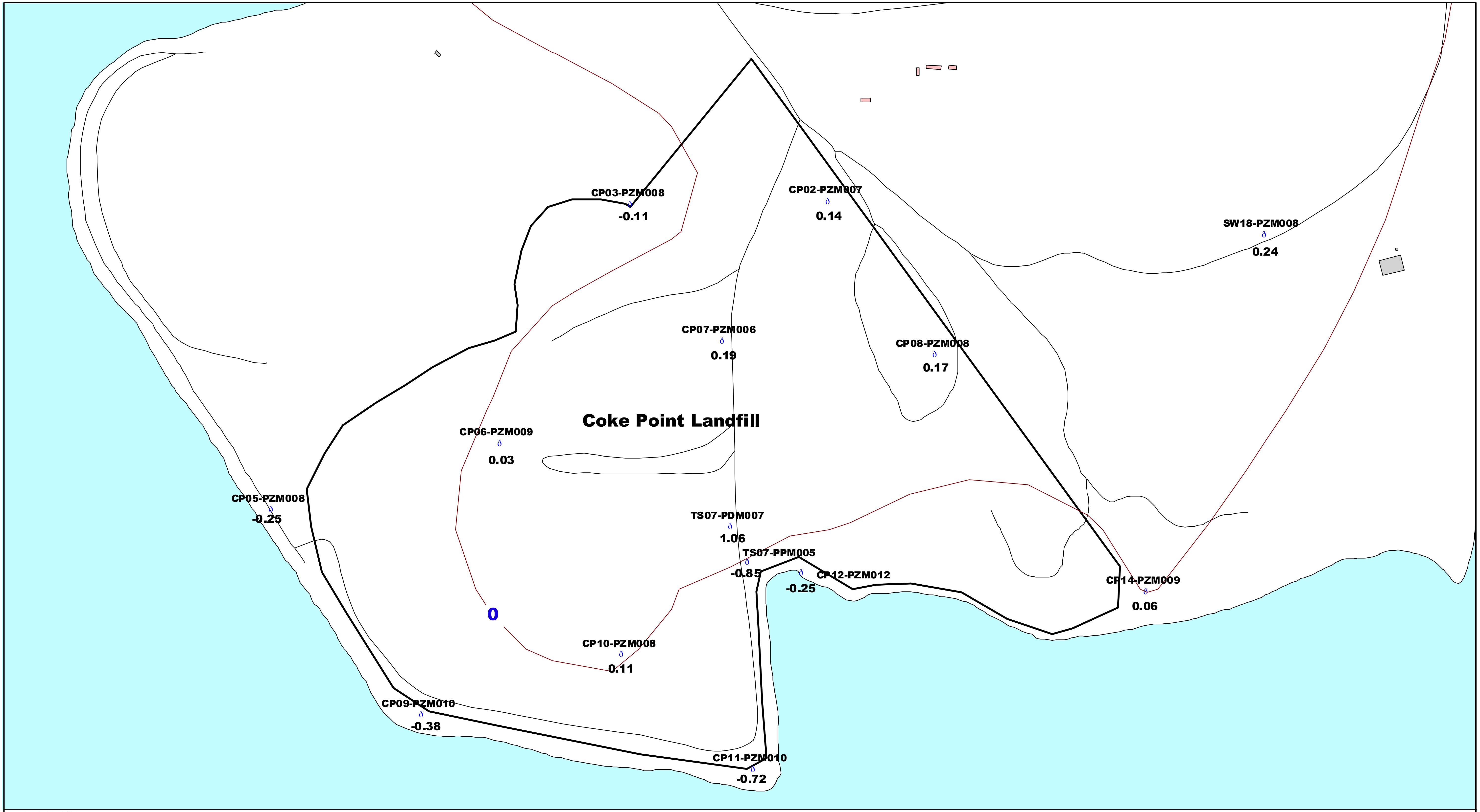

Figure 2.3-11
Water Level Elevations - December 18, 2001, Water Table
Coke Point Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Note: Surface elevation of Bear Creek, Patapsco River, Old Road Bay, and Jones Creek is -1.25 feet NAVD

CH2MHILL

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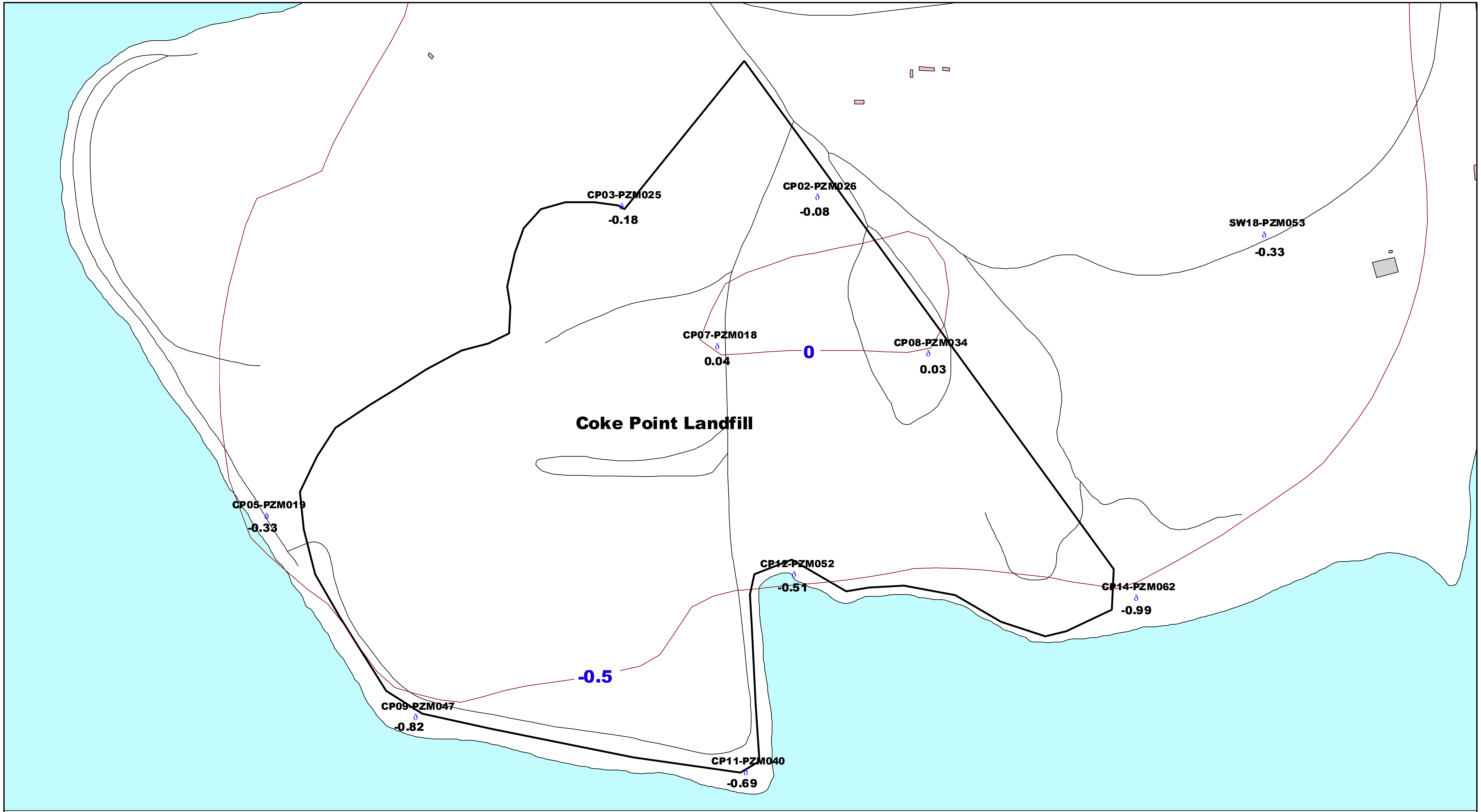


LEGEND

- ◊ Deeper Sand Piezometer
- ╱╲ Deeper Sand Water Level Contour (0.5 Ft. Contour)
- ☐ Special Study Area
- 🟦 Water Body
- ■ Dam/Pier/Boat Ramp/Dry Dock
- ▨ Existing Buildings
- 🟥 Demolished Buildings
- ╱╲ Original 1917 Shore Line
- ╱╲ Roads
- ╱╲ Railroads

Note: Surface elevation of Bear Creek, Patapsco River, Old Road Bay, and Jones Creek is -1.25 feet NAVD

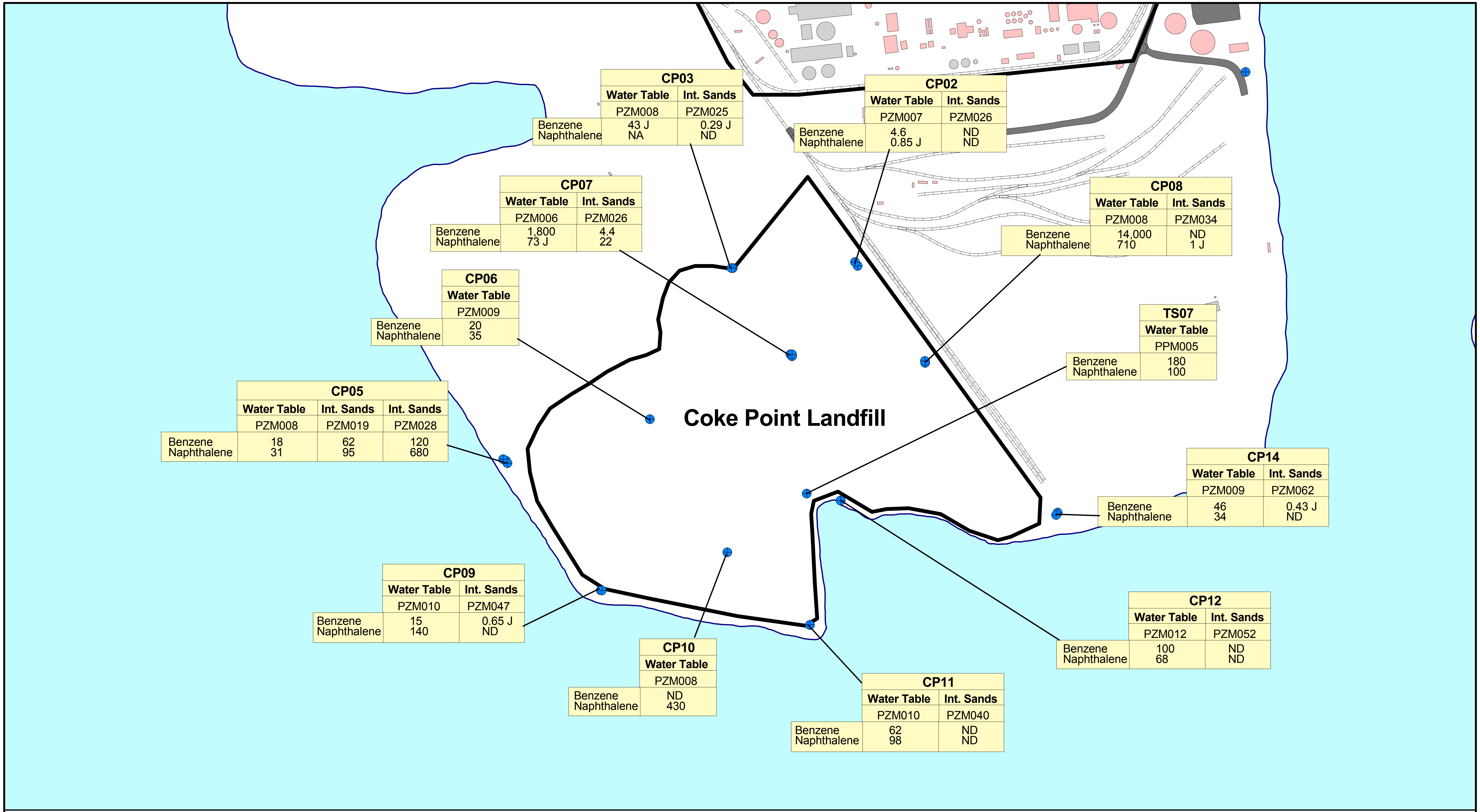
Figure 2.3-12

Water Level Elevations - December 18, 2001, Deeper Sand Piezometric Surface
Coke Point Landfill

Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

File Path: v:\18gis\sparrowspointdivision\figures\bethsteel_constituents.apr



CP03

	Water Table	Int. Sands
	PZM008	PZM025
Benzene	43 J	0.29 J
Naphthalene	NA	ND

CP02

	Water Table	Int. Sands
	PZM007	PZM026
Benzene	4.6	ND
Naphthalene	0.85 J	ND

CP07

	Water Table	Int. Sands
	PZM006	PZM026
Benzene	1,800	4.4
Naphthalene	73 J	22

CP08

	Water Table	Int. Sands
	PZM008	PZM034
Benzene	14,000	ND
Naphthalene	710	1 J

CP06

	Water Table
	PZM009
Benzene	20
Naphthalene	35

TS07

	Water Table
	PPM005
Benzene	180
Naphthalene	100

CP05

	Water Table	Int. Sands	Int. Sands
	PZM008	PZM019	PZM028
Benzene	18	62	120
Naphthalene	31	95	680

CP14

	Water Table	Int. Sands
	PZM009	PZM062
Benzene	46	0.43 J
Naphthalene	34	ND

CP09

	Water Table	Int. Sands
	PZM010	PZM047
Benzene	15	0.65 J
Naphthalene	140	ND

CP12

	Water Table	Int. Sands
	PZM012	PZM052
Benzene	100	ND
Naphthalene	68	ND

CP10

	Water Table
	PZM008
Benzene	ND
Naphthalene	430

CP11

	Water Table	Int. Sands
	PZM010	PZM040
Benzene	62	ND
Naphthalene	98	ND

LEGEND

- ⊕ Piezometer Locations
- ∧∧ Shore Line
- ∧∧ Railroads
- ■ Roads/Paved Areas
- □ Buildings
- ■ Buildings Under Construction
- ■ Demolished Buildings
- ■ Water Bodies

Concentrations in ug/L
J = Estimated Concentration
ND = Not Detected
NA = Not Anlayzed

N

200 0 200 400 600 Feet

Figure 2.3-13
Indicator Organics - Coke Point Landfill
Bethlehem Steel Corp. - Sparrows Point

CH2MHILL

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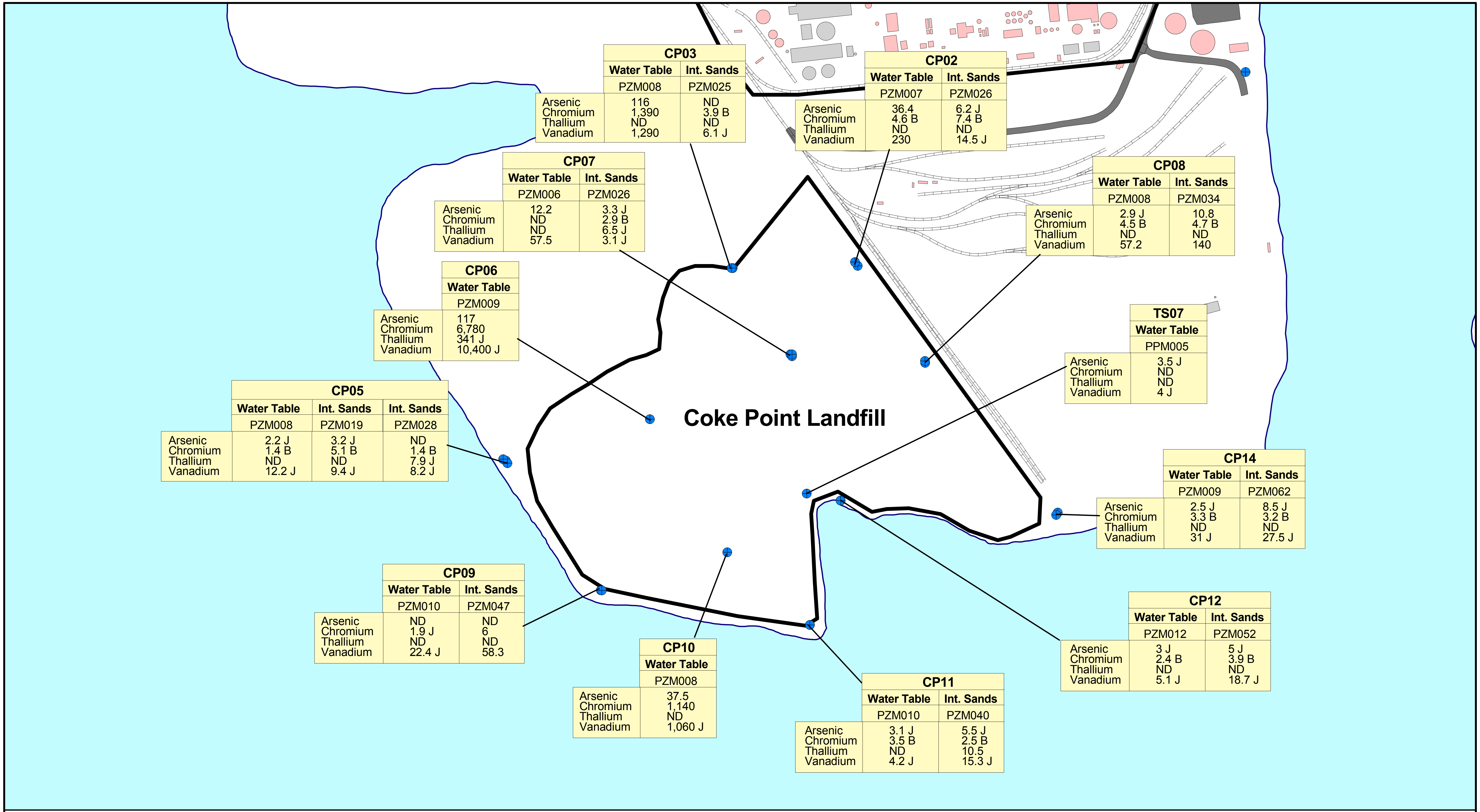


CP03

	Water Table	Int. Sands
	PZM008	PZM025
Arsenic	116	ND
Chromium	1,390	3.9 B
Thallium	ND	ND
Vanadium	1,290	6.1 J

CP02

	Water Table	Int. Sands
	PZM007	PZM026
Arsenic	36.4	6.2 J
Chromium	4.6 B	7.4 B
Thallium	ND	ND
Vanadium	230	14.5 J

CP07

	Water Table	Int. Sands
	PZM006	PZM026
Arsenic	12.2	3.3 J
Chromium	ND	2.9 B
Thallium	ND	6.5 J
Vanadium	57.5	3.1 J

CP08

	Water Table	Int. Sands
	PZM008	PZM034
Arsenic	2.9 J	10.8
Chromium	4.5 B	4.7 B
Thallium	ND	ND
Vanadium	57.2	140

CP06

	Water Table
	PZM009
Arsenic	117
Chromium	6,780
Thallium	341 J
Vanadium	10,400 J

TS07

	Water Table
	PPM005
Arsenic	3.5 J
Chromium	ND
Thallium	ND
Vanadium	4 J

CP05

	Water Table	Int. Sands	Int. Sands
	PZM008	PZM019	PZM028
Arsenic	2.2 J	3.2 J	ND
Chromium	1.4 B	5.1 B	1.4 B
Thallium	ND	ND	7.9 J
Vanadium	12.2 J	9.4 J	8.2 J

CP14

	Water Table	Int. Sands
	PZM009	PZM062
Arsenic	2.5 J	8.5 J
Chromium	3.3 B	3.2 B
Thallium	ND	ND
Vanadium	31 J	27.5 J

CP09

	Water Table	Int. Sands
	PZM010	PZM047
Arsenic	ND	ND
Chromium	1.9 J	6
Thallium	ND	ND
Vanadium	22.4 J	58.3

CP12

	Water Table	Int. Sands
	PZM012	PZM052
Arsenic	3 J	5 J
Chromium	2.4 B	3.9 B
Thallium	ND	ND
Vanadium	5.1 J	18.7 J

CP10

	Water Table
	PZM008
Arsenic	37.5
Chromium	1,140
Thallium	ND
Vanadium	1,060 J

CP11

	Water Table	Int. Sands
	PZM010	PZM040
Arsenic	3.1 J	5.5 J
Chromium	3.5 B	2.5 B
Thallium	ND	10.5
Vanadium	4.2 J	15.3 J

LEGEND

- ⊕ Piezometer Locations
- ∿ Shore Line
- ⩩ Railroads
- ■ Roads/Paved Areas
- □ Buildings
- ■ Buildings Under Construction
- ■ Demolished Buildings
- ■ Water Bodies

Concentrations in ug/L
J = Estimated Concentration
B = Detected in Associated Blank
ND = Not Detected
NA = Not Anlayzed

N

200 0 200 400 600 Feet

Figure 2.3-14
Indicator Metals - Coke Point Landfill
Bethlehem Steel Corp. - Sparrows Point

CH2MHILL

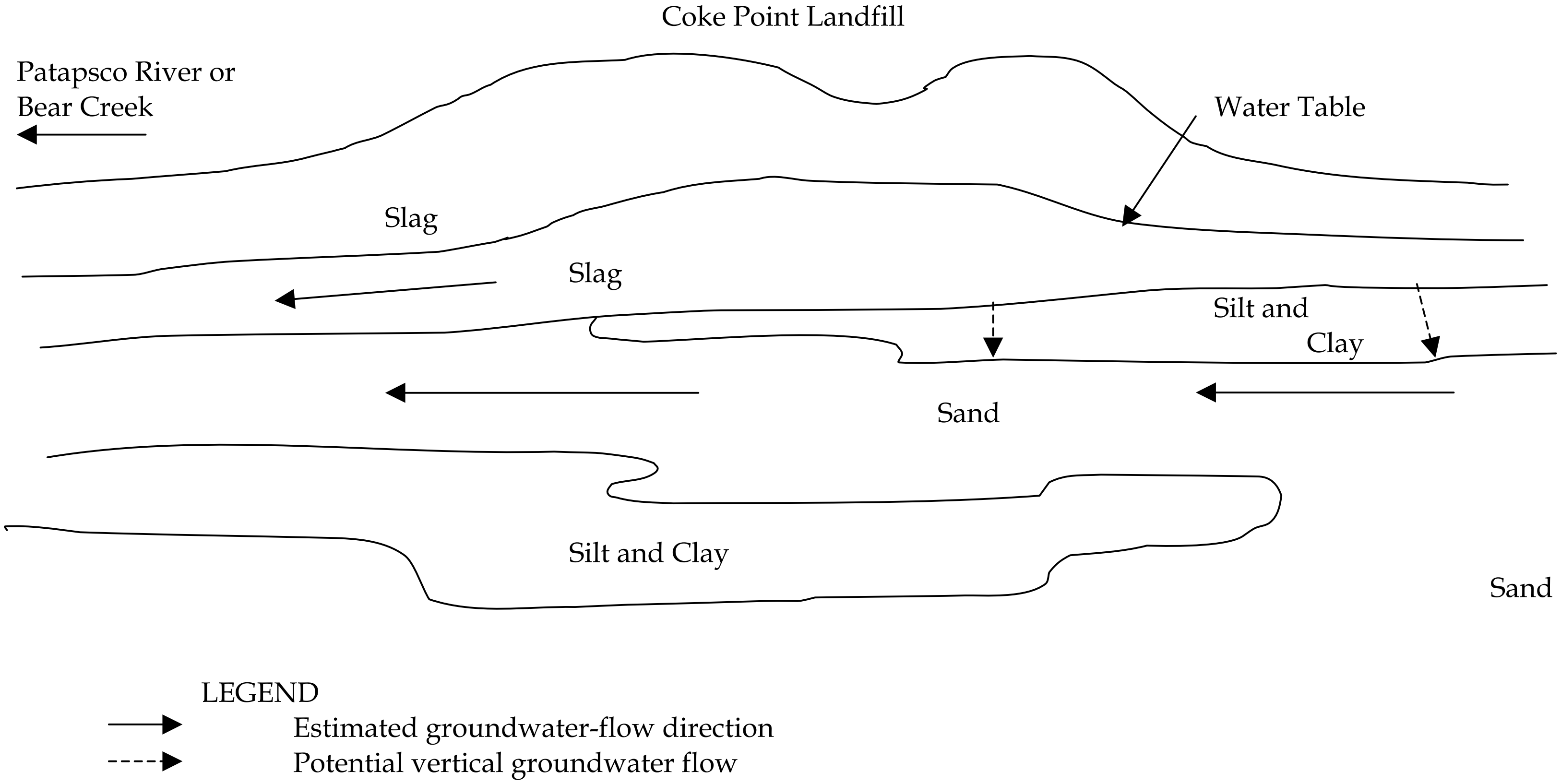


Figure 2.3-15
Conceptual Site Hydrogeologic Model
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation—Sparrows Point Facility

Boring Logs

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP02-PZM007

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START :

END:

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
2						
8						
10						
	10-12	1	1	13-41-100/6 (141)	(GM) Dry Very Dense Slag Gravel Fill. Black Munsell =2.5Y 2.5/1	0.7 ppm
15						
20						
	23-25	0.6	2	7-11-2-2 (13)	(GM) Dry Medium Dense Slag Gravel Fill. Black Munsell =2.5Y 2.5/1	0.0 ppm Water Table ▼
25						
30						
	30-32	1.5	3	11-14-10-3 (24)	(GM) Wet Medium Dense Slag Gravel Fill. Black Munsell =2.5Y 2.5/1	0.0 ppm Bottom of Boring ▼

CH2MHILL

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP02-PZM026

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 11/08/2001 END: 11/08/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
2						
43						
40						
	40-42	1.1	1	13-13-16-22 (29)	(CL) Very Stiff Moist Clay. Penetrometer = 2.5 White Munsell = 5Y 8/1	0.9 ppm
45						
	45-47	1	2	11-15-10-19 (25)	(SC) Wet, Dense, Medium - Coarse Grained Sand with Clay and Trace Silt. Grey Munsell = 10YR 6/1	19.6 ppm Bottom of Boring ▼
50						
55						
60						

CH2MHILL

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP03-PZM008

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/15/2001 END: 11/15/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
2						
8						
10						
	10-12	0.8	1	6-58-68-100/5 (126)	(GM) Dry Very Dense Slag Gravel Fill With Large Chunks of Metal. Black Munsell = 2.5Y 2.5/1	19.4 ppm
15						
20						2.3 ppm
	20-22	2	2	45-23-41-44 (64)	(GM) Damp Very Dense Slag Gravel Fill. Black Munsell = 2.5Y 2.5/1	Water Table ▼
25						
30						

CH2MHILL

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP03-PZM025

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/26/2001 END: 11/26/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
3						
49						
50						
	50-52	1.5	1	2-3-9-11 (12)	(SP) Wet, Medium Dense, Medium- Fine Grained Sand With a Clay Matrix and Clay Laminae. Yellowish Brown, Munsell = 10YR 5/6	0.7 ppm Bottom of Boring ▼
55						
60						
65						
70						

CH2MHILL

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP06-PZM009

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/07/2001 END: 11/07/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
5						
10						3.2 ppm
	10 - 12	1.15	1	3-3-3-4 (6)	(SM) Dry Loose Silty Slag Sand. Black Munsell = 5y 2.5/1	
13						
54						
55						1.8 ppm Smells Like Diesel Fuel
	55 - 57	1	2	25-35-38-40 (73)	(GM) Dry Very Dense Silty Slag Gravel. Black Munsell = 5y 2.5/1	Water Table ▼
20						3.9 ppm
	60 - 62	1.6	3	45-58-32-59 (90)	(GM) Wet Very Dense Silty Sandy Slag Gravel. Dark Grey Munsell = 10 YR 4/1	Bottom of Boring ▼

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP08-PZM008

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/12/2001 END: 11/12/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
2						
8						
10						
	10-12	1.1	1	10-12-18-13 (30)	(GM) Dry Dense Slag Fill Gravel with Silt. Black Munsell = 2.5Y/1	0.4 ppm
15						
	15-17	1.3	2	7-31-29-26 (60)	(GM) Dry Very Dense Slag Fill Gravel with Silt. Black Munsell = 2.5Y/1	0.4 ppm
	18-20	1.1	3	34-33-60-100/1 (93)	(GM) Dry Very Dense Slag Fill Gravel with Silt. Black Munsell = 2.5Y/1	0.6 ppm
20						
						Water Table ▼
25						
	25-27	0.6	4	43-100/2	(GM) Wet Very Dense Slag Fill Gravel with Silt. Black Munsell = 2.5Y/1	1.1 ppm Bottom of Boring ▼
30						

CH2MHILL

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP08-PZM034

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 11/09/2001 END: 11/09/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)				STANDARD PENETRATION TEST RESULTS	CORE DESCRIPTION	COMMENTS
	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	6"-6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
45	45-47	1.1	1	1-0-1-0 (1)	(CL) Wet, Very Soft Marine Clay with some Silt and Shell Fragments. Penetrometer = 0.25 Olive Grey, Munsell = 5Y 3/2	2.8 ppm
50	50-52	1.1	2	1-2-3-6 (5)	(CL) Wet, Soft Marine Clay with some silt and shell Frags. Penetrometer = 0.25 Olive Grey, Munsell = 5Y 3/2 (SM) Very Loose Fine Marine Sand With Shell Hash. Olive Grey, Munsell = 5Y 5/2	3.7 ppm
55						Bottom of Boring ▼
60						
65						

CH2MHILL

PROJECT NUMBER 164586.01.CK.DR

BORING NUMBER CP09-PZM010

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 10/30/2001 END: 10/30/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
5	3 - 5	1.75	1	23-20-19-21 (39)	(GM) Dry, Dense, silt slag gravel. Black and Pale Yellow, Munsell = 2.5Y 2.5/1 and 2.5Y 8/2 respectively.	0.0 ppm
	7 - 9	0.8	2	21-100/4	(GM) Wet Very Dense silt slag gravel with sand. Black Munsell = 5Y 2.5/1	20.4 ppm Water Table ▼
10						
15	13-15	1.75	3	18-27-24-10 (51)	(SP) Wet, Very Dense silty gravely sand. Black, Munsell = 5Y 2.5/1.	8.4 ppm Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP09-PZM047

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 10/31/2001 END: 10/31/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
2						
48						
50	50-52	2	1	2-4-4-6 (8)	(SC) Wet, Loose, Medium Grained Marine Sand With Some Shell Hash and Little Clay and Silt. Dark Olive Grey, Munsell = 5Y 3/2	Bottom of Boring ▼
55						
60						
65						
70						

PROJECT NUMBE 164586.01.CK.DR	**BORING NUMBER** CP10-PZM008 SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/05/2001 END: 11/05/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					<u>SLAG FILL</u>, granular silty slag fill	
5						
10						
	10 - 12	0.8	1	8-11-13-13 (24)	(GM) Dry Medium Dense Silty Gravel with little sand. Very Dark Grayish Brown Munsell =2.5Y 4/2.	2.7 ppm
12						
34						Water Table ▼
35						
	38 - 40	0.75	2	18-17-17-16 (34)		2.6 ppm
40					(GM) Wet Dense Silty Gravel with little sand. Very Dark Grayish Brown Munsell =2.5Y 4/2.	
	40 - 42	0.5	3	5-14-18-23 (32)		6.9 ppm
						Bottom of Boring ▼
45						

CH2MHILL

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP11-PZM010

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 10/30/2001 END: 10/30/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
5	3-5	1.5	1	17-31-37-100/6 (68)	(GM) Dry Very Dense, silty sand slag gravel. Very Dark Grayish Brown Munsell = 2.5Y 3/2	2.2 ppm
10	8-10	1.5	2	34-43-25-26 (68)	(GM) Very Dense Wet silty sandy slag gravel. Very Dark Grayish Brown Munsell = 2.5Y 3/2	Water Table ▼ 5.3 ppm
15	13-15	0.5	3	20-20-18-17 (38)	(SP) Dense, Wet, gravely silty sand. Dark Grey Munsell = 2.5Y 4/1	6.8 ppm Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP11-PZM040

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/01/2001 END: 11/01/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
2						
58						
60	60-62	2	1	Wt of hammer (WOH)	(CH) Wet Very Soft Marine Clay With Shell fragments and no Silt or Sand. Penetrometer=0.25 Dark Grey Munsell = 5Y 4/1	0.5 ppm Bottom of Boring ▼
65						
70						
75						
80						

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP12-PZM012

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/05/2001 END: 11/05/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0	0-2	0.2	1	1-4-4-8 (8)	(SM) Lose Dry Sand with Gravel and Silt Slag. Olive Grey Munsell = 5Y4/2	6.3 ppm
5	4-6	0.75	2	17-32-20-8 (52)	(SM) Wet Medium Dense Silty Clayey Gravel Sand. Note: gravel component is slag. Grayish Brown Munsell = 2.5Y 5/2	Water Table ▼ 12.3 ppm
10						
	13-15	1.2	3	1-1-2-1 (3)	(CL) Wet Soft Silty, Sandy Marine Clay with Shell Bits. Greenish Grey Munsell = GLEY1 6/10Y	1.5 ppm
15						Bottom of Boring ▼
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP12-PZM052

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 11/02/2001 END: 11/02/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
3						
49						
50						
	50-52	1	1	5-34-72-100/3 (106)	(SW) Very Dense Wet Sand With Trace Clay and Silt. Light Olive Brown Munsell = 2.5Y 5/6	0.0 ppm Bottom of Boring ▼
55						
60						
65						
70						

PROJECT NUMBE 164586.01.CK.DR

BORING NUMBER CP14-PZM009

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 11/12/2001 END: 11/12/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
	3-5	0.5	1	17-28-29-22 (57)	(GM) Dry Very Dense Slag Fill Gravel with Silt. Black Munsell = 2.5Y 2.5/1	0.2 ppm
5						
	7 - 9	1	2	19-17-21-56 (38)	(GM) Dry Very Dense Slag Fill Gravel with Silt. Black Munsell = 2.5Y 2.5/1	0.6 ppm
10						
	10 - 12	1.2	3	13-22-43-21 (65)	(GM) Dry Very Dense Slag Fill Gravel with Silt. Very Dark Grey Munsell = 2.5Y 3/1	1.0 ppm Water Table ▼ Bottom of Boring ▼
15						
20						

CH2MHILL

PROJECT NUMBE 164586.01.CK.DR	**BORING NUMBER** CP14-PZM062 SHEET 1 OF 1

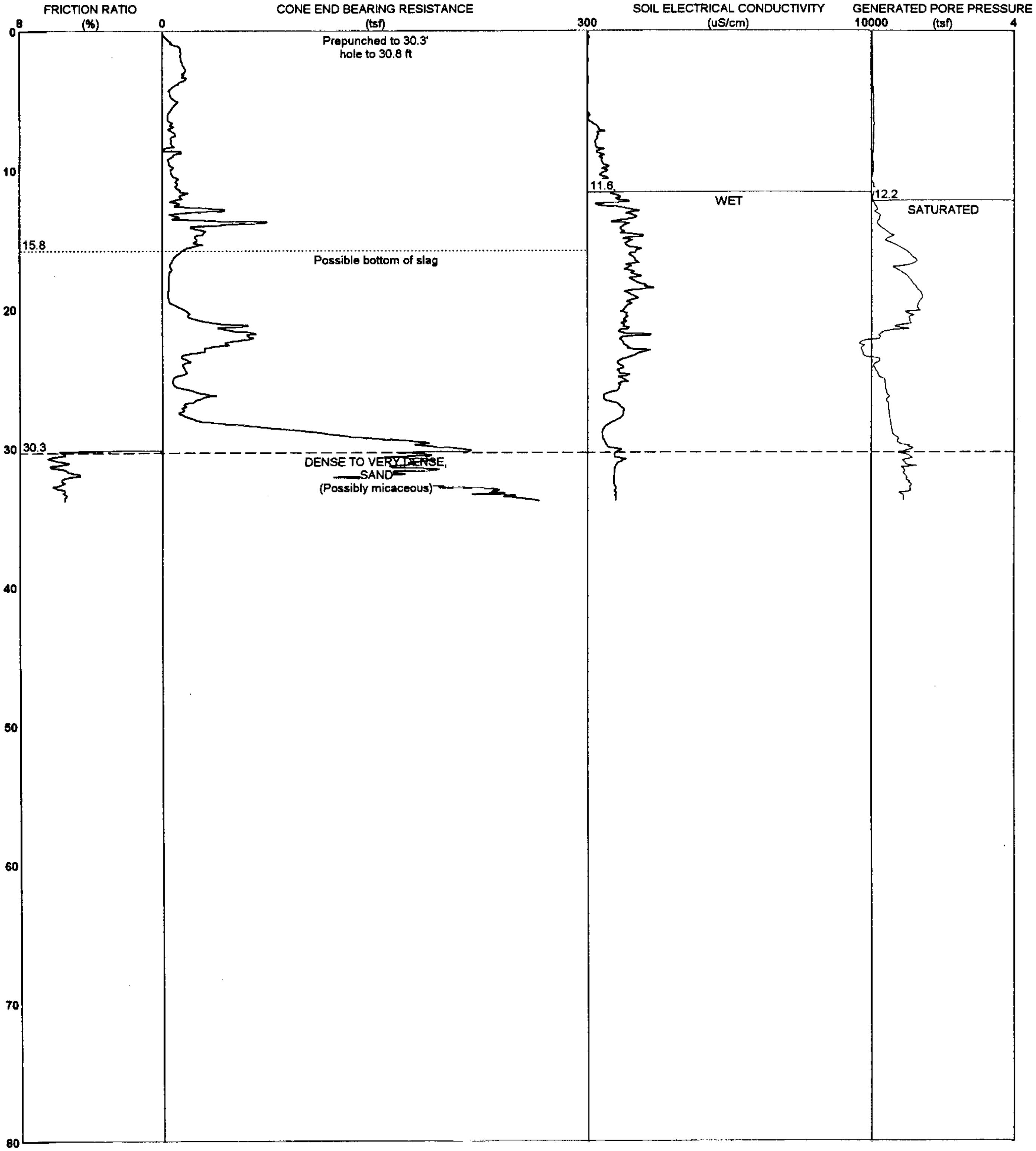
SOIL BORING LOG

PROJECT : Bethlehem Steel
LOCATION : Sparrows Point, MD
ELEVATION :
DRILLING CONTRACTOR : E2SI
DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon
WATER LEVELS :
START : 11/06/2001 END: 11/06/2001
LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Head Space
0					SLAG FILL, granular silty slag fill	
3						
44						
45	45-47	1.5	1	10-5-4-6 (9)	(CL) Wet Medium Stiff Silty Holocene Marine Clay with Shell fragments. Penetrometer = 0.25 Dark Olive Grey Munsell = 5Y 3/2	10.3 ppm
50	50-52	2	2	Wt of hammer		7.5 ppm
					(CL) Wet Very Soft Holocene Marine Clay with Shell fragments. Penetrometer = 0.0 Dark Olive Grey Munsell = 5Y 3/2	
55	55-57	2	3	Wt of hammer		3.9 ppm
60	60-62	2	4	WOH-1-1-1 (2)	(CL) Wet Very Soft Holocene Marine Clay with Shell fragments. Penetrometer = 0.0 Dark Olive Grey Munsell = 5Y 3/2	10.4 ppm
65	65-67	2	5	1-3-6-7 (9)	(CL) Wet Med Stiff Silty Holocene Marine Clay w/Shell frags. Penetrometer = 0.25 Dark Olive Grey Munsell= 5Y3/2 (SC) Wet Very Soft Medium Grained Clayey Sand. White Munsell = 5Y8/1	7.4 ppm Bottom of Boring ▼

CPT Logs

CPTU-EC LOG WITH LITHOLOGIC EVALUATION

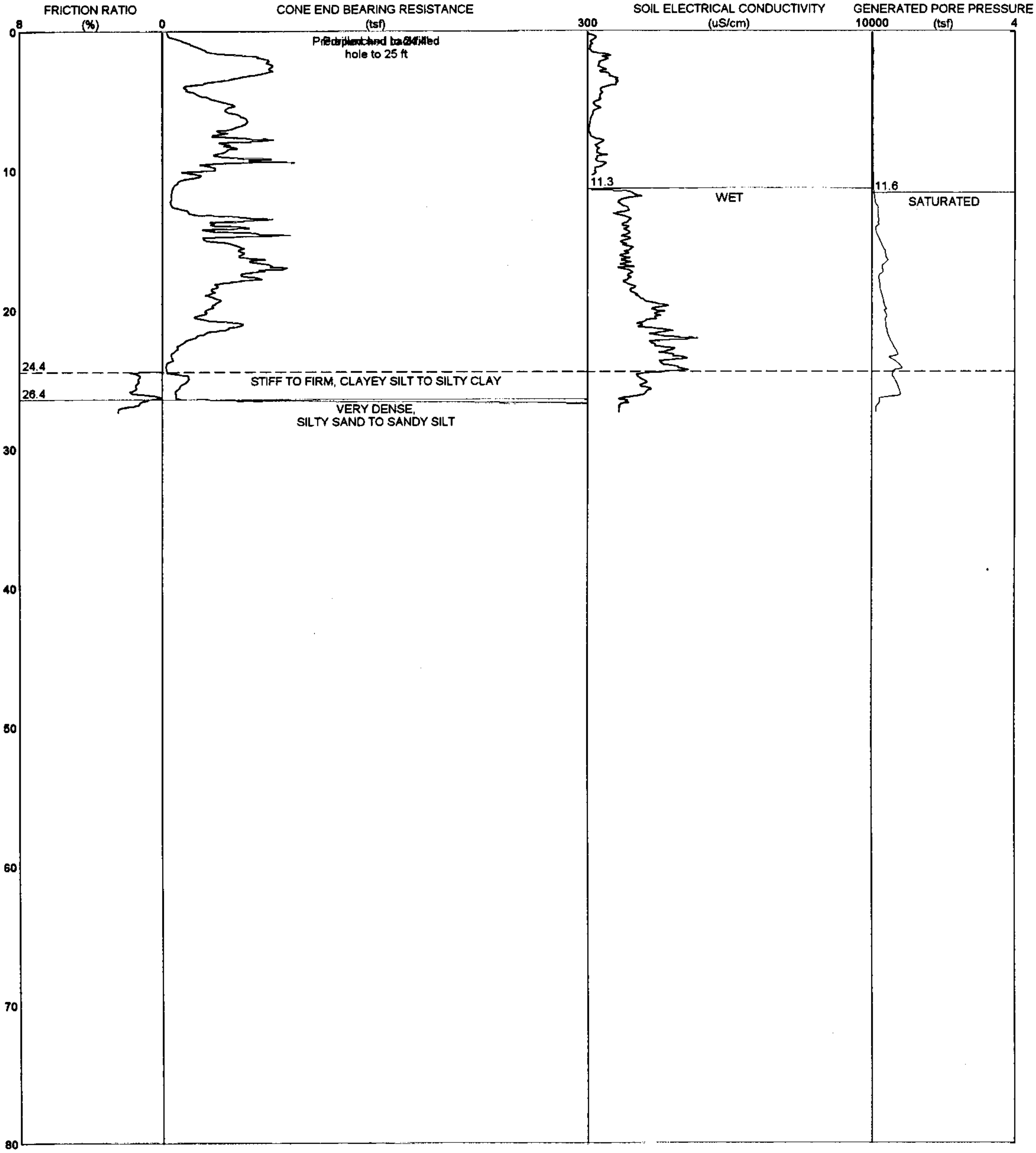


PROJECT NAME:Bethlehem Steel Coke Point Landfill
PROJECT NUMBER:99-120-080

STRATIGRAPHICS

R2DATE: 7-16-1999 TIME:09:16:18.77
SOUNDING NUMBER:CP-PZ-02

CPTU-EC LOG WITH LITHOLOGIC EVALUATION

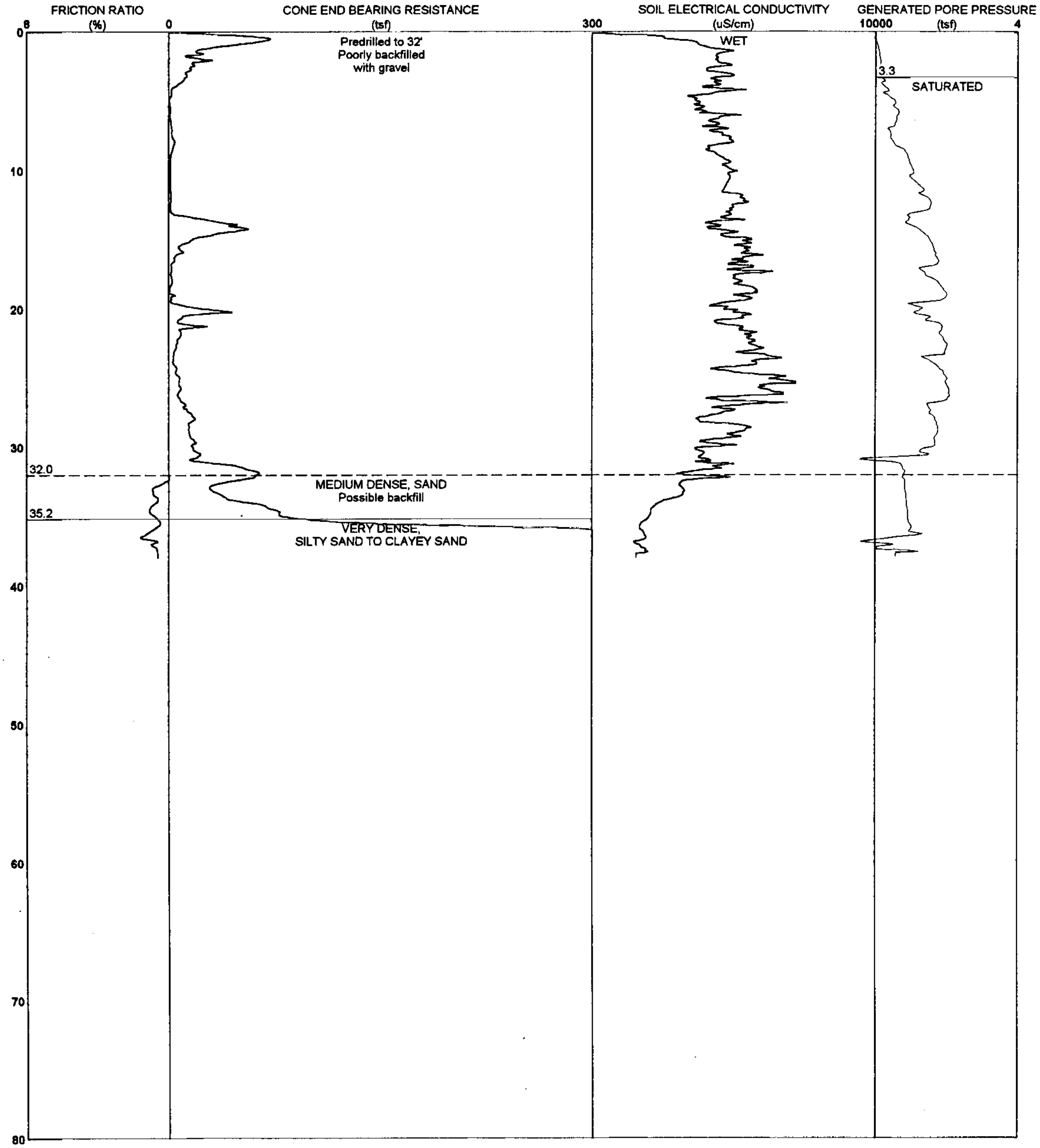


PROJECT NAME:Bethlehem Steel Coke Point Landfill
PROJECT NUMBER:99-120-080

STRATIGRAPHICS

R2DATE: 7-17-1999 TIME:10:30:27.35
SOUNDING NUMBER:CP-PZ-03

CPTU-EC LOG WITH LITHOLOGIC EVALUATION

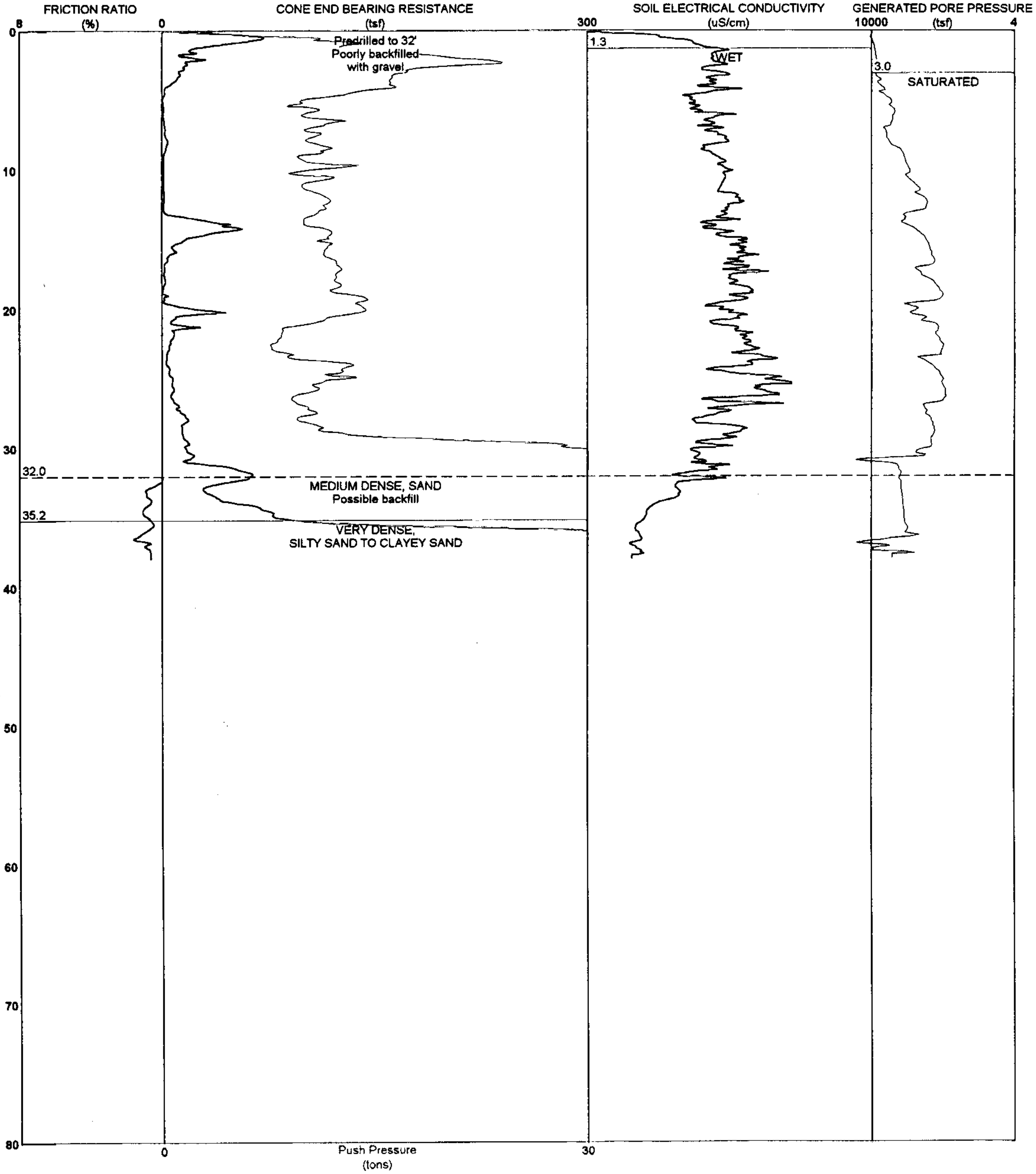


PROJECT NAME:Bethlehem Steel Coke Point Landfill
PROJECT NUMBER:99-120-080

STRATIGRAPHICS

R2DATE: 7-19-1999 TIME:12:15:25.43
SOUNDING NUMBER:CP-PZ-05A

CPTU-EC LOG WITH LITHOLOGIC EVALUATION

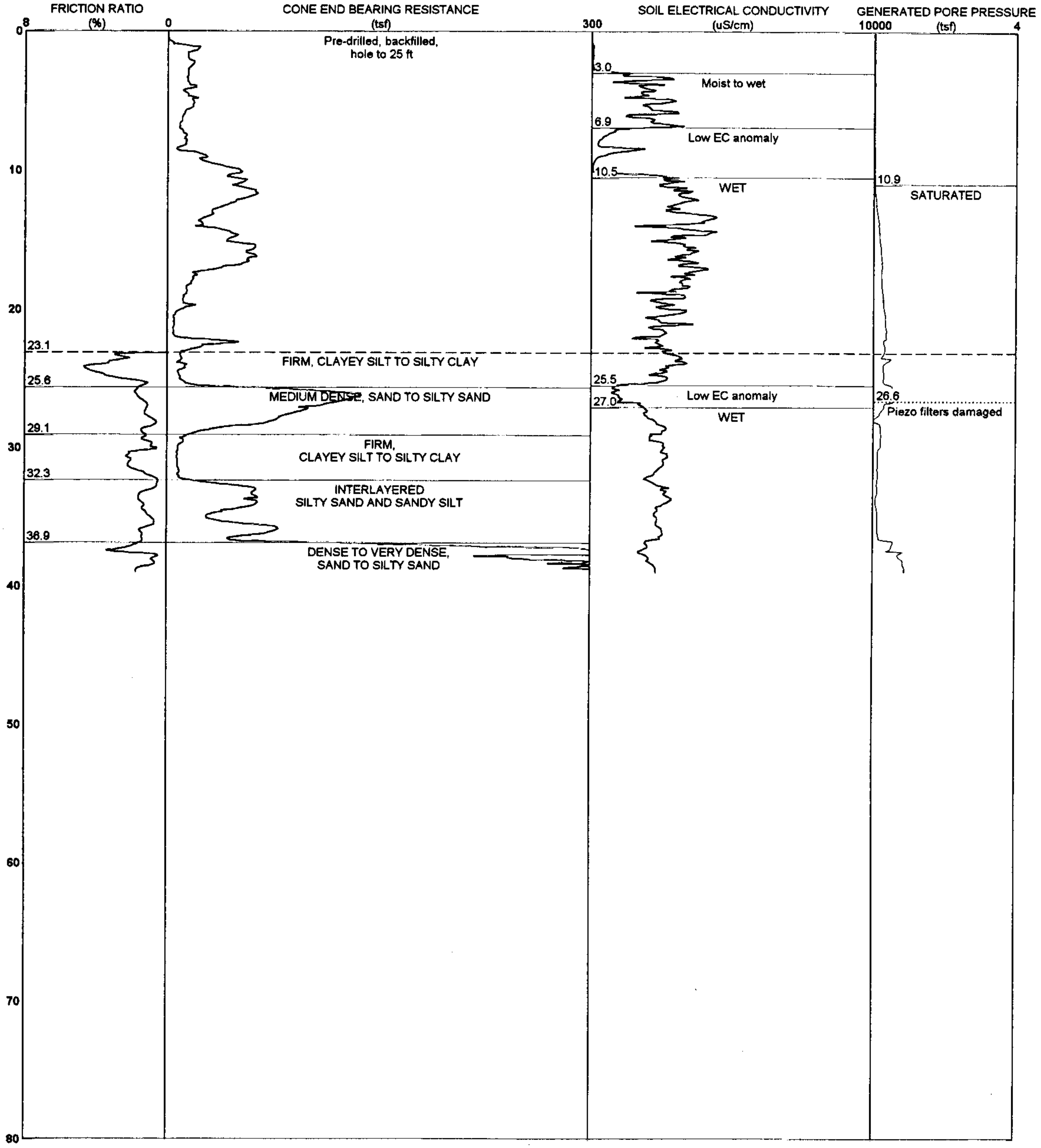


PROJECT NAME:Bethlehem Steel Coke Point Landfill
PROJECT NUMBER:99-120-080

STRATIGRAPHICS

DATE: 7-16-1999 TIME:18:06:16.62
SOUNDING NUMBER:pp-cp-pz-05b

CPTU-EC LOG WITH LITHOLOGIC EVALUATION

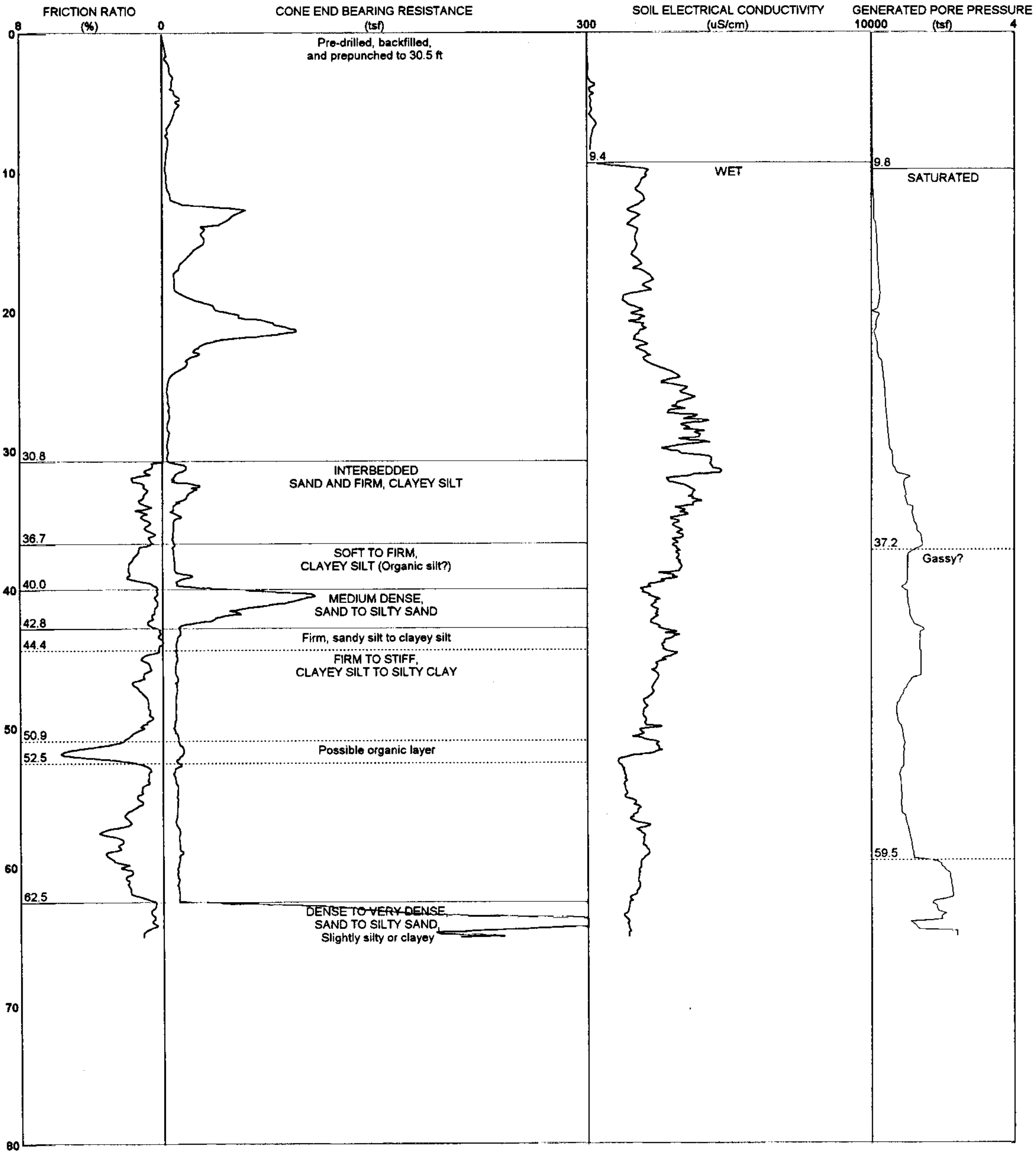


PROJECT NAME:Bethlehem Steel Coke Point Landfill
PROJECT NUMBER:99-120-080

STRATIGRAPHICS

R2DATE: 7-17-1999 TIME:08:46:13.48
SOUNDING NUMBER:CP-PZ-07

CPTU-EC LOG WITH LITHOLOGIC EVALUATION

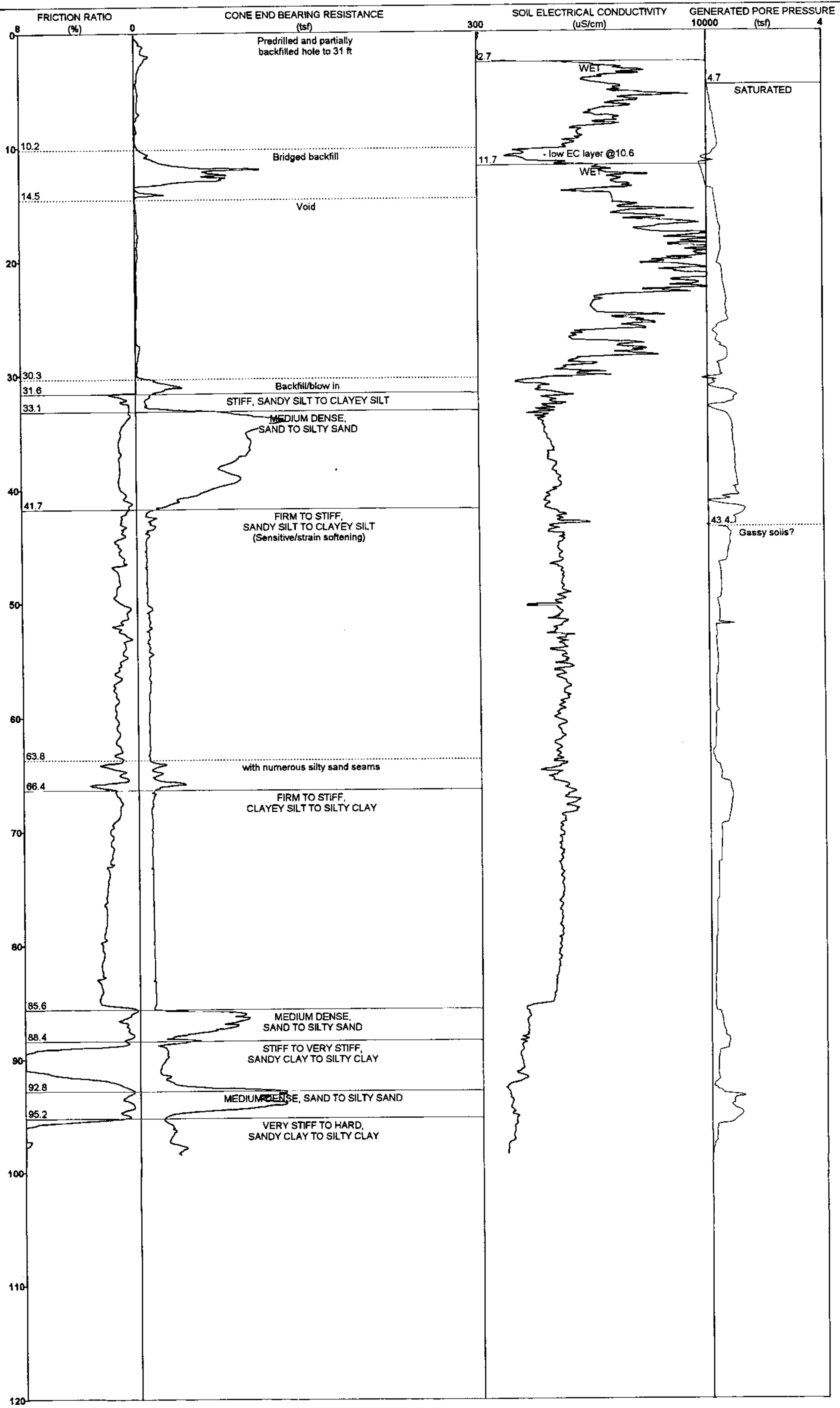


PROJECT NAME:Bethlehem Steel Coke Point Landfill
PROJECT NUMBER:99-120-080

STRATIGRAPHICS

R2DATE: 7-15-1999 TIME:15:59:49.92
SOUNDING NUMBER:CP-PZ-08

CPTU-EC LOG WITH LITHOLOGIC EVALUATION

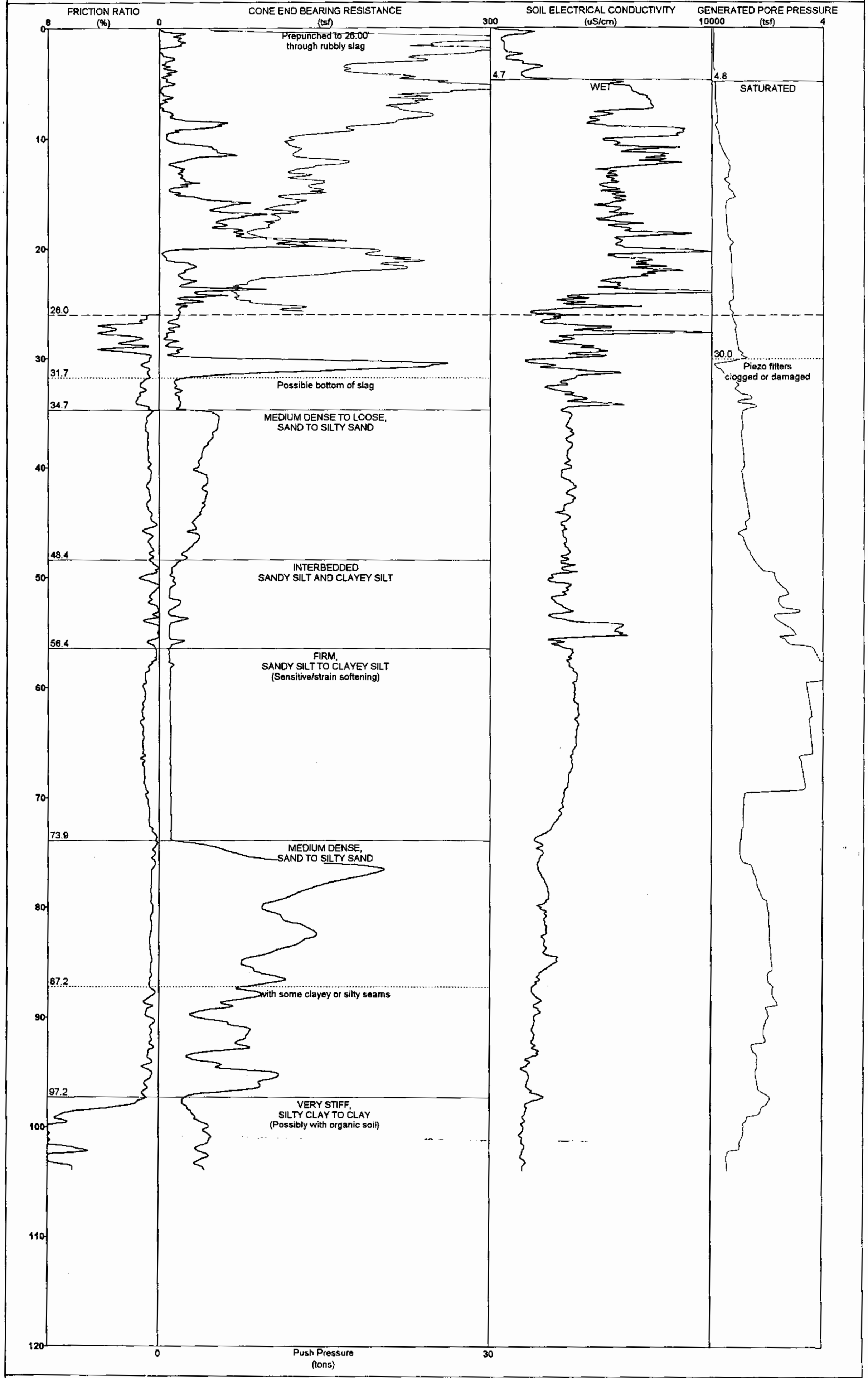


PROJECT NAME:Bethlehem Steel Coke Point Landfill
PROJECT NUMBER:99-120-080

STRATIGRAPHICS

R2DATE: 7-17-1999 TIME:15:15:32.08
SOUNDING NUMBER:CP-PZ-09

CPTU-EC LOG WITH LITHOLOGIC EVALUATION



PROJECT NAME:Bethlehem Steel Coke Point Landfill
PROJECT NUMBER:99-120-080

STRATIGRAPHICS

DATE: 7-14-1999 TIME:13:54:06.24
SOUNDING NUMBER:pp-cp-pz-11

Historical Logs

Historical Logs
Coke Point Area
Bethlehem Steel Corporation—Sparrows Point Facility

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
GB-17	0.00	48.50	Slag	
	48.50	74.50	Slag Gravel	
	74.50	78.50	Silt	
	78.50	95.00	Sand	
GB-18	0.00	68.50	Slag	
	68.50	88.50	Sand & Gravel	
	88.50	93.50	Sand	
	93.50	98.00	Silt	
	98.00	108.50	Silty Sand	
	10.85	109.40	Clay	
GB-19	0.00	40.50	Slag	
	40.50	45.00	Silt	
	45.00	53.00	Sand	
	53.00	60.00	Silt	
	60.00	66.50	Sand	
GB-20	0.00	35.50	Slag	
	35.50	58.00	Fine Sand	
	58.00	65.50	Medium Sand	
GB-21	0.00	40.00	Slag	
	40.00	47.50	Sand	
	47.50	73.00	Silt	
GB-22	0.00	25.00	Slag	
	25.00	38.00	Sand	
	38.00	50.00	Silt	
	50.00	61.50	Sand	

Table 2.3-B
All Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP02-PZM007		CP02-PZM026		CP03-PZM008		CP03-PZM025		CP05-PZM008		CP05-PZM019		CP05-PZM028		CP06-PZM009		CP07-PZM006		CP07-PZM026		CP08-PZM008				CP08-PZM034	
Sample ID	CP02-PZM007-01D		CP02-PZM026-01D		CP03-PZM008-01D		CP03-PZM025-01D		CP05-PZM008-01D		CP05-PZM019-01D		CP05-PZM028-01D		CP06-PZM009-01D		CP07-PZM006-01D		CP07-PZM026-01D		CP08-PZM008-01D		CP08-PZM008-01D DUP		CP08-PZM034-01D	
Sample Date	12/05/01		12/05/01		12/20/01		12/06/01		12/06/01		12/06/01		12/06/01		12/19/01		12/06/01		12/06/01		12/05/01		12/05/01		12/05/01	
Chemical Name																										
Volatile Organic Compounds (UG/L)																										
1,1,1,2-Tetrachloroethane	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
1,1,1-Trichloroethane	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
1,1,2,2-Tetrachloroethane	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
1,1,2-Trichloroethane	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
1,1-Dichloroethane	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
1,1-Dichloroethene	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
1,2,3-Trichloropropane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,2-Dibromo-3-chloropropane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,2-Dibromoethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,2-Dichloroethane	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
1,2-Dichloropropane	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
1,4-Dioxane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2-Butanone	5	U	5	U	10	UJ	5	U	9.1		7.4		25	U	53		250	U	5	U	3,200	U	3,200	U	500	U
2-Chloro-1,3-butadiene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2-Hexanone	5	U	5	U	10	UJ	5	U	5	U	0.61	J	25	U	2.4	J	250	U	5	U	3,200	U	3,200	U	500	U
4-Methyl-2-pentanone	5	U	5	U	10	UJ	5	U	5	U	1.2	J	25	U	10	U	250	U	5	U	3,200	U	3,200	U	500	U
Acetone	43		100		20	UJ	53		69		58		50	U	220		500	U	10	U	6,500	U	6,500	U	5,600	
Acetonitrile	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Acrolein	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Acrylonitrile	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Allyl chloride	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Benzene	4.6		1	U	43	J	0.29	J	18		62		120		20		1,800		4.4		14,000		14,000		100	U
Bromodichloromethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Bromoform	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
Bromomethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Carbon disulfide	1	U	1	U	2	UJ	1	U	1.9		1.2		5	U	2	U	50	U	1	U	650	U	650	U	100	U
Carbon tetrachloride	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
Chlorobenzene	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
Chloroethane	2	UJ	2	UJ	4	UJ	2	U	2	U	2	U	10	U	4	U	100	U	2	U	1,300	U	1,300	U	200	U
Chloroform	1	U	0.36	J	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
Chloromethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Dibromochloromethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Dibromomethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Dichlorodifluoromethane(Freon-12)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Ethyl methacrylate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Ethylbenzene	0.37	J	1	U	2	UJ	1	U	0.53	J	1.3		5	U	0.61	J	50	U	1	U	650	U	650	U	100	U
Iodomethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Isobutanol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Methacrylonitrile	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Methyl methacrylate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Methylene chloride	2	U	2	U	4	UJ	2	U	2	U	2	U	10	U	4	U	100	U	2	U	1,300	U	1,300	U	200	U
Propionitrile	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Styrene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
Toluene	3.4		1	U	33	J	0.72	J	2.4		9.9		6.6		11		97		0.36	J	3,800		3,600		100	U
Trichloroethene	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U
Trichlorofluoromethane(Freon-11)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Vinyl acetate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Vinyl chloride	2	U	2	U	4	UJ	2	U	2	U	2	U	10	U	4	U	100	U	2	U	1,300	U	1,300	U	200	U
Xylene, total	3.1		3	U	45	J	3	U	3.3		10		15	U	2.9	J	150	U	3	U	2,000		2,100		300	U
cis-1,3-Dichloropropene	1	U	1	U	2	UJ	1	U	1	U	1	U	5	U	2	U	50	U	1	U	650	U	650	U	100	U

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B - Detected in blank
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Table 2.3-B
All Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP02-PZM007	CP02-PZM026	CP03-PZM008	CP03-PZM025	CP05-PZM008	CP05-PZM019	CP05-PZM028	CP06-PZM009	CP07-PZM006	CP07-PZM026	CP08-PZM008		CP08-PZM034
Sample ID	CP02-PZM007-01D	CP02-PZM026-01D	CP03-PZM008-01D	CP03-PZM025-01D	CP05-PZM008-01D	CP05-PZM019-01D	CP05-PZM028-01D	CP06-PZM009-01D	CP07-PZM006-01D	CP07-PZM026-01D	CP08-PZM008-01D	CP08-PZM008-01D DUP	CP08-PZM034-01D
Sample Date	12/05/01	12/05/01	12/20/01	12/06/01	12/06/01	12/06/01	12/06/01	12/19/01	12/06/01	12/06/01	12/05/01	12/05/01	12/05/01
Chemical Name													
trans-1,2-Dichloroethene	1 U	1 U	2 UJ	1 U	1 U	1 U	5 U	2 U	50 U	1 U	650 U	650 U	100 U
trans-1,3-Dichloropropene	1 U	1 U	2 UJ	1 U	1 U	1 U	5 U	2 U	50 U	1 U	650 U	650 U	100 U
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG/L)													
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
1,4-Naphthoquinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	20 U	20 U	NA	20 U	20 U	40 U	200 U	20 U	200 U	20 U	100 U	20 U	20 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	10 U	10 U	NA	10 U	10 U	20 U	100 U	30 R	100 U	10 U	50 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	NA	10 U	10 U	20 U	100 U	30 R	100 U	10 U	50 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	NA	10 U	10 U	20 U	100 U	30 R	100 U	10 U	50 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	NA	10 U	10	14 J	100 U	2.7 L	600	3.9 J	53	77 J	10 U
2,4-Dinitrophenol	50 U	50 U	NA	50 U	50 U	100 U	500 U	150 R	500 U	50 U	250 U	50 U	50 U
2,4-Dinitrotoluene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
2,6-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
2-Acetylaminofluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
2-Chlorophenol	10 U	10 U	NA	10 U	10 U	20 U	100 U	30 R	100 U	10 U	50 U	10 U	10 U
2-Methyl-5-nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	10 U	10 U	NA	10 U	3.7 J	5.9 J	29 J	3.5 J	100 U	10 U	32 J	50	10 U
2-Methylphenol	10 U	10 U	NA	10 U	3 J	4.5 J	100 U	2.9 L	20 J	10 U	38 J	49	10 U
2-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	10 U	10 U	NA	10 U	10 U	20 U	100 U	3.8 R	100 U	10 U	50 U	10 U	10 U
2-Picoline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	50 U	50 U	NA	50 U	50 U	100 U	500 U	50 U	500 U	50 U	250 U	50 U	50 U
3,3'-Dimethylbenzidine	50 U	50 U	NA	50 U	50 U	100 U	500 U	50 U	500 U	50 U	250 U	50 U	50 U
3-Methylcholanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	50 U	50 U	NA	50 U	50 U	100 U	500 U	150 R	500 U	50 U	250 U	50 U	50 U
4-Aminobiphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	NA	10 U	10 U	20 U	100 U	30 R	100 U	10 U	50 U	10 U	10 U
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
4-Methylphenol	10 U	10 U	NA	10 U	27	46	31 J	10 L	190	2.8 J	51	67	10 U
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	50 U	50 U	NA	50 U	50 U	100 U	500 U	150 R	500 U	50 U	250 U	50 U	50 U
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	10 U	1 J	NA	10 U	5 J	6.7 J	31 J	2.6 J	100 U	10 U	50 U	5.4 J	10 U
Acenaphthylene	10 U	10 U	NA	10 U	10 U	2.8 J	100 U	1.4 J	100 U	10 U	14 J	19	10 U
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 2.3-B
All Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP02-PZM007	CP02-PZM026	CP03-PZM008	CP03-PZM025	CP05-PZM008	CP05-PZM019	CP05-PZM028	CP06-PZM009	CP07-PZM006	CP07-PZM026	CP08-PZM008		CP08-PZM034
Sample ID	CP02-PZM007-01D	CP02-PZM026-01D	CP03-PZM008-01D	CP03-PZM025-01D	CP05-PZM008-01D	CP05-PZM019-01D	CP05-PZM028-01D	CP06-PZM009-01D	CP07-PZM006-01D	CP07-PZM026-01D	CP08-PZM008-01D	CP08-PZM008-01D DUP	CP08-PZM034-01D
Sample Date	12/05/01	12/05/01	12/20/01	12/06/01	12/06/01	12/06/01	12/06/01	12/19/01	12/06/01	12/06/01	12/05/01	12/05/01	12/05/01
Chemical Name													
Aniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	10 U	10 U	NA	10 U	10 U	20 U	100 U	0.87 J	100 U	10 U	4.7 J	4.8 J	10 U
Aramite	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Chrysene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Di-n-octylphthalate	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Dibenz(a,h)anthracene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Dibenzofuran	6 J	0.84 J	NA	10 U	1.1 J	1.6 J	11 J	2.2 J	100 U	10 U	14 J	19	10 U
Diethylphthalate	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Dimethyl phthalate	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2.6 J	1.5 J	NA	0.92 J	10 U	20 U	100 U	2.1 J	100 U	10 U	4.8 J	5.3 J	10 U
Fluorene	13	10 U	NA	1.3 J	1.2 J	2.2 J	13 J	3.6 J	100 U	10 U	20 J	24	1.3 J
Hexachlorobenzene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Hexachlorocyclopentadiene	50 U	50 U	NA	50 U	50 U	100 U	500 U	50 U	500 U	50 U	250 U	50 U	50 U
Hexachloroethane	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Hexachloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Isophorone	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Isosafrole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosomorpholine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosopiperidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	0.85 J	10 U	NA	10 U	31	95	680	35	73 J	22	570	710	1 J
Nitrobenzene	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
Pentachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachloroethane	50 U	50 U	NA	50 U	50 U	100 U	500 U	50 U	500 U	50 U	250 U	50 U	50 U
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	50 U	50 U	NA	50 U	50 U	100 U	500 U	150 R	500 U	50 U	250 U	50 U	50 U
Phenacetin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1 J	10 U	NA	10 U	1.7 J	1.9 J	100 U	8.1 J	100 U	0.97 J	27 J	32	2.1 J
Phenol	10 U	10 U	NA	10 U	58	120	450	41 L	12 J	16	20 J	16	10 U
Pronamide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1.5 J	1.1 J	NA	10 U	10 U	20 U	100 U	2 J	100 U	10 U	50 U	3.5 J	10 U
Pyridine	18 J	20 U	NA	20 U	20 U	40 U	200 U	20 U	200 U	20 U	82 J	140 J	20 U
Safrole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
a,a-Dimethylphenethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	NA	10 U	10 U	20 U	100 U	10 U	100 U	10 U	50 U	10 U	10 U
n-Nitroso-di-n-butylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	NA	NA

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Table 2.3-B
All Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP02-PZM007		CP02-PZM026		CP03-PZM008		CP03-PZM025		CP05-PZM008		CP05-PZM019		CP05-PZM028		CP06-PZM009		CP07-PZM006		CP07-PZM026		CP08-PZM008				CP08-PZM034	
Sample ID	CP02-PZM007-01D		CP02-PZM026-01D		CP03-PZM008-01D		CP03-PZM025-01D		CP05-PZM008-01D		CP05-PZM019-01D		CP05-PZM028-01D		CP06-PZM009-01D		CP07-PZM006-01D		CP07-PZM026-01D		CP08-PZM008-01D		CP08-PZM008-01D DUP		CP08-PZM034-01D	
Sample Date	12/05/01		12/05/01		12/20/01		12/06/01		12/06/01		12/06/01		12/06/01		12/19/01		12/06/01		12/06/01		12/05/01		12/05/01		12/05/01	
Chemical Name																										
n-Nitroso-n-methylethylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosodiethylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosodimethylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosodiphenylamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosopyrrolidine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
p-Dimethylaminoazobenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
p-Phenylenediamine	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Polychlorinated Biphenyls (UG/L)																										
Aroclor-1016	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1221	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1232	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1242	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1248	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1254	1	U	1	U	0.68	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1260	1	U	1	U	0.51	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Total Metals (UG/L)																										
Antimony	4.8	J	4.1	U	15.5	J	4.1	U	4.1	U	4.1	U	4.1	U	20.6	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U
Arsenic	36.4		6.2	J	116		2	U	2.2	J	3.2	J	2	U	117		12.2		3.3	J	2	U	2.9	J	10.8	
Barium	12.9	J	56.5	J	1,340		96.6	J	743		1,110		224		2,030		86.6	J	66.9	J	109	J	114	J	44.9	J
Beryllium	2.3	B	0.53	B	7.2		2.1	B	2.7	B	3	B	2.7	B	32.1		2	B	2.3	B	1.6	B	1.5	B	1.7	B
Cadmium	0.63	U	0.63	U	5	J	0.63	U	0.63	U	0.63	U	0.63	U	3.2	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
Chromium	4.6	B	7.4	B	1,390		3.9	B	1.4	B	5.1	B	1.4	B	6,780		1.1	U	2.9	B	4.5	B	1.1	U	4.7	B
Cobalt	14.8	J	44.8	J	80.5		7.1	J	0.86	U	1.2	J	0.86	U	99.9		0.86	U	3.7	J	0.86	U	0.86	U	0.86	U
Copper	23.7	J	0.77	U	1,550		0.77	U	0.77	U	0.77	U	0.77	U	746		0.77	U	0.77	U	0.77	U	0.77	U	0.77	U
Lead	9	B	2.8	B	1,600		1.8	U	1.8	U	1.8	U	1.8	U	492		1.8	U	1.8	U	1.8	U	1.8	U	2.3	B
Mercury	0.054	UL	0.054	UL	1		0.054	U	0.054	U	0.11	J	0.054	J	1.3		0.054	U	0.063	J	0.054	U	0.054	U	0.066	L
Nickel	2.4	U	5.4	J	589		2.4	U	9.2	J	18.2	J	9	J	306		6.8	J	2.5	J	4.3	J	3.1	J	9.5	J
Selenium	756		6.4	U	16	U	3.2	U	3.2	U	3.2	U	3.2	U	160	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U
Silver	0.84	B	4.5	B	2.7	J	0.75	U	0.75	U	0.75	U	0.75	U	15.9		0.75	U	0.75	U	0.75	U	0.75	U	1.1	B
Thallium	5.7	U	11.5	U	28.7	U	5.7	U	5.7	U	5.7	U	7.9	J	341	J	5.7	U	6.5	J	5.7	U	5.7	U	5.7	U
Tin	28.8	U	28.8	U	287		38.1	J	28.8	U	28.8	U	28.8	U	144	U	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U
Vanadium	230		14.5	J	1,290		6.1	J	12.2	J	9.4	J	8.2	J	10,400	J	57.5		3.1	J	52.4		57.2		140	
Zinc	3.6	J	6.3	J	2,230		1.5	U	1.5	U	1.5	U	1.5	U	2,970		1.5	U	1.5	U	1.5	U	1.5	U	6.8	J
Common Cations (UG/L)																										
Calcium	541,000		644,000		NA		235,000		NA		NA		NA		2,990,000		NA		NA		NA		NA		123,000	
Iron	45	UL	28,500	L	NA		3,500		NA		NA		NA		1,260,000		NA		NA		NA		NA		450	UL
Magnesium	37,800		99,500		NA		337,000		NA		NA		NA		729,000		NA		NA		NA		NA		272,000	
Manganese	230		15,100		NA		6,360		NA		NA		NA		235,000		NA		NA		NA		NA		701	
Potassium	42,100		21,200		NA		108,000		NA		NA		NA		260,000		NA		NA		NA		NA		71,100	
Sodium	239,000		1,190,000		NA		1,630,000		NA		NA		NA		915,000		NA		NA		NA		NA		1,940,000	
Wet Chemistry (MG/L)																										
Amenable cyanide	0.022	J	0.0086	J	0.14	J	0.013	J	77.3	J	11.9	J	35.9	J	0.06	J	9.3	J	0.037	J	3.1	J	2.9	J	0.04	J
Bicarbonate	5		208		NA		191		NA		NA		NA		25	U	NA		NA		NA		NA		816	
Chloride	137		721		NA		2,820		NA		NA		NA		1,120		NA		NA		NA		NA		3,090	
Sulfate	1,760		1,810		NA		1,130		NA		NA		NA		113		NA		NA		NA		NA		337	
Sulfide	1		1		1	U	1	U	16.4		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Total dissolved solids (TDS)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Table 2.3-B
All Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP09-PZM010		CP09-PZM047				CP10-PZM008		CP11-PZM010		CP11-PZM040		CP12-PZM012		CP12-PZM052		CP14-PZM009		CP14-PZM062		TS07-PPM005	
Sample ID	CP09-PZM010-01D		CP09-PZM047-01D		CP09-PZM047-01D DUP		CP10-PZM008-01D		CP11-PZM010-01D		CP11-PZM040-01D		CP12-PZM012-01D		CP12-PZM052-01D		CP14-PZM009-01D		CP14-PZM062-01D		TS07-PPM005-01D	
Sample Date	12/06/01		12/06/01		12/06/01		12/19/01		12/05/01		12/05/01		12/05/01		12/05/01		12/05/01		12/05/01		12/06/01	
Chemical Name																						
Volatile Organic Compounds (UG/L)																						
1,1,1,2-Tetrachloroethane	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
1,1,1-Trichloroethane	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
1,1,2,2-Tetrachloroethane	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
1,1-Dichloroethane	1	U	1	U	5	U	2	U	0.68	J	25	U	3	U	50	U	2.5	U	1	U	1	U
1,1-Dichloroethene	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
1,2,3-Trichloropropane	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
1,2-Dibromo-3-chloropropane	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
1,2-Dibromoethane	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
1,2-Dichloroethane	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
1,2-Dichloropropane	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
1,4-Dioxane	400	R	200	R	5,000	R	NA		NA		NA		NA		NA		NA		NA		NA	
2-Butanone	9		5	U	25	U	8.3	J	18		120	U	15	U	250	U	12	U	5	U	3.5	J
2-Chloro-1,3-butadiene	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
2-Hexanone	5	U	5	U	25	U	10	U	0.83	J	120	U	15	U	250	U	12	U	5	U	5	U
4-Methyl-2-pentanone	1.1	J	5	U	25	U	10	U	5	U	120	U	15	U	250	U	12	U	5	U	0.74	J
Acetone	120		250		990		88	J	110		1,400		730		2,300		62	J	750		27	
Acetonitrile	20	U	20	U	100	U	NA		NA		NA		NA		NA		NA		NA		NA	
Acrolein	20	U	20	U	100	U	NA		NA		NA		NA		NA		NA		NA		NA	
Acrylonitrile	40	R	20	R	500	R	NA		NA		NA		NA		NA		NA		NA		NA	
Allyl chloride	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
Benzene	15		0.65	J	5	U	3.3	B	62		25	U	100		50	U	46		0.43	J	180	
Bromodichloromethane	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
Bromoform	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
Bromomethane	4	R	2	R	50	R	NA		NA		NA		NA		NA		NA		NA		NA	
Carbon disulfide	2.1		1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
Carbon tetrachloride	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
Chlorobenzene	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
Chloroethane	2	U	2	U	10	U	4	U	2	U	50	U	6	U	100	U	5	U	2	UJ	2	U
Chloroform	1	U	1	U	5	U	1.9	J	1	U	25	U	3	U	50	U	2.5	U	0.35	J	1	U
Chloromethane	2	U	2	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
Dibromochloromethane	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
Dibromomethane	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
Dichlorodifluoromethane(Freon-12)	2	U	2	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
Ethyl methacrylate	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
Ethylbenzene	0.37	J	1	U	5	U	2	U	0.95	J	25	U	3	U	50	U	2.5	U	1	U	2.1	
Iodomethane	2	R	1	R	25	R	NA		NA		NA		NA		NA		NA		NA		NA	
Isobutanol	40	U	40	U	200	U	NA		NA		NA		NA		NA		NA		NA		NA	
Methacrylonitrile	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
Methyl methacrylate	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
Methylene chloride	2	U	2	U	10	U	4	U	2	U	50	U	6	U	100	U	5	U	2	U	2	U
Propionitrile	4	R	2	R	50	R	NA		NA		NA		NA		NA		NA		NA		NA	
Styrene	0.36	J	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
Toluene	3.3		0.5	J	5	U	3.2		7.8		25	U	19		50	U	4.3		0.42	J	28	
Trichloroethene	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
Trichlorofluoromethane(Freon-11)	2	U	2	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
Vinyl acetate	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
Vinyl chloride	2	U	2	U	10	U	4	U	2	U	50	U	6	U	100	U	5	U	2	U	2	U
Xylene, total	4.2		3	U	15	U	3.6	J	13		75	U	22		150	U	5.4	J	3	U	53	
cis-1,3-Dichloropropene	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U

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Table 2.3-B
All Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP09-PZM010		CP09-PZM047				CP10-PZM008		CP11-PZM010		CP11-PZM040		CP12-PZM012		CP12-PZM052		CP14-PZM009		CP14-PZM062		TS07-PPM005	
Sample ID	CP09-PZM010-01D		CP09-PZM047-01D		CP09-PZM047-01D DUP		CP10-PZM008-01D		CP11-PZM010-01D		CP11-PZM040-01D		CP12-PZM012-01D		CP12-PZM052-01D		CP14-PZM009-01D		CP14-PZM062-01D		TS07-PPM005-01D	
Sample Date	12/06/01		12/06/01		12/06/01		12/19/01		12/05/01		12/05/01		12/05/01		12/05/01		12/05/01		12/05/01		12/06/01	
Chemical Name																						
trans-1,2-Dichloroethene	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
trans-1,3-Dichloropropene	1	U	1	U	5	U	2	U	1	U	25	U	3	U	50	U	2.5	U	1	U	1	U
trans-1,4-Dichloro-2-butene	1	U	1	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA	
Semivolatile Organic Compounds (UG/L)																						
1,2,4,5-Tetrachlorobenzene	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
1,2,4-Trichlorobenzene	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
1,2-Dichlorobenzene	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
1,3,5-Trinitrobenzene	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
1,3-Dichlorobenzene	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
1,3-Dinitrobenzene	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
1,4-Dichlorobenzene	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
1,4-Naphthoquinone	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
1-Naphthylamine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
2,2'-Oxybis(1-chloropropane)	10	U	10	U	10	U	20	U	100	U	20	U	20	U	20	U	20	U	20	U	40	U
2,3,4,6-Tetrachlorophenol	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
2,4,5-Trichlorophenol	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
2,4,6-Trichlorophenol	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
2,4-Dichlorophenol	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
2,4-Dimethylphenol	12		10	U	10	U	2.9	J	58		10	U	10	U	10	U	3	J	10	U	8.1	J
2,4-Dinitrophenol	50	U	50	U	50	U	50	U	250	U	50	U	50	U	50	U	50	U	50	U	100	U
2,4-Dinitrotoluene	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
2,6-Dichlorophenol	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
2,6-Dinitrotoluene	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
2-Acetylaminofluorene	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
2-Chlorophenol	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
2-Methyl-5-nitroaniline	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylaniline	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylnaphthalene	4.2	J	10	U	10	U	64		12	J	10	U	5.5	J	10	U	1.8	J	10	U	8.2	J
2-Methylphenol	7.3	J	10	U	10	U	3.7	J	25	J	10	U	0.9	J	10	U	4	J	10	U	2.7	J
2-Naphthylamine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitroaniline	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitrophenol	10	U	10	U	10	U	27		50	U	10	U	1.5	J	10	U	10	U	10	U	20	U
2-Picoline	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
3,3'-Dichlorobenzidine	50	U	50	U	50	U	50	U	250	U	50	U	50	U	50	U	50	U	50	U	100	U
3,3'-Dimethylbenzidine	50	U	50	U	50	U	50	U	250	U	50	U	50	U	50	U	50	U	50	U	100	U
3-Methylcholanthrene	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
3-Nitroaniline	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
4,6-Dinitro-2-methylphenol	50	U	50	U	50	U	50	U	250	U	50	U	50	U	50	U	50	U	50	U	100	U
4-Aminobiphenyl	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
4-Bromophenyl-phenylether	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
4-Chloro-3-methylphenol	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
4-Chloroaniline	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chlorophenyl-phenylether	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
4-Methylphenol	47		10	U	10	U	23		90		10	U	4.6	J	10	U	7.2	J	10	U	17	J
4-Nitroaniline	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
4-Nitrophenol	50	U	50	U	50	U	50	U	250	U	50	U	50	U	50	U	50	U	50	U	100	U
4-Nitroquinoline-1-oxide	100	U	100	U	100	U	NA		NA		NA		NA		NA		NA		NA		NA	
7,12-Dimethylbenz(a)anthracene	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
Acenaphthene	3.8	J	8.8	J	6.8	J	6.9	J	4	J	10	U	0.88	J	10	U	1.2	J	10	U	20	U
Acenaphthylene	13		1.5	J	10	U	35		8.5	J	10	U	10	U	10	U	10	U	10	U	20	U
Acetophenone	1.8	J	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	

NA - Not analyzed
B - Detected in blank
J - Value is estimated
L - Value biased low
R - Unreliable result

U - Not detected
UJ - Not detected, detection limit inaccurate
UL - Not detected, detect limit low

Table 2.3-B
All Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP09-PZM010		CP09-PZM047				CP10-PZM008		CP11-PZM010		CP11-PZM040		CP12-PZM012		CP12-PZM052		CP14-PZM009		CP14-PZM062		TS07-PPM005	
Sample ID	CP09-PZM010-01D		CP09-PZM047-01D		CP09-PZM047-01D DUP		CP10-PZM008-01D		CP11-PZM010-01D		CP11-PZM040-01D		CP12-PZM012-01D		CP12-PZM052-01D		CP14-PZM009-01D		CP14-PZM062-01D		TS07-PPM005-01D	
Sample Date	12/06/01		12/06/01		12/06/01		12/19/01		12/05/01		12/05/01		12/05/01		12/05/01		12/05/01		12/05/01		12/06/01	
Chemical Name																						
Aniline	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
Anthracene	1.1	J	2.3	J	1.2	J	10		50	U	10	U	10	U	10	U	10	U	10	U	20	U
Aramite	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
Benzo(a)anthracene	10	U	10	U	10	U	4.4	J	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Benzo(a)pyrene	10	U	10	U	10	U	4	J	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Benzo(b)fluoranthene	10	U	10	U	10	U	4	J	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Benzo(g,h,i)perylene	10	U	10	U	10	U	3.5	J	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Benzo(k)fluoranthene	10	U	10	U	10	U	4.2	J	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Benzyl alcohol	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
Butylbenzylphthalate	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Chrysene	10	U	10	U	10	U	4.8	J	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Di-n-butylphthalate	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Di-n-octylphthalate	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Dibenz(a,h)anthracene	10	U	10	U	10	U	0.84	J	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Dibenzofuran	3.2	J	4.1	J	2.3	J	35		8.6	J	10	U	10	U	10	U	10	U	10	U	20	U
Diethylphthalate	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Dimethyl phthalate	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Dinoseb	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
Diphenylamine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
Ethyl methanesulfonate	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
Fluoranthene	1.1	J	6.7	J	6.1	J	23		6.2	J	10	U	10	U	10	U	0.94	J	10	U	20	U
Fluorene	4.8	J	5.1	J	2	J	33		6.7	J	10	U	10	U	10	U	10	U	10	U	20	U
Hexachlorobenzene	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Hexachlorobutadiene	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Hexachlorocyclopentadiene	50	U	50	U	50	U	50	U	250	U	50	U	50	U	50	U	50	U	50	U	100	U
Hexachloroethane	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Hexachloropropene	100	U	100	U	100	U	NA		NA		NA		NA		NA		NA		NA		NA	
Indeno(1,2,3-cd)pyrene	10	U	10	U	10	U	3.6	J	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Isophorone	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Isosafrole	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
Methapyrilene	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
Methyl methanesulfonate	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
N-Nitrosomorpholine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
N-Nitrosopiperidine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
Naphthalene	140		10	U	10	U	430		98		10	U	68		10	U	34		10	U	100	
Nitrobenzene	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
Pentachlorobenzene	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
Pentachloroethane	50	U	50	U	50	U	50	U	250	U	50	U	50	U	50	U	50	U	50	U	100	U
Pentachloronitrobenzene	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
Pentachlorophenol	50	U	50	U	50	U	50	U	250	U	50	U	50	U	50	U	50	U	50	U	100	U
Phenacetin	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
Phenanthrene	5.6	J	10	U	0.6	J	72		29	J	1.1	J	2	J	10	U	2.6	J	10	U	20	U
Phenol	180		10	U	10	U	430		290		10	U	14		10	U	14		10	U	21	
Pronamide	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
Pyrene	10	U	3.1	J	2.9	J	14		50	U	10	U	10	U	10	U	10	U	10	U	20	U
Pyridine	2.8	J	20	U	20	U	3.4	J	11	J	20	U	20	U	20	U	3.6	J	20	U	40	U
Safrole	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
a,a-Dimethylphenethylamine	50	U	50	U	50	U	NA		NA		NA		NA		NA		NA		NA		NA	
bis(2-Chloroethoxy)methane	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
bis(2-Chloroethyl)ether	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
bis(2-Ethylhexyl)phthalate	10	U	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U	10	U	20	U
n-Nitroso-di-n-butylamine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitroso-di-n-propylamine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	

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Table 2.3-B
All Results
Coke Point Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	CP09-PZM010		CP09-PZM047				CP10-PZM008		CP11-PZM010		CP11-PZM040		CP12-PZM012		CP12-PZM052		CP14-PZM009		CP14-PZM062		TS07-PPM005	
Sample ID	CP09-PZM010-01D		CP09-PZM047-01D		CP09-PZM047-01D DUP		CP10-PZM008-01D		CP11-PZM010-01D		CP11-PZM040-01D		CP12-PZM012-01D		CP12-PZM052-01D		CP14-PZM009-01D		CP14-PZM062-01D		TS07-PPM005-01D	
Sample Date	12/06/01		12/06/01		12/06/01		12/19/01		12/05/01		12/05/01		12/05/01		12/05/01		12/05/01		12/05/01		12/06/01	
Chemical Name																						
n-Nitroso-n-methylethylamine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosodiethylamine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosodimethylamine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosodiphenylamine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
n-Nitrosopyrrolidine	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA	
p-Dimethylaminoazobenzene	20	U	20	U	20	U	NA		NA		NA		NA		NA		NA		NA		NA	
p-Phenylenediamine	200	U	200	U	200	U	NA		NA		NA		NA		NA		NA		NA		NA	
Polychlorinated Biphenyls (UG/L)																						
Aroclor-1016	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1221	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1232	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1242	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1248	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1254	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Aroclor-1260	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Total Metals (UG/L)																						
Antimony	4.1	U	4.1	U	4.1	U	12.6		4.1	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U
Arsenic	2	U	3.8	B	2.7	B	37.5		3.1	J	5.5	J	3	J	5	J	2.5	J	8.5	J	3.5	J
Barium	887		106	J	96.2	J	3,590		1,460		57	J	135	J	29.1	J	354		35	J	428	
Beryllium	1.7	B	1.4	B	1.1	B	4.3	J	1.9	B	2.3	B	0.46	B	0.5	B	1.1	B	1.1	B	2.6	B
Cadmium	0.63	U	0.63	U	0.63	U	6.4		0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
Chromium	1.9	J	3.3	J	6		1,140		3.5	B	2.5	B	2.4	B	3.9	B	3.3	B	3.2	B	1.1	U
Cobalt	0.86	U	2.3	J	0.86	U	22.8	J	1.4	J	1.7	J	0.86	U	1.2	J	0.95	J	0.86	U	0.86	U
Copper	0.77	U	5.8	B	0.77	U	451		0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	0.93	J	0.77	U
Lead	3.3		1.8	U	1.8	U	664		1.8	U	1.8	U	1.8	U	1.8	U	2.6	B	2	B	1.8	U
Mercury	0.054	R	0.054	R	0.054	R	0.34	B	0.07	J	0.054	U	0.054	UL	0.054	UL	0.071	L	0.054	UL	0.063	J
Nickel	34.2	J	2.4	U	4.5	J	167		17.7	J	5.4	J	2.9	J	4.1	J	5.3	J	2.4	U	2.4	U
Selenium	3.2	U	3.2	U	3.2	U	16	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U
Silver	0.75	U	0.75	U	1.8	J	3.7	J	0.75	U	0.75	U	1	B	1.5	B	0.97	B	1.3	B	0.75	U
Thallium	5.7	U	5.7	U	5.7	U	28.7	U	5.7	U	10.5		5.7	U	5.7	U	5.7	U	5.7	U	5.7	U
Tin	28.8	U	28.8	U	28.8	U	184		28.8	U	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U	28.8	U
Vanadium	22.4	J	58.3		52.7		1,060	J	4.2	J	15.3	J	5.1	J	18.7	J	3.1	J	27.5	J	4	J
Zinc	3.6	J	9.7	B	1.8	B	3,590		1.5	U	1.5	U	1.5	U	9.6	J	1.5	U	1.5	U	1.5	U
Common Cations (UG/L)																						
Calcium	NA		77,600		78,900		1,270,000		819,000		68,100		NA		127,000		882,000		147,000		NA	
Iron	NA		7,560	J	7,670	J	326,000		209		148		NA		45	UL	129	L	813	L	NA	
Magnesium	NA		483,000		511,000		173,000		24.5	J	124,000		NA		274,000		225	J	44,400		NA	
Manganese	NA		976	L	838	L	30,300		7.1	J	15.1		NA		296		35.6		41.6		NA	
Potassium	NA		133,000	J	131,000	J	149,000		122,000		124,000		NA		79,400		43,200		55,200		NA	
Sodium	NA		3,460,000		3,410,000		235,000		609,000		2,970,000		NA		2,140,000		102,000		888,000		NA	
Wet Chemistry (MG/L)																						
Amenable cyanide	1.4	J	0.0038	B	0.0031	B	0.004	J	3.8	J	0.77	J	0.17	J	0.017	J	0.82	J	0.12	J	0.23	J
Bicarbonate	NA		2,000		2,370		25	U	5	U	216		NA		241		5		68		NA	
Chloride	NA		6,090		5,980		315		976		4,620		NA		3,830		127		1,700		NA	
Sulfate	NA		15		18.1		9.3		8.4		20.9		NA		387		131		25.4		NA	
Sulfide	1	U	1	U	1	U	1	U	1	U	1	U	2.9		1		1		2.9		1	U
Total dissolved solids (TDS)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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Study Area Investigations (Continued)

2.4 Greys Landfill (GL SSA)

2.4.1 Site-Specific Activities

2.4.1.1 Geologic Investigations

The geologic model of the GL SSA was based on geologic information obtained from drilling and CPT analysis at several locations. Both borings and CPT analysis were performed during the RSC Study. In addition, information obtained from the Site-Wide Investigation Groundwater Study was used. Finally, geologic information from previous environmental and geotechnical investigations performed at the site was used where data gaps appeared to exist. The locations of all sources of geologic information are provided in Figure 2.4-1.

Soil Borings. Four soil borings were completed in the GL SSA for the RSC Study in conjunction with installation of shallow piezometers. Each of the soil borings was completed within the shallow water-table zone. Three split-spoon soil samples were recovered at each boring location except for boring GL15, where four split-spoon samples were recovered. Split-spoon samples were recovered to provide lithologic descriptions of the screened interval of the piezometers.

The boring designated GL13-PZM032 and those with designations beginning with “BW,” “GL17,” or “GL-GB” in Figure 2.4-1 were performed during previous investigations at the site.

Boring logs for the GL SSA are located in Appendix 2.4-A.

CPT Analysis Sites. There are eight locations where CPT analysis was used to obtain subsurface lithological information in the GL SSA during the RSC Study. The CPT analysis depths varied depths from 34 feet bgs at GL10-CPT to 70 feet bgs at GL11-CPT.

CPT locations designated GL04-CPT, GL05-CPT, and GL07-CPT were used during the Site-Wide Investigation Groundwater Study.

The CPT logs for the GL SSA are located in Appendix 2.4-A.

2.4.1.2 Groundwater Investigations

Piezometer Network. Figure 2.4-2 shows the GL SSA piezometer network used for groundwater investigations conducted for the RSC Study. As shown on the figure, this network includes 8 piezometers that were installed during this study, 15 piezometers installed during 2000 and 13 piezometers installed prior to 2000. Table A-1 in Appendix A presents the construction details for the piezometer network.

Four 2-inch-diameter water table piezometers were installed in the GL SSA at the locations depicted in Figure 2.4-1. Three of the 2-inch piezometers were screened within the water-table unit with the bottom of the 10-foot screen elevation located between -2 feet and -3 feet. Piezometer GL15-PZM022 was installed within a shallow water-bearing sand and screened with a 5-foot length of screen at an elevation of -22 feet.

Four 0.5-inch-diameter piezometers were installed at depths that were correlated to intermediate water-bearing sands below the water table. Each screen installed in the GL SSA was a prepacked 5-foot-long screen. The bottom of the screens ranged in elevation from -12 feet at GL10-PZM012 to -36 feet at GL08-PZM036.

Water-Level Measurements. There were two rounds of water-level measurements taken for piezometers located in the GL SSA. Measurements were taken on December 18, 2001, and March 18, 2002. The data are presented in Table A-2 of Appendix A.

Dissipation Testing. In conjunction with the CPT analysis, dissipation-test results were obtained in seven subsurface intervals where CPT analysis was undertaken during the RSC Study. The data obtained from the dissipation testing are presented in Table 2.4-1. Dissipation-test results and parameters for the GL SSA are included in Appendix B.

2.4.1.3 Chemical Analysis

Groundwater sampling for the GL SSA took place between December 7 and 18, 2001. Samples were collected from 11 locations; four of these locations were sampled at two depths, and three at three depths. Table 2.4-3 lists the locations, depths, and type of analysis for each of the 21 samples. Three piezometers (GL15-PZM022, GL17-PZM032, and GL17-PZP008) were selected for Appendix IX analysis. The other samples were analyzed for the preliminary COPI list. Two trip blanks, three equipment blanks, and four field duplicates were collected by the field team for this study area.

2.4.2 Site Characterization

2.4.2.1 Geologic Results

The upper 100 feet to 120 feet of the subsurface material underlying the GL SSA comprises a sequence of unconsolidated materials (from shallowest to deepest): slag and other anthropogenic-fill materials; interbedded clay, silt, and sand layers of low to moderate density; and then clay and sand units of high density. Figure 2.4-3 shows the locations of four cross sections showing the vertical distribution of the unconsolidated materials. Figures 2.4-4 through 2.4-7 show the cross sections themselves. The character of the unconsolidated materials is summarized below.

Slag and Other Anthropogenic Materials. Slag and other fill materials were deposited on existing land surfaces and in adjoining surface-water bodies during the development of the Sparrows Point peninsula. Slag primarily comprises “cold-poured” materials with the consistency of gravely, silty sand. Landfilled wastes have also been and continue to be placed on the existing land surfaces and made land.

The slag and other anthropogenic material at the site vary in thickness from 0 feet southwest of the GL SSA to 75 feet within the landfill itself, as shown in the isopach map in Figure 2.4-4. The greatest thickness of slag and other materials is found in the landfill itself, where anthropogenic material has been placed on the ground, thus elevating the landfill above the existing land surface. The northern part of the site overlies the former channel of Greys Creek that was filled in with slag; the approximate shoreline of the former channel is included in the figure.

The greatest thickness of slag underlying the GL SSA is found at boring BW-6 in the northwestern part of the SSA (Figure 2.4-8). The material above the typical grade of elevation about 10 feet is not included in the thickness of the slag because the material generally is not slag but landfill material.

Cross section A–A′ (Figure 2.4-4) is oriented north-northeast to south-southwest from boring GL01-CPT to boring BW3; the cross section generally parallels the shoreline of Bear Creek. The cross section begins to the north-northeast within the former channel of Greys Creek and, therefore, exhibits slag below sea level to the north and above sea level to the south, where the slag was placed directly on the original ground surface. Slag thickness to the north is on the order of 15 to 20 feet. As the cross section moves to the south-southwest, it leaves the former stream channel; hence, the slag thins to less than 10 feet at all remaining borings in the cross section.

Cross section B–B′ (Figure 2.4-5) also is oriented north-northeast to south-southwest but crosses the landfill itself. The thickness of slag and other anthropogenic material varies from about 15 feet in the north (at boring GL03-CPT) to almost 70 feet at boring BW-9 and then thinning to less than 10 feet in the southern part of the cross section. Slag present at shallow depths below sea level in the northern part of the cross section indicates the presence of the former creek valley while, to the south, slag is placed on original ground with elevations of 10 feet.

Cross section C–C′ (Figure 2.4-6) is oriented west to east along the northern side of the site. Some slag and other anthropogenic material placed at elevations below sea level indicate the presence of the former Greys Creek valley. The slag thickness is relatively consistent throughout the cross section, varying from about 15 feet to about 20 feet.

Cross section D–D′ (Figure 2.4-7) is oriented west to east near the southern edge of the site but includes locations within the landfill itself. No slag was detected at boring GL10-CPT but the thickness ranged up to about 10 feet at other locations along the cross section.

Talbot Formation. The interbedded clay, silt, and sand layers of low to moderate density underlying the slag are associated with the Pleistocene Talbot Formation, which probably is of marine origin as rising sea level flooded the lower Susquehanna River valley. The Talbot Formation was deposited in deep valleys eroded in the upper surface of the Cretaceous Patapsco Formation formed by the ancestral Susquehanna River. The deposits also can include organic clay.

The top of the Talbot Formation is defined as the bottom of the slag while the bottom of the deposits is defined as the depth at which higher split-spoon blow counts, high resistance to a CPT boring, and perhaps red- to brown-colored or white sand or clay indicate the top of the Patapsco Formation.

Cross section A–A′ (Figure 2.4-4) shows the interbedded nature of the sand, silt, and clay units within the Talbot Formation. Along this cross section, the slag generally is underlain by silt and clay. A sand unit is located at an elevation starting at about -20 feet and underlies the entire cross section to a depth beyond the limits of the available borings. Note, however, that only the upper part of this sand unit is Talbot, and the Talbot sand thins from about 10 feet thick at GL10-CPT to effectively 0 feet thick south of GL10-CPT.

Sand bodies such as the one through most of the cross section at an elevation of about 0 feet to -10 feet likely are connected with the sand described in the previous paragraph, particularly in the vicinity of borings BW-1, GL14-PZM10, and GL10-CPT, where the intervening clay is very thin (i.e., only 2 feet to 4 feet thick). This shallow sand body appears to connect with the slag in the former channel of Greys Creek in the vicinity of boring BW2. Other smaller units of sand, clay, or silt can be seen in the cross section.

Cross section B–B′ (Figure 2.4-5) also shows clay and silt immediately underlying the slag. The sand unit shown in Figure 2.4-4 occurs throughout the cross section at elevations below about -20 feet. Again, though, only the upper part of this sand is Talbot. Other sand units are interbedded in the Talbot Formation. The sand unit located in the central part of the cross section (i.e., encountered in boring GL07-PZM041) at elevations between about -10 feet and -20 feet may be connected with the underlying sand unit because the clay separating the two sand units at boring GL07-PZM041 is less than 10 feet thick.

Cross section C–C′ (Figure 2.4-6) shows the slag immediately underlain by clay or silt along the entire cross section. The sand unit shown below an elevation of about -20 feet to -30 feet is the same sand detected at an elevation of about -20 feet in the other cross sections. Again, most of this sand is Patapsco rather than Talbot, although the Talbot thickens east of GL08-CPT.

Cross section D–D′ (Figure 2.4-7) again shows the slag immediately underlain by clay and silt along most of the length of the cross section. As in the other cross sections, a sand unit extends along the length of the cross section, although the sand is located below an elevation of about -30 feet to -40 feet, deeper than in the other cross sections. Again, most of this sand is Patapsco rather than Talbot, though the Talbot sand thickens east of GL07-CPT. Also deeper than in cross section A–A′ (Figure 2.4-4) is the continuous sand unit at elevations between about -10 feet to -20 feet.

In summary, clay and silt units of the Talbot Formation underlie the slag across most of the site. A sand unit then underlies the clay and silt units starting at an elevation of about -20 feet to -30 feet over most of the site and deepening in the southern part of the site. In general, the sand units appear to be connected laterally and, to a lesser extent, vertically at the site. However, only the upper part of the sand is Talbot.

Patapsco Formation. The clay and sand units of high density below the Talbot Formation are associated with the Cretaceous Patapsco Formation. Besides the higher density of the materials in the Formation, red- to brown-colored sand and clays and white clay can distinguish the Patapsco deposits from overlying Talbot deposits.

The estimated elevation of the top of the Patapsco is shown in Figure 2.4-9. The elevation of the top of the unit varies beneath the site but generally is at an elevation of about -20 feet to -30 feet under most of the site but drops to an elevation of about -52 feet at the eastern end of cross section D–D′ (Figure 2.4-7) at boring GL11-CPT. Data from the vicinity of

Humphrey Impoundment show the top of the Patapsco at a significantly lower elevation than around the GL SSA.

2.4.2.2 Groundwater Results

Results of the water levels taken in December are presented in Figures 2.4-10 and 2.4-11. These figures include contour maps for the unconfined water table zone and the potentiometric surface of the underlying intermediate sand zone. Note that the maps provided in Figures 2.4-10 and 2.4-11 are taken from the facility-wide maps provided in Figures A-1 and A-2, respectively, in Appendix A. The following discussion refers to the maps of the water table and of the potentiometric surface of the intermediate sand unit underlying the site, and to water levels noted in cross sections A–A′ through D–D′ (Figures 2.4-4 through 2.4-7, respectively.)

Figure 2.4-10 shows the water table on December 18, 2001. Water levels measured at other times during the RSC and during the Site-Wide Investigation Groundwater Study show a similar configuration. Note that the elevation of the local surface-water body (Bear Creek) is at -1.25 feet, according to the datum used in the investigation.

In general, the water table slopes radially away from elevated water levels within the landfill. Higher land elevations (i.e., on the order of 60 feet) characterize the landfill itself. It is likely that the water table is elevated (i.e., on the order of 12 feet to 16 feet) under most of the site because of the higher topography. Shallow groundwater that flows westward from the landfill discharges directly into Bear Creek. Shallow groundwater that flows northward from the landfill turns first northwestward and then westward to discharge into Bear Creek. Shallow groundwater that flows southward from the landfill appears to discharge into the drainage ditch along the south side of the site. Finally, shallow groundwater that flows eastward from the site eventually turns southward, then westward to discharge into Bear Creek or the drainage ditch. The water table occurs in the slag and anthropogenic material at the site, except at those few locations where slag is absent, when the water table is in the upper part of the Talbot Formation. The *Report on Groundwater Investigation Study Program at Humphrey Impoundment and Grays Landfill, Sparrows Point Plant, Bethlehem Steel Corporation, 1986-1987* reported hydraulic conductivities of the slag ranging from 0.3 feet/day to 30 feet/day.

Figure 2.4-11 shows the potentiometric surface defined by piezometers screened primarily in sand units at elevations on the order of -10 feet to -20 feet. These sand units appear generally to be connected horizontally and, to a lesser degree, vertically. Groundwater in these sand units is under confined conditions and appears to flow generally westward toward Bear Creek, although elevated water levels appear also to drive some flow radially northward, eastward, and southward. Flow moving northward and southward eventually discharges into Bear Creek whereas flow moving eastward apparently goes under Humphrey Impoundment.

The *Report on Groundwater Investigation Study Program at Humphrey Impoundment and Grays Landfill, Sparrows Point Plant, Bethlehem Steel Corporation, 1986-1987* reported that the hydraulic conductivity of the sand units at the Humphrey Impoundment area to the southeast ranges from 3E-03 to 30 feet/day. Dissipation tests indicate that the vertical hydraulic conductivities of the clay layers underlying the GL SSA are on the order of 1E-04 feet/day to 6E-04 feet/day (Table 2.4-1.)

Cross sections A–A′ through D–D′ (Figures 2.4-4 through 2.4-7) show water levels at different depths in the subsurface at different locations on and near the site. In general, water levels decline with depth across most of the site, which would be expected as water infiltrates from the surface, reaches the water table, and moves downward into the groundwater system. Exceptions to this are where water levels measured in deep piezometers are significantly higher than those measured in shallow piezometers. Such elevated water levels suggest that a hydraulic connection may exist between the vicinity and depths of these piezometers and the elevated water levels observed within the landfill itself, where the higher topography produces water levels with elevations in excess of 10 feet.

In cross section A–A′ (Figure 2.4-4), water levels decline with depth at all observed locations except at GL02-CPT, where the deep piezometer had a higher water level of 8.47 feet in December 2001; the water level in the deep piezometer was measured at 17.05 feet in March 2002.

The water level in piezometer GL14-PZP002 was at 14.59 feet in December 2001 but was only at 4.34 feet in March 2002. This piezometer is located on a narrow berm with an elevation of about 22 feet and, therefore, the lower water observed in March 2002 is closer to the elevation of surface-water bodies in the vicinity and is more likely representative of water levels in this area. Based on the water levels in the cross section, groundwater moves downward from the water-level high near piezometer GL14-PZM010 and laterally away to the north and south. However, the cross section is oriented parallel to Bear Creek and groundwater actually is flowing predominantly westward through the cross section; there may be little vertical component of flow. The unusually high water level observed in piezometer GL02-PZM028 can be seen near the left side of the cross section.

Similar relationships can be seen along the other cross sections (Figures 2.4-5 through 2.4-7). For example, in cross section B–B′ (Figure 2.4-5), the shallow piezometer at location GL07-CPT has a water-level elevation of 16.53 feet while the deeper piezometers at this location show lower water levels, again indicating the potential for groundwater to move downward from the shallow units into the deeper units. The lateral extent of the silt and clay units will limit this potential for movement, though.

Note that the water levels in piezometers GL14-PZM010 and GL10-PZM012 are significantly different, although they are screened in sand units at about the same elevations. This argues for less lateral connection between the sand bodies, as shown in the cross section.

In cross section C–C′ (Figure 2.4-6) the water level in piezometer GL17-PZM032 has been quite variable over time (e.g., it was at -0.08-foot in November 2001, 0.95-foot in December 2001, and 5.78 feet in March 2002.) The reason for this variability is unknown. The water levels in the shallower piezometers at the same location have been relatively steady over the period of measurement. In piezometer GL13-PZM032 (cross section D–D′ in Figure 2.4-7) the water level was 0.41-foot in December 2001 but typically has been 5 feet to 8 feet during the period of record. Therefore, although it looks from Figure 2.4-7 that the potential for groundwater flow is consistently downward, typically the deeper water level has been higher than the next deepest. As mentioned earlier, the reason for the reversal in water levels is unknown, and other inconsistencies require further investigation.

In summary, shallow groundwater at Greys Landfill appears to flow radially away from an elevated water table beneath the landfill. Most of this groundwater moves to Bear Creek. Along the southern side of the landfill, shallow groundwater discharges into the drainage ditch. Some groundwater moving eastward eventually discharges into Tin Mill Canal. Water levels indicate that shallow groundwater potentially moves vertically downward into deeper sand units, although the presence of clay and silt resists this vertical migration. Deeper groundwater also moves laterally away from the elevated water levels associated with the landfill to discharge primarily into Bear Creek.

2.4.2.3 Chemical Analysis

Table 2.4-3 summarizes detected results for field samples. Duplicate results have been included for locations where this quality control procedure was conducted. The qualifying letters appearing beside the concentrations are explained in Section 1.3.3. Blank spaces in the table indicate that the compound was not detected. The concentrations found by the validator to be affected by blank contamination are considered to be not detected and therefore are also indicated by blank spaces. Results rejected by the validator are qualified by "R." "NA" indicates that this chemical was not analyzed in this sample.

The complete analytical results are presented in Table 2.1-B in Appendix 2.4-B. The table shows all results for all locations in the GL SSA for all compounds in each sample collected during the RSC sampling event of late December 2001. The detected results are shaded for easier identification. "NA" indicates that the chemical was not analyzed for because it was not part of the compound list assigned to the sample or, as in the case of GL16-PZP003, some fraction of the sample has no results because of a sampling problem.

There were a few anomalies associated with the Greys Landfill samples:

- The samplers were given the sample-naming scheme according to the planning memorandum to identify the samples. However, when the piezometers were installed, the depth of the piezometers or the locations sometimes varied from the plan. Here is a list of the sample names that were recorded incorrectly on the chain of custody:

Sample ID from Plan	Sample ID Corrected
GL13-PZM007	GL13-PZP003
GL15-PZM027	GL15-PZM022
GL17-PZM008	GL17-PZP008

- Sample GL16-PZP003 had results for volatiles, pesticides, and metals only. The piezometer ran dry, and not enough volume could be collected for the remaining parameters.
- The sampling crew was unable to record field parameters for one sample (GL07-PZM031). The water level at this piezometer was too deep for the Geopump to work, so bailers were used to collect the sample volume, and with this sampling

method, water could not be delivered to the flow-through cell for the field parameter readings. Also, the piezometers ran dry during the bailing process, so samples were collected as soon as enough water had reentered the piezometers to allow sampling.

- In the data validation reports for the GL SSA, an R qualifier was applied to three volatile compounds (1,4-dioxane, acetonitrile, and isobutanol) because of very low relative response factors in the three samples (GL15-PZM022, GL17-PZM032, and GL17-PZM008). These compounds are part of the Appendix IX list, but are not on the COPI list, and are known to be poor responders.
- Blank contamination was common in this area. It affected the metals fraction only and predominantly barium and beryllium. The results affected by blank contamination are qualified with a "B" in Table 2.4-B. Sample results affected by blank contamination are usually considered not detected. Duplicate results were similar, showing good correlation between the sample and its duplicate. All major ion data were reported without qualification.

Chemical analysis results for the shallow groundwater show volatile and semivolatile organic compounds above the detectable limits (Figure 2.4-12), in the area of the GL SSA located downgradient of the closed hazardous waste cell. The highest concentrations of organic compounds were detected in piezometer GL18-PZP002; results indicated 1,500 µg/L of benzene and 2,700 µg/L of naphthalene. Concentrations of COPI metals were present, typically in the parts per billion range (µg/L), throughout the GL SSA (Figure 2.4-13). PCB compounds were not detected in any of the samples. There were no compounds detected on the Appendix IX samples that do not appear on the COPI list.

Chemical results for the intermediate groundwater zone do not indicate concentrations of organic compounds above the detectable limits in many of the locations (Figure 2.4-12). Exceptions are acetone, found in GL15-PZM022 (710 µg/L), and semivolatile organic compounds, found in the parts-per-billion (µg/L) range in GL17-PZM032. Concentrations of COPI metals were found in the parts-per-billion (µg/L) range (Figure 2.4-13). PCB compounds were not detected in any of the samples. There were no compounds detected in the Appendix IX samples that do not appear on the COPI list.

Site Conceptual Model

This section provides a summary and synthesis of the geologic, hydrogeologic, and chemical results of the investigation for the GL SSA. Figure 2.4-14 is a schematic diagram showing the general geology and movement of groundwater and site-related contamination at the site.

The site is immediately underlain primarily by slag of a granular nature and other anthropogenic material making up the mass of the landfill. The anthropogenic material is thickest in the landfill itself. Clay and silt units of the Talbot Formation underlie the slag over most of the site, and these units are in themselves underlain by sand that primarily is associated with the Talbot Formation but also includes units from the underlying Patapsco Formation. Some sand lenses are interbedded in the Talbot Formation and some clay and silt lenses occur in the sand units.

Shallow groundwater at the site primarily moves radially away from the topographic and water-table high within the landfill itself and ultimately discharges into Bear Creek. Over much of the site, shallow groundwater has the potential to move downward into the underlying sand units. Deeper groundwater moves to either Bear Creek to the west or to Jones Creek to the east. An exception to this is that deeper groundwater that moves laterally southeastward from the site may flow under Humphrey Impoundment to the southeast.

2.4.3 References

Report on Groundwater Investigation Study Program at Humphrey Impoundment and Grays Landfill, Sparrows Point Plant, Bethlehem Steel Corporation, 1986-1987. Prepared for Bethlehem Steel Corporation, Sparrows Point, Maryland by Baker/TSA, Inc. July 1987.

Table 2.4-1
Dissipation - Test Results for Fine - Grained Materials
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Borehole Identification and Depth (ft)	Soil Description	*t* (sec)	K_h/K_v	Horizontal Hydraulic Conductivity (K_h)	Vertical Hydraulic Conductivity (K_v)
				ft/day	ft/day
GL10					
20.7	Silty clay to clay	1150	1.2	7.5E-04	6.2E-04
GL08					
22.8	Clayey silt to silty clay	385	3	2.1E-04	6.9E-05
GL09					
31.7	Silty clay to clay	725	3	1.9E-04	6.3E-05
GL11					
34.8	Clayey silt to silty clay	450	3	2.1E-04	7.1E-05
GL08					
35.1	Sandy silt to clayey silt	170	3	5.1E-04	1.7E-04
GL12					
37.4	Clayey silt to silty clay	340	3	2.6E-04	8.6E-05
GL-07					
70.1	Sandy silt to clayey silt	453	3	5.8E-04	1.9E-04

Note

t = time until pre-specified pore-pressure dissipation was reached.

Includes data collected during the Groundwater Study; shaded tests were performed during the RSC Study.

All calculations for the RSC Study are presented in Appendix B.

Table 2.4-2
Sample Analysis
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Location	Water-Bearing Unit	Sample ID	Appendix IX List	COPI List	Date Sampled
GL02-PZM028	Int. Sands	GL02-PZM028-01D		X	12/17/01
GL02-PZM017	Shallow Int. Sands	GL02-PZM017-01D		X	12/17/01
GL02-PZM006	Water Table	GL02-PZM006-01D		X	12/17/01
GL05-PZM020	Int. Sands	GL05-PZM020-01D		X	12/17/01
GL07-PZM031	Int. Sands	GL07-PZM031-01D		X	12/17/01
GL08-PZM036	Int. Sands	GL08-PZM036-01D		X	12/07/01
GL08-PZM000	Water Table	GL08-PZM000-01D		X	12/17/01
GL10-PZM012	Shallow Int. Sands	GL10-PZM012-01D		X	12/18/01
GL10-PZP003	Water Table	GL10-PZP003-01D		X	12/18/01
GL11-PZM030	Int. Sands	GL11-PZM030-01D		X	12/18/01
GL11-PZP002	Water Table	GL11-PZP002-01D		X	12/17/01
GL13-PZM032	Int. Sands	GL13-PZM032-01D		X	12/18/01
GL13-PZM012	Shallow Int. Sands	GL13-PZM012-01D		X	12/18/01
GL13-PZP003	Water Table	GL13-PZP003-01D		X	12/18/01
GL15-PZM022	Int. Sands	GL15-PZM022-01D	X		12/18/01
GL15-PZP008	Water Table	GL15-PZP008-01D		X	12/21/01
GL16-PZP003	Water Table	GL16-PZP003-01D		X	12/18/01
GL17-PZM032	Int. Sands	GL17-PZM032-01D	X		12/17/01
GL17-PZM005	Shallow Int. Sands	GL17-PZM005-01D		X	12/17/01
GL17-PZP008	Water Table	GL17-PZP008-01D	X		12/18/01
GL18-PZP002	Water Table	GL18-PZP002-01D		X	12/17/01

Table 2.4-3
Detected Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL02-PZM006	GL02-PZM017	GL02-PZM028	GL05-PZM020	GL07-PZM031	GL08-PZM000	GL08-PZM036	GL10-PZM012	GL10-PZP003	GL11-PZM030		GL11-PZP002	GL13-PZM012	
											Duplicate			Duplicate
Sample Date	12/17/01	12/17/01	12/17/01	12/17/01	12/17/01	12/17/01	12/07/01	12/18/01	12/18/01	12/18/01	12/18/01	12/17/01	12/18/01	12/18/01
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1-Dichloroethane	69	0.46 J										4.8		
2-Butanone														
4-Methyl-2-pentanone	36													
Acetone	5.6 J													
Benzene	53	0.32 J		0.43 J	0.32 J	1.5						3.5		
Carbon disulfide	0.37 J													
Ethylbenzene	4.5													
Methylene chloride						0.92 J								
Toluene	5.9													
Trichloroethene	0.32 J													
Vinyl chloride	8.6													
Xylene, total	10													
trans-1,2-Dichloroethene	0.94 J													
Semivolatile Organic Compounds (UG/L)														
2,4-Dimethylphenol	28 J					5.2 J							3.9 J	2.6 J
2-Methylnaphthalene														
2-Methylphenol	17 J					5.3 J							1.3 J	0.92 J
4-Methylphenol	75					6.8 J							2.5 J	1.4 J
Acenaphthene						1.6 J								
Acenaphthylene														
Anthracene														
Di-n-butylphthalate														
Dibenzofuran														
Diethylphthalate					1.2 J					1.3 J	1 J			
Fluoranthene														
Fluorene							0.5 J							
Naphthalene				2.8 J	0.69 J	4.8 J	6.3 J							
Phenanthrene							1.1 J					0.57 J		
Phenol	2.6 J					4.8 J								
Pyrene				1.5 J										
Pyridine														
Total Metals (UG/L)														
Arsenic	7.9 J	11.6	66	17.1	7.7 J	6.1 J	31.7		3.5 J	8.4 J	7.2 J	3.6 J		
Barium							56 J		137 J				32.6	32.2
Cadmium								0.66 J	0.9 J		1 J			
Chromium	1.3 J		2.9 J		12.1				6.3					
Cobalt							1 J							
Copper														442
Lead			1.9 J		4.9									
Mercury														
Nickel					24 J	6.3 J								
Selenium	7.2													
Silver													6	5.7
Thallium		11.2									13.6			

NA - Not analyzed
J - Value is estimated
L - Value biased low
U - Not detected
Blank contamination considered not detected

UJ - Not detected, DL estimated
UL - Not detected, DL low

Table 2.4-3
Detected Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL02-PZM006	GL02-PZM017	GL02-PZM028	GL05-PZM020	GL07-PZM031	GL08-PZM000	GL08-PZM036	GL10-PZM012	GL10-PZP003	GL11-PZM030		GL11-PZP002	GL13-PZM012	
											Duplicate			Duplicate
Sample Date	12/17/01	12/17/01	12/17/01	12/17/01	12/17/01	12/17/01	12/07/01	12/18/01	12/18/01	12/18/01	12/18/01	12/17/01	12/18/01	12/18/01
Chemical Name														
Vanadium	5.8 J	7.4 J	12.7 J	8.9 J		10.7 J	10.4 J	4.8 J	16.7 J	11.6 J	8.3 J	3.8 J	54.9 J	57.3 J
Zinc	3.5 J	9.9 J	44		176		7.6 J		56.3					
Common Cations (UG/L)														
Calcium	231,000	64,700		NA	NA		30,800	16,200	NA	23,900	24,100	234,000	120,000	124,000
Iron	53.4 J	155,000	26,700	NA	NA	1,100	114,000	85,300	NA	156,000	159,000	3,420	1,410,000	1,420,000
Magnesium	8,950	109,000	267,000	NA	NA	26,000	24,500	8,280	NA	20,800	21,300	54,100	235,000	242,000
Manganese	33.4	5,550	799	NA	NA	1,950	3,840	1,130	NA	2,890	2,930	412	131,000	131,000
Potassium	128,000	20,300	73,000	NA	NA	72,900	2,210 J	2,160 J	NA	1,740 J	1,300 J	87,400	3,380 J	3,720 J
Sodium	177,000	1,060,000	2,310,000	NA	NA	342,000	96,800	70,300	NA	93,000	97,000	164,000	94,800	96,400
Wet Chemistry (MG/L)														
Amenable cyanide	0.9	0.049 J	0.016 J	0.0018 J	0.01 J	2.3 J	0.035 J	0.037	0.15 J	0.075 J	0.078 J	0.87 J		
Bicarbonate	37.1	152	330	NA	NA	330	80.3	76.2	NA	57.7	51.5	214	68	70
Chloride	228	2,020	4,040	NA	NA	736	71.3	202	NA	374	353	216	145	153
Sulfate	898	188	294	NA	NA	29.4	102		NA			774	3,870	3,880
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed
J - Value is estimated
L - Value biased low
U - Not detected
Blank contamination considered not detected

UJ - Not detected, DL estimated
UL - Not detected, DL low

Table 2.4-3
Detected Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL13-PZM032	GL13-PZP003	GL15-PZM022		GL15-PZP008	GL16-PZP003	GL17-PZM005	GL17-PZM032	GL17-PZP008	GL18-PZP002	
				Duplicate							Duplicate
Sample Date	12/18/01	12/18/01	12/18/01	12/18/01	12/21/01	12/18/01	12/17/01	12/17/01	12/18/01	12/17/01	12/17/01
Chemical Name											
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethane						2.6				140	120
2-Butanone						20					
4-Methyl-2-pentanone						23	3.9 J				
Acetone		3.4 J	710	440		67	4.4 J		11		
Benzene		1.1				140	8.3	0.97 J	0.64 J	1,500	1,300
Carbon disulfide						0.68 J			1.4		
Ethylbenzene						0.27 J	0.24 J				7 J
Methylene chloride											
Toluene		0.26 J				1.1	1.9	0.25 J	0.38 J	300	200
Trichloroethene						0.44 J					
Vinyl chloride						0.73 J				20 J	
Xylene, total						1.5 J	3.6			110 J	76 J
trans-1,2-Dichloroethene											
Semivolatile Organic Compounds (UG/L)											
2,4-Dimethylphenol						NA	210		NA		
2-Methylnaphthalene						NA	5.9 J	1.3 J	NA	25 J	26
2-Methylphenol						NA	34		NA	720	690
4-Methylphenol						NA	340 J		NA	2,000	1,900
Acenaphthene						NA	2 J	23	NA	33	35
Acenaphthylene						NA			NA	84	94
Anthracene						NA			NA	17 J	19 J
Di-n-butylphthalate		0.77 J				NA			NA		
Dibenzofuran						NA	2 J	12	NA	56	63
Diethylphthalate						NA			NA		
Fluoranthene						NA			NA	9.9 J	12 J
Fluorene						NA	2.1 J	11	NA	61	68
Naphthalene		77				NA	1,100	14	NA	2,700	2,600
Phenanthrene						NA	3 J	1.8 J	NA	77	86
Phenol						NA	1,800		NA	1,700	1,700
Pyrene						NA			NA	4.5 J	5.6 J
Pyridine						NA			NA	76	91
Total Metals (UG/L)											
Arsenic		6.4 J			4.5 J	19.7	20.5		NA	15	14.9
Barium	482		146 J	141 J	28.9 J	126 J		1,150 J	NA		
Cadmium			2.5 J	1.8 J		20.7		3.2 J	NA		
Chromium			28.8	27.3		65.8			NA		
Cobalt					25.1 J	16.6 J			NA		1.8 J
Copper						97.1			NA		
Lead	5.6					676			NA		
Mercury			0.071 J			1.8 L			NA	0.06 L	
Nickel			16.3 J	15 J	5.2 J	110	36 J		NA	26 J	27.7 J
Selenium		8.1		5.8		5.8			NA	7.7	7.8
Silver						1.9 J			NA		
Thallium	14.6		11.7	11.4		5.9 J	6 J	20.8	NA		7.8 J

NA - Not analyzed
J - Value is estimated
L - Value biased low
U - Not detected
Blank contamination considered not detected

UJ - Not detected, DL estimated
UL - Not detected, DL low

Table 2.4-3
Detected Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL13-PZM032	GL13-PZP003	GL15-PZM022		GL15-PZP008	GL16-PZP003	GL17-PZM005	GL17-PZM032	GL17-PZP008	GL18-PZP002	
				Duplicate							Duplicate
Sample Date	12/18/01	12/18/01	12/18/01	12/18/01	12/21/01	12/18/01	12/17/01	12/17/01	12/18/01	12/17/01	12/17/01
Chemical Name											
Vanadium	9.8 J	4.9 J	12.7 J	12.8 J	2.5 J	210	31 J	13.6 J	NA	163	176
Zinc	10.5 J				19.9 J	3,050		4.9 J	NA		
Common Cations (UG/L)											
Calcium	35,700	63,700	31,400 J	30,400 J	216,000	NA	134,000	141,000 J	NA	NA	NA
Iron	153,000	1,580	238,000 J	230,000 J	9,350	NA	136	409,000 J	NA	NA	NA
Magnesium	70,000	7,190	41,700 J	40,300 J	30,300	NA		120,000 J	NA	NA	NA
Manganese	3,030	183	5,120 J	4,940 J	4,960	NA	0.51 J	9,750 J	NA	NA	NA
Potassium	6,960	54,600	3,690 J	3,240 J	35,000 J	NA	247,000	8,130	NA	NA	NA
Sodium	887,000	79,200	315,000	310,000	49,700	NA	566,000	605,000	NA	NA	NA
Wet Chemistry (MG/L)											
Amenable cyanide	0.035 J	0.77 J	0.016	0.027	0.59	NA	9.1	0.067	NA	30.2 J	30.9 J
Bicarbonate	41.2	146	39.1	33	92.4	NA		57.7	NA	NA	NA
Chloride	1,630	84.6	808	800	98.5	NA	704	1,950	NA	NA	NA
Sulfate	197	309	219	219	801	NA	790	89.9	NA	NA	NA
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed
J - Value is estimated
L - Value biased low
U - Not detected
Blank contamination considered not detected

UJ - Not detected, DL estimated
UL - Not detected, DL low

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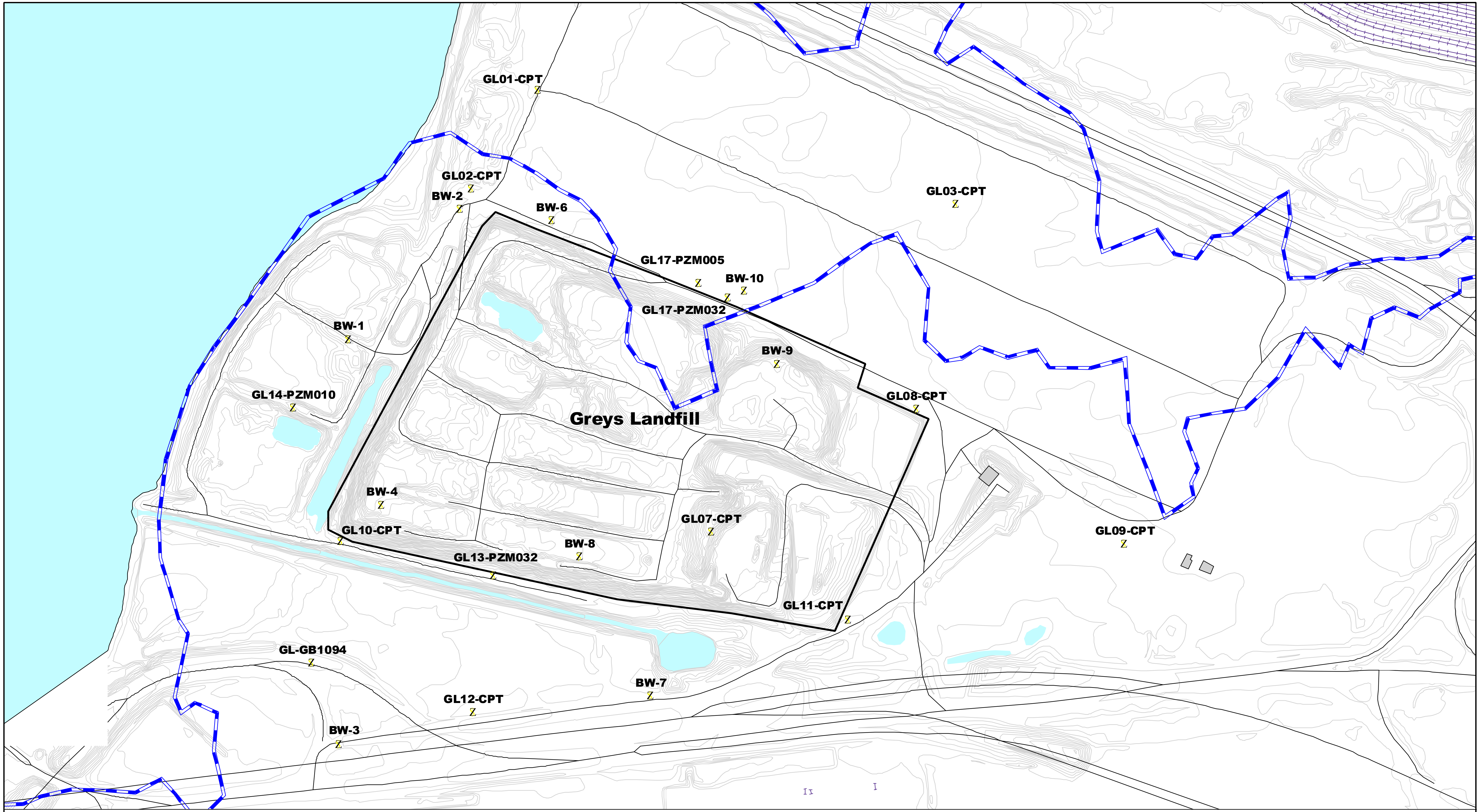

LEGEND

- Z Geologic Investigation Boring Location
- ▭ Special Study Area
- 🟦 Water Body
- ■ Dam/Pier/Boat Ramp/Dry Dock
- ▨ Existing Buildings
- 🟥 Demolished Buildings
- Original 1917 Shore Line
- Roads
- Railroads
- Contours (2' Interval)

N

0 200 400 Feet

Figure 2.4-1
Geologic Investigation Locations
Greys Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

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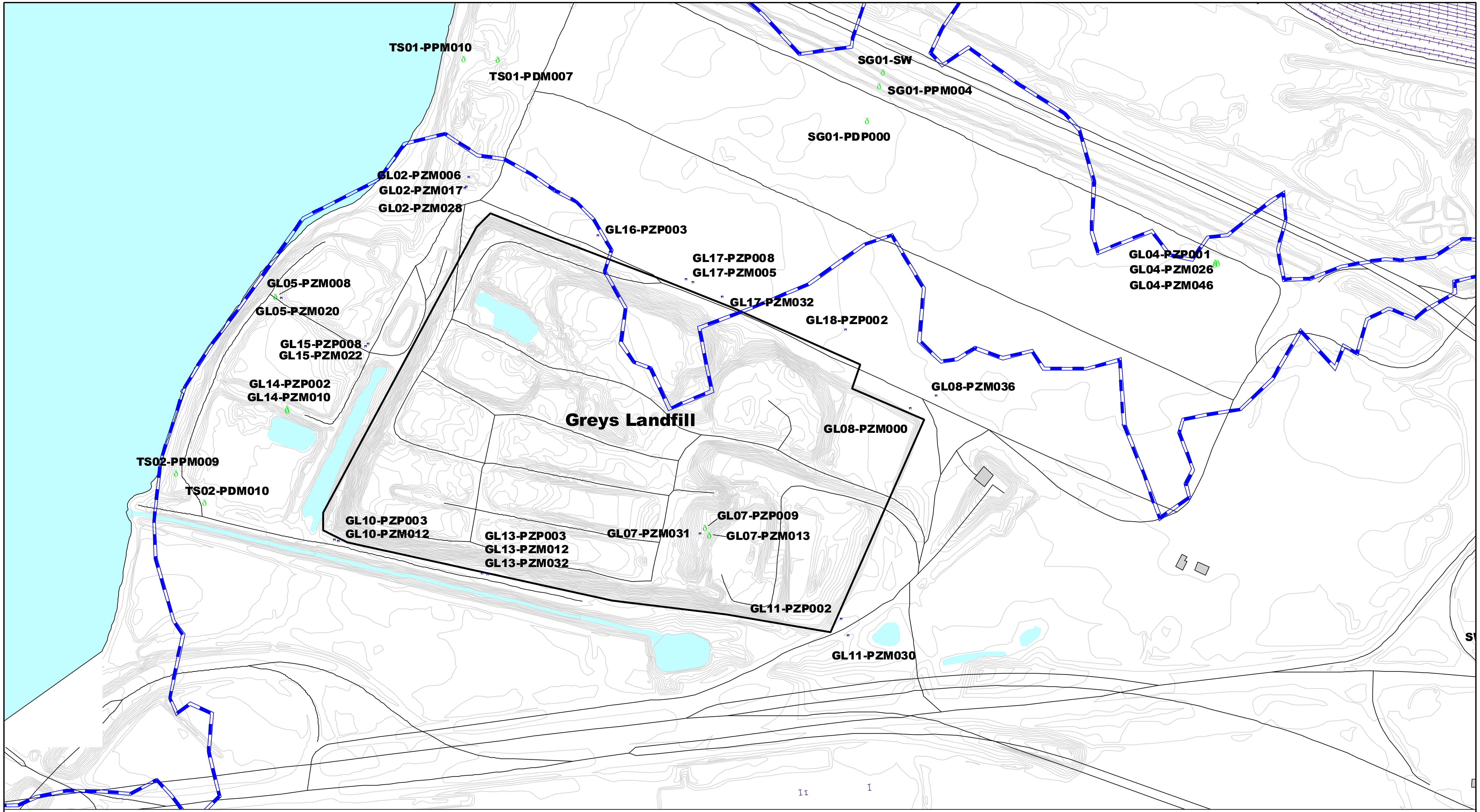

LEGEND

Piezometer Location (Groundwater Sampling and Water Level Measurement)

Piezometer Location (Water Level Measurement Only)

☐ Special Study Area

▨ Water Body

■ Dam/Pier/Boat Ramp/Dry Dock

▨ Existing Buildings

▨ Demolished Buildings

Original 1917 Shore Line

Roads

Railroads

Contours (2' Interval)

N

0 200 400 Feet

Figure 2.4-2
Piezometer Network Locations
Greys Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

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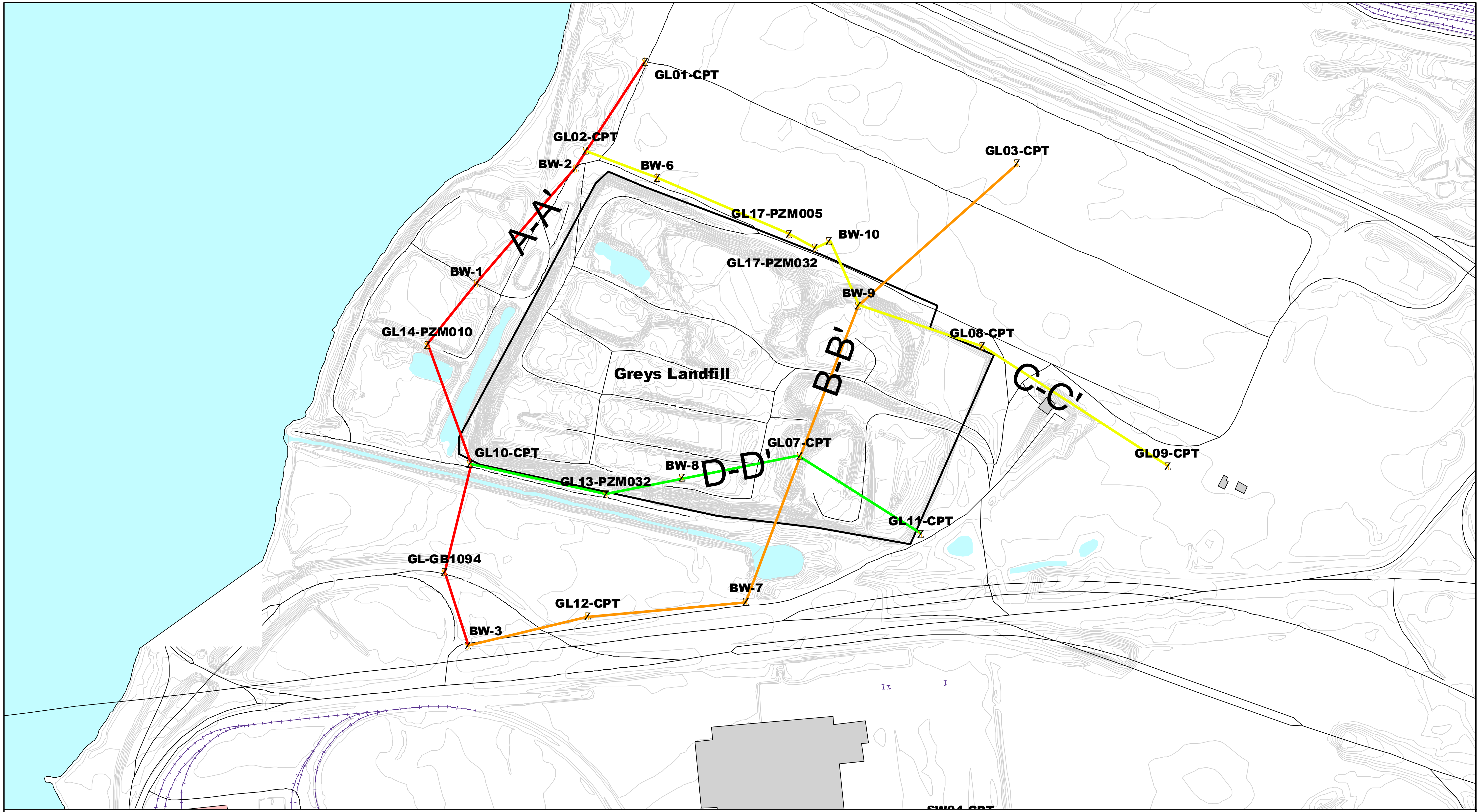


LEGEND

Z Boring Locations
▭ Special Study Area
🟦 Water Body
■ Dam/Pier/Boat Ramp/Dry Dock
▨ Existing Buildings
🟥 Demolished Buildings

/\/ Roads
/\/ Railroads
/\/ Contours (2' Interval)

Cross Sections:
/\/ A-A'
/\/ B-B'
/\/ C-C'
/\/ D-D'

Figure 2.4-3
Cross Section Location Map
Greys Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

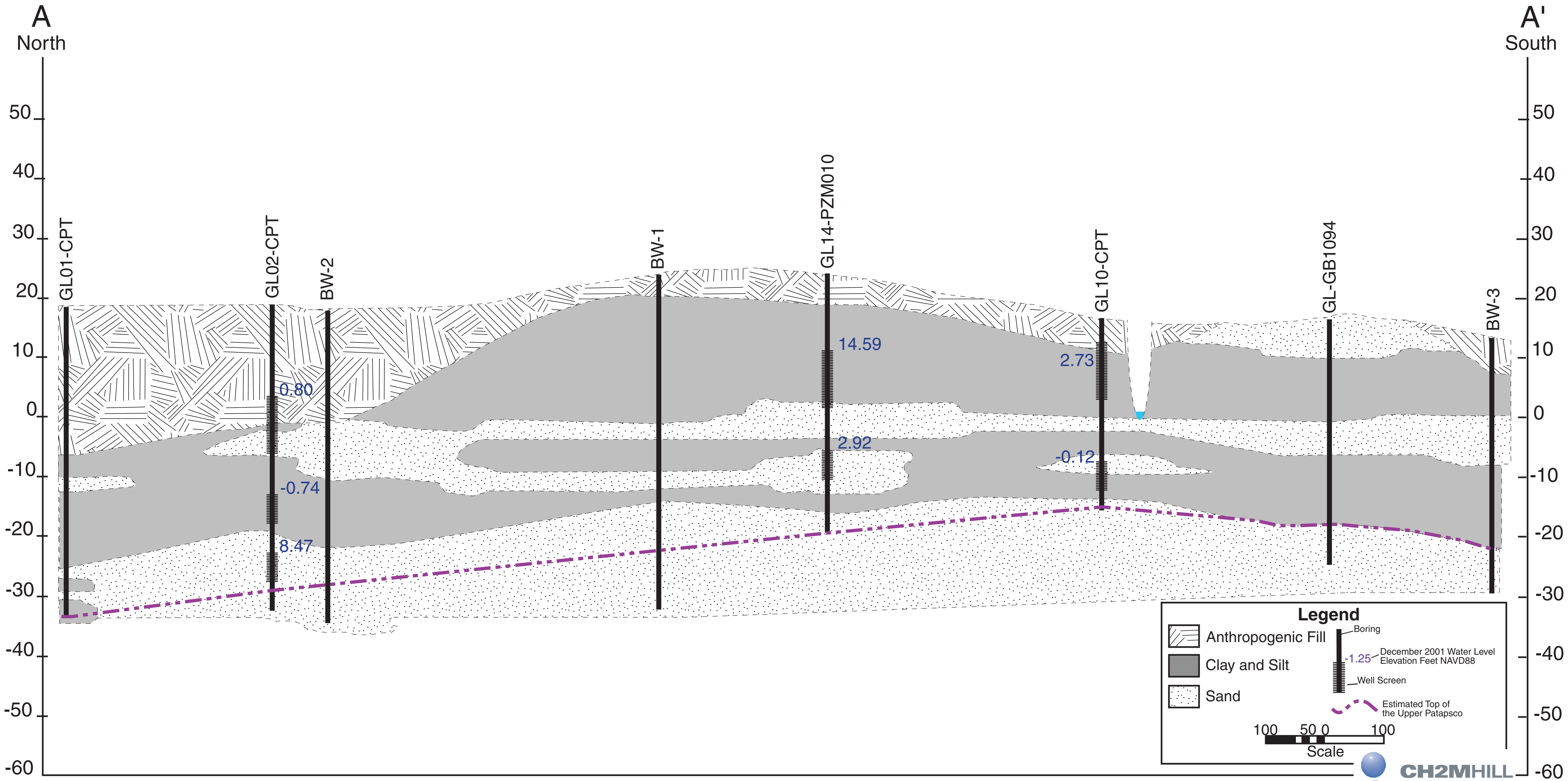
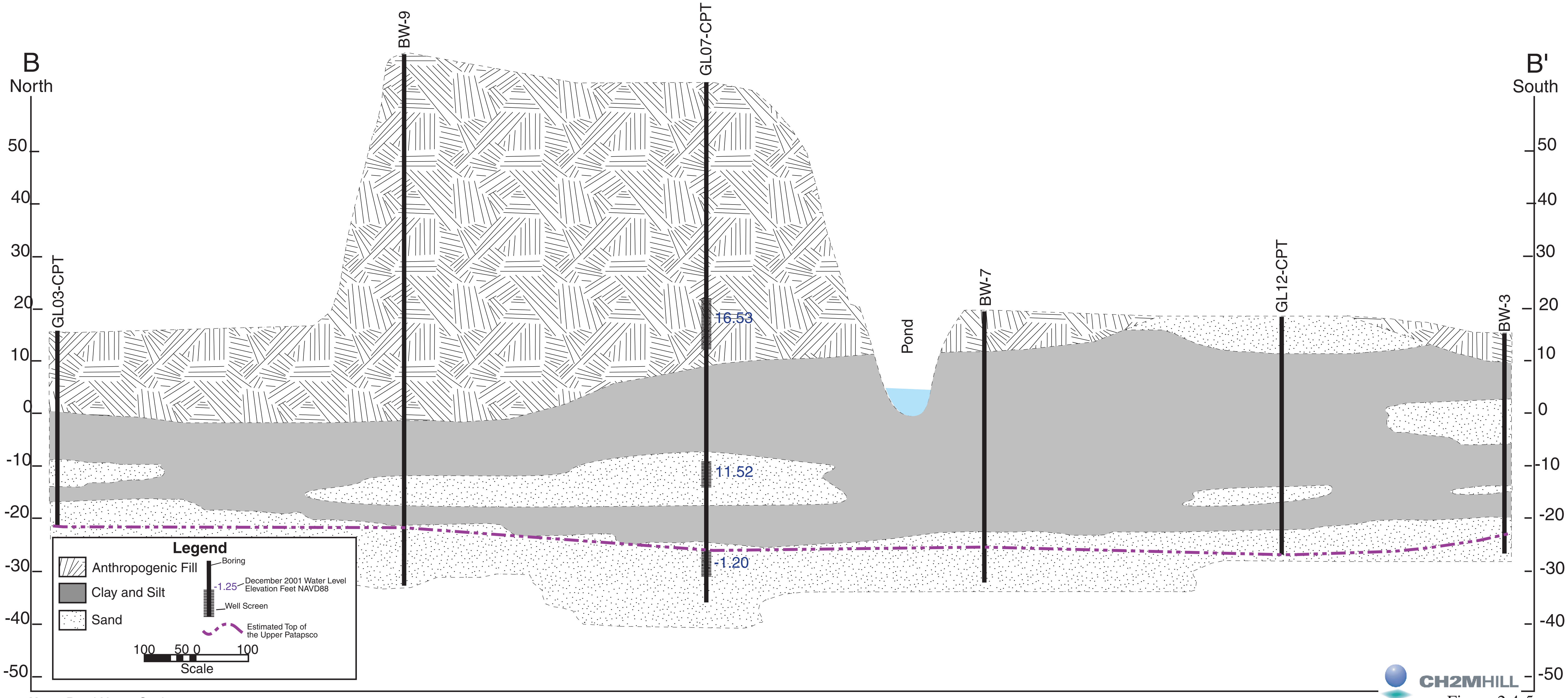


Figure 2.4-4
Section A-A'
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility



Note: Pond Not to Scale

Figure 2.4-5
Section B-B'
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

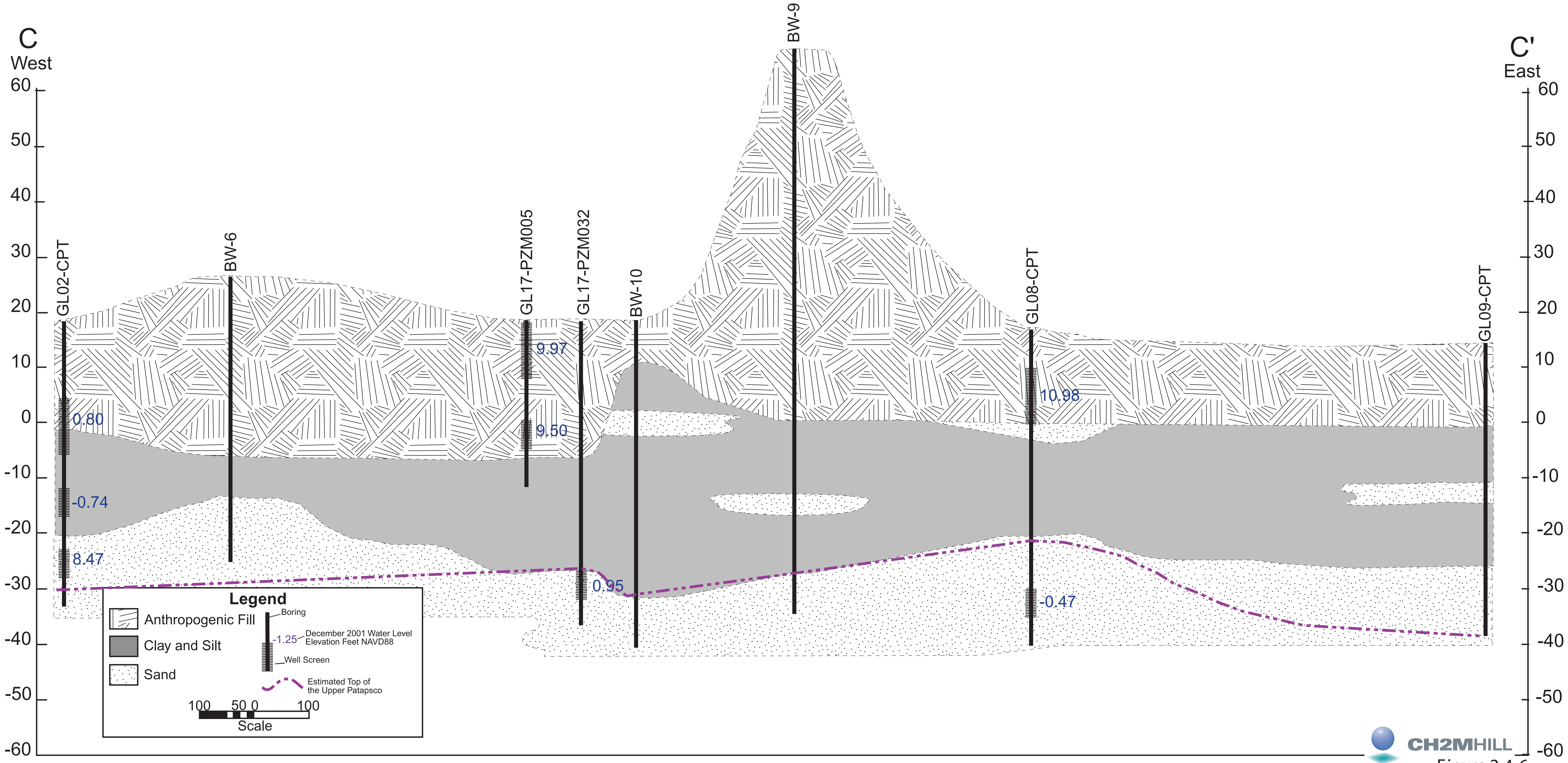


Figure 2.4-6
Section C-C'
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

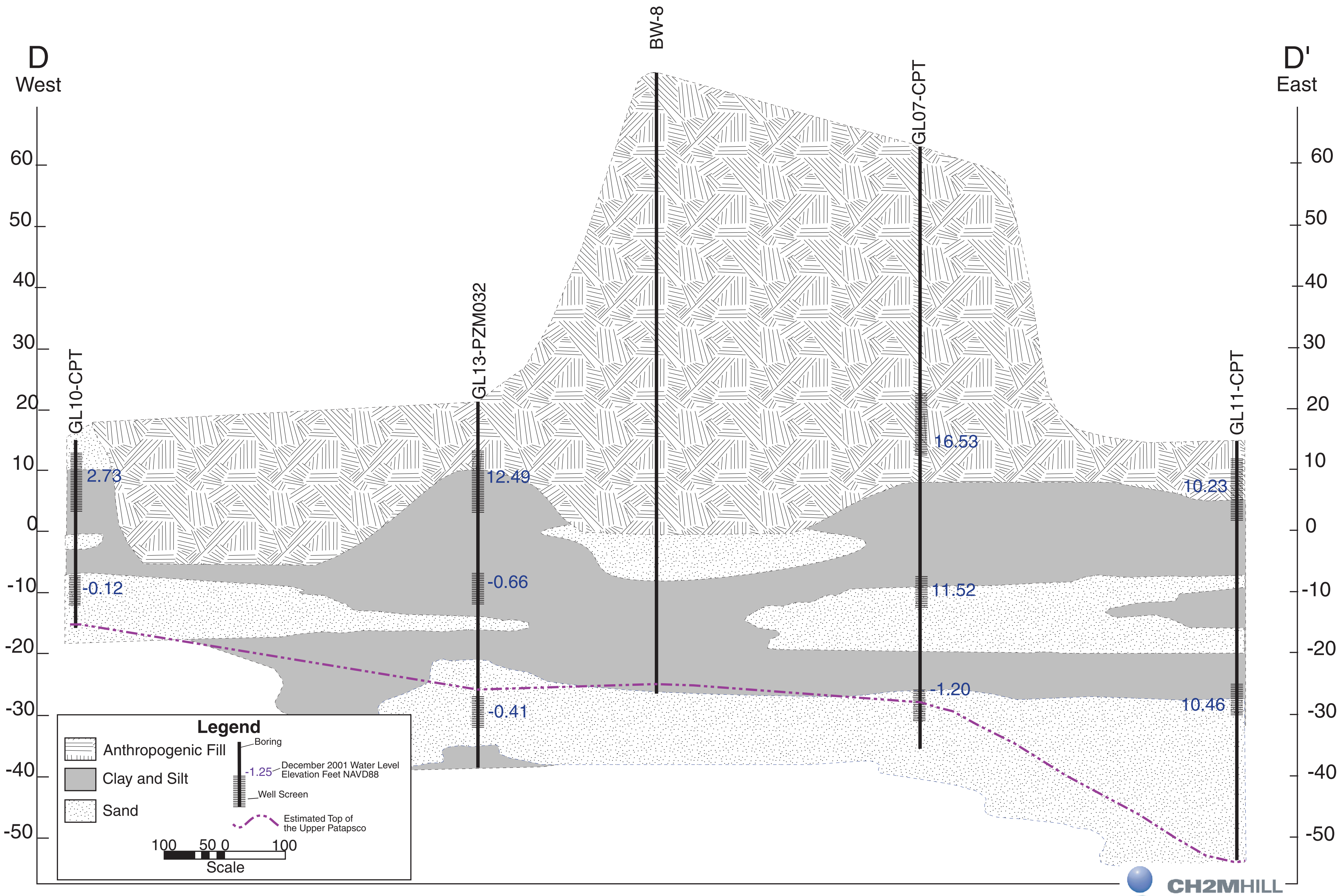


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Figure 2.4-7
Section D-D'
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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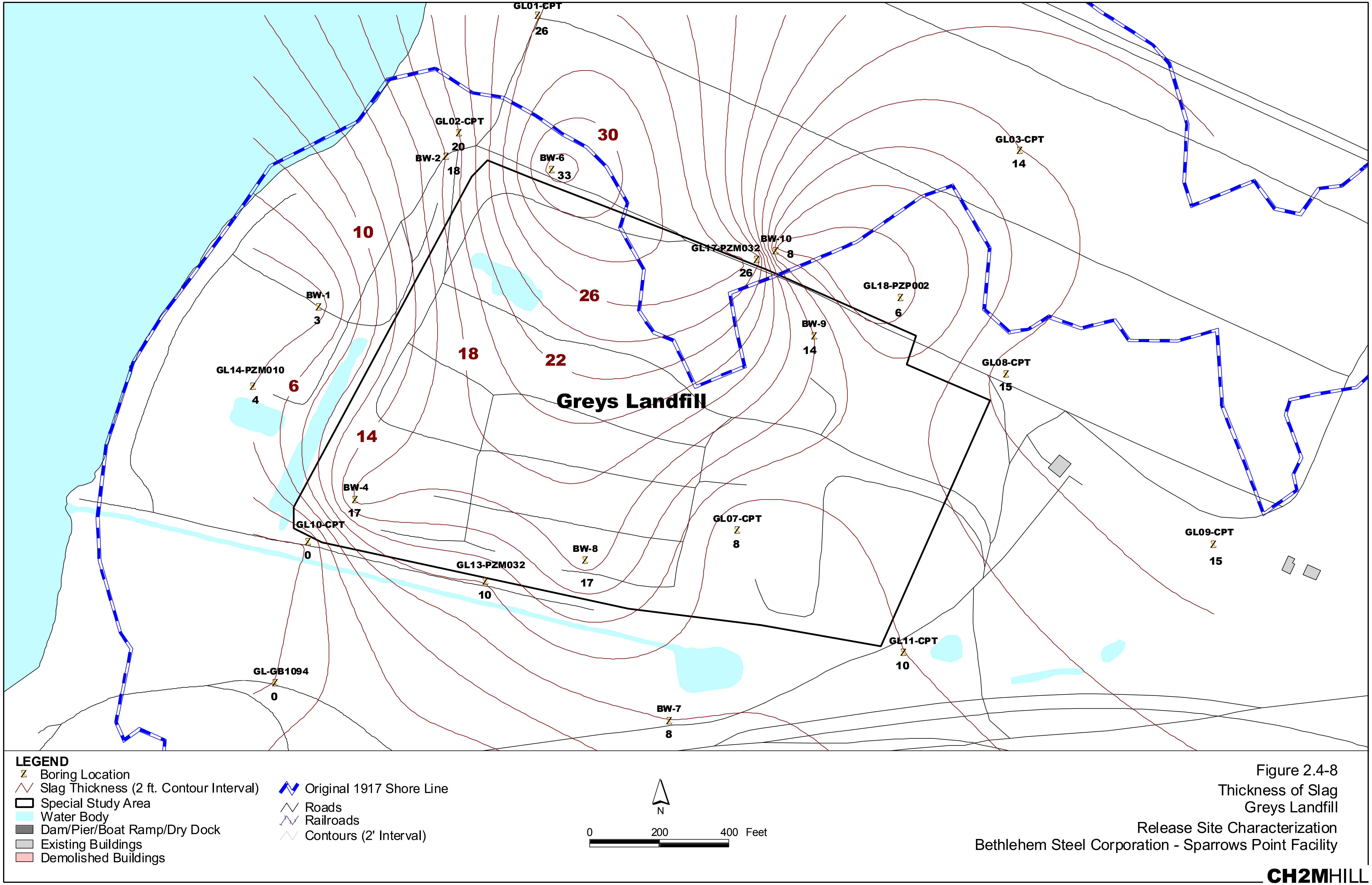

Figure 2.4-8
Thickness of Slag
Greys Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

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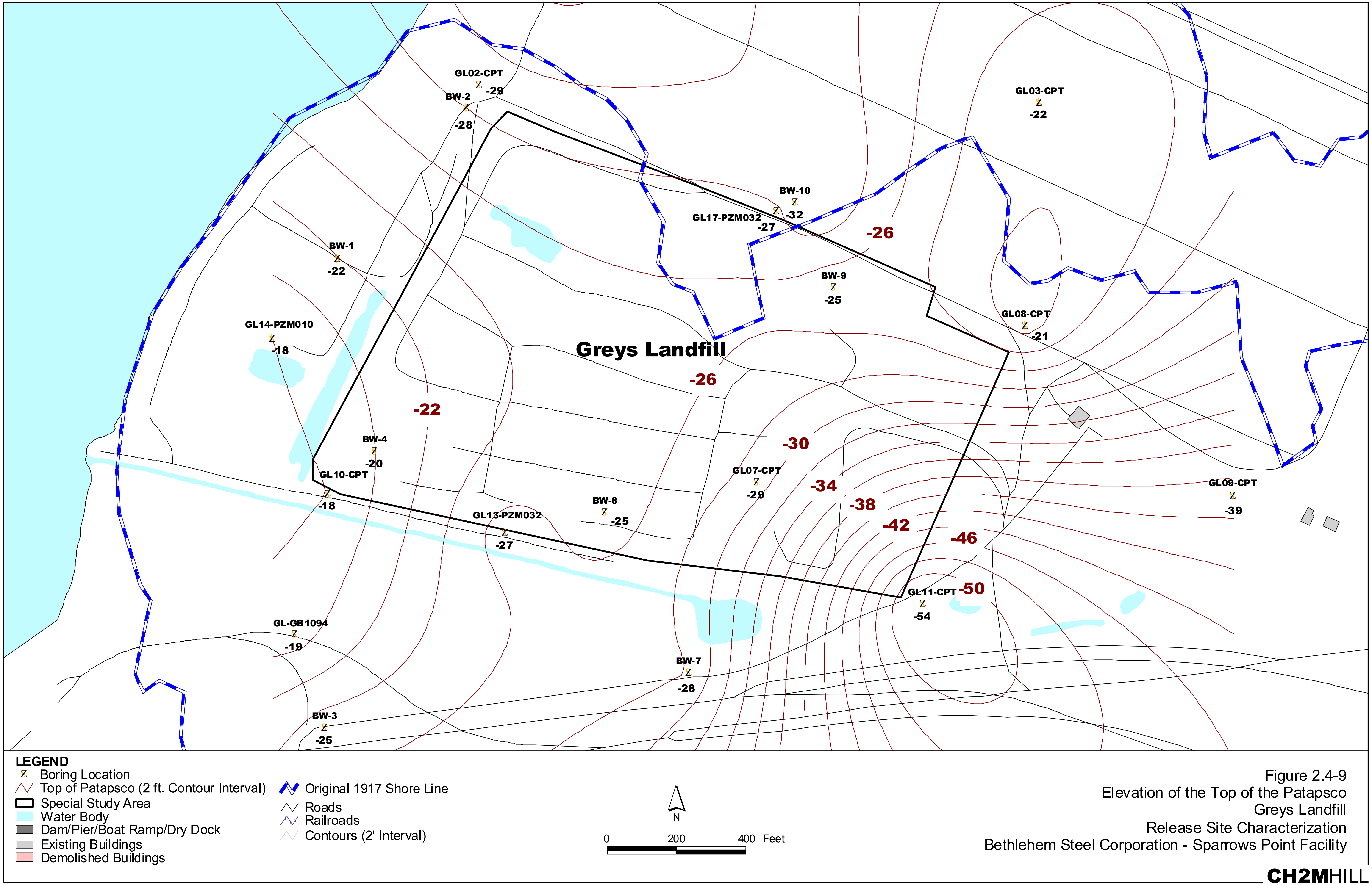

Figure 2.4-9
Elevation of the Top of the Patapsco
Greys Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

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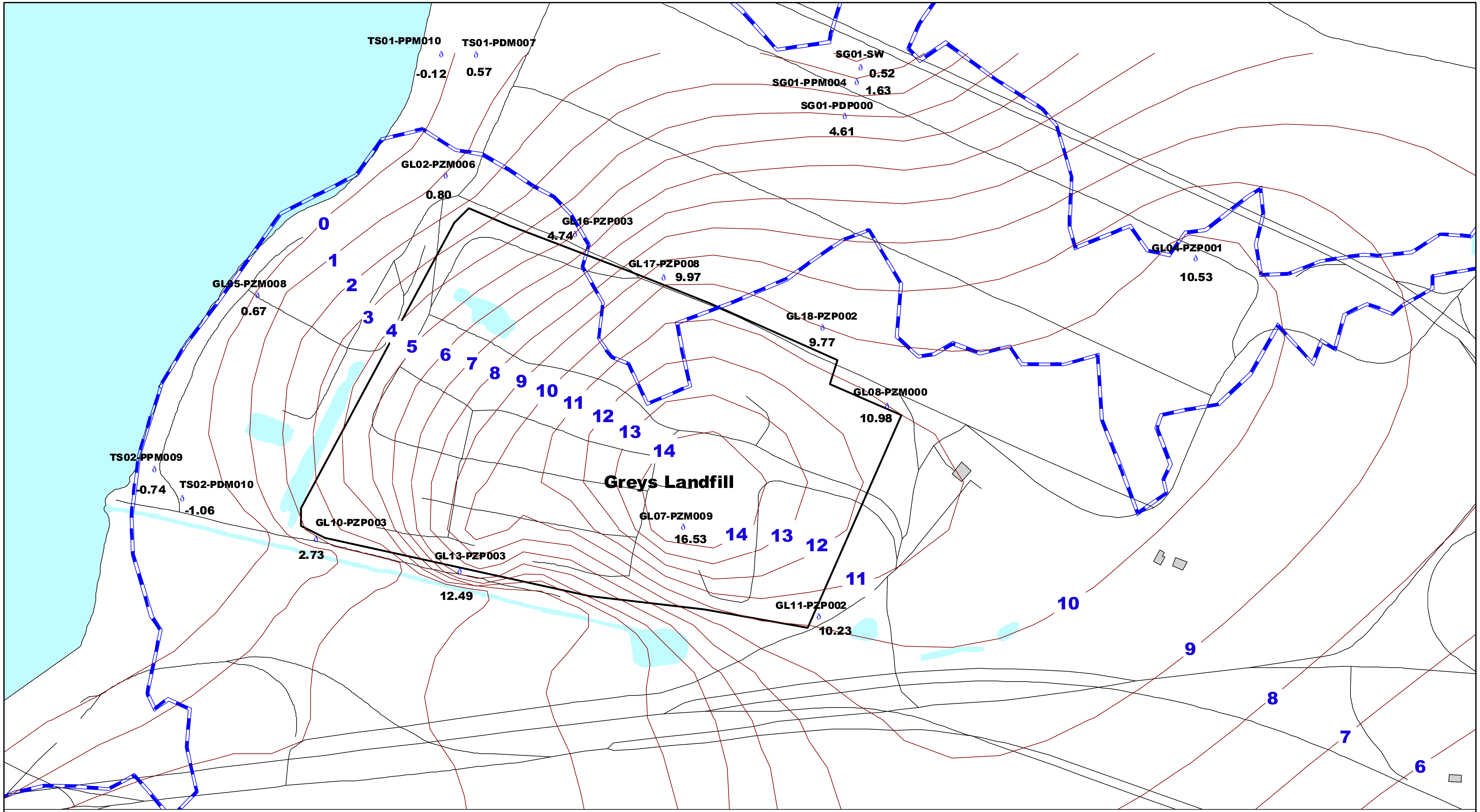

Note: Surface elevation of Bear Creek, Patapsco River, Old Road Bay, and Jones Creek is -1.25 feet NAVD

Figure 2.4-10
Water Level Elevations - December 18, 2001, Water Table
Greys Landfill
Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

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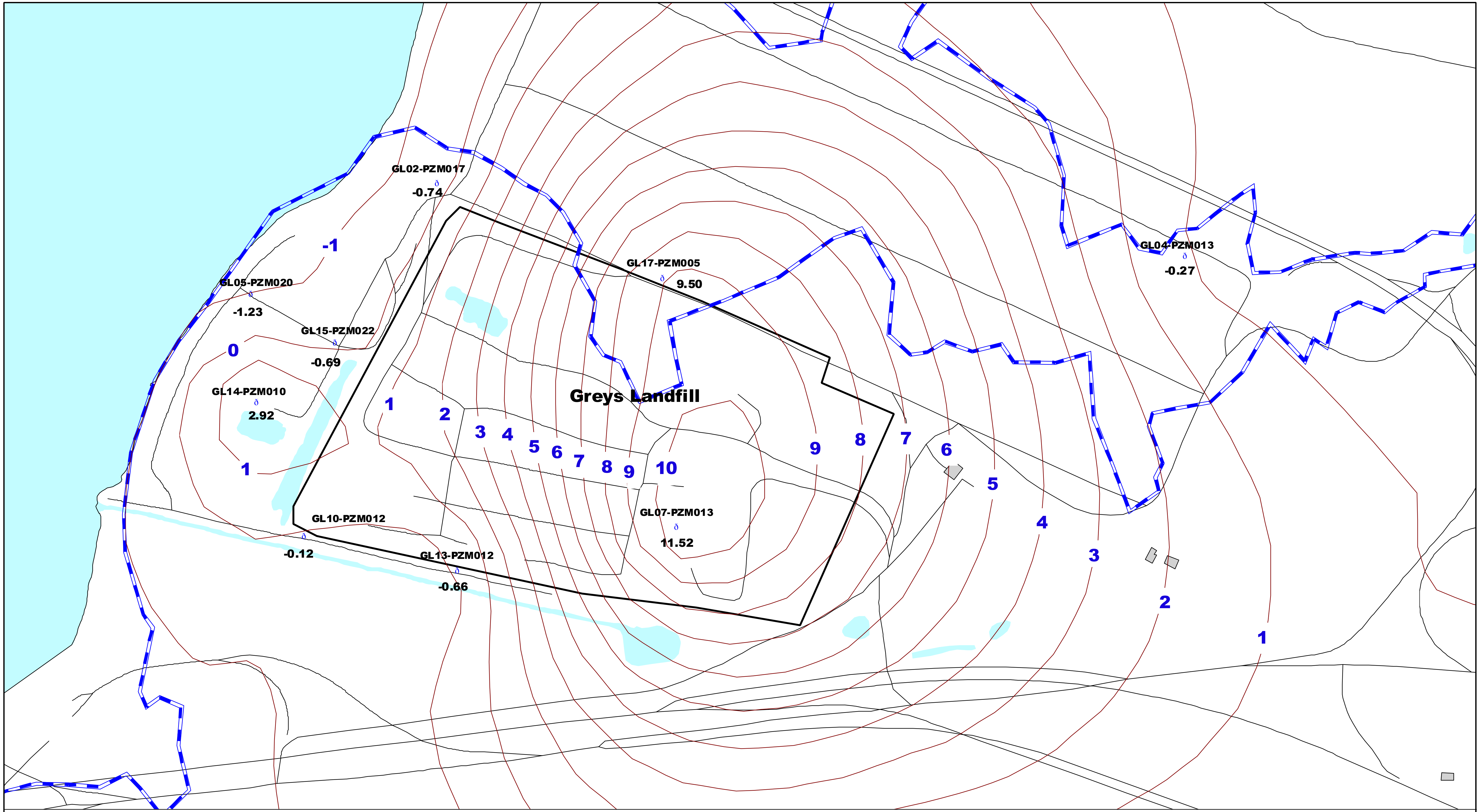

LEGEND
- ♁ Deeper Sand Piezometer
- ╱╲ Deeper Sand Water Level Contour (1 Ft. Contour)
- ☐ Special Study Area
- 🟦 Water Body
- ■ Dam/Pier/Boat Ramp/Dry Dock
- ▨ Existing Buildings
- 🟥 Demolished Buildings
- Original 1917 Shore Line
- Roads
- Railroads

Note: Surface elevation of Bear Creek, Patapsco River, Old Road Bay, and Jones Creek is -1.25 feet NAVD

N

0 200 400 Feet

Figure 2.4-11
Water Level Elevations - December 18, 2001, Deeper Sand Piezometric Surface
Greys Landfill

Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

CH2MHILL

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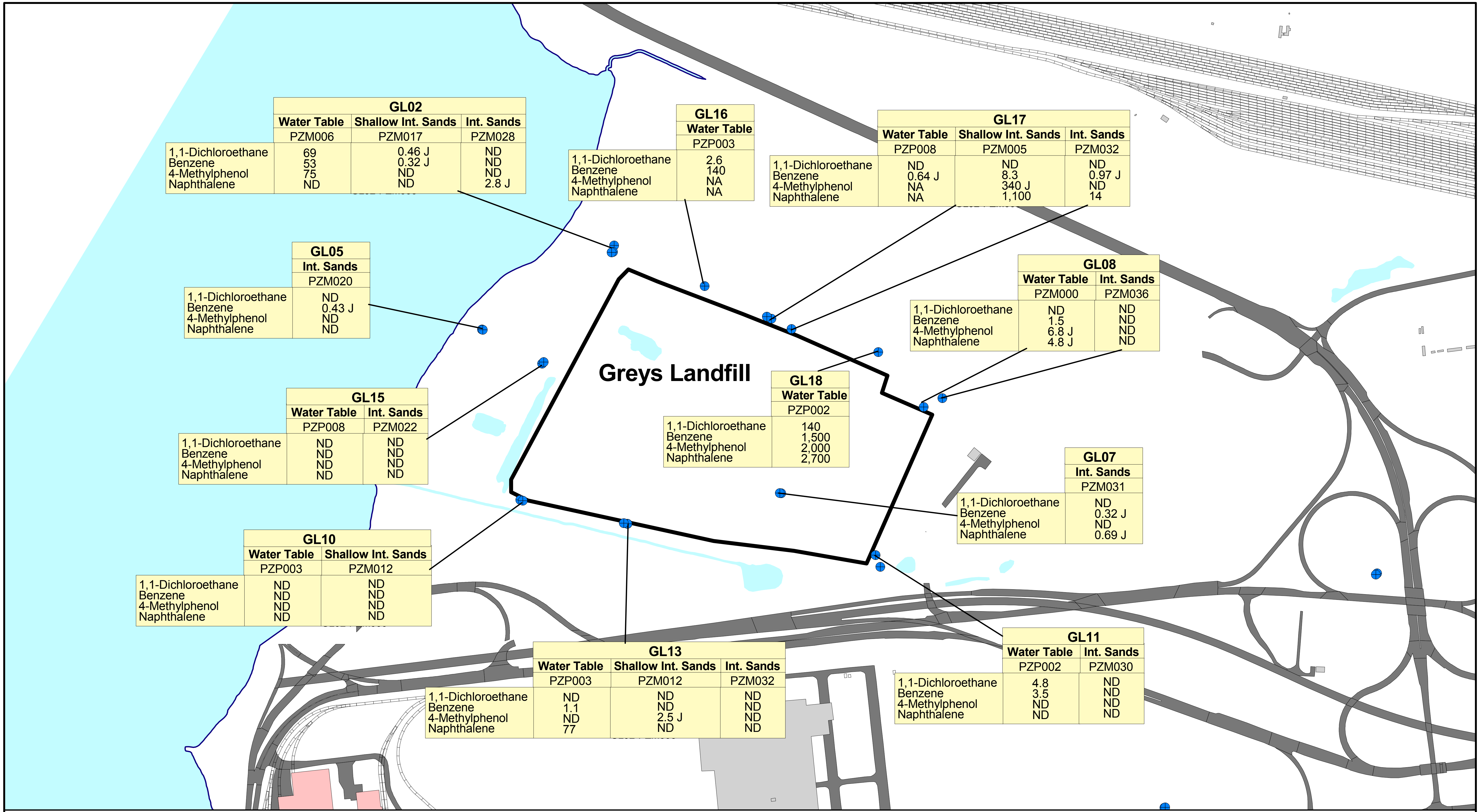

GL02

	Water Table	Shallow Int. Sands	Int. Sands
	PZM006	PZM017	PZM028
1,1-Dichloroethane	69	0.46 J	ND
Benzene	53	0.32 J	ND
4-Methylphenol	75	ND	ND
Naphthalene	ND	ND	2.8 J

GL16

	Water Table
	PZP003
1,1-Dichloroethane	2.6
Benzene	140
4-Methylphenol	NA
Naphthalene	NA

GL17

	Water Table	Shallow Int. Sands	Int. Sands
	PZP008	PZM005	PZM032
1,1-Dichloroethane	ND	ND	ND
Benzene	0.64 J	8.3	0.97 J
4-Methylphenol	NA	340 J	ND
Naphthalene	NA	1,100	14

GL05

	Int. Sands
	PZM020
1,1-Dichloroethane	ND
Benzene	0.43 J
4-Methylphenol	ND
Naphthalene	ND

GL08

	Water Table	Int. Sands
	PZM000	PZM036
1,1-Dichloroethane	ND	ND
Benzene	1.5	ND
4-Methylphenol	6.8 J	ND
Naphthalene	4.8 J	ND

GL18

	Water Table
	PZP002
1,1-Dichloroethane	140
Benzene	1,500
4-Methylphenol	2,000
Naphthalene	2,700

GL15

	Water Table	Int. Sands
	PZP008	PZM022
1,1-Dichloroethane	ND	ND
Benzene	ND	ND
4-Methylphenol	ND	ND
Naphthalene	ND	ND

GL07

	Int. Sands
	PZM031
1,1-Dichloroethane	ND
Benzene	0.32 J
4-Methylphenol	ND
Naphthalene	0.69 J

GL10

	Water Table	Shallow Int. Sands
	PZP003	PZM012
1,1-Dichloroethane	ND	ND
Benzene	ND	ND
4-Methylphenol	ND	ND
Naphthalene	ND	ND

GL11

	Water Table	Int. Sands
	PZP002	PZM030
1,1-Dichloroethane	4.8	ND
Benzene	3.5	ND
4-Methylphenol	ND	ND
Naphthalene	ND	ND

GL13

	Water Table	Shallow Int. Sands	Int. Sands
	PZP003	PZM012	PZM032
1,1-Dichloroethane	ND	ND	ND
Benzene	1.1	ND	ND
4-Methylphenol	ND	2.5 J	ND
Naphthalene	77	ND	ND

LEGEND

●	Piezometer Locations
〰	Shore Line
〰	Railroads
■	Roads/Paved Areas
■	Buildings
■	Buildings Under Construction
■	Demolished Buildings
■	Water Bodies

Concentrations in ug/L
J = Estimated Concentration
ND = Not Detected
NA = Not Analyzed

N

450 0 450 900 Feet

Figure 2.4-12
Indicator Organics - Greys Landfill
Bethlehem Steel Corp. - Sparrows Point Facility

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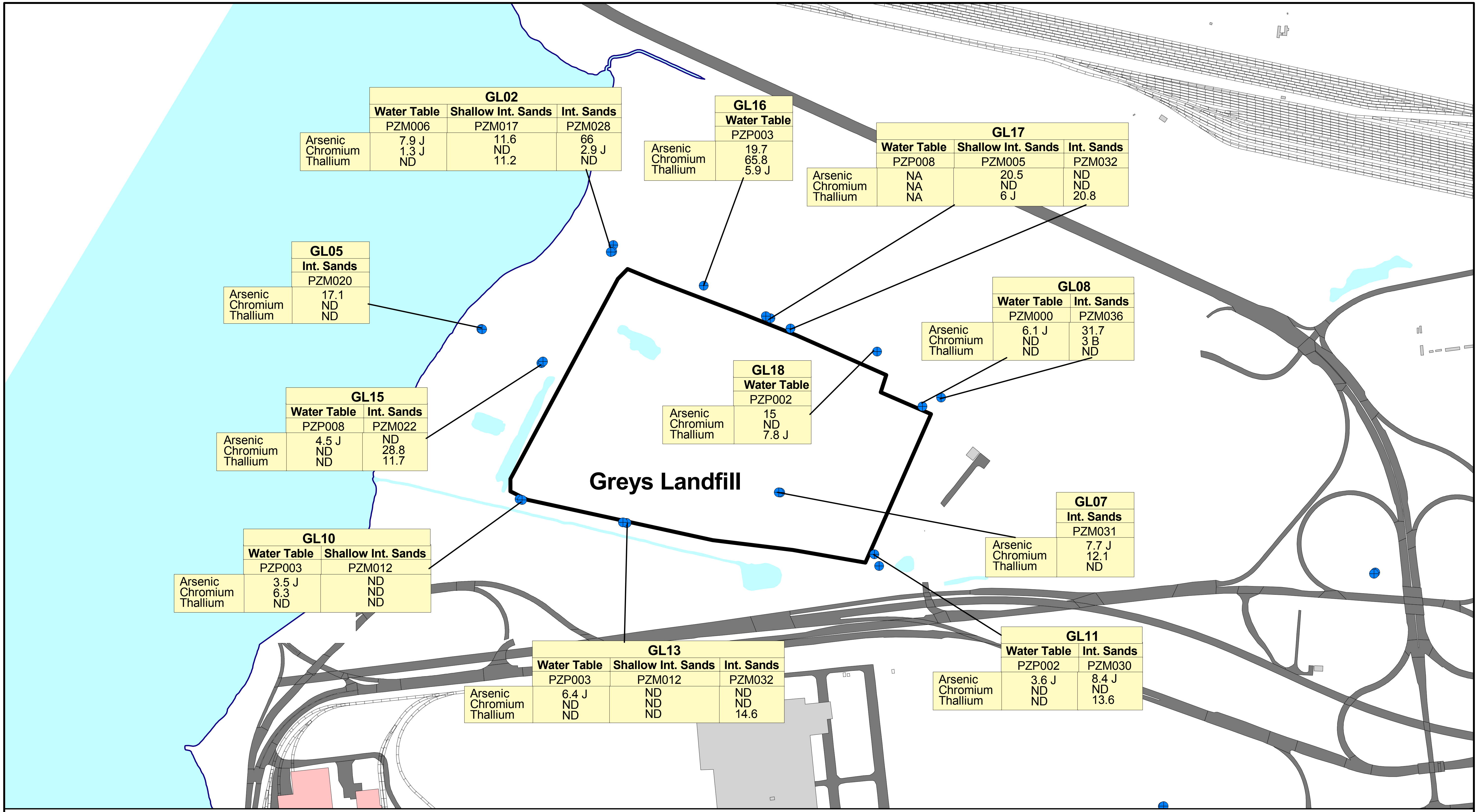

GL02

	Water Table	Shallow Int. Sands	Int. Sands
	PZM006	PZM017	PZM028
Arsenic	7.9 J	11.6	66
Chromium	1.3 J	ND	2.9 J
Thallium	ND	11.2	ND

GL16

	Water Table
	PZP003
Arsenic	19.7
Chromium	65.8
Thallium	5.9 J

GL17

	Water Table	Shallow Int. Sands	Int. Sands
	PZP008	PZM005	PZM032
Arsenic	NA	20.5	ND
Chromium	NA	ND	ND
Thallium	NA	6 J	20.8

GL05

	Int. Sands
	PZM020
Arsenic	17.1
Chromium	ND
Thallium	ND

GL08

	Water Table	Int. Sands
	PZM000	PZM036
Arsenic	6.1 J	31.7
Chromium	ND	3 B
Thallium	ND	ND

GL18

	Water Table
	PZP002
Arsenic	15
Chromium	ND
Thallium	7.8 J

GL15

	Water Table	Int. Sands
	PZP008	PZM022
Arsenic	4.5 J	ND
Chromium	ND	28.8
Thallium	ND	11.7

GL07

	Int. Sands
	PZM031
Arsenic	7.7 J
Chromium	12.1
Thallium	ND

GL10

	Water Table	Shallow Int. Sands
	PZP003	PZM012
Arsenic	3.5 J	ND
Chromium	6.3	ND
Thallium	ND	ND

GL11

	Water Table	Int. Sands
	PZP002	PZM030
Arsenic	3.6 J	8.4 J
Chromium	ND	ND
Thallium	ND	13.6

GL13

	Water Table	Shallow Int. Sands	Int. Sands
	PZP003	PZM012	PZM032
Arsenic	6.4 J	ND	ND
Chromium	ND	ND	ND
Thallium	ND	ND	14.6

LEGEND

⊕ Piezometer Locations	▨ Buildings
Shore Line	▨ Buildings Under Construction
Railroads	▨ Demolished Buildings
■ Roads/Paved Areas	▨ Water Bodies

Concentrations in ug/L
J = Estimated Concentration
B = Detected in Associated Blank
ND = Not Detected
NA = Not Analyzed

N

450 0 450 900 Feet

Figure 2.4-13
Indicator Metals - Greys Landfill
Bethlehem Steel Corp. - Sparrows Point Facility

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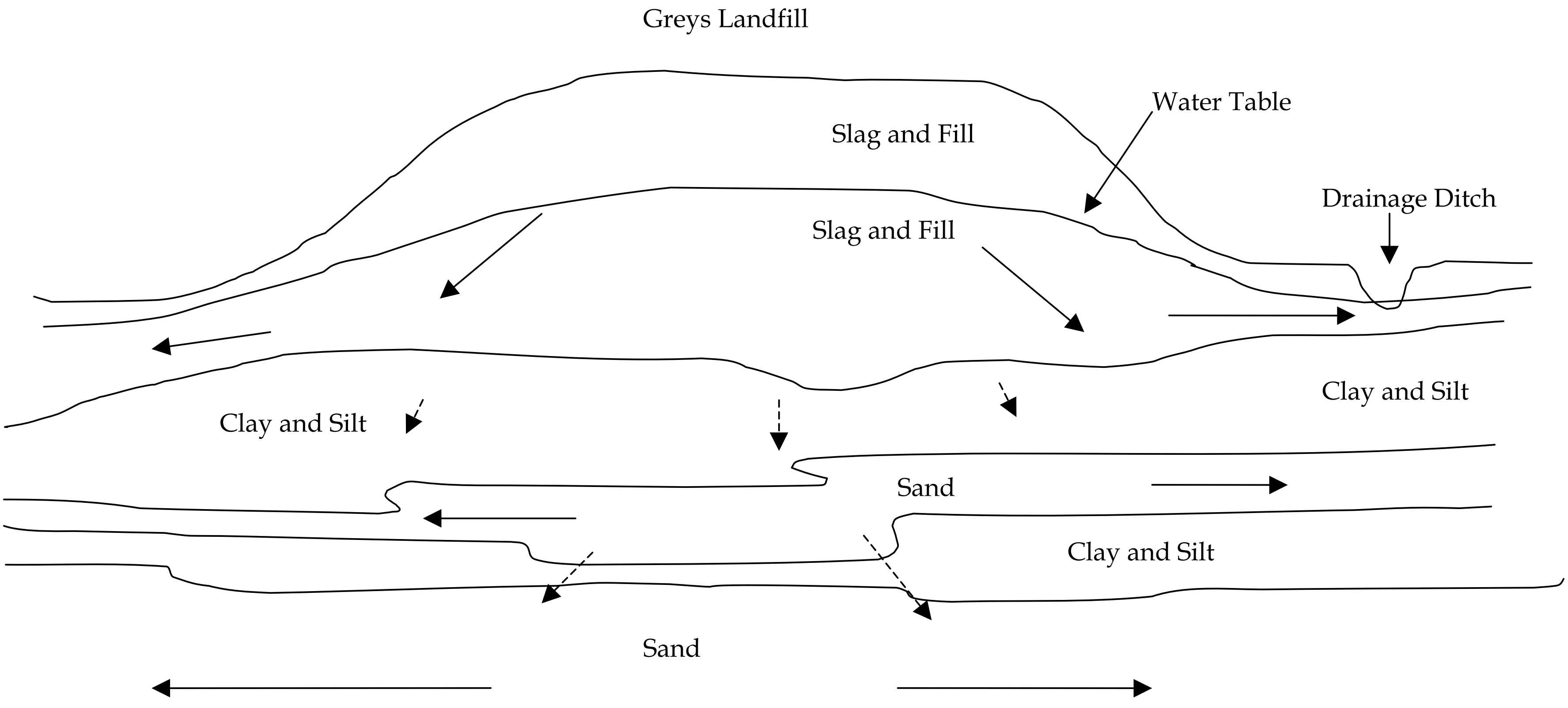


Figure 2.4-14
Conceptual Site Hydrogeologic Model
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation—Sparrows Point Facility

Boring Logs

PROJECT NUMBE 164586.01.GL.DR

BORING NUMBER GL18-PZP002

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 10/26/2001 END: 10/26/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0						
	3-5	1.2	1	16-14-14-57 (28)	(GM) Dry Medium Dense Sandy Silty Clayey Slag Gravel. Grey and Black Munsell = Gley1 3/n	PID = 19.5 ppm
5						
						Water Table ▼
	7-9	1.8	2	21-13-8-8 (21)	(GM) Wet Medium Dense Silty, Clayey Gravel. Black Munsell = 5Y 2.5/1	PID = 14.9 ppm
10						
	13-15		3	3-woh-woh-who (woh)	(CL) Very Soft Wet Sandy Silty Clay. Penotrometer=0.25 Dark Greenish Grey Munsell= Gley1 4/1/5GY	PID= 7.6 ppm
15						Bottom of boring
20						
25						

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER GL16-PZP003

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 10/26/2001 END: 10/26/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0						
5	3-5	1.5	1	7-3-5-6 (8)	(CL) Dry Medium Stiff Sandy Clay. Penetrometer= 2.5. Dark grayish Brown Munsell = 2.5Y 4/2	PID = 14.1 ppm
						Water Table ▼
10	8-10	1.5	2	29-45-27-67 (72)	(SM) Very Dense Wet Silty Sand. Black Munsell = 2.5Y 2.5/1	PID = 3.9 ppm
15	13-15	1.5	3	7-8-2-2 (10)	(SM) Wet Medium Dense Sand Silt Clay Mixture. Very Dark Grayish Brown 2.5Y 3/2	PID = 4.3 ppm Bottom of boring
20						
25						

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER GL15-PZM022

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 10/29/2001 END: 10/29/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0						
2						
38	38-40	1.5'	1	2-2-7-19 (9)	(SM) Loose Wet Silty, Clayey Sand. Grey. Munsell = 2.5Y 5/1	PID = 2.1 ppm
40	40-42	1.6'	2	10-12-20-32 (32)	(SM) Dense Wet Silty, Clayey Sand. Dark Greenish Grey. Munsell = Gley1 4/1/10Y	PID = 4 ppm
	42.5-44.5	0.9	3	6-7-9-14 (16)	(SC) Wet Medium Dense Clayey Sand With Silt. Light Bluish Grey GLEY2 7/1/5B (CL) Wet Hard Clay Pen =2 Color Same as above	PID = 3.2 ppm
45	45-47	1.6	4	7-15-24-25 (39)	(CL) Wet Hard Sandy Clay. Penetrometer= 4.0, With Veneers of Wet Dense Clayey Sand. Light Bluish Grey GLEY2 7/1/5B	PID = 1.8 ppm Bottom of boring
55						
60						
65						

CH2MHILL

PROJECT NUMBE 164586.01.HT.DR

BORING NUMBER GL14-PZM010

SHEET 1 OF 1

SOIL BORING LOG

PROJECT : Bethlehem Steel

LOCATION : Sparrows Point, MD

ELEVATION :

DRILLING CONTRACTOR : E2SI

DRILLING METHOD AND EQUIPMENT USED : Hollow Stem Auger with 2' split-spoon

WATER LEVELS :

START : 10/30/2001 END: 10/30/2001

LOGGER : Linda Lotto

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0						
	3-5	0.1	1	5-8-9-8 (17)	(MH) Medium Dense Dry Silty Fill Soil. Dark Olive Brown Munsell = 2.5Y 3/3	PID = 0.7 ppm
5						
10						
	12-14	1.1	2	2-2-3-3 (5)	(CL) Dry Soft Clay. Penetrometer = 0. Olive Munsell = 5Y 5/4 (SM) Wet Loose Sand with silt and trace clay. Olive Munsell = 5Y 5/4	Water Table ▼ PID = 1.5 ppm
15						
	18-20	1	3	3-3-4-3 (7)	(SM) Wet Loose Sand with Silt and Little Clay. Olive Munsell= 5Y 5/3 (CL) Wet Medium Stiff Clay. Penetrometer = 4.0. Olive Munsell = 5Y 5/3	PID = 1 ppm Bottom of boring
20						
25						

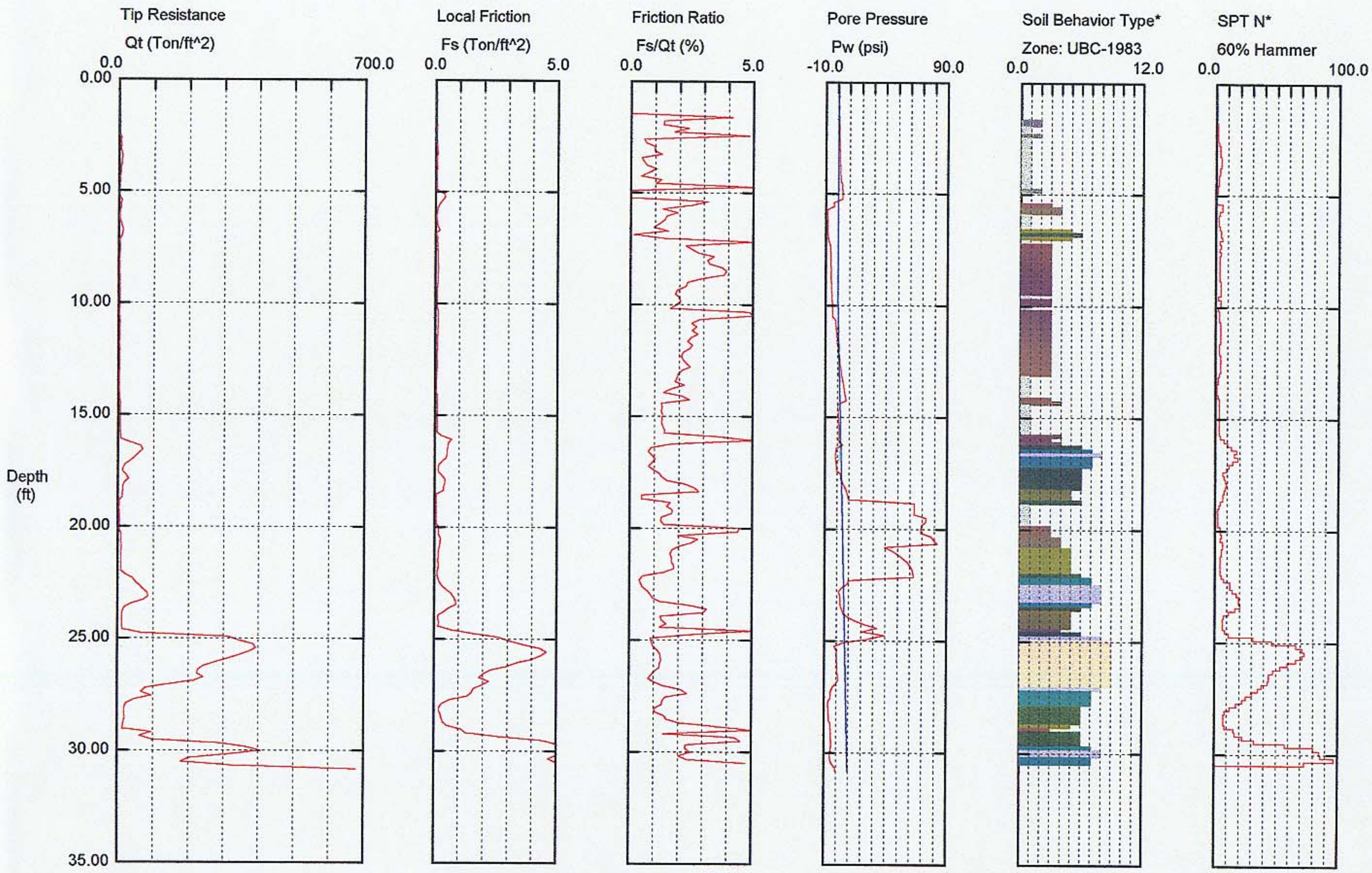
CPT Logs

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 193005
Cone Used: 416

CPT Date/Time: 11-07-01 10:13
Location: CPT - 10A
Job Number: BETH STEEL



Maximum Depth = 30.84 feet

Depth Increment = 0.16 feet

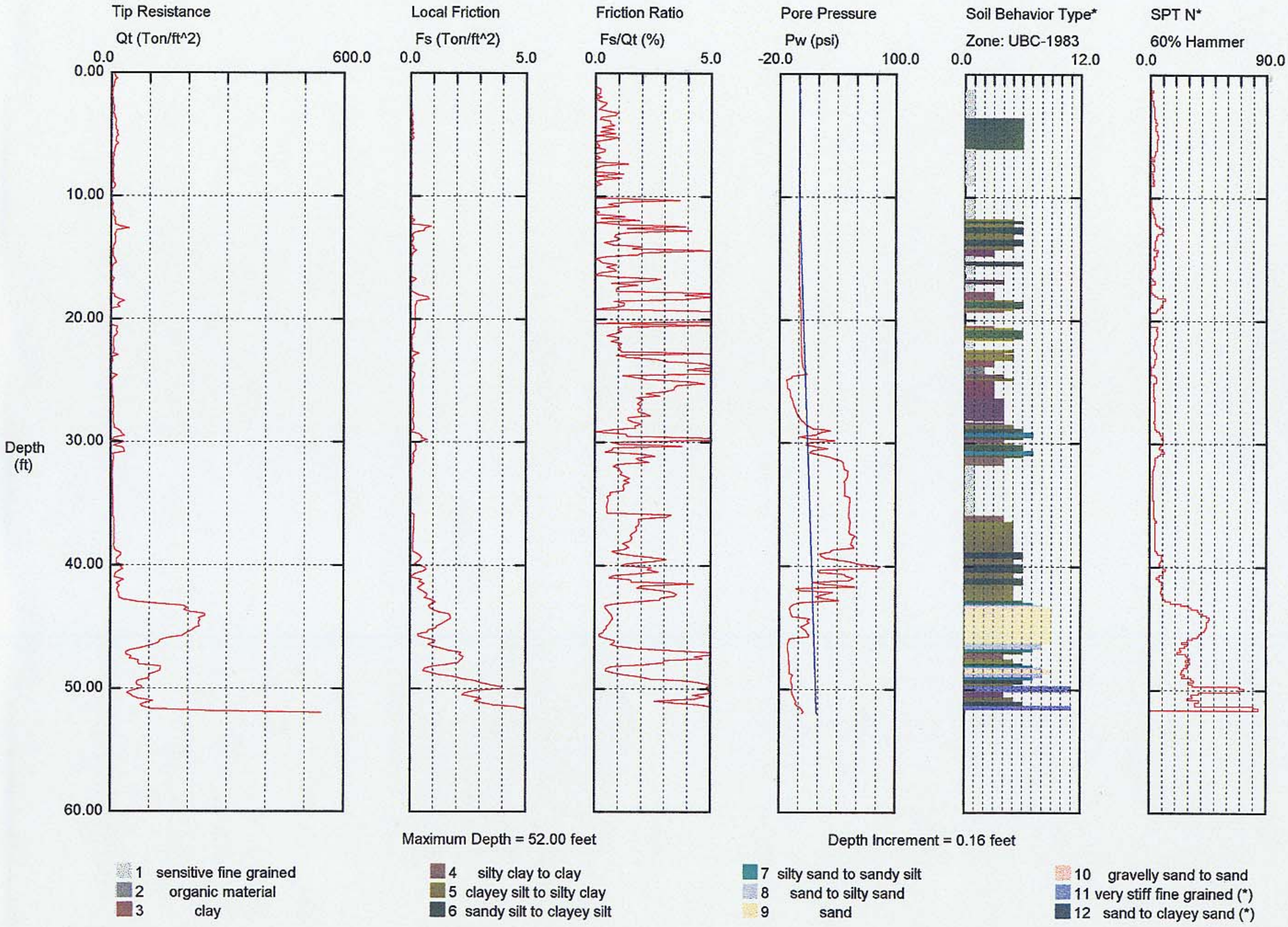
▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay
▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt
▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 193006
Cone Used: 416

CPT Date/Time: 11-07-01 12:38
Location: CPT GL - 01
Job Number: BETH STEEL



Maximum Depth = 52.00 feet

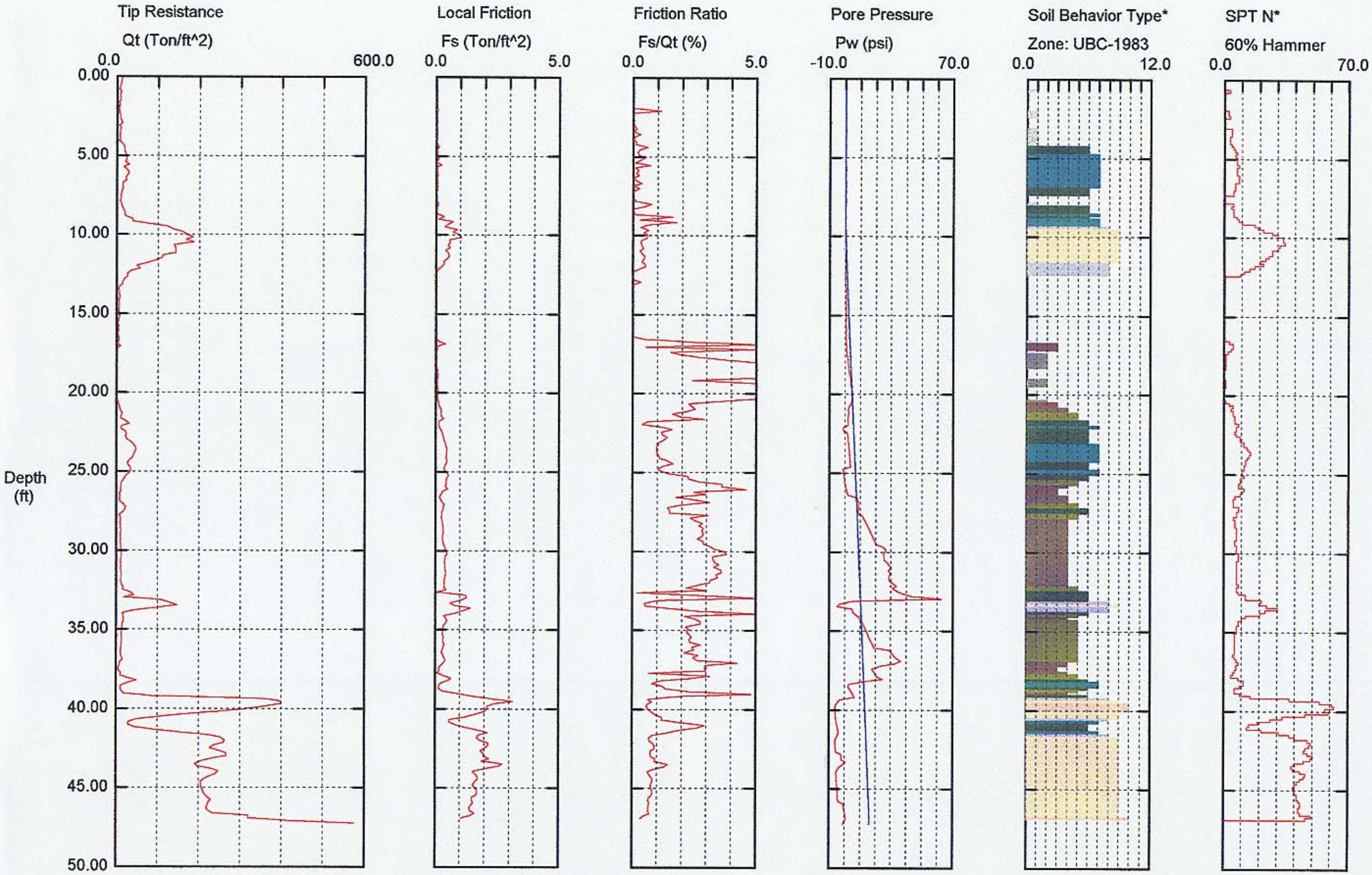
Depth Increment = 0.16 feet

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 193007
Cone Used: 416

CPT Date/Time: 11-07-01 14:24
Location: CPT GL - 02
Job Number: BETH STEEL



Maximum Depth = 47.24 feet

Depth Increment = 0.16 feet

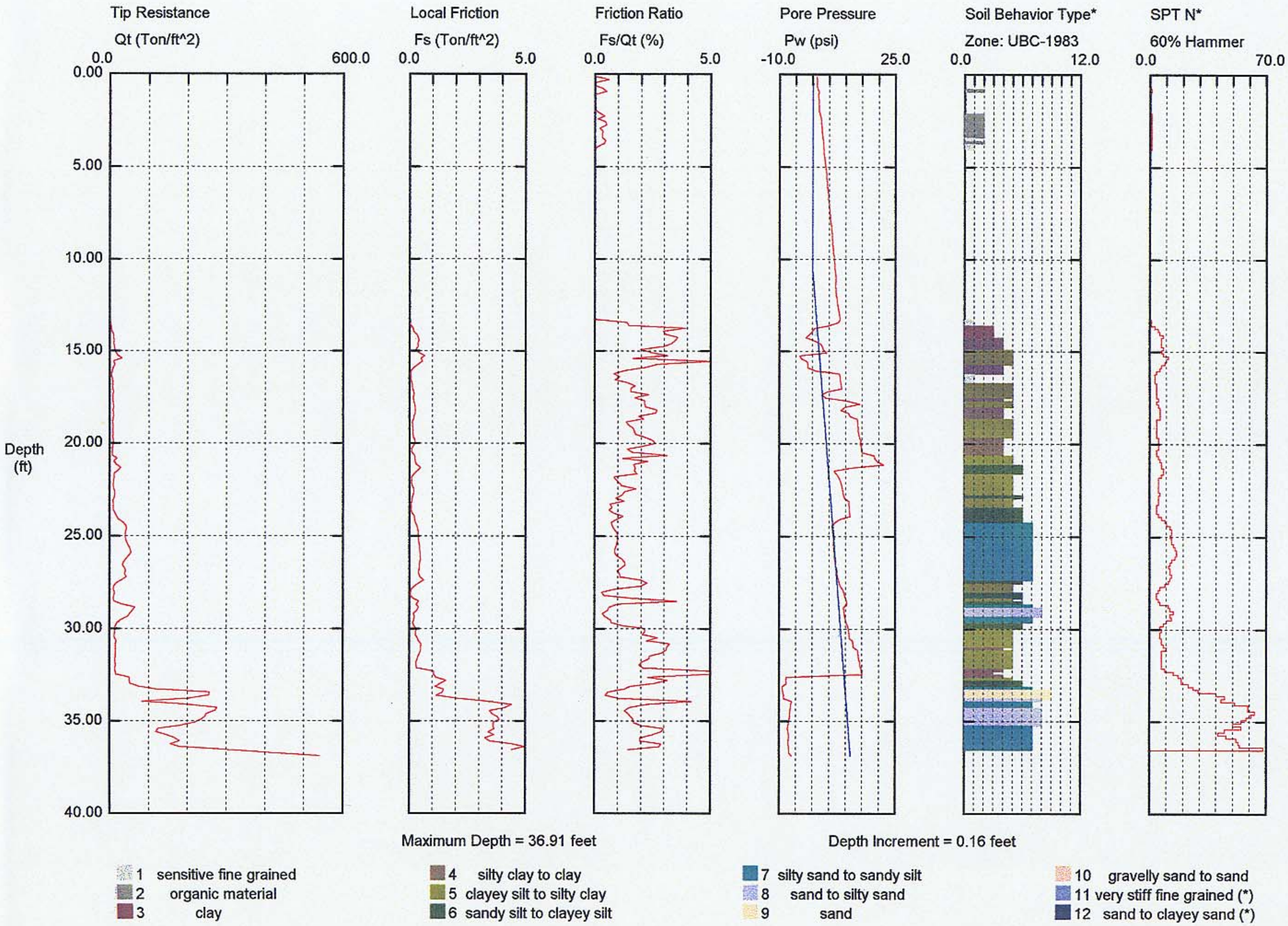
▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay
▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt
▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 193000
Cone Used: 416

CPT Date/Time: 09-26-01 12:24
Location: GL - 03
Job Number: BETH STEEL



Maximum Depth = 36.91 feet

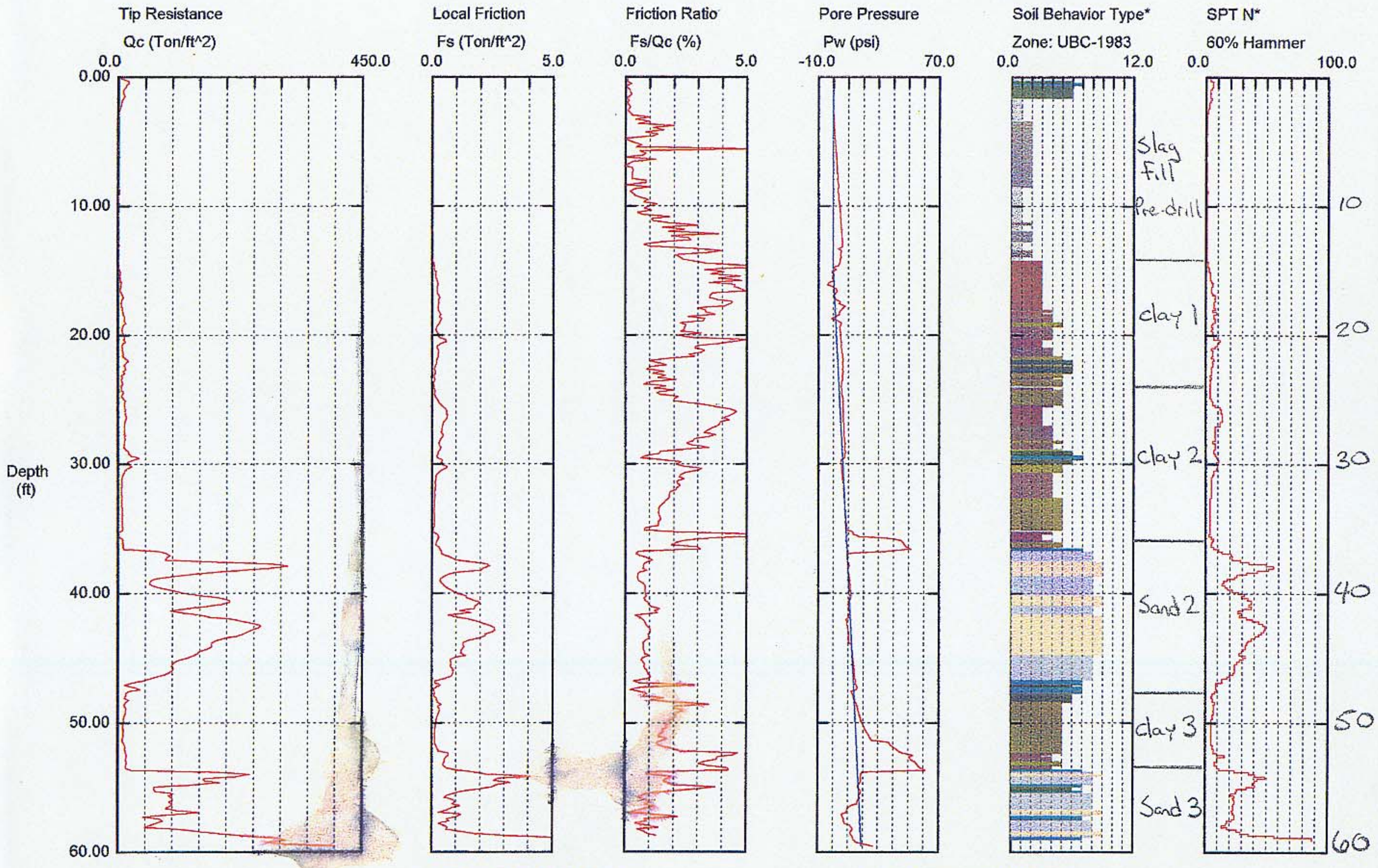
Depth Increment = 0.16 feet

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 139001
Cone Used: 416

CPT Date/Time: 08-24-00 12:58
Location: GL - 04 - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 59.55 feet

Depth Increment = 0.16 feet

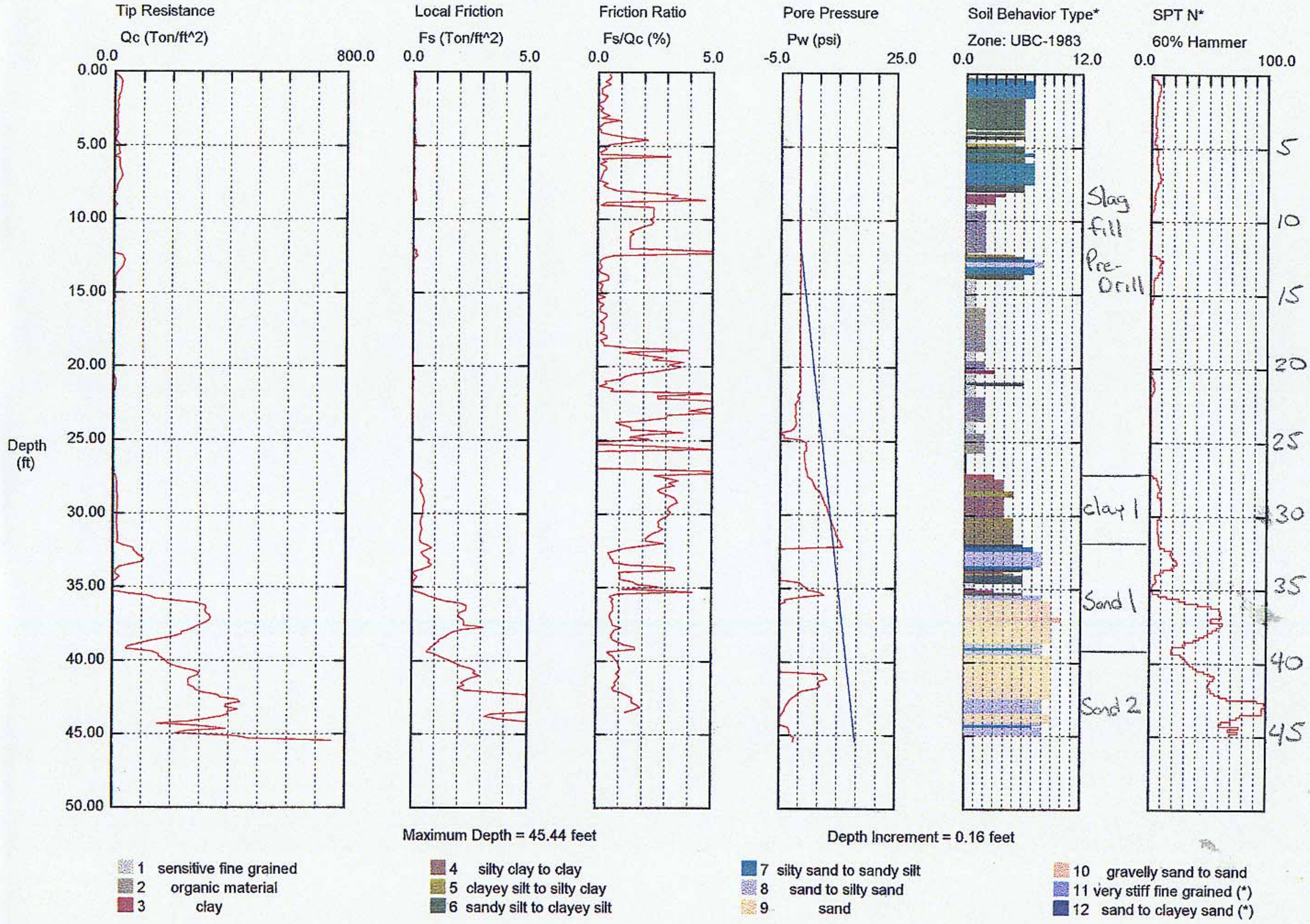
- 1 sensitive fine grained
- 2 organic material
- 3 clay
- 4 silty clay to clay
- 5 clayey silt to silty clay
- 6 sandy silt to clayey silt
- 7 silty sand to sandy silt
- 8 sand to silty sand
- 9 sand
- 10 gravelly sand to sand
- 11 very stiff fine grained (*)
- 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2

Operator: AL MYERS
Sounding: 139002
Cone Used: 416

CPT Date/Time: 08-25-00 08:19
Location: GL - 05 - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 45.44 feet

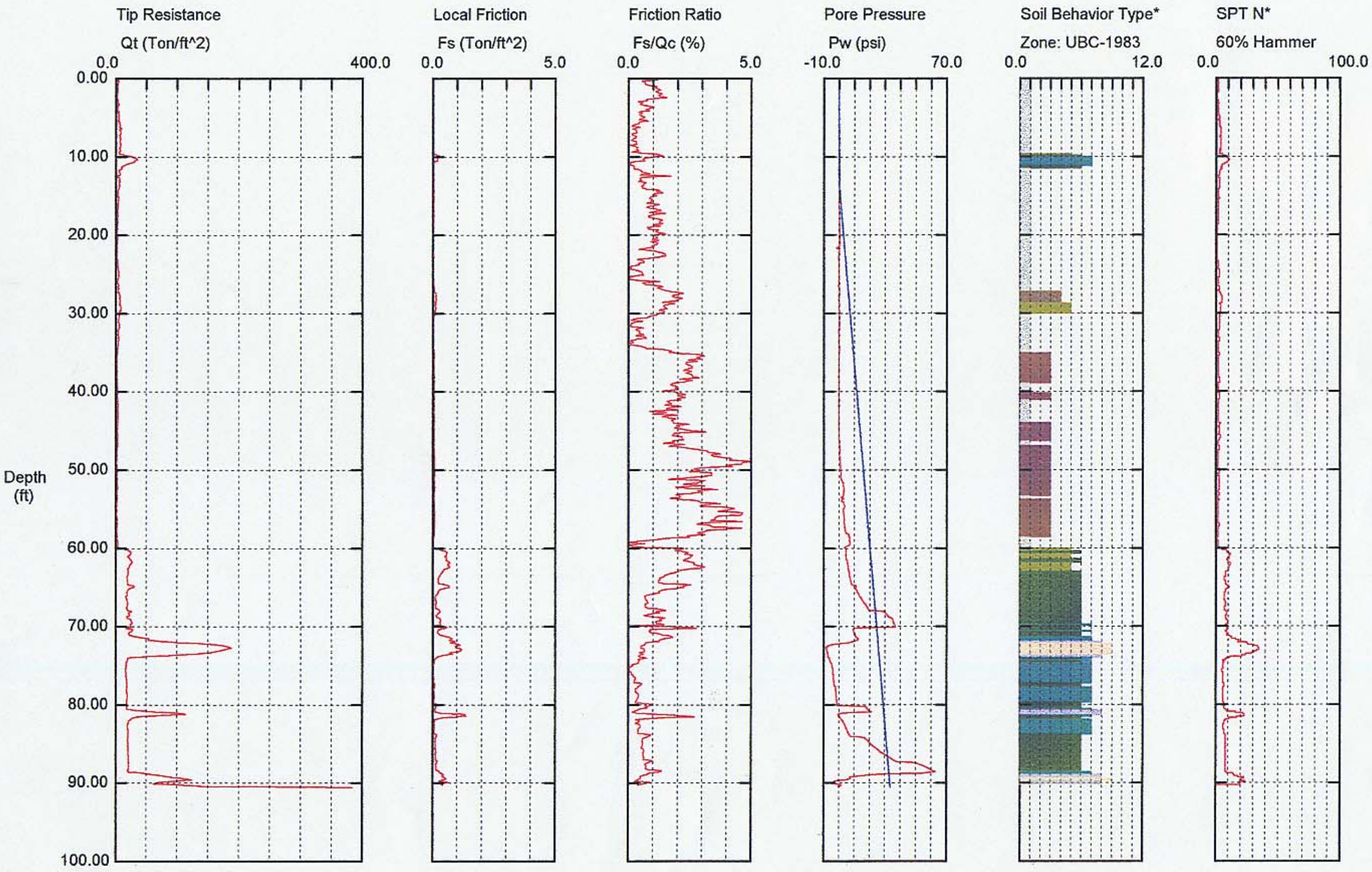
Depth Increment = 0.16 feet

*Soil behavior type an ased on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 139061
Cone Used: 419

CPT Date/Time: 10-09-00 08:22
Location: GL - 07C - CPT
Job Number: CH2MHILL BETH ST



Maximum Depth = 90.55 feet

Depth Increment = 0.16 feet

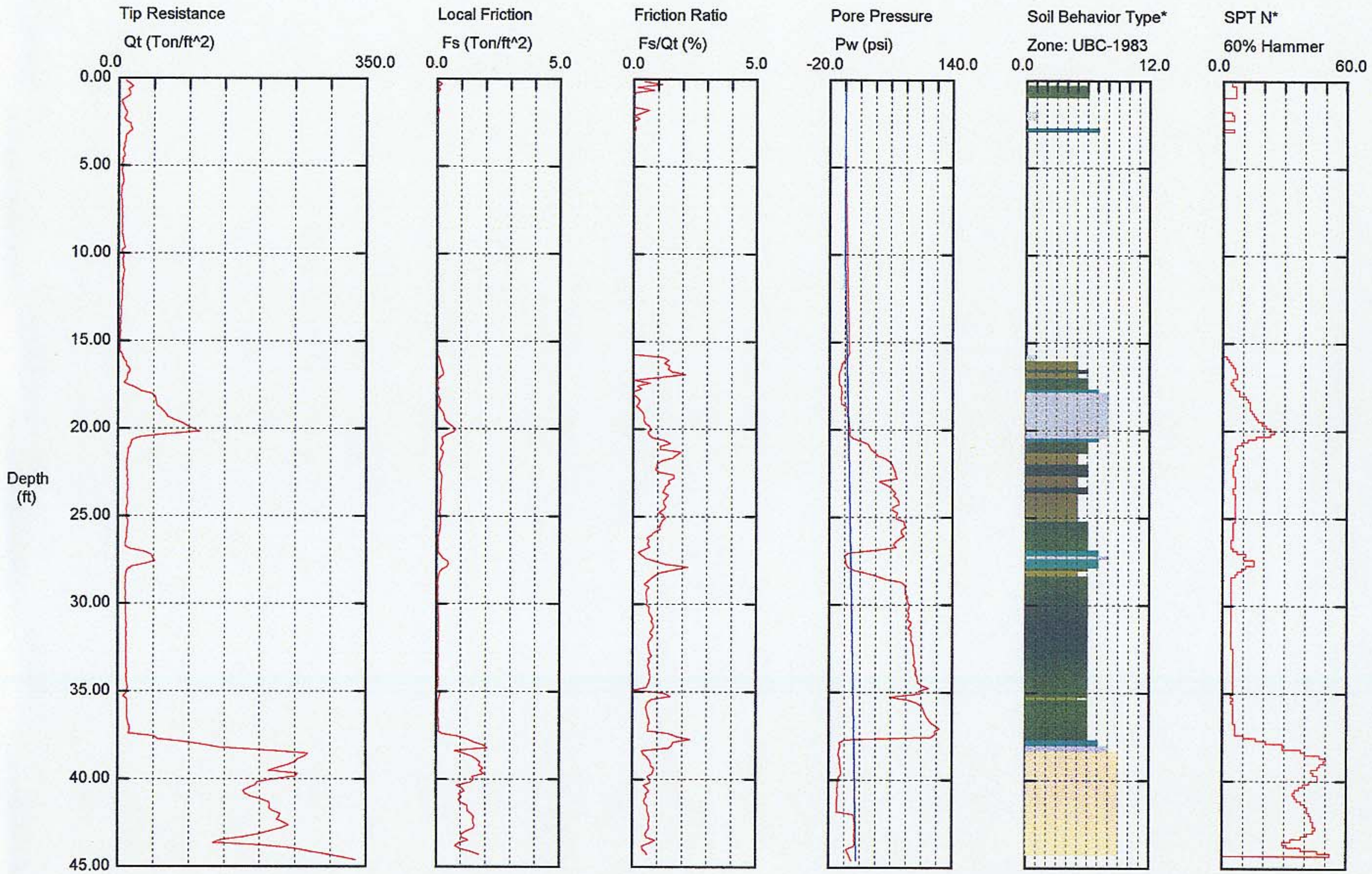
▨ 1 sensitive fine grained
▨ 2 organic material
▨ 3 clay
▨ 4 silty clay to clay
▨ 5 clayey silt to silty clay
▨ 6 sandy silt to clayey silt
▨ 7 silty sand to sandy silt
▨ 8 sand to silty sand
▨ 9 sand
▨ 10 gravelly sand to sand
▨ 11 very stiff fine grained (*)
▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 193003
Cone Used: 416

CPT Date/Time: 11-06-01 14:52
Location: CPT - GL - 08A
Job Number: BETH STEEL



Maximum Depth = 44.62 feet

Depth Increment = 0.16 feet

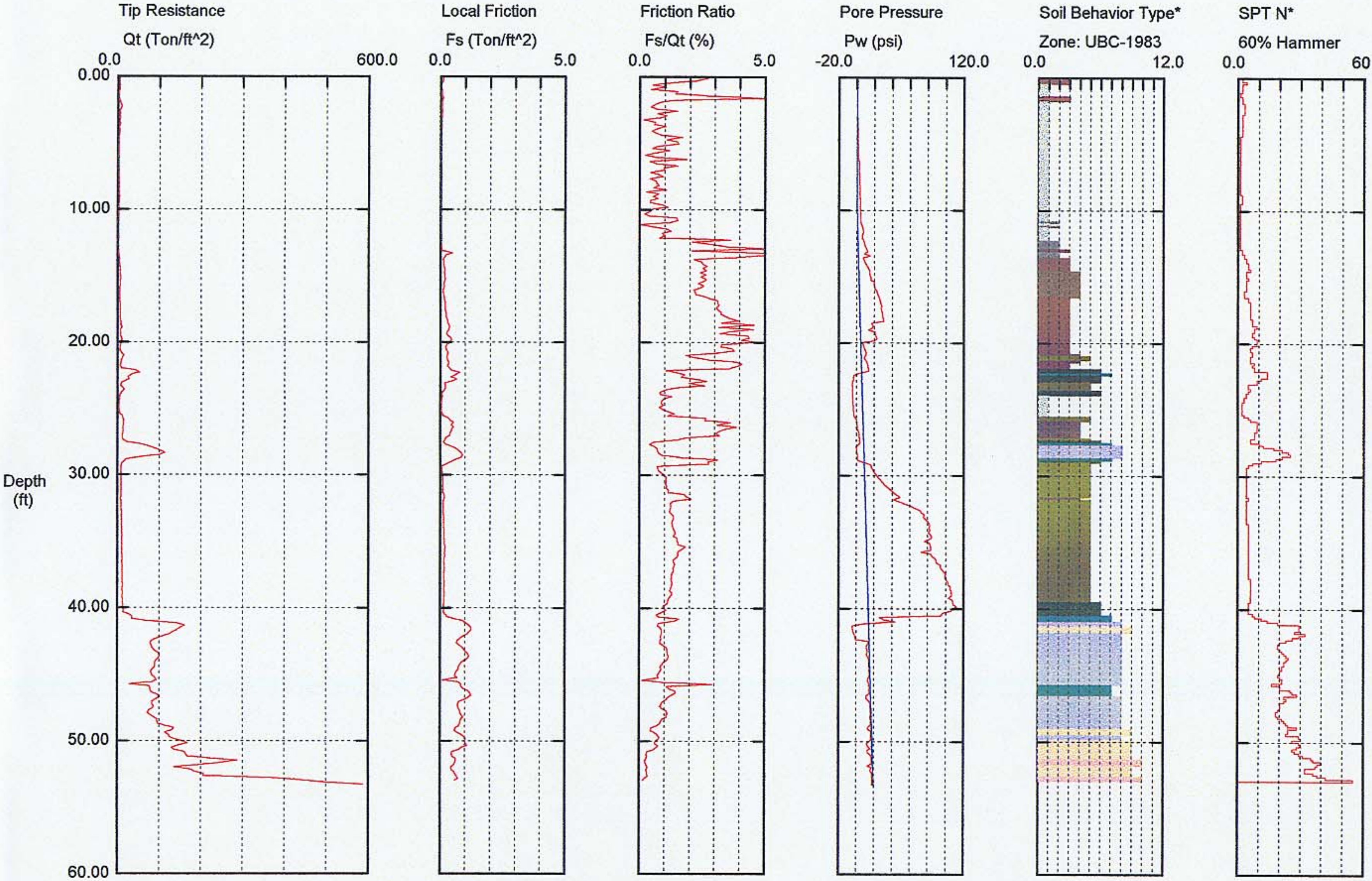
- 1 sensitive fine grained
- 2 organic material
- 3 clay
- 4 silty clay to clay
- 5 clayey silt to silty clay
- 6 sandy silt to clayey silt
- 7 silty sand to sandy silt
- 8 sand to silty sand
- 9 sand
- 10 gravelly sand to sand
- 11 very stiff fine grained (*)
- 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 193001
Cone Used: 416

CPT Date/Time: 11-05-01 10:22
Location: CPT - GL09
Job Number: BETH STEEL



Maximum Depth = 53.31 feet

Depth Increment = 0.16 feet

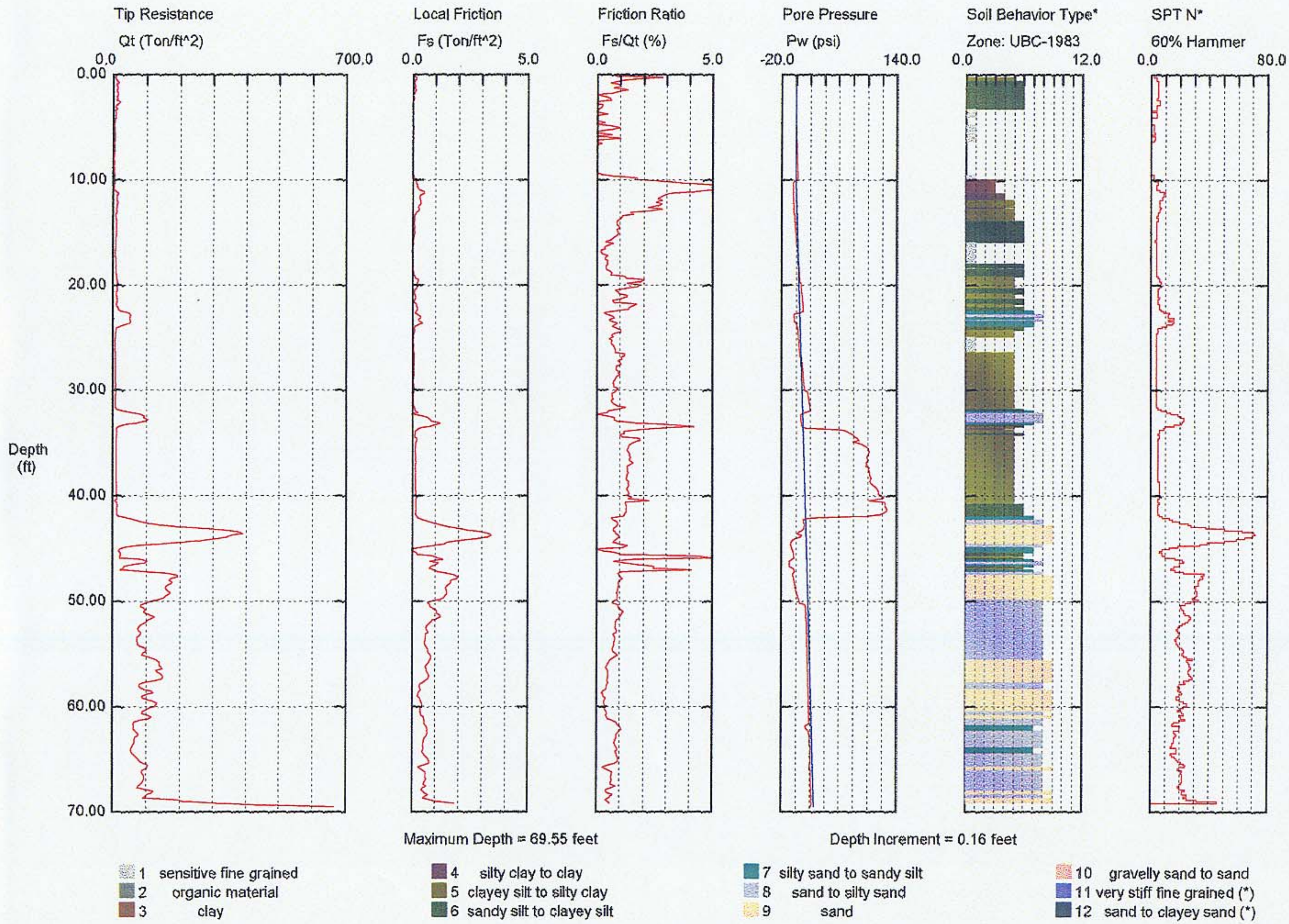
- ▨ 1 sensitive fine grained
- ▨ 2 organic material
- ▨ 3 clay
- ▨ 4 silty clay to clay
- ▨ 5 clayey silt to silty clay
- ▨ 6 sandy silt to clayey silt
- ▨ 7 silty sand to sandy silt
- ▨ 8 sand to silty sand
- ▨ 9 sand
- ▨ 10 gravelly sand to sand
- ▨ 11 very stiff fine grained (*)
- ▨ 12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 193008
Cone Used: 416

CPT Date/Time: 11-08-01 09:20
Location: CPT GL - 11
Job Number: BETH STEEL

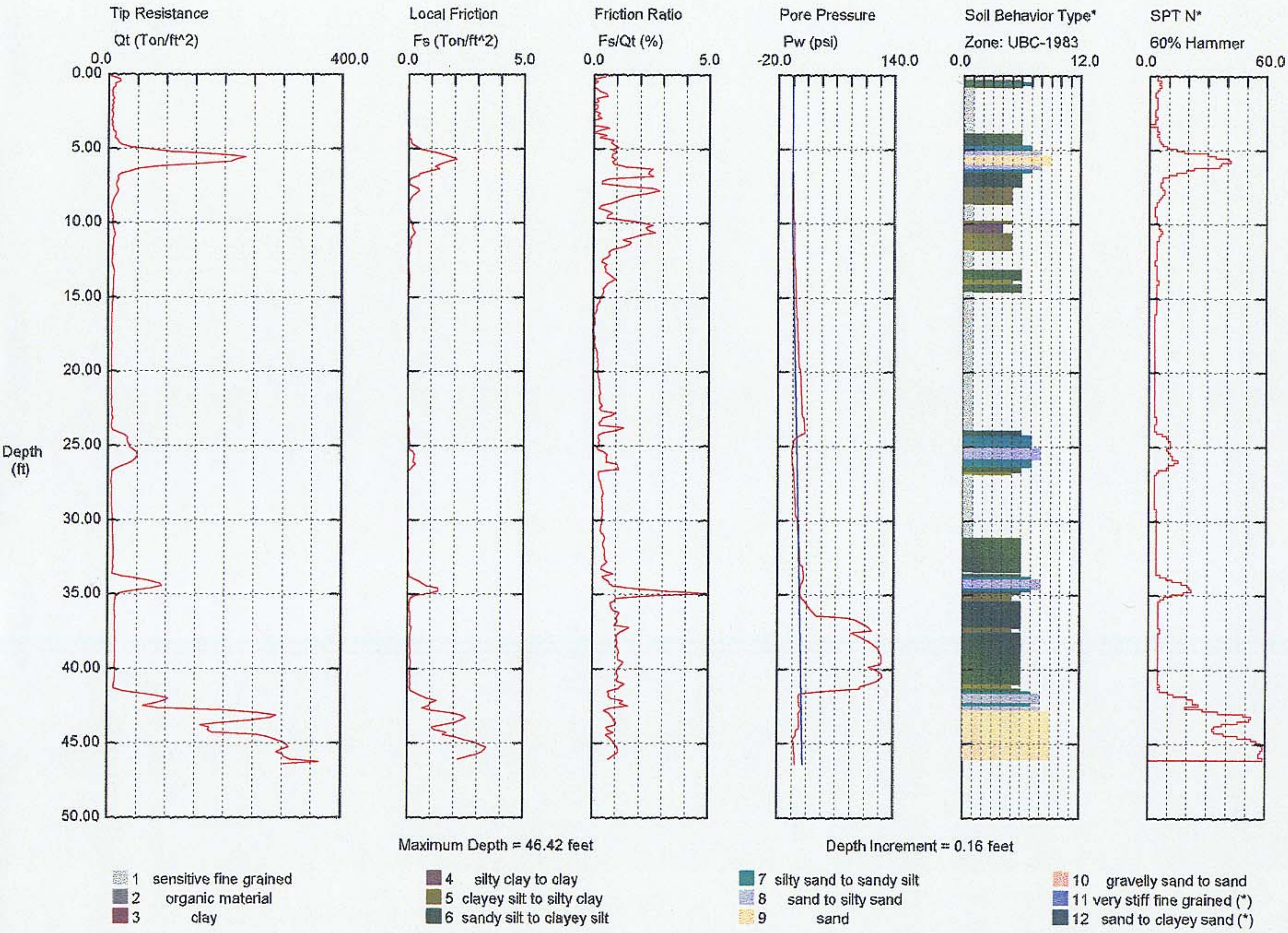


*Soil behavior type and SPT based on data from UBC-1983

E2S

Operator: AL MYERS
Sounding: 193009
Cone Used: 416

CPT Date/Time: 11-08-01 11:17
Location: CPT GL - 12
Job Number: BETH STEEL



Maximum Depth = 46.42 feet

Depth Increment = 0.16 feet

Historical Logs

Historical Logs
Greys Landfill Area
Bethlehem Steel Corporation—Sparrows Point Facility

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
BW-1	0.00	3.50	Slag	
	3.50	4.50	Silty Sand	
	4.50	24.00	Silty Clay	
	24.00	28.00	Silty Sand	
	28.00	33.00	Silty Clay	
	33.00	35.50	Sand	
	35.50	38.00	Sandy Clay	
	38.00	50.00	Sand	
	50.00	54.00	Decomposed Rock	
BW-2	0.00	8.00	Slag	
	8.00	11.00	Waste	
	11.00	19.00	Slag	
	19.00	21.00	Sand	
	21.00	22.00	Sludge	
	22.00	28.00	Sand	
	28.00	33.00	Clay & Sand	
	33.00	39.00	Silty Clay	
	39.00	50.00	Sand	
BW-3	0.00	5.00	Aggregate	
	5.00	6.00	Silt	
	6.00	12.00	Silty Clay	
	12.00	21.00	Silty Sand	
	21.00	29.00	Clay	
	29.00	30.00	Sand	
	30.00	34.00	Silty Clay	
	34.00	42.00	Sand	
BW-4	0.00	7.00	Black waste material	
	7.00	13.00	Slag	
	13.00	28.00	Black waste material	
	28.00	54.00	Slag and black waste material	
	54.00	60.00	Black waste material	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	60.00	63.00	Clayey sand	
	63.00	67.00	Medium to fine sand, trace silt	
	67.00	93.00	Silty clay	
	93.00	97.00	Medium to fine silty sand	
BW-6	0.00	7.00	Slag	
	7.00	8.50	Waste Material	
	8.50	14.00	Slag	
	14.00	21.50	Black Waste	
	21.50	22.00	Silty Clay	
	22.00	33.00	Red to Black Waste	
	33.00	40.00	Silty Clay	
	40.00	52.00	Sand	
BW-7	0.00	3.00	Slag	
	3.00	4.00	Clayey Sand	
	4.00	6.00	Sand	
	6.00	8.00	Waste Material	
	8.00	42.00	Silty Clay	
	42.00	44.00	Clayey Sand	
	44.00	52.00	Sand	
BW-8	0.00	5.00	Black Waste Material	
	5.00	9.00	Black Waste with Construction Debris	
	9.00	10.00	Slag	
	10.00	19.00	Black Waste with Construction Debris	
	19.00	28.00	Slag	
	28.00	33.00	Gray Waste Material	
	33.00	38.50	Black Waste Material	
	38.50	49.00	Black to Red Slag	
	49.00	56.00	Slag	
	56.00	58.00	Black Waste Material	
	58.00	62.00	Gray Waste Material	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
	62.00	68.00	Black Waste Material	
	68.00	76.00	Saturated Black Waste Material	
	76.00	83.00	Clayey Sand	
	83.00	101.00	Silty Clay	
BW-9	0.00	48.00	Black Waste Material	
	48.00	53.00	Slag & Waste Material	
	53.00	59.00	Gray Waste Material	
	59.00	65.00	Black Waste Material	
	68.00	80.00	Silty Clay	
	80.00	86.00	Silty Sand	
	86.00	95.00	Silty Clay	
	95.00	102.00	Silty Sand	
BW-10	0.00	8.00	Slag	
	8.00	18.00	Silty Clay	
	18.00	22.00	Sandy Silt	
	22.00	24.00	Silty Clay	
	24.00	25.00	Silty Sand	
	25.00	51.00	Silty Clay	
	51.00	57.00	Silty Sand	
GL13-PZM032	0	12	Slag and misc. fill	
	12	13.5	Sand	
	13.5	16	Sandy Silt	
	16	25	Silty clay	
	25	26	Sand	
	26	27	Silt and clay	
	27	28	Sand	
	28	35	Silty clay	
	35	37.5	Sand	
	37.5	42	Clay	
	42	57	Sand	
	57	60	Silty clay	

Boring No.	Top Depth	Bottom Depth	Lithology	Comments
GL14-PZM010	0	5	Slag and misc. fill	
	5	21	Clay	
	21	27	Silt and sand	
	27	29	Clay	
	29	37.5	Silty sand	
	37.5	39.5	Clay	
	39.5	43.5	Sand	
GL17-PZM005	0	26	Slag	
	26	30	Silty clay, wet medium stiff, dark gray brown	
			color, trace fine sand	
GL17-PZM032	0	26	Slag and misc. fill	
	26	35	Clay	
	35	35.5	Sand	
	35.5	45	Clay	
	45	45.5	Clayey Silt	
	45.5	56	Sand	
GL-GB1062	0.00	7.00	Clay and sand	
	7.00	12.00	Sand	
	12.00	21.00	Silt	
GL-GB1094	0.00	7.00	Silty sand	
	7.00	17.00	Clay	
	17.00	23.00	Sand	
	23.00	34.00	Clayey silt	
	34.00	41.00	Sand	

Table 2.4-B
All Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL02-PZM006		GL02-PZM017		GL02-PZM028		GL05-PZM020		GL07-PZM031		GL08-PZM000		GL08-PZM036		GL10-PZM012		GL10-PZP003		GL11-PZM030				GL11-PZP002		GL13-PZM012			
Sample ID	GL02-PZM006-01D		GL02-PZM017-01D		GL02-PZM028-01D		GL05-PZM020-01D		GL07-PZM031-01D		GL08-PZM000-01D		GL08-PZM036-01D		GL10-PZM012-01D		GL10-PZP003-01D		GL11-PZM030-01D		GL11-PZM030-01D DUP		GL11-PZP002-01D		GL13-PZM012-01D		GL13-PZM012-01D DUP	
Sample Date	12/17/01		12/17/01		12/17/01		12/17/01		12/17/01		12/17/01		12/07/01		12/18/01		12/18/01		12/18/01		12/18/01		12/17/01		12/18/01		12/18/01	
Chemical Name																												
Volatile Organic Compounds (UG/L)																												
1,1,1,2-Tetrachloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	69		0.46	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	4.8		1	U	1	U
1,1-Dichloroethene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichloropropane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,2-Dibromo-3-chloropropane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,2-Dibromoethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,2-Dichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2-Butanone	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
2-Chloro-1,3-butadiene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2-Hexanone	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	36		5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	5.6	J	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Acetonitrile	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Acrolein	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Acrylonitrile	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Allyl chloride	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Benzene	53		0.32	J	1	U	0.43	J	0.32	J	1.5		1	U	1	U	1	U	1	U	1	U	3.5		1	U	1	U
Bromodichloromethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Carbon disulfide	0.37	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon tetrachloride	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Chloroform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloromethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Dibromochloromethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Dibromomethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Dichlorodifluoromethane(Freon-12)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Ethyl methacrylate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Ethylbenzene	4.5		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Iodomethane	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Isobutanol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Methacrylonitrile	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Methyl methacrylate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Methylene chloride	2	U	2	U	2	U	2	U	2	U	0.92	J	2	U	2	U	2	U	2	U	2	U	2	U	2	U	0.83	B
Propionitrile	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Styrene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	5.9		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	0.32	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichlorofluoromethane(Freon-11)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Vinyl acetate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Vinyl chloride	8.6		2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Xylene, total	10		3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U
cis-1,3-Dichloropropene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

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Table 2.4-B
All Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL02-PZM006	GL02-PZM017	GL02-PZM028	GL05-PZM020	GL07-PZM031	GL08-PZM000	GL08-PZM036	GL10-PZM012	GL10-PZP003	GL11-PZM030		GL11-PZP002	GL13-PZM012	
Sample ID	GL02-PZM006-01D	GL02-PZM017-01D	GL02-PZM028-01D	GL05-PZM020-01D	GL07-PZM031-01D	GL08-PZM000-01D	GL08-PZM036-01D	GL10-PZM012-01D	GL10-PZP003-01D	GL11-PZM030-01D	GL11-PZM030-01D DUP	GL11-PZP002-01D	GL13-PZM012-01D	GL13-PZM012-01D DUP
Sample Date	12/17/01	12/17/01	12/17/01	12/17/01	12/17/01	12/17/01	12/07/01	12/18/01	12/18/01	12/18/01	12/18/01	12/17/01	12/18/01	12/18/01
Chemical Name														
trans-1,2-Dichloroethene	0.94 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (UG/L)														
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Naphthoquinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	40 U	20 U	20 U	20 U	20 U	40 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	20 UJ	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	28 J	10 U	10 U	10 U	10 U	5.2 J	10 U	10 U	10 U	10 U	10 U	10 U	3.9 J	2.6 J
2,4-Dinitrophenol	100 U	50 U	50 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
2,4-Dinitrotoluene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Acetylaminofluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methyl-5-nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	20 UJ	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	17 J	10 U	10 U	10 U	10 U	5.3 J	10 U	10 U	10 U	10 U	10 U	10 U	1.3 J	0.92 J
2-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Picoline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	100 U	50 U	50 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
3,3'-Dimethylbenzidine	100 U	50 U	50 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
3-Methylcholanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	100 UJ	50 U	50 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
4-Aminobiphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	75	10 U	10 U	10 U	10 U	6.8 J	10 U	10 U	10 U	10 U	10 U	10 U	2.5 J	1.4 J
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	100 U	50 U	50 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	20 U	10 U	10 U	10 U	10 U	1.6 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 2.4-B
All Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL02-PZM006	GL02-PZM017	GL02-PZM028	GL05-PZM020	GL07-PZM031	GL08-PZM000	GL08-PZM036	GL10-PZM012	GL10-PZP003	GL11-PZM030		GL11-PZP002	GL13-PZM012	
Sample ID	GL02-PZM006-01D	GL02-PZM017-01D	GL02-PZM028-01D	GL05-PZM020-01D	GL07-PZM031-01D	GL08-PZM000-01D	GL08-PZM036-01D	GL10-PZM012-01D	GL10-PZP003-01D	GL11-PZM030-01D	GL11-PZM030-01D DUP	GL11-PZP002-01D	GL13-PZM012-01D	GL13-PZM012-01D DUP
Sample Date	12/17/01	12/17/01	12/17/01	12/17/01	12/17/01	12/17/01	12/07/01	12/18/01	12/18/01	12/18/01	12/18/01	12/17/01	12/18/01	12/18/01
Chemical Name														
Aniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Aramite	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	20 U	10 U	10 U	10 U	1.2 J	20 U	10 U	10 U	10 U	1.3 J	1 J	10 U	10 U	10 U
Dimethyl phthalate	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	20 U	10 U	10 U	10 U	10 U	20 U	0.5 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	20 UJ	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	100 U	50 U	50 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Hexachloroethane	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	20 UJ	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isosafrole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosomorpholine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosopiperidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	20 UJ	10 U	10 U	2.8 J	0.69 J	4.8 J	6.3 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	20 UJ	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachloroethane	100 U	50 U	50 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	100 U	50 U	50 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Phenacetin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	20 U	10 U	10 U	10 U	10 U	20 U	1.1 J	10 U	10 U	10 U	10 U	0.57 J	10 U	10 U
Phenol	2.6 J	10 U	10 U	10 U	10 U	4.8 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pronamide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	20 U	10 U	10 U	1.5 J	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyridine	40 U	20 U	20 U	20 U	20 U	40 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Safrole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
a,a-Dimethylphenethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	20 UJ	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	20 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
n-Nitroso-di-n-butylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	NA	NA	NA	NA

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Sample Date	12/17/01	12/17/01	12/17/01	12/17/01	12/17/01	12/17/01	12/07/01	12/18/01	12/18/01	12/18/01	12/18/01	12/17/01	12/18/01	12/18/01
Chemical Name														
n-Nitroso-n-methylethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosopyrrolidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Dimethylaminoazobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Phenylenediamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)														
Aroclor-1016	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1221	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1232	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1242	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1248	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1254	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1260	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Total Metals (UG/L)														
Antimony	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	20.6 U	20.6 U
Arsenic	7.9 J	11.6	66	17.1	7.7 J	6.1 J	31.7	2 U	3.5 J	8.4 J	7.2 J	3.6 J	2 U	2 U
Barium	21.5 B	74.7 B	151 B	108 B	106 B	99.2 B	56 J	180 B	137 J	138 B	144 B	39.2 B	32.6	32.2
Beryllium	4 B	3.9 B	3.9 B	3.2 B	2.9 B	3.6 B	3.4 B	4.4 B	6.1 B	5.2 B	4.5 B	3 B	0.56 B	0.68 B
Cadmium	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.66 J	0.9 J	0.63 U	1 J	0.63 U	3.2 U	3.2 U
Chromium	1.3 J	1.1 U	2.9 J	1.1 U	12.1	1.1 U	3 B	1.1 U	6.3	1.1 U	1.1 U	1.1 U	5.6 U	1.1 U
Cobalt	0.86 U	9.9 B	0.86 U	4.8 B	1.9 B	1.9 B	1 J	0.86 U	7.2 B	0.86 U	0.86 U	1.9 B	0.86 U	0.86 U
Copper	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	3.9 U	442
Lead	1.8 U	1.8 U	1.9 J	1.8 U	4.9	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	9.1 U	9.1 U
Mercury	0.054 UL	0.054 UL	0.054 UL	0.054 UL	0.054 UL	0.054 UL	0.054 U	0.054 UL	0.054 UL	0.054 UL	0.054 UL	0.054 UL	0.054 U	0.054 U
Nickel	31.9 B	9.4 B	2.4 U	4.3 B	24 J	6.3 J	2.4 U	2.4 U	20.4 B	2.4 U	2.4 U	9.9 B	2.4 U	2.4 U
Selenium	7.2	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	79.8 U	79.8 U
Silver	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	6	5.7
Thallium	5.7 U	11.2	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	13.6	5.7 U	144 U	144 U
Tin	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	144 U	144 U
Vanadium	5.8 J	7.4 J	12.7 J	8.9 J	1.5 U	10.7 J	10.4 J	4.8 J	16.7 J	11.6 J	8.3 J	3.8 J	54.9 J	57.3 J
Zinc	3.5 J	9.9 J	44	1.5 U	176	1.5 U	7.6 J	1.5 U	56.3	1.5 U	1.5 U	15.5 B	7.5 U	7.5 U
Common Cations (UG/L)														
Calcium	231,000	64,700	124,000 B	NA	NA	88,800 B	30,800	16,200	NA	23,900	24,100	234,000	120,000	124,000
Iron	53.4 J	155,000	26,700	NA	NA	1,100	114,000	85,300	NA	156,000	159,000	3,420	1,410,000	1,420,000
Magnesium	8,950	109,000	267,000	NA	NA	26,000	24,500	8,280	NA	20,800	21,300	54,100	235,000	242,000
Manganese	33.4	5,550	799	NA	NA	1,950	3,840	1,130	NA	2,890	2,930	412	131,000	131,000
Potassium	128,000	20,300	73,000	NA	NA	72,900	2,210 J	2,160 J	NA	1,740 J	1,300 J	87,400	3,380 J	3,720 J
Sodium	177,000	1,060,000	2,310,000	NA	NA	342,000	96,800	70,300	NA	93,000	97,000	164,000	94,800	96,400
Wet Chemistry (MG/L)														
Amenable cyanide	0.9	0.049 J	0.016 J	0.0018 J	0.01 J	2.3 J	0.035 J	0.037	0.15 J	0.075 J	0.078 J	0.87 J	0.02 U	0.02 U
Bicarbonate	37.1	152	330	NA	NA	330	80.3	76.2	NA	57.7	51.5	214	68	70
Chloride	228	2,020	4,040	NA	NA	736	71.3	202	NA	374	353	216	145	153
Sulfate	898	188	294	NA	NA	29.4	102	1 U	NA	1 U	1 U	774	3,870	3,880
Sulfide	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 2.4-B
All Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL13-PZM032		GL13-PZP003		GL15-PZM022				GL15-PZP008		GL16-PZP003		GL17-PZM005		GL17-PZM032		GL17-PZP008		GL18-PZP002			
Sample ID	GL13-PZM032-01D		GL13-PZP003-01D		GL15-PZM022-01D		GL15-PZM022-01D DUP		GL15-PZP008-01D		GL16-PZP003-01D		GL17-PZM005-01D		GL17-PZM032-01D		GL17-PZP008-01D		GL18-PZP002-01D		GL18-PZP002-01D DUP	
Sample Date	12/18/01		12/18/01		12/18/01		12/18/01		12/21/01		12/18/01		12/17/01		12/17/01		12/18/01		12/17/01		12/17/01	
Chemical Name																						
Volatile Organic Compounds (UG/L)																						
1,1,1,2-Tetrachloroethane	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
1,1,1-Trichloroethane	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
1,1,2,2-Tetrachloroethane	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
1,1,2-Trichloroethane	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
1,1-Dichloroethane	1	U	1	U	1	U	10	U	1	U	2.6		1	U	1	U	1	U	140		120	
1,1-Dichloroethene	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
1,2,3-Trichloropropane	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
1,2-Dibromo-3-chloropropane	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
1,2-Dibromoethane	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
1,2-Dichloroethane	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
1,2-Dichloropropane	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
1,4-Dioxane	NA		NA		200	R	2,000	R	NA		NA		NA		200	R	200	R	NA		NA	
2-Butanone	5	U	5	U	5	U	50	U	5	U	20		5	U	5	U	5	U	250	U	150	U
2-Chloro-1,3-butadiene	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
2-Hexanone	5	U	5	U	5	U	50	U	5	U	5	U	5	U	5	U	5	U	250	U	150	U
4-Methyl-2-pentanone	5	U	5	U	5	U	50	U	5	U	23		3.9	J	5	U	5	U	250	U	150	U
Acetone	10	U	3.4	J	710		440		3.2	B	67		4.4	J	10	U	11		500	U	300	U
Acetonitrile	NA		NA		20	R	200	R	NA		NA		NA		20	R	20	R	NA		NA	
Acrolein	NA		NA		20	U	200	U	NA		NA		NA		20	U	20	U	NA		NA	
Acrylonitrile	NA		NA		20	U	200	U	NA		NA		NA		20	U	20	U	NA		NA	
Allyl chloride	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
Benzene	1	U	1.1		1	U	10	U	1	U	140		8.3		0.97	J	0.64	J	1,500		1,300	
Bromodichloromethane	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
Bromoform	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
Bromomethane	NA		NA		2	UJ	20	UJ	NA		NA		NA		2	UJ	2	UJ	NA		NA	
Carbon disulfide	1	U	1	U	1	U	10	U	1	U	0.68	J	1	U	1	U	1.4		50	U	30	U
Carbon tetrachloride	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
Chlorobenzene	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
Chloroethane	2	U	2	U	2	U	20	U	2	U	2	U	2	U	2	U	2	U	100	U	60	U
Chloroform	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
Chloromethane	NA		NA		2	U	20	U	NA		NA		NA		2	U	2	U	NA		NA	
Dibromochloromethane	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
Dibromomethane	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
Dichlorodifluoromethane(Freon-12)	NA		NA		2	U	20	U	NA		NA		NA		2	U	2	U	NA		NA	
Ethyl methacrylate	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
Ethylbenzene	1	U	1	U	1	U	10	U	1	U	0.27	J	0.24	J	1	U	1	U	50	U	7	J
Iodomethane	NA		NA		1	U	10	R	NA		NA		NA		1	R	1	R	NA		NA	
Isobutanol	NA		NA		40	R	400	R	NA		NA		NA		40	R	40	R	NA		NA	
Methacrylonitrile	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
Methyl methacrylate	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
Methylene chloride	2	U	2	U	2	U	5.3	B	2	U	2	U	2	U	2	U	2	U	100	U	60	U
Propionitrile	NA		NA		2	U	20	U	NA		NA		NA		2	U	2	U	NA		NA	
Styrene	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
Tetrachloroethene	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U
Toluene	1	U	0.26	J	1	U	10	U	1	U	1.1		1.9		0.25	J	0.38	J	300		200	
Trichloroethene	1	U	1	U	1	U	10	U	1	U	0.44	J	1	U	1	U	1	U	50	U	30	U
Trichlorofluoromethane(Freon-11)	NA		NA		2	U	20	U	NA		NA		NA		2	U	2	U	NA		NA	
Vinyl acetate	NA		NA		1	U	10	U	NA		NA		NA		1	U	1	U	NA		NA	
Vinyl chloride	2	U	2	U	2	U	20	U	2	U	0.73	J	2	U	2	U	2	U	20	J	60	U
Xylene, total	3	U	3	U	3	U	30	U	3	U	1.5	J	3.6		3	U	3	U	110	J	76	J
cis-1,3-Dichloropropene	1	U	1	U	1	U	10	U	1	U	1	U	1	U	1	U	1	U	50	U	30	U

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Table 2.4-B
All Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL13-PZM032	GL13-PZP003	GL15-PZM022		GL15-PZP008	GL16-PZP003	GL17-PZM005	GL17-PZM032	GL17-PZP008	GL18-PZP002	
Sample ID	GL13-PZM032-01D	GL13-PZP003-01D	GL15-PZM022-01D	GL15-PZM022-01D DUP	GL15-PZP008-01D	GL16-PZP003-01D	GL17-PZM005-01D	GL17-PZM032-01D	GL17-PZP008-01D	GL18-PZP002-01D	GL18-PZP002-01D DUP
Sample Date	12/18/01	12/18/01	12/18/01	12/18/01	12/21/01	12/18/01	12/17/01	12/17/01	12/18/01	12/17/01	12/17/01
Chemical Name											
trans-1,2-Dichloroethene	1 U	1 U	1 U	10 U	1 U	1 U	1 U	1 U	1 U	50 U	30 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	10 U	1 U	1 U	1 U	1 U	1 U	50 U	30 U
trans-1,4-Dichloro-2-butene	NA	NA	1 U	10 U	NA	NA	NA	1 U	1 U	NA	NA
Semivolatile Organic Compounds (UG/L)											
1,2,4,5-Tetrachlorobenzene	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
1,3,5-Trinitrobenzene	NA	NA	50 U	50 U	NA	NA	NA	50 U	NA	NA	NA
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
1,3-Dinitrobenzene	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
1,4-Naphthoquinone	NA	NA	50 U	50 U	NA	NA	NA	50 U	NA	NA	NA
1-Naphthylamine	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	20 U	20 U	10 U	10 U	20 U	NA	40 U	10 U	NA	40 U	40 U
2,3,4,6-Tetrachlorophenol	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
2,4,5-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	NA	20 UJ	10 U	NA	20 UJ	20 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	NA	210	10 U	NA	20 UJ	20 U
2,4-Dinitrophenol	50 U	50 U	50 U	50 U	50 U	NA	100 U	50 U	NA	100 U	100 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
2,6-Dichlorophenol	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
2-Acetylaminofluorene	NA	NA	20 U	20 U	NA	NA	NA	20 U	NA	NA	NA
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
2-Methyl-5-nitroaniline	NA	NA	20 U	20 U	NA	NA	NA	20 U	NA	NA	NA
2-Methylaniline	NA	NA	20 U	20 U	NA	NA	NA	20 U	NA	NA	NA
2-Methylnaphthalene	10 U	10 U	10 U	10 U	10 U	NA	5.9 J	1.3 J	NA	25 J	26
2-Methylphenol	10 U	10 U	10 U	10 U	10 U	NA	34	10 U	NA	720	690
2-Naphthylamine	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
2-Nitroaniline	NA	NA	50 U	50 U	NA	NA	NA	50 U	NA	NA	NA
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	NA	20 UJ	10 U	NA	20 UJ	20 U
2-Picoline	NA	NA	20 U	20 U	NA	NA	NA	20 U	NA	NA	NA
3,3'-Dichlorobenzidine	50 U	50 U	50 U	50 U	50 U	NA	100 U	50 U	NA	100 U	100 U
3,3'-Dimethylbenzidine	50 U	50 U	50 U	50 U	50 U	NA	100 U	50 U	NA	100 U	100 U
3-Methylcholanthrene	NA	NA	50 U	50 U	NA	NA	NA	50 U	NA	NA	NA
3-Nitroaniline	NA	NA	50 U	50 U	NA	NA	NA	50 U	NA	NA	NA
4,6-Dinitro-2-methylphenol	50 U	50 U	50 U	50 U	50 U	NA	100 UJ	50 U	NA	100 UJ	100 U
4-Aminobiphenyl	NA	NA	50 U	50 U	NA	NA	NA	50 U	NA	NA	NA
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
4-Chloroaniline	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	20 U	20 U
4-Methylphenol	10 U	10 U	10 U	10 U	10 U	NA	340 J	10 U	NA	2,000	1,900
4-Nitroaniline	NA	NA	50 U	50 U	NA	NA	NA	50 U	NA	NA	NA
4-Nitrophenol	50 U	50 U	50 U	50 U	50 U	NA	100 U	50 U	NA	100 U	100 U
4-Nitroquinoline-1-oxide	NA	NA	100 U	100 U	NA	NA	NA	100 U	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	20 U	20 U	NA	NA	NA	20 U	NA	NA	NA
Acenaphthene	10 U	10 U	10 U	10 U	10 U	NA	2 J	23	NA	33	35
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	NA	20 U	10 U	NA	84	94
Acetophenone	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA

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Table 2.4-B
All Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL13-PZM032		GL13-PZP003		GL15-PZM022				GL15-PZP008		GL16-PZP003		GL17-PZM005		GL17-PZM032		GL17-PZP008		GL18-PZP002			
Sample ID	GL13-PZM032-01D		GL13-PZP003-01D		GL15-PZM022-01D		GL15-PZM022-01D DUP		GL15-PZP008-01D		GL16-PZP003-01D		GL17-PZM005-01D		GL17-PZM032-01D		GL17-PZP008-01D		GL18-PZP002-01D		GL18-PZP002-01D DUP	
Sample Date	12/18/01		12/18/01		12/18/01		12/18/01		12/21/01		12/18/01		12/17/01		12/17/01		12/18/01		12/17/01		12/17/01	
Chemical Name																						
Aniline	NA		NA		10	U	10	U	NA		NA		NA		10	U	NA		NA		NA	
Anthracene	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		17	J	19	J
Aramite	NA		NA		50	U	50	U	NA		NA		NA		50	U	NA		NA		NA	
Benzo(a)anthracene	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Benzo(a)pyrene	10	U	10	UJ	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Benzo(b)fluoranthene	10	U	10	UJ	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Benzo(g,h,i)perylene	10	U	10	UJ	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Benzo(k)fluoranthene	10	U	10	UJ	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Benzyl alcohol	NA		NA		10	U	10	U	NA		NA		NA		10	U	NA		NA		NA	
Butylbenzylphthalate	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Chrysene	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Di-n-butylphthalate	10	U	0.77	J	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Di-n-octylphthalate	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Dibenz(a,h)anthracene	10	U	10	UJ	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Dibenzofuran	10	U	10	U	10	U	10	U	10	U	NA		2	J	12		NA		56		63	
Diethylphthalate	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Dimethyl phthalate	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Dinoseb	NA		NA		20	U	20	U	NA		NA		NA		20	U	NA		NA		NA	
Diphenylamine	NA		NA		10	U	10	U	NA		NA		NA		10	U	NA		NA		NA	
Ethyl methanesulfonate	NA		NA		10	U	10	U	NA		NA		NA		10	U	NA		NA		NA	
Fluoranthene	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		9.9	J	12	J
Fluorene	10	U	10	U	10	U	10	U	10	U	NA		2.1	J	11		NA		61		68	
Hexachlorobenzene	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Hexachlorobutadiene	10	U	10	U	10	U	10	U	10	U	NA		20	UJ	10	U	NA		20	UJ	20	U
Hexachlorocyclopentadiene	50	U	50	U	50	U	50	U	50	U	NA		100	U	50	U	NA		100	U	100	U
Hexachloroethane	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Hexachloropropene	NA		NA		100	U	100	U	NA		NA		NA		100	U	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	10	U	10	UJ	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
Isophorone	10	U	10	U	10	U	10	U	10	U	NA		20	UJ	10	U	NA		20	UJ	20	U
Isosafrole	NA		NA		20	U	20	U	NA		NA		NA		20	U	NA		NA		NA	
Methapyrilene	NA		NA		50	U	50	U	NA		NA		NA		50	U	NA		NA		NA	
Methyl methanesulfonate	NA		NA		10	U	10	U	NA		NA		NA		10	U	NA		NA		NA	
N-Nitrosomorpholine	NA		NA		10	U	10	U	NA		NA		NA		10	U	NA		NA		NA	
N-Nitrosopiperidine	NA		NA		10	U	10	U	NA		NA		NA		10	U	NA		NA		NA	
Naphthalene	10	U	77		10	U	10	U	10	U	NA		1,100		14		NA		2,700		2,600	
Nitrobenzene	10	U	10	U	10	U	10	U	10	U	NA		20	UJ	10	U	NA		20	UJ	20	U
Pentachlorobenzene	NA		NA		10	U	10	U	NA		NA		NA		10	U	NA		NA		NA	
Pentachloroethane	50	U	50	U	50	U	50	U	50	U	NA		100	U	50	U	NA		100	U	100	U
Pentachloronitrobenzene	NA		NA		50	U	50	U	NA		NA		NA		50	U	NA		NA		NA	
Pentachlorophenol	50	U	50	U	50	U	50	U	50	U	NA		100	U	50	U	NA		100	U	100	U
Phenacetin	NA		NA		20	U	20	U	NA		NA		NA		20	U	NA		NA		NA	
Phenanthrene	10	U	10	U	10	U	10	U	10	U	NA		3	J	1.8	J	NA		77		86	
Phenol	10	U	10	U	10	U	10	U	10	U	NA		1,800		10	U	NA		1,700		1,700	
Pronamide	NA		NA		20	U	20	U	NA		NA		NA		20	U	NA		NA		NA	
Pyrene	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		4.5	J	5.6	J
Pyridine	20	U	20	U	20	U	20	U	20	U	NA		40	U	20	U	NA		76		91	
Safrole	NA		NA		20	U	20	U	NA		NA		NA		20	U	NA		NA		NA	
a,a-Dimethylphenethylamine	NA		NA		50	U	50	U	NA		NA		NA		50	U	NA		NA		NA	
bis(2-Chloroethoxy)methane	10	U	10	U	10	U	10	U	10	U	NA		20	UJ	10	U	NA		20	UJ	20	U
bis(2-Chloroethyl)ether	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
bis(2-Ethylhexyl)phthalate	10	U	10	U	10	U	10	U	10	U	NA		20	U	10	U	NA		20	U	20	U
n-Nitroso-di-n-butylamine	NA		NA		10	U	10	U	NA		NA		NA		10	U	NA		NA		NA	
n-Nitroso-di-n-propylamine	NA		NA		10	U	10	U	NA		NA		NA		10	U	NA		20	U	NA	

NA - Not analyzed
J - Value estimated
L - Value biased low
R - Unreliable result
Blank contamination considered not detected

U - Not detected
UJ - Not detected, DL estimated
UL -Not detected, DL low

Table 2.4-B
All Results
Greys Landfill Release Site Characterization
Bethlehem Steel Corporation - Sparrows Point Facility

Station ID	GL13-PZM032	GL13-PZP003	GL15-PZM022		GL15-PZP008	GL16-PZP003	GL17-PZM005	GL17-PZM032	GL17-PZP008	GL18-PZP002	
Sample ID	GL13-PZM032-01D	GL13-PZP003-01D	GL15-PZM022-01D	GL15-PZM022-01D DUP	GL15-PZP008-01D	GL16-PZP003-01D	GL17-PZM005-01D	GL17-PZM032-01D	GL17-PZP008-01D	GL18-PZP002-01D	GL18-PZP002-01D DUP
Sample Date	12/18/01	12/18/01	12/18/01	12/18/01	12/21/01	12/18/01	12/17/01	12/17/01	12/18/01	12/17/01	12/17/01
Chemical Name											
n-Nitroso-n-methylethylamine	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
n-Nitrosodiethylamine	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
n-Nitrosodimethylamine	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
n-Nitrosopyrrolidine	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	NA	NA
p-Dimethylaminoazobenzene	NA	NA	20 U	20 U	NA	NA	NA	20 U	NA	NA	NA
p-Phenylenediamine	NA	NA	200 U	200 U	NA	NA	NA	200 U	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)											
Aroclor-1016	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Aroclor-1221	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Aroclor-1232	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Aroclor-1242	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Aroclor-1248	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Aroclor-1254	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Aroclor-1260	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Total Metals (UG/L)											
Antimony	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	NA	4.1 U	4.1 U
Arsenic	2 U	6.4 J	2 U	2 U	4.5 J	19.7	20.5	2 U	NA	15	14.9
Barium	482	32 B	146 J	141 J	28.9 J	126 J	56.1 B	1,150 J	NA	71.9 B	75.6 B
Beryllium	5.2 B	4.6 B	3.8 B	3.8 B	0.4 U	5.7 B	4.7 B	3.8 B	NA	3.3 B	3.2 B
Cadmium	0.63 U	0.63 U	2.5 J	1.8 J	0.63 U	20.7	0.63 U	3.2 J	NA	0.63 U	0.63 U
Chromium	1.1 U	1.1 U	28.8	27.3	1.1 U	65.8	1.1 U	1.1 U	NA	1.1 U	1.1 U
Cobalt	0.86 U	1.9 B	0.86 U	0.86 U	25.1 J	16.6 J	0.86 U	0.86 U	NA	1.7 B	1.8 J
Copper	0.77 U	0.77 U	0.77 U	0.77 U	1.1 B	97.1	0.77 U	0.77 U	NA	0.77 U	0.77 U
Lead	5.6	1.8 U	3.6 U	3.6 U	1.8 U	676	1.8 U	3.6 U	NA	1.8 U	1.8 U
Mercury	0.054 UL	0.054 UL	0.071 J	0.054 U	0.054 U	1.8 L	0.054 UL	0.054 U	NA	0.06 L	0.054 UL
Nickel	2.4 U	7.4 B	16.3 J	15 J	5.2 J	110	36 J	2.4 U	NA	26 J	27.7 J
Selenium	3.2 U	8.1	3.2 U	5.8	3.2 U	5.8	3.2 U	6.4 U	NA	7.7	7.8
Silver	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	1.9 J	0.75 U	0.75 U	NA	0.75 U	0.75 U
Thallium	14.6	5.7 U	11.7	11.4	5.7 U	5.9 J	6 J	20.8	NA	5.7 U	7.8 J
Tin	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	28.8 U	36.8 B	NA	28.8 U	28.8 U
Vanadium	9.8 J	4.9 J	12.7 J	12.8 J	2.5 J	210	31 J	13.6 J	NA	163	176
Zinc	10.5 J	1.5 U	1.5 U	1.5 U	19.9 J	3,050	1.5 U	4.9 J	NA	1.5 U	1.5 U
Common Cations (UG/L)											
Calcium	35,700	63,700	31,400 J	30,400 J	216,000	NA	134,000	141,000 J	NA	NA	NA
Iron	153,000	1,580	238,000 J	230,000 J	9,350	NA	136	409,000 J	NA	NA	NA
Magnesium	70,000	7,190	41,700 J	40,300 J	30,300	NA	7.3 B	120,000 J	NA	NA	NA
Manganese	3,030	183	5,120 J	4,940 J	4,960	NA	0.51 J	9,750 J	NA	NA	NA
Potassium	6,960	54,600	3,690 J	3,240 J	35,000 J	NA	247,000	8,130	NA	NA	NA
Sodium	887,000	79,200	315,000	310,000	49,700	NA	566,000	605,000	NA	NA	NA
Wet Chemistry (MG/L)											
Amenable cyanide	0.035 J	0.77 J	0.016	0.027	0.59	NA	9.1	0.067	NA	30.2 J	30.9 J
Bicarbonate	41.2	146	39.1	33	92.4	NA	5 U	57.7	NA	NA	NA
Chloride	1,630	84.6	808	800	98.5	NA	704	1,950	NA	NA	NA
Sulfate	197	309	219	219	801	NA	790	89.9	NA	NA	NA
Sulfide	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	NA	1 U	1 U
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Blank contamination considered not detected

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