LTV Steel

HANNA FURNACE CORPORATION

South Buffalo Redevelopment Plan: Steel Manufacturing Site

Voluntary Cleanup Site Assessment Report
Volume 3: Appendix G

MALCOLM PIRNIE

September 1997

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SOUTH BUFFALO REDEVELOPMENT PLAN
STEEL MANUFACTURING SITE

VOLUNTARY CLEAN-UP SITE ASSESSMENT REPORT

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APPENDIX G

PHASE I/PHASE II REPORT OF FORMER REPUBLIC STEEL PLANT AREA "STEEL MANUFACTURING SITE"

MALCOLM PIRNIE

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

LTV STEEL COMPANY
AND
HANNA FURNACE CORPORATION

SEPTEMBER 1997

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0848-263/ESA

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PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

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1.0 INTRODUCTION

1.1 BACKGROUND AND SITE DESCRIPTION

LTV Steel Company (LTV) owns or co-owns with Hanna Furnace Corporation (HFC) vacant industrial property located in Buffalo, New York (Figures 1-1 and 1-2) that was formerly (starting in the early 1900s) used for steel making operations, coke production and storage, and maintenance and storage of various equipment related to site operations. The Steel Manufacturing Site is part of the area of South Buffalo commonly referred to as the Former Republic Steel Plant Area. All operations ceased in the early 1980s and related structures were demolished as part of decommissioning activities that were completed in the early 1990's. As shown on Figure 1-3, the Steel Manufacturing Site is approximately 218 acres in size and is bound on the north by the Buffalo River and South Park Avenue, on the west by railroad tracks, on the east by Abby Street, and on the south by Tifft Street and Hood Industries. A tract of land owned and operated by August-Feine, Inc. is the only active facility that remains on the site (see Figure 1-3 and Plate 1). Based on the operational history, the Steel Manufacturing Site can be segregated into four parcels:

- Area I - The former LTV Steel Plant.
- Area II - The former Donner-Hanna Coke Plant.
- Area III - The former LTV Warehouse Area.
- Area IV - The former Donner-Hanna Coke Yard.

These parcels are illustrated on Figure 1-3 and Plate 1 and described briefly below:

Area I - Former LTV Steel Plant Parcel - The former Republic Steel Plant was located on this northern-most parcel. This parcel is currenly owned by LTV Steel and is approximately 91 acres in area. In the late 1980s, the Steel Plant structures were demolished and the area regraded.

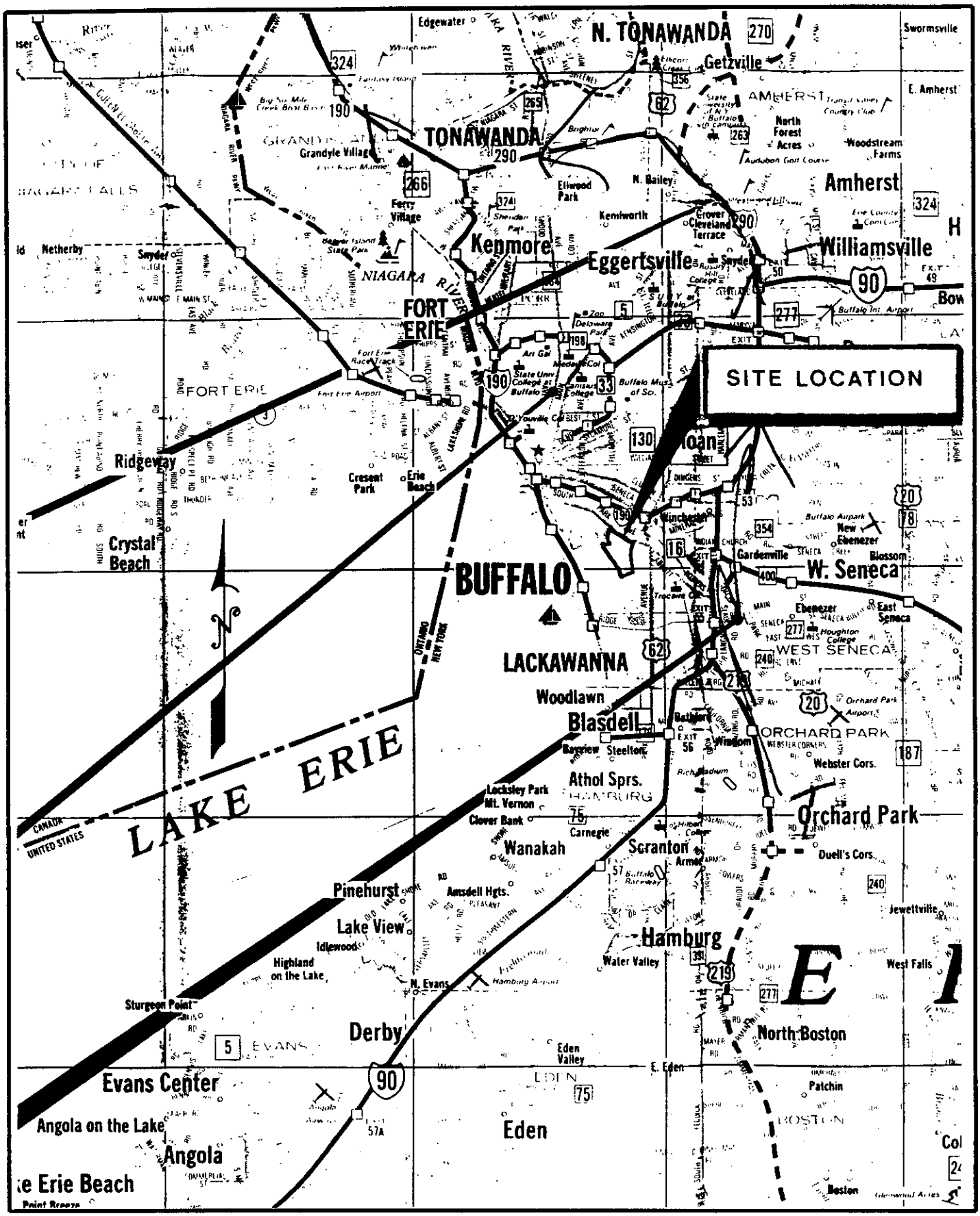

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FIG1.1

FORMER REPUBLIC STEEL PLANT AREA
SITE LOCATION MAP

LTV STEEL COMPANY
BUFFALO, NEW YORK

AUGUST 1997

FIGURE 1-2

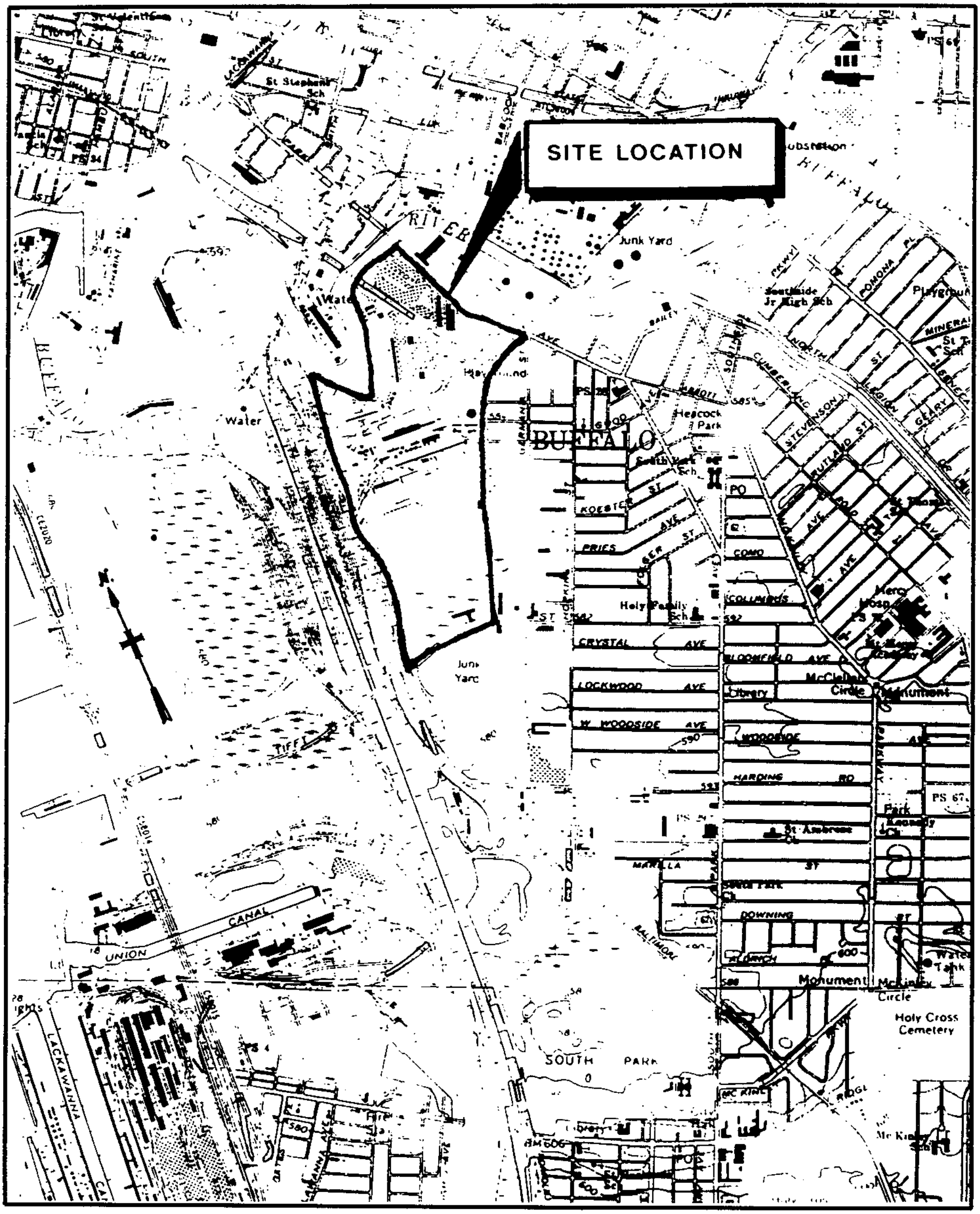

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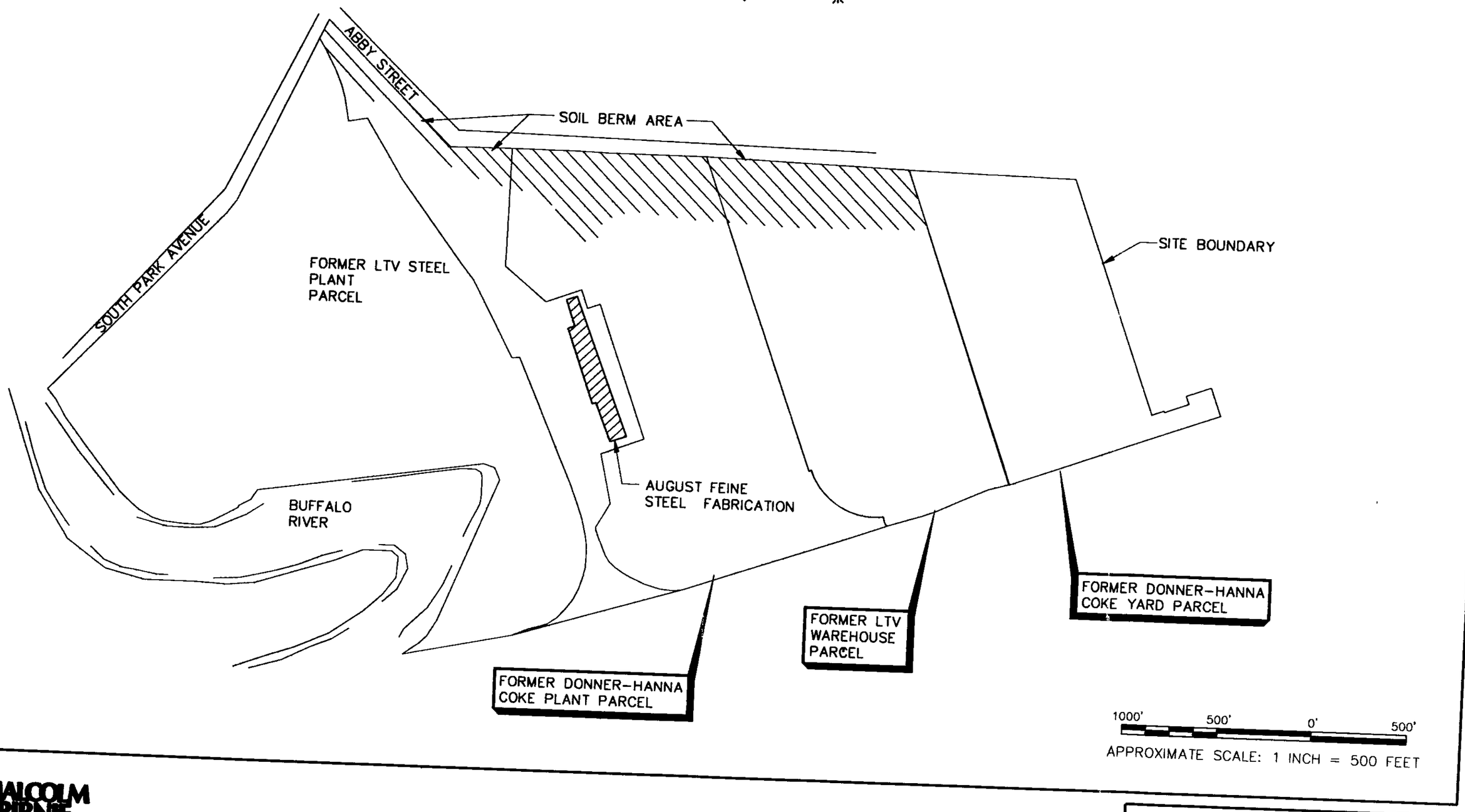
FIG1.2

FORMER REPUBLIC STEEL PLANT AREA
SITE VICINITY MAP

LTV STEEL COMPANY
BUFFALO, NEW YORK

AUGUST 1997

FIGURE 1-3



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LTV-A

FORMER REPUBLIC STEEL PLANT AREA
STEEL MANUFACTURING SITE
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
SITE MAP

LTV STEEL COMPANY
BUFFALO, NEW YORK

JUNE 1997

Area II - Former Donner-Hanna Coke Plant Parcel - The former Donner Hanna Coke Plant was located on this parcel. It is approximately 53 acres in area and is jointly owned by LTV Steel Company and Hanna Furnace Corporation. The plant was used to manufacture coke for steel making. By-products such as tar and manufactured gas were generated during the conversion of coal to coke and temporarily stored on-site prior to distribution. Many of the structures were demolished in the mid- to late-1970s and the parcel was then leveled and graded. A small parcel of land owned by August Feine, Inc. and two larger parcels owned by Conrail or Niagara Fronteir Transit Authority (NFTA) separate Area I from Area II. These parcels were not evlauated as part of this report.

Area III - Former LTV Warehouse Parcel - The former LTV Warehouse parcel (currently owned by LTV Steel) is approximately 43 acres in size. It is located to the south of the Donner-Hanna Coke Plant parcel. This parcel was used for storage of equipment and reportedly contained a coke tar pile south of the warehouse and a pelletized slag pile near the southern boundary of the site. The Warehouse parcel is currently being used as a staging/bioremediation area for petroleum contaminated soils excavated from the Truscon property.

Area IV - Former Donner-Hanna Coke Yard Parcel - The former Donner-Hanna Coke Yard parcel is approximately 31-acres in size, is the southern-most parcel on the site, and is jointly owned by LTV Steel Company and Hanna Furnace Corporation. The parcel was allegedly used for the disposal of tar from the Coke Plant and the storage of coke and coal. The entire parcel is currently identified on the New York State Department of Environmental Conservation (NYSDEC) Inactive Hazardous Waste Site List with a "3" classification (i.e., the property poses no significant threat to human health). The assigned classification was determined from the results of a 1989 Phase II investigation of the parcel conducted by Recra Environmental as an agent for the NYSDEC.

The surface of the entire Steel Manufacturing Site is relatively flat and consists of graded fill. There are small piles of soil and/or fill debris at various locations on the site

which were randomly dumped or bulldozed into piles. A large soil fill berm exists along a portion of the eastern site boundary between the Steel Manufacturing Site and Abby Street. Foundations associated with former buildings and storage tanks are sporadically visible at the ground surface. The entire Steel Manufacturing Site is surrounded by chain link fencing.

1.2 SOUTH BUFFALO REDEVELOPMENT PLAN

The City of Buffalo, in partnership with the City of Lackawanna, Erie County and the Erie County Industrial Development Agency has developed a conceptual plan for redevelopment of over 1,200 acres of "brownfields" (inactive industrial) properties in South Buffalo. Development of the Former Republic Steel Plant Area is one of the key elements of the "South Buffalo Redevelopment Plan". This Area is targeted for redevelopment as a light industrial/commercial park.

1.3 PURPOSE AND OBJECTIVES

LTV and HFC are considering transferring ownership of the four parcels described above. In anticipation of potential transfer of ownership, this Phase I Environmental Site Assessment (ESA) and Phase II Site Investigation were performed at the site to assess the environmental condition of the properties. The objectives of the Phase I ESA are to:

- Identify recognized environmental conditions associated with the four parcels which might affect future uses.
- Serve as the basis for focusing the Phase II Site Investigation.

The objectives of the Phase II Site Investigation are to:

- Characterize recognized environmental conditions to determine if hazardous substances and/or petroleum products are present in site soils or groundwater.
- Delineate the nature and extent of soil and/or groundwater contamination to the extent necessary to assess the need for and magnitude of voluntary clean-up efforts necessary to support the City of Buffalo's South Buffalo Redevelopment Plan.

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2.0 PHASE I ENVIRONMENTAL SITE ASSESSMENT (ESA)

A Phase I ESA was conducted to determine specific areas of the site with potential environmental conditions based on historical site information, information provided by former employees of the site, a regulatory records search and site conditions assessed during a site walkover. The ESA was performed in conformance with ASTM Standard E1527-94. Performance of an ESA in conformance with ASTM E1527 is intended to reduce, but not eliminate, uncertainty regarding the potential for unrecognized environmental conditions in connection with a property.

2.1 SITE HISTORY

The parcels are currently owned by LTV Steel Company based in Cleveland, Ohio or jointly owned (Donner Hanna parcels) by LTV Steel Company and Hanna Furnace Corporation. Although the chain of title was not available for review, a review of records and photographs at the Buffalo History Museum, Erie County Department of Environment and Planning, Erie County Finance Department, Erie County Department of Public Works, and the New York State Department of Environmental Conservation indicates that the site has been used for the manufacture of steel and coke, as well as storage of raw and finished materials throughout its history dating back to the early 1900's. Malcolm Pirnie, Inc. also interviewed long-time employees of the LTV Steel Corporation and its predecessors (Republic Steel and Donner-Hanna Coke). Mr. Edward Hartman was consulted to describe work activities at the Donner-Hanna Coke Plant and Mr. James Meredith was consulted to describe work activities and demolition work at the LTV (Republic) Steel Plant.

The property was partially developed in the early 1900s. By 1906, many of the bar mills and furnaces at the former LTV Steel Plant were operational and the former Donner-Hanna Coke Plant was present in 1917. The property currently owned by August Feine was developed prior to 1917. A description of the history of each of the four areas at the site is presented below. The basis for this discussion is developed from a review of 1927, 1951,

1960, and 1972 aerial photographs and Sanborn Maps from 1889, 1900, 1917, 1940, 1950, and 1986.

2.1.1 Area I - Former LTV Steel Plant Parcel

The former LTV Steel Plant Parcel began producing steel in 1906 and was operated by Donner Steel Company from 1906 to 1931. In 1931, operations were turned over to Republic Steel. A summary of observations gathered during review of the aerial photos and Sanborn Maps is presented below:

- **1889 (Sanborn)** - Only a small portion of the extreme northern end of the plant site is visible on the Sanborn map in the vicinity of South Park Avenue (formerly Plank Road and Abbott Road) as it crossed the Buffalo River. R. Evans & Son Glue Factory is present on the site.

- **1900 (Sanborn)** - R. Evans & Son Glue Factory buildings are present at the same location as 1889; however, the buildings are indicated as vacant and dilapidated.

- **1917 (Sanborn)** - Steel plant used the name Donner Steel Co. Inc. and performed iron smelting and steel making. The plant was generally located east of the Buffalo River as the river meanders around the current Buffalo Color Corporation. Large structures on the property included four bar mills, an open hearth building, a roll shop, blooming mill, two shipping buildings, a heating furnace building, a brick shed, two power houses, gas producers, and a machine shop. Property southwest of the intersection of Abbott Road (South Park Avenue) and Abby Street between Abbott and the D.L.& W. Railroad was primarily residential with a business called Perry's Iron Works (Dryer Road area). Railroad spurs and tracks surrounded and were interspersed within the plant.

- **1927 (Aerial Photo)** - The plant site operations grew in size from 1917 to 1927. The aerial photograph indicates that the plant grew to the size and operation depicted in the 1940 Sanborn Map. The Dryer Road residential area southwest of Abby Street and South Park is still visible.

- **1940 (Sanborn)** - Republic Steel Corporation is identified as the owner of the steel plant. The residential area on Dyer Road had been converted into a scrap iron and pig iron yard between 1927 and 1940. Newly installed structures included a die roll finishing shop, pickling and chipping building, pickling and heat treatment building, forge shop, a larger shipping building,

stripper and extractor yard, locomotive repair, cleaning pits, a larger blooming mill, and a thickener (clarifier). The heating furnace building was changed to the pit furnace building. Three large oil tanks are present on the site near the southeast end of the meander of large bend in the Buffalo River. The Sanborn Map indicates that tanks were built in a concrete pit possibly providing secondary containment.

- **1950 (Sanborn)** - No significant changes were observed at the plant between 1940 and 1950.

- **1951 (Aerial Photo)** - The plant did not change significantly between 1950 and 1951.

- **1960 (Aerial Photo)** - The plant did not change significantly between 1951 and 1960. A stock house and other small buildings are present in the triangular area formed by the railroad tracks in the southeast portion of the plant site.

- **1972 (Aerial Photo)** - A few changes of note were made to the plant. The scale pit was built between 1960 and 1972 in the northern portion of the plant to the east of the railroad bridge. A laboratory is present south of the large oil tanks. The northernmost large oil tank has been removed.

- **1986 (Sanborn)** - LTV Corporation is identified as the owner of the property. The Sanborn map indicates that operations have been suspended.

During a majority of the active site history, the steel plant operated two blast furnaces where molten iron was produced from a charge of pellets (upgraded iron ore), scrap iron, limestone (flux) and coke. The molten iron was subsequently converted to steel in two basic oxygen furnaces. The steel ingots produced were sent to the blooming mill where heated ingots ranging from 5 to 6 tons in weight were passed back and forth in large steel rolls squeezing the ingots into heavy square or rectangular sections known as blooms. The 25 to 30-foot long blooms were then sent to the billet mill where hot rolling lengthened the blooms. The blooms were then re-heated in the bar mills and shaped to customer's requirements.

The plant also operated two sulfuric acid pickling processes. Intermediate pickling was performed on the hot rolled bar products and finishing pickling was performed to achieve final surface quality.

2.1.1.1 Wastewater Sources and Characteristics

The primary source of wastewater produced at the plant was from the Venturi scrubber used to clean the blast furnace gases. Scrubber water discharge contained suspended solids from the blast furnace gases and may have contained significant levels of cyanides, phenol, and ammonia. Wastewater from the blooming mill was derived from direct cooling of the rolled product. The wastewater included suspended solids and oil and grease used for lubrication of the rolls. Similar wastewater was produced in the bar mill.

The pickling process used to chemically remove oxides and scale from the surface of the steel produced a spent sulfuric acid pickle liquor. Rinse water from both the intermediate and finishing pickling operations were discharged to the on-site wastewater treatment plant.

2.1.1.2 Wastewater Treatment and Disposal

Wastewater from the Venturi scrubber used for cleaning blast furnace gases was treated in a clarifier located in the northwestern portion of the site. Treated effluent was discharged into the Buffalo River. Wastewater from most of the other cooling processes was discharged into the Buffalo River following settling of suspended solids or skimming of oil. Spent sulfuric acid from the pickling operations was trucked to a 15,000 gallon storage tank on the plant property. The acid waste was used in neutralization and coagulation processes for the plant wastewater treatment system.

2.1.1.3 Other Potential Waste Sources

The plant had numerous aboveground and underground storage tanks containing lubrication oil, engine oil, valve oil, black oil, lithium grease, fuel oil, gasoline, quench oil, diesel fuel, and heating oil. A tank inventory is provided in Table 2-1. The inventory is derived from a 1974 schematic of the Republic Steel Corporation plant oil lines prepared for their Spill Prevention Control and Countermeasures (SPCC) Management Plan. In addition to the tanks, there were two maintenance shops, a scale pit, two clarifiers and several roll finishing buildings.

TABLE 2-1

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

FORMER REPUBLIC STEEL PLANT TANK INVENTORY

Tank Contents	Size of Tank
Water Glycol Tank	4000 gal
Oil Lube	2000 gal
Light Oil	3000 gal
Oil Lube	10000 gal
Oil	250,000 gal
Oil	12000 gal
Engine Oil	12000 gal
Black Oil	12000 gal
Valve Oil	2000 gal
Lithium Grease	680 gal
Lithium Grease	680 gal
Oil Lube	3500 gal
Diesel Fuel	800 gal
Gas Tank	1000 gal
Fuel Oil	6000 gal
Valve Oil	150 gal
Engine Oil	300 gal
RSC#60 Oil	300 gal
Bowser Recirc. Oil System	1100 gal
34663-34664-31106.422.1-Oil	10000 gal
Unknown	500,000 gal
Unknown	500,000 gal
Engine Oil	440 gal
Quench Oil	6000 gal
Fuel Oil	2000 gal
Diesel Fuel	15,000 gal
Diesel Fuel	15,000 gal
Heating Oil	275 gal
Heating Oil	275 gal

2.1.2 Area II - Former Donner-Hanna Coke Plant Parcel

From 1919 until 1982, the Donner-Hanna Coke Plant produced coke from coal and recovered by-products from the manufacturing process. The coke production capacity was approximately 3,000 tons per day. Typical gas production at the facility was approximately 11,500 standard cubic feet per ton of coal. The manufactured gas was refined and sold to Iroquois Gas. A summary of observations gathered during review of the aerial photos and Sanborn Maps is presented below:

- **1917 (Sanborn Map)** - The Donner-Hanna Coke Plant site included only August Feine Co. Structural Steel Works located on W. Baraga Street. Railroad tracks are present to the north of the Feine building and to the west of the site. A number of streets are present south of the Feine building including Mystic Street, Beacon Street, Bell Street, Rochester and Pittsburgh Avenue. There are a total of fourteen residential dwellings located on the above-mentioned streets.

- **1927 (Aerial Photo)** - The Donner-Hanna Coke Plant site was operating with numerous visible aboveground tanks, buildings, and coal and coke piles. There is no evidence of the streets and homes that were present in 1917. The Feine building is the same size as in 1917. Railroad spurs traverse into the plant and tracks are located to the north and west of the site. A large manufactured gas holder is present east of the Feine building and four purifier boxes are located to the southwest of the gas holder.

- **1940 (Sanborn Map)** - Buildings, tanks and other site features have not changed significantly from previous years. Tank contents identified on the Sanborn Map include acid, tar, naphthalene, toluol, benzol, and ammonia. Koppers Company Whole Tar Products is present in the northeast portion of the site, south of Baraga Street. Tar tanks are present on this portion of the property. Iroquois Gas Company is present to the north of Koppers.

- **1950 (Sanborn Map) and 1951 (Aerial Photo)** - The Coke Plant site did not change significantly since 1940. Two minor changes include the presence of an additional smaller gas holder to the west of the large gas holder, and four additional purifier boxes to the east of the previously mentioned purifier boxes.

- **1960 (Aerial Photo)** - There appears to be no significant change in the plant operations and site features.

- **1986 (Sanborn Map)** - The only change appears to be that operations are suspended. Also, the original four purifier boxes had been removed from the Iroquois portion of the site.

Donner Hanna Coke Corporation produced primarily coke from coal. Coke production is a carbon removal process involving heating the coal to temperatures of 350 to 1000 degrees Centigrade in the absence of air forming impure carbon residue called "coke" and some volatile products. The condensation of the volatile products from this destructive distillation produces black coal tar as light to heavy grade crudes.

The process also emits coal gas composed of a mixture of hydrogen, methane, carbon monoxide, ethane, ammonia, carbon dioxide, hydrogen sulfide, and other minor components. Recovered by-products from the coal to coke process included phenols as sodium phenolate, ammonia as ammonium sulfate, tars as heavy and light grade crudes, an unrectified light oil containing benzene, toluene and xylene, and naphthalene as a tar from the final cooler. The plant also had a large gas holding tank used to store processed coke oven gas prior to its reuse as fuel in the coke batteries and other plant areas. In addition, there were various piping and utility systems located both aboveground and below ground. Production, storage and handling were performed in the following areas:

- Gas Holder and Iron Oxide (Purifier) Box Area.
- Tar Storage Tank Area.
- Light Oil Area.
- Benzol Washer and Final Cooler Area.
- Locomotive Shed Area.
- Old Tar Tank Area.
- Tar Precipitator Area.
- Shop Area.
- Tar Decanter Area.
- Underground Piping near August Feine.
- Electrical Substation.

These areas were identified as areas of potential environmental impacts for the purpose of focusing Phase II investigation activities. Structures were decommissioned and demolished to ground level in 1990 and 1991. Aboveground features were decontaminated and demolished with the resulting waste products reportedly managed in accordance with

applicable local, State, and Federal regulations. Trenches and pits were cleaned, fractured, and backfilled. Some underground piping and utilities were also removed.

In a Phase II Investigation Report for the Donner-Hanna Coke Yard Site prepared by Recra Environmental as agents for the NYSDEC, it was reported that a 145-foot deep injection well was used during a four-year period prior to 1952 for the disposal of undocumented quantities of ammonia- and phenol-containing wastes. The location of this well was never identified. A well depth of 145 feet places the bottom of the well near the base of the Onondaga Limestone Formation. Since bedrock groundwater is not used as a source of potable water in the Buffalo area, potential historic disposal of these waste materials would have no impact on human health.

2.1.3 Area III - Former LTV Warehouse Area Parcel

The LTV warehouse parcel was reportedly used for storage and maintenance of equipment. The warehouse was present in a 1927 aerial photograph. A summary of observations gathered during review of the aerial photos and Sanborn Maps is presented below:

- **1917 (Sanborn Map)** - The warehouse site contained a Bridge Shop operated by Lackawanna Bridge Company. A paint shop was present in a small portion of the northern side of the building. Two electric cranes existed to the east of the Bridge Shop and two railroad spurs entered the site from the west.

- **1927 (Areal Photo)** - The warehouse building was visible in the photograph and was the only building on the site at this time. A covered shipping yard is present on the western side of the building.

- **1940 (Sanborn Map)** - The warehouse, called Factory Main Shop at this time, was operated by Bethlehem Steel Company. Relatively small portions of the northern side of the building were used as a bolt & rivet shop, paint shop, machine shop and forge shop. A woodworking shop is also present on a portion of the east side of the building. Additional railroad spurs are located to the west of the building. An office building on the eastern side of the site was present with access to Abby Street. It appears that tractor trailer trucks or railroad cars were stored on this portion of the site.

- **1950 (Sanborn Map)** - There appears to be no change on the site since 1940.
- **1951 (Aerial Photo)** - In addition to the warehouse building, a pile of fill is noted to the south of the warehouse. A covered shipping yard was added on the southwestern corner of the warehouse building.
- **1960 (Aerial Photo)** - Either a building or a covered shipping yard was present to the south of the warehouse. Railroad spurs appear to traverse underneath the cover into the shipping yard. Piles of fill were noted to the southeast of the warehouse.
- **1972 (Aerial Photo)** - The warehouse building is present as is the small building with access off Abby Street. The covered shipping yard is no longer on the site. Small debris piles are noted on the entire site with dirt access roadways around the piles.
- **1986 (Sanborn Map)** - LTV Corporation is identified as the owner of the property. Only the original warehouse structure and office are present on the site.

2.1.4 Area IV - Former Donner-Hanna Coke Yard Parcel

The former Donner-Hanna Coke Yard Parcel is the southern most parcel of the entire Steel Manufacturing Site. Hood Industries owns and operates property contiguous to the Donner-Hanna Coke Yard site on Tifft Street. The Donner-Hanna Coke Yard site was used for the storage of coke and coal and allegedly the disposal of acid sludges and tar from the steel plant and coke plant. A preliminary Phase I/Phase II Investigation was performed by Recra Environmental, Inc as agents of the NYSDEC in July 1990 on the former Donner-Hanna Coke Yard site. The report indicates that large quantities of coke overlay native soil (generally consisting of lacustrine sand, silt and clay). The investigation detected benzene, as well as other volatile organic compounds, and polynuclear aromatic hydrocarbons (PAHs) in soil, groundwater and surface water. Based on the preliminary findings of the Phase I/II Investigation, the Donner-Hanna Coke Yard site was listed on the New York State Department of Environmental Conservation (NYSDEC) Inactive Hazardous Waste Site list with a "3" classification (hazardous waste disposed of on the property with no significant threat to human health).

The site was extensively filled over time while primarily being used for coke storage. A summary of observations gathered during review of the aerial photos and Sanborn Maps is presented below:

- **1917 (Sanborn Map)** - Three streets are present to the north of Tifft Street. The streets are not evident on the 1927 aerial photo.
- **1927 (Aerial Photo)** - It appears that this area was a meadow or wetland .
- **1940 (Sanborn Map)** - No change apparent since 1917 Sanborn Map.
- **1950 (Sanborn Map)** - A small building identified as 'welding' appears near the intersection of Abby and Tifft on what is now Hood Industries.
- **1951 (Aerial Photo)** - The site had been partially filled in the northern portion. Vegetative growth was noted to the east and south of the site. A wet area of the site is still visible.
- **1960 (Aerial Photo)** - Piles of fill were noted on most of the site. The wet area noted in 1951 is smaller.
- **1972 (Aerial Photo)** - The entire site is characterized by scattered piles. The piles appear to be coal or coke. Hood Industries building is present on Tifft Street south of the Donner-Hanna Coke Yard site.

2.2 REGULATORY RECORDS SEARCH

A review of available environmental records for the subject property and nearby sites was conducted by Environmental Data Resources, Inc. (EDR) in conformance with the specific requirements of ASTM Standard Practice for Environmental Site Assessments. The sites researched under the regulatory review included:

- National Priority List (NPL) sites, RCRA Treatment, Storage and Disposal (TSD) sites, NY State Listed Hazardous Waste Sites, RCRA Corrective Action Sites, Records of Decision (RODs), Consent Orders, and Coal Gas databases for sites within a one mile radius.
- CERCLIS sites, NY State Landfills, and Leaking Underground Storage Tank (LUST) databases for sites within a half mile radius.

- Underground Storage Tanks (USTs), RCRA Small Quantity Generators (SQGs), and RCRA Large Quantity Generators (LQGs) for sites within a quarter mile radius, and Above-ground Storage Tanks (ASTs) within a one-eight mile radius.

- Delisted sites and miscellaneous environmental permits or spill data existing at the target property.

A summary of the findings is presented below. The complete database search is presented as Attachment A.

- A total of two Resource Conservation and Recovery Act TSD (treat, store, and dispose) sites were identified and located within one (1) mile of the property. Those include Advanced Electro Polishing Inc. and PVS Chemical Inc.

- A total of seven State Hazardous Waste sites are located within one (1) mile of the property. Of those, only one site (Donner-Hanna Coke Yard site) is on the target property. The other six include: Buffalo Color Corp. Area D; Marilla Street Landfill; Tifft and Hopkins; Lehigh Valley Railroad; Alltifft Landfill; and Ramco Steel. The six latter sites listed are not in the immediate vicinity of the property and are not anticipated to pose a threat to the parcels.

- A total of one handler with RCRA Corrective Action Activity (CORRACTS) is located with one (1) mile of the property. This CORRACTS site is PVS Chemical Inc. of New York.

- A total of two Leaking Underground Storage Tanks (LUSTs) are located within ½ mile of the property. These include Davis and Mavis, and Pallet Exchange, Inc., located between ¼ and ½ miles east of the Site. Given the significant distance and the likely direction of groundwater flow towards the Buffalo River, it is unlikely that these tanks could impact the subject property.

- A review of groundwater supply wells near the property indicated that no registered public or private wells are located within a 1- mile radius of the site.

2.3 SITE RECONNAISSANCE

The site reconnaissance was conducted in March 1997. The property consists of approximately 218 acres of relatively flat-lying graded fill from the demolition of former site structures. Vegetation was present during the site visit; however, as expected during spring weather, the vegetation was very sparse. Fences with locked gates surround the 218 acres of the site with the exception of a dirt road that traverses the site near the August Feine property. A large soil fill berm exists along a portion of the eastern site boundary between the site and Abby Street. All site structures were demolished when the plant operations were suspended in the 1980s. Therefore, no building interiors were inspected as part of the Phase I. During the site walkover, only three areas with potential environmental conditions were noted:

- Two fill ports on the edge of the Buffalo River at the major bend in Area I.
- A blue staining on the ground surface of an area approximately 100 square feet in Area III.
- Black coal/coke fill over much of Area IV.

As part of plant demolition operations, the ground surface was graded. This activity could have masked potential areas of environmental conditions which could have been otherwise visually identified. A list of areas of potential environmental condition was assembled and targeted for drilling and sampling during a Phase II Investigation.

2.4 AREAS OF POTENTIAL ENVIRONMENTAL CONDITIONS

Based on historical site information, information provided by former employees of the site, regulatory records search and site conditions assessed during a site walkover, the Phase I ESA identified the following specific areas of the site as having potential environmental conditions:

Area I

- Scale Pit Area.
- Fuel Oil Storage Area.
- Clarifier Area.
- Oil House and Pickling Area.
- Machine Shop/Electric Shop Area.
- Pickling Area.
- Gas Cleaning/Producer Area.
- Transformer Area.
- Locomotive Repair Shop Area.
- BOF Dust Precipitator Area.
- Fuel Oil Storage Area.
- Underground Piping Area.
- Area North of Skull Cracker Building.

Area II

- Gas Holder and Iron Oxide (Purifier) Box Area.
- Tar Storage Tank Area.
- Light Oil Area.
- Benzol Washer and Final Cooler Area.
- Locomotive Shed Area.
- Old Tar Tank Area.
- Tar Precipitator Area.
- Shop Area.
- Tar Decanter Area.
- Underground Piping near August Feine.
- Electrical Substation.

Area III

- Wood Shop Area.
- Maintenance Shop Area.
- Paint Shop Area.
- Sludge Disposal Area.
- Storage Area.
- Tar Disposal Area.

Area IV

- Entire area based on storage of coke and disposal of sludge and tar.

3.0 PHASE II ENVIRONMENTAL SITE ASSESSMENT

3.1 GENERAL

As concluded from the Phase I ESA, areas of potential environmental conditions have been identified for the Steel Manufacturing Site. A Phase II ESA was designed and conducted to characterize the geology and hydrogeology of the four parcels (Areas I-IV) which constitute the Steel Manufacturing Site and to assess whether historic industrial uses of the Site have contaminated on-site media (soil, groundwater, surface soil, and air). The following subsections describe: the methods used to characterize the Steel Manufacturing Site; the geologic and hydrogeologic conditions; and the results of an environmental sampling program.

3.2 INVESTIGATIVE METHODOLOGY

Field investigations for the Phase II Environmental Site Assessment were conducted during March and April 1997. The Steel Manufacturing Site is sub-divided into four separate areas based on existing physical boundaries and the site history described in Section 2.0. These areas include:

- Area I - Former LTV Steel Plant Parcel.
- Area II - Former Donner-Hanna Coke Plant Parcel.
- Area III - Former LTV Warehouse Area Parcel.
- Area IV - Former Donner-Hanna Coke Yard Parcel.

The Steel Manufacturing Site (hereafter referred to as the Site) characterization program included the collection and analysis of soil gas, surface soil, subsurface soil, groundwater and surface water samples. Area-specific sampling and analysis programs were developed for each of the four parcels to assess the potential for environmental impacts resulting from historic industrial uses of the properties. Since none of the former site structures currently exist (with the exception of the building owned by August Feine), area-specific sampling locations were selected using an overlay of a survey grid established for the site (400 foot

centers) on a historic aerial photograph dated 1972. The aerial photo was scanned and digitized to create a CADD base map with the topographic and survey grid data input as a CADD-based overlay. Using this survey grid/aerial photo map, accurate sampling locations associated with each specific area of interest identified as a result of the Phase I were selected. Sample locations were selected by matching survey grid coordinates to site-specific areas of interest. The aerial photo, survey grid, and sampling locations are shown on Plate 2. Field activities performed to characterize the site included:

- Geophysical reconnaissance survey.
- Passive soil gas investigation.
- Surface soil sampling.
- Installation of boreholes, monitoring wells, and piezometers with subsurface soil characterization;
- Development of all newly installed monitoring wells.
- Test pit excavation.
- Surface water sampling.
- Groundwater sampling.

A detailed discussion of these activities is presented in the following subsections.

3.2.1 Surface Soil Characterization

Surface soil sampling was performed at a total of 23 sample locations in Areas I, II and III of the site. Surface soils in Area IV were not sampled since the coke that exists at the ground surface across most of the area is planned for excavation as part of coke recovery operations at the site. The sample locations designated SS-1 through SS-23, are shown on Plate 2. Samples SS-1 through SS-9 and sample SS-23 were collected within Areas II and III. Samples SS-10 through SS-22 were collected in Area I. Samples were collected at locations of historical significance, at random locations across the site or at discolored

surface soil locations identified during the Phase I ESA to assess the potential for contamination in the surface soil at the site.

Surface samples were collected from 0 to 1-foot below ground surface using a 3-inch diameter split spoon sampler. At sample location SS-23 a stainless steel trowel was used to collect discolored surface soil (light blue color) present in the southern portion of Area III. The soils were analyzed for full TCL organic compounds and TAL metals, plus cyanide.

3.2.2 Subsurface Soil Characterization

3.2.2.1 Geophysics

Prior to implementing an intrusive program to characterize the subsurface conditions, an EM31 and EM61 geophysical survey was conducted in the vicinity of the Donner-Hanna Coke Plant parcel's former Benzol production and storage area. The purpose of the geophysical investigation was to establish the effectiveness of these methods to identify buried building foundations and the location of underground piping. The findings and results from the geophysical survey are presented in Attachment B-1. Because of the high conductivity of the fill materials and the lack of definitive anomaly locations relative to the known locations of buried building foundations and tank pads, geophysical testing was discontinued.

3.2.2.2 Passive Soil Gas

A shallow, passive soil gas investigation was conducted in Area II in the vicinity of the former coke by-products handling facilities. A total of thirty (30) GORE-SORBER soil gas units were installed on a grid to identify the presence of polynuclear aromatic hydrocarbon (PAHs) compounds and aromatic hydrocarbons (benzene, toluene, ethylbenzene and xylene{BTEX}) in fill material at the site. The installation of each unit required the manual advancement of small diameter (½ - inch) holes to an approximate depth of 2.5 feet below ground surface. The GORE-SORBER units were then installed to the base of each hole and left in place for a period of approximately 2 weeks. The units were subsequently collected and sent to the W.L. Gore & Associates analytical laboratory for

analyses. The location of the soil gas probes and the results of the soil gas investigation are presented in Attachment B-2.

3.2.2.3 Subsurface Borings

A subsurface investigation was conducted by Malcolm Pirnie during March and April 1997 to collect subsurface soil samples required to characterize the overburden materials at the site in Areas I, III, and IV. Area II subsurface characterization activities were performed by ICF Kaiser. A description of the investigation for Area II is presented in Attachment B-3.

The drilling program involved the advancement of a total of 95 borings and included the installation of four (4) monitoring wells in Area I, two (2) wells in Area III, and nine (9) wells in Area IV. The monitoring wells were installed to facilitate sampling of the shallow groundwater and assess the groundwater flow direction in the shallow water-bearing zone at the site. Well installations in Area IV supplemented an existing monitoring well network installed during a Phase II Investigation conducted by RECRA, Inc. as agents for the NYSDEC in 1989.

Borings in Area I were given an alpha-numeric designation A1- (A series through M series) corresponding to the area of interest identified on Plate 2. Generally, two to three soil borings were completed in each area of interest. Borings in Area III are designated A3-SB- (1 through 6) and correlate to specific activities identified for the warehouse building (i.e., maintenance shop, paint shop, wood shop, etc.) and in other portions of the warehouse area to characterize areas distant from the warehouse. Borings in Area IV were designated A4-SB- (1 through 44) and MW-1/1A, 2/2A, 3/3A, 4, 5, and 6. The locations of these boreholes and monitoring wells are shown on Plate 2.

Boreholes were advanced using 4-1/4 inch hollow stem augers to completion depths below the surficial fill unit and coincident with, or below the fill/native soil contact. At the monitoring well locations, wells were constructed using 2-inch diameter Schedule 40 screen and riser pipe material. The screens, which are five feet in length and have a .006-inch slot size, were generally installed to the base of the fill unit identified during borehole and auger advancement. A riser pipe was extended approximately two (2) feet above the well grade elevation and a primary sand pack consisting of a select #1 silica sand equivalent was then

placed to the top of the screened interval. Where possible, the thickness of the sand pack was extended above the top of the screened interval to intercept the shallow groundwater table. Bentonite chips were placed above the sand pack to a minimum thickness of one (1) foot to seal the well. All borings were then backfilled with drill cuttings. Because the monitoring wells are considered temporary, steel protective casings were not installed above the riser stickup. A locking mechanical plug was used to complete the wells.

Three wells were installed below the base of the coke /fill unit in Area IV. The wells, given the designations A4-MW-1 A4-MW-2 and A4-MW-3, were drilled to a maximum depth approximately six feet below the fill unit into native sediments. A shallow well was then completed in the fill unit (saturated coke) immediately adjacent to the deeper well completed in native material. The shallow wells were designated A4-MW-1A, MW-2A and MW-3A. Monitoring well construction details are presented in Table 3-2. Well construction diagrams are included in Attachment B-4.

The depths of boreholes completed in Areas I, III and IV at the site are summarized in Table 3-1. Boreholes completed in Area II are summarized in Attachment B-3. Stratigraphic information used to physically characterize the fill and native sediments was determined from continuous 3-inch diameter split-spoon samples collected during borehole advancement. Soil samples collected at each location were inspected and described on stratigraphic borehole logs by an on-site geologist. When feasible, an HNu photoionization detector (PID) with a 10.2 Ev lamp was used to scan split spoon soil samples immediately upon retrieval from each boring. Soil samples were placed in labeled glass jars for total organic vapor analysis and archiving purposes. Resultant PID readings were recorded on the field stratigraphic borehole logs presented in Attachment B-5. PID readings were not elevated above background in the ambient air in the vicinity of any of the boreholes during intrusive activities. Subsequent to a visual, olfactory and PID screening process, suspected contaminated soil samples were submitted to Columbia Analytical Services for Full TCL organic compounds and TAL metals or select metals. Specific analytical parameters are summarized in Section 3.4.

As part of a supplemental boring/sampling program completed in the western portion of Area IV, soil samples were collected and analyzed from 24 soil borings. A total of four

TABLE 3-1

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

BOREHOLE SUMMARY DATA

Borehole ID Number	Estimated Ground Elev. (ft.)	Total Borehole Depth (ft.)	Intervals Sampled for Laboratory Analysis
Area I (Former LTV Steel Plant Parcel)			
A1-SB-1	583.8	12.0	
A1-SB-2	583.8	14.0	
A1-SB-3	583.8	11.0	
A1-SB-4	583.8	14.0	
A1-SB-5	583.8	8.0	
A1-SB-6	583.8	8.0	
A1-SB-7	583.8	14.0	
A1-SB-A1	583.8	14.0	8.0 - 12.0
A1-SB-A2	589.7	16.0	8.0-10.0; 8.0-12.0
A1-SB-A3	584.2	12.0	8.0 - 12.0
A1-SB-B1	584.5	14.0	10.0 - 14.0
A1-SB-B2	583.3	14.0	10.0-14.0; 12.0-14.0
A1-SB-B3	583.2	12.0	10.0 - 14.0
A1-SB-C1	583.7	12.0	10.0 - 12.0
A1-SB-C2	584.0	18.0	12.0 - 14.0
A1-SB-C3	582.5	16.0	
A1-SB-D1	581.8	14.0	10.0 - 14.0
A1-SB-D2	582.6	14.0	10.0 - 14.0
A1-SB-D3	583.3	12.0	10.0-12.0; 10.0-14.0
A1-SB-E1	583.4	8.0	4.0 - 8.0
A1-SB-E2	583.3	10.0	4.0-6.0; 4.0-8.0
A1-SB-E3	582.0	8.0	4.0 - 8.0
A1-SB-F1	582.7	6.0	4.0 - 6.0
A1-SB-F2	583.6	14.0	4.0 - 6.0
A1-SB-GI	583.3	12.0	8.0-10.0; 11.0-11.5
A1-SB-G2	583.8	8.2	
A1-SB-H1	584.0	14.0	8.0 - 10.0
A1-SB-H2	582.7	10.0	8.0 - 10.0
A1-SB-I1	582.1	14.0	10.0 - 13.0
A1-SB-I2	583.3	12.0	8.0-10.0; 10.0-13.0
A1-SB-J1	582.7	14.0	
A1-SB-J2	583.3	12.0	8.0-10.0; 10.0-12.0
A1-SB-K1	581.8	8.0	6.0 - 8.5
A1-SB-K2	588.9	12.0	6.5-7.0; 6.0-8.5
A1-SB-K3	583.9	10.0	6.0 - 8.5
A1-SB-M2	585.8	14.0	6.0 - 6.5
Area III (Former Warehouse Site Parcel)			
A3-SB-1	584.9	12.0	1.0 - 1.5
A3-SB-2	586.9	28.0	10.0 - 10.5
A3-SB-3	583.9	8.0	1.0 - 1.5
A3-SB-4	583.7	8.0	4.0 - 5.0
A3-SB-5	583.7	10.0	4.0 - 5.0
A3-SB-6	583.9	10.0	2.5 - 3.0
A3-GW-4	584.8	10.0	2.5 - 3.0
Area IV (Former Donner-Hanna Coke Yard Parcel)			
A4-SB-1	583.8	8.0	6.0 - 8.0
A4-SB-2	584.2	6.0	
A4-SB-3	584.5	8.0	
A4-SB-4	583.2	8.0	
A4-SB-5	583.7	8.0	
A4-SB-6	584.0	8.0	6.5 - 7.0
A4-SB-7	582.5	6.0	
A4-SB-8	581.8	6.0	4.0 - 4.7
A4-SB-9	582.6	6.0	
A4-SB-10	583.4	8.0	2.5 - 3.5
A4-SB-11	582.4	6.0	
A4-SB-12	582.0	6.0	
A4-SB-13	582.7	8.0	
A4-SB-14	583.6	8.0	

TABLE 3-1

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

BOREHOLE SUMMARY DATA

Borehole ID Number	Estimated Ground Elev. (ft.)	Total Borehole Depth (ft.)	Intervals Sampled for Laboratory Analysis
A4-SB-15	583.5	8.0	
A4-SB-16	583.8	8.0	
A4-SB-17	584.0	8.0	
A4-SB-18	582.7	8.0	
A4-SB-20	582.3	8.0	
A4-SB-21	582.9	8.0	5.7 - 6.0
A4-SB-22	583.8	8.0	
A4-SB-23	583.3	8.0	2.5-3.5; 6.0-6.5
A4-SB-24	582.7	6.0	
A4-SB-25	581.2	6.0	
A4-SB-26	581.8	8.0	
A4-SB-27	583.9	8.0	2.0 - 2.5
A4-SB-28	583.5	8.0	
A4-SB-29	582.9	8.0	6.5 - 7.0
A4-SB-30	582.8	8.0	6.0 - 6.5
A4-SB-31	581.7	6.0	
A4-SB-32	582.3	6.0	
A4-SB-33	582.7	6.0	
A4-SB-34	583.7	8.0	
A4-SB-35	582.8	6.0	
A4-SB-36	582.0	6.0	4.2 - 4.7
A4-SB-37	581.8	6.0	
A4-SB-38	582.7	8.0	
A4-SB-39	585.2	10.0	2.5 - 3.0
A4-SB-40	583.6	8.0	
A4-SB-41	584.5	8.0	6.5 - 7.0
A4-SB-42	582.3	6.0	
A4-SB-43	582.6	6.0	
A4-SB-44	583.3	6.0	
A4-MW-1	583.6	14.0	
A4-MW-1A	583.6	7.0	
A4-MW-2	581.8	14.0	5.5 - 6.0
A4-MW-2A	582.1	7.0	
A4-MW-3	581.3	14.0	
A4-MW-3A	582.3	7.3	
A4-MW-4	583.4	14.0	2.5 - 3.0
A4-MW-5	583.6	12.0	4.5 - 5.0
A4-MW-6	583.8	12.3	

Note:
See Appendix B-2 for Borehole Summary Data in Area II
All boreholes are 8.5 inches in diameter.

TABLE 3-2

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

MONITORING WELL CONSTRUCTION DATA

Well ID Number	Estimated Ground Elev. (ft.)	Total Borehole Depth (ft.)	PVC Riser Elev. (ft.)	Top of Sandpack (ft.)	Screened Interval (ft.)	Base of Sandpack (ft.)	Native Soil (ft bg)
Area I (Former LTV Steel Plant Parcel)							
A1-SB-A2	589.7	16.0	591.7	10.0	12.0 - 17.0	17.2	
A1-SB-F2	586.2	14.0	588.2	5.0	8.0 - 13.0	14.0	
A1-SB-K2	588.9	12.0	591.0	4.0	6.0 - 11.0	11.0	
A1-SB-M2	585.8	14.0	587.8	5.5	7.8 - 12.8	12.8	
Area II (Former Donner-Hanna Coke Plant Parcel)							
A2-P-I	587.2	10.0	590.0	4.0	5.0 - 10.0	10.0	
A2-P-II	588.8	10.0	590.9	4.0	5.0 - 10.0	10.0	
Area III (Former Warehouse Parcel)							
A3-SB-3	583.9	8.0	585.4	2.0	2.0 - 7.0	7.0	
A3-SB-6	583.9	10.0	585.7	3.0	3.0 - 8.0	8.0	
A3-GW-4	584.8	10.0	588.5	3.0	3.0 - 8.0	8.0	
Area IV (Former Donner-Hanna Coke Yard Parcel)							
A4-MW-1	583.6	14.0	585.8	8.0	8.0 - 13.0	14.0	6
A4-MW-1A	583.6	7.0	585.8	2.0	2.0 - 7.0	7.0	6
A4-MW-2	581.8	14.0	584.1	8.0	8.0 - 13.0	14.0	5.4
A4-MW-2A	582.1	7.0	584.2	2.0	2.0 - 7.0	7.0	5.4
A4-MW-3	581.3	14.0	583.9	7.5	7.7 - 12.7	12.7	5
A4-MW-3A	582.3	7.3	584.1	2.0	2.3 - 7.3	7.3	5
A4-MW-4	583.4	14.0	585.1	5.5	7.0 - 12.0	12.2	clay 04 (Pebl 02.9)
A4-MW-5	583.6	12.0	585.9	5.0	7.0 - 12.0	12.0	4.3
A4-MW-6	583.8	12.3	585.7	4.0	6.0 - 11.0	11.3	3

Note:
All monitoring wells constructed of PVC with diameters 2-inches.

soil borings were sampled in six subareas defined in the area of tar material and designated A through F. Boring locations and subareas are shown on Figure 3-2. The purpose of the supplemental boring program was to characterize the potential source of benzene in the area identified during the Phase II ESA. Samples were analyzed for TCLP VOCs, SVOCs, select metals and total cyanide to determine if characteristic hazardous waste for toxicity exist in the area. The results of the boring/sampling program in Area IV is described in Section 3.4.4.

3.2.2.4 Well Development

All newly installed monitoring wells were developed by bailing with a dedicated disposable plastic bailer. The existing well A3- GW-4 which was later to be included in the groundwater sampling event, was also redeveloped by bailing. Purged groundwater was monitored for pH, turbidity, and specific conductivity. Where possible, development was continued until turbidity values were less than 50 NTU, or until pH, and conductivity values had stabilized after purging approximately ten well volumes. The monitoring wells designated A4-MW-1, A4-MW-2, A4-MW-3A, A4-MW-6, A3-SB-3, A3-SB-6, A1-MW-F2, and A1-MW-M2 were slow to recharge and were bailed to "dryness" during well development. Well development field logs are presented in Attachment B-6.

3.2.2.5 Test Pit Excavation

A total of eleven test pits were excavated to depths of approximately 5 -10 feet below grade into the soil berm located along Abby Street and into areas of known underground oil pipelines in Area I (see Plate 2). Test pits designated TP-4 through 8 were excavated into the soil berm to characterize materials present in the berm. An additional surface soil sample (LTV-1) was collected on the east side of the soil berm in Area I during the test pit program to characterize a white-colored discharge from the soil berm. Samples were collected at each location and analyzed for Full TCL organic compounds and TAL metals. Samples from TP-5 and TP-6, which were located adjacent to each other and of similar materials, were composited. Test pits TP-1 through 3 and TP-9 through 11 were excavated in an area of known underground oil pipelines in Area I. Visual observations of

oil contamination, where apparent, were noted. A sample was collected from the Test pit excavated at TP-10 and analyzed for BTEX and PAHs. Overburden materials were described by an on-site geologist and recorded on test pit logs included in Attachment B-7.

3.2.3 Surface Water Characterization

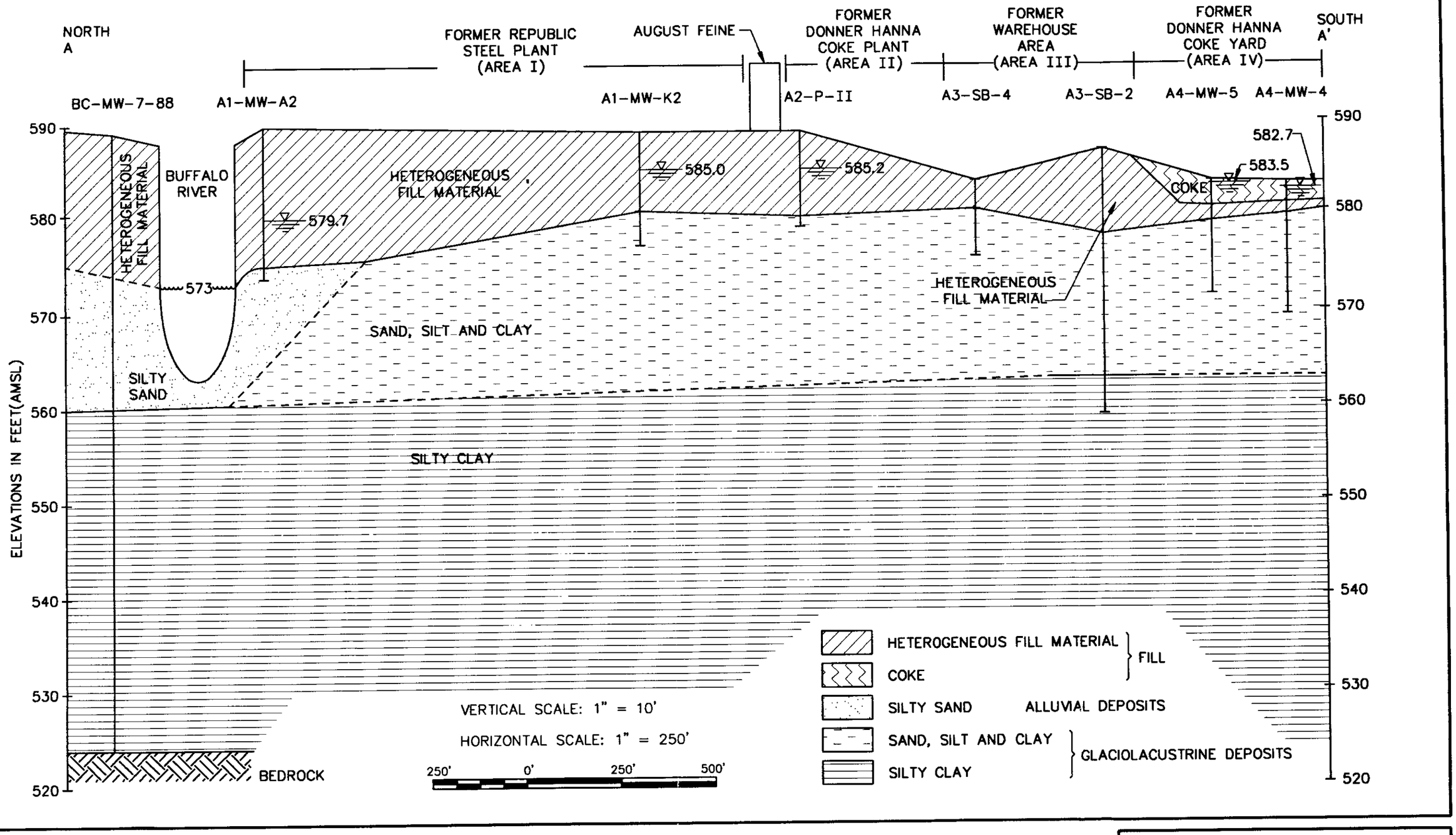
Three surface water samples were collected from the standing surface waters existing on the undulating surface of the coke in Area IV. Sampling locations are shown on Plate 2. The samples designated SW-1 and SW-3 were collected from discolored ponded areas found in the northwestern and northeastern quadrants of the site, respectively. The sample, SW-2 was collected near the southern downstream terminus of the north - south trending drainage swale that bisects the former coke storage area. Samples were analyzed for Full TCL organic compounds and TAL metals.

3.2.4 Groundwater Characterization

Groundwater samples were collected from fifteen new monitoring wells (MW) two piezometers (P) and one existing monitoring well (GW) during a sampling event conducted in April 1997. Monitoring well sampling locations are shown on Plate 2. Groundwater samples were analyzed for Full TCL organic compounds and TAL metals. Data for field measured parameters are summarized in Table 3-3.

3.3 SITE GEOLOGY/HYDROGEOLOGY

Heterogeneous fill material overlies native soils across the entire site. As shown in the cross-section on Figure 3-1, the fill thickness ranges from 6 to 10 feet. At the Former Donner Hanna Coke Yard (Area IV) portion of the site up to 6 feet of coke overlies fill (see Figure 3-2). The fill material is generally coarse-grained and is comprised of mixtures of slag, ash, coal, and construction and demolition debris in a matrix of sand and gravel. The berms on the eastern side of the site are composed of fill material and are approximately 10 feet in height. Tar material is intermixed with the coke fill in the northwestern portion of Area IV and extends into fill material located in the extreme southwest corner of Area III.



7516 : 17770368001\: \ACAD\PROJ\08482631\FIG4-2 SCALE: 1:11 06/24, 1997 at 09:53

MALCOLM PIRNIE

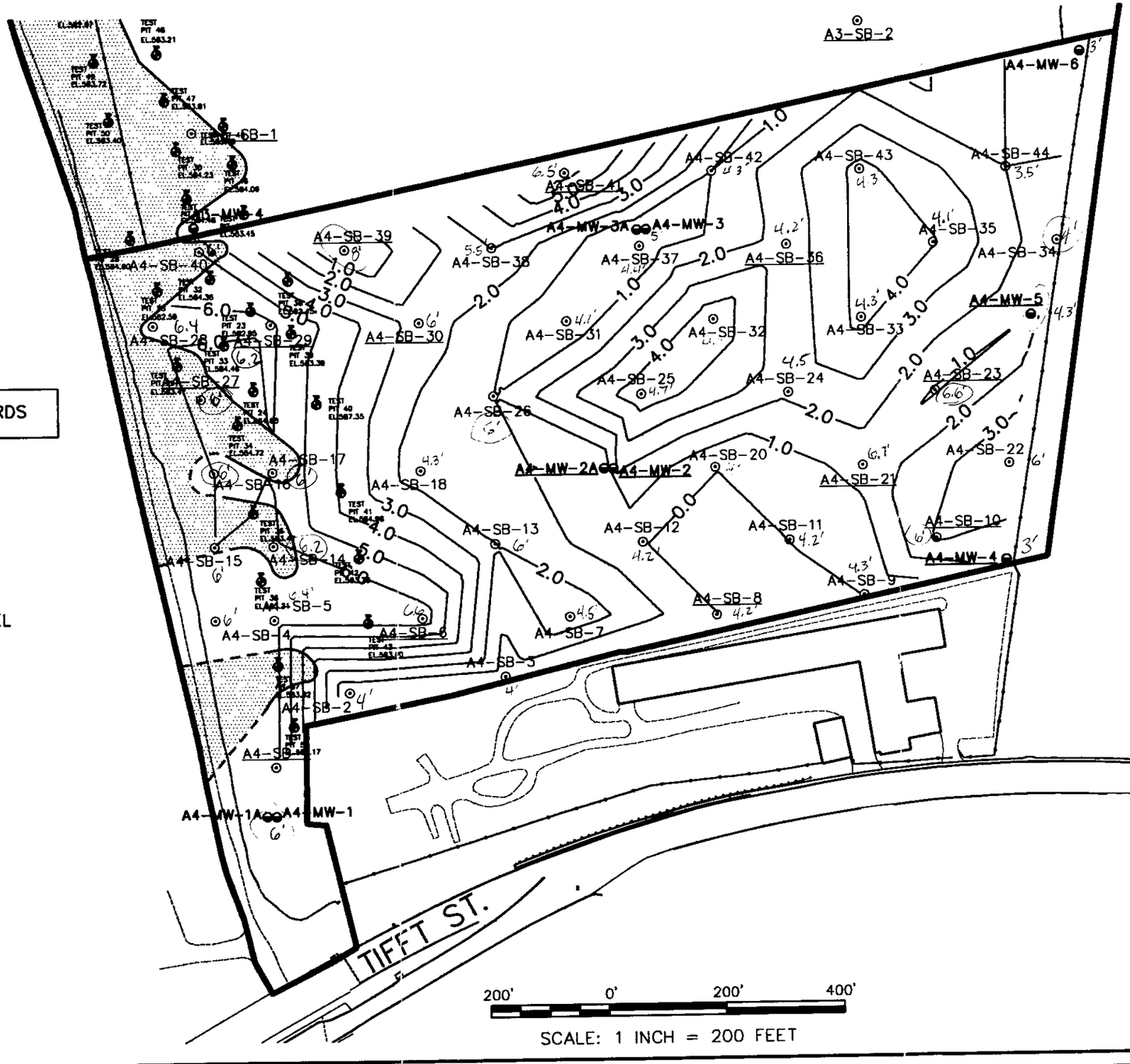
FIG4-2

FORMER REPUBLIC STEEL PLANT AREA
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT

GEOLOGIC CROSS SECTION ALONG LINE A-A'

LTV STEEL COMPANY
BUFFALO, NEW YORK

JUNE 1997



N.

ESTIMATED COKE VOLUME = 88,400 CUBIC YARDS

LEGEND

AREA IV DONNER HANNA COKE YARD PARCEL

A2-SB-35 SOIL BORING

A3-MW-3 MONITORING WELL

DISTRIBUTION OF TAR IN COKE YARD AREA

MALCOLM PIRNIE

0848F002

FORMER REPUBLIC STEEL PLANT AREA
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT

COKE THICKNESS MAP

LTV STEEL COMPANY
BUFFALO, NEW YORK

JUNE 1997

TABLE 3-3

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF FIELD MEASUREMENTS FROM WELL DEVELOPMENT AND SAMPLING [1]

LOCATION	A4-MW-1		A4-MW-1A		A4-MW-2		A4-MW-2A		A4-MW-3		A4-MW-3A	
	development	sampling	development	sampling	development	sampling	development	sampling	development	sampling	development	sampling
DATE	4/1/97	4/3/97	4/1/97	4/3/97	4/1/97	4/3/97	4/1/97	4/3/97	4/1/97	4/3/97	4/1/97	4/3/97
VOL. PURGED (gal)/ WELL VOLUMES	7.5/4	-	10.0/11	-	5.0/2	-	18.0/16	-	10.0/5	-	10.0/8	-
TEMP (°C)	-	8.0	-	6.0	-	6.0	-	7.0	-	6.0	-	7.0
pH (units)	6.2	7.27	6.7	7.06	6.5	6.49	7.4	6.14	3.7	4.64	9.2	6.8
CONDUCTANCE (umhos/cm)[3]	3220	2020	2390	1860	2550	2870	600	1670	34,300	4690	2690	1170
TURBIDITY (NTU)	>100	> 100	>100	81	>100	> 100	> 100	> 100	< 50	> 100	> 100	64
APPEARANCE	Muddy	Turbid	Black, Cloudy	Turbid	Brown, Muddy	Turbid	Dark Grey	Turbid	Clear Yellow	Turbid	Grey Green	Clear

Notes:

(1) Parameters taken from last bailer during well development. During sampling, parameters were taken from the initial bailer.

(2) Parameters not measured to avoid meter damage.

(3) Conductance corrected to 25°C.

- Not Applicable

TABLE 3-3

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF FIELD MEASUREMENTS FROM WELL DEVELOPMENT AND SAMPLING[1]

LOCATION	A4-MW-4		A4-MW-5		A4-MW-6		GW-4		A3-SB-3		A3-SB-6	
	development	sampling	development	sampling	development	sampling	development	sampling	development	sampling	development	sampling
DATE	4/1/97	4/3/97	4/1/97	4/3/97	4/1/97	4/3/97	4/1/97	4/3/97	4/1/97	4/3/97	4/1/97	4/3/97
VOL. PURGED (gal)/ WELL VOLUMES	20.0/10	-	15.0/8	-	10.0/6	-	20.0/12	-	5.0/4	-	15.0/10	-
TEMP (°C)	-	8.0	-	6.0	-	8.0	-	6.0	-	7.0	-	9.0
pH (units)	6.5	6.90	6.6	7.01	6.5	7.23	5.6	7.44	9.1	11.29	10.0	9.39
CONDUCTANCE (umhos/cm)[3]	1720	1340	2070	1670	2360	2150	5020	1750	1910	1300	1360	1310
TURBIDITY (NTU)	> 100	> 100	> 100	> 100	> 100	85	> 100	95	> 100	61	< 100	94
APPEARANCE	Yellow Silty	Turbid	Grey Muddy	Cloudy	Yellow Brown	Cloudy	Rusty Clearing	Cloudy	Black Silty	Clear	Clearing Grey	Turbid

Notes:

(1) Parameters taken from last bailer during well development. During sampling, parameters were taken from the initial bailer.

(2) Parameters not measured to avoid meter damage.

(3) Conductance corrected to 25°C.

- Not Applicable

TABLE 3-3

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF FIELD MEASUREMENTS FROM WELL DEVELOPMENT AND SAMPLING[1]

LOCATION	A2-P-1		A2-P-11		A1-SB-K2		A1-SB-M2		A1-SB-F2		A1-SB-A2	
	development	sampling	development	sampling	development	sampling	development	sampling	development	sampling	development	sampling
DATE	3/17/97	4/4/97	4/1/97	4/4/97	4/1/97	4/4/97	4/1/97	4/4/97	4/1/97	4/4/97	4/1/97	4/4/97
VOL. PURGED (gal)/ WELL VOLUMES	12.0/12	-	15.0/3	-	20.0/17	-	6.0/5	-	5.0/5	-	20.0/3	-
TEMP (°C)	-	10.0	(2)	11.0	(2)	10.0	-	11.0	-	9.0	-	10.0
pH (units)	9.28	9.10	(2)	7.81	(2)	7.56	6.3	8.74	8.3	8.62	10.8	11.01
CONDUCTANCE (umhos/cm)[3]	2930	2050	(2)	1130	(2)	780	640	730	1085	1040	902	820
TURBIDITY (NTU)	> 100	12	> 100	5	> 100	55	> 100	42	> 100	> 100	> 100	30
APPEARANCE	Black, Clearing	Clear	Black	Clear	Oily Black	Turbid	Turbid Brown	Clear	Grey Brown	Muddy Brown	Dark Cloudy	Clear

Notes:

(1) Parameters taken from last bailer during well development. During sampling, parameters were taken from the initial bailer.

(2) Parameters not measured to avoid meter damage.

(3) Conductance corrected to 25°C.

- Not Applicable

The fill material is underlain by native glaciolacustrine sand, silt, and clay. These black to gray unconsolidated sediments are dense and organic-rich, and minor amounts of peat were encountered in soil borings completed in the coke yard area. Alluvium consisting of black to gray silty sand with traces of clay underlies the fill proximal to the Buffalo River. Information presented in the Remedial Investigation of the Buffalo Color site (1990), located directly across the river from the site, identified glaciolacustrine silty clay and clayey silt deposits underlying the alluvium and the sand, silt, and clay deposits.

Groundwater occurs in the overburden fill material at relatively shallow depths in the southern portion of the site (1 to 2 feet below grade) and at depths greater than 10 feet in the northern portion of the site. Due to low permeability, the clay-rich glaciolacustrine deposits underlying the more permeable fill act as a barrier to the vertical migration of groundwater, causing shallow water table conditions and groundwater flow in the fill that is primarily horizontal. The differences in permeability between the two types of material are evidenced in Table 3-4, which shows the results of particle size distribution tests for both fill material and native soil. These tests indicate that the fill material is composed of a much greater fraction of larger particles than the native glaciolacustrine deposits. Additionally, due to the techniques used to collect the soil samples, it was not possible to collect any particles present in the fill with diameters greater than 3 inches. These tests, therefore, do not quantify the size of construction and demolition debris such as cobble-sized bricks that are present in the fill.

Plate 3 shows groundwater elevations and inferred flow directions based on depth-to-groundwater measurements collected April 3, 1997. As shown on Plate 3, the groundwater in the shallow water-bearing zone migrates toward the Buffalo River in the northern portion of the site, and towards the south in the southern portion of the site. The groundwater in the southern portion of the site migrates to the south due to a smaller gradient caused by the gradual thinning of the shallow water-bearing zone occurring in the more permeable fill. As the fill thins to the south, the land surface elevation also decreases, causing a gradient sufficient to produce groundwater flow towards the lower topographic elevations to the south.

TABLE 3-4

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF PARTICLE SIZE DISTRIBUTION TESTS

PARTICLE SIZE DISTRIBUTION IN PERCENT				
AREA	**SOIL TYPE**	**GRAVEL**	**SAND**	**SILT and CLAY**
I	Native	0.3	21.9	77.8
I	Fill	30.4	64.3	5.3
II	Native	2.0	31.5	66.5
II	Fill	20.1	57.9	22.0
III	Fill	33.7	59.5	6.8
IV	Native	3.3	13.4	83.3

3.4 ENVIRONMENTAL SAMPLING RESULTS

The environmental sampling program at the site included the collection and analysis of soil gas, surface soil, subsurface soil, groundwater and surface water samples. Area-specific sampling and analysis programs were developed for each of the four areas identified in the Phase I ESA to assess potential environmental impacts associated with historic uses of the site. As described in Section 3.1, area-specific sampling locations were identified in the field using the historic aerial photograph, the site base map and the survey grid as shown on Plate 2.

A total of 65 subsurface soil samples, 23 surface soil samples, 3 surface water samples, and 17 groundwater samples were analyzed at Columbia Analytical Laboratory using CLP protocols. The analytical program is summarized in Table 3-5. Due to their voluminous nature, the Laboratory Form I data sheets are not included in this report. Analytical data for samples collected from Areas I, III, and IV are summarized in Tables 3-6 through 3-17. Area II results are presented in the report prepared by ICF Kaiser (see Attachment B-2). Data tables are located in the text following a discussion of the results for each specific area. Additionally, Plates 4 through 7 spatially present a summary of the analytical results on the site base map for each media analyzed.

The planned end use for this site is the development of a mixed light industrial/corporate park (warehousing and distribution focus). Large areas of the property will likely be covered by site structures, parking lots and roadways. Included in the summary of tabulated analytical data, is a comparison to USEPA Region III Risk-Based Concentrations for industrial sites or where EPA risk-based concentrations have not been established for certain inorganic parameters, background inorganic parameter concentrations detected in the Truscon property soils located immediately north of Area I are identified for comparison. These comparisons served as a screening tool to identify areas/subareas of the site which pose a potential environment concern. A discussion of the environmental sampling results for each area of the site is presented in the following subsections.

TABLE 3-5

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF ENVIRONMENTAL SAMPLING AND ANALYSIS PROGRAM[1]

I - Former LTV Steel Plant Parcel			Parameters						
Media	Sample ID [3]	Sampled Intervals (ft)	TCL VOCs	TCL SVOCs	TAL Metals	Cyanide	PCBs	Indicators[2]	TCLP VOCs and SVOCs
Surface Soil	SS-10, SS-11, SS-12, SS-13, SS-17, SS-18, SS-20, SS-21	0-1	x						
	SS-10/11	0-1		x	x	x	x		
	SS-12/13	0-1		x	x	x	x		
	SS-14	0-1	x	x	x	x	x		
	SS-15	0-1	x	x	x	x	x		
	SS-16	0-1	x	x	x	x	x		
	SS-17/18/19	0-1		x	x	x	x		
	SS-20/21	0-1		x	x	x	x		
	SS-22	0-1	x	x	x	x	x		
Subsurface Soil	A1-SB-A1/A2/A3	8.0-12.0		x	x	x			
	A1-SB-A2	8.0-10.0	x						
	A1-SB-B1/B2/B3	10.0-14.0		x	x	x			
	A1-SB-B2	12.0-14.0	x						
	A1-SB-C1	10.0-12.0		x	x	x			
	A1-SB-C2	12.0-14.0	x						
	A1-SB-D1/D2/D3	10.0-14.0		x	x	x			
	A1-SB-D3	10.0-12.0	x						
	A1-SB-E1/E2/E3	4.0-8.0		x	x	x			
	A1-SB-E2	4.0-6.0	x						
	A1-SB-F1	4.0-6.0	x						
	A1-SB-F1/F2	4.0-6.0		x	x	x			
	A1-SB-G1	11.0-11.5	x						
	A1-SB-G1	8.0-10.0		x	x	x			
	A1-SB-H1	8.0-10.0	x						
	A1-SB-H1/H2	8.0-10.0		x	x	x			
	A1-SB-I1/I2	10.0-13.0		x	x	x			
	A1-SB-I2	8.0-10.0	x						
	A1-SB-J2	8.0-10.0	x						
	A1-SB-J2	10.0-12.0		x	x	x			
	A1-SB-K1/K2/K3	6.0-8.5		x	x	x			
	A1-SB-K2	6.5-7.0	x						
	A1-SB-M1/M2	6.0-6.5		x	x	x			
	A1-SB-M2	6.0-6.5	x						
Groundwater	A1-SB-A2 (MW-A2)		x	x	x	x			
	A1-SB-F2 (MW-F2)		x	x	x	x			
	A1-SB-K2 (MW-K2)		x	x	x	x			
	A1-SB-M2 (MW-M2)		x	x	x	x			

Notes:
(1) See ICF Kaiser Report in Appendix B-2 for Donner-Hanna Coke Plant Parcel sampling summary.
(2) Indicators include: Benzene, toluene, ethylbenzene, and xylene; and Polynuclear Aromatic Hydrocarbons (PAHs).
(3) Commas (,) separate discrete samples and backslashes (/) denote composited samples.

TABLE 3-5

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF ENVIRONMENTAL SAMPLING AND ANALYSIS PROGRAM[1]

Area III - Former Warehouse Parcel			Parameters						
Media	Sample ID[3]	Sampled Intervals (ft)	TCL VOCs	TCL SVOCs	TAL Metals	Cyanide	PCBs	Indicators[2]	TCLP VOAs and SVOCs
Surface Soil	SS-1, SS-2, SS-3,	0-1	x	x	x	x			
	SS-4, SS-23	0-1	x	x	x	x			
Subsurface Soil	A3-SB-1	1.0-1.5				x		x	
	A3-SB-2	10.0-10.5				x		x	
	A3-SB-3	1.0-1.5				x		x	
	A3-SB-4	4.0-5.0	x		x	x	x		
	A3-SB-5	4.0-5.0	x		x	x	x		
	A3-SB-6	2.5-3.0	x		x	x	x		
Groundwater	A3-MW-3		x	x	x	x			
	A3-MW-6		x	x	x	x			
	A3-GW-4		x	x	x	x			

Notes:

(1) See ICF Kaiser Report in Appendix B-2 for Donner-Hanna Coke Plant Parcel sampling summary.

(2) Indicators include: Benzene, toluene, ethylbenzene, and xylene; and Polynuclear Aromatic Hydrocarbons (PAHs).

(3) Commas (,) separate discrete samples and backslashes (/) denote composited samples.

TABLE 3-5

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF ENVIRONMETAL SAMPLING AND ANALYSIS PROGRAM[1]

Area IV - Former Donner-Hanna Coke Yard Parcel			Parameters						
Media	Sample ID	Sampled Intervals (ft)	TCL VOCs	TCL SVOCs	TAL Metals	Cyanide	PCBs	Indicators(2)	TCLP VOCs and SVOCs
Surface Water	A4-SW-1		x		x	x			
	A4-SW-2		x		x	x			
	A4-SW-3		x		x	x			
Subsurface Soil	A4-SB-1	6.0-8.0	x	x	x	x			
	A4-MW-4	2.5-3.0							x
	A4-SB-6	6.5-7.0	x	x	x	x			
	A4-SB-8	4.2-4.7	x	x	x	x			
	A4-SB-10	2.5-3.5							x
	A4-SB-21	5.7-6.0	x	x	x	x			
	A4-SB-23	2.5-3.5							x
		6.0-6.5							x
	A4-SB-27	2.0-2.5							x
	A4-SB-29	6.5-7.0	x	x	x	x			
	A4-SB-30	6.0-6.5	x	x	x	x			
	A4-SB-36	4.2-4.7	x	x	x	x			
	A4-SB-39	2.5-3.0							x
	A4-SB-41	6.5-7.0	x	x	x	x			
Groundwater	A4-MW-1		x	x	x	x			
	A4-MW-1A		x	x	x	x			
	A4-MW-2		x	x	x	x			
	A4-MW-2A		x	x	x	x			
	A4-MW-3		x	x	x	x			
	A4-MW-3A		x	x	x	x			
	A4-MW-4		x	x	x	x			
	A4-MW-5		x	x	x	x			
	A4-MW-6		x	x	x	x			

Notes:
(1) See ICF Kaiser Report in Appendix B-2 for Donner-Hanna Coke Plant sampling summary.
(2) Indicators include: Benzene, toluene, ethylbenzene, and xylene; and Polynuclear Aromatic Hydrocarbons (PAHs).
(3) Commas (,) separate discrete samples and backslashes (/) denote composited samples.

TABLE 3-5

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF ENVIRONMENTAL SAMPLING AND ANALYSIS PROGRAM[1]

Soil Berm			Parameters						
Media	Sample ID[3]	Sampled Intervals (ft)	TCL VOCs	TCL SVOCs	TAL Metals	Cyanide	PCBs	Indicators[2]	TCLP VOCs and SVOCs
Surface Soil	A1-LTV-1	0-1	x	x	x				
	A1-TP-4	0-1	x	x	x				
	A2-TP-5/6	0-1	x	x	x				
	A3-TP-7	0-1	x	x	x				
	A3-TP-8	0-1	x	x	x				

Notes:
(1) See ICF Kaiser Report in Appendix B-2 for Donner-Hanna Coke Plant sampling summary.
(2) Indicators include: Benzene, toluene, ethylbenzene, and xylene; and Polynuclear Aromatic Hydrocarbons (PAHs).
(3) Commas (,) separate discrete samples and backslashes (/) denote composited samples.

3.4.1 Area I - Former LTV Steel Plant Parcel

The focus of the site characterization at the former LTV Steel Plant Parcel (Area I) was to determine if contamination existed in areas where historic operations may have caused or contributed to the release of organic and/or inorganic compounds that could pose environmental or human health risks. This approach allows for the detection of contamination in the most probable areas for contamination to exist related to historic industrial uses of the site. The selection of the historic areas of interest was based on the operational history described in Section 2.0. The subareas of interest identified in Area I are shown on Plate 2 and summarized below:

- Scale Pit (Subarea A).
- Fuel Oil Storage Area (Subarea B).
- Clarifier Area (Subarea C).
- Oil House and Pickling Area (Subarea D).
- Machine Shop/Electric Shop Area (Subarea E).
- Pickling Area (Subarea F).
- Gas Cleaning/Product Area (Subarea G).
- Transformer Area (Subarea H).
- Locomotive Repair Shop Area (Subarea I).
- BOF Dust Precipitator Area (Subarea J).
- Fuel Oil Storage Area (Subarea K).
- Underground Piping Area (Subarea L).
- Skull Cracker Area (Subarea M).

To assess whether contamination exists in these areas, Area I media were characterized through a sampling and analysis program. Results of the Area I characterization are discussed below.

Surface Soil/Fill

A total of 13 surface samples were collected and analyzed as either discrete or composite samples. Samples were analyzed for VOCs, SVOCs, PCBs, and TAL metals. Table 3-6 summarizes compounds detected in surface soil samples. The distribution of the detected compounds is shown on Plate 4. VOCs were not detected above EPA risk-based concentrations in any of the surface soil samples analyzed. A PCB isomer, Aroclor-1248, was detected at a concentration of 1.0 mg/kg (SS-10/11) in one composite

sample located in the vicinity of the former fuel oil storage tanks (Subarea K). Although this concentration exceeds EPA risk-based concentration value of 0.74, this concentration does not exceed the NYSDEC TAGM 4046 Value of 1.0 mg/kg and PCBs were not detected at other surface or subsurface soil sample locations, thus PCBs are not considered a parameter of concern in the surface soils in Area I. Benzo(a)pyrene was detected slightly above the EPA risk-based concentration in 5 of the 8 samples analyzed. Several other polynuclear aromatic hydrocarbons (PAHs) were detected above EPA risk-based concentrations in the same composite sample that detected the PCB isomer (Subarea K). PAH concentrations are often elevated at sites with heavy industrial use. Two of the inorganic parameters (TAL metals), beryllium and manganese, were detected in the surface soil samples at concentrations which exceeded EPA risk-based concentrations.

Subsurface Soil/Fill

A total of 29 subsurface soil/fill samples were collected from 13 different subareas of interest. Samples collected from each subarea of interest were generally composited and analyzed for SVOCs and inorganic parameters. A single discrete VOC sample was also collected and analyzed from each subarea. The selection criteria for submitting samples for laboratory analysis was elevated readings on the PID and/or visual or olfactory evidence of contamination. Native soil located below the coarse fill was often submitted for analysis even if evidence of contamination was not apparent. Subsurface soil/fill analytical results are presented in Table 3-7. The distribution of the detected compounds is shown on Plate 5. VOCs were detected at relatively low concentrations in generally three subareas of Area I: the former oil house/pickling subarea (Subarea D); the former machine shop/electrical shop subarea (Subarea E); and the tar/fuel oil underground piping subarea (Subarea L). However, VOCs were not detected in any of the 13 subareas of interest at concentrations exceeding EPA risk-based concentrations. As expected with the storage or piping of petroleum products; benzene, toluene, ethylbenzene and xylene (BTEX) compounds were detected.

Of the SVOCs detected, PAHs were detected at concentrations exceeding EPA risk-based concentrations at the former machine shop/electric shop subarea (Subarea E),

TABLE 3-6
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF SURFACE SOIL RESULTS - AREA 1

Parameter	EPA Risk Based Concen.*	Background Soil Concen.[1]	SS-10/11[2]	SS-12/13[3]	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-17/18/19	SS-20/21[4]	SS-22
Volatile Organic Compounds (mg/kg)													
Methylene Chloride	760	-				0.009		0.009	0.008		Not		
1,1,1-Trichloroethane	180000	-							0.021		Analyzed		
Semivolatile Organic Compounds (mg/kg)													
Acenaphthylene	-	-	4.6										
Anthracene	610000	-	24	0.52									
Benzo(a)anthracene	7.8	-	**16**	1.4		0.75	0.59				1.5		0.62
Benzo(a)pyrene	0.78	-	**12**	**1.4**	0.44	**0.96**	0.53	Not	Not	Not	**1.4**		**0.99**
Benzo(b)fluoranthene	7.8	-	**15**	2.1	0.81	1.1	1.3	Analyzed	Analyzed	Analyzed	2.3	0.48	1.5
Benzo(k)fluoranthene	7.8	-	**8.5**	1.1		0.67	0.74				1.4		0.84
Benzo(g,h,i)perylene	-	-	5.4	0.67	0.45	0.6	0.6				0.92		
Bis(2-ethylhyxyl)phthalate	410	-		0.42		1	0.39						0.76
Carbazole	-	-	5.5										
Chrysene	780	-	21	1.4	0.53	0.8	1				1.6		0.72
Fluoranthene	82000	-	36	2.7	0.82	1.1	1.2				3	0.55	0.5
Indeno(1,2,3-cd)pyrene	7.8	-	5.7	0.65		0.53	0.55				0.86		0.65
Phenanthrene	-	-	19	2	0.53	0.65	1.3				1.9		
Pyrene	61000	-	27	2.2	0.65	1.1	1.3				2.6	0.58	0.87
PCB (mg/kg)													
PCB 1248	0.74	-	**1**					Not Analyzed					

NOTES:

* - USEPA Region III Risk-Based Concentration

(1) Background inorganic soil concentrations from Truscon Property.

(2) Composite sample from SS-10 and SS-11. Discrete VOC samples were collected from each location. VOCs were not detected in either sample.

(3) Composite sample from SS-12 and SS-13. Discrete VOC samples were collected from each location. VOCs were not detected in either sample.

(4) Composite sample from SS-20 and SS-21. Discrete VOC samples were collected from each location. VOCs were not detected in either sample.

Blank space denotes parameter was not detected.

Shading denotes concentration exceeds EPA Risk Based Concentration values.

- Data not available.

TABLE 3-6
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF SURFACE SOIL RESULTS - AREA 1

Parameter	EPA Risk Based Concen.*	Background Soil Concen.[1]	SS-10/11[2]	SS-12/13[3]	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-17/18/19	SS-20/21[4]	SS-22
Inorganic Compounds (mg/kg)													
Aluminum	1000000	11700	14600	14100	15700	11500	6730	Not Analyzed	Not Analyzed	Not Analyzed	10700	9390	8250
Arsenic	610	5.17	24.7	25.5	12.2	8.85	7.61				4.37	11.5	8.89
Barium	140000	212	152	130	160	191	121				164	143	92.4
Beryllium	1.3	1.01	**2.87**	**3.5**	**2.19**	**2.39**	1				**1.91**	**1.93**	**1.4**
Cadmium	1000	0.882	1.51	1.79	0.831	2.89	3.77				2.37	2.94	1.27
Calcium	-	44400	144000	139000	218000	202000	166000				193000	136000	50600
Chromium	10000	29.6	257	197	434	636	891				635	891	73.1
Cobalt	120000	6.34 U	6.5	24.8		6.14	8.19					11.5	6.78
Copper	82000	55.7	141	170	26.4	92.2	94.6				87.7	146	45.4
Iron	610000	24900	134000	165000	94100	97200	160000				144000	223000	64500
Lead	400	63.5	145	195	79.6	145	397				147	83.7	76.5
Magnesium	-	7920	20000	24700	12300	22000	24200				19700	19100	7320
Manganese	10000	1080	5470	5420	**10800**	**17000**	**26300**				**13600**	**17100**	2340
Nickel	41000	22.6	78.7	122	11.3	63.2	52.8				28.5	57.8	19.3
Potassium	-	1160	1060	1210	850	685	372				857	498	654
Selenium	10000	12.7			21.9	24.6	46.3				57.1	61	8.38
Silver	10000	1.27 U	1.65	1.69	2.53	2.14	4.16				3.05	2.96	
Sodium	-	367	505	617	341	336	333				452	366	268
Vanadium	14000	21	53.5	125	201	386	289				203	210	35
Zinc	610000	138	293	714	143	541	607				341	229	147
Cyanide	41000	0.634 U	3.64	3.35	5.11	1.6	4.13				5.1	6.38	2.06

Notes:

* - USEPA Region III Risk-Based Concentration

(1) Background inorganic soil concentrations from Truscon Property.

(2) Composite sample from SS-10 and SS-11. Discrete VOC samples were collected from each location. VOCs were not detected in either sample.

(3) Composite sample from SS-12 and SS-13. Discrete VOC samples were collected from each location. VOCs were not detected in either sample.

(4) Composite sample from SS-20 and SS-21. Discrete VOC samples were collected from each location. VOCs were not detected in either sample.

Blank space denotes parameter was not detected.

Shading denotes concentration exceeds EPA Risk Based Concentration value or Background Soil Concentrations.

- Data not available.

U - Compound was analyzed for but was not detected. Actual background concentration is less than this value.

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"
SUMMARY OF SUBSURFACE SOIL RESULTS - AREA I

Parameter	EPA Risk Based Concen.*	Background Soil Concen.[1]	A1-SB (or MW)-A1,A2, A3	A1-SB-B1,B2, B3	A1-SB-C2	A1-SB-D1,D2, D3	A1-SB-E1,E2,E3	A1-SB (or MW)-F1,F2	A1-SB-G1	A1-SB-H1,H2	A1-SB I1,I2	A1-SB-J2	A1-SB (or MW)-K1,K2, K3	A1-TpP10[12]	A1-SB (or MW)-M1/M2
Sample Depth (ft)			**8-12**	**10-14**	**12-14**	**10-14**	**4-8**	**4-6**	**8-10, 11-11.5**	**8-10**	**8-13**	**10-12, 8-10**	**6-8.5**	**4-5**	**6-6.5**
Volatile Organic Compounds (mg/kg)															
Acetone	200000	-	(2)	(3)	0.061			(6)	(7)	(8)	(9)	(10)	(11)	NA	0.11[13]
Benzene	200	-				6.2 [4]									
2-Butanone	1000000	-												NA	0.014[13]
cis-1,2-Dichloroethene	20000	-					0.042 [5]							NA	
Ethylbenzene	200000	-				7.7 [4]								6.6	
Methylene Chloride	760	-												NA	0.007[13]
Toluene	410000	-				3.6 [4]									
Total Xylenes	1000000	-				25.0 [4]								52	
Trichloroethene	520	-					0.150 [5]							NA	

Notes:

* - USEPA Region III Risk-Based Concentration

(1) Background inorganic soil concentrations from Truscon Property.

(2) Sample A1-MW-A2, 8-10 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.

(3) Sample A1-SB-B2, 12-14 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.

(4) Sample A1-SB-D3, 10-12 feet was analyzed for TCL VOCs. Concentrations of detected parameters are shown.

(5) Sample A1-SB-E2, 4-6 feet was analyzed for TCL VOCs. Concentrations of detected parameters are shown.

(6) Sample A1-SB-F1, 4-6 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.

(7) Sample A1-SB-G1, 11-11.5 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.

(8) Sample A1-SB-H1, 8-10 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.

(9) Sample A1-SB-I2, 8-10 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.

(10) Sample A1-SB-J2, 8-10 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.

(11) Sample A1-MW-K2, 6.5-7 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.

(12) A sample collected from 5-5.5 feet was analyzed for VOCs. VOCs were not detected in the sample at a dilution of 25 ppm.

(13) Sample A1-MW-M2, 6-6.5 feet was analyzed for TCL VOCs. Concentrations of detected parameters are shown.

Blank space denotes parameter was not detected.

Shading denotes concentration exceeds EPA Risk Based Concentration values.

\- Data not available

NA - Not Analyzed

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"
SUMMARY OF SUBSURFACE SOIL RESULTS - AREA I

Parameter	EPA Risk Based Concen.	Background Soil Concen.[1]	A1-SB (or MW)-A1,A2, A3	A1-SB-B1,B2,B3	A1-SB-C1	A1-SB-D1,D2,D3	A1-SB-E1,E2,E3	A1-SB (or MW)-F1,F2	A1-SB-G1	A1-SB-H1,H2	A1-SB I1,I2	A1-SB-J2	A1-SB (or MW)-K1,K2, K3	A1-T10[12]	A1-SB (or MW)-M1/M2
Sample Depth (ft)			8-12	10-14	10-12	10-14	4-8	4-6	8-10, 11-11.5	8-10	8-13	10-12, 8-10	6-8.5	4-5	6-6.5
Semivolatile Organic Compounds (mg/kg)															
Acenapthene	120000	-			3.1		0.69						10	380	
Acenaphthylene	-	-												2200	
Anthracene	610000	-			2.1		1.6						7.4	2100	
Benzo(a)anthracene	7.8	-					3.9			0.89			**8.1**	**1700**	0.6
Benzo(a)pyrene	0.78	-					**3.1**			0.67			**6.1**	**1400**	0.56
Benzo(b)fluoranthene	7.8	-					3.6	0.45		0.88				**1600**	0.94
Benzo(k)fluoranthene	7.8	-					2.1							**660**	
Benzo(g,h,i)perylene	-	-					1.6								
Chrysene	780	-					3.3			0.74			14	**1400**	0.67
Dibenzo(a,h)anthracene	0.78	-					0.75								
Dibenzofuran	8200	-					0.51							NA	
Fluoranthene	82000	-					7.3	0.73	0.7	1.8		0.93	7.3	3900	0.98
Fluorene	82000	-			2.4		0.75					0.51	24	2500	
Indeno(1,2,3-cd)pyrene	7.8	-					1.6							**640**	
2-Methylnapthalene	-	-			13								17	NA	
Napthalene	82000	-					0.78					0.72		7300	
Phenanthrene	-	-	93		9.6		5.8	0.45	0.64	1.4		1.8	33	5100	1.1
Pyrene	61000	-	42		2.8		6.4	0.66	0.61	1.4		0.7	28	3000	1.2

Notes:
* - USEPA Region III Risk-Based Concentration
Blank space denotes parameter was not detected.
Shading denotes concentration exceeds EPA Risk Based Concentration values.
- Data not available
NA - Not Analyzed

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"
SUMMARY OF SUBSURFACE SOIL RESULTS - AREA I

Parameter	EPA Risk Based Concen.	Background Soil Concen.[1]	A1-SB (or MW)-A1,A2, A3	A1-SB-B1,B2,B3	A1-SB-C1	A1-SB-D1,D2,D3	A1-SB-E1,E2,E3	A1-SB (or MW)-F1,F2	A1-SB-G1	A1-SB-H1,H2	A1-SB I1,I2	A1-SB-J2	A1-SB (or MW)-K1,K2, K3	A1-T10[12]	A1-SB (or MW)-M1/M2
Sample Depth (ft)			8-12	10-14	10-12	10-14	4-8	4-6	8-10, 11-11.5	8-10	8-13	10-12, 8-10	6-8.5	4-5	6-6.5
Inorganic Compounds (mg/kg)															
Aluminum	1000000	11700	29400	12900	7590	11600	25500	19100	9220	7180	15000	22000	9700		21800
Antimony	820	7.6 U													
Arsenic	610	5.17			3.5	21.8		2.4		16.7			11.6		
Barium	140000	212	408	117	54.7	118	304	243	62.4	85.5	132	142	85.6		332
Beryllium	1.3	1.01	**3.82**			1.03	**3.18**	**1.5**	**2.9**	1.26	0.751	0.928	**1.36**		**1.78**
Cadmium	1000	0.882	1.29			1.25	1.8	1.05	4.72	5.05					1.3
Calcium	-	44400	174000	14700	8180	39200	159000	56000	49400	16000	80800	12600	21900	Not	136000
Chromium	10000	29.6	101	25.9	11.3	20.2	328	71.7	42.6	45.3	22.3	24.8	37.4	Analyz.	393
Cobalt	120000	6.34 U		10.9	7.68			11.3		8.88	9.01	11.6			
Copper	82000	55.7	50.1	26.7	19.8	51.5	204	40.2		97.9	25.6	14.2	48.4		84.6
Iron	610000	24900	69900	26500	18700	75000	117000	63500	275000	192000	23800	23800	84100		82600
Lead	400	63.5	11.5	17.4	68.4	116	159	24.2	15.3	293	31.1	14.8	192		118
Magnesium	-	7920	15400	5180	2860	4490	8040	9930	3290	1880	21900	5210	2930		26900
Manganese	10000	1080	3250	674	303	1010	7500	2360	4180	5370	642	449	1170		**16600**
Mercury	200	0.211				0.32				2.37					
Nickel	41000	22.6	70.2	32.6	21.6	18.9	15.6	37.6		51.7	22.1	30.7	18.3		25.4
Potassium	-	1160	912	2210	1160	1420	1680	2180	673	4830	2760	2060	1510		1730
Selenium	10000	12.7	3.28	1.04			2.02				4.79	2.48	2.7		13.9
Silver	10000	1.27 U													
Sodium	-	367	956	206	206	224	553	418	165	503	345	372	320		551
Thallium	160	1.27 U							2.56						
Vanadium	14000	21	19.6	23.1	13.3	19.3	69.6	37.5	26.7	33.3	26.9	23.7	46.4		163
Zinc	610000	138	21.3	87.7	71.9	228	207	128	44	1760	76.3	101	174		192
Cyanide	41000	0.634 U					2.79			3.07			3.78		

Notes:

* - USEPA Region III Risk-Based Concentration

(1) Background inorganic soil concentrations from Truscon Property.

Blank space denotes parameter was not detected.

Shading denotes concentration exceeds EPA Risk Based Concentration values.

- Data not available

U - Compound was analyzed for but was not detected. Actual background concentration is less than this value.

the former fuel oil storage subarea (Subarea K), and the tar/fuel oil underground piping subarea (Subarea L). The highest concentrations of PAHs were detected in the vicinity of underground piping located at the north end of the piping tunnel between Areas I and II that transported tar/water/fuel oil in subsurface piping. Visual staining and free-phase tar/oil was apparent in the test pit during sample collection. Only beryllium and manganese were detected in the subsurface soil samples at concentrations exceeding EPA risk-based concentrations.

Groundwater

A total of four groundwater samples were collected and analyzed for VOCs, SVOCs and inorganic parameters (TAL metals). Groundwater samples were collected from wells screened in the upper saturated zone (generally occurring in the lower portion of the fill and native soil below the fill). Groundwater analytical results for Area I are presented in Table 3-8. The distribution of the detected compounds is shown on Plate 7. Elevated pH was measured in well A1-MW-A2 (11.29 pH units {see Table 3-3}), near the scale pit located in Subarea A. Although acetone was detected in each of the groundwater samples, the presence of acetone at low concentrations is often associated with laboratory contamination. In general, aromatic hydrocarbons (i.e., toluene, ethylbenzene and xylenes) were detected in groundwater analyzed in the vicinity of the former scale pit (Subarea A). PAHs were also detected in groundwater in this subarea. Although aromatic hydrocarbons were not detected in groundwater in the vicinity of the fuel oil storage tanks (Subarea K), low concentrations of PAHs were detected in the groundwater. Several inorganic parameters were elevated in groundwater collected from the former pickling area of the plant (Subarea F). Since groundwater is not used as a source of potable supply in the Buffalo area and soluble inorganic parameters are often sorbed to the aquifer matrix during transport, the occurrence of the elevated metals concentrations in Area I does not pose a significant environmental concern.

TABLE 3-8
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF GROUNDWATER SAMPLING RESULTS - AREA I

Parameter	NYS Class GA Groundwater Quality Stds	A1-MW-A2	A1-MW-F2	A1-MW-K2	A1-MW-M2	A1-MW-M2 Duplicate
Volatile Organic Compounds (mg/L)						
Acetone	0.05	**0.064**	**0.054**	0.047	0.023	0.022
Carbon Disulfide	0.05	0.017				
Ethylbenzene	0.005	**0.0099**				
Toluene	0.005	**0.0094**				
Xylene (Total)	0.005	**0.03**				
Semivolatile Organic Compounds (mg/L)						
Acenapthene	0.02	0.0089		0.0096		
Acenapthylene	0.02					
Carbazole	NA					
Chrysene	0.000002			**0.006**		
Dibenzofuran	0.005					
2,4-Dimethylphenol	NA					
Fluoranthene	0.05					
Fluorene	0.05	0.012		0.015		
2-Methylnaphthalene	0.05	**0.084**		0.034		
2-Methylphenol	0.005					
4-Methylphenol	0.05					
Napthalene	0.01	**0.024**				
Phenanthrene	0.05	0.027		0.012		
Phenol	0.001	**0.011**				
Pyrene	0.05	0.01		0.011		

Notes: Blank space indicates that parameter was not detected.

NA - NYS Guidance Value not available.

Shading denotes concentration exceeds NYS Class GA Groundwater Quality Standards

TABLE 3-8
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF GROUNDWATER SAMPLING RESULTS - AREA I

	NYS Class GA Groundwater	A1-MW-A2	A1-MW-F2	A1-MW-K2	A1-MW-M2	A1-MW-M2 Duplicate
Inorganic Compounds (mg/L)						
Aluminum	NA	1.9	126	5.54	3.18	2.62
Arsenic	0.025		0.022			
Barium	1	0.0654	**1.04**	0.1	0.0382	0.0356
Beryllium	0.003		**0.00624**			
Calcium	NA	113	189	114	90.1	89.7
Chromium	0.05		**0.175**	0.0106		
Cobalt	NA		0.0736			
Copper	0.2		**0.284**			
Iron	0.3	**2.85**	**188**	**23.9**	**6.27**	**5.11**
Lead	0.025		**0.15**	**0.141**		
Magnesium	35	2.84	33.9	27.8	10.8	10.2
Manganese	0.3	0.0956	**4.27**	**2.64**	**1.27**	**1.15**
Nickel	NA		0.231			
Potassium	NA	32.1	37	18.8	16.2	16.4
Selenium	0.01	0.00541				0.00752
Sodium	20	**35.2**	**140**	**20.2**	**26.2**	**27.5**
Thallium	0.004					
Vanadium	NA		0.221			
Zinc	0.3	0.0226	**0.735**	0.098	0.038	0.041
Cyanide	0.1			**0.209**	0.034	0.031

Notes: Blank space indicates that parameter was not detected.

NA - NYS Guidance Value not available.

Shading denotes concentration exceeds NYS Class GA Groundwater Quality Standards

3.4.2 Area II - Former Donner-Hanna Coke Plant Parcel

Analytical results for surface soil, subsurface soil and groundwater in Area II are discussed in the report prepared by ICF Kaiser presented in Attachment B-2.

3.4.3 Area III - Former LTV Warehouse Area Parcel

The focus of the site characterization at the former LTV warehouse area parcel (Area III) was to determine if contamination existed at the property in areas where historic activities may have caused or contributed to the release of organic and inorganic compounds that could pose environmental or human health risks. This approach allows for the detection of contamination in the most probable areas for contamination to exist related to historic industrial uses of the site. The selection of the historic areas of interest is based on the operational history described in Section 2.0. These areas included a paint shop, machine shop and wood shop. These areas of interest identified in Area III are shown on Plate 2. Other portions of Area III were investigated based on field observations. To assess whether contamination exists in these areas, site media were characterized through a sampling and analysis program of fill, native soils and groundwater. Results of the site characterization are discussed below.

Surface Soil/Fill

A total of 4 surface soil/fill samples were collected and analyzed for VOCs, SVOCs, PCBs, and TAL metals (A3-SS-1, 2, 3, and 4). One sample (viz., A3-SS-23) was analyzed for TAL metals only. Surface soil/fill analytical results are presented in Table 3-9. The distribution of the detected compounds is shown on Plate 4. VOCs were not detected in any of the surface samples analyzed. However, the relatively high concentrations of many semi-volatile organic compounds in sample A3-SS-4 necessitated a 500:1 dilution and resulted in an elevated minimum detection limit for VOCs of 33,000 ug/kg.

Of the SVOCs detected, PAHs were detected at concentrations exceeding EPA risk-based concentrations in one of the four samples analyzed for organic compounds (viz. A3-SS-4). This sample was collected from the western portion of Area III where tar-like

TABLE 3-9
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF SURFACE SOIL RESULTS - AREA III

Parameter	EPA Risk Based Concen.*	Background Soil Concen.(1)	SS-1	SS-2	SS-3	SS-4	SS-23
Volatile Organic Compounds (mg/kg)							
		-					NA
Semivolatile Organic Compounds (mg/kg)							
Acenaphthene	120000	-				430	
Acenaphthylene	-	-				190	
Anthracene	610000	-				750	
Benzo(a)anthracene	7.8	-		4.8		**1000**	
Benzo(a)pyrene	0.78	-				**1000**	Not
Benzo(b)fluoranthene	7.8	-		4.9	4	**1100**	Analyzed
Benzo(k)fluoranthene	7.8	-				**760**	
Benzo(g,h,i)perylene	-	-				450	
Carbazole	-	-				310	
Chrysene	780	-				**890**	
Dibenzo(a,h)anthracene	0.78	-				**170**	
Dibenzofuran	8200	-				320	
Fluorene	82000	-				520	
Fluoranthene	82000	-		8.3	7.5	1300	
Indeno(1,2,3-cd)pyrene	7.8	-				**450**	
2-Methylnapthalene	-	-				250	
Napthalene	82000	-				1300	
Phenanthrene	-	-			5.1	1300	
Pyrene	61000	-		6.4	5.2	1300	
PCB (mg/kg)							
	-	-					NA

Notes:
* - USEPA Region III Risk-Based Concentration
(1) Background inorganic soil concentrations from Truscon Property.
Blank space denotes parameter was not detected.
Shading denotes concentration exceeds EPA Risk Based Concentration value.
- Data not available.
NA - Not Analyzed

TABLE 3-9
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF SURFACE SOIL RESULTS - AREA III

Parameter	EPA Risk Based Concen.*	Background Soil Concen.(1)	SS-1	SS-2	SS-3	SS-4	SS-23
Inorganic Compounds (mg/kg)							
Aluminum	1000000	11700	15000	14600	17100 D	7480	66.7
Antimony	820	7.6					4.29
Arsenic	610	5.17	14.5	25.3	19.8 D	13.3	
Barium	140000	212	81.3	193	165	112	81.7
Beryllium	1.3	1.01	0.621	**1.91**	**3.29**	0.88	
Cadmium	1000	0.882		1.35	0.795	2.13	
Calcium	-	44400	370000	78500	203000 D	47700	61500
Chromium	10000	29.6	866	49.3	612 D	146	9.35
Cobalt	120000	6.34				8.62	
Copper	82000	55.7	27.2	57.2	50.1	112	38
Iron	610000	24900	104000	76700	78800 D	103000	5970
Lead	400	63.5	76.1	185	178 N	226	49.4
Magnesium	-	7920	16500	5630	27800 D	4580	
Manganese	10000	1080	**19400**	3950	**15700 D**	3180	242
Mercury	610	0.211				47.9	10.4
Nickel	41000	22.6	9.92	15.3	17.8	49	
Potassium	-	1160	504	1380	758	666	938
Selenium	10000	12.7	9.12	18.4	4.64	32.4	5.32
Silver	10000	1.27	2.34	1.46	2.27		
Sodium	-	367	512	419	535		460
Vanadium	14000	21	383	34.5	237 D	58.1	
Zinc	610000	138	37.7	243	216 D	627	15.7
Cyanide	41000	0.634		15.5		184	21900

Notes:

* - USEPA Region III Risk-Based Concentration

(1) Background inorganic soil concentrations from Truscon Property.

Blank space denotes parameter was not detected.

Shading denotes concentration exceeds EPA Risk Based Concentration or Background Soil Concentration value.

- Data not available.

U - Compound was analyzed for but was not detected. Background concentration is less than this value.

N - Spiked sample recovery not within control limits

D - Spike diluted out

materials exists on the ground surface. Based on TCLP results of a tar sample collected from Area IV (discussed in Section 3.3.4) and analyzed for VOCs and SVOCs, the tar-like material is not considered a characteristic hazardous waste. PCBs were not detected in any of the four samples analyzed.

Only beryllium and manganese were detected in the surface soil samples at concentrations which exceeded EPA risk-based concentrations. Elevated cyanide concentrations were detected in the surface soil/fill sample collected at location A3-SS-23. The vicinity of this sample location is stained blue. The cyanide concentration does not exceed EPA risk-based concentrations.

Subsurface Soil/Fill

A total of 6 subsurface soil/fill samples were collected from suspected contaminated fill or native soil. Samples A3-SB-1, MW-2, and SB-3 were collected at random locations within Area III and were analyzed for site indicator parameters (i.e. BTEX, PAHs, and cyanide) and samples A3-SB-4, 5, and 6 were collected in the vicinity of suspected former operations at the warehouse (wood shop, machine shop, and paint shop, respectively) and analyzed for VOCs, SVOCs, PCBs and TAL metals. Subsurface soil/fill analytical results are presented in Table 3-10. The distribution of the detected compounds is shown on Plate 6. In two of the six subsurface samples analyzed (viz., A3-SB-1 and 3), aromatic hydrocarbon compounds (BTEX) were detected; however, BTEX concentrations did not exceed EPA risk-based concentrations. As shown on Plate 6, these samples were collected from fill material in the southwest portion of the Area III in the vicinity of the tar-like material (A3-SB-1) and in the northeastern portion of Area III in the vicinity of a historic material storage area.

Of the SVOCs detected, PAHs were detected at concentrations exceeding EPA risk-based concentrations in the two samples coincident with the detection of VOCs (A3-SB-1 and 3) and to a lesser degree, in one sample collected on the north side of the former warehouse near Area II (A3-SB-6). No PCBs were detected in the samples analyzed.

TABLE 3-10
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF SUBSURFACE SOIL RESULTS - AREA III

Parameter	EPA Risk Based Concen.*	Background Soil Concen.(1)	A3-SB-1	A3-SB-2	A3-MW-3	A3-SB-4	A3-SB-5	A3-MW-6
Sample Depth (ft)			1.0-1.5	10-10.5	1.0-1.5	4-5	4-5	2.5-3
Volatile Organic Compounds (mg/kg)								
Acetone	200000	-	NA	NA	NA	0.048		
Benzene	200	-			22			
2-Butanone	1000000	-	NA	NA	NA	0.014		
Ethylbenzene	200000	-	6.2		0.081			
Toluene	410000	-	4.9		0.036			
Total Xylenes	1000000	-	45		0.369			
Semivolatile Organic Compounds (mg/kg)								
Acenapthene	120000	-	440		500			
Acenaphthylene	-	-	100		100			
Anthracene	610000	-	240		210			
Benzo(a)anthracene	7.8	-	230		110			7.7
Benzo(a)pyrene	0.78	-	210		73			6.7
Benzo(b)fluoranthene	7.8	-	210		87			8.7
Benzo(k)fluoranthene	7.8	-	130		49			
Benzo(g,h,i)perylene	-	-	90					
Chrysene	780	-	170		85			8.1
Fluoranthene	82000	-	640		380			19
Fluorene	82000	-	300		480			
Indeno(1,2,3-cd)pyrene	7.8	-	86					
Napthalene	82000	-	1200		1400			
Phenanthrene	-	-	620		780			17
Pyrene	61000	-	480		250			14
PCB (mg/kg)								
			NA	NA	NA			

NOTES: * - USEPA Region III Risk-Based Concentration

(1) Background inorganic soil concentrations from Truscon Property.

Blank space denotes parameter was not detected.

Shading denotes concentration exceeds EPA values.

- Data not available NA - Not Analyzed

TABLE 3-10
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF SUBSURFACE SOIL RESULTS - AREA III

Parameter	EPA Risk Based Concen.*	Background Soil Concen.(1)	A3-SB-1	A3-SB-2	A3-MW-3	A3-SB-4	A3-SB-5	A3-MW-6
Sample Depth (ft)			1.0-1.5	10-10.5	1.0-1.5	4-5	4-5	2.5-3
Inorganic Compounds (mg/kg)								
Aluminum	1000000	11700				20800	23400	36500
Arsenic	610	5.17						4.39
Barium	140000	212				112	163	414
Beryllium	1.3	1.01				1.03	1.13	4.72
Cadmium	1000	0.882	Not	Not	Not	1.1	1.2	1.18
Calcium	-	44400	Analyzed	Analyzed	Analyzed	2320	4010	251000
Chromium	10000	29.6				27.2	29.1	108
Cobalt	120000	6.34 U					11.3	
Copper	82000	55.7				24.6	28.2	23.8
Iron	610000	24900				40100	33400	30100
Lead	400	63.5				19.9	20.1	236
Magnesium	-	7920				3870	4490	14300
Manganese	10000	1080				195	311	5360
Mercury	200	-						
Nickel	41000	22.6				27.6	32.8	
Potassium	-	1160				1650	2010	1740
Sodium	-	367				80.2	101	929
Vanadium	14000	21				27.9	33.3	48.4
Zinc	610000	138				128	121	97.7
Cyanide	41000	0.634 U	8.16		1780			6.14

NOTES:

* - USEPA Region III Risk-Based Concentration

(1) Background inorganic soil concentrations from Truscon Property.

Blank space denotes parameter was not detected.

Shading denotes concentration exceeds EPA values or background soil concentration.

- Data not available

U - Compound was analyzed for but was not detected. Actual background concentration is less than this value.

TAL metals were not detected in the subsurface soil samples at concentrations exceeding EPA risk-based concentrations.

Groundwater

A total of three groundwater samples were collected and analyzed for VOCs, SVOCs and inorganic parameters. Groundwater samples were collected from wells screened in the upper saturated zone (generally occurring in saturated fill). Groundwater analytical results are presented in Table 3-11. The distribution of the detected compounds is shown on Plate 7.

The pH of groundwater collected from well A3-MW-3 is elevated relative to the pH of other groundwater samples in Area III (see Table 3-3). Benzene and acetone were the only VOCs detected in the groundwater. Benzene was also detected in the unsaturated soils at this location. A relatively high concentration of benzene (1.2 mg/l) was detected in groundwater at well location A3-GW-4. As shown on Plate 7, a similar benzene concentration was detected in surface water located less than 100 feet to the south in Area IV.

Several SVOCs were detected at concentrations exceeding NYS groundwater quality standards. These exceedances were coincident with elevated concentrations of VOCs detected in the groundwater at the same locations. Acid extractables (2-methylphenol, 4-methyl phenol, and phenol) and PAHs (naphthalene and dibenzofuran) were the primary SVOCs detected above NYS groundwater quality standards.

Inorganic parameter concentrations of generally considered non-toxic metals (i.e., potassium, manganese, iron, etc.) are often naturally elevated in shallow groundwaters of Western New York as encountered in numerous site assessments performed by Malcolm Pirnie. Of the inorganic parameters that are considered toxic, cyanide is considered the primary inorganic parameter of interest in Area III. The detection of cyanide above NYS Class GA groundwater quality standards is coincident with elevated VOCs and SVOCs in the groundwater. In addition to cyanide, anomalously high concentrations of thallium (100 mg/l) and iron (298 mg/l) were detected in wells A3-MW-3 and A3-MW-4, respectively.

TABLE 3-11
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF GROUNDWATER SAMPLING RESULTS - AREA III

Parameter	NYS Class GA Groundwater Quality Stds	A3-MW-3	A3-GW-4	A3-MW-6
Volatile Organic Compounds (mg/L)				
Acetone	0.05	**0.093**		0.026
Benzene	0.0007	**0.047**	**1.2**	
Carbon Disulfide	0.05			
Ethylbenzene	0.005			
Toluene	0.005			
Xylene (Total)	0.005			
Semivolatile Organic Compounds (mg/L)				
Acenapthene	0.02			
Acenapthylene	0.02		0.014	
Carbazole	NA		0.018	
Chrysene	0.000002			
Dibenzofuran	0.005		**0.0095**	
2,4-Dimethylphenol	NA		0.11	
Fluoranthene	0.05	0.011		
Fluorene	0.05	**0.0056**	0.015	
2-Methylnaphthalene	0.05		0.016	
2-Methylphenol	0.005		0.044	
4-Methylphenol	0.05		**0.061**	
Napthalene	0.01	**0.026**	**0.12**	
Phenanthrene	0.05	0.016	0.01	
Phenol	0.001	**0.021**	**0.12**	
Pyrene	0.05	0.0067		

Notes: NA - NYS Guidance Value not available.

TABLE 3-11
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF GROUNDWATER SAMPLING RESULTS - AREA III

	NYS Class GA Groundwater	A3-MW-3	A3-GW-4	A3-MW-6
Inorganic Compounds (mg/L)				
Aluminum	NA	1.62	4.63	2.21
Arsenic	0.025	0.0247		0.0118
Barium	1	0.0287		0.0778
Beryllium	0.003			
Calcium	NA	220	437	304
Chromium	0.05		0.027	
Cobalt	NA			
Copper	0.2		0.0343	
Iron	0.3	**6.23**	**298**	**3.14**
Lead	0.025			
Magnesium	35	0.916	**76.8**	5.01
Manganese	0.3	0.079	**7.48**	0.133
Nickel	NA			
Potassium	NA	15.1	12.8	10.2
Selenium	0.01	**0.0127**		0.0080
Sodium	20		**41.8**	**29.2**
Thallium	0.004	**100**		
Vanadium	NA			
Zinc	0.3	0.03	0.134	0.0295
Cyanide	0.1	**17.0**	**0.245**	0.0526

Notes: NA - NYS Guidance Value not available.

3.4.4 Area IV- Former Donner-Hanna Coke Storage Yard Parcel

As described in Section 3.3, several feet of coke covers fill and native soil in the former Donner Hanna Coke Storage Yard Parcel (Area IV). Since the coke in Area IV is planned for removal as part of a coke recovery program, one objective of the Area IV investigation was to characterize the media that would remain following coke excavation. Therefore, the sampling and analysis program focused on characterizing the fill, native soils, and coke making byproduct materials present in Area IV. Additionally, surface water and groundwater were characterized to assess whether special handling requirements may be necessary during excavation. Characterization of Area IV involved analyzing subsurface soil/fill and waste material (non-soil) samples, surface water, shallow groundwater (in the coke and fill) and deeper groundwater (in native soil).

Subsurface Soil/Fill

A total of 10 subsurface soil/fill samples were collected and analyzed for VOCs, SVOCs, and select inorganic parameters. Subsurface soil/fill analytical results are presented in Table 3-12. The distribution of the detected compounds is shown on Plate 6. In 1 of 10 subsurface samples analyzed, benzene was detected at concentrations exceeding EPA risk-based concentrations (viz., A4-SB-29). Other aromatic compounds were detected at relatively low concentrations in several other samples collected from Area IV. As shown on Plate 6, the A4-SB-29 sample location is situated in the northwestern portion of Area IV. The sample represents native soil underlying the coke. Although volatile organic compounds were detected in samples collected from other portions of Area IV, they were detected at concentrations below EPA risk-based concentrations and are compounds often associated with contaminants detected in analytical laboratories.

PAHs were detected in the native soils and fill below the coke at several locations. However, only benzo(a)pyrene was detected at a concentration exceeding EPA risk-based concentrations and then only at one sample location (viz., A4-MW-5).

Inorganic parameter were not detected in Area IV at concentrations exceeding EPA risk-based concentrations.

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"
SUMMARY OF SUBSURFACE SOIL RESULTS - AREA IV

Parameter	EPA Risk Based Concen.*	Background Soil Concen(1)	A4-MW-2	A4-SB-30	A4-SB-41	A4-SB-21	A4-SB-8	A4-MW-5	A4-SB-36	A4-SB-1	A4-SB-6	A4-SB-29
Sample Depth (ft)			5.5-6	6-6.5	6.5-7	5.7-6	4.2-4.7	4.5-5	4.2-4.7	6-8	6.5-7	6.5-7
Volatile Organic Compounds (mg/kg)												
Acetone	200000	-	.093	0.1		0.1	0.034	0.18				
Benzene	200	-	0.016	0.074	4.6						0.011	420
2-Butanone (MEK)	1000000	-						0.055				
Methylene Chloride	760	-									0.015	
Toluene	410000	-			1.1							210
Total Xylenes	1000000	-										53
Semivolatile Organic Compounds (mg/kg)												
Acenaphthylene	-	-						0.65				
Anthracene	610000	-						1.2				
Benzo(a)anthracene	7.8	-						2				
Benzo(a)pyrene	0.78	-						2				
Benzo(b)fluoranthene	7.8	-						2.2				
Benzo(k)fluoranthene	7.8	-						1.3				
Benzo(g,h,i)perylene	-	-						0.91				
Bis(2-ethylhexyl)phthala	410	-	3.1				0.57					
Butyl benzyl phthalate	410000	-			0.64		1.5					
Chrysene	780	-						1.8				
Di-n-butyl phthalate	200000	-	4.1B	4.6B	5.2B		2.9					
Di-N-Octylphthalate	-	-			15							
Fluoranthene	82000	-			0.62			5.2				
Fluorene	82000	-						0.63				
Indeno(1,2,3-cd)pyrene	7.8	-						0.91				
Napthalene	82000	-			0.75			2.8				
Phenanthrene	-	-			0.65			3.1				
Phenol	1000000	-										25
Pyrene	61000	-			0.52			3.9				

NOTES: *- USEPA Region III Risk-Based Concentration

B - Compound in the associated Method Blank

(1) Background inorganic soil concentrations from Truscon Property.

(2) Analyzed for arsenic, chromium, copper, lead, mercury, and zinc. Mercury not detected in samples identified in this table.

Shading denotes concentration exceeds EPA values.

Blank space denotes parameter was not detected.

- Data not available

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"
SUMMARY OF SUBSURFACE SOIL RESULTS - AREA IV

Parameter	EPA Risk Based Concen.*	Background Soil Concen(1)	A4-MW-2	A4-SB-30	A4-SB-41	A4-SB-21	A4-SB-8	A4-MW-5	A4-SB-36	A4-SB-1	A4-SB-6	A4-SB-29
Sample Depth (ft)			5.5-6	6-6.5	6.5-7	5.7-6	4.2-4.7	4.5-5	4.2-4.7	6-8	6.5-7	6.5-7
Inorganic Compounds (mg/kg)(2)												
Arsenic	610	5.17								2.7	28	
Chromium	10000	29.6	25.5	36.8	581	49.1	25.9	27.4	75.3	16.4	32.9	27.9
Copper	82000	55.7	20.7	31.8	50.2	33.4	23.1	13.3	19	19.1	57.3	18
Lead	400	63.5	20.4	24.5	48.2	24.7	20	21	21	15.5	151	13.7
Zinc	610000	138	86	99.6	180	88.9	98.1	113	107	77.2	662	86.6
Cyanide	41000	0.634 U			17.9						11.6	

NOTES:
*- USEPA Region III Risk-Based Concentration
(1) Background inorganic soil concentrations from Truscon Property.
(2) Analyzed for arsenic, chromium, copper, lead, mercury, and zinc. Mercury not detected in samples identified in this table.
Shading denotes concentration exceeds EPA values.
Blank space denotes parameter was not detected.
- Data not available
U - Compound was analyzed for but was not detected. Actual background concentration is less than this value.

Groundwater and Surface Water

A total of nine groundwater samples were collected and analyzed for VOCs, SVOCs and inorganic parameters. Groundwater samples were collected from wells screened in two locations within the uppermost saturated zone (i.e., in the saturated coke and/or fill and in the native soil below the coke/fill). Where well pairs exist, the well designated with an 'A' descriptor (e.g., A4-MW-1A) is representative of the shallower of the well pair. Groundwater analytical results are presented in Table 3-13. The distribution of the detected compounds is shown on Plate 7.

A relatively low pH was measured in well A4-MW-3 (4.64 pH units-see Table 3-3). In general, similar aromatic hydrocarbons (i.e. benzene, toluene, and xylenes) detected in the soils in the northwestern portion of Area IV were detected in the shallow groundwater samples collected from the northern and western portions of Area IV (viz., A4-MW-3A and 1A, respectively). Concentrations of VOCs and SVOCs were not detected above NYS Class GA groundwater quality standards in the eastern portion of Area IV. Elevated concentrations of acetone relative to the NYS groundwater quality standard are likely attributable to the presence of tar in the Area IV. Acetone was detected at high concentrations in tar samples collected and analyzed during the Recra Environmental Phase II Investigation conducted in 1989.

Several SVOCs were detected at concentrations exceeding NYS Class groundwater quality standards. These exceedances were coincident with elevated concentrations of VOCs detected in the groundwater at the same locations. Acid extractables (2-methylphenol, 4-methyl phenol, and phenol) and PAHs (naphthalene and dibenzofuran) were the primary SVOCs detected above NYS Class GA groundwater quality standards. Organic concentrations in samples analyzed from the shallow monitoring wells were generally greater than concentrations detected in the deeper monitoring wells.

Several inorganic parameters were also elevated relative to NYS Class GA groundwater quality standards. Many of the inorganic parameters detected above the standards are generally considered non-toxic metals and are often naturally elevated in shallow groundwaters of Western New York. This is typical when turbidity levels of the groundwater samples exceed 100 NTU (as was the case with a majority of the

TABLE 3-13
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
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SUMMARY OF GROUNDWATER SAMPLING RESULTS - AREA IV

Parameter	NYS Class GA Groundwater Quality Stds	A4-MW-1	A4-MW-1A	A4-MW-2	A4-MW-2A	A4-MW-3	A4-MW-3A	A4-MW-4	A4-MW-6	A4-MW-5	A4-MW-5 Duplicate
Volatile Organic Compounds (mg/L)											
Acetone	0.05	**0.088**	0.044	0.044		**0.9**				NA	NA
Benzene	0.0007		0.0062				**4.9**				
2-Butanone	0.05					**0.24**				NA	NA
Ethylbenzene	0.005										
Toluene	0.005		**0.0052**				**0.4**				
Xylene (Total)	0.005		**0.028**								
Semivolatile Organic Compounds (mg/L)											
Acenapthene	0.02										
Acenapthylene	0.02										
Carbazole	-	0.0088								NA	NA
Chrysene	0.000002										
Dibenzofuran	0.005	**0.0054**								NA	NA
2,4-Dimethylphenol	-		0.25				0.013			NA	NA
Fluoranthene	0.05										
Fluorene	0.05	0.008									
2-Methylphenol	0.005		**0.2**							NA	NA
4-Methylphenol	0.05		**0.44**				0.019			NA	NA
Napthalene	0.01	**0.053**	**0.33**				**0.029**			**0.0079**	
Phenanthrene	0.05	0.013	0.05							0.0062	0.006
Phenol	0.001		**0.22**			**0.099**	**0.053**			NA	NA
Pyrene	0.05										

Notes: Blank space indicates that parameter was not detected

- =NYS Guidance Value not available.

NA - Not Analyzed

TABLE 3-13
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF GROUNDWATER SAMPLING RESULTS - AREA IV

	NYS Class GA Groundwater	A4-MW-1	A4-MW-1A	A4-MW-2	A4-MW-2A	A4-MW-3	A4-MW-3A	A4-MW-4	A4-MW-6	A4-MW-5	A4-MW-5 Duplicate
Inorganic Compounds (mg/L)											
Aluminum	-	1.64	2.98	3.76	12.2	2540	3.15	2.85	2.09	NOT ANALYZED	NOT ANALYZED
Arsenic	0.025				0.0142						
Barium	1		0.0413	0.0508	0.138	0.0278	0.0319	0.0677	0.0335		
Beryllium	0.003					**0.154**					
Cadmium	0.01					**0.0989**					
Calcium	-	631	611	658	109	286	462	238	338		
Chromium	0.05				0.0303	**0.128**					
Cobalt	-					3.22					
Copper	0.2		0.0569		0.0329	0.0263					
Iron	0.3	**89**	**92.7**	**11**	**22**	**11400**	**63.4**	**71.8**	**3.76**		
Lead	0.025		**0.0751**		**0.156**	**0.587**					
Magnesium	35	29.1	24.9	**200**	9.21	**2420**	**80.9**	**58.2**	**103**		
Manganese	0.3	**6.43**	**5.11**	**6.78**	**1.01**	**248**	**9.05**	**3.67**	**8.36**		
Mercury	0.002		0.00089								
Nickel	-					7.04					
Potassium	-	14.6	17.9	5.38	7.71	14.4	24.3	3.22	2.22		
Selenium	0.01	**0.0109**	0.00925	**0.0211**	0.00512		0.00514		**0.0143**		
Silver	0.05					0.046					
Sodium	20	**37.6**	**27.5**	**274**	10.8	**728**	**68.2**	**32.7**	**170**		
Zinc	0.3	0.0402	0.0803	0.044	0.160	**26.1**	0.0845	0.0407	0.0343		
Cyanide	0.1	0.087	**0.177**	0.016	0.060	**1.34**	**0.878**	**1.28**	**2.15**	**0.173**	**0.176**

Notes: Blank space indicates that parameter was not detected

- =NYS Guidance Value not available.

NA - Not Analyzed

groundwater samples collected for this investigation). Of the elevated inorganic parameters that are considered toxic; only lead, chromium, cadmium and cyanide are considered inorganic parameters of interest in Area IV. Coincident with elevated VOCs and SVOCs, these three parameters were elevated in samples collected from the northern and western portions of Area IV. Although VOCs and SVOCs were either not detected or were present at concentrations above NYS Class GA groundwater quality standards in the eastern portion of Area IV, cyanide was detected at concentrations exceeding the NYS Class GA groundwater quality standards.

A total of three surface water samples were collected and analyzed for VOCs, SVOCs and select inorganic parameters. Surface water analytical results are presented in Table 3-14. The distribution of the detected compounds is shown on Plate 7. In two of the three surface water samples (viz., A4-SW-1 and 2), benzene was detected above the NYS Class D surface water guidance value. Toluene was also detected above the guidance value in A4-SW-2. Of the SVOCs detected, phenol was the only one detected above guidance values (viz., in three samples). Inorganic parameters were not elevated in the surface water relative to guidance values.

Waste Material

A total of six non-soil samples were collected and analyzed for toxic hazardous waste characteristics using TCLP extraction methodology for organic parameters. Waste material samples included: tar; tar-stained sands and residue; various colored sand fill; and oily residue material. Waste material descriptions, sampling depths and TCLP analytical results are summarized in Table 3-15. The TCLP results indicate that black oily sand fill located above native soil at boring A4-SB-23 (6-6.5') will leach benzene at concentrations that exceed NYSDEC TCLP Maximum Concentration Values. All other waste material samples characterized using TCLP methods did not exceed NYSDEC Maximum Concentration Values.

The results of the supplemental boring/sampling program completed in the western portion of Area IV in the vicinity of the tar-like material indicates that TCLP benzene concentrations exceed EPA maximum Concentrations of Contaminants for Toxicity

TABLE 3-14
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF SURFACE WATER SAMPLING RESULTS - AREA IV

Parameter	Surface Water Gudance Values Class D	A4-SW1	A4-SW2	A4-SW3
Volatile Organic Compounds (µg/L)				
Benzene	6	**1200**	**950**	
Toluene	5		**42**	
Semivolatile Organic Compounds (µg/L)				
4-Methylphenol	NA	12		12
Napthalene	10	5		9.6
Phenol	5	**52**	**19**	**40**
N-nitroso-di-n-propylamine	NA			19
Inorganic Compounds (mg/L)				
Arsenic	0.36			
Chromium	NA			
Copper	0.2	0.0205		
Lead	NA			
Mercury	0.0002			
Zinc	0.3	0.0586		
Cyanide	0.022	0.050		

Notes: (1) Guidance Value
NA - NYS Guidance Value not available.

Characteristics in several of these areas. Individual soil samples were composited from the entire thickness of fill in each of the six areas identified in Figure 3-2 to create a single soil sample representative of the each subarea A through F. Analytical results are presented on Table 3-16A with EPA Maximum Concentration of Contaminants for Toxicity Characteristics for comparison. As shown in the table, only benzene concentrations in subareas B through E were detected at concentrations exceeding EPA toxicity criteria. All other TCLP compounds were detected at concentrations below EPA toxicity criteria.

To better delineate the subareas with EPA toxicity criteria exceedances, discrete samples were composited by corresponding depth interval within composite subareas B, C, and E (i.e. 0 to 2 ft, 2 to 4 ft, and 4 to 6 ft). Because the TCLP benzene concentrations in subarea D were far greater than the other subareas, the discrete depth interval samples from this area were composited separately from the other subareas. Samples were analyzed for TCLP VOCs only, since SVOCs and metals did not exceed EPA Maximum Concentration of Contaminants for Toxicity Characteristics. As shown on Table 3-16B, analytical results indicate that benzene concentrations in only the lower most stratigraphic interval (4 to 6 ft) sampled in composite subareas B, C, and E exceeded the EPA Maximum Concentration for Toxicity Characteristics. Composite sample results for intervals 2 to 4 ft and 4 to 6 ft also exceeded EPA toxicity criteria for benzene in Subarea D. All other sample intervals were below EPA toxicity criteria.

3.4.5 Abby Street Soil Berm

A total of 5 test pits were excavated into the soil berm located between the site and Abby Street in Areas I, II, and III. Sampling was performed to characterize the materials used to construct the soil berm. Generally, broken concrete, bricks and other C&D type materials were encountered in a matrix of sandy silt soil. Samples were analyzed for VOCs, SVOCs, PCBs and TAL metals and cyanide. Samples composited from two test pit locations in Area II were composited; however, discrete VOCs samples were collected and analyzed. In addition to the test pits, a surface grab sample was collected (viz., LTV-1) from a surface seep of white-colored discharge from the east side

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF TCLP ANALYTICAL RESULTS

Parameter	Maximum Concentration of Contaminants for Toxicity Characteristics	A4-SB-27	A4-SB-39	A4-MW-4	A4-SB-10	A4-SB-23	A4-SB-23
	Sample Description	Tar	Red Gray Fine Sand	Blue Green Sand Fill	Tar Stained Sand	Green sand w/sulfur odor	Black oily sands
Sample depth (ft)		2.0-2.5	2.5-3.0	2.5-3.0	2.5-3.5	2.5-3.5	6.0-6.5
Volatile Organic Compounds (mg/L)							
Benzene	0.5	0.081	0.052				4.1
2-Butanone(MEK)	200						
Carbon Tetrachloride	0.5						
Chlorobenzene	100						
Chloroform	6						
1,2-Dichloroethane	0.5						
1,1-Dichloroethene	0.7						
Tetrachloroethene	0.7						
Trichloroethene	0.5						
Vinyl Chloride	0.2						
Semivolatile Organic Compounds (mg/L)							
1,4-Dichlorobenzene	7.5						
2,4-Dinitrotoluene	0.13						
Hexachlorobenzene	0.13						
Hexachlorobutadiene	0.5						
Hexachloroethane	3						
2-Methylphenol(o Cresol)	200	1.3					1.1
3+4-Methylphenol(m+p Cresol)	200						1.7
Nitrobenzene	2						
Pentachlorophenol	100						
Pyridine	5						
2,4,6-Trichlorophenol	2						
2,4,5-Trichlorophenol	400						

NOTES:

Shading denotes concentration exceeds NYSDEC Maximum Concentration Value.
Blank space denotes parameter was not detected.

TABLE 16A
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MAUNFACTURING SITE"

TAR AREA TCLP CHARACTERIZATION RESULTS

Parameter	MCCTC*	Tar Area					
		A	B	C	D	E	F
Volatile Organic Compounds (mg/L)							
Benzene	0.5		0.71	1.1	38.0	1.6	
Carbon Tetrachloride	0.5						
Chlorobenzene	100						
Chloroform	6						
1,2-Dichloroethane	0.5				0.59		
1,1-Dichloroethene	0.7						
Tetrachloroethene	0.7						
Trichloroethene	0.5						
Vinyl Chloride	0.2						
Semivolatile Organic Compounds (mg/L)							
1,4-Dichlorobenzene	7.5						
2,4-Dinitrotoluene	0.13						
Hexachlorobenzene	0.13						
Hexachlorobutadiene	0.5						
Hexachloroethane	3						
2-Methylphenol(o Cresol)	200		0.78		0.64	0.83	
3+4-Methylphenol(m+p Cresol)	200		2.0	0.17	1.7	2.7	
Nitrobenzene	2						
Pentachlorophenol	100						
Pyridine	5		0.29		1.6	1.2	
2,4,6-Trichlorophenol	2						
2,4,5-Trichlorophenol	400						
Inorganic Parameters (mg/L)							
Arsenic	5						
Chromium	1				0.205		
Copper			0.0258	0.02	0.0344		
Lead	5				0.143	0.59	
Mercury	0.2						
Zinc		1.43	0.161	0.278	1.04	0.652	
Total Cyanide		23.1	53.2	13.4	11.9	77.7	44.4

Notes:

* - EPA Maximum Concentration of Contaminants for Toxicity Characteristic

Shading denotes concentration exceeds MCCTC*.

Blank space denotes parameter was not detected.

TABLE 3-16B
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

TAR AREA TCLP CHARACTERIZATION RESULTS

Parameter	MCCTC*	Tar Area					
		Areas B, C, E			Area D		
		0-2'	2-4'	4-6'	0-2'	2-4'	4-6'
Volatile Organic Compounds (mg/L)							
Benzene	0.5	0.36	0.18	3.7	0.014	6.9	130
Carbon Tetrachloride	0.5						
Chlorobenzene	100						
Chloroform	6						
1,2-Dichloroethane	0.5						
1,1-Dichloroethene	0.7						
Tetrachloroethene	0.7						
Trichloroethene	0.5						
Vinyl Chloride	0.2						

Notes:
* - EPA Maximum Concentration of Contaminants for Toxicity Characteristics.
Shading denotes concentration exceeds MCCTC*.
Blank space denotes parameter was not detected.

of the soil berm in Area I for analysis of VOCs and SVOCs, TAL metals and cyanide. Analytical results are presented in Table 3-17. The distribution of the detected compounds is shown on Plates 5 and 6.

Acetone was the only VOC detected and was present at a concentration typical of laboratory contamination. Benzo(a)pyrene was the only PAH detected at concentrations exceeding their respective EPA risk-based concentrations. PCBs were not detected in any samples. Of the inorganic parameters exceeding EPA risk-based concentrations, lead concentrations in the composite sample collected from test pits A2-TP5/6 in Area II were substantially elevated compared to lead concentrations detected in other test pit samples. Other elevated inorganic parameters included several non-toxic metals (i.e., potassium, iron, etc.)

TABLE 3-17
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER REPUBLIC STEEL PLANT AREA
"STEEL MANUFACTURING SITE"

SUMMARY OF SOIL SAMPLE RESULTS - SOIL BERM

Parameter	EPA Risk Based Concen.*	Background Soil Concentrations[1]	LTV-1	A1-TP-4	A2-TP5/6[2]	A3-TP7	A3-TP7,Duplicate	A3-TP8
Volatile Organic Compounds (mg/kg)								
Acetone	200000	-	0.045					
Semivolatile Organic Compounds (mg/kg)								
Acenapthene	120000	-			0.53			0.4
Anthracene	610000	-		1.1	1.3			0.94
Benzo(a)anthracene	7.8	-		2.0	2.7	0.49		1.9
Benzo(a)pyrene	0.78	-		**2.0**	**2.5**	0.52		**1.8**
Benzo(b)fluoranthene	7.8	-		2.7	3.8	0.66	5.1	2.6
Benzo(k)fluoranthene	7.8	-		1.1	1.4			0.88
Benzo(g,h,i)perylene	-	-		0.79				0.55
Bis(2-ethylhexyl)phthalate	410	-	0.58					
Chrysene	780	-		2.2	2.8	0.57		1.9
Dibenzofuran	8200	-			0.43			
Di-N-Butylphthalate	200000	-	0.55					
Fluoranthene	82000	-		4.3	4.3	1.1	8.5	4.1
Fluorene	82000	-		0.64	0.74			0.49
Indeno(1,2,3-cd)pyrene	7.8	-		0.79	0.71			0.59
Phenanthrene	-	-		3.6	4.7	1.2	7.8	3.2
Pyrene	61000	-		3.6	5.5	1.1	9	3.7
Inorganic Compounds (mg/kg)								
Aluminum	1000000	11700	3350	10400 D	11100	12500	11100	7200
Arsenic	610	5.17	3.47	31.4 D	2.21			1.19
Barium	140000	212	97.9	83.3	239	92.4	98.7	50.7
Beryllium	1.3	1.01				0.761	0.832	
Cadmium	1000	0.882			0.846	0.969	1.24	
Calcium	-	44400	342000	148000 D	24900	50600	55400	109000
Chromium	10000	29.6	41.1	72.9 N	18	21.3	24	9.86
Copper	82000	55.7	10.6	36.9 N	46.3	28.2	34.4	14.6
Iron	610000	24900	7300	19100 D	16000	12400	14000	9810
Lead	400	63.5	45.3	145	**792**	126	187	30.4
Magnesium	-	7920	3210	16000 D	6620	8910	11300	15700
Manganese	10000	1080	894	1270 D	412	345	519	369
Nickel	41000	22.6		12.7	15.4	18.1	18.1	8.3
Potassium	-	1160	411	1530	1400	1030	1040	1080
Selenium	10000	12.7	2.68	6.16	2.41	3.67	4.85	3.74
Sodium	-	367	308	200	226	603	509	190
Vanadium	14000	21	22	41.2	20.4	19.1	21.4	13.6
Zinc	610000	138	49.9	214 N	287	257	254	67.2
Total Cyanide	41000							

Notes:
* - USEPA Region III Risk-Based Concentration
(1) Background inorganic soil concentrations from Truscon property
(2) Composite sample from TP-5 and TP-6. Discrete VOC samples collected from each testpit. VOCs were not detected in either sample.
Shading denotes concentration exceeds EPA values (or background values for inorganic parameters).
Blank space denotes parameter was not detected.
NA - Not Analyzed
- = Data not available
N - Spiked sample recovery not within control limits
D - Spike diluted out

4.0 SUMMARY AND CONCLUSIONS

4.1 STEEL MANUFACTURING SITE CHARACTERIZATION

4.1.1 Phase I ESA Results

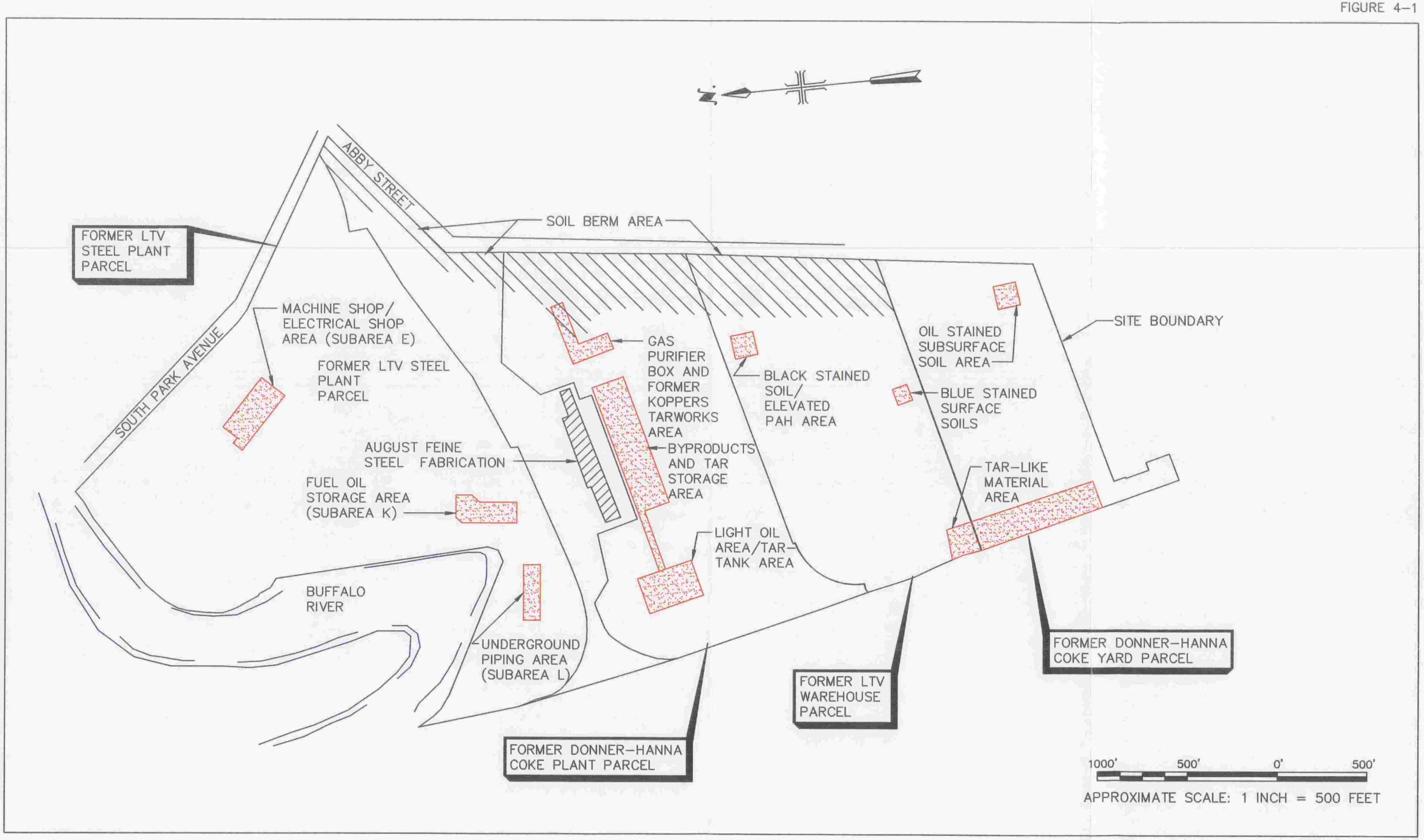
The Phase I ESA identified several subareas with potential environmental conditions associated with historic industrial uses of the site. These subareas included: 13 subareas in the former LTV Steel Plant Parcel (Area I) related to steel making operations and fuel oil storage and transport; 14 subareas at the former Donner-Hanna Coke Plant Parcel (Area II) related to coke making byproduct treatment and product storage areas; 5 subareas in the Former LTV Warehouse Parcel (Area III) related to equipment maintenance activities, suspected surface disposal of gas purifier box wastes (blue stained soils) and the presence of tar-like materials in the southwest corner; and the entire former Donner-Hanna Coke Storage Yard Parcel (Area IV) which is listed as a Class 3 Inactive Hazardous Waste site on the NYSDEC Registry of Inactive Hazardous Waste Sites. These Areas and Subareas are shown on Figure 4-1, Plate 2 and in Attachment B-3.

4.1.2 Phase II Site Investigation Results

The Phase I ESA results served as the basis for scoping the Phase II Site Investigation, which was designed to characterize environmental issues, if any, associated with the proposed end use of the site (viz. light industrial/commercial park). Each of the subareas identified during the Phase I ESA were investigated during the Phase II Site Investigation. In addition, supplemental samples were collected and analyzed to characterize overall site impacts.

Groundwater investigations performed as part of the Phase II Site Investigation identified site operations related contaminant concentrations in excess of New York State Class "GA" Groundwater Quality Standards in the shallow groundwater (uppermost saturated zone) present in the on-site fill materials. The contaminants identified and their concentrations were locally specific to the former steel-making operations. Since

FIGURE 4–1



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MALCOLM PIRNIE

LTV-B

FORMER REPUBLIC STEEL PLANT AREA
PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT

AREAS OF ENVIRONMENTAL CONDITION

LTV STEEL COMPANY
BUFFALO, NEW YORK

JUNE 1997

groundwater is not used for water supply in South Buffalo, since groundwater yields from fine grained soils present on the site are low, and since there are no sensitive downgradient receptors; the groundwater impact is limited to the on-site fill material.

Therefore, the results of the Phase II Investigation focuses on discussions of surficial and subsurface soil contamination on an Area-by-Area basis (see Figure 4-1).

Area I - Former LTV Steel Plant Parcel -Surface soil sampling results identified concentrations of several PAH compounds above EPA risk-based concentrations in over half of the samples analyzed; however only a limited number of surface samples were collected and analyzed relative to the size of the Area.

Subsurface soil sampling during the Phase II ESA identified three subareas with subsurface soil contamination. These three subareas include:

- The former machine shop/electric shop subarea (Subarea E).
- The former fuel oil storage subarea (Subarea K).
- The tar/fuel oil underground piping subarea (Subarea L).

Subsurface contamination was characterized by elevated PAH compounds associated with the former storage and transport of fuel oil. Stained soils and/or tar-like oil were observed in several boreholes in these three subareas.

Area II - Former Donner-Hanna Coke Plant Parcel - The surface soil analytical results identified several PAH compounds exceeding EPA risk-based concentrations in Area II. The results of the Phase II ESA also identified eleven subareas with subsurface contamination. These subareas include:

- The light oil area.
- Underground piping area.
- Old tar tanks.
- Benzol washers and final coolers area.
- Tar decanters.
- Gas holder and iron oxide (gas purifier)boxes.
- Possible tar unit.
- Primary cooler area.

- Northeast soil gas plume (the area in the vicinity of former Koppers Tar Works).

The subsurface soils were contaminated with aromatic hydrocarbons (BTEX) and PAHs. Many of the PAH compound concentrations exceeded EPA risk-based concentrations. Black stained soils, elevated PID readings, and olfactory evidence of contamination were apparent at these subareas.

Area III - Former LTV Warehouse Parcel - The results of the Phase II ESA surface soil sampling identified limited surface soil contamination. PAH compounds exceed EPA risk-based criteria in the western portion of the parcel where tar-like materials existed on the ground surface. Also, in the south central portion of the parcel (approximately 100 foot by 100 foot area in the vicinity of sample location A3-SS-23), a tar-like material existed on the ground surface.

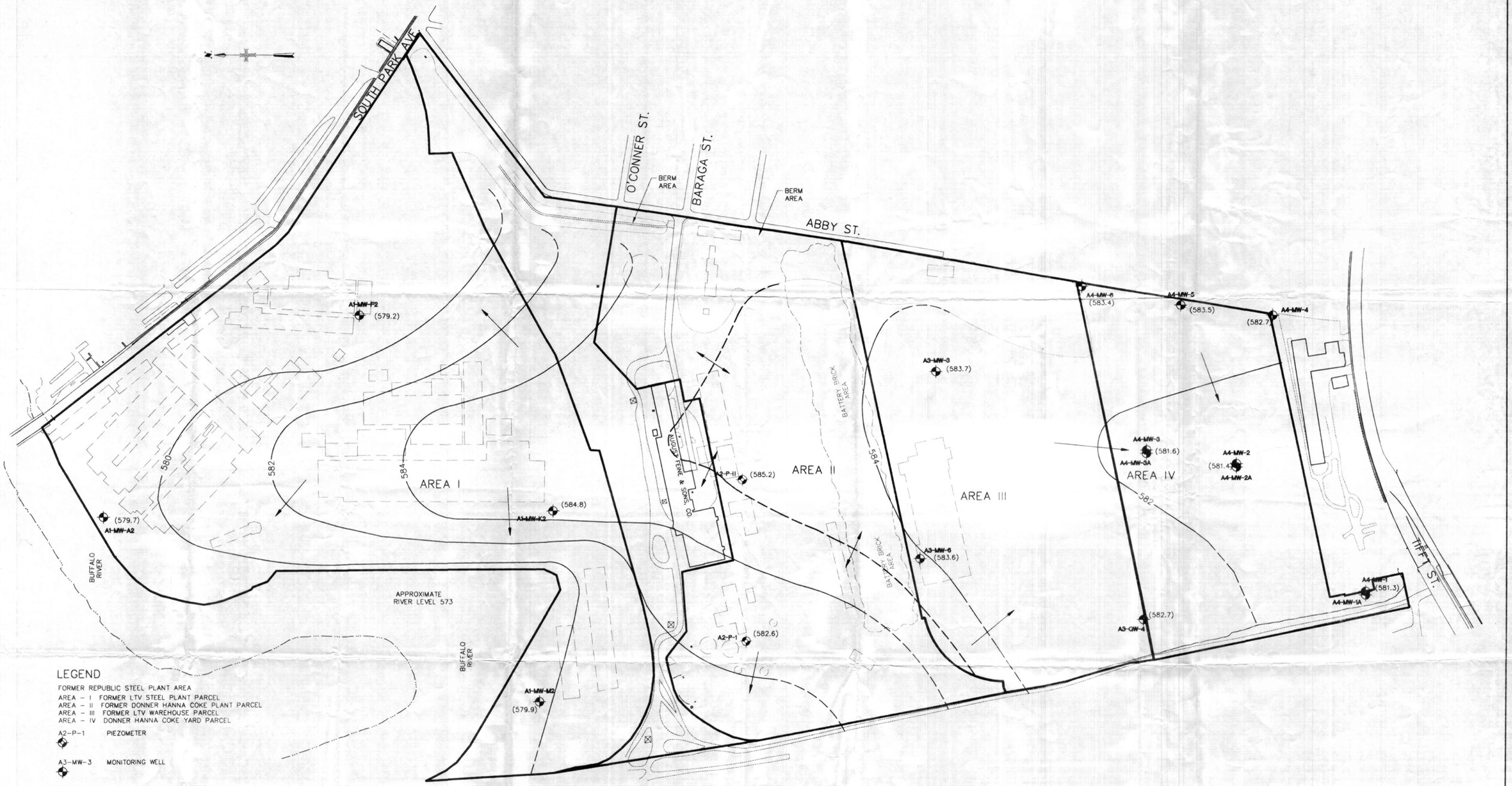
The results of the Phase II subsurface soil sampling identified three of the five subareas identified in the Phase I ESA with soil contamination. The southwest corner of Area III is contaminated with BTEX and PAH compounds. Cyanide concentrations detected in the blue stained surface soils in the south-central portion of Area III did not exceed EPA risk-based concentrations for industrial sites. Black stained soils and elevated PAH concentrations were detected in the northeastern portion of Area III.

Area IV - The Former Donner-Hanna Coke Yard Parcel - The coke in Area IV is planned for removal as part of a coke recovery program. The Phase II ESA characterized the media remaining following coke excavation. As a result, surface soils were not characterized. The investigation identified benzene contaminated subsurface soils, groundwater and surface water in the northwestern corner subarea. In the same area, tar-like materials are observed at the ground surface and intermixed with the coke in the subsurface. Although TCLP extraction analysis indicates that the tar-like material does not leach appreciable quantities of benzene, other materials in this portion of Area IV are a potential source of benzene. TCLP extraction analysis of materials present in the

western portion of Area IV indicates that approximately 10,000 cubic yards of material could be TCLP Characteristic hazardous wastes. TCLP extraction analysis of soil collected from oil stained soils in the southeast portion of the area indicate that the soils in this area could also be TCLP characteristic hazardous wastes.

Abby Street Berm

During the investigation of the four Areas, the soil berm along Abby Street was investigated to characterize the soils (reportedly owned by the City of Buffalo) in the berm to determine if environmental concerns were present. Although PAH concentrations exceeded EPA risk-based concentrations in several samples collected from the berm, the depth of the contamination and lack of visual and olfactory evidence of contamination suggests that the soil berm is not an area of environmental concern.



LEGEND

FORMER REPUBLIC STEEL PLANT AREA
AREA – I FORMER LTV STEEL PLANT PARCEL
AREA – II FORMER DONNER HANNA COKE PLANT PARCEL
AREA – III FORMER LTV WAREHOUSE PARCEL
AREA – IV DONNER HANNA COKE YARD PARCEL

A2-P-1 PIEZOMETER

A3-MW-3 MONITORING WELL

(579.9) SHALLOW GROUNDWATER ELEVATION 4/3/97

APPROXIMATE LOCATION OF GROUNDWATER DIVIDE

GENERAL DIRECTION OF FLOW

DASHED WHERE INFERRED

BUILDING FOUNDATION

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ____
DWN ____
CKD ____

LTV STEEL COMPANY
FORMER REPUBLIC STEEL PLANT AREA
STEEL MANUFACTURING SITE

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT

SHALLOW GROUNDWATER ISOPOTENTIAL MAP

SCALE: 1" = 200'

DATE APRIL 1997

SHEET ____ OF ____

CAD REF. NO. 0848PLT6

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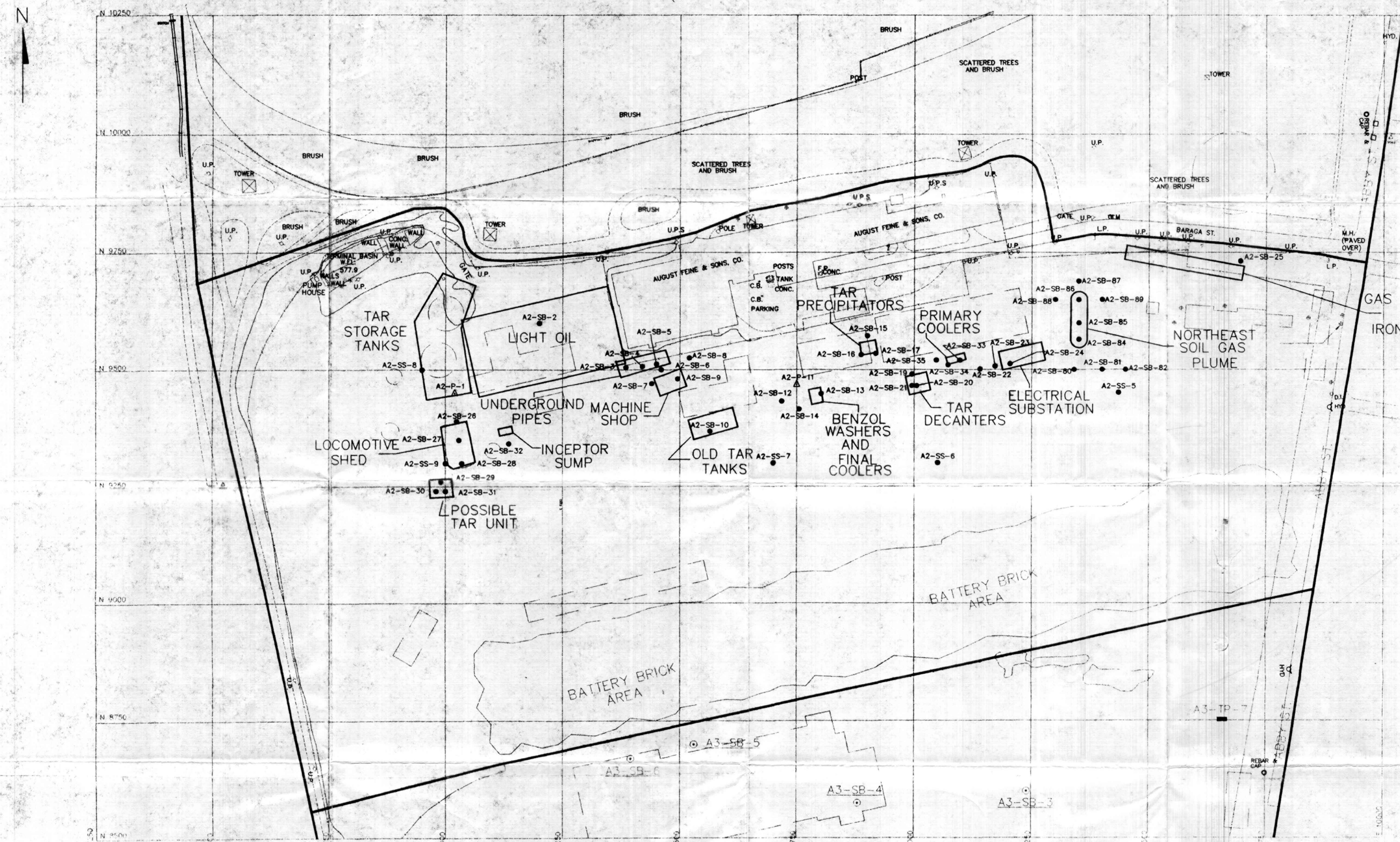
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E 8000
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E 8500
E 8750
E 9000
E 9250
E 9500
E 9750
BRUSH
SCATTERED TREES AND BRUSH
TOWER
POST
U.P.
PUMP HOUSE
TERMINAL BASIN
CONC. WALL
GATE
POLE
AUGUST FEINE & SONS, CO.
POSTS
TANK
CONC.
C.B.
PARKING
BARAGA ST.
O'CONNER ST.
M.H. (PAVED OVER)
L.P.
HYD.
REBAR CAP
TAR STORAGE TANKS
LIGHT OIL
UNDERGROUND PIPES
MACHINE SHOP
INCEPTOR SUMP
LOCOMOTIVE SHED
POSSIBLE TAR UNIT
OLD TAR TANKS
TAR PRECIPITATORS
BENZOL WASHERS AND FINAL COOLERS
PRIMARY COOLERS
TAR DECANTERS
ELECTRICAL SUBSTATION
NORTHEAST SOIL GAS PLUME
GAS HOLDER AND IRON OXIDE BOXES
BATTERY BRICK AREA
A2-SS-8
A2-P-1
A2-SB-2
A2-SB-3
A2-SB-4
A2-SB-5
A2-SB-6
A2-SB-7
A2-SB-8
A2-SB-9
A2-SB-10
A2-P-11
A2-SB-12
A2-SB-13
A2-SB-14
A2-SB-15
A2-SB-16
A2-SB-17
A2-SB-19
A2-SB-20
A2-SB-21
A2-SB-22
A2-SB-23
A2-SB-24
A2-SB-25
A2-SB-26
A2-SB-27
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A2-SB-34
A2-SB-35
A2-SB-80
A2-SB-81
A2-SB-82
A2-SB-84
A2-SB-85
A2-SB-86
A2-SB-87
A2-SB-88
A2-SB-89
A2-SS-5
A2-SS-6
A2-SS-7
A2-SS-9
A3-SB-3
A3-SB-4
A3-SB-5
A3-SB-6
A3-TP-7

GRAPHIC SCALE

0 50 100 200

LEGEND:

- A2-P-11 — PIEZOMETER
- A2-B-14 — SOIL BORING LOCATION
- A2-SS-7 — SURFACE SOIL LOCATION
- APPROXIMATE AREA BOUNDARY

FIGURE 3

ICF KAISER ENGINEERS

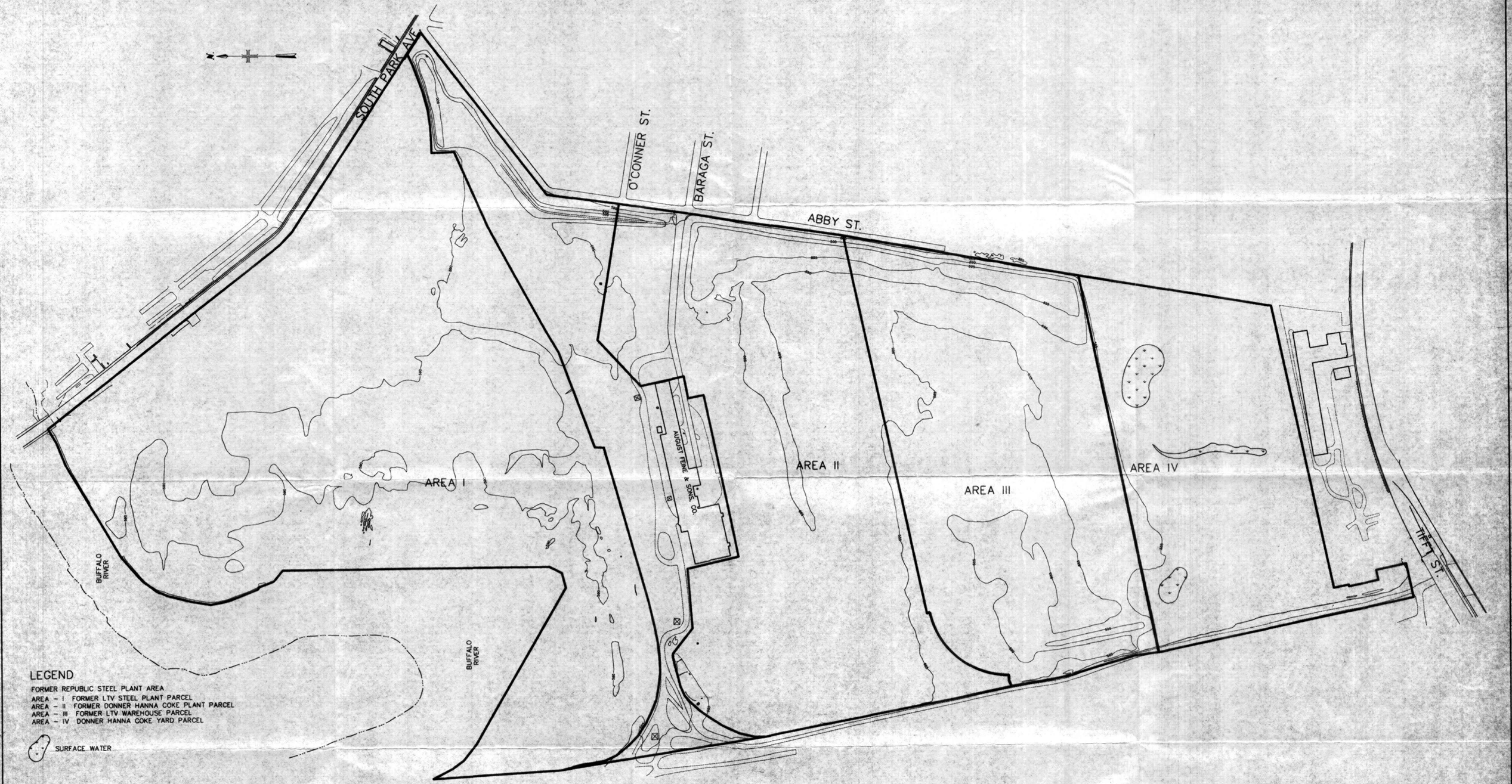
SCALE: 1"=100'	APPROVED BY:	DRAWN BY: M. WILLIAMS
DATE: 5/12/97		CHECKED BY:

AREA II : FORMER DONNER HANNA COKE PLANT SITE
PHASE I AND PHASE II INVESTIGATION

LTV STEEL COMPANY
SOUTH BUFFALO SITE

SHEET NUMBER
DRAWING NUMBER
20153001

PLATE 1



MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ____
DWN ____
CKD ____

LTV STEEL COMPANY
FORMER REPUBLIC STEEL PLANT AREA
STEEL MANUFACTURING SITE

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT

SITE FEATURES MAP

SCALE: 1" = 200'

DATE APRIL 1997

SHEET ____ OF ____

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0848GSP

SOUTH PARK AVE.

O'CONNER ST.

BARAGA ST.

ABBY ST.

BERM AREA

BERM AREA

BATTERY BROOK

AUGUSTA

A1-MW-F2 (ANALYZED 4/1997)	
VOC'S	ug/l
ACETONE	54
INORGANICS	mg/l
BARIUM	1.04
BERYLLIUM	0.00624
CHROMIUM	0.175
COPPER	0.284
IRON	188
LEAD	0.150
MANGANESE	4.27
SODIUM	140
ZINC	0.735

A1-MW-A2	
VOC'S (BTEX)	ug/l
TOLUENE	7
TOTAL XYLENES	14J
SVOC'S (PAH'S)	ug/l
PHENOL	2J

A1-P-4
GROUNDWATER ANALYZED FOR BTEX, PAH'S, ~~AND~~ CYANIDE, AND IRON ~~NO PARAMETERS~~ IRON WAS DETECTED THE ONLY PARAMETER DETECTED BUT AT A CONCENTRATION BELOW THE NYS GA GW QUALITY STD.

INORGANICS (mg/L) IRON 3.4

A1-MW-K2
GROUNDWATER ANALYZED FOR BTEX, PAH'S, AND CYANIDE, 4 PARAMETERS WERE DETECTED BELOW THE NYS GA GW QUALITY STD.

A1-MW-3
GROUNDWATER ANALYZED FOR BTEX, PAH'S, AND CYANIDE NO PARAMETERS DETECTED

A1-P-3
GROUNDWATER ANALYZED FOR BTEX, PAH'S, ~~AND~~ CYANIDE, AND IRON ~~NO PARAMETERS~~ IRON WAS DETECTED THE ONLY PARAMETER DETECTED BUT AT A CONCENTRATION BELOW THE NYS GA GW QUALITY STD.

A2-MW-13	
INORGANICS	mg/l
ARSENIC	0.038
LEAD	0.230
ZINC	0.350
CYANIDE	0.01

A2-MW-9	
VOC'S	ug/l
BENZENE	69
TOLUENE	35
XYLENE (TOTAL)	7J
SVOC'S (PAH'S)	ug/l
NAPHTHALENE	270
INORGANICS	mg/l
CYANIDE	1.0

A2-MW-12	
VOC'S (BTEX)	ug/l
BENZENE	41
ETHYLBENZENE	42
TOLUENE	86
XYLENE (TOTAL)	140
SVOC'S (PAH'S)	ug/l
ACENAPHTHENE	300
ANTHRACENE	73
BENZO(a)ANTHRACENE	38
BENZO(b)FLOURANTHENE	46
CHRYSENE	31
FLUORANTHENE	150
FLUORENE	210
NAPHTHALENE	3200
PHENANTHRENE	320
PYRENE	93

INORGANICS CYANIDE mg/L 1.4

A2-P-11	
VOC'S (BTEX)	ug/l
BENZENE	86
TOLUENE	28
SVOC'S	ug/l
ACENAPHTHALENE	21
BENZO(b)FLUORANTHENE	7
DIBENZOFURAN	6
NAPHTHALENE	400
INORGANICS	mg/l
IRON	0.610
MANGANESE	0.505
SELENIUM	0.016
CYANIDE	1.250

A2-MW-10	
VOC'S (BTEX)	ug/l
BENZENE	3J
INORGANICS	mg/l
CHROMIUM	0.051
LEAD	0.030

A2-MW-11	
INORGANICS	mg/l
LEAD	0.240
CYANIDE	0.250

A3-MW-3 (ANALYZED 4/1997)	
VOC'S	ug/l
ACETONE	93
BENZENE	47
SVOC'S	ug/l
NAPHTHALENE	26
FLUORENE	5.8
PHENOL	21
INORGANICS	mg/l
IRON	6.23
SELENIUM	0.0127
THALLIUM	100
CYANIDE	17

A4-MW-6 (ANALYZED 4/1997)	
INORGANICS	mg/l
IRON	3.78
MAGNESIUM	103
MANGANESE	8.36
SELENIUM	0.0143
SODIUM	170
CYANIDE	2.15

A4-MW-5 (ANALYZED 4/1997) (INDICATOR PARAMETERS)	
SVOC'S	ug/l
NAPHTHALENE	7.9
INORGANICS	mg/l
CYANIDE	0.173

A4-MW-4 (ANALYZED 4/1997)	
INORGANICS	mg/l
IRON	71.8
MAGNESIUM	58.2
MANGANESE	3.67
SODIUM	32.7
CYANIDE	1.28

A4-MW-2 (ANALYZED 4/1997)	
INORGANICS	mg/l
IRON	11
MAGNESIUM	200
MANGANESE	6.78
SELENIUM	0.0211
SODIUM	274

A4-MW-1	
SVOC'S (PAH'S)	ug/l
BENZO(a)ANTHRACENE	12
BENZO(b)FLUORANTHENE	12
BENZO(k)FLUORANTHENE	7J
CHRYSENE	12
INDENO (1, 2, 3-CD) PYRENE	4J

A4-MW-3 (ANALYZED 4/1997)	
VOC'S	ug/l
ACETONE	900
2-BUTANONE(MEK)	240
SVOC'S	ug/l
PHENOL	99
INORGANICS	mg/l
BERYLLIUM	0.154
CADMIUM	0.0989
CHROMIUM	0.128
IRON	11,400
LEAD	0.587
MAGNESIUM	2420
MANGANESE	248
SODIUM	728
ZINC	26.1
CYANIDE	1.34

A3-MW-6 (ANALYZED 4/1997)

A4-MW-3 ZINC 26.1 CYANIDE 1.34

A1-MW-F2

MW A1-P-4

MW A1-P-3

A2-MW-13

A2-MW-12

A2-MW-11

A3-MW-3

A4-MW-6

A4-MW-5

A4-MW-4

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MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES
DWN
CKD

LTV STEEL COMPANY
FORMER REPUBLIC STEEL PLANT AREA
STEEL MANUFACTURING SITE

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT

SURFACE SOIL SAMPLE RESULTS

SCALE: 1" = 200'

DATE APRIL 1997

SHEET ___ OF ___

CAD REF. NO. 0848PLT2

A1-SB-E1, E2, E3	
SVOC'S 4-8'	ug/kg
BENZO(a) PYRENE	3,100
INORGANICS 4-8'	mg/kg
BERYLLIUM	3.18

A1-SB-G1	
INORGANICS 8-10'	mg/kg
BERYLLIUM	2.9

A1-TP-4	
SVOC'S	ug/kg
BENZO(a) PYRENE	2,000

A2-TP-5, 6	
SVOC'S	ug/kg
BENZO(a) PYRENE	2,500
INORGANICS	mg/kg
LEAD	792

A1-SB (OR MW-F1), F2	
INORGANICS	mg/kg
BERYLLIUM	1.5

A1-SB (OR MW)-A1, A2, A3	
INORGANICS 8-12'	mg/kg
BERYLLIUM	3.82

A1-SB (OR MW)-K1, K2, K3	
SVOC'S 6.0-8.5'	ug/kg
BENZO(a) ANTHRACENE	8,100
BENZO(a) PYRENE	6,100
INORGANICS 6.0-8.5'	mg/kg
BERYLLIUM	1.36

A1-SB (OR MW)-M1/M2	
INORGANICS 6-6.5'	mg/kg
BERYLLIUM	1.75
MANGANESE	16,600

A1-TP-10 (4.0'-5.0')	
SVOC'S	ug/kg
BENZO(a) ANTHRACENE	1,700,000
BENZO(a) PYRENE	1,400,000
BENZO(b) FLUORANTHENE	1,600,000
BENZO(k) FLUORANTHENE	860,000
CHRYSENE	1,400,000
INDENO (1, 2, 3-cd) PYRENE	640,000

SOUTH PARK AVE.
O'CONNER ST.
BERM AREA
BARAGA ST.
ABBY ST.
AUGUST FIRE
AREA I
AREA II
BUFFALO RIVER
BUFFALO RIVER
A1-TP-4
A2-TP-5
A2-TP-6
A2-SB-B4
A1-MW-F2
A1-SB-F1
A1-SB-E3
A1-SB-E2
A1-SB-E1
A1-SB-B3
A1-SB-B2
A1-SB-B1
A1-SB-D3
A1-SB-D1
A1-SB-D2
A1-SB-H1
A1-SB-H2
A1-SB-I1
A1-SB-I2
A1-SB-G2
A1-SB-G1
A1-SB-K1
A1-SB-J1
A1-SB-J2
A1-SB-K3
A1-MW-K2
A1-TP-9
A1-SB-A3
A1-MW-A2
A1-SB-A1
A1-SB-C3
A1-SB-C2
A1-SB-C1
A1-TP-11
A1-TP-3
A1-TP-2
A1-TP-1
A1-TP-10
A1-MW-M2
A1-SB-M1
A2-P-11
A2-P-1

LEGEND

FORMER REPUBLIC STEEL PLANT AREA
AREA I – FORMER LTV STEEL PLANT PARCEL
AREA II – FORMER DONNER HANNA COKE PLANT PARCEL
AREA III – FORMER LTV WAREHOUSE PARCEL
AREA IV – DONNER HANNA COKE YARD PARCEL

A2-TP-6 TEST PIT
A2-P-1 PIEZOMETER
A2-SB-35 SOIL BORING
A4-SW-1 SURFACE WATER SAMPLE
A4-SS-1 SURFACE SOIL SAMPLE
A3-MW-3 MONITORING WELL

DENOTES COMPOSITE SOIL SAMPLE FOR SVOC'S, INORGANICS, PCB'S.

ONLY RESULTS WHICH EXCEED USEPA REGION III RISK-BASED CONCENTRATIONS ARE SHOWN

MALCOLM PIRNIE

REVISIONS

NO.	BY	DATE	REMARKS

DES
DWN
CKD

LTV STEEL COMPANY
FORMER REPUBLIC STEEL PLANT AREA
STEEL MANUFACTURING SITE

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT

AREA I
TEST PIT AND SUBSURFACE SOIL ANALYTICAL RESULTS

SCALE: 1" = 200'

DATE APRIL 1997

SHEET ___ OF ___

CAD REF. NO. 0848PLT3

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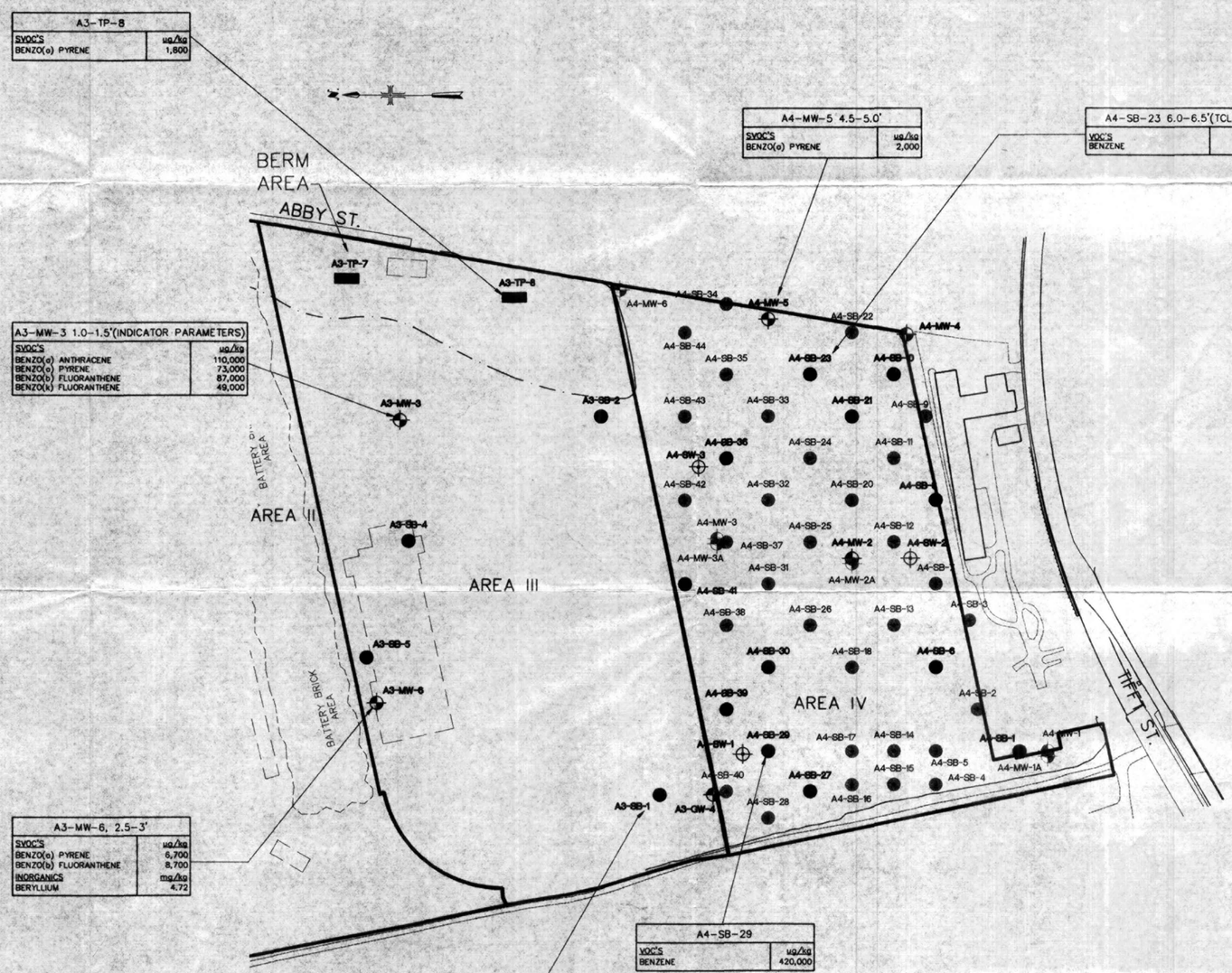
0848CED



LEGEND

FORMER REPUBLIC STEEL PLANT AREA
AREA I – FORMER LTV STEEL PLANT PARCEL
AREA II – FORMER DONNER HANNA COKE PLANT PARCEL
AREA III – FORMER LTV WAREHOUSE PARCEL
AREA IV – DONNER HANNA COKE YARD PARCEL

A2-TP-6 TEST PIT

A2-P-1 PIEZOMETER

A2-SB-35 SOIL BORING

A4-SW-1 SURFACE WATER SAMPLE

A4-SS-1 SURFACE SOIL SAMPLE

A3-MW-3 MONITORING WELL

(INDICATOR PARAMETERS) – SOIL SAMPLE ANALYZED FOR BTEX, PAHS, AND CYANIDE

(TCLP) – SOIL SAMPLE ANALYZED FOR TCLP VOLATILES AND SEMIVOLATILES

ONLY RESULTS WHICH EXCEED USEPA REGION III RISK-BASED CONCENTRATIONS ARE SHOWN

MALCOLM PIRNIE

REVISIONS

NO.	BY	DATE	REMARKS

DES
DWN
CKD

LTV STEEL COMPANY
FORMER REPUBLIC STEEL PLANT AREA
STEEL MANUFACTURING SITE

PHASE I/PHASE II ENVIRONMENTAL SITE ASSESSMENT

AREA III AND IV TEST PIT AND SUBSURFACE SOIL ANALYTICAL RESULTS

SCALE: 1" = 200'

DATE APRIL 1997

SHEET ___ OF ___

CAD REF. NO. 0848PLT4

3603 03152.33130 I:\ACAD\PROJ\08482631\0848PLT4 Scale: 1:1 Date: 08/22/1997 Time: 11:38

0848GSP

The EDR-Radius Map
with GeoCheck™

Former Republic Steel Property
South Park, Abbey St.+Tifft St
Buffalo, NY 14220

Inquiry Number: 0158322.1r

February 06, 1997

Environmental
Data
Resources, Inc.

Creators of Toxicheck/®

***The* Source
For Environmental
Risk Management
Data**

3530 Post Road
Southport, Connecticut 06490

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The search met the specific requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-94, or custom distances requested by the user.

The address of the subject property for which the search was intended is:

SOUTH PARK, ABBEY ST.+TIFFT ST
BUFFALO, NY 14220

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the subject property or within the ASTM E 1527-94 search radius around the subject property for the following Databases:

NPL:	National Priority List
Delisted NPL:	NPL Deletions
CERCLIS:	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP:	Comprehensive Environmental Response, Compensation, and Liability Information System
SWF/LF:	Facility Register
UST:	Petroleum Bulk Storage (PBS, CBS, MOSF) Database (UST)
AST:	Petroleum Bulk Storage (AST)
RAATS:	RCRA Administrative Action Tracking System
RCRIS-SQG:	Resource Conservation and Recovery Information System
RCRIS-LQG:	Resource Conservation and Recovery Information System
HMIRS:	Hazardous Materials Information Reporting System
PADS:	PCB Activity Database System
ERNS:	Emergency Response Notification System
FINDS:	Facility Index System
TRIS:	Toxic Chemical Release Inventory System
NPL Liens:	Federal Superfund Liens
TSCA:	Toxic Substances Control Act
MLTS:	Material Licensing Tracking System
RODS:	Records Of Decision
CONSENT:	Superfund (CERCLA) Consent Decrees
Coal Gas:	Former Manufactured gas (Coal Gas) Sites.

Unmapped (orphan) sites are not considered in the foregoing analysis.

Search Results:

Search results for the subject property and the search radius, are listed below:

Subject Property:

The subject property was identified in the following government records. For more information on this property see page 8 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
REPUBLIC STEEL SOUTH PARK AVENUE BUFFALO, NY	Ny Spills	N/A

EXECUTIVE SUMMARY

Surrounding Properties:

Elevations have been determined from the USGS 1 degree Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. EDR's definition of a site with an elevation equal to the subject property includes a tolerance of -10 feet. Sites with an elevation equal to or higher than the subject property have been differentiated below from sites with an elevation lower than the subject property (by more than 10 feet). Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

RCRIS: The Resource Conservation and Recovery Act database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act. The source of this database is the U.S. EPA.

A review of the RCRIS-TSD list, as provided by EDR, and dated 07/01/1996 has revealed that there are 2 RCRIS-TSD sites within approximately 1 Mile of the subject property.

Equal/Higher Elevation	Address	TP Dist	Map ID	Page
ADVANCED ELECTRO POLISHING INC	***356 HOPKINS ST***	***1/2 - 1***	***7***	***14***
PVS CHEMICAL INC NEW YORK	***55 LEE ST***	***1/2 - 1***	***10***	***17***

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already by listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data comes from the Department of Environmental Conservation's Inactive Hazardous waste Disposal Sites in New York State.

A review of the SHWS list, as provided by EDR, and dated 04/30/1996 has revealed that there are 5 SHWS sites within approximately 1 Mile of the subject property.

Equal/Higher Elevation	Address	TP Dist	Map ID	Page
DONNER HANNA COKE	ABBY AND MYSTIC STREET	1/4 - 1/2	2	8
TIFFT AND HOPKINS	PROVIDENCE STREET (PAPE	1/4 - 1/2	3	9
LEHIGH VALLEY RR	***TIFFT STREET***	***1/2 - 1***	***6***	***12***
ALLTIFT LANDFILL	TIFFT STREET	1/2 - 1	8	15
RAMCO STEEL	110 HOPKINS ST	1/2 - 1	9	16

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 09/27/1996 has revealed that there is 1 CORRACTS site within approximately 1 Mile of the subject property.

Equal/Higher Elevation	Address	TP Dist	Map ID	Page
PVS CHEMICAL INC NEW YORK	***55 LEE ST***	***1/2 - 1***	***10***	***17***

EXECUTIVE SUMMARY

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data comes from the Department of Environmental Conservation's Spills Information Database.

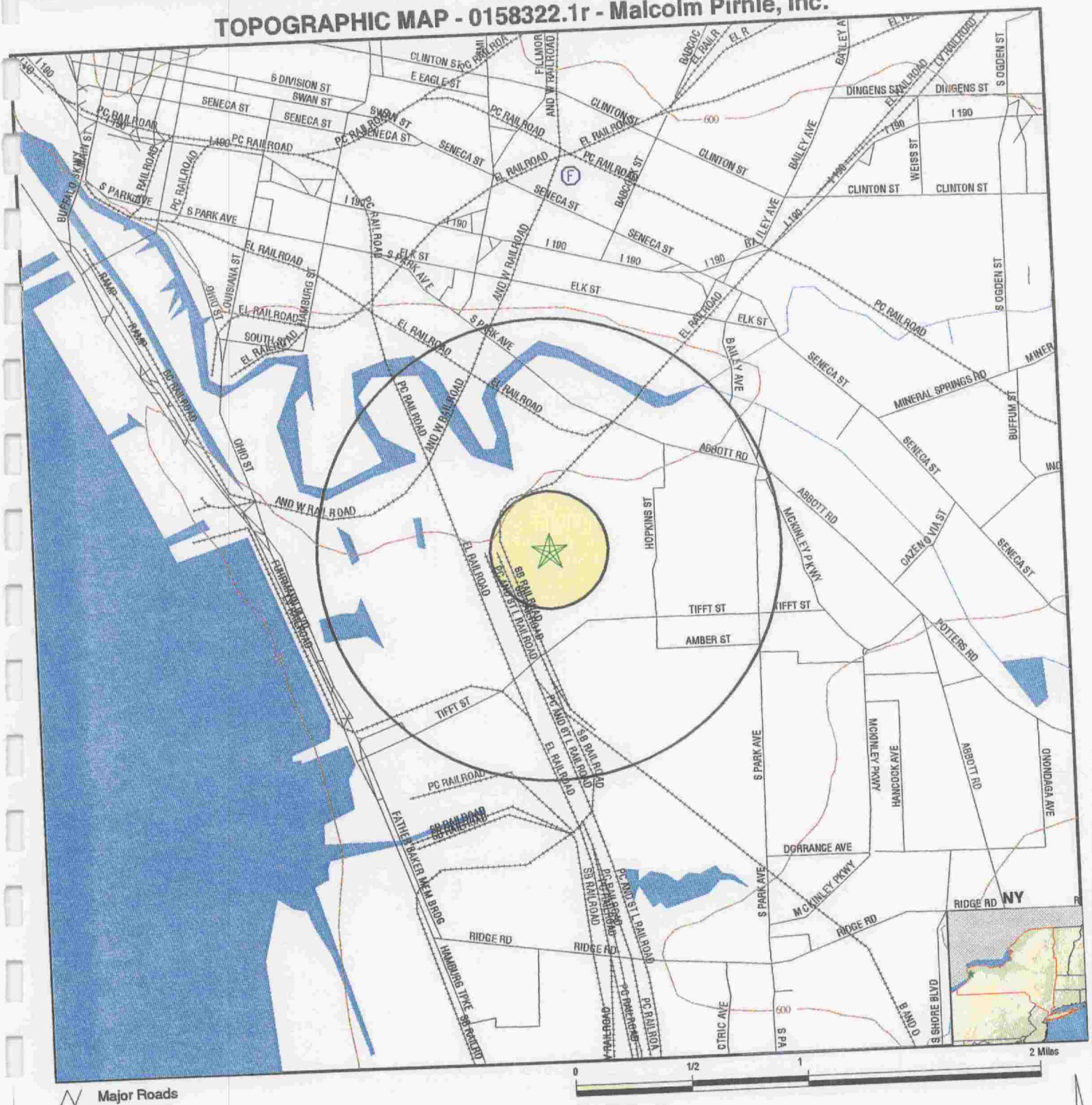
A review of the LUST list, as provided by EDR, and dated 09/30/1996 has revealed that there are 2 LUST sites within approximately 0.5 Miles of the subject property.

Equal/Higher Elevation	Address	TP Dist	Map ID	Page
DAVIS & MAVIS 478 HOPKINS	478 HOPKINS ST	1/4 - 1/2	4	10
PALLET EXCHANGE, INC.	***534 HOPKINS ST.***	***1/4 - 1/2***	***5***	***11***

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
ALTIFT REALTY	CERCLIS, FINDS
NIAGARA LANDFILL INC	SWF/LF
EVANS LF (OLD) (T)	SWF/LF
NORTHSIDE TRANSFER STA.	SWF/LF
WMNY TRANSFER STATION	SWF/LF
NYS THRUWAY AUTH. SLF	SWF/LF
SQUAW ISLAND SLF	SWF/LF
NIMO-CHERRY FARM	SWF/LF
SPRINGVILLE LF (V)	SWF/LF
AMHERST LF (T)	SWF/LF
BLASDELL LF (V)	SWF/LF
DEPEW LF (V)	SWF/LF
GEORGE SCHREIBER	SWF/LF
ALLIED CHEM-HOPKINS ST.	SWF/LF
SMALL BOAT HARBOR CONTAIN	SWF/LF
TIFFT FARM NATURE PRESERV	SWF/LF
OLD LAND RECLAMATION	SWF/LF
LAMB & WEBSTER C & D	SWF/LF
IWS SCHULTZ C&D	SWF/LF
COLLINS T.S.	SWF/LF
BERNARD COPE SLF	SWF/LF
DUPONT SLF	SWF/LF
SOUTH SIDE T.S. INDIAN RD	SWF/LF
MCMANNUS STEEL CONSTR.	LUST
RUBENSTEIN'S SCRAP YARD	LUST
PVS CHEMICAL	LUST, NY Spills
KENDALL OIL	LUST

TOPOGRAPHIC MAP - 0158322.1r - Malcolm Pirnie, Inc.



- Major Roads
- Contour Lines
- Waterways
- Earthquake epicenter, Richter 5 or greater
- (F) Closest Federal Well in quadrant
- [S] Closest State Well in quadrant
- (P) Closest public water supply well
- (HD) Closest Hydrogeological Data

TARGET PROPERTY:	Former Republic Steel Property	CUSTOMER:	Malcolm Pirnie, Inc.
ADDRESS:	South Park, Abbey St.+Tifft St	CONTACT:	Jeanne Asquith
CITY/STATE/ZIP:	Buffalo NY 14220	INQUIRY #:	0158322.1r
		DATE:	February 06, 1997 4:32 pm

GEOCHECK VERSION 2.1
SUMMARY

GEOLOGIC AGE IDENTIFICATION†

Geologic Code:	D2
Era:	Paleozoic
System:	Devonian
Series:	Middle Devonian

ROCK STRATIGRAPHIC UNIT†

Category:	Stratified Sequence

GROUNDWATER FLOW INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, including well data collected on nearby properties, regional groundwater flow information (from deep aquifers), or surface topography.‡

General Topographic Gradient: General NNW
General Hydrogeologic Gradient: No hydrogeologic data available.
Site-Specific Hydrogeological Data*:

Search Radius:	2.0 miles
Status:	Not found

USGS TOPOGRAPHIC MAP ASSOCIATED WITH THIS SITE

Target Property:	2442078-G7 BUFFALO SE, NY

FEDERAL DATABASE WELL INFORMATION

WELL QUADRANT	DISTANCE FROM TP	LITHOLOGY	DEPTH TO WATER TABLE
Northern	1 - 2 Miles	Limestone	20 ft.

STATE DATABASE WELL INFORMATION

WELL QUADRANT	DISTANCE FROM TP
Southern	>2 Miles

PUBLIC WATER SUPPLY SYSTEM INFORMATION (EPA-FRDS)

Searched by Nearest Well.
NOTE: PWS System location is not always the same as well location.

PWS Name:	PRYME TIME RESTAURANT CHAFFEE, NY 14030
Location Relative to TP:	>2 Miles North
Well currently has or has had major violation(s):	No

AREA RADON INFORMATION

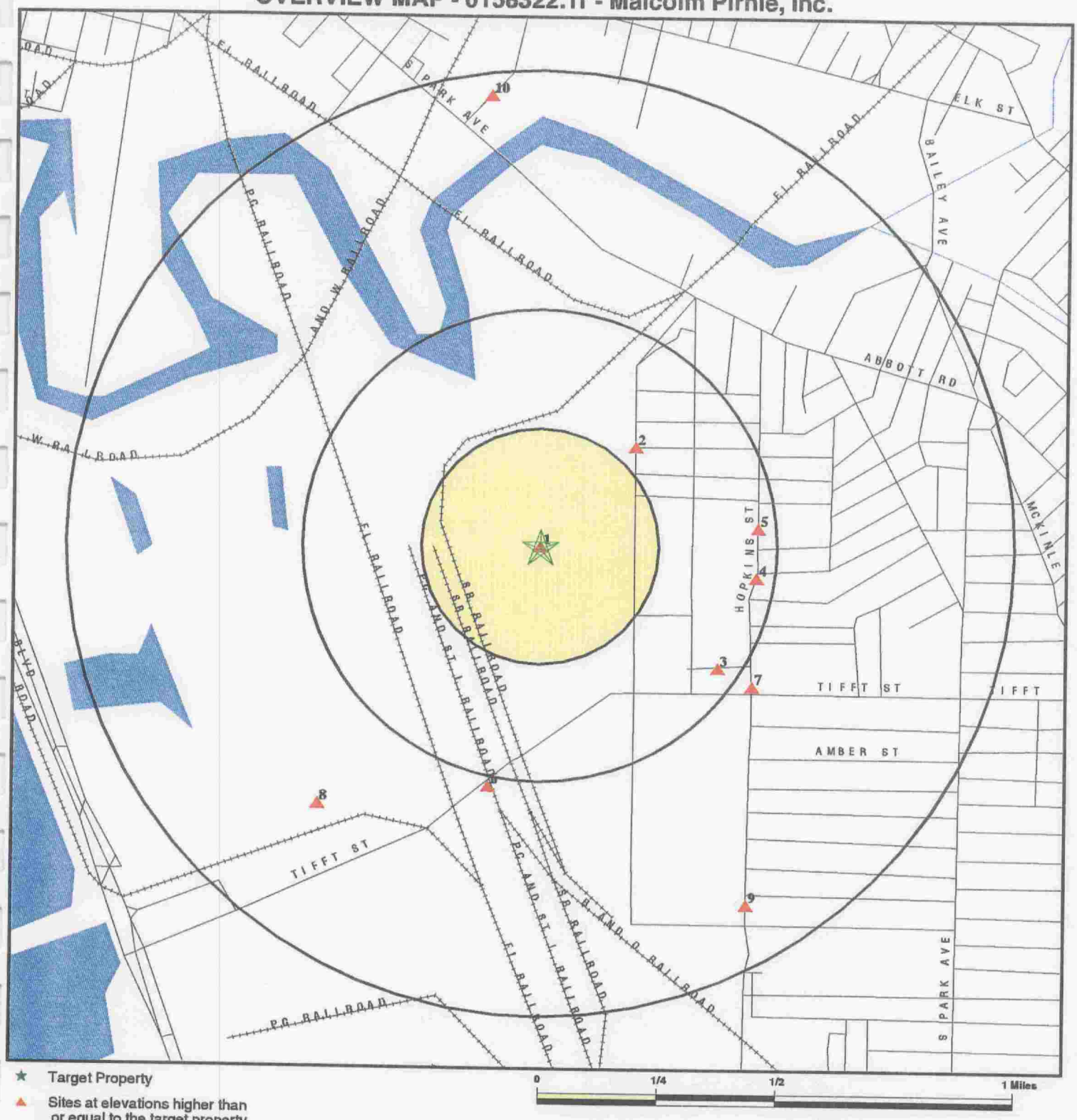
ERIE COUNTY, NY

Number of sites tested: 622

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area	1.000 pCi/L	89%	11%	0%
Basement	1.150 pCi/L	87%	11%	2%

† Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map. USGS Digital Data Series DDS - 11 (1994)
‡ U.S. EPA Ground Water Handbook, Vol I: Ground Water and Contamination. Office of Research and development EPA/625/6-90/016a Chapter 4, page 78 September 1990.

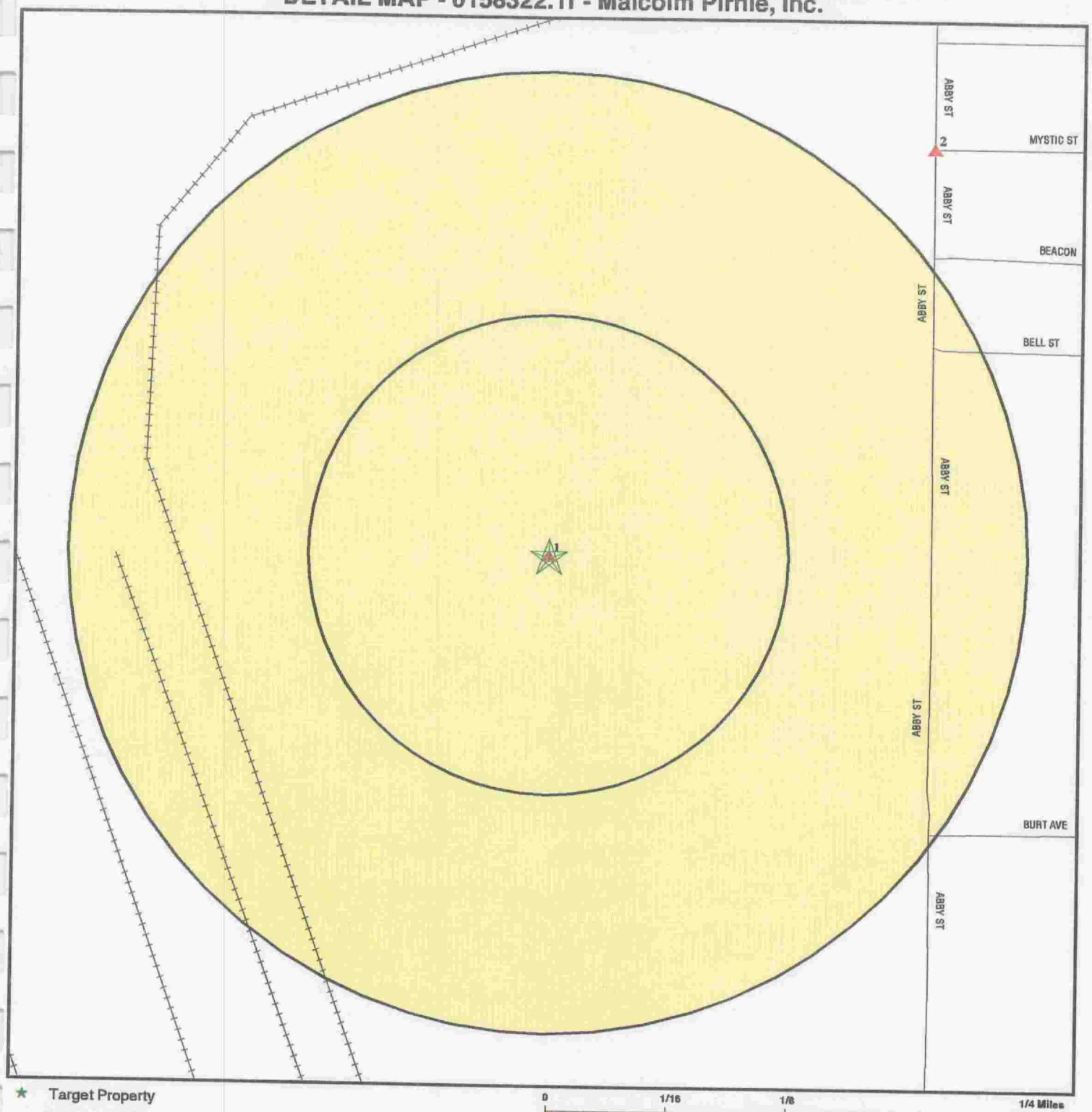
OVERVIEW MAP - 0158322.1r - Malcolm Pirnie, Inc.



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- Coal Gasification Sites (if requested)
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines

TARGET PROPERTY:	Former Republic Steel Property	CUSTOMER:	Malcolm Pirnie, Inc.
ADDRESS:	South Park, Abbey St.+Tifft St	CONTACT:	Jeanne Asquith
CITY/STATE/ZIP:	Buffalo NY 14220	INQUIRY #:	0158322.1r
LAT/LONG:	42.8512 / 78.8410	DATE:	February 06, 1997 4:29 pm

DETAIL MAP - 0158322.1r - Malcolm Pirnie, Inc.



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites (if requested)
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines

TARGET PROPERTY:	Former Republic Steel Property	CUSTOMER:	Malcolm Pirnie, Inc.
ADDRESS:	South Park, Abbey St.+Tifft St	CONTACT:	Jeanne Asquith
CITY/STATE/ZIP:	Buffalo NY 14220	INQUIRY #:	0158322.1r
LAT/LONG:	42.8512 / 78.8410	DATE:	February 06, 1997 4:31 pm

MAP FINDINGS SUMMARY SHOWING ALL SITES

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
NPL		1.000	0	0	0	0	NR	0
Delisted NPL		TP	NR	NR	NR	NR	NR	0
RCRIS-TSD		1.000	0	0	0	2	NR	2
State Haz. Waste		1.000	0	0	2	3	NR	5
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		TP	NR	NR	NR	NR	NR	0
CORRACTS		1.000	0	0	0	1	NR	1
State Landfill		0.500	0	0	0	NR	NR	0
LUST		0.500	0	0	2	NR	NR	2
UST		0.250	0	0	NR	NR	NR	0
AST		0.125	0	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
RCRIS Sm. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRIS Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
NY Spills	X	TP	NR	NR	NR	NR	NR	0
ROD		1.000	0	0	0	0	NR	0
CONSENT		1.000	0	0	0	0	NR	0
Coal Gas		1.000	0	0	0	0	NR	0

TP = Target Property

NR = Not Requested at this Search Distance

* Sites may be listed in more than one database

MAP FINDINGS SUMMARY SHOWING
ONLY SITES HIGHER THAN OR THE SAME ELEVATION AS TP

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
NPL		1.000	0	0	0	0	NR	0
Delisted NPL		TP	NR	NR	NR	NR	NR	0
RCRIS-TSD		1.000	0	0	0	2	NR	2
State Haz. Waste		1.000	0	0	2	3	NR	5
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		TP	NR	NR	NR	NR	NR	0
CORRACTS		1.000	0	0	0	1	NR	1
State Landfill		0.500	0	0	0	NR	NR	0
LUST		0.500	0	0	2	NR	NR	2
UST		0.250	0	0	NR	NR	NR	0
AST		0.125	0	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
RCRIS Sm. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRIS Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
NY Spills	X	TP	NR	NR	NR	NR	NR	0
ROD		1.000	0	0	0	0	NR	0
CONSENT		1.000	0	0	0	0	NR	0
Coal Gas		1.000	0	0	0	0	NR	0

TP = Target Property

NR = Not Requested at this Search Distance

* Sites may be listed in more than one database

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

---

1 Target Property — **REPUBLIC STEEL**, **SOUTH PARK AVENUE**, **BUFFALO, NY** — **NY Spills** — **S102178877**, **N/A**

SPILLS:

Facility ID:	9408504	Region of Spill:	9
Facility Contact:	Not reported	Facility Tele:	Not reported
Investigator:	JDC	Spill Type:	Facility
Caller Name:	GLENN HAFNER	Caller Agency:	MOBIL OIL
Caller Phone:	(716) 827-5127	Caller Extension:	Not reported
Notifier Name:	Not reported	Notifier Agency:	Not reported
Notifier Phone:	Not reported	Notifier Extension:	Not reported
Spiller Contact:	Not reported	Spiller Phone:	Not reported
Spiller:	UNKNOWN		
Address	Not reported		
	Not reported		
Spill Class:	No spill occured. No DEC Response. No corrective action required.		
Spill Closed Dt:	02/02/1995		
Material Class:	Petroleum	Spilled Code:	0066
Quantity Spilled:	0 gallons	Quant Recovered:	0 gallons
Spill Cause:	Abandoned Drums	Resource Affected:	On Land
Water Affected:	Not reported	Spill Source:	Other Commercial/Industrial
Spill Notifier:	Citizen	PBS Number:	Not reported
Spill Date:	09/01/1994 12:00	Reported to Dept:	09/26/1994 14:00
Tank Number:	Not reported	Tank Capacity:	0 Gallons
Test method:	Not reported	Leak Rate:	0.00
Gross Leak/Fail:	Not reported		
Cleanup Ceased:	02/02/1995		
Last Inspection:	Not reported		
Cleanup Meets Standard:	True		
Recommended Penalty:	No Penalty		
Spiller Cleanup Date:	Not reported		
Enforcement Date:	Not reported		
Investigation Complete:	Not reported		
UST Involvement:	Fale		
Spill Record Last Update:	02/07/1995		
Corrective Action Plan Submitted:	Not reported		
Date Spill Entered In Computer Data File:	09/30/1994		

---

2 NE 1/4-1/2 Higher — **DONNER HANNA COKE**, **ABBY AND MYSTIC STREET**, **BUFFALO, NY 14220** — **SHWS** — **S101008660**, **N/A**

DONNER HANNA COKE (Continued) **S101008660**

SHWS:

Facility ID:	915017	EPA ID:	NYD002110971
Owner:	Hanna Furnace Corporation Box A, South Park Station Buffalo, NY 14220		
Owner Telephone:	Not reported		
Operator:	Hanna Furnace Corporation Box A South Park Station Buffalo, NY 14220		
Contact:	Kevin Mahar	Telephone	Not reported
Site Classification:	Does not present a significant threat to the public health or the environment - action may be defered.		
Region:	9		
Site Type:	Dump		
Acres:	33	User:	Donner Hanna Coke
HW Started:	1951	HW Ended:	1975
HW Disposed:	Ammonium sulfate, Other coke related waste		
Units:	Unknown, Unknown		
Air Data:	Unavailable	Surf. Water Data:	Unavailable
Grnd. Water Data:	Available	Soil Data:	Available
Sediment Data:	Unavailable		
Ground Water Standards Contravention:		Yes	
Drinking Water Standards Contravention:		No	
Surface Water Standards Contravention:		No	
Air Standards Contravention:		No	
Enforcement Status:	Not reported	Legal Action:	No
State Action:	No	Fed Action:	No
Remedial Action:	None		
Remed action type:	None		
Soil Type:	Urban soil & layers of clay found at 4-6 ft. depth		
Grnd Water Depth:	Unknown		

Assessment of Environmental Problems:

Analysis of the soil samples shows high levels of most of thePNAs, and the concentration of iron was higher than backgroundlevels. Groundwater is also contaminated at this site.

Assessment of Health Problems:

Access to the site is partially controlled. The surrounding areaconsists of many other hazardous waste sites and heavy industries.Direct on-site contact with contaminated soils, leachate, a tar-likesubstance extruding from the subsurface, surface water and sediments arethe more likely possible routes of exposure. Groundwater standards areexceeded for arsenic, cyanide and manganese while drinking waterstandards are exceeded for acetone, benzene, toluene and metals. Publicwater serves the area.

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3 **TIFFT AND HOPKINS** **SHWS** **S101008743**
SE **PROVIDENCE STREET (PAPER STREET)** **N/A**
1/4-1/2 **BUFFALO, NY**
Higher

TIFFT AND HOPKINS (Continued) **S101008743**

SHWS:

Facility ID:	915131	EPA ID:	Not reported
Owner:	Artim Transportation Systems, Inc. PO Box 10834 Merrillville, IN 46411		
Owner Telephone:	Not reported		
Operator:	Consumer Beverages 2230 South Park Buffalo, NY 14220		
Contact:	Not reported	Telephone	Not reported
Site Classification:	Temporary classification assigned to sites that have inadiquate and/or insufficient data for inclusion in any of the other classifications.		
Region:	9		
Site Type:	Landfill		
Acres:	Not reported	User:	unknown
HW Started:	Not reported	HW Ended:	Not reported
HW Disposed:	unknown wastes		
Units:	unknown		
Air Data:	Unavailable	Surf. Water Data:	Unavailable
Grnd. Water Data:	Unavailable	Soil Data:	Available
Sediment Data:	Unavailable		
Ground Water Standards Contravention:		No	
Drinking Water Standards Contravention:		No	
Surface Water Standards Contravention:		No	
Air Standards Contravention:		No	
Enforcement Status:	Not reported	Legal Action:	No
State Action:	No	Fed Action:	No
Remedial Action:	None		
Remed action type:	none		
Soil Type:	unknown		
Grnd Water Depth:	unknown		

Assessment of Environmental Problems:
Subsurface soil is contaminated with PAHs and chlorobenzene.

Assessment of Health Problems:
Relatively high concentrations of chlorobenzene (2,300ppb),1,2-dichlorobenzene (340,000 ppb), 1,2,4-trichlorobenzene (63,000 ppb),and naphthalene (810,000 ppb) were documented in subsurface soils duringthe Preliminary Site Assessment. Presently the potential of exposure tothese chemicals is limited because of an existing clay cap andpavement. However, if this cap is disturbed exposure to these compoundsis possible. The immediate area is served by public water and there areno known users of groundwater in the immediate area.

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4 East 1/4-1/2 Higher **DAVIS & MAVIS 478 HOPKINS** **LUST** **S100560472**
478 HOPKINS ST **N/A**
BUFFALO, NY

LUST:

Facility ID:	9306635	Region of Spill:	9
Facility Contact:	Not reported	Facility Tele:	Not reported
Investigator:	RMC	Spill Type:	Facility
Caller Name:	JOHN OTTO	Caller Agency:	NYSDEC
Caller Phone:	(716) 851-7220	Caller Extension:	Not reported
Notifier Name:	Not reported	Notifier Agency:	Not reported
Notifier Phone:	Not reported	Notifier Extension:	Not reported
Spiller Contact:	Not reported	Spiller Phone:	(414) 658-4831

DAVIS & MAVIS 478 HOPKINS (Continued) **S100560472**

Spiller: KAT REALTY
Address: 4314 39TH AVENUE
KENOSHA, WI 53144
Spill Class: Known release with minimal potential for fire or hazard. DEC Response. Willing Responsible Party. Corrective action taken.
Spill Closed Dt: 12/29/1993
Spill Cause: Tank Failure
Water Affected: Not reported
Spill Notifier: DEC
Spill Date: 08/30/1993 09:00
Cleanup Ceased: 12/28/1993
Last Inspection: 08/31/1993
Cleanup Meets Standard: False
Recommended Penalty: No Penalty
Spiller Cleanup Date: Not reported
Enforcement Date: Not reported
Investigation Complete: Not reported
UST Involvement: True
Spill Record Last Update: 01/11/1994
Corrective Action Plan Submitted: Not reported
Date Spill Entered In Computer Data File: 08/31/1993
Resource Affected: On Land
Spill Source: Other Commercial/Industrial
PBS Number: 9-421545
Reported to Dept: 08/30/1993 09:30

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5 East 1/4-1/2 Higher **PALLET EXCHANGE, INC.** **UST** **U001329151**
534 HOPKINS ST. **LUST** **N/A**
BUFFALO, NY 14220

LUST:
Facility ID: 8700394
Facility Contact: Not reported
Investigator: MNP
Caller Name: Not reported
Caller Phone: Not reported
Notifier Name: Not reported
Notifier Phone: Not reported
Spiller Contact: Not reported
Spiller: PALLET EXCHANGE
Address: 534 HOPKINS STREET
BUFFALO, NY
Spill Class: Not reported
Spill Closed Dt: 12/10/1987
Spill Cause: Tank Failure
Water Affected: Not reported
Spill Notifier: Other
Spill Date: 04/09/1987 16:35
Cleanup Ceased: 12/10/1987
Last Inspection: 09/03/1987
Cleanup Meets Standard: True
Recommended Penalty: No Penalty
Spiller Cleanup Date: Not reported
Enforcement Date: Not reported
Investigation Complete: Not reported
UST Involvement: True
Spill Record Last Update: 12/10/1987
Corrective Action Plan Submitted: Not reported
Date Spill Entered In Computer Data File: 04/15/1987
Region of Spill: 9
Facility Tele: Not reported
Spill Type: Facility
Caller Agency: Not reported
Caller Extension: Not reported
Notifier Agency: Not reported
Notifier Extension: Not reported
Spiller Phone: (716) 823-2400
Resource Affected: Groundwater
Spill Source: Gas Station
PBS Number: Not reported
Reported to Dept: 04/09/1987 16:35

PALLET EXCHANGE, INC. (Continued) **U001329151**

PBS UST:

Facility ID:	9-488798	CBS Number:	Not reported
Town:	Not reported	SWIS ID:	1402
Telephone:	(716) 823-2400	Location:	Not reported
Operator:	PALLET EXCHANGE, INC.		
Contact:	Not reported		
Emergency Contact:	JAMES R. JANKOWIAK, (716) 675-8725		
Facility Type:	Not reported		
Total Tanks:	1	Old PBS Num:	Not reported
Owner:	PALLET EXCHANGE, INC. 534 HOPKINS ST. BUFFALO, NY 14220 (716) 823-2400		
Owner Type:	Not reported	Owner Mark:	First Owner
Owner Subtype:	Not reported		
Mailing Address:	PALLET EXCHANGE, INC. 534 HOPKINS ST. BUFFALO, NY 14220 (716) 823-2400 Not Reported		
Facility Status:	Inactive	Total Capacity:	0
Certification:	06/23/1989	Expiration:	06/23/1994
Tank Status:	Closed Before April 1, 1991		
Tank Location:	UNDERGROUND		
Tank ID:	001	Install Date:	00/00
Product Stored:	NOS 1,2, OR 4 FUEL OIL	Tank Type:	Steel/carbon steel
Tank Internal:	Not reported	Pipe Internal:	Not reported
Pipe Location:	Not reported	Pipe Type:	COPPER
Tank External:	Not reported		
Pipe External:	Not reported		
Second Containment:	NONE		
Leak Detection:	NONE		
Overfill Prot:	Not reported	Dispenser:	Submersible
Date Tested:	Not reported	Next Test Date:	Not reported
Date Closed:	00/00	Test Method:	Not reported
Data File:	Chemical Bulk Storage Facility		

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6 SSW 1/2-1 Higher **LEHIGH VALLEY RR**
TIFFT STREET
BUFFALO, NY 14211

FINDS 1000230818
RCRIS-LQG NYD000513945
CERC-NFRAP
SHWS
SWF/LF

CERCLIS-NFRAP Classification Data:

Site Incident Category:	Not reported	Federal Facility:	NO
Ownership Status:	OTHER	NPL Status:	NOT ON NPL
EPA Notes:	ENTER AS A NEW SITE; PA/SI WILL BE THE PHASE II (THE SAME DOCUMENT) STATE ID # 915071		

CERCLIS-NFRAP Assessment History:

Assessment:	FINAL HAZARD RANKING DETRMINED	Completed:	08/01/82
Assessment:	SCREENING SITE INSPECTION	Completed:	02/14/91
Assessment:	DISCOVERY	Completed:	08/01/82
Assessment:	PRELIMINARY ASSESSMENT	Completed:	05/01/83

CERCLIS-NFRAP Alias Name(s):
TIFFT FARM PRESERVE LF
TIFFT ST/LEHIGH VALLEY RR (OLD NAME)

LEHIGH VALLEY RR (Continued) **1000230818**

RCRIS:
Owner: LEIGH VALLEY RAILROAD CO
(513) 574-6600

Contact: KERRY HANLON
(203) 796-5252

Classification: Large Quantity Generator

Waste	Quantity	Waste	Quantity
F001	0.000 (N)	NONE	0.000 (N)

(P) = Pounds , (K) = Kilograms , (M) = Metric Tons , (T) = Tons , (N) = Not Reported

Used Oil Recyc: No

Violation Status: No violations found

SHWS:

Facility ID:	915071	EPA ID:	NYD000513945
Owner:	Lehigh Valley Railroad Co. 415 Brighton St. Bethlehem, PA 18015		
Owner Telephone:	Not reported		
Operator:	Booth Oil Co. Not reported Not reported		
Contact:	Not reported	Telephone	Not reported
Site Classification:	Site is properly closed - no evidence of present or potential adverse impact - no further action is required.		
Region:	9		
Site Type:	Dump		
Acres:	Not reported	User:	Lehigh Valley Railroad
HW Started:	1977	HW Ended:	1982
HW Disposed:	Waste oil mixed with chlorinated volatile, organic compounds. (RCRA F001 Waste)		
Units:	1,000 gallons estimated		
Air Data:	Unavailable	Surf. Water Data:	Available
Grnd. Water Data:	Available	Soil Data:	Available
Sediment Data:	Available		
Ground Water Standards Contravention:		Yes	
Drinking Water Standards Contravention:		No	
Surface Water Standards Contravention:		Yes	
Air Standards Contravention:		No	
Enforcement Status:	Negotiation In Progress	Legal Action:	No
State Action:	No	Fed Action:	No
Remedial Action:	None		
Remed action type:	None		
Soil Type:	Clay with interbedded silt and sand		
Grnd Water Depth:	Varies from 2 to 10 feet		

LEHIGH VALLEY RR (Continued) **1000230818**

Assessment of Environmental Problems:
Residual hazardous waste remains on-site. Site is properly closed, noevidence of present or potential adverse impact; no further action isrequired at this site.

Assessment of Health Problems:
Land use in the vicinity of the site is a mixture of undevelopedrailroad and recreational areas. There are no access restrictions tothe property. Previous investigations have documented contaminationof groundwater, surficial soils, sludge and solid wastes on site withheavy metals and organic compounds. The removal of hazardous wasteand some soils has occurred, however stained and oil-soaked soilsstill remain on-site. Therefore, the potential for exposure by directcontact with contaminated soil or inhalation of contaminated windborneparticulates exist. Groundwater is not used as a drinking watersource. Public water is supplied to the area.

LF:

Facility ID:	15S85	Telephone:	Not reported
DEC Region:	9	Permit #:	Not reported
Permit issue date:	Not reported	Permit Expires:	Not reported
Authrzd/Operate Dt:	Not reported	Constrct Perm #:	Not reported
Auth. to Construct:	Not reported	Const Permit Exp:	Not reported
Regulatory Status:	None	Receiving Waste:	False
Started Rec Waste:	Not reported	Stop Rec Waste:	Not reported
Aquifer:	none		
Date Ordered On Concent Signed:		Not reported	
Accomplish Date Of Order:		Not reported	
Inactive HWS:	True	Inactive HWS Num:	915071
Inactive HWS Class:	Temporary classification assigned to sites that have inadequate and/or insufficient data or inclusion in any of the other classifications.		
Waste type:	Not reported		
Owner Name:	Not reported	Owner Type:	Private
Mail Address:	Not reported		
Owner Phone Num:	Not reported	Operator Name:	Not reported
Ny Transverse Mercator Coordinates East:		Not reported	
Ny Transverse Mercator Coordinates North:		Not reported	
Annual Report Submitted to ALB:			
1989:	False	1990:	False
1991:	False	1992:	False
1993:	False	1994:	False
1995:	False		
Primary Liner:	Not reported	Secondary Liner:	Not reported
Annual Rprt Waived:	Not reported	Tiping Fee Rprtd:	Not reported

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7 **ADVANCED ELECTRO POLISHING INC** **RCRIS-SQG** **1000912642**
ESE **356 HOPKINS ST** **FINDS** **NY0000886150**
1/2-1 **BUFFALO, NY 14220** **RCRIS-TSD**
Higher

ADVANCED ELECTRO POLISHING INC (Continued) **1000912642**

RCRIS:
Owner: ADVANCED ELECTRO POLISHING INC
(716) 821-9171

Contact: DENNIS HAYES
(716) 821-9171

Classification: Conditionally Exempt Small Quantity Generator, TSDF

Waste	Quantity	Waste	Quantity
D000	0.000 (N)	D002	0.000 (N)
D007	0.000 (N)		

(P) = Pounds , (K) = Kilograms , (M) = Metric Tons , (T) = Tons , (N) = Not Reported

Used Oil Recyc: No

TSDF Activities: Not reported

Violation Status: No violations found

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8 SW 1/2-1 Higher **ALLTIFT LANDFILL** **SHWS** **S101008672**
TIFFT STREET **N/A**
BUFFALO, NY 14202

SHWS:

Facility ID:	915054	EPA ID:	NYD000513713
Owner:	Alltift Inc. PO Box 246 Buffalo, NY 14240		
Owner Telephone:	Not reported		
Operator:	Downing Cont. Service PO Box 246 Buffalo, NY 14240		
Contact:	Not reported	Telephone	Not reported
Site Classification:	Significant threat to the public health or environment - action required.		
Region:	9		
Site Type:	Landfill		
Acres:	25	User:	Downing Cont.Serv.,Buffalo(C)Altift,Inc
HW Started:	1930	HW Ended:	1975
HW Disposed:	Miscellaneous Organic Chemicals, Inorganic Chemicals, Chrome Sludge, Copper Sulfate, Nitrobenzene, Monochlorobenzene, Napthalene		
Units:	unknown, unknown, unknown, unknown, unknown, unknown, unknown		
Air Data:	Unavailable	Surf. Water Data:	Available
Grnd. Water Data:	Available	Soil Data:	Available
Sediment Data:	Available		
Ground Water Standards Contravention:		Yes	
Drinking Water Standards Contravention:		No	
Surface Water Standards Contravention:		Yes	
Air Standards Contravention:		No	
Enforcement Status:	Negotiation In Progress	Legal Action:	No
State Action:	Yes	Fed Action:	No
Remedial Action:	Proposed, In Progress		
Remed action type:	RD-RA		
Soil Type:	Clay		
Grnd Water Depth:	0-20 feet		

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

ALLTIFT LANDFILL (Continued) **S101008672**

Assessment of Environmental Problems:
The groundwater, surface waters and sediments have been contaminatedby hazardous wastes. Preliminary results from the Remedial Investi-gation indicate that the wastes extend to the east of the existingborder.

Assessment of Health Problems:
Not reported

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9 SSE 1/2-1 Higher **RAMCO STEEL** **SHWS** **S101008670**
110 HOPKINS ST **N/A**
BUFFALO, NY 14202

SHWS:

Facility ID:	915046B	EPA ID:	NYD000961003
Owner:	Hopkins Tifft Realty Corp 110 Hopkins Street Buffalo, NY 14240		
Owner Telephone:	Not reported		
Operator:	Ramco Steel, Bliss & Laughlin 110 Hopkins Street Buffalo, NY		
Contact:	Not reported	Telephone	Not reported
Site Classification:	Significant threat to the public health or environment - action required.		
Region:	9		
Site Type:	Lagoon		
Acres:	8.463	User:	Ramco Steel, Bliss & Laughlin
HW Started:	1929	HW Ended:	1979
HW Disposed:	Pickle liquor, Rinse water & lime sludge, Iron and chrome		
Units:	75,000 gallons/year, 6,000,000 gallons/year, unknown		
Air Data:	Unavailable	Surf. Water Data:	Unavailable
Grnd. Water Data:	Available	Soil Data:	Available
Sediment Data:	Available		
Ground Water Standards Contravention:		Yes	
Drinking Water Standards Contravention:		No	
Surface Water Standards Contravention:		No	
Air Standards Contravention:		No	
Enforcement Status:	Negotiation In Progress	Legal Action:	No
State Action:	Yes	Fed Action:	No
Remedial Action:	None		
Remed action type:	Not reported		
Soil Type:	Cinders, rock fill underlain by clay		
Grnd Water Depth:	Unknown		

RAMCO STEEL (Continued) **S101008670**

Assessment of Environmental Problems:
The pond which is listed on the national wetland inventory, iscontaminated with metals and its restoration is warranted. The areagroundwater has also been contaminated.

Assessment of Health Problems:
The land use in the vicinity of the site is industrial and commercialincluding rail service. Residential neighborhoods are present 400meters to the east of the site. Past investigations have documentedstained soils, discolored sediments and water, spilled waste materialand drums on-site. Discolored water has been observed leaving the sitevia a drainage ditch that flows north. This drainage system flowstoward the Tifft Farm Nature Preserve. Access to the site is possiblefrom the back of the property, however, there is little evidence thatresidents utilize this area. Potential exposure pathways on-siteinclude direct contact with waste material, affected soils, sedimentsand surface water. The site is also adjacent to and encroached upon bythe Alltift Landfill (a Class 2 site known to have received hazardouswaste). The area is served by public water. The RI Investigation didnot document the disposal of listed hazardous waste.

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10 North 1/2-1 Higher **PVS CHEMICAL INC NEW YORK** **FINDS** **1000106511**
55 LEE ST **RCRIS-LQG** **NYD980534390**
BUFFALO, NY 14210 **TRIS**
RCRIS-TSD
RAATS
CORRACTS
NY Spills

CORRACTS Data:
Prioritization: High
Status: Not reported

RCRIS:
Owner: PVS CHEMICALS INC
(313) 921-1200

Contact: WILLIAM DECKER
(716) 825-5762

Classification: Large Quantity Generator, TSDF

Waste	Quantity	Waste	Quantity
D002	0.000 (N)	D002	12,700.800 (M)
NONE	0.000 (N)		

(P) = Pounds , (K) = Kilograms , (M) = Metric Tons , (T) = Tons , (N) = Not Reported

Used Oil Recyc: No

TSDF Activities: Not reported

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
- Facility has an active water discharge permit (under PCS)
- Facility is monitored or permitted for air emissions under the Clean Air Act (under AFS/AIRS)
- Civil judicial and administrative enforcement case against facility (under DOCKET)

SPILLS:

Facility ID:	9510124	Region of Spill:	9
Facility Contact:	KEN HALGASH	Facility Tele:	(716) 879-7173
Investigator:	KAH	Spill Type:	UST

PVS CHEMICAL INC NEW YORK (Continued) **1000106511**

Caller Name:	JANICE BENEDICT	Caller Agency:	SPILL CENTER
Caller Phone:	(603) 887-2746	Caller Extension:	Not reported
Notifier Name:	KEN HALGASH	Notifier Agency:	PRAXAIR
Notifier Phone:	(716) 879-7173	Notifier Extension:	Not reported
Spiller Contact:	KEN HALGASH	Spiller Phone:	(716) 879-7173
Spiller:	PRAXAIR		
Address	PO BOX 44		
	TONAWANDA, NY 14151-		
Spill Class:	Possible release with minimal potential for fire or hazard or Known release with no damage. DEC Response. Willing Responsible Party. Corrective action taken.		
Spill Closed Dt:	11/14/1995		
Material Class:	Petroleum	Spilled Code:	0010
Quantity Spilled:	1 gallons	Quant Recovered:	1 gallons
Spill Cause:	Equipment Failure	Resource Affected:	On Land
Water Affected:	Not reported	Spill Source:	Other Commercial/Industrial
Spill Notifier:	Responsible Party	PBS Number:	Not reported
Spill Date:	11/13/1995 22:00	Reported to Dept:	11/13/1995 23:52
Tank Number:	Not reported	Tank Capacity:	0 Gallons
Test method:	Not reported	Leak Rate:	0.00
Gross Leak/Fail:	Not reported		
Cleanup Ceased:	11/14/1995		
Last Inspection:	Not reported		
Cleanup Meets Standard:	True		
Recommended Penalty:	No Penalty		
Spiller Cleanup Date:	Not reported		
Enforcement Date:	Not reported		
Investigation Complete:	Not reported		
UST Involvement:	Fale		
Spill Record Last Update:	12/14/1995		
Corrective Action Plan Submitted:	Not reported		
Date Spill Entered In Computer Data File:	11/13/1995		

Facility ID:	8700944	Region of Spill:	9
Facility Contact:	Not reported	Facility Tele:	Not reported
Investigator:	JDC	Spill Type:	Facility
Caller Name:	Not reported	Caller Agency:	Not reported
Caller Phone:	Not reported	Caller Extension:	Not reported
Notifier Name:	Not reported	Notifier Agency:	Not reported
Notifier Phone:	Not reported	Notifier Extension:	Not reported
Spiller Contact:	Not reported	Spiller Phone:	(716) 825-5762
Spiller:	PVS CHEMICAL		
Address	55 LEE STREET		
	BUFFALO, NY		
Spill Class:	Not reported		
Spill Closed Dt:	05/04/1987		
Material Class:	Not reported	Spilled Code:	Not reported
Quantity Spilled:	0 UNITS NOT REPORTED	Quant Recovered:	0 UNITS NOT REPORTED
Spill Cause:	Unknown	Resource Affected:	Air
Water Affected:	Not reported	Spill Source:	Other Commercial/Industrial
Spill Notifier:	Responsible Party	PBS Number:	Not reported
Spill Date:	05/04/1987 05:20	Reported to Dept:	05/04/1987 05:50
Tank Number:	Not reported	Tank Capacity:	0 Gallons
Test method:	Not reported	Leak Rate:	0.00
Gross Leak/Fail:	Not reported		
Cleanup Ceased:	05/04/1987		
Last Inspection:	05/04/1987		

PVS CHEMICAL INC NEW YORK (Continued) **1000106511**

Cleanup Meets Standard: True
Recommended Penalty: No Penalty
Spiller Cleanup Date: Not reported
Enforcement Date: Not reported
Investigation Complete: Not reported
UST Involvement: Fale
Spill Record Last Update: Not reported
Corrective Action Plan Submitted: Not reported
Date Spill Entered In Computer Data File: 05/11/1987

Facility ID: 8702972
Facility Contact: Not reported
Investigator: RNL
Caller Name: Not reported
Caller Phone: Not reported
Notifier Name: Not reported
Notifier Phone: Not reported
Spiller Contact: Not reported
Spiller: CHEMICAL PROCESS & SUPPLY
Address 55 LEE STREET
BUFFALO, NY 14210
Spill Class: Not reported
Spill Closed Dt: 09/11/1987
Material Class: Not reported
Quantity Spilled: 0 UNITS NOT REPORTED
Spill Cause: Equipment Failure
Water Affected: BUFFALO RIVER
Spill Notifier: Responsible Party
Spill Date: 07/13/1987 09:00
Tank Number: Not reported
Test method: Not reported
Gross Leak/Fail: Not reported
Cleanup Ceased: 09/11/1987
Last Inspection: Not reported
Cleanup Meets Standard: True
Recommended Penalty: No Penalty
Spiller Cleanup Date: Not reported
Enforcement Date: Not reported
Investigation Complete: Not reported
UST Involvement: Fale
Spill Record Last Update: 09/14/1987
Corrective Action Plan Submitted: Not reported
Date Spill Entered In Computer Data File: 07/14/1987

Region of Spill: 9
Facility Tele: Not reported
Spill Type: Facility
Caller Agency: Not reported
Caller Extension: Not reported
Notifier Agency: Not reported
Notifier Extension: Not reported
Spiller Phone: (716) 825-5762
Spilled Code: Not reported
Quant Recovered: 0 UNITS NOT REPORTED
Resource Affected: Surface Water
Spill Source: Other Commercial/Industrial
PBS Number: Not reported
Reported to Dept: 07/13/1987 16:00
Tank Capacity: 0 Gallons
Leak Rate: 0.00

Facility ID: 8704461
Facility Contact: Not reported
Investigator: MNP
Caller Name: Not reported
Caller Phone: Not reported
Notifier Name: Not reported
Notifier Phone: Not reported
Spiller Contact: Not reported
Spiller: PVS
Address 55 LEE STREET
BUFFALO, NY
Spill Class: Not reported
Spill Closed Dt: 08/28/1987

Region of Spill: 9
Facility Tele: Not reported
Spill Type: Facility
Caller Agency: Not reported
Caller Extension: Not reported
Notifier Agency: Not reported
Notifier Extension: Not reported
Spiller Phone: (716) 825-5762

PVS CHEMICAL INC NEW YORK (Continued) **1000106511**

Material Class: Not reported
Quantity Spilled: 0 UNITS NOT REPORTED
Spill Cause: Human Error
Water Affected: Not reported
Spill Notifier: Responsible Party
Spill Date: 08/28/1987 19:35
Tank Number: Not reported
Test method: Not reported
Gross Leak/Fail: Not reported
Cleanup Ceased: 08/28/1987
Last Inspection: Not reported
Cleanup Meets Standard: True
Recommended Penalty: No Penalty
Spiller Cleanup Date: Not reported
Enforcement Date: Not reported
Investigation Complete: Not reported
UST Involvement: Fale
Spill Record Last Update: 09/01/1987
Corrective Action Plan Submitted: Not reported
Date Spill Entered In Computer Data File: 08/31/1987

Spilled Code: Not reported
Quant Recovered: 0 UNITS NOT REPORTED
Resource Affected: Air
Spill Source: Other Commercial/Industrial
PBS Number: Not reported
Reported to Dept: 08/28/1987 19:49
Tank Capacity: 0 Gallons
Leak Rate: 0.00

Facility ID: 8709563
Facility Contact: Not reported
Investigator: JDC
Caller Name: CHRIS CANCILLA
Caller Phone: (716) 825-5712
Notifier Name: Not reported
Notifier Phone: Not reported
Spiller Contact: Not reported
Spiller: PVS CHEMICAL
Address 55 LEE STREET
BUFFALO, NY
Spill Class: Not reported
Spill Closed Dt: 02/12/1988
Material Class: Nonpetroleum/Nonhazardous
Quantity Spilled: 70 pounds
Spill Cause: Equipment Failure
Water Affected: Not reported
Spill Notifier: Responsible Party
Spill Date: 02/10/1988 12:50
Tank Number: Not reported
Test method: Not reported
Gross Leak/Fail: Not reported
Cleanup Ceased: 02/12/1988
Last Inspection: Not reported
Cleanup Meets Standard: True
Recommended Penalty: No Penalty
Spiller Cleanup Date: Not reported
Enforcement Date: Not reported
Investigation Complete: Not reported
UST Involvement: Fale
Spill Record Last Update: 03/29/1988
Corrective Action Plan Submitted: Not reported
Date Spill Entered In Computer Data File: 02/12/1988

Region of Spill: 9
Facility Tele: Not reported
Spill Type: Facility
Caller Agency: PVS CHEMICAL
Caller Extension: Not reported
Notifier Agency: Not reported
Notifier Extension: Not reported
Spiller Phone: (716) 825-5712

Spilled Code: 0127
Quant Recovered: 0 pounds
Resource Affected: Air
Spill Source: Other Commercial/Industrial
PBS Number: Not reported
Reported to Dept: 02/10/1988 16:58
Tank Capacity: 0 Gallons
Leak Rate: 0.00

Facility ID: 8801202
Facility Contact: Not reported

Region of Spill: 9
Facility Tele: Not reported

PVS CHEMICAL INC NEW YORK (Continued) **1000106511**

Investigator:	MJH	Spill Type:	Facility
Caller Name:	PATRICK MCPHERSON	Caller Agency:	PVS CHEMICAL
Caller Phone:	(716) 825-5762	Caller Extension:	Not reported
Notifier Name:	Not reported	Notifier Agency:	Not reported
Notifier Phone:	Not reported	Notifier Extension:	Not reported
Spiller Contact:	Not reported	Spiller Phone:	(716) 825-5762
Spiller:	PVS CHEMICAL		
Address	55 LEE STREET BUFFALO, NY		
Spill Class:	Not reported		
Spill Closed Dt:	05/09/1988		
Material Class:	Hazardous Material	Spilled Code:	1701
Quantity Spilled:	0 gallons	Quant Recovered:	0 gallons
Spill Cause:	Equipment Failure	Resource Affected:	Air
Water Affected:	Not reported	Spill Source:	Other Commercial/Industrial
Spill Notifier:	Responsible Party	PBS Number:	Not reported
Spill Date:	05/08/1988 10:40	Reported to Dept:	05/08/1988 10:40
Tank Number:	Not reported	Tank Capacity:	0 Gallons
Test method:	Not reported	Leak Rate:	0.00
Gross Leak/Fail:	Not reported		
Cleanup Ceased:	05/09/1988		
Last Inspection:	Not reported		
Cleanup Meets Standard:	True		
Recommended Penalty:	No Penalty		
Spiller Cleanup Date:	Not reported		
Enforcement Date:	Not reported		
Investigation Complete:	Not reported		
UST Involvement:	Fale		
Spill Record Last Update:	05/19/1988		
Corrective Action Plan Submitted:	Not reported		
Date Spill Entered In Computer Data File:	05/10/1988		

Facility ID:	8806982	Region of Spill:	9
Facility Contact:	Not reported	Facility Tele:	Not reported
Investigator:	CAF	Spill Type:	Facility
Caller Name:	CHRIS CANSILLA	Caller Agency:	PVS
Caller Phone:	(716) 825-5762	Caller Extension:	Not reported
Notifier Name:	Not reported	Notifier Agency:	Not reported
Notifier Phone:	Not reported	Notifier Extension:	Not reported
Spiller Contact:	Not reported	Spiller Phone:	(716) 825-5762
Spiller:	PVS		
Address	55LEE STREET BUFFALO, NY 14210		
Spill Class:	Not reported		
Spill Closed Dt:	11/29/1988		
Material Class:	Nonpetroleum/Nonhazardous	Spilled Code:	0039
Quantity Spilled:	50 gallons	Quant Recovered:	0 gallons
Spill Cause:	Equipment Failure	Resource Affected:	On Land
Water Affected:	Not reported	Spill Source:	Other Commercial/Industrial
Spill Notifier:	Responsible Party	PBS Number:	Not reported
Spill Date:	11/21/1988 11:00	Reported to Dept:	11/21/1988 11:10
Tank Number:	Not reported	Tank Capacity:	0 Gallons
Test method:	Not reported	Leak Rate:	0.00
Gross Leak/Fail:	Not reported		
Cleanup Ceased:	11/29/1988		
Last Inspection:	11/22/1988		
Cleanup Meets Standard:	True		

PVS CHEMICAL INC NEW YORK (Continued) **1000106511**

Recommended Penalty: No Penalty
Spiller Cleanup Date: Not reported
Enforcement Date: Not reported
Investigation Complete: Not reported
UST Involvement: Fale
Spill Record Last Update: 12/13/1988
Corrective Action Plan Submitted: Not reported
Date Spill Entered In Computer Data File: 11/22/1988

Facility ID: 9100414
Facility Contact: Not reported
Investigator: MEL
Caller Name: CHRIS CANACILLA
Caller Phone: (716) 825-5762
Notifier Name: Not reported
Notifier Phone: Not reported
Spiller Contact: Not reported
Spiller: PVS CHEMICAL
Address 55 LEE STREET
BUFFALO, NY
Spill Class: Not reported
Spill Closed Dt: 04/12/1991
Material Class: Not reported
Quantity Spilled: 0 UNITS NOT REPORTED
Spill Cause: Equipment Failure
Water Affected: BUFFALO RIVER
Spill Notifier: Responsible Party
Spill Date: 04/10/1991 01:30
Tank Number: Not reported
Test method: Not reported
Gross Leak/Fail: Not reported
Cleanup Ceased: 04/12/1991
Last Inspection: 04/10/1991
Cleanup Meets Standard: True
Recommended Penalty: No Penalty
Spiller Cleanup Date: Not reported
Enforcement Date: Not reported
Investigation Complete: Not reported
UST Involvement: Fale
Spill Record Last Update: 03/13/1992
Corrective Action Plan Submitted: Not reported
Date Spill Entered In Computer Data File: 04/12/1991

Region of Spill: 9
Facility Tele: Not reported
Spill Type: Facility
Caller Agency: PVS CHEMICAL
Caller Extension: Not reported
Notifier Agency: Not reported
Notifier Extension: Not reported
Spiller Phone: (716) 825-5762
Spilled Code: Not reported
Quant Recovered: 0 UNITS NOT REPORTED
Resource Affected: Surface Water
Spill Source: Other Commercial/Industrial
PBS Number: Not reported
Reported to Dept: 04/10/1991 03:11
Tank Capacity: 0 Gallons
Leak Rate: 0.00

Facility ID: 9109272
Facility Contact: Not reported
Investigator: MF
Caller Name: JOE FLANERY
Caller Phone: (716) 824-0499
Notifier Name: Not reported
Notifier Phone: Not reported
Spiller Contact: Not reported
Spiller: PVS CHEMICAL
Address 55 LEE STREET
BUFFALO, NY 14210
Spill Class: Not reported
Spill Closed Dt: 12/02/1991
Material Class: Not reported

Region of Spill: 9
Facility Tele: Not reported
Spill Type: Facility
Caller Agency: PVS
Caller Extension: Not reported
Notifier Agency: Not reported
Notifier Extension: Not reported
Spiller Phone: (716) 824-0499
Spilled Code: Not reported

PVS CHEMICAL INC NEW YORK (Continued) **1000106511**

Quantity Spilled:	0 UNITS NOT REPORTED	Quant Recovered:	0 UNITS NOT REPORTED
Spill Cause:	Equipment Failure	Resource Affected:	Air
Water Affected:	Not reported	Spill Source:	Other Commercial/Industrial
Spill Notifier:	Responsible Party	PBS Number:	Not reported
Spill Date:	11/30/1991 18:00	Reported to Dept:	11/30/1991 20:22
Tank Number:	Not reported	Tank Capacity:	0 Gallons
Test method:	Not reported	Leak Rate:	0.00
Gross Leak/Fail:	Not reported		
Cleanup Ceased:	12/02/1991		
Last Inspection:	Not reported		
Cleanup Meets Standard:	True		
Recommended Penalty:	No Penalty		
Spiller Cleanup Date:	Not reported		
Enforcement Date:	Not reported		
Investigation Complete:	Not reported		
UST Involvement:	Fale		
Spill Record Last Update:	12/19/1991		
Corrective Action Plan Submitted:	Not reported		
Date Spill Entered In Computer Data File:	12/02/1991		

Facility ID:	9110556	Region of Spill:	9
Facility Contact:	Not reported	Facility Tele:	Not reported
Investigator:	MF	Spill Type:	Facility
Caller Name:	CHRIS CANCILLA	Caller Agency:	PVS
Caller Phone:	(716) 825-5762	Caller Extension:	Not reported
Notifier Name:	Not reported	Notifier Agency:	Not reported
Notifier Phone:	Not reported	Notifier Extension:	Not reported
Spiller Contact:	Not reported	Spiller Phone:	(716) 825-5762
Spiller:	PVS CHEMICAL		
Address	55 LEE STREET BUFFALO, NY 14210		
Spill Class:	Not reported		
Spill Closed Dt:	01/10/1992		
Material Class:	Petroleum	Spilled Code:	0001
Quantity Spilled:	38 gallons	Quant Recovered:	30 gallons
Spill Cause:	Human Error	Resource Affected:	On Land
Water Affected:	Not reported	Spill Source:	Other Commercial/Industrial
Spill Notifier:	Responsible Party	PBS Number:	Not reported
Spill Date:	01/09/1992 04:00	Reported to Dept:	01/09/1992 08:46
Tank Number:	Not reported	Tank Capacity:	0 Gallons
Test method:	Not reported	Leak Rate:	0.00
Gross Leak/Fail:	Not reported		
Cleanup Ceased:	01/10/1992		
Last Inspection:	Not reported		
Cleanup Meets Standard:	True		
Recommended Penalty:	No Penalty		
Spiller Cleanup Date:	Not reported		
Enforcement Date:	Not reported		
Investigation Complete:	Not reported		
UST Involvement:	Fale		
Spill Record Last Update:	01/30/1992		
Corrective Action Plan Submitted:	Not reported		
Date Spill Entered In Computer Data File:	01/09/1992		

Facility ID:	9201381	Region of Spill:	9
Facility Contact:	Not reported	Facility Tele:	Not reported
Investigator:	RNL	Spill Type:	Facility

PVS CHEMICAL INC NEW YORK (Continued) **1000106511**

Caller Name:	CHRIS CANCILLA	Caller Agency:	PVS CHEMICAL
Caller Phone:	(716) 825-5762	Caller Extension:	Not reported
Notifier Name:	Not reported	Notifier Agency:	Not reported
Notifier Phone:	Not reported	Notifier Extension:	Not reported
Spiller Contact:	Not reported	Spiller Phone:	(716) 825-5762
Spiller:	PVS CHEMICAL		
Address	55 LEE STREET BUFFALO, NY		
Spill Class:	Known release that creates potential for fire or hazard. (Highly Improbable)		
Spill Closed Dt:	05/05/1992		
Material Class:	Nonpetroleum/Nonhazardous	Spilled Code:	0039
Quantity Spilled:	20 gallons	Quant Recovered:	0 gallons
Spill Cause:	Human Error	Resource Affected:	Surface Water
Water Affected:	Not reported	Spill Source:	Other Commercial/Industrial
Spill Notifier:	Responsible Party	PBS Number:	Not reported
Spill Date:	05/02/1992 17:00	Reported to Dept:	05/04/1992 18:12
Tank Number:	Not reported	Tank Capacity:	0 Gallons
Test method:	Not reported	Leak Rate:	0.00
Gross Leak/Fail:	Not reported		
Cleanup Ceased:	05/05/1992		
Last Inspection:	Not reported		
Cleanup Meets Standard:	True		
Recommended Penalty:	No Penalty		
Spiller Cleanup Date:	Not reported		
Enforcement Date:	Not reported		
Investigation Complete:	Not reported		
UST Involvement:	Fale		
Spill Record Last Update:	08/03/1992		
Corrective Action Plan Submitted:	Not reported		
Date Spill Entered In Computer Data File:	05/06/1992		

Facility ID:	9410426	Region of Spill:	9
Facility Contact:	Not reported	Facility Tele:	Not reported
Investigator:	FG	Spill Type:	Facility
Caller Name:	CHRIS KINSELLA	Caller Agency:	PVS
Caller Phone:	(716) 825-5762	Caller Extension:	Not reported
Notifier Name:	Not reported	Notifier Agency:	Not reported
Notifier Phone:	Not reported	Notifier Extension:	Not reported
Spiller Contact:	Not reported	Spiller Phone:	(716) 825-5762
Spiller:	PVS CHEMICAL		
Address	55 LEE STREET BUFFALO, NY		
Spill Class:	Known release that creates potential for fire or hazard. (Highly Improbable)		
Spill Closed Dt:	11/07/1994		
Material Class:	Nonpetroleum/Nonhazardous	Spilled Code:	0039
Quantity Spilled:	10 pounds	Quant Recovered:	0 pounds
Spill Cause:	Equipment Failure	Resource Affected:	Surface Water
Water Affected:	BUFFALO RIVER	Spill Source:	Other Commercial/Industrial
Spill Notifier:	Responsible Party	PBS Number:	Not reported
Spill Date:	11/04/1994 16:00	Reported to Dept:	11/04/1994 16:58
Tank Number:	Not reported	Tank Capacity:	0 Gallons
Test method:	Not reported	Leak Rate:	0.00
Gross Leak/Fail:	Not reported		
Cleanup Ceased:	11/07/1994		
Last Inspection:	Not reported		

PVS CHEMICAL INC NEW YORK (Continued) **1000106511**

Cleanup Meets Standard: True
Recommended Penalty: No Penalty
Spiller Cleanup Date: Not reported
Enforcement Date: Not reported
Investigation Complete: Not reported
UST Involvement: Fale
Spill Record Last Update: 11/14/1994
Corrective Action Plan Submitted: Not reported
Date Spill Entered In Computer Data File: 11/07/1994

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)	Facility ID
BUFFALO	S100668558	MCMANNUS STEEL CONSTR.	EAST FERRY AT LESLIE		LUST	8606908
BUFFALO	S100669696	RUBENSTEIN'S SCRAP YARD	HOPKINS STREET		LUST	9607636
BUFFALO	S100667145	PVS CHEMICAL	LEE STREET		LUST, NY Spills	9103867
BUFFALO	1000252436	ALTIFT REALTY	TIFFT ST	14220	CERCLIS, FINDS	
BUFFALO	S100667782	KENDALL OIL	TIFFT STREET		LUST	9203684
ERIE COUNTY	S101650734	NIAGARA LANDFILL INC			SWF/LF	
ERIE COUNTY	S101650780	EVANS LF (OLD) (T)			SWF/LF	
ERIE COUNTY	S101315475	NORTHSIDE TRANSFER STA.			SWF/LF	
ERIE COUNTY	S101315476	WMNY TRANSFER STATION			SWF/LF	
ERIE COUNTY	S101650750	NYS THRUWAY AUTH. SLF			SWF/LF	
ERIE COUNTY	S101650753	SQUAW ISLAND SLF			SWF/LF	
ERIE COUNTY	S101650768	NIMO-CHERRY FARM			SWF/LF	
ERIE COUNTY	S101650770	SPRINGVILLE LF (V)			SWF/LF	
ERIE COUNTY	S101650772	AMHERST LF (T)			SWF/LF	
ERIE COUNTY	S101650773	BLASDELL LF (V)			SWF/LF	
ERIE COUNTY	S101650774	DEPEW LF (V)			SWF/LF	
ERIE COUNTY	S101650775	GEORGE SCHREIBER			SWF/LF	
ERIE COUNTY	S101650776	ALLIED CHEM-HOPKINS ST.			SWF/LF	
ERIE COUNTY	S101650777	SMALL BOAT HARBOR CONTAIN			SWF/LF	
ERIE COUNTY	S101650778	TIFFT FARM NATURE PRESERV			SWF/LF	
ERIE COUNTY	S101650779	OLD LAND RECLAMATION			SWF/LF	
ERIE COUNTY	S101650723	LAMB & WEBSTER C & D			SWF/LF	
ERIE COUNTY	S101650730	IWS SCHULTZ C&D			SWF/LF	
ERIE COUNTY	S101650731	COLLINS T.S.			SWF/LF	
ERIE COUNTY	S101650743	BERNARD COPE SLF			SWF/LF	
ERIE COUNTY	S101650744	DUPONT SLF			SWF/LF	
ERIE COUNTY	S100295902	SOUTH SIDE T.S. INDIAN RD	INDIAN ROAD		SWF/LF	

GEOCHECK VERSION 2.1 ADDENDUM
FEDERAL DATABASE WELL INFORMATION

Well Closest to Target Property (Northern Quadrant)

BASIC WELL DATA

Site ID:	425226078501601	Distance from TP:	1 - 2 Miles
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	1900	County:	Erie
Altitude:	590.00 ft.	State:	New York
Well Depth:	180.00 ft.	Topographic Setting:	Not Reported
Depth to Water Table:	20.00 ft.	Prim. Use of Site:	Not Reported
Date Measured:	01011951	Prim. Use of Water:	Unused

LITHOLOGIC DATA

Geologic Age ID (Era/System/Series):	Devonian-Middle
Principal Lithology of Unit:	Limestone
Further Description:	Not Reported

WATER LEVEL VARIABILITY

Not Reported

GEOCHECK VERSION 2.1
STATE DATABASE WELL INFORMATION

Water Well Information:

Well Within >2 Miles of Target Property (Southern Quadrant)

Public Water Supply #:	1400444	Source ID:	001
PW Supply Name:	ECWA WOODLAWN PLANT		
Source Name:	LAKE ERIE		
Source Description:	Surface		
Availability/Utilization:	Permanent Utilization	Source Type:	Source Record
Latitude:	424752	Longitude:	-785110
Source Prod Capacity:	0	Fed ID of Seller:	Not Reported
Watershed Basin:	01	Watershed Sub-basin:	04
Treatment Plant ID:	002	Date of rec Last Update:	Not Reported
Water Type:	Not Reported	Record Tag:	Not Reported

GEOCHECK VERSION 2.1
PUBLIC WATER SUPPLY SYSTEM INFORMATION

Searched by Nearest Well.

PWS SUMMARY:

PWS ID:	NY0018673	PWS Status:	Active	Distance from TP:	>2 Miles
Date Initiated:	Not Reported	Date Deactivated:	Not Reported	Dir relative to TP:	North
PWS Name:	PRYME TIME RESTAURANT CHAFFEE, NY 14030				
Addressee / Facility:	System Owner/Responsible Party CARMODY JAMES T PIONEER TRI COUNTY ENT LTD 123 MICHIGAN AVE BUFFALO, NY 14204				
Facility Latitude:	42 53 11		Facility Longitude:	078 52 42	
City Served:	SARDINIA (T)				
Treatment Class	Not Reported		Population Served:	Not Reported	

Well currently has or has had major violation(s): No

EPA Waste Codes Addendum

Code	Description
D000	NOT DEFINED
D002	A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.
D007	CHROMIUM
F001	THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLOROETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE, AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
NONE	NONE

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM RECORDS:

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA/NTIS
Telephone: 703-603-8904
CERCLIS: CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 03/31/96
Date Made Active at EDR: 06/03/96
Database Release Frequency: Monthly
Date of Data Arrival at EDR: 04/23/96
Elapsed ASTM days: 41
Date of Last EDR Contact: 01/13/97

ERNS: Emergency Response Notification System
Source: EPA/NTIS
Telephone: 202-260-2342
ERNS: Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 06/30/96
Date Made Active at EDR: 11/05/96
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 08/19/96
Elapsed ASTM days: 78
Date of Last EDR Contact: 11/27/96

NPL: National Priority List
Source: EPA
Telephone: 703-603-8852
NPL: National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC).

Date of Government Version: 06/01/96
Date Made Active at EDR: 07/17/96
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 06/25/96
Elapsed ASTM days: 22
Date of Last EDR Contact: 12/23/96

RCRIS: Resource Conservation and Recovery Information System
Source: EPA/NTIS
Telephone: 703-308-7907
RCRIS: Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Date of Government Version: 07/01/96
Date Made Active at EDR: 10/09/96
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 08/07/96
Elapsed ASTM days: 63
Date of Last EDR Contact: 12/04/96

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FEDERAL NON-ASTM RECORDS:

CONSENT: Superfund (CERCLA) Consent Decrees
Source: EPA Regional Offices
Telephone: Varies
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: Varies
Database Release Frequency: Varies
Date of Last EDR Contact: Varies
Date of Next Scheduled EDR Contact: 09/01/95

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 703-308-7907
CORRACTS: CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/27/96
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 12/18/96
Date of Next Scheduled EDR Contact: 03/17/97

FINDS: Facility Index System
Source: EPA/NTIS
Telephone: 703-908-2493
FINDS: Facility Index System. FINDS contains both facility information and "pointers" to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 09/30/95
Database Release Frequency: Quarterly
Date of Last EDR Contact: 12/30/96
Date of Next Scheduled EDR Contact: 04/07/97

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4555
HMIRS: Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/95
Database Release Frequency: Annually
Date of Last EDR Contact: 01/27/97
Date of Next Scheduled EDR Contact: 04/28/97

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 02/13/96
Database Release Frequency: Quarterly
Date of Last EDR Contact: 01/14/97
Date of Next Scheduled EDR Contact: 04/14/97

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 205-564-4267
NPL LIENS: Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 11/25/96
Date of Next Scheduled EDR Contact: 02/24/97

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-260-3992
PADS: PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 08/26/96
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 11/18/96
Date of Next Scheduled EDR Contact: 02/17/97

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RAATS: RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA.

Date of Government Version: 04/17/95
Database Release Frequency: N/A
Date of Last EDR Contact: 12/16/96
Date of Next Scheduled EDR Contact: 03/17/97

ROD: Records Of Decision
Source: NTIS
Telephone: 703-416-0703
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 03/31/95
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 12/02/96
Date of Next Scheduled EDR Contact: 03/03/97

TRIS: Toxic Chemical Release Inventory System
Source: EPA/NTIS
Telephone: 202-260-2320
TRIS: Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/92
Database Release Frequency: Annually
Date of Last EDR Contact: 12/30/96
Date of Next Scheduled EDR Contact: 03/31/97

TSCA: Toxic Substances Control Act
Source: EPA/NTIS
Telephone: 202-260-1444
TSCA: Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site. USEPA has no current plan to update and/or re-issue this database.

Date of Government Version: 01/31/95
Database Release Frequency: Annually
Date of Last EDR Contact: 12/18/96
Date of Next Scheduled EDR Contact: 03/17/97

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STATE OF NEW YORK ASTM RECORDS:

LUST: Spills Information Database
Source: Department of Environmental Conservation
Telephone: 518-457-2462
LUST: Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 09/30/96
Date Made Active at EDR: 01/29/97
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 12/23/96
Elapsed ASTM days: 37
Date of Last EDR Contact: 01/27/97

SHWS: Inactive Hazardous Waste Disposal Sites in New York State
Source: Department of Environmental Conservation
Telephone: 518-457-0747
SHWS: State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 04/30/96
Date Made Active at EDR: 06/06/96
Database Release Frequency: Annually
Date of Data Arrival at EDR: 05/06/96
Elapsed ASTM days: 31
Date of Last EDR Contact: 12/02/96

SWF/LF: Facility Register
Source: Department of Environmental Conservation
Telephone: 518-457-2051
SWF/LF: Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Section 2004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 06/30/96
Date Made Active at EDR: 09/23/96
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 08/12/96
Elapsed ASTM days: 42
Date of Last EDR Contact: 11/12/96

UST: Petroleum Bulk Storage (PBS, CBS, MOSF) Database (UST)
Source: Department of Environmental Conservation
Telephone: 518-457-4351
UST: Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 09/30/96
Date Made Active at EDR: 12/18/96
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 11/18/96
Elapsed ASTM days: 30
Date of Last EDR Contact: 02/03/97

STATE OF NEW YORK NON-ASTM RECORDS:

AST: Petroleum Bulk Storage (AST)
Source: Department of Environmental Conservation
Telephone: 518-457-4351
AST: Registered Aboveground Storage Tanks.

Date of Government Version: 09/30/96
Database Release Frequency: Quarterly
Date of Last EDR Contact: 02/03/97
Date of Next Scheduled EDR Contact: 05/05/97

SPILLS: Spills Information Database
Source: Department of Environmental Conservation
Telephone: 518-457-2462
SPILLS: Data collected on spills reported to NYSDEC as required by one or more of the following: Article 12 of the Navigation Law, 6 NYCRR Section 613.8 (from PBS regs), or 6 NYCRR Section 595.2 (from CBS regs). It includes spills active as of April 1, 1986, as well as spills occurring since this date.

Date of Government Version: 09/30/96
Database Release Frequency: Quarterly
Date of Last EDR Contact: 01/27/97
Date of Next Scheduled EDR Contact: 04/28/97

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NEW YORK COUNTY RECORDS

CORTLAND COUNTY:

Cortland County UST Listing (AST)
Source: Cortland County Health Department
Telephone: 607-753-5035

Date of Government Version: 11/15/96
Database Release Frequency: Quarterly

Date of Last EDR Contact: 12/09/96
Date of Next Scheduled EDR Contact: 03/10/96

Cortland County UST Listing (UST)
Source: Cortland County Health Department
Telephone: 607-753-5035

Date of Government Version: 11/15/96
Database Release Frequency: Quarterly

Date of Last EDR Contact: 12/09/96
Date of Next Scheduled EDR Contact: 03/10/97

NASSAU COUNTY:

NCPHO Article XI Database (AST)
Source: Nassau County Health Department
Telephone: 516-571-3314

Date of Government Version: 12/01/96
Database Release Frequency: Quarterly

Date of Last EDR Contact: 12/09/96
Date of Next Scheduled EDR Contact: 03/10/97

NCPHO Article XI Database (UST)
Source: Nassau County Health Department
Telephone: 516-571-3314

Date of Government Version: 12/01/96
Database Release Frequency: Quarterly

Date of Last EDR Contact: 12/09/96
Date of Next Scheduled EDR Contact: 03/10/97

ROCKLAND COUNTY:

Petroleum Bulk Storage Database (AST)
Source: Rockland County Health Department
Telephone: 914-364-2605

Date of Government Version: 12/18/96
Database Release Frequency: Quarterly

Date of Last EDR Contact: 12/09/96
Date of Next Scheduled EDR Contact: 03/10/97

Petroleum Bulk Storage Database (UST)
Source: Rockland County Health Department
Telephone: 914-364-2605

Date of Government Version: 12/18/96
Database Release Frequency: Quarterly

Date of Last EDR Contact: 12/09/96
Date of Next Scheduled EDR Contact: 03/10/97

SUFFOLK COUNTY:

Underground Storage Tank Database (AST)
Source: Suffolk County Department of Health Services
Telephone: 516-854-2521

Date of Government Version: 03/01/96
Database Release Frequency: Annually

Date of Last EDR Contact: 12/09/96
Date of Next Scheduled EDR Contact: 03/10/97

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Underground Storage Tank Database (UST)
Source: Suffolk County Department of Health Services
Telephone: 516-854-2521

Date of Government Version: 03/01/96
Database Release Frequency: Annually

Date of Last EDR Contact: 12/09/96
Date of Next Scheduled EDR Contact: 03/10/97

Historical and Other Database(s)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

Disclaimer Provided by Real Property Scan, Inc.

The information contained in this report has predominantly been obtained from publicly available sources produced by entities other than Real Property Scan. While reasonable steps have been taken to insure the accuracy of this report, Real Property Scan does not guarantee the accuracy of this report. Any liability on the part of Real Property Scan is strictly limited to a refund of the amount paid. No claim is made for the actual existence of toxins at any site. This report does not constitute a legal opinion.

DELISTED NPL: Delisted NPL Sites
Source: EPA
Telephone: 703-603-8769
DELISTED NPL: The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

NFRAP: No Further Remedial Action Planned
Source: EPA/NTIS
Telephone: 703-416-0702
NFRAP: As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

FRDS: Federal Reporting Data System
Source: EPA/Office of Drinking Water
Telephone: 202-260-2805
FRDS provides information regarding public water supplies and their compliance with monitoring requirements, maximum contaminant levels (MCL's), and other requirements of the Safe Drinking Water Act of 1986.

Area Radon Information: The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

Oil/Gas Pipelines/Electrical Transmission Lines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines and electrical transmission lines.

Sensitive Receptors: There are individuals who, due to their fragile immune systems, are deemed to be especially sensitive to environmental discharges. These typically include the elderly, the sick, and children. While the exact location of these sensitive receptors cannot be determined, EDR indicates those facilities, such as schools, hospitals, day care centers, and nursing homes, where sensitive receptors are likely to be located.

USGS Water Wells: In November 1971 the United States Geological Survey (USGS) implemented a national water resource information tracking system. This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on more than 900,000 wells, springs, and other sources of groundwater.

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1994 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Water Dams: National Inventory of Dams
Source: Federal Emergency Management Agency
Telephone: 202-646-2801
WATER DAMS: National computer database of more than 74,000 dams maintained by the Federal Emergency Management Agency.

New York Public Water Wells
Source: New York Department of Health
Telephone: 518-458-6731

MALCOLM PIRNIE

ATTACHMENT B-1

- **GEOPHYSICAL SURVEY RESULTS**

336 Harris Hill Road, Suite 100
Williamsville, NY 14221
(716) 565-0624 • FAX (716) 565-0625

GEOMATRIX

May 12, 1997
B4055

Mr. Richard Frappa
Malcolm Pirnie, Inc.
40 Centre Drive
Orchard Park, NY 14127

Re: Geophysical Feasibility Survey Results, LTV Steel, Buffalo, NY

Dear Mr. Frappa:

1.0 INTRODUCTION AND PURPOSE

We are pleased to provide Malcolm Pirnie, Inc. with this report summarizing our findings of the geophysical survey at the above noted site. On February 15 and 16, 1997 Geomatrix Consultants Inc. (Geomatrix) performed terrain conductivity and time domain electromagnetic (TDEM) geophysical surveys at the site. The area surveyed is approximately 4.5 acres in size and is a portion of the LTV property in Buffalo, NY.

The geophysical survey was part of a multidisciplinary study being conducted by Malcolm Pirnie, Inc. The purpose of the feasibility survey was to determine if geophysical techniques would be useful for identifying the locations of buried building foundations and a large buried water pipe prior to subsequent intrusive investigation.

2.0 METHODOLOGY

2.1 Geophysical Reference Grid

A reference grid was established at the site prior to the initiation of the geophysical survey. The grid spacing was 400 ft x 400 ft. Geomatrix subsequently installed a 25 ft by 100 ft subgrid using labeled wire pin flags. The reference grid was established such that data could be accurately recorded along east-west trending survey lines spaced 12.5 ft apart.

2.2 EM31 Survey

A Geonics EM31-DL Frequency Domain Terrain Conductivity meter was used to collect apparent conductivity data at the site. Data were collected along lines oriented east-west.

Quadrature and in-phase data were simultaneously collected at 12.5 foot line intervals and at station intervals of approximately 2.5 feet. The quadrature component data are a measurement of the apparent ground conductivity. Quadrature component data are sensitive to the presence of stratigraphic changes, fill and conductive soils. Quadrature component data were collected in units of milliSiemens per meter (mS/m).

The EM31-DL also records the in-phase component of the electromagnetic field measured in units of parts per thousand (ppt). The in-phase component data are sensitive to the presence of highly conductive materials such as steel, copper and aluminum. All readings with the EM31-DL were taken with the instrument oriented parallel to the direction of travel, in the vertical dipole mode and with the instrument at waist height. The EM31-DL has a depth of exploration of approximately 12 to 15 feet when operated in this configuration.

The EM31-DL was calibrated at a base station south west of the survey area. The base station area is believed to represent background conditions and was free of any visible sources of potential signal interference. The instrument was calibrated following procedures specified in the operations manual. Readings were automatically stored in a solid state data logger during the survey. The data logger was interfaced to a portable computer and the data were transferred to a floppy disk for subsequent processing and interpretation. A total of 6,700 data points were measured and recorded with the EM31.

2.3 Geonics EM61 High Sensitivity Metal Detection Survey

The Geonics EM61 unit is a high sensitivity, high resolution TDEM metal detector that can detect both ferrous and nonferrous metallic objects. It has an approximate investigation depth of 10 feet. The processing console is contained in a backpack worn by the operator which is interfaced to a digital data logger. The transmitter and two receiver coils are located on a two-wheeled cart that is pulled by the operator.

The device's transmitter coil generates a pulsed primary EM field at a rate of 150 pulses per second, inducing eddy currents into the subsurface. The decay rates of these eddy currents are measured by two, 3.28 foot (1 meter) square receiver coils. By taking the measurements at a relatively long time frame after termination of the primary pulse, the response is practically independent of the survey area's terrain conductivity. That is, the decay rates of the eddy currents are much longer for metals than for normal soils.

Data are collected from the EM61's two receiver coils. One of the receiver coils is located coincident to the transmitter coil. The other receiver coil is located 1.31 feet (0.4 meters) above the transmitter coil. Data from the top receiver coil are stored on Channel

1 of a digital data logger. Data from the bottom receiver coil are stored on Channel 2 of the data logger. Channel 1 and Channel 2 data are simultaneously recorded at each station location.

Channel 1 data are a measure of the presence or absence of surface metals. Channel 2 data measure the presence of surface and buried metals. To minimize the effects from surface metals, Channel 2 data are subtracted from Channel 1 data. These data are referred to as the "differential" and are stored in Channel 4. In areas of potentially high signal interference, such as overhead power lines, a noise reduction factor (0.28) can be applied to Channel 1 data prior to calculating the differential. These data are stored in Channel 3 which is referred to as the normalized differential channel.

For the LTV Site, Channel 4 data are presented due to the potential presence of surface metals. The instrument responses are recorded in units of milliVolts (mV). Data were recorded digitally by a data logger at a rate of approximately 2 measurements per foot. A total of 19,500 data points were collected and recorded with the EM61.

2.4 Data Reduction

The results of the EM surveys were edited and viewed in profile format using the manufacturer' software, DAT31 and DAT61. Data were pre-sorted and bi-directionally gridded using the Akima spline based gridding software BIGRID. Gridded data were color contoured for ease of interpretation and for final presentation purposes using the software GEOSOFT. Various filters (high and low pass) were applied in an attempt to enhance linear anomalies that may be associated with the foundations and buried pipes.

Preliminary results were delivered to Malcolm Pirnie approximately 1 week after the completion of geophysical field activities.

2.5 Limitations

The geophysical methods used during this survey are established, indirect techniques for non-destructive subsurface reconnaissance exploration. As these instruments utilize indirect methods, they are subject to inherent limitations and ambiguities. Targets such as buried drums, buried tanks, conduits, etc. are detectable only if they produce recognizable anomalies or patterns against the background geophysical data collected. As with any remote sensing technique, the anomalies identified during a geophysical survey should be further investigated by other techniques such as historical aerial photography, test pitting and/or test borings.

GEOMATRIX

3.0 RESULTS

The geophysical data are presented as a series of color contour maps in Figures 1, 2, and 3. The color bar to the right of each map indicates the colors associated with respective measured values. Actual data measurement points are superimposed on the maps.

The EM31 quadrature component data are presented in Figure 1. The data represents the apparent conductivity of the soils and material that lie within the depth of investigation of the EM31; approximately 12 to 15 feet.

The EM31 inphase data are presented in Figure 2. The inphase component of the electromagnetic field, measured by the EM31, is most sensitive to buried metals. The character of the inphase response, low or high, is partially dependent on the orientation of the buried metal(s) relative to the orientation of the EM31 device during data acquisition, or the survey direction. A buried metal pipe, for example, will exhibit a high inphase response when the trend of the pipe is parallel to the survey direction. When a survey line crosses a metal pipe or other linear metal object that is perpendicular to survey direction, it is characterized by a negative inphase response.

The EM61 Channel 3 survey data are shown in Figure 3. Areas suspected to be free of buried metals are shown as color shades of green/yellow. All areas exhibiting a response greater than background (15 to 20 mVolts) likely contain buried metals. These areas are depicted in shades of yellow through purple on Figure 3.

It was anticipated that the presence of the foundations and buried pipes may result in an anomalous linear response due to the possible presence of:

- steel reinforcing bar within the cement foundations;
- steel reinforcing bar within the concrete surrounding the pipes;
- resistive gravel backfill around the pipes; and/or
- disturbed soil resulting in a different moisture content and possible different soil texture.

A large manhole and associated pumphouse (locations indicated on figures) provide a direct reference by which to assess the success of the geophysical techniques to map the location of the large buried pipe known to exist within the study area. It is believed that the pipe exists between these two points. There is no compelling evidence within the geophysical data set that this pipe is geophysically identified. The linear anomalies that are observed in the data are likely related to smaller pipes and/or buried sections of railroad lines.

GEOMATRIX

The large conductive anomaly, shown in shades of purple on Figure 1, is likely related to the presence of conductive fill material that at one time formed the base of a series railroad tracks known to have existed in this area.

Building foundations are expected to be observed as somewhat rectilinear anomalies. While numerous anomalies are observed in the geophysical data set, there is no compelling evidence that building foundations were located.

4.0 CONCLUSIONS

The geophysical feasibility survey conducted on a portion of the LTV site in Buffalo, NY does not appear to have been successful at mapping the locations of a large buried water pipe or building foundations. This may be due to the absence of steel reinforcing bar in the concrete/cement. An alternative explanation is that a geophysical response from the pipe and foundations is present within the data but unrecognized due to the presence of numerous other anomalies. It is possible that any of the anomalous responses observed in the geophysical data may be related to a building foundation or buried pipe, however, a clear indication of a linear or rectilinear anomaly was not observed. Numerous anomalies are observed throughout the data set that may represent buried metals.

The heterogeneous nature of the subsurface material, as evidenced by the large variations in apparent conductivity over short distances, and the high conductivities observed in the EM data, likely precludes the use of Ground Penetrating Radar (GPR) techniques to map the locations of the buried water pipe and building foundations.

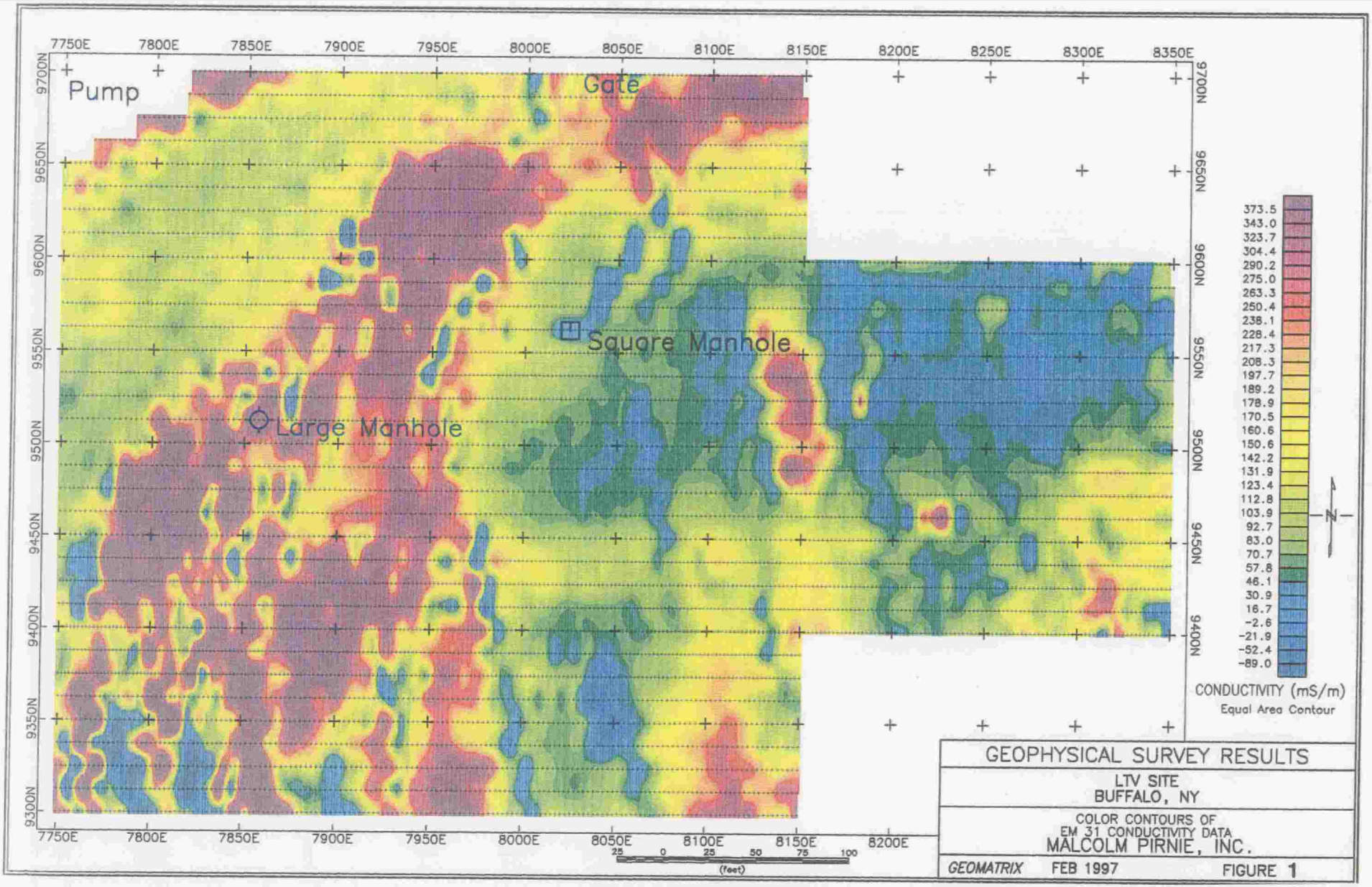
We trust that the information presented in this report meets with your needs in order to assist you in your investigation. If you have any questions or comments please do not hesitate to contact our office.

Yours very truly,

GEOMATRIX CONSULTANTS, INC.

John Luttinger
Project Geophysicist

FIGURES

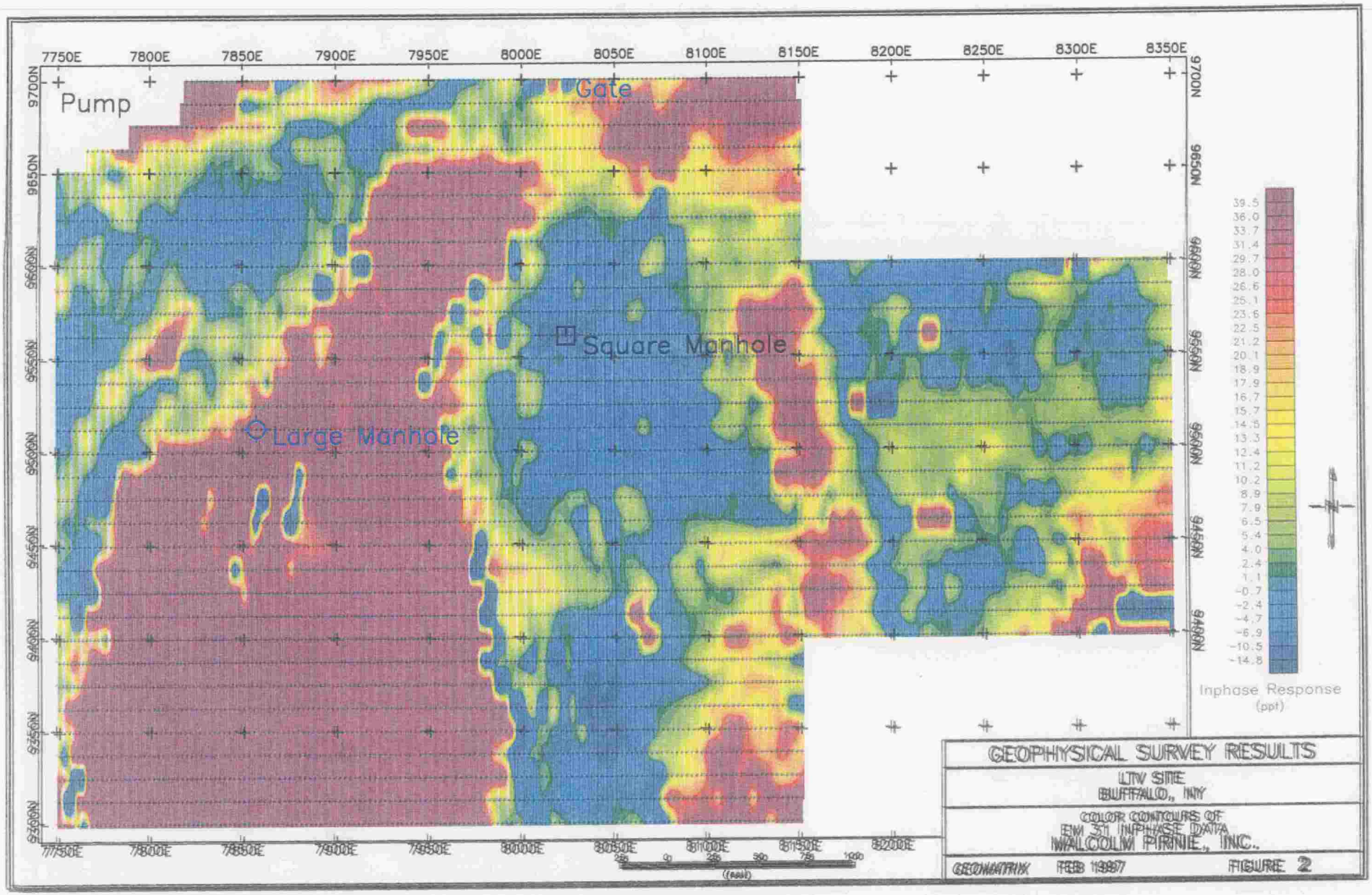


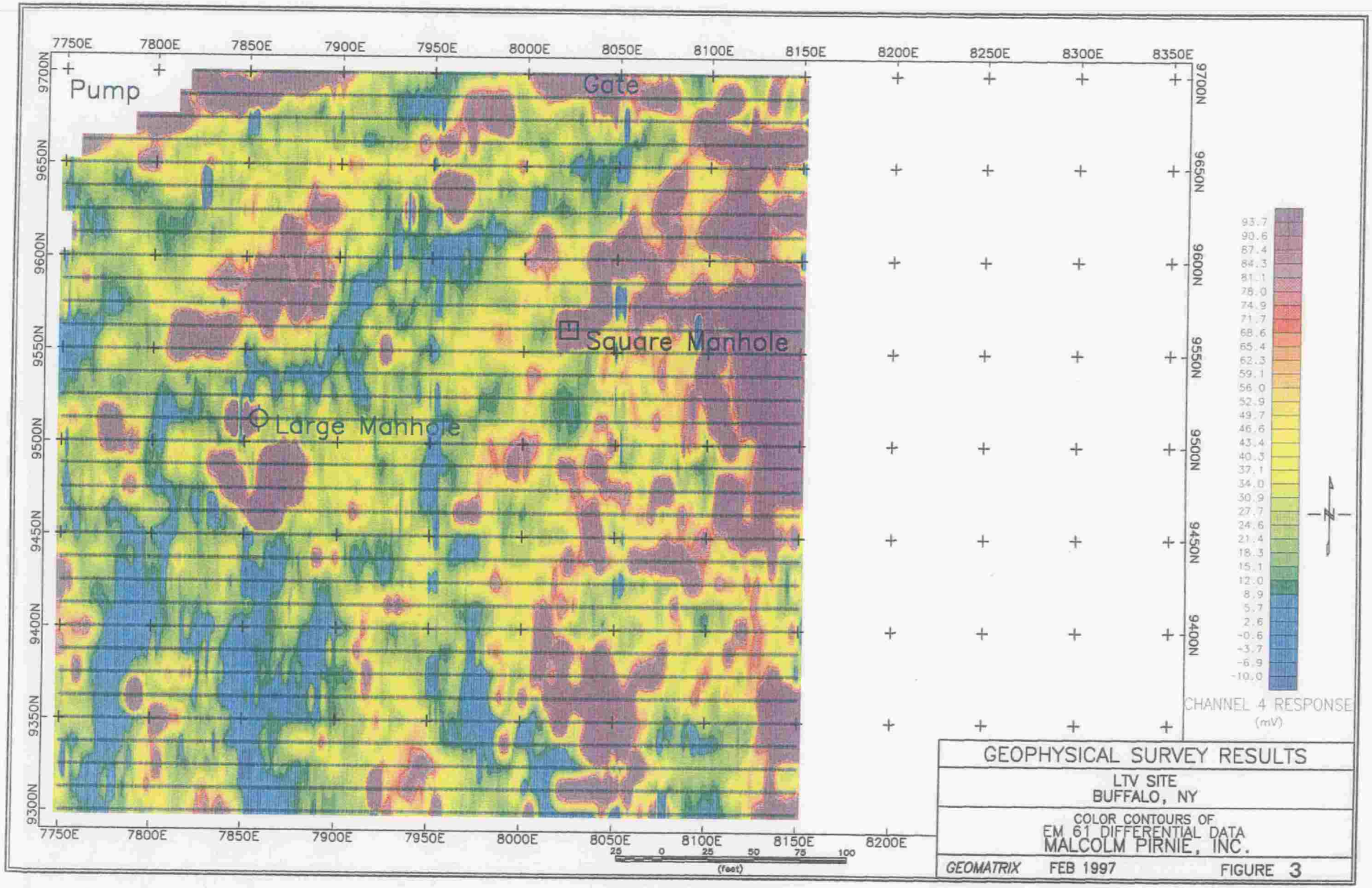
GEOPHYSICAL SURVEY RESULTS

LTV SITE
BUFFALO, NY

COLOR CONTOURS OF
EM 31 CONDUCTIVITY DATA
MALCOLM PIRNIE, INC.

GEOMATRIX FEB 1997 FIGURE 1


7750E
7800E
7850E
7900E
7950E
8000E
8050E
8100E
8150E
8200E
8250E
8300E
8350E
9700N
9650N
9600N
9550N
9500N
9450N
9400N
9350N
9300N
Pump
Gate
Square Manhole
Large Manhole
39.5
36.0
33.7
31.4
29.7
28.0
26.6
25.1
23.6
22.5
21.2
20.1
18.9
17.9
16.7
15.7
14.5
13.3
12.4
11.2
10.2
8.9
7.9
6.5
5.4
4.0
2.4
1.1
-0.7
-2.4
-4.7
-6.9
-10.5
-14.8
Inphase Response
(ppt)
GEOPHYSICAL SURVEY RESULTS
LTV SITE
BUFFALO, NY
COLOR CONTOURS OF
EM 31 INPHASE DATA
MALCOLM PIRNIE, INC.
GEOMATRIX
FEB 1997
FIGURE 2



GEOPHYSICAL SURVEY RESULTS

LTV SITE
BUFFALO, NY

COLOR CONTOURS OF
EM 61 DIFFERENTIAL DATA
MALCOLM PIRNIE, INC.

GEOMATRIX FEB 1997 FIGURE 3

MALCOLM PIRNIE

ATTACHMENT B-2

- **SOIL GAS ANALYTICAL RESULTS**

W. L. GORE & ASSOCIATES, INC.

101 LEWISVILLE ROAD • P.O. BOX 1100 • ELKTON, MARYLAND 21922-1100 PHONE: 410/392-3300
FAX: 410/996-3325 • TELEX 467637 GORE FB ELKT

ENVIRONMENTAL PRODUCTS GROUP

GORE-SORBER℠ Screening Survey
Final Report

MGP Phase I & II
Buffalo, NY

March 7, 1997

Prepared For:
Malcolm Pirnie, Inc.
40 Center Drive
Orchard Park, NY 14127

W.L. Gore & Associates, Inc.
Written/Submitted by

Ray Fenstermacher, P.G.
Associate

W.L. Gore & Associates, Inc.
Reviewed/Approved by

Jay W. Hodny, M.S.
Associate

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GORE-SORBER℠ Screening Survey
Final Report

REPORT DATE: March 7, 1997 **AUTHOR:** RFF

SITE INFORMATION

Site Reference: MGP Phase I & II, Buffalo, NY
Customer Purchase Order Number: 0848-263-100
Gore Production Order Number: 071968 **Gore Site Code:** YD

FIELD PROCEDURES

 # Modules shipped: 33
Installation Date(s): February 17, 1997 **# Modules Installed:** 31
Field work performed by: Malcolm Pirnie, Inc.

Retrieval date(s): March 3, 1997 **Exposure Time:** 14 **[days]**
 # Modules Retrieved: 31 **# Trip Blanks Returned:** 2 *
 # Modules Lost in Field: -0- **# Unused Modules Returned:** -0-

Date/Time Received by Gore: March 4, 1997 @ 11:30am **By:** CJF
Recorded Cooler/Water Temperature Control Blank temperature: 2.6 **[°C]**
Chain of Custody Form attached: √
Chain of Custody discrepancies: None
Comments: Although only one module was noted as a trip blank on the chain of custody, two unused modules were returned with this survey and both of these modules were treated as trip blanks.

GORE-SORBER℠ Screening Survey
Final Report

ANALYTICAL PROCEDURES

W.L. Gore & Associates' Screening Module Laboratory operates under the guidelines of its Quality Assurance Manual, Operating Procedures and Methods. The quality assurance program is consistent with Good Laboratory Practices (GLP) and ISO Guide 25, "General Requirements for the Competence of Calibration and Testing Laboratories", third edition, 1990. The Laboratory is audited regularly by a quality system design, development and auditing company.

Instrumentation consists of Hewlett-Packard 5890 gas chromatographs and 5971 mass selective detectors, as well as Perkin-Elmer ATD 400 automated thermal desorption units. Sample preparation simply involves cutting the tip off the bottom of the sample module and transferring one or more exposed sorbent containers (sorbers, each containing 40mg of a suitable granular adsorbent) to a thermal desorption tube for analysis. Sorbers remain clean and protected from dirt, soil, and ground water by the insertion/retrieval cord, and require no further sample preparation.

Screening Method Quality Assurance:

Before each run sequence, two instrument blanks, a sorber containing 5µg BFB (Bromofluorobenzene), and a method blank are analyzed. The BFB mass spectra must meet the criteria set forth in our methods before samples can be analyzed. A sorber containing BFB is also analyzed after every 30 samples and/or trip blanks, as is a method blank. Standards containing the selected target compounds at three calibration levels of 5, 20, and 50µg are analyzed at the beginning of each run. The criterion for each target compound is less than 35% RSD (relative standard deviation). If this criterion is not met for any target compound, the analyst has the option of generating second- or third-order standard curves, as appropriate. A second-source reference standard, at a level of 20µg per target compound, is analyzed after every ten samples and/or trip blanks, and at the end of the run sequence. Positive identification of target compounds is determined by the presence of the target ion and at least two secondary ions, retention time versus reference standard, and the analyst's judgment.

NOTE: All data have been archived. Any replicate sorbers not used in the initial analysis will be discarded fifteen (15) days from the date of analysis.

Laboratory analysis: thermal desorption, gas chromatography, mass selective detection
Quality Assurance Level: 2 (ANA-4/GS3)
Instrument ID: # 2 **Chemist:** WW **Data Subdirectory:** 071968
Compounds/mixtures requested: Custom Target Analyte List (A7)
Deviations from Standard Method: None
Comments: Soil vapor analytes and abbreviations are tabulated in the Data Table Key (page 5).

GORE-SORBER[sm] Screening Survey
Final Report

DATA TABULATION

 # CONTOUR MAPS ENCLOSED: Two (2) B-sized color contour maps
LIST OF MAPS ENCLOSED:

- Benzene, Toluene, Ethyl benzene, and total Xylenes (BTEX)
- Polycyclic Aromatic Hydrocarbons (PAHs)

Compound Name	Method Detection Limit [μg]	Low Map (gray) Limit [μg]	Highest Detect Level [μg]	Upper Map (purple) Limit [μg]
BTEX	0.02	0.22	282.62	282.62
PAHs	0.03	0.03	60.16	60.16

NOTE: All data values presented in Appendix A represent masses of compound(s) desorbed from the GORE-SORBER Screening Modules received and analyzed by W.L. Gore, as identified in the Chain of Custody (Appendix A). The measurement traceability and instrument performance are reproducible and accurate for the measurement process documented. Semi-quantitation of the compound mass is based on either a single-level (QA Level 1) or three-level (QA Level 2) standard calibration.

Comments:

- The minimum (gray) contour level, for each mapped analyte or group of analytes, was set at the maximum blank level observed or the MDL, whichever was greater. The maximum contour level was set at the maximum value observed

GORE-SORBER℠ Screening Survey
Final Report

KEY TO DATA TABLE
MGP Phase I & II, Buffalo, NY

UNITS

µg	micrograms (per sorber), reported for compounds for which we run external standards.
MDL	method detection limit

ANALYTES

BTEX	combined masses of benzene, toluene, ethylbenzene and total xylenes (Gasoline Range Aromatics)
BENZ	benzene
TOL	toluene
EtBENZ	ethylbenzene
mpXYL	m-, p-xylene
oXYL	o-xylene
Combined PAHs	combined masses of naphthalene, 2-methylnaphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, and pyrene.

BLANKS

TBn	unexposed trip blanks, which traveled with the exposed modules

APPENDIX A:

1. CHAIN OF CUSTODY
2. DATA TABLE
3. COLOR CONTOUR MAPS

GORE-SORBER® Screening Survey Chain of Custody

For W.L. Gore & Associates use only
Production Order # 71968

W. L. Gore & Associates, Inc., Environmental Products Group
101 Lewisville Road • Elkton, Maryland 21921 • Tel: (410) 392-3300 • Fax (410) 996-3325

Instructions: Customer must complete ALL shaded cells

Customer Name: MALCOLM PIRNIE INC	Site Name: NFG-P PHASE I + II
Address: 40 CENTER DR	Site Address:
ORCHARD PARK NY 14127	BUFFALO NY
	Project Manager: JEANNE ASMUTH
Phone: 716 667-6634	Customer Project No.:
FAX: 716 667 6274	Customer P.O. #: 0545-263100 Quote #: RK 7566

Serial # of Modules Shipped			# of Modules for Installation 30		# of Trip Blanks 3		
# 133095	through	# [redacted] RED	Total Modules Shipped: 33			Pieces	
#	through	# 133130	Total Modules Received:			Pieces	
#	through	#	Total Modules Installed:			Pieces	
#	through	#	Serial # of Trip Blanks (*Client Decides*)		#		
#	through	#	# 133129	#	#		
#	through	#	#	#	#		
#	through	#	#	#	#		

Installation Performed By:	Installation Method(s) (*circle those that apply*):
Name (*please print*): R. DUBISZ / J. MERRITT	Slide Hammer Hammer Drill Auger
Company/Affiliation: MALCOLM PIRNIE, INC	Other:
Installation Start Date and Time: 2 / 17 / 97	: 0830 AM PM
Installation Complete Date and Time: 2 / 17 / 97	: 1600 AM PM
Retrieval Performed By:	Total Modules Retrieved: Pieces
Name (*please print*): R. DUBISZ / J. MERRITT	Total Modules Lost in Field: Pieces
Company/Affiliation: MALCOLM PIRNIE, INC	Total Unused Modules Returned: Pieces
Retrieval Start Date and Time: 3 / 3 / 97	: 0930 AM PM
Retrieval Complete Date and Time: 3 / 3 / 97	: 1200 AM PM

Target Analytes to be Mapped (*Check Options or List as appropriate*):	To Be Determined Pending Completion of Lab Analysis [ ] or write "None", if applicable.	
Analyte #1:	Analyte #2:	Analyte #3:
Other Instructions, if any:		

Relinquished By C J Zandvliet	Date	Time	Received By:	Date	Time
Affiliation: W.L. Gore & Associates, Inc.	3/3/97	1500	Affiliation:		
Relinquished By [signature]	Date	Time	Received By:	Date	Time
Affiliation: MALCOLM PIRNIE, INC	3/3/97	1330	Affiliation:		
Relinquished By	Date	Time	Received By: C J Zandvliet	Date	Time
Affiliation			Affiliation: W.L. Gore & Associates, Inc.	3/3/97	1130

JEANNE WILL FAX #'S

Temperature of Samples When Received By Gore: 2.1 °C

C.S Forstner 410 996 3325

GORE-SORBER® Screening Survey Installation and Retrieval Log

SITE NAME & LOCATION

Page ___ of ___

LINE #	MODULE #	INSTALLATION DATE/TIME	RETRIEVAL DATE/TIME	EVIDENCE OF LIQUID HYDROCARBONS (LPH) or HYDROCARBON ODOR (Check as appropriate)			MODULE IN WATER (check one)		COMMENTS
				LPH	ODOR	NONE	YES	NO	
1.	133058		3/3/97 1026						
2.	99		1021						
3.	100		[illegible]						
4.	101		1030						
5.	102		[illegible]						
6.	[illegible]		[illegible]	✓					
7.	104		[illegible]						
8.	105		1012						
9.	106		[illegible]						
10.	107		[illegible]						
11.	108		1030						
12.	109		[illegible]						
13.	110		[illegible]						
14.	111		1037						
15.	112		[illegible]						
16.	113		[illegible]						
17.	114		[illegible]						
18.	115		[illegible]						
19.	116		1110						
20.	117		1113						
21.	118		[illegible]				Y		
22.	119		1120						
23.	120		1135						
24.	121		[illegible]						
25.	122		[illegible]						
26.	123		[illegible]				Y		
27.	124		[illegible]						
28.	[illegible]		[illegible]						
29.	126		[illegible]						
30.	[illegible]								
31.			[illegible]						
32.									
33.									
34.									
35.									
36.									
37.									
38.									
39.									
40.									
41.									
42.									

GORE SORBER SCREENING SURVEY ANALYTICAL RESULTS
MALCOLM PIRNIE INC., ORCHARD PARK, NY
GORE CUSTOM TARGET COMPOUND LIST (A7)
MGP PHASE I AND II, BUFFALO, NY
SITE YD - PRODUCTION ORDER #071968

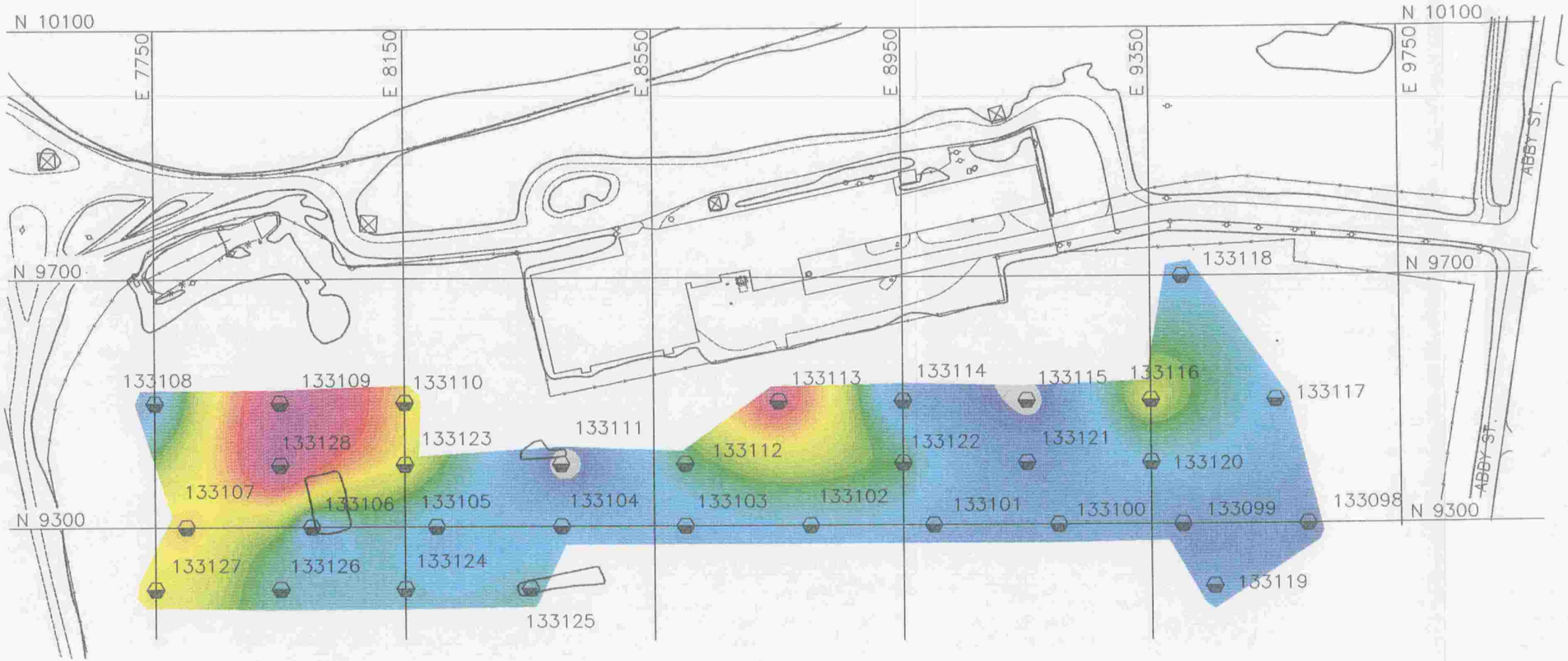
SAMPLE NAME	BTEX, ug	BENZ, ug	TOL, ug	EtBENZ, ug	mpXYL, ug	oXYL, ug	Combined PAHs, ug	NAPH, ug	2MeNAPH, ug	Acenaphthylene, ug	Acenaphthene, ug	Fluorene, ug
MDL =	0.02	0.03	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.05	0.04	0.07
133098	0.26	0.11	0.05	0.01	0.05	0.03	0.01	0.00	0.00	0.00	0.01	0.00
133099	0.29	0.11	0.09	0.02	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00
133100	0.46	0.20	0.13	0.02	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00
133101	0.44	0.13	0.24	0.01	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00
133102	0.90	0.61	0.18	0.01	0.07	0.03	0.00	0.00	0.00	0.00	0.00	0.00
133103	0.68	0.38	0.15	0.05	0.06	0.04	0.15	0.04	0.02	0.00	0.00	0.02
133104	1.21	0.49	0.50	0.03	0.12	0.07	0.00	0.00	0.00	0.00	0.00	0.00
133105	0.68	0.49	0.10	0.01	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00
133106	0.51	0.23	0.14	0.01	0.08	0.04	0.80	0.80	0.00	0.00	0.00	0.00
133107	20.19	12.77	5.64	0.06	1.15	0.58	0.36	0.35	0.01	0.00	0.00	0.00
133108	0.58	0.15	0.18	0.04	0.16	0.05	0.00	0.00	0.00	0.00	0.00	0.00
133109	134.97	117.58	0.47	14.75	1.26	0.92	6.25	5.89	0.15	0.02	0.03	0.06
133110	14.04	6.06	6.50	0.10	1.09	0.29	0.11	0.10	0.01	0.00	0.00	0.01
133111	0.14	0.06	0.04	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
133112	2.20	1.84	0.24	0.01	0.05	0.05	0.16	0.07	0.03	0.00	0.02	0.02
133113	92.13	72.83	7.00	2.65	7.07	2.59	14.51	8.29	1.76	0.71	0.33	1.70
133114	0.37	0.21	0.09	0.01	0.04	0.02	2.28	0.58	0.31	0.44	0.05	0.33
133115	0.15	0.07	0.04	0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
133116	9.54	1.03	1.42	0.97	3.31	2.81	60.16	40.82	12.06	0.06	1.40	1.86
133117	0.89	0.22	0.36	0.04	0.14	0.12	6.36	1.59	0.91	0.02	1.53	0.97
133118	0.79	0.65	0.10	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
133119	0.51	0.35	0.11	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00
133120	1.20	0.23	0.18	0.06	0.42	0.31	25.02	7.70	4.15	0.09	6.02	2.72
133121	0.40	0.25	0.10	0.01	0.03	0.02	0.34	0.03	0.02	0.00	0.07	0.02
133122	3.06	2.68	0.21	0.03	0 10	0.04	0.06	0.03	0.02	0.00	0.01	0.00
133123	10.30	2.11	0.08	0.60	6.92	0.59	0.06	0.05	0.00	0.00	0.01	0.00
133124	1.42	1.03	0.21	0.02	0.09	0.07	0.00	0.00	0.00	0.00	0.00	0.00
133125	1.64	1.38	0.14	0.02	0.06	0.04	0.00	0.00	0.00	0.00	0.00	0.00
133126	1.56	1.18	0.20	0.03	0.10	0.05	0.00	0.00	0.00	0.00	0.00	0.00
133127	9.96	9.22	0.52	0.03	0.13	0.06	0.00	0.00	0.00	0.00	0.00	0.00
133128	282.62	152.69	125.12	0.26	3.67	0.88	0.76	0.62	0.11	0.00	0.00	0.03
TB, 133129	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TB, 133130	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max Observed	282.62	152.69	125.12	14.75	7.07	2.81	60.16	40.82	12.06	0.71	6.02	2.72

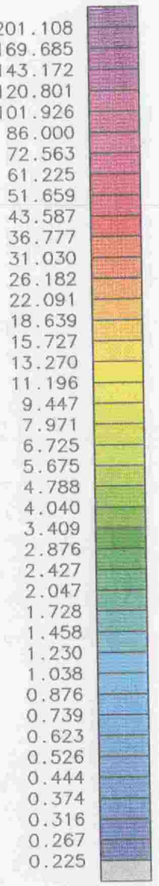
*Phenathrene, anthracene, fluoranthene and pyrene masses estimated using the fluorene response factor.

GORE SORBER SCREENING SURVEY ANALYTICAL RESULTS
MALCOLM PIRNIE INC., ORCHARD PARK, NY
GORE CUSTOM TARGET COMPOUND LIST (A7)
MGP PHASE I AND II, BUFFALO, NY
SITE YD - PRODUCTION ORDER #071968

SAMPLE NAME	Phenanthrene, ug	Anthracene, ug	Fluoranthene, ug	Pyrene, ug
MDL =	0.04	0.10	0.17	0.24
133098	0.00	0.00	0.00	0.00
133099	0.00	0.00	0.00	0.00
133100	0.00	0.00	0.00	0.00
133101	0.00	0.00	0.00	0.00
133102	0.00	0.00	0.00	0.00
133103	0.04	0.02	0.00	0.00
133104	0.00	0.00	0.00	0.00
133105	0.00	0.00	0.00	0.00
133106	0.00	0.00	0.00	0.00
133107	0.00	0.00	0.00	0.00
133108	0.00	0.00	0.00	0.00
133109	0.07	0.01	0.03	0.00
133110	0.00	0.00	0.00	0.00
133111	0.00	0.00	0.00	0.00
133112	0.01	0.00	0.00	0.00
133113	1.21	0.40	0.06	0.04
133114	0.33	0.15	0.06	0.04
133115	0.00	0.00	0.00	0.00
133116	2.81	0.73	0.27	0.16
133117	0.94	0.32	0.05	0.03
133118	0.00	0.00	0.00	0.00
133119	0.00	0.00	0.00	0.00
133120	3.46	0.65	0.14	0.08
133121	0.11	0.03	0.04	0.03
133122	0.00	0.00	0.00	0.00
133123	0.00	0.00	0.00	0.00
133124	0.00	0.00	0.00	0.00
133125	0.00	0.00	0.00	0.00
133126	0.00	0.00	0.00	0.00
133127	0.00	0.00	0.00	0.00
133128	0.00	0.00	0.00	0.00
TB, 133129	0.00	0.00	0.00	0.00
TB, 133130	0.00	0.00	0.00	0.00
Max Observed	3.46	0.73	0.27	0.16

*Phenathrene, anthracene, fluoranthene and pyrene masses estimated using the fluorene response factor.





133119 GORE-SORBER Screening Module Location

Scale 1:2400

100 0 100 200

(feet)

NOTE: CONTOUR PLOT REPRESENTS MASS OF COMPOUND DESORBED FROM GORE-SORBER SCREENING MODULES, IDENTIFIED AND QUANTIFIED BY GAS CHROMATOGRAPH MASS SELECTIVE DETECTION.

ORIG. CAD: AREA2.DXF

GORE-SORBER SCREENING SURVEY

W.L. GORE & ASSOCIATES, INC.
P.O. BOX 1100
101 LEWISVILLE ROAD
ELKTON, MD 21922-1100
(410) 392-3300

MGP PHASE I/PHASE II SITE, BUFFALO, NY

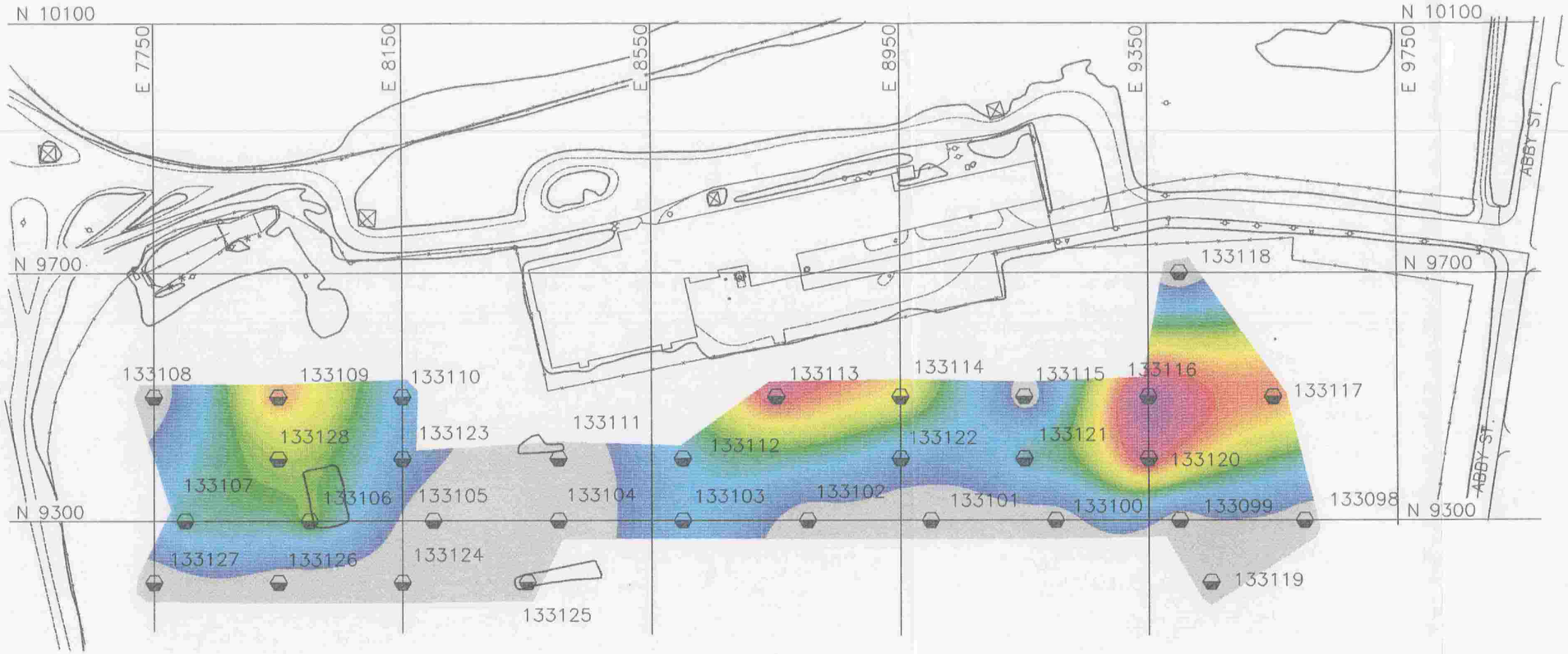
BTEX

MALCOLM PIRNIE, INC., ORCHARD PARK, NY

REV. #: 0

REV. DATE:

DATE DRAWN:	4 MARCH 1997	GRID FILE:	BTG1.GRD
DRAWN BY:	JH	PLOT FILE:	BTG.PLT
DATE GRIDDED:	7 MARCH 1997	PROJECT NUMBER:	071968
GRIDDED BY:	JH	SITE CODE:	YD



133119 GORE-SORBER Screening Module Location

Scale 1:2400

100 0 100 200

(feet)

NOTE: CONTOUR PLOT REPRESENTS MASS OF COMPOUND DESORBED FROM GORE-SORBER SCREENING MODULES, IDENTIFIED AND QUANTIFIED BY GAS CHROMATOGRAPH MASS SELECTIVE DETECTION.

ORIG. CAD: AREA2.DXF

GORE-SORBER SCREENING SURVEY

W.L. GORE & ASSOCIATES, INC.
P.O. BOX 1100
101 LEWISVILLE ROAD
ELKTON, MD 21922-1100
(410) 392-3300

MGP PHASE I/PHASE II SITE, BUFFALO, NY

POLYCYCLIC AROMATIC HYDROCARBONS

MALCOLM PIRNIE, INC., ORCHARD PARK, NY

REV. #: 0

REV. DATE:

DATE DRAWN:	4 MARCH 1997	GRID FILE:	B101.GRD
DRAWN BY:	JH	PLOT FILE:	B1C.PLT
DATE GRIDDED:	7 MARCH 1997	PROJECT NUMBER:	071968
GRIDDED BY:	JH	SITE CODE:	YD

MALCOLM PIRNIE

ATTACHMENT B-3

- **ICF KAISER AREA II INVESTIGATION REPORT**

FINAL REPORT FOR THE PHASE II ENVIRONMENTAL SITE ASSESSMENT OF THE DONNER-HANNA COKE PLANT BUFFALO, NEW YORK

JULY 9, 1997

SUBMITTED TO:

MALCOLM PIRNIE, INC.
40 CENTRE DRIVE
BUFFALO, NEW YORK 14219-0138

PRESENTED BY:

ICF KAISER ENGINEERS, INC.
GATEWAY VIEW PLAZA
1600 WEST CARSON STREET
PITTSBURGH, PA 15219-1031

1.0 INTRODUCTION

ICF Kaiser Engineers, Inc. (ICF Kaiser) performed a Phase II Environmental Site Assessment (Phase II ESA) for Malcolm Pirnie, Inc. for the former site of the Donner-Hanna Coke Plant located in Buffalo, New York. The former coke plant site is one of four areas investigated by Malcolm Pirnie during a site characterization study of the LTV Steel site. As described in the report, the former Donner-Hanna Coke Plant is designated as Area II for sample descriptor purposes. The field portion of the Phase II ESA was jointly performed in March, 1997 by Bill Squire, a geologist in ICF Kaiser's Pittsburgh, PA office, and Bryan Hann, a geologist in Malcolm Pirnie's Buffalo, NY office.

The objective of the Phase II ESA was to identify contamination or environmental impairment on the property through the collection of site specific data on potential contamination of soil, subsurface materials, groundwater, and other environmental media.

Specifically, the Phase II ESA involved conducting soil and groundwater sampling at various locations within the former Donner-Hanna Coke Plant (D-H Plant) site to determine the presence or absence of metals, VOC, SVOC, and/or PCB contamination due to past operations of the plant. A Phase I ESA was previously performed for the subject property by Malcolm Pirnie, Inc.

2.0 BACKGROUND

The former D-H Plant consisted of a facility that produced coke and various by-products from coal. The coke production area included coal and coke handling equipment, coke batteries, coal and coke storage areas, and associated auxiliary equipment. The by-product area produced various by-products from coke oven gases generated during the coking process, including products such as coal tar, light oil, and ammonium sulfate. The by-product area consisted of process equipment, storage tanks, and piping used to extract and purify the various by-products from the coke oven off-gases.

The D-H Plant also had a large gas holding tank used to store processed coke oven gas prior to its reuse as fuel in the coke batteries and other plant areas. In addition, there were various piping and utility systems located both aboveground and belowground. There were also a large number of trenches, pits, and sumps located throughout the D-H Plant.

In 1990 and 1991, the D-H plant was decommissioned and demolished down to ground level by ICF Kaiser. Aboveground buildings, structures, tanks, vessels, and piping were decontaminated and demolished, with the resulting waste products managed in accordance with applicable local, State, and Federal regulations. The concrete trenches and pits were cleaned, fractured to prevent runoff water accumulation, and backfilled during the decommissioning and demolition (D&D) process. Some of the underground piping systems and utilities were also removed in various areas of the D-H Plant as well. Upon completion of D&D activities, the D-H Plant Site was graded and seeded to prevent erosion.

3.0 FIELD ACTIVITIES

Soil Gas Survey

Field activities were initiated by performing a passive soil gas survey across the site using GORE-SORBER℠ screening modules, which are hydrophobic, microporous, sorbent, soil vapor collection devices. The soil gas survey was performed by Malcolm Pirnie prior to starting other field sampling activities at the site. Thirty-one modules were installed at a depth of 2.5-ft. bgs in a grid pattern. Modules were normally spaced at 100-ft. intervals between the N9200 and N9700 lines and at 200-ft. intervals between the E7750 and E9600 lines (The coordinate references are presented in Figures 1 and 2). The modules were left in the ground for 14 days and then analyzed for Benzene, Toluene, Ethylbenzene, Xylene (BTEX) and Polynuclear Aromatic Hydrocarbon (PAH) compounds. Laboratory analysis consisted of thermal desorption, gas chromatography, and mass spectroscopy. It should be noted that while the results are useful for screening purposes, they are not definitive. For any given compound, only the total mass desorbed from the module is reported, not mass per volume. This method of reporting results does not permit valid comparison against regulatory levels.

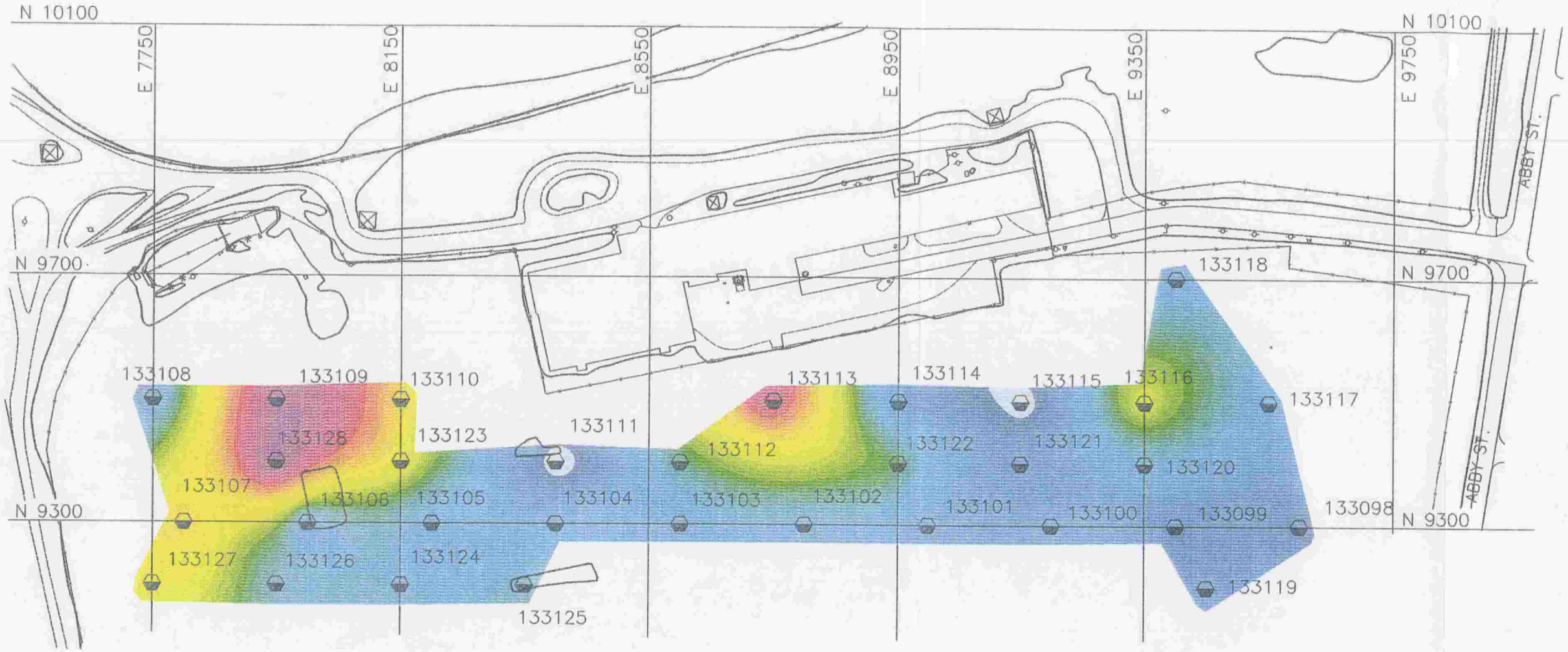
Subsurface Soil Sampling

Based on observations made during the D&D of the D-H Plant by ICF Kaiser and on ICF Kaiser's knowledge of the coking process, 14 areas of the plant were identified for surface and/or subsurface soil sampling. The areas included the following former production, storage, and maintenance facilities:

- Tar Storage Tanks
- Light Oil Area
- Underground Pipes
- Machine Shop
- Old Tar Tanks
- Benzol Washer & Final Cooler Area
- Tar Precipitator Area
- Tar Decanters
- The Electrical Substation
- Gas Holder & Iron Oxide Boxes
- Locomotive Shed
- Interceptor Sump
- Primary Cooler Area
- Possible Tar Unit

The contaminants of concern in these areas are contaminants commonly found at coke and by-product plants. These contaminants include by-product constituents from coal tar (PAHs), light oil (benzene, toluene, and xylenes), and salt (ammonia). Other potential contaminants include chemicals such as naphthalene and cyanide that are often produced in the coke oven gas purification process. In addition, metals contamination may be present due to by-product operations or activities that may have occurred at the steel plants adjacent to the property. The Phase II ESA was focused to investigate potential contamination in shallow and deeper subsurface soil, and groundwater that may have been present due to past coke plant operations. As part of a site-wide investigation of surface soil at the entire LTV Site (Areas I through IV), Malcolm Pirnie sampled and evaluated potential surface soil (0-0.5 ft) contamination at the former coke plant site.

An historical aerial photograph of the plant with a reference grid overlay previously prepared by Malcolm Pirnie was consulted to determine the locations for soil borings within each of the identified areas. The number of borings per area was chosen to provide adequate areal coverage while minimizing statistical skewing of analytical results. Small areas, such as the Tar Tanks, typically were designated to have one boring, while larger areas, such as the Benzol Washers and Final Coolers, were designated to have three or four borings. The decision to collect only shallow soil samples or



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4.788
4.040
3.409
2.876
2.427
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1.728
1.458
1.230
1.038
0.876
0.739
0.623
0.526
0.444
0.374
0.316
0.267
0.225

BTEX
[ug]

133119 GORE-SORBER Screening Module Location

Scale 1:2400

100 0 100 200

(feet)

Figure 1

NOTE: CONTOUR PLOT REPRESENTS MASS OF COMPOUND DESORBED FROM GORE-SORBER SCREENING MODULES, IDENTIFIED AND QUANTIFIED BY GAS CHROMATOGRAPH MASS SELECTIVE DETECTION.

ORIG. CAD: AREA2.DXF

GORE-SORBER SCREENING SURVEY

W.L. GORE & ASSOCIATES, INC.
P.O. BOX 1100
101 LEWISVILLE ROAD
ELKTON, MD 21922-1100
(410) 392-3300

MGP PHASE I/PHASE II SITE, BUFFALO, NY

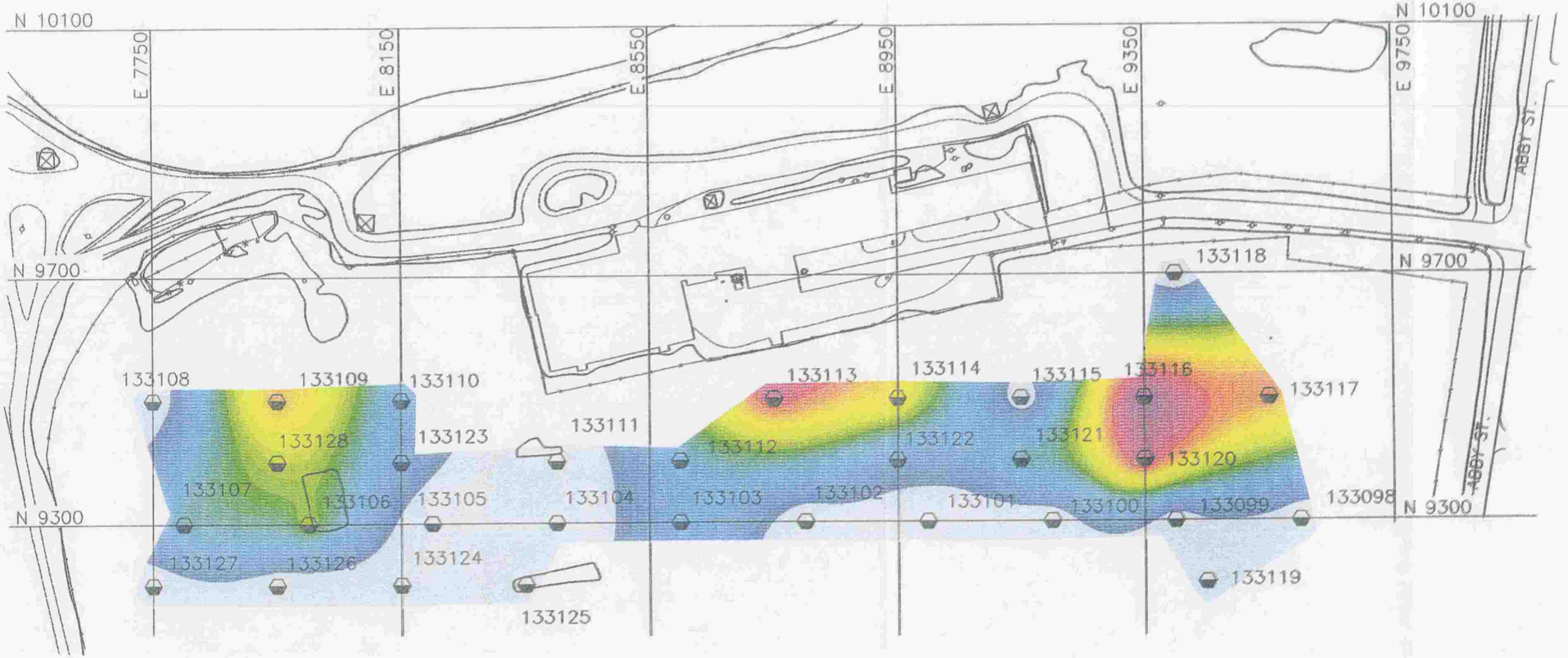
BTEX

MALCOLM PIRNIE, INC., ORCHARD PARK, NY

REV. #: 0

REV. DATE:

DATE DRAWN:	4 MARCH 1997	GRID FILE:	BTO1.GRD
DRAWN BY:	JH	PLOT FILE:	BTC.PLT
DATE GRIDDED:	7 MARCH 1997	PROJECT NUMBER:	071968
GRIDDED BY:	JH	SITE CODE:	YD



133119 GORE-SORBER Screening Module Location

Scale 1:2400

100 0 100 200

(feet)

NOTE: CONTOUR PLOT REPRESENTS MASS OF COMPOUND DESORBED FROM GORE-SORBER SCREENING MODULES, IDENTIFIED AND QUANTIFIED BY GAS CHROMATOGRAPH MASS SELECTIVE DETECTION.

ORIG. CAD: AREA2.DXF

Figure 2

GORE-SORBER SCREENING SURVEY

W.L. GORE & ASSOCIATES, INC.
P.O. BOX 1100
1901 LENDVILLE ROAD
ELKTON, MD 21922-1100
(410) 392-3300

MSP PHASE I/PHASE II SITE, BUFFALO, NY

REV. #: 0

POLYCYCLIC AROMATIC HYDROCARBONS

REV. DATE:

MALCOLM PIRNIE, INC., ORCHARD PARK, NY

DATE DRAWN:	4 MARCH 1997	GRID FILE:	B101.GRD
DRAWN BY:	JH	PLOT FILE:	B1C.PLT
DATE GRIDDED:	7 MARCH 1997	PROJECT NUMBER:	071968
GRIDDED BY:	JH	SITE CODE:	YD

both shallow and deeper subsurface soil samples in each area was based partly on observations made during the D&D and partly on a general knowledge of the coking process. Viscous substances such as tar tend not to migrate far into the subsurface whereas substances such as light oil are more mobile and tend to sink. Therefore, shallow subsurface soils were favored in areas where tar was the suspected contaminant and samples at greater depths were collected in areas with potential benzene contamination. Shallow subsurface soils were generally collected 2 to 4 feet below the ground surface, below the layer of cover soils emplaced after the D&D of the plant.

After the boring locations were marked on the aerial photograph and their reference grid coordinates determined, the locations were marked in the field. Starting from a surveyed grid node, the field team used a tape measure and pin flags to mark each proposed boring location. For the purposes of this investigation, the production area of the plant was labeled Area 2 (A2) and borings were numbered sequentially with either a "P" (piezometer) or "B" (boring) prefix, resulting in borings with designations such as A2-P-1, A2-B-2, etc. Thirty-five boring locations, including two piezometer locations, were marked in the field (see Figure 3). Two areas, the Tar Storage Tank Area and the Benzol Washer and Final Cooler Area, had temporary piezometers installed in a selected boring after the soil sampling to permit collection of groundwater samples. Both piezometers were screened from 5 to 10-ft. bgs.

The borings were completed using a 3-inch O.D. split-spoon driven ahead of a 4.25-inch I.D. hollow stem auger, following ASTM method D 1586-84. Split spoon or auger refusal was often encountered at a location and the boring location was then moved, sometimes more than once. If a boring had to be moved, the field team was careful to always keep the new boring within the general confines of the area being investigated. Borings were moved anywhere from approximately 2-ft. to 25-ft. and the new coordinates were noted. The drilling method was slightly modified, based on field observations, so that the first boring in an area was begun with a split spoon, when possible, to determine the thickness of cover material. Subsequent borings in the same area were augered to the depth of the cover material, generally 2-ft, before beginning split spoon sampling. This modification to the drilling method reduced the need to move subsequent boreholes several times due to split spoon refusal in the cover material.

Once a split spoon sample was obtained, the sample was described in the field logbook. The description included the following information, which was used to prepare boring logs for each borehole (Boring Logs for each soil boring are presented in Appendix A):

- sampling interval
- sample recovery in feet
- texture
- apparent consolidation
- other physical observations
- analytical sample number, when appropriate
- blow count
- color
- apparent moisture content
- odor
- HnU organic vapor meter readings

Field observations showed a covering of demolition debris (slag, cinders, sand, brick, concrete rubble, metal, etc.), generally about 2-ft thick, overlying the original ground surface of the former plant property. The original surface of the plant property (below the demolition debris) was found to be predominantly fill material consisting of ash, slag, silt/clay, medium to coarse sand and fine to medium gravel. In addition, a light to dark blue cemented sand was found in the Light Oil, Tar Decanters, and Primary Coolers areas at depths between 2 and 7-ft. bgs. The blue coloration and cementing is believed to result from ferrous cyanide generated during coke gas distillation and purification

processes (See Section 5 for a further discussion of this topic.). A black-brown-gray, soft to medium stiff silt and clay underlies the entire site at an average depth of about 9-ft. bgs. Saturated conditions were often observed in the fill material at approximately 5-ft. bgs.

The collection of samples for laboratory analysis was targeted at the top 2-ft. of the original ground surface (shallow subsurface sample), and, when required, the top 2-ft. of the underlying native, fine grained soil (deeper subsurface sample). Collection of samples from these two different soil types provides a good indication of the depth of potentially impacted soil due to viscous or fluid contaminants. Samples for laboratory analysis were either collected directly into glass jars (grab samples) or were held in a covered stainless steel bowl to be composited with material from other borings (composite samples). Samples were collected, packed, shipped, and analyzed in accordance with applicable provisions of method SW 846. The samples were marked for Target Analyte List (TAL) metals and total cyanide, Target Compound List (TCL) VOC, TCL SVOC, and TCL PCB analyses, except for samples from the Gas Holder & Iron Oxide Boxes area, which were marked for all of the above plus reactive sulfide and reactive cyanide; and samples from the Electrical Substation, which had TCL VOC, TCL SVOC, and TCL PCB analyses only.

In the northeastern corner of the property, results from the soil gas survey revealed a plume of organic vapors in an area not originally included as part of the soil sampling investigation. Additional borings extending to the north, east, and west from the center of the plume were drilled and evaluated through field observations and readings from the HnU organic vapor meter. For these borings, the most elevated concentrations of organic vapors were detected in borings A2-B-85 (125-ft. north), and A2-B-86 (175-ft. north), as measured from the approximate center of the plume, at depths of up to 6-ft. bgs (the total depth of the borings). One soil sample was collected from boring A2-B-85 and marked for BTEX, PAH, and cyanide analyses from the samples collected in this area.

Surface Soil Sampling

In addition to the soil sampling efforts conducted at the 14 identified areas throughout the plant, three shallow surface soil samples were collected along the southern side of the plant between the former production area and coke batteries, one sample was collected on the western side, and one sample was collected on the eastern side. These samples were collected from the cover material placed over the site after the D&D of the plant to provide a general characterization of the near-surface soils (0.0-0.5-ft. bgs) throughout the area. Samples were marked for TAL metals and total cyanide, TCL VOC, TCL SVOC, and TCL PCB analyses.

Groundwater Sampling

Two groundwater samples were collected from temporary piezometers installed in selected borings in the Tar Storage Tanks area (boring A2-P-1) and the Benzol Washers area (boring A2-P-11). Samples were collected through the total length of the screen (5 to 10-ft. bgs). These locations were chosen for groundwater sampling based on the results of the soil gas survey and on field observations during boring placement. The groundwater sampling was intended to determine what impact elevated levels of BTEX and PAH compounds found during the soil gas survey were having on the groundwater at the property. Samples were analyzed for TAL metals, total cyanide, TCL VOCs and TCL SVOCs.

4.0 RESULTS

Tables listing analytical results for the soil gas survey, the 14 sampling areas,the soil gas plume sample, and groundwater sampling can be found in Appendix B. Complete soil gas survey results are presented in Table B-1. Results for the 14 areas and boring A2-B-85 in the soil gas plume, are presented in Table B-2, and complete groundwater sampling results are in Table B-3. Summary tables of analytical results have been prepared for each of the 14 areas and boring A2-B-85 in the soil gas plume and are included in Section 5.0. Figures 4, 5, and 6 show boring locations and selected analytes found in the shallow and/or deep samples associated with each boring.

5.0 DISCUSSION OF RESULTS

The following discussion is presented on an area-by-area basis for each of the areas investigated during the Phase II ESA at the Donner-Hanna Coke Plant. An overall discussion of the results for the entire property is presented in Section 5.16.

5.1 TAR STORAGE TANK AREA

The coke plant had tar storage tanks located at the northwest corner of the property, adjacent to the light oil area. These tanks were used to store coal tar produced in the by-product recovery operations at the plant. Potential contaminants of concern in this area include coal tar constituents such as PAHs and VOCs (primarily benzene, toluene, and xylene). Cyanides may also be present due to process operations that occurred adjacent to this area. One subsurface soil boring was performed in this area to investigate potential soil contamination. In addition, a temporary piezometer was installed in the soil boring after soil sample collection for use in investigating potential groundwater contamination.

Boring A2-P-1 was drilled to a depth of 13 ft. Field observations reported a mild chemical odor in the 9-11 ft. interval. Soil samples were collected from the 2-4 ft. and 11-13 ft. intervals. Samples were analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. A temporary piezometer was also installed in the boring after the soil sampling was completed, with the screen set in the 5-10 ft. interval. One groundwater sample, A2-P1, was collected and analyzed for TAL metals and total cyanide, TCL VOCs, and TCL SVOCs. Table 1 presents selected analytical results for soil samples A2P10204 and A2P11113. Complete groundwater analytical results can be found in Table B-3.

Analytical results for the 2-4 ft. sample, A2P10204, show no metals in concentrations above their US Environmental Protection Agency (USEPA) Region III Risk Based Concentrations (RBC) for soil ingestion at industrial sites. Benzene (3.1 ppm), toluene (1.0 ppm), and total xylenes (8 ppm) did not exceed RBCs. Three PAH compounds, benzo(a)anthracene (7.9 ppm), benzo(a)pyrene (6.7 ppm), and benzo(b)fluoranthene (8.4 ppm), are above RBC. Total cyanide was detected at 2.58 ppm. PCBs were not detected.

Analytical results for the 11-13 ft. sample, A2P11113, show no metals in concentrations exceeding RBCs. Total cyanide was not detected in this interval, nor were any BTEX compounds. Only one PAH compound, benzo(a)pyrene (3.4 ppm), was detected above RBCs. No PCBs were detected in this interval.

JOB NO.: 7004500000 PLOT SCALE: 1=100
STARTED ON: 5/12/97 REVISED: 0/00/00

N

SAMPLE	A2B20204	A2B20911
DEPTH (FT)	2–4	9–11
ARSENIC	ND	3.36
BARIUM	435.00	118.00
CHROMIUM	4.31	31.50
LEAD	ND	19.50
TOTAL CYANIDE	95.20	ND
TOTAL VOCs	4.40	0.31
TOTAL SVOCs	65.41	ND

SAMPLE	A2B50204	A2B51012
DEPTH (FT)	2–4	10–12
ARSENIC	8.30	4.19
BARIUM	435.00	153.00
CADMIUM	1.01	ND
CHROMIUM	40.20	27.60
LEAD	236.00	15.30
TOTAL CYANIDE	50.80	ND
TOTAL VOCs	ND	0.02
TOTAL SVOCs	377.50	ND

SAMPLE	A2B90204
DEPTH (FT)	2–4
ARSENIC	7.56
BARIUM	411.00
CHROMIUM	9.92
LEAD	10.80
TOTAL CYANIDE	228.00
TOTAL VOCs	ND
TOTAL SVOCs	ND

SAMPLE	A2P10204	A2P11113
DEPTH (FT)	2–4	11–13
ARSENIC	ND	1.96
BARIUM	91.30	86.50
CADMIUM	1.47	ND
CHROMIUM	1050.00	16.50
LEAD	172.00	10.40
SELENIUM	7.45	ND
TOTAL CYANIDE	2.58	ND
TOTAL VOCs	12.09	ND
TOTAL SVOCs	65.60	84.31

SAMPLE	A2B280709
DEPTH (FT)	7–9
ARSENIC	13.70
BARIUM	208.00
CADMIUM	2.88
CHROMIUM	19.80
LEAD	55.10
MERCURY	0.77
SELENIUM	4.12
TOTAL CYANIDE	1.97
TOTAL VOCs	705.00
TOTAL SVOCs	77.00

SAMPLE	A2B310204	A2B311012
DEPTH (FT)	2–4	10–12
ARSENIC	2.56	ND
BARIUM	54.20	184.00
CADMIUM	ND	0.94
CHROMIUM	5.67	28.40
LEAD	11.30	51.70
MERCURY	2.78	ND
TOTAL CYANIDE	24.50	ND
TOTAL VOCs	ND	46.50
TOTAL SVOCs	688.00	83.50

SAMPLE	A2B321618
DEPTH (FT)	16–18
ARSENIC	1.91
BARIUM	53.70
CADMIUM	0.81
CHROMIUM	16.60
LEAD	12.10
TOTAL CYANIDE	ND
TOTAL VOCs	0.022
TOTAL SVOCs	ND

N 9750
N 9500
N 9250
E 8000
E 8500
E 9000

BRUSH
U.P.
CONC. WALL
CONC. WALL
TERMINAL BASIN
W.FL. 577.9
WALLS
WALL
PUMP HOUSE
585
GATE
LIGHT OIL
AUGUST FEINE & SONS, CO.
TAR STORAGE TANKS
A2-SB-2
A2-SB-5
A2-SB-4
A2-SB-3
A2-SB-8
A2-SS-8
A2-P-1
A2-SB-6
A2-SB-7
A2-SB-9
MACHINE SHOP
LOCOMOTIVE SHED
A2-SB-26
UNDERGROUND PIPES
A2-SB-27
A2-SB-32
INCEPTOR SUMP
A2-SS-9
A2-SB-29
A2-SB-28
POSSIBLE TAR UNIT
A2-SB-30
A2-SB-31

NOTES:
1. ALL ANALYTICAL RESULTS IN mg/kg.
2. ONLY DETECTED TCLP METALS LISTED.
3. AREA BOUNDARIES FOR ILLUSTRATION PURPOSES ONLY.
4. ND DENOTES NOT DETECTED

LEGEND:
- A2-P-1 △ PIEZOMETER
- A2-B-2 ● SOIL BORING LOCATION
- A2-SS-9 ◉ SURFACE SOIL LOCATION
- APPROXIMATE AREA BOUNDARY

GRAPHIC SCALE
0 50 100 200

FIGURE 4

LTV STEEL COMPANY
SOUTH BUFFALO SITE

AREA II : WESTERN SECTION
PHASE I AND PHASE II INVESTIGATION

ICF KAISER ENGINEERS
PITTSBURGH, PA

DATE: 5/13/97 DR.: M. WILLIAMS
SCALE: 1"=100' DWG. NO. 20153002

JOB NO.: 7004500000 PLOT SCALE: 1=100

STARTED ON: 5/13/97 REVISED: 0/00/00

N

SAMPLE	A2P110206	A2P110911
DEPTH (FT)	2-6	9-11
ARSENIC	7.55	ND
BARIUM	1140.00	441.00
CADMIUM	ND	ND
CHROMIUM	11.00	26.40
LEAD	93.40	28.20
MERCURY	ND	0.65
TOTAL CYANIDE	209.00	43.40
TOTAL VOCs	26.60	ND
TOTAL SVOCs	1113.00	21.01

SAMPLE	A2B170204
DEPTH (FT)	2-4
ARSENIC	6.23
BARIUM	295.00
CHROMIUM	19.40
LEAD	121.00
SELENIUM	2.44
TOTAL CYANIDE	191.00
TOTAL VOCs	ND
TOTAL SVOCs	37.50

SAMPLE	A2B350204
DEPTH (FT)	2-4
ARSENIC	3.44
BARIUM	541.00
CHROMIUM	14.00
TOTAL CYANIDE	106.00
TOTAL VOCs	0.025
TOTAL SVOCs	634.20

SAMPLE	A2B210204
DEPTH (FT)	2-4
ARSENIC	28.80
BARIUM	510.00
CADMIUM	2.58
CHROMIUM	153.00
LEAD	432.00
TOTAL CYANIDE	97.30
TOTAL VOCs	ND
TOTAL SVOCs	1929.00

SAMPLE	A2B100204	A2B100911
DEPTH (FT)	2-4	9-11
ARSENIC	61.80	4.71
BARIUM	238.00	142.00
CADMIUM	1.04	ND
CHROMIUM	51.70	35.30
LEAD	2800.00	17.20
TOTAL CYANIDE	169.00	ND
TOTAL VOCs	ND	0.08
TOTAL SVOCs	1750.00	4.93

SCATTERED TREES AND BRUSH

BRUSH

TOWER

U.P.S

POLE

TOWER

U.P.S

U.P.S

AUGUST FEINE & SONS, CO.

AUGUST FEINE & SONS, CO.

N 9750

POSTS

TANK

C.B.

CONC.

C.B.

PARKING

F.P. CONC.

POST

TAR PRECIPITATORS

PRIMARY COOLERS

A2-SB-5

A2-SB-4

A2-SB-6

A2-SB-8

N 9500

A2-SB-3

A2-SB-7

A2-SB-9

MACHINE SHOP

A2-SB-15

A2-SB-16

A2-SB-17

A2-SB-33

A2-SB-35

A2-SB-23

A2-SB-19

A2-SB-34

A2-SB-22

A2-P-11

A2-SB-12

A2-SB-13

A2-SB-21

A2-SB-20

A2-SB-14

TAR DECANTERS

BENZOL WASHERS AND FINAL COOLERS

A2-SB-10

OLD TAR TANKS

A2-SS-7

A2-SS-6

N 9250

E 8500

E 8750

E 9000

LEGEND:

A2-P-11 PIEZOMETER

A2-B-10 SOIL BORING LOCATION

A2-SS-7 SURFACE SOIL LOCATION

APPROXIMATE AREA BOUNDARY

NOTES:
1. ALL ANALYTICAL RESULTS IN mg/kg.
2. ONLY DETECTED TCLP METALS LISTED.
3. AREA BOUNDARIES FOR ILLUSTRATION PURPOSES ONLY.
4. ND DENOTES NOT DETECTED.

GRAPHIC SCALE

0 50 100 200

FIGURE 5

LTV STEEL COMPANY
SOUTH BUFFALO SITE

AREA II : CENTER SECTION
PHASE I AND PHASE II INVESTIGATION

ICF KAISER ENGINEERS
PITTSBURGH, PA

DATE: 5/13/97 DR.: M. WILLIAMS

SCALE: 1"=100' DWG. NO. 20153003

JOB NO.: 7004500000 PLOT SCALE: 1=1

STARTED ON: 5/13/97 REVISED: 0/00/00

N

SAMPLE	A2B250608	A2B251012
DEPTH (FT)	6-8	10-12
ARSENIC	2.14	3.36
BARIUM	232.00	104.00
CADMIUM	3.61	1.78
CHROMIUM	282.00	48.20
LEAD	54.70	76.60
MERCURY	15.20	0.98
SELENIUM	5.67	ND
TOTAL CYANIDE	800.00	290.00
REACTIVE SULFIDE	ND	ND
REACTIVE CYANIDE	ND	ND
TOTAL VOCs	2.05	0.13
TOTAL SVOCs	894.30	2.58

SAMPLE	A2B885(4-6)
DEPTH (FT)	4-6
TOTAL CYANIDE	198.00
TOTAL VOCs	209.00
TOTAL SVOCs	2258.20

SAMPLE	A2B240205
DEPTH	2-5
METALS	NA
TOTAL VOCs	ND
TOTAL SVOCs	310.20

TOWER
U.P.
U.P.S
U.P.S
U.P.S
AUGUST FEINE & SONS, CO.
GATE
U.P.
GLM
L.P.
U.P.
U.P.
U.P.
BARAGA ST.
U.P.
U.P.
U.P.
M.H. (PAVED OVER)
ABBY ST.
9042
N 9750
F.P.
CONC.
POST
A2-SB-25
L.P.
BARAGA ST.
A2-SB-87
A2-SB-86
A2-SB-88
A2-SB-89
A2-SB-85
A2-SB-84
PRIMARY COOLERS
NORTHEAST SOIL GAS PLUME
GAS HOLDER AND IRON OXIDE BOXES
A2-SB-33
A2-SB-23
A2-SB-24
A2-SB-35
N 9500
A2-SB-34
A2-SB-22
A2-SB-80
A2-SB-81
A2-SB-82
A2-SB-19
A2-SB-21
A2-SB-20
590
A2-SS-5
E 9750
TAR DECANTERS
ELECTRICAL SUBSTATION
A2-SS-6
N 9250
E 9250
E 9500
GRAPHIC SCALE
0 50 100 200

LEGEND:

A2-P-11
△ PIEZOMETER

A2-B-24
● SOIL BORING LOCATION

A2-SS-7
◉ SURFACE SOIL LOCATION

APPROXIMATE AREA BOUNDARY

NOTES:
1. ALL ANALYTICAL RESULTS IN mg/kg.
2. ONLY DETECTED TCLP METALS LISTED.
3. AREA BOUNDARIES FOR ILLUSTRATION PURPOSES ONLY.
4. ND DENOTES NOT DETECTED.

FIGURE 6

LTV STEEL COMPANY
SOUTH BUFFALO SITE

AREA II : EASTERN SECTION
PHASE I AND PHASE II INVESTIGATION

ICF KAISER ENGINEERS
PITTSBURGH, PA

DATE: 5/13/97 DR.: M. WILLIAMS

SCALE: 1"=100' DWG. NO. 20153004

TABLE 1
Tar Storage Tanks
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Tar Storage Tanks	A2-P-1	13	9450	8020	A2P10204 (g) A2P11113 (g)

Sample A2P10204 -- depth 2-4 ft				Sample A2P11113 -- depth 11-13 ft			
METALS	**CONCENTRATION**	**RBC[1]**	**UNITS**	**METALS**	**CONCENTRATION**	**RBC**	**UNITS**
Aluminum	4970.00	1000000.00	mg/kg	Aluminum	12100.00	1000000.00	mg/kg
Arsenic	ND	610.00	mg/kg	Arsenic	1.96	610.00	mg/kg
Barium	91.30	140000.00	mg/kg	Barium	86.50	140000.00	mg/kg
Beryllium	ND	1.30	mg/kg	Beryllium	0.63	1.30	mg/kg
Cadmium	1.47	1000.00	mg/kg	Cadmium	ND	1000.00	mg/kg
Calcium	136000.00		mg/kg	Calcium	1910.00		mg/kg
Chromium	1050.00	1000000.00	mg/kg	Chromium	16.50	1000000.00	mg/kg
Cobalt	ND	120000.00	mg/kg	Cobalt	8.68	120000.00	mg/kg
Copper	88.30	82000.00	mg/kg	Copper	14.90	82000.00	mg/kg
Iron	157000.00	610000.00	mg/kg	Iron	22800.00	610000.00	mg/kg
Lead	172.00		mg/kg	Lead	10.40		mg/kg
Magnesium	34200.00		mg/kg	Magnesium	2460.00		mg/kg
Manganese	35700.00	47000.00	mg/kg	Manganese	183.00	47000.00	mg/kg
Nickel	23.10	41000.00	mg/kg	Nickel	23.30	41000.00	mg/kg
Potassium	343.00		mg/kg	Potassium	1070.00		mg/kg
Selenium	7.45	10000.00	mg/kg	Selenium	ND	10000.00	mg/kg
Sodium	453.00		mg/kg	Sodium	227.00		mg/kg
Vanadium	484.00	14000.00	mg/kg	Vanadium	24.50	14000.00	mg/kg
Zinc	565.00	610000.00	mg/kg	Zinc	57.10	610000.00	mg/kg
Total Cyanide	2.58		mg/kg	Total Cyanide	ND		mg/kg
TCL VOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL VOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Benzene	3.10	200.00	mg/kg	Benzene	ND	200.00	mg/kg
Toluene	0.99	410000.00	mg/kg	Toluene	ND	410000.00	mg/kg
Total Xylene	8.00	1000000.00	mg/kg	Total Xylene	ND	1000000.00	mg/kg
Total VOCs	**12.09**		**mg/kg**	**Total VOCs**	**0.00**		**mg/kg**
TCL SVOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL SVOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Acenaphthene	ND	120000.00	mg/kg	Acenaphthene	1.10	120000.00	mg/kg
Acenaphthylene	ND		mg/kg	Acenaphthylene	2.30		mg/kg
Anthracene	ND	610000.00	mg/kg	Anthracene	4.30	610000.00	mg/kg
Benzo(a)anthracene	7.90	7.80	mg/kg	Benzo(a)anthracene	4.30	7.80	mg/kg
Benzo(a)pyrene	6.70	0.78	mg/kg	Benzo(a)pyrene	3.40	0.78	mg/kg
Benzo(b)fluoranthene	8.40	7.80	mg/kg	Benzo(b)fluoranthene	3.80	7.80	mg/kg
Benzo(g,h,i)perylene	3.10		mg/kg	Benzo(g,h,i)perylene	1.20		mg/kg
Benzo(k)fluoranthene	5.00	78.00	mg/kg	Benzo(k)fluoranthene	2.20	78.00	mg/kg
Chrysene	6.10	780.00	mg/kg	Chrysene	3.40	780.00	mg/kg
Dibenzo(a,h)anthracene	ND	0.78	mg/kg	Dibenzo(a,h)anthracene	0.59	0.78	mg/kg
Fluoranthene	11.00	82000.00	mg/kg	Fluoranthene	9.60	82000.00	mg/kg
Fluorene	ND	82000.00	mg/kg	Fluorene	5.30	82000.00	mg/kg
Indeno(1,2,3-cd)pyrene	3.50	7.80	mg/kg	Indeno(1,2,3-cd)pyrene	1.20	7.80	mg/kg
Naphthalene	ND	82000.00	mg/kg	Naphthalene	14.00	82000.00	mg/kg
Phenanthrene	2.90	610000.00	mg/kg	Phenanthrene	12.00	610000.00	mg/kg
Pyrene	11.00	61000.00	mg/kg	Pyrene	7.00	61000.00	mg/kg
Total SVOCs	**65.60**		**mg/kg**	**Total SVOCs**	**84.31**		**mg/kg**
PCBs	**CONCENTRATION**	**RBC***	**UNITS**	**PCBs**	**CONCENTRATION**	**RBC***	**UNITS**
No detections		2.86	mg/kg	No detections		2.86	mg/kg

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* RBC value for total PCBs

ND Not Detected

Only BTEX compounds listed.

Only PAH compounds listed.

Analytical results for groundwater sample A2-P1 show four of the 11 metals detected (iron, manganese, selenium, sodium) above their NYSDEC Class GA groundwater quality standards. These metals naturally occur in the environment and are often elevated in regional overburden groundwater. Total cyanide was detected at 0.212 ppm, which is above the GA groundwater standards. Benzene (12 mg/l), toluene (2.5 mg/l), and total xylenes (2 ppm), together with seven of nine SVOCs/PAHs (14.1 mg/l total SVOCs/PAHs) detected were above the GA groundwater quality standards.

5.2 LIGHT OIL AREA

The light oil area of the former D-H plant is located in the northwest portion of the property, adjacent to and east of the tar storage tank area. This area was formerly used to store and partially refine light oil produced in the by-product recovery process. Potential contaminants of concern in this area include benzene, toluene, and xylene, along with other VOCs that may have been produced during light oil refining. One subsurface soil boring was performed in this area to investigate potential contamination.

Boring A2-B-2 was drilled in the Light Oil area to a depth of 12 ft. Field observations reported a blue to dark blue sand from 2-7 ft. and a slight petroleum-like odor in the 2-4 ft. interval. Soil samples were collected from the 2-4 ft. and 9-11 ft. intervals. Samples were analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. Table 2 presents selected analytical results for soil samples A2B20204 and A2B20911.

Analytical results for the 2-4 ft. sample collected in the Light Oil Area, sample A2B20204, show one metal, beryllium (6.11 ppm), at a concentration above the USEPA Region III RBC for industrial sites. Toluene (1.8 ppm) and total xylenes (2.6 ppm) were below RBCs. Only one PAH compound, benzo(a)pyrene (2.4 ppm), was detected at a concentration above RBC. Total cyanide was detected at 95.20 ppm. PCBs were not detected.

Analytical results for the 9-11 ft. sample, sample A2B20911, show no metals detected at concentrations above RBCs. Benzene (0.14 ppm), toluene (0.14 ppm) and total xylenes (0.03 ppm) were all below RBCs. Total cyanide was not detected, nor were PAHs or PCBs.

5.3 UNDERGROUND PIPES AREA

The underground pipes area of the site is located along the north-central property boundary. A large underground process pipeline was removed in this area during plant D&D operations. Potential contaminants of concern include coal tar constituents (PAHs), VOCs (benzene, toluene, and xylenes), naphthalene, and cyanides. Two surface soil borings and one subsurface boring were performed in this area to investigate potential contamination due to possible past releases from the former process pipeline.

Borings A2-B-3, -4, -5 were drilled in a line approximately 65 ft. long near the fence in the Underground Pipes area to depths of 4, 4, and 12 ft., respectively. Field observations at A2-B-5 reported a slight petroleum-like odor in the 2-4 ft. interval. A composite soil sample was collected from the 2-4 ft. intervals of the three borings and a grab soil sample was collected from the 10-12 ft. interval of boring A2-B-5. Samples were analyzed for TAL metals and total cyanide, TCL VOCs,

TABLE 2
Light Oil
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Light Oil	A2-B-2	12	9600	8200	A2B20204 (g) A2B20911 (g)

Sample A2B20204 – depth 2-4 ft				Sample A2B20911 – depth 9-11 ft			
METALS	**CONCENTRATION**	**RBC[1]**	**UNITS**	**METALS**	**CONCENTRATION**	**RBC**	**UNITS**
Aluminum	52100.00	1000000.00	mg/kg	Aluminum	23600.00	1000000.00	mg/kg
Arsenic	ND	610.00	mg/kg	Arsenic	3.36	610.00	mg/kg
Barium	435.00	140000.00	mg/kg	Barium	118.00	140000.00	mg/kg
Beryllium	6.11	1.30	mg/kg	Beryllium	1.16	1.30	mg/kg
Calcium	315000.00		mg/kg	Calcium	2510.00		mg/kg
Chromium	4.31	1000000.00	mg/kg	Chromium	31.50	1000000.00	mg/kg
Cobalt	ND	120000.00	mg/kg	Cobalt	11.70	120000.00	mg/kg
Copper	ND	82000.00	mg/kg	Copper	26.90	82000.00	mg/kg
Iron	4900.00	610000.00	mg/kg	Iron	48700.00	610000.00	mg/kg
Lead	ND		mg/kg	Lead	19.50		mg/kg
Magnesium	4570.00		mg/kg	Magnesium	4420.00		mg/kg
Manganese	5170.00	47000.00	mg/kg	Manganese	304.00	47000.00	mg/kg
Nickel	ND	41000.00	mg/kg	Nickel	31.40	41000.00	mg/kg
Potassium	1950.00		mg/kg	Potassium	4030.00		mg/kg
Sodium	1080.00		mg/kg	Sodium	502.00		mg/kg
Vanadium	ND	14000.00	mg/kg	Vanadium	40.40	14000.00	mg/kg
Zinc	14.80	610000.00	mg/kg	Zinc	116.00	610000.00	mg/kg
Total Cyanide	95.20		mg/kg	Total Cyanide	ND		mg/kg
TCL VOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL VOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Benzene	ND	200.00	mg/kg	Benzene	0.14	0.06	mg/kg
Toluene	1.80	410000.00	mg/kg	Toluene	0.14	1.50	mg/kg
Total Xylene	2.60	1000000.00	mg/kg	Total Xylene	0.03	1000000.00	mg/kg
Total VOCs	**4.40**		**mg/kg**	**Total VOCs**	**0.31**		**mg/kg**
TCL SVOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL SVOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Acenaphthene	3.30	120000.00	mg/kg	Acenaphthene	ND	120000.00	mg/kg
Acenaphthylene	5.50		mg/kg	Acenaphthylene	ND		mg/kg
Anthracene	2.90	610000.00	mg/kg	Anthracene	ND	610000.00	mg/kg
Benzo(a)anthracene	2.90	7.80	mg/kg	Benzo(a)anthracene	ND	7.80	mg/kg
Benzo(a)pyrene	2.40	0.78	mg/kg	Benzo(a)pyrene	ND	0.78	mg/kg
Benzo(b)fluoranthene	2.60	7.80	mg/kg	Benzo(b)fluoranthene	ND	7.80	mg/kg
Benzo(g,h,i)perylene	1.10		mg/kg	Benzo(g,h,i)perylene	ND		mg/kg
Benzo(k)fluoranthene	1.60	78.00	mg/kg	Benzo(k)fluoranthene	ND	78.00	mg/kg
Chrysene	2.20	780.00	mg/kg	Chrysene	ND	780.00	mg/kg
Fluoranthene	11.00	82000.00	mg/kg	Fluoranthene	ND	82000.00	mg/kg
Fluorene	3.90	82000.00	mg/kg	Fluorene	ND	82000.00	mg/kg
Indeno(1,2,3-cd)pyrene	1.00	7.80	mg/kg	Indeno(1,2,3-cd)pyrene	ND	7.80	mg/kg
Naphthalene	2.90	82000.00	mg/kg	Naphthalene	ND	82000.00	mg/kg
Phenanthrene	13.00	610000.00	mg/kg	Phenanthrene	ND	610000.00	mg/kg
Pyrene	3.10	61000.00	mg/kg	Pyrene	ND	61000.00	mg/kg
Total SVOCs	**65.41**		**mg/kg**	**Total SVOCs**	**0.00**		**mg/kg**
PCBs	**CONCENTRATION**	**RBC***	**UNITS**	**PCBs**	**CONCENTRATION**	**RBC**	**UNITS**
No detections		2.86	mg/kg	No detections		2.86	mg/kg

NOTES:
[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites
* RBC value for total PCBs
ND Not Detected
Only BTEX compounds listed.
Only PAH compounds listed.

TCL SVOCs, and TCL PCBs. Table 3 presents selected analytical results for soil samples A2B50204 and A2B51012.

Analytical results for the 2-4 ft. composite sample, A2B50204, show one metal, beryllium (3.18 ppm), at a concentration above RBCs. Total cyanide was detected at 50.80 ppm. Four of 16 PAH compounds (377.5 ppm total PAHs) detected were found above RBCs. No VOCs or PCBs were detected.

Analytical results for the 10-12 ft. sample, A2B51012, show no metals at concentrations above RBCs. Total cyanide was not detected. Benzene was detected, however, the concentration (0.02 ppm) did not exceed RBCs. No PAHs or PCBs were detected in the subsurface sample.

5.4 MACHINE SHOP

The machine shop area includes the soils located around and within the former machine shop for the coke plant. During D&D activities at the plant, flooring contaminated with PCBs was removed from the machine shop. Along with PCBs, other potential contaminants in this area may include constituents of machine oils and lubricants (VOCs and SVOCs). Four surface soil borings were performed in this area to investigate potential contamination due to past machine shop operations.

Borings A2-B-6, -7, -8, -9 were drilled around the perimeter of the Machine Shop area to depths of 4, 4, 5, and 4 ft., respectively. The borings were spaced to cover an area of approximately 2700 sq. ft. Only one sample, a composite soil sample, was collected from the 2-4 ft. intervals of the four borings. The sample was analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. Table 4 presents selected analytical results for composite soil sample A2B90204.

Analytical results for the 2-4 ft. composite sample, A2B90204, show one metal, beryllium (3.49 ppm), at a concentration above RBCs. Total cyanide is reported at 228.0 ppm. BTEX, PAHs, and PCBs were not detected.

5.5 OLD TAR TANKS AREA

The old tar tank area represents the former location of two tar storage tanks that were adjacent to the main by-products process area, in the west-central portion of the facility. These tanks were older tar storage tanks for the plant that were used in addition to the tar storage tanks located in the northwest corner of the property. Potential contaminants of concern in this area include coal tar constituents such as PAHs and VOCs (primarily benzene, toluene, and xylene). Cyanides may also be present due to process operations that occurred adjacent to this area. One subsurface soil boring was performed in this area to investigate potential contamination that may be present due to past by-product plant operations and activities.

Boring A2-B-10 was drilled in the Old Tar Tanks area to a depth of 12 ft. Soil samples were collected from the 2-4 ft. and 9-11 ft. intervals. Samples were analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. Table 5 presents selected analytical results for soil samples A2B100204 and A2B100911.

Analytical results for the 2-4 ft. sample, A2B100204, show one metal, beryllium (1.98 ppm) at a concentration above RBCs. Total cyanide was detected at 169.00 ppm. Four of the 15 PAH

TABLE 3
Underground Pipes
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES NORTH	COORDINATES EAST	SAMPLE NUMBER (composite=c, grab=g)
Underground Pipes	A2-B-3	4	9505	8385	A2B50204 (c) *
	A2-B-4	4	9507	8420	
	A2-B-5	12	9512	8450	A2B51012 (g)

Sample A2B50204 – depth 2-4 ft				Sample A2B51012 – depth 10-12 ft			
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	27600.00	1000000.00	mg/kg	Aluminum	19800.00	1000000.00	mg/kg
Arsenic	8.30	610.00	mg/kg	Arsenic	4.19	610.00	mg/kg
Barium	435.00	140000.00	mg/kg	Barium	153.00	140000.00	mg/kg
Beryllium	3.18	1.30	mg/kg	Beryllium	1.22	1.30	mg/kg
Cadmium	1.01	1000.00	mg/kg	Cadmium	ND	1000.00	mg/kg
Calcium	139000.00		mg/kg	Calcium	3570.00		mg/kg
Chromium	40.20	1000000.00	mg/kg	Chromium	27.60	1000000.00	mg/kg
Cobalt	ND	120000.00	mg/kg	Cobalt	14.30	120000.00	mg/kg
Copper	142.00	82000.00	mg/kg	Copper	32.80	82000.00	mg/kg
Iron	45600.00	610000.00	mg/kg	Iron	45100.00	610000.00	mg/kg
Lead	236.00		mg/kg	Lead	15.30		mg/kg
Magnesium	5340.00		mg/kg	Magnesium	4910.00		mg/kg
Manganese	3430.00	47000.00	mg/kg	Manganese	693.00	47000.00	mg/kg
Nickel	17.80	41000.00	mg/kg	Nickel	41.70	41000.00	mg/kg
Potassium	2370.00		mg/kg	Potassium	1240.00		mg/kg
Sodium	822.00		mg/kg	Sodium	431.00		mg/kg
Vanadium	18.70	14000.00	mg/kg	Vanadium	29.50	14000.00	mg/kg
Zinc	187.00	610000.00	mg/kg	Zinc	99.20	610000.00	mg/kg
Total Cyanide	50.80		mg/kg	Total Cyanide	ND		mg/kg
TCL VOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL VOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Benzene	ND	200.00	mg/kg	Benzene	0.02	200.00	mg/kg
Total VOCs	**0.00**		**mg/kg**	**Total VOCs**	**0.02**		**mg/kg**
TCL SVOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL SVOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Acenaphthene	4.50	120000.00	mg/kg	Acenaphthene	ND	120000.00	mg/kg
Acenaphthylene	13.00		mg/kg	Acenaphthylene	ND		mg/kg
Anthracene	16.00	610000.00	mg/kg	Anthracene	ND	610000.00	mg/kg
Benzo(a)anthracene	33.00	7.80	mg/kg	Benzo(a)anthracene	ND	7.80	mg/kg
Benzo(a)pyrene	33.00	0.78	mg/kg	Benzo(a)pyrene	ND	0.78	mg/kg
Benzo(b)fluoranthene	37.00	7.80	mg/kg	Benzo(b)fluoranthene	ND	7.80	mg/kg
Benzo(g,h,i)perylene	16.00		mg/kg	Benzo(g,h,i)perylene	ND		mg/kg
Benzo(k)fluoranthene	21.00	78.00	mg/kg	Benzo(k)fluoranthene	ND	78.00	mg/kg
Chrysene	26.00	780.00	mg/kg	Chrysene	ND	780.00	mg/kg
Dibenzo(a,h)anthracene	5.40	0.78	mg/kg	Dibenzo(a,h)anthracene	ND	0.78	mg/kg
Fluoranthene	55.00	82000.00	mg/kg	Fluoranthene	ND	82000.00	mg/kg
Fluorene	11.00	82000.00	mg/kg	Fluorene	ND	82000.00	mg/kg
Indeno(1,2,3-cd)pyrene	16.00	7.80	mg/kg	Indeno(1,2,3-cd)pyrene	ND	7.80	mg/kg
Naphthalene	3.60	82000.00	mg/kg	Naphthalene	ND	82000.00	mg/kg
Phenanthrene	38.00	610000.00	mg/kg	Phenanthrene	ND	610000.00	mg/kg
Pyrene	49.00	61000.00	mg/kg	Pyrene	ND	61000.00	mg/kg
Total SVOCs	**377.50**		**mg/kg**	**Total SVOCs**	**0.00**		**mg/kg**
PCBs	**CONCENTRATION**	**RBC****	**UNITS**	**PCBs**	**CONCENTRATION**	**RBC**	**UNITS**
No detections		2.86	mg/kg	No detections		2.86	mg/kg

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* Composite sample taken from 2-4 ft interval in borings A2-B-3 and A2-B-4 and A2-B-5.

** RBC value for total PCBs

ND Not Detected

Only BTEX compounds listed.

Only PAH compounds listed.

TABLE 4
Machine Shop
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Machine Shop	A2-B-6	4	9508	8460	
	A2-B-7	4	9470	8440	
	A2-B-8	5	9520	8520	
	A2-B-9	4	9480	8503	A2B90204 (c) *

Sample A2B90204 -- depth 2-4 ft							
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	29200.00	1000000.00	mg/kg	Magnesium	7610.00		mg/kg
Arsenic	7.56	610.00	mg/kg	Manganese	4700.00	47000.00	mg/kg
Barium	411.00	140000.00	mg/kg	Nickel	8.68	41000.00	mg/kg
Beryllium	3.49	1.30	mg/kg	Potassium	1860.00		mg/kg
Calcium	146000.00		mg/kg	Sodium	747.00		mg/kg
Chromium	9.92	1000000.00	mg/kg	Vanadium	13.20	14000.00	mg/kg
Copper	17.00	82000.00	mg/kg	Zinc	124.00	610000.00	mg/kg
Iron	36200.00	610000.00	mg/kg	Total Cyanide	228.00		mg/kg
Lead	10.80		mg/kg				
TCL VOCs	CONCENTRATION	RBC	UNITS	TCL VOCs	CONCENTRATION	RBC	UNITS
No detections			mg/kg				
TCL SVOCs	CONCENTRATION	RBC	UNITS	TCL SVOCs	CONCENTRATION	RBC	UNITS
No detections			mg/kg				
PCBs	CONCENTRATION	RBC**	UNITS	PCBs	CONCENTRATION	RBC	UNITS
No detections		2.86	mg/kg				

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* Composite sample taken from 2-4 ft interval in borings A2-B-6 and A2-B-7, A2-B-8 and A2-B-9.

** RBC value for total PCBs

ND Not Detected

TABLE 5
Old Tar Tanks
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Old Tar Tanks	A2-B-10	12	9368	8564	A2B100204 (g) A2B100911(g)

Sample A2B100204 -- depth 2-4 ft				Sample A2B100911 -- depth 9-11 ft			
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	13800.00	1000000.00	mg/kg	Aluminum	25100.00	1000000.00	mg/kg
Antimony	16.90	820.00	mg/kg	Antimony	ND	820.00	mg/kg
Arsenic	61.80	610.00	mg/kg	Arsenic	4.71	610.00	mg/kg
Barium	238.00	140000.00	mg/kg	Barium	142.00	140000.00	mg/kg
Beryllium	1.98	1.30	mg/kg	Beryllium	1.08	1.30	mg/kg
Cadmium	1.04	1000.00	mg/kg	Cadmium	ND	1000.00	mg/kg
Calcium	69000.00		mg/kg	Calcium	2100.00		mg/kg
Chromium	51.70	1000000.00	mg/kg	Chromium	35.30	1000000.00	mg/kg
Cobalt	ND	120000.00	mg/kg	Cobalt	41.60	120000.00	mg/kg
Copper	164.00	82000.00	mg/kg	Copper	31.60	82000.00	mg/kg
Iron	76700.00	610000.00	mg/kg	Iron	47300.00	610000.00	mg/kg
Lead	2800.00		mg/kg	Lead	17.20		mg/kg
Magnesium	5360.00		mg/kg	Magnesium	4870.00		mg/kg
Manganese	2660.00	47000.00	mg/kg	Manganese	499.00	47000.00	mg/kg
Nickel	30.70	41000.00	mg/kg	Nickel	44.50	41000.00	mg/kg
Potassium	951.00		mg/kg	Potassium	2600.00		mg/kg
Sodium	418.00		mg/kg	Sodium	149.00		mg/kg
Vanadium	40.10	14000.00	mg/kg	Vanadium	40.90	14000.00	mg/kg
Zinc	325.00	610000.00	mg/kg	Zinc	146.00	610000.00	mg/kg
Total Cyanide	169.00		mg/kg	Total Cyanide	ND		mg/kg
TCL VOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL VOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Ethylbenzene	ND	200000.00	mg/kg	Ethylbenzene	0.03	200000.00	mg/kg
Total Xylene	ND	1000000.00	mg/kg	Total Xylene	0.06	1000000.00	mg/kg
Total VOCs	**0.00**		**mg/kg**	**Total VOCs**	**0.09**		**mg/kg**
TCL SVOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL SVOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Acenaphthylene	54.00		mg/kg	Acenaphthylene	ND		mg/kg
Anthracene	53.00	610000.00	mg/kg	Anthracene	ND	610000.00	mg/kg
Benzo(a)anthracene	150.00	7.80	mg/kg	Benzo(a)anthracene	ND	7.80	mg/kg
Benzo(a)pyrene	100.00	0.78	mg/kg	Benzo(a)pyrene	ND	0.78	mg/kg
Benzo(b)fluoranthene	130.00	7.80	mg/kg	Benzo(b)fluoranthene	0.48	7.80	mg/kg
Benzo(g,h,i)perylene	71.00		mg/kg	Benzo(g,h,i)perylene	ND		mg/kg
Benzo(k)fluoranthene	83.00	78.00	mg/kg	Benzo(k)fluoranthene	ND	78.00	mg/kg
Chrysene	130.00	780.00	mg/kg	Chrysene	ND	780.00	mg/kg
Dibenzo(a,h)anthracene	22.00	0.78	mg/kg	Dibenzo(a,h)anthracene	ND	0.78	mg/kg
Fluoranthene	330.00	82000.00	mg/kg	Fluoranthene	1.20	82000.00	mg/kg
Fluorene	34.00	82000.00	mg/kg	Fluorene	ND	82000.00	mg/kg
Indeno(1,2,3-cd)pyrene	70.00	7.80	mg/kg	Indeno(1,2,3-cd)pyrene	ND	7.80	mg/kg
Naphthalene	63.00	82000.00	mg/kg	Naphthalene	1.20	82000.00	mg/kg
Phenanthrene	210.00		mg/kg	Phenanthrene	1.20		mg/kg
Pyrene	250.00	61000.00	mg/kg	Pyrene	0.85	61000.00	mg/kg
Total SVOCs	**1760.00**		**mg/kg**	**Total SVOCs**	**4.93**		**mg/kg**
PCBs	**CONCENTRATION**	**RBC***	**UNITS**	**PCBs**	**CONCENTRATION**	**RBC**	**UNITS**
No detections		2.86	mg/kg	No detections		2.86	mg/kg

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* RBC value for total PCBs

ND Not Detected

Only BTEX compounds listed.

Only PAH compounds listed.

compounds (1750 ppm total PAHs) detected were above RBCs. No VOCs or PCBs were detected.

Analytical results for the 9-11 ft. sample, A2B100911, show no metals at concentrations above RBCs. Total cyanide was not detected. Ethylbenzene (0.03 ppm) and total xylenes (0.06 ppm) were detected, however, the concentrations were well below RBCs. Five PAHs (4.93 ppm total PAHs) were also detected but at concentrations below RBCs. No total cyanides or PCBs were detected.

5.6 BENZOL WASHER & FINAL COOLER AREA

The benzol washers and final coolers were process units within the former by-product plant that were used to remove by-products such as tar and light oil from raw coke oven gas. These units were located adjacent to each other in the central portion of the former by-product area of the D-H plant. Potential contaminants of concern include PAHs, benzene, toluene, xylenes, and cyanide. Three surface soil borings and one subsurface soil boring were performed in this area to investigate potential contamination. A temporary piezometer was installed in the subsurface boring after soil sampling had been completed in order to investigate potential groundwater contamination.

Borings A2-P-11, A2-B-12, -13, -14 were drilled in the Benzol Washers and Final Coolers area to depths of 12, 2.8, 4, and 4 ft., respectively. The borings were spaced to cover an area of approximately 2615 sq. ft. Field observations at A2-B-12 reported a thin layer of blue-green sand at approximately 1 ft. and a strong chemical odor from 2-4 ft. in A2-B-13. A composite soil sample was collected in the 2-6 ft. interval of the four borings and a grab soil sample was collected from the 9-11 ft. interval of boring A2-P-11. Samples were analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. A temporary piezometer was also installed in boring A2-P-11 after the soil sampling was completed, with the screen set in the 5-10 ft. interval. One groundwater sample, A2-P11, was collected and analyzed for TAL metals and total cyanide, TCL VOCs, and TCL SVOCs. Table 6 presents selected analytical results for composite soil sample A2P110206 and grab soil sample A2P110911. Complete groundwater analytical results can be found in Table B-3.

Analytical results for the 2-6 ft. composite sample, A2P110206, show one metal, beryllium (4.41 ppm), at a concentration above RBCs. Total cyanide was detected at 209.00 ppm. Benzene (13 ppm), ethylbenzene (9.3 ppm), and total xylenes (4.30 ppm) were detected below RBCs. Three of 13 SVOCs/PAHs detected (1113 ppm total SVOCs/PAHs) were above RBCs. PCBs were not detected.

Analytical results for the 9-11 ft. grab soil sample, A2P110911, show one metal, beryllium (1.89 ppm), at a concentration above RBCs. Total cyanide was detected at 43.40 ppm. There were no PAH compounds found to exceed RBCs. No VOCs or PCBs were detected.

Analytical results for groundwater sample A2-P11 show four metals, including selenium (0.016 mg/l), above their NYSDEC Class GA groundwater quality standards. Total cyanide was detected at 1.25 ppm, which is above the GA groundwater standards. Benzene (0.086 mg/l), toluene (0.028 mg/l), and total xylenes (0.005 mg/l), together with several SVOCs/PAHs (0.519 mg/l total SVOCs/PAHs), were detected at concentrations above the GA groundwater quality standards.

5.7 TAR PRECIPITATOR AREA

The tar precipitators were electrostatic precipitator units used to remove tar mists from raw coke oven gas. These units were located near the north-central property boundary of the former D-H

TABLE 6
Benzol Washers and Final Coolers
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Benzol Washers & Final Coolers	A2-P-11	12	9468	8750	A2P110206 (c) * A2P110911 (g)
	A2-B-12	2.8	9432	8718	
	A2-B-13	4	9448	8802	
	A2-B-14	4	9415	8755	

Sample A2P110206 -- depth 2-6 ft				Sample A2P110911 -- depth 9-11 ft			
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	38600.00	1000000.00	mg/kg	Aluminum	24600.00	1000000.00	mg/kg
Arsenic	7.55	610.00	mg/kg	Arsenic	ND	610.00	mg/kg
Barium	1140.00	140000.00	mg/kg	Barium	441.00	140000.00	mg/kg
Beryllium	4.41	1.30	mg/kg	Beryllium	1.89	1.30	mg/kg
Cadmium	ND	1000.00	mg/kg	Cadmium	ND	1000.00	mg/kg
Chromium	11.00	1000000.00	mg/kg	Chromium	26.40	1000000.00	mg/kg
Cobalt	ND	120000.00	mg/kg	Cobalt	10.30	120000.00	mg/kg
Copper	11.40	82000.00	mg/kg	Copper	26.60	82000.00	mg/kg
Iron	11500.00	610000.00	mg/kg	Iron	31600.00	610000.00	mg/kg
Lead	93.40		mg/kg	Lead	28.20		mg/kg
Magnesium	17300.00		mg/kg	Magnesium	9490.00		mg/kg
Manganese	5260.00	47000.00	mg/kg	Manganese	2360.00	47000.00	mg/kg
Mercury	ND	610.00	mg/kg	Mercury	0.65	610.00	mg/kg
Nickel	ND	41000.00	mg/kg	Nickel	24.90	41000.00	mg/kg
Potassium	1220.00		mg/kg	Potassium	1840.00		mg/kg
Sodium	707.00		mg/kg	Sodium	731.00		mg/kg
Vanadium	8.31	14000.00	mg/kg	Vanadium	27.50	14000.00	mg/kg
Zinc	118.00	610000.00	mg/kg	Zinc	90.00	610000.00	mg/kg
Total Cyanide	209.00		mg/kg	Total Cyanide	43.40		mg/kg
TCL VOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL VOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Benzene	13.00	200.00	mg/kg	Benzene	ND	200.00	mg/kg
Ethylbenzene	9.30	200000.00	mg/kg	Ethylbenzene	ND	200000.00	mg/kg
Total Xylene	4.30	1000000.00	mg/kg	Total Xylene	ND	1000000.00	mg/kg
Total VOCs	**26.60**		**mg/kg**	**Total VOCs**	**0.00**		**mg/kg**
TCL SVOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL SVOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Acenaphthene	61.00	120000.00	mg/kg	Acenaphthene	ND	120000.00	mg/kg
Acenaphthylene	48.00		mg/kg	Acenaphthylene	0.98		mg/kg
Anthracene	39.00	610000.00	mg/kg	Anthracene	ND	610000.00	mg/kg
Benzo(a)anthracene	48.00	7.80	mg/kg	Benzo(a)anthracene	0.58	7.80	mg/kg
Benzo(a)pyrene	36.00	0.78	mg/kg	Benzo(a)pyrene	0.53	0.78	mg/kg
Benzo(b)fluoranthene	40.00	7.80	mg/kg	Benzo(b)fluoranthene	0.62	7.80	mg/kg
Chrysene	43.00	780.00	mg/kg	Chrysene	ND	780.00	mg/kg
Fluoranthene	81.00	82000.00	mg/kg	Fluoranthene	1.60	82000.00	mg/kg
Fluorene	46.00	82000.00	mg/kg	Fluorene	ND	82000.00	mg/kg
Naphthalene	460.00	82000.00	mg/kg	Naphthalene	13.00	82000.00	mg/kg
Phenanthrene	120.00	610000.00	mg/kg	Phenanthrene	1.40	610000.00	mg/kg
Pyrene	60.00	61000.00	mg/kg	Pyrene	1.10	61000.00	mg/kg
Total SVOCs	**1113.00**		**mg/kg**	**Total SVOCs**	**21.01**		**mg/kg**
PCBs	**CONCENTRATION**	**RBC****	**UNITS**	**PCBs**	**CONCENTRATION**	**RBC**	**UNITS**
No detections		2.86	mg/kg	No detections		2.86	mg/kg

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* Composite sample taken from 4-6 ft interval of A2-P-11, 2-2.8 ft interval of A2-B-12, and 2-4 ft interval of A2-B-13 and A2-B-14.

** RBC value for total PCBs

ND Not Detected

Only BTEX compounds listed.

Only PAH compounds listed.

plant. Contaminants of concern in the tar precipitator area include tar constituents such as PAHs, VOCs (primarily benzene, toluene, and xylenes) and cyanides. Three surface soil borings were performed in this area to investigate potential contamination due to past process operations.

Borings A2-B-15, -16, -17, were drilled in the Tar Precipitators area, each to a depth of 4 ft. The borings were spaced to cover an area of approximately 715 sq. ft. A composite soil sample was collected from the 2-4 ft. intervals of the three borings. Samples were analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. Table 7 presents selected analytical results for composite soil sample A2B170204.

Analytical results for the 2-4 ft. composite sample, A2B170204, show one metal, beryllium (1.92 ppm), at a concentration above RBCs. Total cyanide was detected at 191.00 ppm. Two of six PAH compounds detected (37.5 ppm total PAHs) were above RBCs. No VOCs or PCBs were detected.

5.8 TAR DECANTER AREA

The tar decanters at the former D-H plant were located in the east-central portion of the by-product area. These units were used to separate tar, ammonia flushing liquor, and tar decanter sludge that had been removed from raw coke oven gas at the coke batteries. Potential contaminants that may be present include VOCs (benzene, toluene, and xylene), PAHs (coal tar constituents), naphthalene, cyanides, and coal tar decanter sludge constituents such as PAHs, VOCs, and lead. (Coal tar decanter sludge is classified as RCRA listed hazardous waste K087). Three surface soil borings were performed in this area to investigate potential contamination that may be present due to past plant operations.

Borings A2-B-19, -20, -21 were drilled in the Tar Decanter area to depths of 4, 4.5, and 4 ft., respectively. The borings were spaced to cover an area of approximately 250 sq. ft. Several unsuccessful attempts were made to complete boring A2-B-18 and the boring was ultimately abandoned. Field observations reported a 0.2 ft. layer of cemented sand at approximately 2 ft. in A2-B-19; a 0.3 ft. layer of dense, blue sand at approximately 2.5 ft. and a creosote/diesel- like odor in A2-B-20; and a layer of cemented, blue sand at approximately 2 ft. in A2-B-21. A composite soil sample was collected from the 2-4.5 ft. intervals of the three successfully completed borings. The sample was analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. Table 8 presents selected analytical results for composite soil sample A2B210204.

Analytical results for the 2-4 ft. composite sample, A2B210204, show one metal, beryllium (3.69 ppm), at a concentration above RBCs. Total cyanide was detected at 97.30 ppm. Four of 16 SVOCs/PAHs detected (1929 ppm total SVOCs/PAHs) were above RBCs. No VOCs or PCBs were detected.

5.9 ELECTRICAL SUBSTATION

The primary electrical substation at the D-H plant was located in the east-central portion of the property, south of the by-product building. During the D&D activities at the plant, PCB transformers were removed from the substation. Potential contaminants in this area include PCBs, VOCs, and SVOCs that may have been present in the transformer dielectric fluid. Three surface soil borings were performed in this area to investigate potential contamination that may be present due to past activities at the substation.

TABLE 7
Tar Precipitators
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Tar Precipitators	A2-B-15	4	9570	8900	A2B170204 (c) *
	A2-B-16	4	9532	8887	
	A2-B-17	4	9535	8918	

Sample A2B170204 – depth 2-4 ft							
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	17600.00	1000000.00	mg/kg	Magnesium	8220.00		mg/kg
Arsenic	6.23	610.00	mg/kg	Manganese	2570.00	47000.00	mg/kg
Barium	295.00	140000.00	mg/kg	Nickel	12.50	41000.00	mg/kg
Beryllium	1.92	1.30	mg/kg	Potassium	1880.00		mg/kg
Calcium	94700.00		mg/kg	Selenium	2.44	10000.00	mg/kg
Chromium	19.40	1000000.00	mg/kg	Sodium	830.00		mg/kg
Copper	42.30	82000.00	mg/kg	Vanadium	14.80	14000.00	mg/kg
Iron	36700.00	610000.00	mg/kg	Zinc	181.00	610000.00	mg/kg
Lead	121.00		mg/kg	Total Cyanide	191.00		mg/kg
TCL VOCs	CONCENTRATION	RBC	UNITS	TCL VOCs	CONCENTRATION	RBC	UNITS
No detections			mg/kg				
TCL SVOCs	CONCENTRATION	RBC	UNITS	TCL SVOCs	CONCENTRATION	RBC	UNITS
Benzo(a)pyrene	6.30	0.78	mg/kg	Fluoranthene	7.00	82000.00	mg/kg
Benzo(b)fluoranthene	7.90	7.80	mg/kg	Indeno(1,2,3-cd)pyrene	5.30	7.80	mg/kg
Benzo(g,h,i)perylene	5.60		mg/kg	Pyrene	5.40	61000.00	mg/kg
Total SVOCs	37.50		mg/kg				
PCBs	CONCENTRATION	RBC**	UNITS	PCBs	CONCENTRATION	RBC	UNITS
No detections		2.86	mg/kg				

NOTES:
[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites
* Composite sample taken from 2-4 ft interval in borings A2-B-15, A2-B-16 and A2-B-17.
** RBC value for total PCBs
ND Not Detected
Only PAH compounds listed.

TABLE 8
Tar Decanters
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Tar Decanters	A2-B-18	Abandoned *	N/A	N/A	
	A2-B-19	4	9490	8995	
	A2-B-20	4.5	9470	9015	
	A2-B-21	4	9465	8995	A2B210204 (c) **

Sample A2B210204 -- depth 2-4 ft							
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	35200.00	1000000.00	mg/kg	Lead	432.00		mg/kg
Arsenic	28.80	610.00	mg/kg	Magnesium	26700.00		mg/kg
Barium	510.00	140000.00	mg/kg	Manganese	6600.00	47000.00	mg/kg
Beryllium	3.69	1.30	mg/kg	Nickel	26.10	41000.00	mg/kg
Cadmium	2.58	1000.00	mg/kg	Potassium	1950.00		mg/kg
Calcium	187000.00		mg/kg	Sodium	688.00		mg/kg
Chromium	153.00	1000000.00	mg/kg	Vanadium	26.10	14000.00	mg/kg
Copper	99.90	82000.00	mg/kg	Zinc	1750.00	610000.00	mg/kg
Iron	68100.00	610000.00	mg/kg	Total Cyanide	97.30		mg/kg
TCL VOCs	CONCENTRATION	RBC	UNITS	TCL VOCs	CONCENTRATION	RBC	UNITS
No detections			mg/kg				
TCL SVOCs	CONCENTRATION	RBC	UNITS	TCL SVOCs	CONCENTRATION	RBC	UNITS
Acenaphthene	49.00	120000.00	mg/kg	Chrysene	100.00	780.00	mg/kg
Acenaphthylene	90.00		mg/kg	Fluoranthene	310.00	82000.00	mg/kg
Anthracene	110.00	610000.00	mg/kg	Fluorene	110.00	82000.00	mg/kg
Benzo(a)anthracene	110.00	7.80	mg/kg	Indeno(1,2,3-cd)pyrene	48.00	7.80	mg/kg
Benzo(a)pyrene	110.00	0.78	mg/kg	Naphthalene	110.00	82000.00	mg/kg
Benzo(b)fluoranthene	110.00	7.80	mg/kg	Phenanthrene	280.00	610000.00	mg/kg
Benzo(g,h,i)perylene	48.00		mg/kg	Pyrene	220.00	61000.00	mg/kg
Benzo(k)fluoranthene	61.00	78.00	mg/kg				
Total SVOCs	1929.00		mg/kg				
PCBs	CONCENTRATION	RBC***	UNITS	PCBs	CONCENTRATION	RBC	UNITS
No detections		2.86	mg/kg				

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* Boring A2-B-18 abandoned due to split spoon refusal to boundary of area.

** Composite sample taken from 2-4 ft interval in borings A2-B-19 and A2-B-21; taken from 2.5-4.5 ft interval in boring A2-B-20.

*** RBC value for total PCBs

ND Not Detected

Only PAH compounds listed.

Borings A2-B-22, -23, -24 were drilled in a line approximately 65 ft. long in the Substation area to depths of 5, 3, and 4 ft., respectively. A composite soil sample was collected in the 2-5 ft. intervals of the three borings. The sample was analyzed for TCL VOCs, TCL SVOCs, and TCL PCBs. Table 9 presents selected analytical results for composite soil sample A2B240205.

Analytical results for the 2-4 ft. composite sample, A2B240205, detected 14 PAH compounds. Four of the 14 PAHs detected were above RBCs (310.2 ppm total PAH). No VOCs or PCBs were detected. TAL metals and total cyanide were not analyzed.

5.10 GAS HOLDER & IRON OXIDE BOXES

The coke oven gas holder for the former D-H plant was located near the northeastern boundary of the property and was used to store excess coke oven gas produced in the coking process. The D-H plant sold excess coke oven gas to the local municipality and used units containing iron oxide catalyst to further purify the gas prior to offsite use. Potential contaminants of concern include cyanides, sulfides, PAHs, and VOCs. One subsurface soil boring was performed in the area of the gas holder and iron oxide boxes to investigate potential contamination due to past operations.

Boring A2-B-25 was drilled in the Gas Holder & Iron Oxide Boxes area to a depth of 12 ft. Soil samples were collected from the 6-8 ft. and 10-12 ft. intervals. Samples were analyzed for TAL metals, total cyanide, reactive sulfide, reactive cyanide reactivity, TCL VOCs, TCL SVOCs, and TCL PCBs. Table 10 presents selected analytical results for soil samples A2B250608 and A2B251012.

Analytical results for the 6-8 ft. sample, A2B250608, show one metal, beryllium (4.39 ppm), at a concentration above RBCs. Total cyanide was detected at 800.00 ppm. No reactive sulfide or reactive cyanide were detected. Acetone (0.25 ppm) and benzene (1.80 ppm) were found in concentrations well below their respective RBCs, and five of 18 SVOCs/PAHs (894 ppm total SVOC/PAH) detected were above RBCs. PCBs were not detected.

Analytical results for the 10-12 ft. sample, A2B251012, show no metals above RBCs. Total cyanide was detected at 290.00 ppm. No reactive sulfide or reactive cyanide were detected. Acetone (0.066 ppm), benzene (0.042 ppm), and 2-butanone (MEK)(0.019 ppm) were detected, but at concentrations below their respective RBC. No SVOC/PAH compounds were detected at concentrations exceeding their respective RBC (2.58 total SVOC/PAH). PCBs were not detected.

5.11 LOCOMOTIVE SHED

The locomotive shed at the former D-H plant was located in the southwestern portion of the plant, south of the tar storage areas. The locomotive shed was used for maintenance of locomotives and other railroad machinery used in the plant. Potential contaminants of concern include PAHs, VOCs, and PCBs. Three subsurface soil borings were performed in the area of the former locomotive shed to investigate potential contamination.

Borings A2-B-26, -27, -28, were drilled in a line approximately 100 ft. long in the Locomotive Shed area, each to a depth of 9 ft. Field observations at A2-B-26 reported the 4.5-7.5 ft. interval to be saturated with a black liquid which had a mild to strong petroleum-like odor. The 7-9 ft. interval of A2-B-27 was reported to be saturated with the same black liquid and had a slight petroleum-like odor.

TABLE 9
Electrical Substation
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES NORTH	COORDINATES EAST	SAMPLE NUMBER (composite=c, grab=g)
Electrical Substation	A2-B-22	5	9499	9140	
	A2-B-23	3	9512	9172	
	A2-B-24	4	9517	9204	A2B240205 (c) *

Sample A2B240205 – depth 2-5 ft							
METALS	**CONCENTRATION**	**RBC[1]**	**UNITS**	**METALS**	**CONCENTRATION**	**RBC**	**UNITS**
Not analyzed			mg/kg				
TCL VOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL VOCs**	**CONCENTRATION**	**RBC**	**UNITS**
No detections			mg/kg				
TCL SVOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL SVOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Acenaphthylene	13.00		mg/kg	Chrysene	24.00	780.00	mg/kg
Anthracene	9.80	610000.0	mg/kg	Fluoranthene	55.00	82000.00	mg/kg
Benzo(a)anthracene	22.00	7.80	mg/kg	Fluorene	8.30	82000.00	mg/kg
Benzo(a)pyrene	24.00	0.78	mg/kg	Indeno(1,2,3-cd)pyrene	9.10	7.80	mg/kg
Benzo(b)fluoranthene	31.00	7.80	mg/kg	Naphthalene	6.40	82000.00	mg/kg
Benzo(g,h,i)perylene	7.60		mg/kg	Phenanthrene	47.00	610000.00	mg/kg
Benzo(k)fluoranthene	13.00	78.00	mg/kg	Pyrene	40.00	61000.00	mg/kg
Total SVOCs	**310.20**		**mg/kg**				
PCBs	**CONCENTRATION**	**RBC****	**UNITS**	**PCBs**	**CONCENTRATION**	**RBC**	**UNITS**
No detections		2.86	mg/kg				

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* Composite sample taken from 3-5 ft interval of A2-B-22;
2-3 ft interval of A2-B-23; 2-4 ft interval of A2-B-24.

** RBC value for total PCBs

ND Not Detected

Only PAH compounds listed.

TABLE 10
Gas Holder and Iron Oxide Boxes
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Gas Holder & Iron Oxide Boxes	A2-B-25	12	9732	9695	A2B250608 (g) A2B251012 (g)

Sample A2B250608 -- depth 6-8 ft				Sample A2B251012 -- depth 10-12 ft			
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	35300.00	1000000.00	mg/kg	Aluminum	15400.00	1000000.00	mg/kg
Arsenic	2.14	610.00	mg/kg	Arsenic	3.36	610.00	mg/kg
Barium	232.00	140000.00	mg/kg	Barium	104.00	140000.00	mg/kg
Beryllium	4.39	1.30	mg/kg	Beryllium	1.21	1.30	mg/kg
Cadmium	3.61	1000.00	mg/kg	Cadmium	1.78	1000.00	mg/kg
Calcium	117000.00		mg/kg	Calcium	14600.00		mg/kg
Chromium	282.00	1000000.00	mg/kg	Chromium	48.20	1000000.00	mg/kg
Cobalt	11.60	120000.00	mg/kg	Cobalt	ND	120000.00	mg/kg
Copper	138.00	82000.00	mg/kg	Copper	65.80	82000.00	mg/kg
Iron	58100.00	610000.00	mg/kg	Iron	48000.00	610000.00	mg/kg
Lead	54.70		mg/kg	Lead	76.60		mg/kg
Magnesium	27700.00		mg/kg	Magnesium	3490.00		mg/kg
Manganese	2370.00	47000.00	mg/kg	Manganese	376.00	47000.00	mg/kg
Mercury	15.20	610.00	mg/kg	Mercury	0.98	610.00	mg/kg
Nickel	319.00	41000.00	mg/kg	Nickel	36.00	41000.00	mg/kg
Potassium	2470.00		mg/kg	Potassium	1110.00		mg/kg
Selenium	5.67	10000.00	mg/kg	Selenium	ND	10000.00	mg/kg
Sodium	702.00		mg/kg	Sodium	182.00		mg/kg
Vanadium	32.10	14000.00	mg/kg	Vanadium	21.00	14000.00	mg/kg
Zinc	504.00	610000.00	mg/kg	Zinc	143.00	610000.00	mg/kg
Total Cyanide	800.00		mg/kg	Total Cyanide	290.00		mg/kg
Sulfide Reactivity	ND		mg/kg	Sulfide Reactivity	ND		mg/kg
Cyanide Reactivity	ND		mg/kg	Cyanide Reactivity	ND		mg/kg
TCL VOCs	CONCENTRATION	RBC	UNITS	TCL VOCs	CONCENTRATION	RBC	UNITS
Benzene	1.80	200.00	mg/kg	Benzene	0.042	200.00	mg/kg
Total VOCs	**2.05**		**mg/kg**	**Total VOCs**	**0.13**		**mg/kg**
TCL SVOCs	CONCENTRATION	RBC	UNITS	TCL SVOCs	CONCENTRATION	RBC	UNITS
Acenaphthene	6.30	120000.00	mg/kg	Acenaphthene	ND	120000.00	mg/kg
Acenaphthylene	25.00		mg/kg	Acenaphthylene	ND		mg/kg
Anthracene	42.00	610000.00	mg/kg	Anthracene	ND	610000.00	mg/kg
Benzo(a)anthracene	67.00	7.80	mg/kg	Benzo(a)anthracene	ND	7.80	mg/kg
Benzo(a)pyrene	56.00	0.78	mg/kg	Benzo(a)pyrene	ND	0.78	mg/kg
Benzo(b)fluoranthene	82.00	7.80	mg/kg	Benzo(b)fluoranthene	ND	7.80	mg/kg
Benzo(g,h,i)perylene	23.00		mg/kg	Benzo(g,h,i)perylene	ND		mg/kg
Benzo(k)fluoranthene	30.00	78.00	mg/kg	Benzo(k)fluoranthene	ND	78.00	mg/kg
Chrysene	63.00	780.00	mg/kg	Chrysene	ND	780.00	mg/kg
Dibenzo(a,h)anthracene	10.00	0.78	mg/kg	Dibenzo(a,h)anthracene	ND	0.78	mg/kg
Fluoranthene	120.00	82000.00	mg/kg	Fluoranthene	1.00	82000.00	mg/kg
Fluorene	33.00	82000.00	mg/kg	Fluorene	ND	82000.00	mg/kg
Indeno(1,2,3-cd)pyrene	26.00	7.80	mg/kg	Indeno(1,2,3-cd)pyrene	ND	7.80	mg/kg
Naphthalene	58.00	82000.00	mg/kg	Naphthalene	ND	82000.00	mg/kg
Phenanthrene	110.00	610000.00	mg/kg	Phenanthrene	0.91	610000.00	mg/kg
Pyrene	110.00	61000.00	mg/kg	Pyrene	0.67	61000.00	mg/kg
Total SVOCs	**894.30**		**mg/kg**	**Total SVOCs**	**2.58**		**mg/kg**
PCBs	CONCENTRATION	RBC*	UNITS	PCBs	CONCENTRATION	RBC	UNITS
No detections		2.86	mg/kg	No detections		2.86	mg/kg

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* RBC value for total PCBs

ND Not Detected

Only BTEX compounds listed.

Only PAH compounds listed.

A composite soil sample was collected from the 7-9 ft. intervals of the three borings. Samples were analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. Table 11 presents selected analytical results for composite soil sample A2B280709.

Analytical results for the 7-9 ft. composite sample, A2B280709, show one metal, beryllium (1.31 ppm), at a concentration above RBCs. Total cyanide was detected at 1.97 ppm. Benzene (54 ppm), toluene (200 ppm), ethylbenzene (22 ppm), and total xylenes (429 ppm) were all detected below their respective RBC. One SVOC and one PAH compound was detected, however, both are below their RBC (77 ppm total SVOCs/PAH). PCBs were not detected.

5.12 POSSIBLE TAR UNIT

A tar storage or processing unit was reportedly located near the locomotive shed although no evidence of such a unit was identified during D&D activities. One surface soil boring and two subsurface soil borings were performed at the suspected location of this unit to investigate potential contamination that may be present due to past operations.

Borings A2-B-29, -30, -31 were drilled in the Possible Tar Unit area to depths of 7, 4, and 12 ft., respectively. The borings were spaced to cover an area of approximately 175 sq. ft. Field observations at A2-B-29 reported an oily sheen on the split spoon sample and a slight petroleum-like odor in the 5.5-7 ft. interval. A black oily material was observed in the 2.5-3 ft. interval of A2-B-30. A black oil/grease/tar-like substance was observed in the 9-10 ft. interval of A2-B-31. A composite soil sample was collected in the 2-4 ft. interval of each boring and a grab soil sample was collected from the 10-12 ft. interval of boring A2-B-31. Samples were analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. Table 12 presents selected analytical results for composite soil sample A2B310204 and grab soil sample A2B311012.

Analytical results for the 2-4 ft. composite sample, A2B310204, show no metals at concentrations above RBCs. Total cyanide was detected at 24.50 ppm. VOCs were not detected. Four of 15 SVOCs/PAHs detected (688 ppm total SVOCs/PAHs) were above RBCs. No VOCs or PCBs were detected.

Analytical results for the 10-12 ft. grab soil sample, A2B311012, show no metals at concentrations above RBCs. All four BTEX compounds were detected, however, none exceeded RBCs. Only one of 15 SVOCs/PAHs detected (83.5 ppm total SVOCs/PAHs) was above RBCs. No total cyanide or PCBs were detected.

5.13 INTERCEPTOR SUMP

The interceptor sump at the former D-H plant was used to collect condensate that formed during refining of the wash oil used to remove light oil from coke oven gas in the benzol washers. Emulsions that formed during light oil separation were often also routed to the interceptor sump in many coke by-product plants. Potential contaminants of concern at the interceptor sump include light oil constituents (benzene, toluene, and xylenes), naphthalene, and cyanides. One subsurface soil boring was performed in this area to investigate potential contamination. Since the interceptor sump was located entirely below ground level in the former plant, this boring was advanced to a greater depth than other subsurface borings at the plant.

TABLE 11
Locomotive Shed
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Locomotive Shed	A2-B-26	9	9390	8024	
	A2-B-27	9	9350	8029	
	A2-B-28	9	9300	8035	A2B280709 (c) *

Sample A2B280709 -- depth 7-9 ft							
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	17100.00	1000000.00	mg/kg	Magnesium	4350.00		mg/kg
Arsenic	13.70	610.00	mg/kg	Manganese	1620.00	47000.00	mg/kg
Barium	208.00	140000.00	mg/kg	Mercury	0.77	610.00	mg/kg
Beryllium	1.31	1.30	mg/kg	Nickel	21.70	41000.00	mg/kg
Cadmium	2.88	1000.00	mg/kg	Potassium	1780.00		mg/kg
Calcium	95700.00		mg/kg	Selenium	4.12	10000.00	mg/kg
Chromium	19.80	1000000.00	mg/kg	Sodium	1190.00		mg/kg
Copper	42.00	82000.00	mg/kg	Vanadium	20.80	14000.00	mg/kg
Iron	81500.00	610000.00	mg/kg	Zinc	657.00	610000.00	mg/kg
Lead	55.10		mg/kg	Total Cyanide	1.97		mg/kg
TCL VOCs	CONCENTRATION	RBC	UNITS	TCL VOCs	CONCENTRATION	RBC	UNITS
Benzene	54.00	200.00	mg/kg	Toluene	200.00	410000.00	mg/kg
Ethylbenzene	22.00	200000.00	mg/kg	Total Xylene	429.00	1000000.00	mg/kg
Total VOCs	**705.00**		**mg/kg**				
TCL SVOCs	CONCENTRATION	RBC	UNITS	TCL SVOCs	CONCENTRATION	RBC	UNITS
Naphthalene	48.00	82000.00	mg/kg				
Total SVOCs	**77.00**		**mg/kg**				
PCBs	CONCENTRATION	RBC**	UNITS	PCBs	CONCENTRATION	RBC	UNITS
No detections		2.86	mg/kg				

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* Composite sample taken from 7-9 ft interval of borings A2-B-26, A2-B-27, A2-B-28.

** RBC value for total PCBs

ND Not Detected

Only BTEX compounds listed.

Only PAH compounds listed.

TABLE 12
Possible Tar Unit
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES NORTH	COORDINATES EAST	SAMPLE NUMBER (composite=c, grab=g)
Possible Tar Unit	A2-B-29	7	9260	7990	A2B310204 (c) * A2B311012 (g)
	A2-B-30	4	9240	7980	
	A2-B-31	12	9240	8000	

Sample A2B310204 -- depth 2-4 ft				Sample A2B311012 -- depth 10-12 ft			
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	2090.00	1000000.00	mg/kg	Aluminum	24300.00	1000000.00	mg/kg
Arsenic	2.56	610.00	mg/kg	Arsenic	ND	610.00	mg/kg
Barium	54.20	140000.00	mg/kg	Barium	184.00	140000.00	mg/kg
Beryllium	ND	1.30	mg/kg	Beryllium	1.00	1.30	mg/kg
Cadmium	ND	1000.00	mg/kg	Cadmium	0.94	1000.00	mg/kg
Calcium	4180.00		mg/kg	Calcium	4910.00		mg/kg
Chromium	5.67	1000000.00	mg/kg	Chromium	28.40	1000000.00	mg/kg
Cobalt	ND	120000.00	mg/kg	Cobalt	9.20	120000.00	mg/kg
Copper	20.80	82000.00	mg/kg	Copper	24.50	82000.00	mg/kg
Iron	7180.00	610000.00	mg/kg	Iron	32500.00	610000.00	mg/kg
Lead	11.30		mg/kg	Lead	51.70		mg/kg
Magnesium	474.00		mg/kg	Magnesium	4320.00		mg/kg
Manganese	94.10	47000.00	mg/kg	Manganese	313.00	47000.00	mg/kg
Mercury	2.78	610.00	mg/kg	Mercury	ND	610.00	mg/kg
Nickel	6.44	41000.00	mg/kg	Nickel	31.80	41000.00	mg/kg
Potassium	ND		mg/kg	Potassium	2220.00		mg/kg
Sodium	121.00		mg/kg	Sodium	142.00		mg/kg
Vanadium	ND	14000.00	mg/kg	Vanadium	26.80	14000.00	mg/kg
Zinc	21.90	610000.00	mg/kg	Zinc	232.00	610000.00	mg/kg
Total Cyanide	24.50		mg/kg	Total Cyanide	ND		mg/kg
TCL VOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL VOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Benzene	ND	200.00	mg/kg	Benzene	15.00	200.00	mg/kg
Ethylbenzene	ND	200000.00	mg/kg	Ethylbenzene	2.90	200000.00	mg/kg
Toluene	ND	410000.00	mg/kg	Toluene	4.20	410000.00	mg/kg
Total Xylene	ND	1000000.00	mg/kg	Total Xylene	24.40	1000000.00	mg/kg
Total VOCs	**0.00**		**mg/kg**	**Total VOCs**	**46.50**		**mg/kg**
TCL SVOCs	**CONCENTRATION**	**RBC**	**UNITS**	**TCL SVOCs**	**CONCENTRATION**	**RBC**	**UNITS**
Acenaphthylene	28.00		mg/kg	Acenaphthylene	2.40		mg/kg
Anthracene	26.00	610000.00	mg/kg	Anthracene	2.10	610000.00	mg/kg
Benzo(a)anthracene	28.00	7.80	mg/kg	Benzo(a)anthracene	1.40	7.80	mg/kg
Benzo(a)pyrene	24.00	0.78	mg/kg	Benzo(a)pyrene	1.10	0.78	mg/kg
Benzo(b)fluoranthene	31.00	7.80	mg/kg	Benzo(b)fluoranthene	1.40	7.80	mg/kg
Benzo(k)fluoranthene	14.00	78.00	mg/kg	Benzo(k)fluoranthene	0.70	78.00	mg/kg
Chrysene	27.00	780.00	mg/kg	Chrysene	1.40	780.00	mg/kg
Fluoranthene	60.00	82000.00	mg/kg	Fluoranthene	2.90	82000.00	mg/kg
Fluorene	23.00	82000.00	mg/kg	Fluorene	2.60	82000.00	mg/kg
Indeno(1,2,3-cd)pyrene	13.00	7.80	mg/kg	Indeno(1,2,3-cd)pyrene	ND	7.80	mg/kg
Naphthalene	270.00	82000.00	mg/kg	Naphthalene	52.00	82000.00	mg/kg
Phenanthrene	64.00	610000.00	mg/kg	Phenanthrene	5.40	610000.00	mg/kg
Pyrene	45.00	61000.00	mg/kg	Pyrene	2.40	61000.00	mg/kg
Total SVOCs	**688.00**		**mg/kg**	**Total SVOCs**	**83.50**		**mg/kg**
PCBs	**CONCENTRATION**	**RBC****	**UNITS**	**PCBs**	**CONCENTRATION**	**RBC**	**UNITS**
No detections		2.86	mg/kg	No detections		2.86	mg/kg

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* Composite sample taken from 2-4 ft interval of borings A2-B29, A2-B-30, A2-B-31.

** RBC value for total PCBs

ND Not Detected

Only BTEX compounds listed.

Only PAH compounds listed.

Boring A2-B-32 was drilled in the Interceptor Sump area to a depth of 18 ft. Field observations at A2-B-32 reported the 6-8.5 ft. interval to be saturated with a yellow-green liquid. One soil sample was collected from the 16-18 ft. interval of the boring. The sample was analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. Table 13 presents selected analytical results for soil sample A2B321618.

Analytical results for the 16-18 ft. sample, A2B321618, show no metals at concentrations above RBCs. Benzene (0.014 ppm) and toluene (0.008 ppm) were detected below their respective RBCs. No total cyanide, SVOCs or PCBs were detected.

5.14 PRIMARY COOLER AREA

The primary coolers at the former D-H plant were located south of the by-product building and were used to remove tar from raw coke oven gas. Potential contaminants of concern in this area include PAHs, VOCs (benzene, toluene, and xylenes), and cyanides. Three surface soil borings were performed in this area to investigate potential contamination that may be present due to past operations.

Borings A2-B-33, -34, -35 were drilled in a line approximately 50 ft. long in the Primary Coolers area to depths of 2.8, 3.5, and 4 ft., respectively. Field observations reported a blue-gray cemented sand at approximately 2.75 ft. in A2-B-34. A composite soil sample was collected in the 2-4 ft. interval of the borings. The sample was analyzed for TAL metals and total cyanide, TCL VOCs, TCL SVOCs, and TCL PCBs. Table 14 presents selected analytical results for composite soil sample A2B350204.

Analytical results for the 2-4 ft. composite sample, A2B350204, show one metal, beryllium (4.76 ppm), at a concentration above RBCs. Total cyanide was detected at 106.00 ppm. Benzene (0.009 ppm) and tetrachloroethene (PCE) were detected at concentrations well below RBCs. Five of 16 SVOCs/PAHs (634 ppm total SVOC/PAH) detected were above RBCs. PCBs were not detected.

5.15 NORTHEAST SOIL GAS PLUME

The results of the soil gas investigation performed prior to soil and groundwater sampling activities at the site indicated that a contaminant plume of SVOCs and VOCs was present in the soil located in the northeast portion of the property. This is the approximate location of the former Koppers Tar Works identified on earlier Sanborn maps reviewed during Phase I. A subsurface soil boring was drilled in this area to provide further information about potential contamination in this area, supplementing the soil gas survey data and information from samples collected near the suspect area during the Phase II ESA.

Boring A2-B-85 was drilled in the Northeast Soil Gas Plume area to a depth of 6 ft. A grab soil sample was collected in the 4-6 ft. interval of the boring. The sample was analyzed for total cyanide, BTEX, and PAHs. Table 15 presents selected analytical results for soil sample A2-B85(4-6).

TABLE 13
Interceptor Sump
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Interceptor Sump	A2-B-32	18	9347	8130	A2B321618 (g)

Sample A2B321618 -- depth 16-18 ft							
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	11800.00	1000000.00	mg/kg	Lead	12.10		mg/kg
Arsenic	1.91	610.00	mg/kg	Magnesium	15000.00		mg/kg
Barium	53.70	140000.00	mg/kg	Manganese	471.00	47000.00	mg/kg
Cadmium	0.81	1000.00	mg/kg	Nickel	26.30	41000.00	mg/kg
Calcium	41700.00		mg/kg	Potassium	2080.00		mg/kg
Chromium	16.60	1000000.00	mg/kg	Sodium	252.00		mg/kg
Cobalt	8.92	120000.00	mg/kg	Vanadium	18.80	14000.00	mg/kg
Copper	28.10	82000.00	mg/kg	Zinc	70.90	610000.00	mg/kg
Iron	26800.00	610000.00	mg/kg	Total Cyanide	ND		mg/kg
TCL VOCs	CONCENTRATION	RBC	UNITS	TCL VOCs	CONCENTRATION	RBC	UNITS
Benzene	0.014	200.00	mg/kg	Toluene	0.008	410000.00	mg/kg
Total VOCs	**0.022**		**mg/kg**				
TCL SVOCs	CONCENTRATION	RBC	UNITS	TCL SVOCs	CONCENTRATION	RBC	UNITS
No detections			mg/kg				
PCBs	CONCENTRATION	RBC*	UNITS	PCBs	CONCENTRATION	RBC	UNITS
No detections		2.86	mg/kg				

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* RBC value for total PCBs

ND Not Detected

Only BTEX compounds listed.

TABLE 14
Primary Coolers
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Primary Coolers	A2-B-33	2.8	9520	9097	
	A2-B-34	3.5	9510	9072	
	A2-B-35	4	9520	9047	A2B350204 (c) *

Sample A2B350204 – depth 2-4 ft							
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Aluminum	44700.00	1000000.00	mg/kg	Magnesium	20300.00		mg/kg
Arsenic	3.44	610.00	mg/kg	Manganese	7360.00	47000.00	mg/kg
Barium	541.00	140000.00	mg/kg	Nickel	8.49	41000.00	mg/kg
Beryllium	4.76	1.30	mg/kg	Potassium	2460.00		mg/kg
Calcium	246000.00		mg/kg	Sodium	763.00		mg/kg
Chromium	14.00	1000000.00	mg/kg	Vanadium	12.00	14000.00	mg/kg
Copper	22.90	82000.00	mg/kg	Zinc	26.10	610000.00	mg/kg
Iron	41200.00	610000.00	mg/kg	Total Cyanide	106.00		mg/kg
TCL VOCs	CONCENTRATION	RBC	UNITS	TCL VOCs	CONCENTRATION	RBC	UNITS
Benzene	0.009	200.00	mg/kg				
Total VOCs	0.03		mg/kg				
TCL SVOCs	CONCENTRATION	RBC	UNITS	TCL SVOCs	CONCENTRATION	RBC	UNITS
Acenaphthylene	55.00		mg/kg	Dibenzo(a,h)anthracene	5.30	0.78	mg/kg
Anthracene	41.00	610000.00	mg/kg	Fluoranthene	100.00	82000.00	mg/kg
Benzo(a)anthracene	39.00	7.80	mg/kg	Fluorene	31.00	82000.00	mg/kg
Benzo(a)pyrene	39.00	0.78	mg/kg	Indeno(1,2,3-cd)pyrene	19.00	7.80	mg/kg
Benzo(b)fluoranthene	41.00	7.80	mg/kg	Naphthalene	7.90	82000.00	mg/kg
Benzo(g,h,i)perylene	21.00		mg/kg	Phenanthrene	81.00	610000.00	mg/kg
Benzo(k)fluoranthene	19.00	78.00	mg/kg	Pyrene	83.00	61000.00	mg/kg
Chrysene	34.00	780.00	mg/kg				
Total SVOCs	634.20		mg/kg				
PCBs	CONCENTRATION	RBC**	UNITS	PCBs	CONCENTRATION	RBC	UNITS
No detections		2.86	mg/kg				

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

* Composite sample taken from 2-2.8 ft interval of boring A2-B-33;
2-3.5 ft interval of boring A2-B-34; 2-4 ft interval of boring A2-B-35.

** RBC value for total PCBs

ND Not Detected

Only BTEX compounds listed.

Only PAH compounds listed.

TABLE 15
Northeast Soil Gas Plume
Selected Analytical Results
Soil Samples
Donner-Hanna Coke Plant

AREA	BORING NUMBER	TOTAL DEPTH	COORDINATES		SAMPLE NUMBER (composite=c, grab=g)
			NORTH	EAST	
Northeast Soil Gas Plume	A2-B-85	6	9600	9350	A2B85(4-6) (g)

Sample A2B85(4-6) -- depth 4-6 ft							
METALS	CONCENTRATION	RBC[1]	UNITS	METALS	CONCENTRATION	RBC	UNITS
Total Cyanide	198.00		mg/kg				
BTEX	CONCENTRATION	RBC	UNITS	BTEX	CONCENTRATION	RBC	UNITS
Benzene	ND	200.00	mg/kg	Toluene	20.00	410000.00	mg/kg
Ethylbenzene	11.00	200000.00	mg/kg	Total Xylene	178.00	1000000.00	mg/kg
Total VOCs	209.00		mg/kg				
PAHs	CONCENTRATION	RBC	UNITS	PAHs	CONCENTRATION	RBC	UNITS
Acenaphthene	8.20	120000.00	mg/kg	Chrysene	140.00	780.00	mg/kg
Acenaphthylene	29.00		mg/kg	Dibenzo(a,h)anthracene	18.00	0.78	mg/kg
Anthracene	57.00	610000.00	mg/kg	Fluoranthene	500.00	82000.00	mg/kg
Benzo(a)anthracene	170.00	7.80	mg/kg	Fluorene	86.00	82000.00	mg/kg
Benzo(a)pyrene	94.00	0.78	mg/kg	Indeno(1,2,3-cd)pyrene	50.00	7.80	mg/kg
Benzo(b)fluoranthene	150.00	7.80	mg/kg	Naphthalene	150.00	82000.00	mg/kg
Benzo(g,h,i)perylene	43.00		mg/kg	Phenanthrene	370.00	610000.00	mg/kg
Benzo(k)fluoranthene	93.00	78.00	mg/kg	Pyrene	300.00	61000.00	mg/kg
Total SVOCs	2258.20		mg/kg				

NOTES:

[1] US EPA Region III Risk Based Concentrations-Soil Ingestion at Industrial Sites

ND Not Detected

Only BTEX compounds listed.

Only PAH compounds listed.

Analytical results for the 4-6 ft. grab sample, A2-B85(4-6), detected total cyanide at 198.00 ppm. Ethylbenzene (11.0 ppm), toluene (20 ppm), and total xylenes (178 ppm) were detected at concentrations below RBCs. Six of 16 PAHs detected (2258 ppm total SVOCs/PAHs) were above RBCs.

5.16 SUMMARY OF RESULTS

Total cyanide concentrations in the surface soil samples (2-4 ft. bgs) were plotted on a site map in an effort to determine trends in cyanide concentration. The highest concentration (800 ppm) was found in the Gas Holder and Iron Oxide Boxes area in the northeast corner of the site with the concentration decreasing to the south and west of this location (see Figure 4, 5, and 6). Through past experience in coke plant operations and field observations, it is believed that the cyanide is predominantly in the form of ferrous cyanide, which is a very stable cyanide compound.

Total SVOC concentrations in the surface soil samples (2-4 ft. bgs) were also plotted, with two large and two small "hot spots" identified. The two large areas include the soil between the former locations of the Old Tar Tank, and the former Tar Decanters and the area centered on boring A2-B-85 (total SVOCs 2258.2 ppm) in the soil gas survey plume and extending northeast toward the Gas Holder and Iron Oxide Boxes (boring A2-B-25, total SVOCs 894.3 ppm). The two small SVOC hot spot areas include an area in the vicinity of the locomotive shed and the soil in the vicinity of a shallow surface soil sample collected 0.0-0.5 ft. bgs at boring location A2-SS-8. Analytical results for many of the other areas of the site show numerous individual samples with SVOCs, primarily PAH compounds, in concentrations above their USEPA Region III RBC (see Figures 4, 5, 6 and Tables 1 through 15).

A plot of total VOC concentrations shows four locations with elevated total VOC concentrations. Two of these areas correspond with SVOC hot spots. The first area, the Benzol Washer Area is located between the Old Tar Tank Area and Tar Decanter Area. The second area is centered on boring A2-B-85 in the soil gas survey plume. The remaining two areas are located at the former site of the Locomotive Shed and the former Tar Storage Tank location. Analytical results for several other areas show individual VOCs, primarily BTEX compounds, in elevated concentrations.

Groundwater analytical results from boring A2-P-1 show slightly elevated levels of total cyanide; moderately elevated levels of SVOCs (with Naphthalene above the standard) and BTEX compounds (especially Benzene) above their Standards. Results from A2-P-11 show total cyanide above 1 mg/L; slightly elevated levels of SVOCs, primarily PAH compounds; and slightly elevated levels of BTEX compounds.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The results of the Phase II ESA at the former D-H coke plant property indicate that contaminants are present in many areas of the site. Future use of the property may require remedial action prior to development of the property.

Total cyanide was detected over the majority of the sites with total cyanide concentrations in the soil decreasing from the northeast to the south and west across the property; SVOC contamination was present in the site soil at concentrations exceeding USEPA Region III Risk Based Concentrations for soil ingestion at industrial sites at depths ranging from 2 to 6-ft. bgs. across the majority of the former Donner-Hanna coke plant. Low levels of VOCs were also found. Contamination from VOCs and SVOCs (primarily BTEX and PAH compounds) was also found at depths ranging between 7 and 13-ft. bgs. in the Tar Storage Tank Area, Benzol Washer and Final Cooler Area, Locomotive Shed, and possible Tar Unit.

Low concentrations of total cyanide were detected in groundwater samples. VOC and SVOC contamination was generally present at levels above New York State regulatory levels in the Tar Storage Tank area with lower concentrations, though still exceeding regulatory levels, in the Benzol Washer and Final Coolers area. Information regarding groundwater flow paths and velocities are discussed in the Phase II ESA report prepared by Malcolm Pirnie.

The soil gas sampling results identified three areas with elevated levels of soil gas BTEX and PAH compounds. Two of these areas, the Tar Storage Tank Area and the Benzol Washer and Final Cooler Area, were included as part of the Phase II ESA soil sampling activities. A soil sample was was collected from the third area, the contaminated area in the northeast portion of the site that was identified through the soil gas survey, to confirm the soil gas sampling results. The soil sampling results from the three possibly contaminated areas highlighted by the soil gas survey confirm the presence of BTEX and PAH contamination in these areas.

APPENDIX A

SOIL BORING LOGS

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Tar Storage Tanks
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

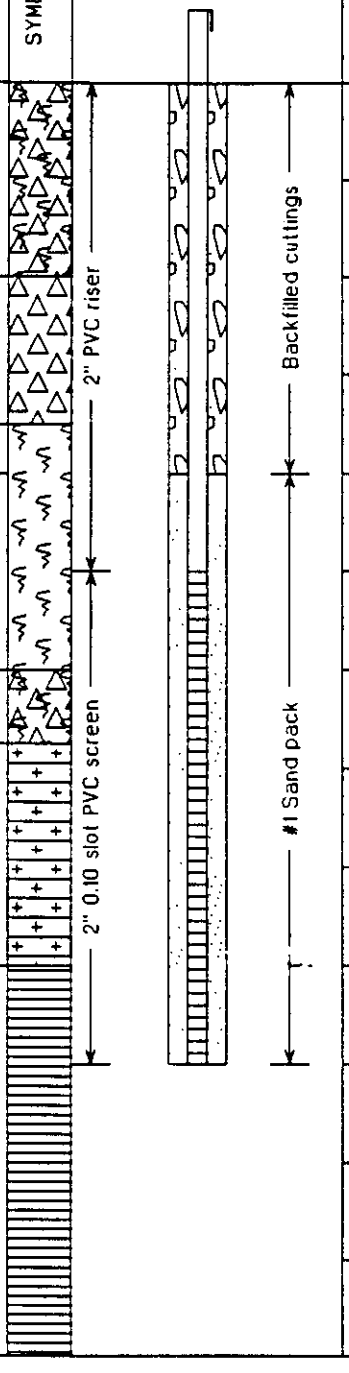
NORTHING: 9450
EASTING: 8020

BORING NO.: A2-P-1
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/10/97
FINISH DATE: 3/10/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION
1			25, 31, 45			Black-brown med. to coarse slag and ash, nonplastic, moist (fill)
2		1.3	62	0		
3			24, 52		A2P10204	Black-brown med. to coarse slag, dry to damp (fill)
4		1.4	21, 10	0		Black, fine-grain ash, moist to wet (fill)
5			10, 28, 10			Black ash and crushed coal, loose to med. dense, nonplastic, damp grading to dry (fill)
6		1.0	7	6		
7			4, 10			Black, med. to coarse ash and slag, loose, wet to saturated (fill)
8		1.1	20, 32	6		Gray-white, fine grain clay-like material, sl. sticky, soft, med. plasticity, damp to moist (fill)
9			8, 22			As above, wet to saturated
10		1.4	9, 8	18		Brown-gray-black clay, soft to med. stiff, low to med. plasticity, damp (CL)
11			8, 14			
12			7, 12, 15		A2P11113	Green-brown-gray clay grading to fine sandy clay, soft to med. stiff, med. to high plasticity, damp to moist (CH)
13		2.0	15	9		Total Depth - 13 ft.

SYMBOL

WELL DIAGRAM



DEPTH

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Light Oil
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9600
EASTING: 8200

BORING NO.: A2-B-2
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/11/97
FINISH DATE: 3/11/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1			6 10 29			Black-brown fine to coarse sand, slag, and ash, piece of refractory brick, loose, damp (fill)			1
2		1.0	52/0	0		Fine to coarse sand and well rnd gravel, some silt, loose, saturated (fill)			2
3			19 16 16		A2B20204	Rust and blue, med. to coarse sand, little silt, med. dense, moist grading to saturated, sl. petroleum odor (fill)			3
4		1.8	13	54					4
5			7 12 23			As above, more and darker blue, saturated grading to wet			5
6		1.8	14 24	17.5		As above, dark blue, fine to med. grain, med. dense, moist to wet			6
7			42						7
8		1.4	14 6	12		Blue-green subangular to subrounded gravel, fine to coarse sand, little silt, loose, wet to moist (fill)			8
9			5 5			Blue-gray fine to coarse sand, few slag, med. dense to loose, wet to saturated (fill)			9
10		1.5	13 17	18	A2B20911	Black-gray clay, few rust mottles, med. stiff, med. plasticity, moist to damp (CL)			10
11			1 6						11
12		1.5	13 22			Total Depth - 12 ft.			12

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Underground Pipes
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9505
EASTING: 8385

BORING NO.: A2-B-3
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/11/97
FINISH DATE: 3/11/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Slag and brick demolition debris		Drilled interval	1
2			6			Brown sand, gravel, slag, silt, med. dense, moist (fill)			2
3			5		A2B50204			Composite sample of A2-B-3, A2-B-4, A2-B-5	3
			39			Black-brown sand, gravel, slag, wood, brick, med. dense to loose, moist to wet (fill)			
4		1.5	50/3	0		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Underground Pipes
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9507
EASTING: 8420

BORING NO.: A2-B-4
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/11/97
FINISH DATE: 3/11/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Black-brown, med. to coarse sand and gravel (fill)		Drilled interval	1
2						Brown, med to coarse sand, little subrnd to well rnd gravel, loose, moist to wet (fill)			2
3			6 9 12		A2B50204			Composite sample of A2-B-3, A2-B-4, A2-B-5	3
4		0.9	10	0		Total Depth = 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Underground Pipes
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9512
EASTING: 8450

BORING NO.: A2-B-5
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/11/97
FINISH DATE: 3/11/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1			5 16 17			Black, fine to coarse sand, slag, gravel, brick, and crushed coal, loose, damp (fill)			1
2		1.4	14	0		As above, lt. brown to brown			2
3			7 7 8		A2B50204			Composite sample of A2-B-3, A2-B-4, A2-B-5	3
4		0.7	9	0		Brown, med. to coarse sand, little fine gravel, few coarse slag, loose, wet to saturated (fill)			4
5			6 12 9			As above, blue-gray, sl. petroluem odor			5
6		1.2	6	0		Black, med. to coarse sand, little fine to med. gravel, loose, saturated, sl. petroleum odor (fill)			6
7			5 9 5						7
8		1.5	10	1		As above, sl. petroleum odor			8
9			9 5 5			Gray clay, stiff, med. to high plasticity, damp			9
10		1.4	11	1		As above, brown and gray			10
11			9 10 16		A2B51012				11
12		0.9	23	1.5		Total Depth - 12 ft.			12

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Machine Shop
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____
WELL LEVEL (ft-msl): _____

NORTHING: 9508
EASTING: 8460

BORING NO.: A2-B-6
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/12/97
FINISH DATE: 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris		Drilled interval	1
2			15			Brown sand, gravel, ash, slag, little clay, loose, damp grading to wet (fill)			2
3			11		A2B90204			Composite sample of A2-B-6, A2-B-7, A2-B-8, A2-B-9	3
			11						
4		1.7	9	0		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Machine Shop
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9470
EASTING: 8440

BORING NO.: A2-B-7
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/12/97
FINISH DATE: 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris		Drilled interval	1
2			9			Brown-black gravel, ash, slag, sand, loose, moist to wet (fill)			2
3			12		A2B90204			Composite sample of A2-B-6, A2-B-7, A2-B-8, A2-B-9	3
			6						
4		0.9	7	0		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: TV Donner-Hanna Coke Plant
BORING LOCATION: Machine Shop
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9520
EASTING: 8520

BORING NO.: A2-B-8
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/12/97
FINISH DATE: 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris			1
2								Drilled interval	2
3			7			Gray-black med. to coarse sand and fine to med. gravel, loose, wet to saturated (fill)			3
4			5		A2B90204			Composite sample of A2-B-6, A2-B-7, A2-B-8, A2-B-9	4
			9			As above, black			
5		1.2	9	1.2		Total Depth - 5 ft.			5

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME LTV Donner-Hanna Coke Plant
BORING LOCATION Machine Shop
DRILLING FIRM Buffalo Drilling Co.
DRILLING METHOD Split-Spoon/Hollow Stem Auger
LOGGED BY B. Squire

WATER LEVELS
DRILLING (ft-bgs) _____ _____
WELL LEVEL (ft-msl) _____ _____

NORTHING 9480
EASTING 8503

BORING NO. A2-B-9
G.S. ELEV. N/A
CASING ELEV. N/A
START DATE 3/12/97
FINISH DATE 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris		Drilled interval	1
2			12			Gray-brown clay and fine sand, soft to med. stiff, damp (fill)			2
			15			Brown, med. sand, little slag, loose, wet to saturated (fill)			
3					A2B90204			Composite sample of A2-B-6, A2-B-7, A2-B-8, A2-B-9	3
			22						
4		1.0	27	0		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Old Tar Tanks
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9368
EASTING: 8564

BORING NO.: A2-B-10
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/11/97
FINISH DATE: 3/11/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Coarse demolition debris (fill)		Drilled interval	1
2			22			Black, fine to coarse sand, fine ash, few slag and brick, loose, damp, (fill)			2
3			10		A2B100204				3
4		1.4	6	0					4
			5			As above, loose to med. dense			
5			3						5
			4			Brown, fine to med. sand, med. dense to dense, wet to saturated, (fill)			
6		1.8	5	40					6
			20			As above, saturated			
7			20						7
			30						
8		1.3	12	20					8
			35			As above, dense			
9			5						9
			11			Maroon-brown silty material, med. stiff, wet (fill)			
			4			Black, med. sand, few well rnd gravel, few pieces of wood (fill)			
10		1.1	2	8.5	A2B100911	Gray clay, soft to med. stiff, med. to high plasticity, damp (CL)			10
			3						
11			4			As above, soft grading to med. stiff			11
			7						
12		1.3	10	2		Total Depth - 12 ft.			12

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Benzol Washers & Final Coolers
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9468
EASTING: 8750

BORING NO.: A2-P-11
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/12/97
FINISH DATE: 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION
1-3						Drilled interval Demolition debris
4						
5			15 31 32		A2P110206	Brown grading to black-brown, fine to coarse sand, fine to med. gravel, little silt, loose, wet grading to saturated (fill) Composite sample of A2-P-11, A2-B-12, A2-B-13, A2-B-14
6		1.7	36	8		
7			7 2 1			Brown, fine to coarse sand, loose, saturated (fill)
8		0.5	2			
9			37 23 6			Brown, fine to coarse sand, fine to coarse gravel, some silt/clay, little organic matter, med. dense, saturated (fill)
10		1.5	5	1		Dark-gray clay, soft, high plasticity, moist (CH)
11			1 1 4		A2P110911	As above, dark-gray grading to green-gray
12		0.8	9			Total Depth = 12 ft.

SYMBOL

WELL DIAGRAM

2" PVC riser
2" 0.10 slot PVC screen
#1 Sand pack
Backfilled cuttings

DEPTH

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Benzol Washers & Final Coolers
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____
NORTHING: 9432
EASTING: 8718

BORING NO.: A2-B-12
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/12/97
FINISH DATE: 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
			5			Brown-black sand and gravel, med. dense to dense, damp (fill)			
1						Black sand, gravel, slag, silt, piece of brick, dense, dry to damp (fill)			1
		1.8				Brown, med. sand, thin layer of blue-green sand, dense, dry to damp (fill)			
2			21		A2P110206	Brown sand as above		Composite sample of A2-P-11, A2-B-12, A2-B-13, A2-B-14	2
3		0.3	100/4	0		Total Depth - 2.8 ft.			3
4									4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: JTV Donner-Hanna Coke Plant
BORING LOCATION: Benzol Washers & Final Coolers
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____
WELL LEVEL (ft-msl): _____

NORTHING: 9448
EASTING: 8802

BORING NO.: A2-B-13
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/12/97
FINISH DATE: 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris		Drilled interval	1
2			14			Black, med. sand, few broken, well rnd gravel, loose to med. dense, wet to saturated, strong chemical odor (benzene?) (fill)			2
3			17		A2P110206			Composite sample of A2-P-11, A2-B-12, A2-B-13, A2-B-14	3
			30						
4		1.9	45	35		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME LTV Donner-Hanna Coke Plant
BORING LOCATION Benzol Washers & Final Coolers
DRILLING FIRM Buffalo Drilling Co.
DRILLING METHOD Split-Spoon/Hollow Stem Auger
LOGGED BY B. Squire

WATER LEVELS
DRILLING (ft-bgs) _____ _____
WELL LEVEL (ft-msl) _____ _____
NORTHING 9415
EASTING 8755

BORING NO. A2-B-14
G.S. ELEV. N/A
CASING ELEV. N/A
START DATE 3/12/97
FINISH DATE 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris		Drilled interval	1
2			18			Black, fine to med. sand, few slag, pieces of wood, loose to med. dense, moist (fill)			2
3			22		A2P110206			Composite sample of A2-P-11, A2-B-12, A2-B-13, A2-B-14	3
4		1.3	20 18	14		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Tar Precipitators
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9570
EASTING: 8900

BORING NO.: A2-B-15
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/12/97
FINISH DATE: 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Sand and gravel, coarse slag (fill)		Drilled interval	1
2			33			Black grading to dark brown, fine to coarse sand, some fine to med. gravel, some clay, few organic matter (wood), loose, damp grading to wet (fill)			2
3			12		A2B170204			Composite sample of A2-B-15, A2-B-16, A2-B-17	3
			6						
4		1.4	50/3	1.5		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME LTV Donner-Hanna Coke Plant
BORING LOCATION Tar Precipitators
DRILLING FIRM Buffalo Drilling Co.
DRILLING METHOD Split-Spoon/Hollow Stem Auger
LOGGED BY B. Squire

WATER LEVELS
DRILLING (ft-bgs) _____ _____
WELL LEVEL (ft-msl) _____ _____

NORTHING 9532
EASTING 8887

BORING NO. A2-B-16
G.S. ELEV. N/A
CASING ELEV. N/A
START DATE 3/12/97
FINISH DATE 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2			7			Black-brown, med. to coarse sand, med. to coarse well rnd gravel, few slag, piece of wood, loose, wet grading to saturated (fill)			2
3			8		A2B170204			Composite sample of A2-B-15, A2-B-16, A2-B-17	3
			12						
4		1.0	50/3	0		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Tar Precipitators
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9535
EASTING: 8918

BORING NO.: A2-B-17
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/12/97
FINISH DATE: 3/12/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2			7			Black, med. to coarse sand, some fine to med. gravel, few slag, loose, wet to saturated (fill)			2
3			9		A2B170204			Composite sample of A2-B-15, A2-B-16, A2-B-17	3
			8						
4		0.7	8	0		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME LTV Donner-Hanna Coke Plant
BORING LOCATION Tar Decanters
DRILLING FIRM Buffalo Drilling Co.
DRILLING METHOD Split-Spoon/Hollow Stem Auger
LOGGED BY B. Squire

WATER LEVELS
DRILLING (ft-bgs) _____ _____
WELL LEVEL (ft-msl) _____ _____
NORTHING 9490
EASTING 8995

BORING NO. A2-B-19
G.S. ELEV. N/A
CASING ELEV. N/A
START DATE 3/13/97
FINISH DATE 3/13/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2			4			Brown, fine to coarse sand, some silt, few fine gravel, thin layer of clay, 0.2 ft. layer of cemented sand (fill)			2
3			7		A2B210204			Composite sample of A2-B-19, A2-B-20, A2-B-21	3
			20						
4		2.0	13	0		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Tar Decanters
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9470
EASTING: 9015

BORING NO.: A2-B-20
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/13/97
FINISH DATE: 3/13/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2									2
3			5 14		A2B210204	Black grading to lt. brown, fine to coarse sand, fine to med. gravel, thin layer of clay, 0.3 ft. layer of compacted blue sand, top - saturated, btm - damp, mild creosote/diesel odor at top (fill)		Composite sample of A2-B-19, A2-B-20, A2-B-21	3
4		1.3	13 9	3		Total Depth - 4.5 ft.			4
5									5

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Tar Decanters
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs) _____ _____
WELL LEVEL (ft-msl) _____ _____

NORTHING: 9465
EASTING: 8995

BORING NO.: A2-B-21
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/13/97
FINISH DATE: 3/13/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2			11			Fine to med. sand, little fine gravel, few slag, layer of cemented blue sand, loose, saturated (fill)			2
3			13 14		A2B210204			Composite sample of A2-B-19, A2-B-20, A2-B-21	3
4		1.0	9	0		Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME LTV Donner-Hanna Coke Plant
BORING LOCATION Substation
DRILLING FIRM Buffalo Drilling Co.
DRILLING METHOD Split-Spoon/Hollow Stem Auger
LOGGED BY B. Squire

WATER LEVELS
DRILLING (ft-bgs) _____ _____
WELL LEVEL (ft-msl) _____ _____

NORTHING 9499
EASTING 9140

BORING NO. A2-B-22
G.S. ELEV. N/A
CASING ELEV. N/A
START DATE 3/17/97
FINISH DATE 3/17/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2									2
3			wh			Brown, med. to coarse sand and ash, dense, wet (fill)			3
4			4		A2B240205			Composite sample of A2-B-22, A2-B-23, A2-B-24	4
5		1.3	7	0		Total Depth - 5 ft.			5

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Substation
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9512
EASTING: 9172

BORING NO.: A2-B-23
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/17/97
FINISH DATE: 3/17/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2			15		A2B240205	Black-brown, silt and coarse sand, dense, moist (fill)		Composite sample of A2-B-22, A2-B-23, A2-B-24	2
						Total Depth - 2.75 ft.			
		0.8	50/3						
3									3
4									4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Substation
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9517
EASTING: 9204

BORING NO.: A2-B-24
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/17/97
FINISH DATE: 3/17/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2			2			Black ash, slag, fine to med. gravel, med. to coarse sand, loose, wet (fill)			2
3			2		A2B240205			Composite sample of A2-B-22, A2-B-23, A2-B-24	3
4		0.5	2			Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Gas Holder & Iron Oxide Boxes
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9732
EASTING: 9695

BORING NO.: A2-B-25
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/17/97
FINISH DATE: 3/17/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
0						Mounded soil berm			0
1									1
2								Drilled interval	2
3									3
4			4			Brown clay soil and fill material, dense, damp (fill)			4
5			6						5
			13			Sand and gravel, piece of brick, rock fragment, loose, saturated (fill)			
6		1.0	12	0.2					6
			15						
7			19		A2B250608	Black, silty ash, soft/loose, nonplastic, moist (fill)			7
			16						
8		1.3	9	1.4					8
9			5						9
			6						
			8						
10		0.9	8	0.6		Black-gray silt, med. stiff, low to med. plasticity, damp (ML)			10
11			4						11
			4		A2B251012	Black-gray silty clay grading to clay, med. stiff to stiff, high plasticity, damp to moist (CH)			
			8						
12		1.1	10	0		Total Depth = 12 ft.			12

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Locomotive Shed
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9390
EASTING: 8024

BORING NO.: A2-B-26
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/14/97
FINISH DATE: 3/14/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Gray, coarse, angular limestone gravel (fill)		Drilled interval	1
2			33			As above, loose, damp to moist			2
3			45						3
			47						
4		1.4	80			As above, wet, btm 0.3 ft. black-gray with petroleum odor			4
			85						
5		0.6	80			As above, black, saturated, v. strong petroleum odor			5
			47						
6			60			As above, brown, wet to saturated			6
			75						
7		1.6	80			Black ash and gravel, little clay; med. dense, wet to saturated, mild petroleum odor (fill)			7
			48						
8			58		A2B280709	Brown, fine to coarse sand, dense, wet (SW)		Composite sample of A2-B-26, A2-B-27, A2-B-28	8
			47						
9		1.8	75	200		Total Depth ~ 9 ft.			9

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Locomotive Shed
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Solit-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9350
EASTING: 8029

BORING NO.: A2-B-27
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/14/97
FINISH DATE: 3/14/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Gray, coarse, angular limestone gravel (fill)			1
2									2
3								Drilled interval	3
4									4
5									5
6									6
7			19		A2B280709	Black, angular, fine to coarse gravel, fine to coarse sand, med. dense to dense, wet to saturated, sl. petroleum odor (fill)			7
8			36 62			Gray, fine to coarse sand, little fine to med. gravel, dense, wet (fill)		Composite sample of A2-B-26, A2-B-27, A2-B-28	8
9		1.3	70	38		Maroon-rust ash, few white and tan mottles, med.dense, damp to dry (fill) Total Depth - 9 ft.			9

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Locomotive Shed
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9300
EASTING: 8035

BORING NO.: A2-B-28
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/14/97
FINISH DATE: 3/14/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Gray, coarse, angular limestone gravel (fill)			1
2									2
3								Drilled interval	3
4									4
5									5
6									6
7									7
8			3		A2B280709	Gray-green-brown clay, med. stiff to stiff, high plasticity, damp to moist (CH)			8
			7						
			11			Black, fine to coarse sand and subangular to subrnd gravel (SW)		Composite sample of A2-B-26, A2-B-27, A2-B-28	
9		1.0	11	6		Total Depth - 9 ft.			9

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Former Tar Pit
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9260
EASTING: 7990

BORING NO.: A2-B-29
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/14/97
FINISH DATE: 3/14/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2									2
3			11			Black ash, little fine to med. gravel, loose, damp (fill)			3
4			13		A2B310204			Composite sample of A2-B-29, A2-B-30, A2-B-31	4
5		1.7	9			As above			5
6			8						6
7		1.5	7			Brown-black clay, soft to med. stiff, med. plasticity, sl. petroluem odor, oily sheen visible (CL to CH)			7
			14						
			14						
			18			Total Depth - 7 ft.			

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Former Tar Pit
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9240
EASTING: 7980

BORING NO.: A2-B-30
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/14/97
FINISH DATE: 3/14/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2			13			Black ash, few fine to med. gravel, loose, damp (fill)			2
			13			Black sandy clay, oily material, soft to med. stiff, sl. plasticity, damp, oily (fill)			
3			12		A2B310204	Black ash, few fine to med. gravel, loose, damp (fill)		Composite sample of A2-B-29, A2-B-30, A2-B-31	3
4		1.5	9			Total Depth - 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Former Tar Pit
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9240
EASTING: 8000

BORING NO.: A2-B-31
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/14/97
FINISH DATE: 3/14/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Coarse demolition debris (fill)		Drilled interval	1
2			12			Black ash, few fine to med. gravel, loose, damp (fill)			2
3			17		A2B310204			Composite sample of A2-B-29, A2-B-30, A2-B-31	3
4		1.4	11						4
5			12			As above			5
6		1.3	7						6
7			7						7
8		1.0	7			As above, saturated			8
9			5						9
10		1.4	5						10
11			7						11
12		1.2	7			As above, med. dense to dense, saturated			12
			8						
			43						
			38			Black-brown, fine sand, ash, oil/grease, piece of wood, v. dense, dry (fill)			
			13						
			6			Black-gray clay, med. stiff, high plasticity, damp (CH)			
			10		A2B311012				
			18						
			31			Total Depth - 12 ft.			

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME LTV Donner-Hanna Coke Plant
BORING LOCATION Interceptor Sump
DRILLING FIRM Buffalo Drilling Co.
DRILLING METHOD Split-Spoon/Hollow Stem Auger
LOGGED BY B. Squire

WATER LEVELS
DRILLING (ft-bgs) _____ _____
WELL LEVEL (ft-msl) _____ _____
NORTHING 9347
EASTING 8130

BORING NO. A2-B-32
G.S. ELEV. N/A
CASING ELEV. N/A
START DATE 3/17/97
FINISH DATE 3/17/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Coarse concrete and brick (fill)		Drilled interval	1
2			3			Brown, med. to coarse sand, little fine to med. gravel, little clay, loose, damp grading to wet (fill)			2
3			2						3
4		1.6	1						4
5			3			Brown, med. to coarse sand, loose, wet to saturated (fill)			5
6		1.0	2			Black, fine to coarse sand, loose, saturated (fill)			6
7			2						7
8		1.4	6	550		Black slag, ash, gravel, sand, loose, saturated with yellow-green oily liquid (fill)			8
9			50/0	8					9
10		1.4	8	60		As above			10
11			10			Black grading to gray-black clay, stiff, damp (CL)			11
12		0.6	7	80					12
13			6			As above, gray			13
14		1.8	8	40					14
15			8			As above, grading to v. fine to fine sandy clay, soft, damp to moist (CL)			15
16		1.6	5						16
17			6			Layered gray-black-brown, silty, fine to coarse sand, loose, saturated and brown-gray, v. fine sandy clay, med. stiff, damp (SM and CL)			17
18		1.1	3	0	A2B321618	Gray-brown clay, soft to med. stiff, med. to high plasticity, damp (CH)			18
			9						
			18						
			21						
			9						
			21						
			16						
			17						
			1						
			2						
			7						
			12						
			10						
			18						
			27						
			36			Total Depth - 18 ft.			

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Primary Coolers
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): ____ ____
WELL LEVEL (ft-msl): ____ ____

NORTHING: 9520
EASTING: 9097

BORING NO.: A2-B-33
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/13/97
FINISH DATE: 3/13/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2			12		A2B350204	Black and white, fine to med. sand, med. dense to dense, damp (fill)		Composite sample of A2-B-33, A2-B-34, A2-B-35	2
		0.8	80/3	0		Blue, fine to med. sand, med. dense, damp (fill)			
3						Total Depth - 2.8 ft.			3
4									4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS — BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Primary Coolers
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9510
EASTING: 9072

BORING NO.: A2-B-34
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/13/97
FINISH DATE: 3/13/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2			28			Black and brown, med. sand, med. dense to dense, damp to moist (fill)			2
			39		A2B350204	Blue-gray, cemented sand, v. dense, dry (fill)			
3		1.5	80/5	1.8		Dark brown, fine top med. sand,med. dense, moist (fill)		Composite sample of A2-B-33, A2-B-34, A2-B-35	3
						Total Depth - 3.5 ft.			
4									4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME: LTV Donner-Hanna Coke Plant
BORING LOCATION: Primary Coolers
DRILLING FIRM: Buffalo Drilling Co.
DRILLING METHOD: Split-Spoon/Hollow Stem Auger
LOGGED BY: B. Squire

WATER LEVELS
DRILLING (ft-bgs): _____ _____
WELL LEVEL (ft-msl): _____ _____

NORTHING: 9520
EASTING: 9047

BORING NO.: A2-B-35
G.S. ELEV.: N/A
CASING ELEV.: N/A
START DATE: 3/13/97
FINISH DATE: 3/13/97

DEPTH	S.S. SAMPLE	RECOVERY (ft./2 ft.)	BLOWS/6 in.	HNu Reading (ppm)	ANALYTICAL SAMPLE ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
1						Demolition debris (fill)		Drilled interval	1
2			10			Brown, fine to coarse sand, few fine to med. gravel, med. dense to dense, wet (fill)			2
3			14 16		A2B350204			Composite sample of A2-B-33, A2-B-34, A2-B-35	3
4		1.8	22	0		Total Depth = 4 ft.			4

NOTES:
1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures
3. wh-weight of hammer
4. wr-weight of rods
5. ft-bgs-feet below ground surface
6. ft-msl-feet above mean sea level

APPENDIX B

ANALYTICAL RESULTS

Table B-2
Complete Analytical Results
Soil Samples

			SAMPLE NUMBER										
	UNITS	USEPA RBC[1]	A2P10204	A2P11113	A2B20204	A2B20911	A2B50204	A2B51012	A2B90204	A2B100204	A2B100911	A2P110206	A2P110911
TCL SVOCs** Acenaphthene	mg/kg	120000.00	ND	1.10	3.30	ND	4.50	ND	ND	ND	ND	61.00	ND
Acenaphthylene	mg/kg		ND	2.30	5.50	ND	13.00	ND	ND	54.00	ND	48.00	0.98
Anthracene	mg/kg	610000.00	ND	4.30	2.90	ND	16.00	ND	ND	53.00	ND	39.00	ND
Benzo(a)anthracene	mg/kg	7.80	7.90	4.30	2.90	ND	33.00	ND	ND	150.00	ND	48.00	0.58
Benzo(a)pyrene	mg/kg	0.78	6.70	3.40	2.40	ND	33.00	ND	ND	100.00	ND	36.00	0.53
Benzo(b)fluoranthene	mg/kg	7.80	8.40	3.80	2.60	ND	37.00	ND	ND	130.00	0.48	40.00	0.62
Benzo(g,h,i)perylene	mg/kg		3.10	1.20	1.10	ND	16.00	ND	ND	71.00	ND	ND	ND
Benzo(k)fluoranthene	mg/kg	78.00	5.00	2.20	1.60	ND	21.00	ND	ND	83.00	ND	ND	ND
Benzyl Alcohol	mg/kg	610000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butyl Benzyl Phthalate	mg/kg	410000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
di-n-Butylphthalate	mg/kg	200000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	mg/kg	290.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	mg/kg	7.80	3.50	1.20	1.00	ND	16.00	ND	ND	70.00	ND	ND	ND
4-Chloroaniline	mg/kg	8200.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(-2-Chloroethoxy)methane	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroethyl)ether	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	mg/kg	160000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	mg/kg	10000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2'-oxybis(1-Chloropropane)	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	mg/kg	780.00	6.10	3.40	2.20	ND	26.00	ND	ND	130.00	ND	43.00	ND
Dibenzo(a,h)anthracene	mg/kg	0.78	ND	0.59	ND	ND	5.40	ND	ND	22.00	ND	ND	ND
Dibenzofuran	mg/kg	8200.00	ND	3.40	0.81	ND	ND	ND	ND	ND	ND	31.00	ND
1,3-Dichlorobenzene	mg/kg	180000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	mg/kg	180000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	mg/kg	240.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-dichlorobenzidine	mg/kg	13.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol	mg/kg	6100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethylphthalate	mg/kg	1000000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	mg/kg	1000000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	mg/kg	41000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.20
2,4-Dinitrophenol	mg/kg	4100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	mg/kg	4100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	mg/kg	2000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-ethylhexyl)phthalate	mg/kg	410.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	mg/kg	82000.00	11.00	9.60	11.00	ND	55.00	ND	ND	330.00	1.20	81.00	1.60
Fluorene	mg/kg	82000.00	ND	5.30	3.90	ND	11.00	ND	ND	34.00	ND	46.00	ND
Hexachlorobenzene	mg/kg	3.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	mg/kg	73.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	mg/kg	14000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	mg/kg	410.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	mg/kg	6000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	mg/kg		ND	4.30	5.20	ND	ND	ND	ND	ND	ND	ND	ND
4,6-dinitro-2-Methylphenol	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-chloro-3-Methylphenol	mg/kg	100000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table B-1
Complete Analytical Results
Soil Gas Survey
Donner-Hanna Coke Plant

	Compound	Benzene	Toluene	Ethylbenzene	mp-Xylene	o-Xylene	Total BTEX[1]	Naphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene*	Anthracene*	Fluoranthene*	Pyrene*	Total PAH[2]
	Units	ug	ug	ug	ug	ug	ug	ug	ug	ug	ug	ug	ug	ug	ug	ug	ug
Sample Number	133098	0.11	0.05	0.01	0.05	0.03	0.25	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
	133099	0.11	0.09	0.02	0.04	0.03	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133100	0.20	0.13	0.02	0.08	0.03	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133101	0.13	0.24	0.01	0.03	0.02	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133102	0.61	0.18	0.01	0.07	0.03	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133103	0.38	0.15	0.05	0.06	0.04	0.68	0.40	0.02	0.00	0.00	0.02	0.04	0.02	0.00	0.00	0.50
	133104	0.49	0.50	0.03	0.12	0.07	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133105	0.49	0.10	0.01	0.05	0.02	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133106	0.23	0.14	0.01	0.08	0.04	0.50	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80
	133107	12.77	5.64	0.06	1.15	0.58	20.20	0.35	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
	133108	0.15	0.18	0.04	0.16	0.05	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133109	117.58	0.47	14.75	1.26	0.92	134.98	5.89	0.15	0.02	0.03	0.06	0.07	0.01	0.03	0.00	6.26
	133110	6.06	6.50	0.10	1.09	0.29	14.04	0.10	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.12
	133111	0.06	0.04	0.01	0.03	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133112	1.84	0.24	0.01	0.05	0.05	2.19	0.07	0.03	0.00	0.02	0.02	0.01	0.00	0.00	0.00	0.15
	133113	72.83	7.00	2.65	7.07	2.59	92.14	8.29	1.76	0.71	0.33	1.70	1.21	0.40	0.06	0.04	14.50
	133114	0.21	0.09	0.01	0.04	0.02	0.37	0.58	0.31	0.44	0.05	0.33	0.33	0.15	0.06	0.04	2.29
	133115	0.07	0.04	0.01	0.03	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133116	1.03	1.42	0.97	3.31	2.81	9.54	40.82	12.06	0.06	1.40	1.86	2.81	0.73	0.27	0.16	60.17
	133117	0.22	0.36	0.04	0.14	0.12	0.88	1.59	0.91	0.02	1.53	0.97	0.94	0.32	0.05	0.03	6.36
	133118	0.65	0.10	0.01	0.03	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133119	0.35	0.11	0.00	0.03	0.02	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133120	0.23	0.18	0.06	0.42	0.31	1.20	7.70	4.15	0.09	6.02	2.72	3.46	0.65	0.14	0.08	25.01
	133121	0.25	0.10	0.01	0.03	0.02	0.41	0.03	0.02	0.00	0.07	0.02	0.11	0.03	0.04	0.03	0.35
	133122	2.68	0.21	0.03	0.10	0.04	3.06	0.03	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.06
	133123	2.11	0.08	0.60	6.92	0.59	10.30	0.05	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.06
	133124	1.03	0.21	0.02	0.09	0.07	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133125	1.38	0.14	0.02	0.06	0.04	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133126	1.18	0.20	0.03	0.10	0.05	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133127	9.22	0.52	0.03	0.13	0.06	9.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	133128	152.69	125.12	0.26	3.67	0.88	282.62	0.62	0.11	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.76
Trip Blank	133129	0.22	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trip Blank	133130	0.14	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note:
[1] Benzene, Toluene, Ethylbenzene, Xlyenes
[2] Polynuclear Aromatic Hydrocarbons
* Estimated values

Table B-2
Complete Analytical Results
Soil Samples

				SAMPLE NUMBER										
		UNITS	USEPA RBC[1]	A2P10204	A2P11113	A2B20204	A2B20911	A2B50204	A2B51012	A2B90204	A2B100204	A2B100911	A2P110206	A2P110911
METALS	Aluminum	mg/kg	1000000.00	4970.00	12100.00	52100.00	23600.00	27600.00	19800.00	29200.00	13800.00	25100.00	38600.00	24600.00
	Antimony	mg/kg	820.00	ND	ND	ND	ND	ND	ND	ND	16.90	ND	ND	ND
	Arsenic	mg/kg	610.00	ND	1.96	ND	3.36	8.30	4.19	7.56	61.80	4.71	7.55	ND
	Barium	mg/kg	140000.00	91.30	86.50	435.00	118.00	435.00	153.00	411.00	238.00	142.00	1140.00	441.00
	Beryllium	mg/kg	1.30	ND	0.63	6.11	1.16	3.18	1.22	3.49	1.98	1.08	4.41	1.89
	Cadmium	mg/kg	1000.00	1.47	ND	ND	ND	1.01	ND	ND	1.04	ND	ND	ND
	Calcium	mg/kg		136000.00	1910.00	315000.00	2510.00	139000.00	3570.00	146000.00	69000.00	2100.00	206000.00	48700.00
	Chromium	mg/kg	1000000.00	1050.00	16.50	4.31	31.50	40.20	27.60	9.92	51.70	35.30	11.00	26.40
	Cobalt	mg/kg	120000.00	ND	8.68	ND	11.70	ND	14.30	ND	ND	41.60	ND	10.30
	Copper	mg/kg	82000.00	88.30	14.90	ND	26.90	142.00	32.80	17.00	164.00	31.60	11.40	26.60
	Iron	mg/kg	610000.00	157000.00	22800.00	4900.00	48700.00	45600.00	45100.00	36200.00	76700.00	47300.00	11500.00	31600.00
	Lead	mg/kg		172.00	10.40	ND	19.50	236.00	15.30	10.80	2800.00	17.20	93.40	28.20
	Magnesium	mg/kg		34200.00	2460.00	4570.00	4420.00	5340.00	4910.00	7610.00	5360.00	4870.00	17300.00	9490.00
	Manganese	mg/kg	47000.00	35700.00	183.00	5170.00	304.00	3430.00	693.00	4700.00	2660.00	499.00	5260.00	2360.00
	Mercury	mg/kg	610.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.65
	Nickel	mg/kg	41000.00	23.10	23.30	ND	31.40	17.80	41.70	8.68	30.70	44.50	ND	24.90
	Potassium	mg/kg		343.00	1070.00	1950.00	4030.00	2370.00	1240.00	1860.00	951.00	2600.00	1220.00	1840.00
	Selenium	mg/kg	10000.00	7.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Silver	mg/kg	10000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sodium	mg/kg		453.00	227.00	1080.00	502.00	822.00	431.00	747.00	418.00	149.00	707.00	731.00
	Thallium	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Vanadium	mg/kg	14300.00	484.00	24.50	ND	40.40	18.70	29.50	13.20	40.10	40.90	8.31	27.50
	Zinc	mg/kg	610000.00	565.00	57.10	14.80	116.00	187.00	99.20	124.00	325.00	146.00	118.00	90.00
	Total Cyanide	mg/kg		2.58	ND	95.20	ND	50.80	ND	228.00	169.00	ND	209.00	43.40
	Sulfide Reactivity	mg/kg		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Cyanide Reactivity	mg/kg		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B-2
Complete Analytical Results
Soil Samples

			SAMPLE NUMBER										
	UNITS	USEPA RBC[1]	A2P10204	A2P11113	A2B20204	A2B20911	A2B50204	A2B51012	A2B90204	A2B100204	A2B100911	A2P110206	A2P110911
TCL VOCs Acetone	mg/kg	200000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	mg/kg	200.00	3.10	ND	ND	0.14	ND	0.02	ND	ND	ND	13.00	ND
Bromodichloromethane	mg/kg	92.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	mg/kg	720.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	mg/kg	2900.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	mg/kg	1000000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	mg/kg	200000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	mg/kg	44.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	mg/kg	41000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	mg/kg	820000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	mg/kg	940	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	mg/kg	440.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	mg/kg	68.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	mg/kg	200000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	mg/kg	63.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	mg/kg	9.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	mg/kg	20000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	mg/kg	41000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	mg/kg	84.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	mg/kg	33.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	mg/kg	33.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	mg/kg	200000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	0.03	9.30	ND
Methylene Chloride	mg/kg	760.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone (MIBK)	mg/kg	160000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	mg/kg	410000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	mg/kg	220.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	mg/kg	110.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	mg/kg	410000.00	0.99	ND	1.80	0.14	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	mg/kg	72000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	mg/kg	100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	mg/kg	520.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	mg/kg	3.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene*	mg/kg	1000000.00	1.90	ND	ND	0.01	ND	ND	ND	ND	0.03	ND	ND
m+p-Xylene*	mg/kg	1000000.00	6.10	ND	2.60	0.02	ND	ND	ND	ND	0.03	4.30	ND
Total VOCs	**mg/kg**		**12.09**	**ND**	**4.40**	**0.31**	**ND**	**0.02**	**ND**	**ND**	**0.08**	**26.60**	**ND**
Total BTEX	**mg/kg**		**12.09**	**ND**	**4.40**	**0.31**	**ND**	**0.02**	**ND**	**ND**	**0.08**	**26.60**	**ND**

Table B-2
Complete Analytical Results
Soil Samples

			SAMPLE NUMBER										
	UNITS	USEPA RBC[1]	A2P10204	A2P11113	A2B20204	A2B20911	A2B50204	A2B51012	A2B90204	A2B100204	A2B100911	A2P110206	A2P110911
2-Methylphenol	mg/kg	100000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	mg/kg	10000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	mg/kg	82000.00	ND	14.00	2.90	ND	3.60	ND	ND	63.00	1.20	460.00	13.00
2-Nitroaniline	mg/kg	120.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	mg/kg	6100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	mg/kg	6100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	mg/kg	1000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrophenol	mg/kg	130000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Nitrosodimethylamine	mg/kg	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Nitrosodiphenylamine	mg/kg	1200.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
di-n-octylphthalate	mg/kg	41000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	mg/kg	48.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	mg/kg	610000.00	2.90	12.00	13.00	ND	38.00	ND	ND	210.00	1.20	120.00	1.40
Phenol	mg/kg	1000000.00	ND	0.92	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-bromophenyl-Phenylether	mg/kg	120000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-chlorophenyl-Phenylether	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Nitroso-di-n-propylamine	mg/kg	0.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	mg/kg	61000.00	11.00	7.00	3.10	ND	49.00	ND	ND	250.00	0.85	60.00	1.10
1,2,4-Trichlorobenzene	mg/kg	20000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	mg/kg	520.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	mg/kg	20000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total SVOCs	**mg/kg**		**65.60**	**84.31**	**65.41**	**ND**	**377.50**	**ND**	**ND**	**1750.00**	**4.93**	**1113.00**	**21.01**
Total PAHs	mg/kg		65.60	75.69	59.40	ND	377.50	ND	ND	1750.00	4.93	1082.00	19.81
TCL PCBs 1016	mg/kg	140.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1221	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1232	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1242	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1248	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1254	mg/kg	41.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1260	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

[1] USEPA Region III Risk Based Concentrations for soil ingestion at industrial sites

* RBC value is for total Xylenes

NA Not Analyzed

ND Not Detected

BTEX compounds listed in blue.

PAH compounds listed in red.

Table B-2
Complete Analytical Results
Soil Samples

				SAMPLE NUMBER										
		UNITS	USEPA RBC[1]	A2B170204	A2B210204	A2B240205	A2B250608	A2B251012	A2B280709	A2B310204	A2B311012	A2B321618	A2B350204	A2-B85 4-6
METALS	Aluminum	mg/kg	1000000.00	17600.00	35200.00	NA	35300.00	15400.00	17100.00	2090.00	24300.00	11800.00	44700.00	NA
	Antimony	mg/kg	820.00	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	NA
	Arsenic	mg/kg	610.00	6.23	28.80	NA	2.14	3.36	13.70	2.56	ND	1.91	3.44	NA
	Barium	mg/kg	140000.00	295.00	510.00	NA	232.00	104.00	208.00	54.20	184.00	53.70	541.00	NA
	Beryllium	mg/kg	1.30	1.92	3.69	NA	4.39	1.21	1.31	ND	1.00	ND	4.76	NA
	Cadmium	mg/kg	1000.00	ND	2.58	NA	3.61	1.78	2.88	ND	0.94	0.81	ND	NA
	Calcium	mg/kg		94700.00	187000.00	NA	117000.00	14600.00	95700.00	4180.00	4910.00	41700.00	246000.00	NA
	Chromium	mg/kg	1000000.00	19.40	153.00	NA	282.00	48.20	19.80	5.67	28.40	16.60	14.00	NA
	Cobalt	mg/kg	120000.00	ND	ND	NA	11.60	ND	ND	ND	9.20	8.92	ND	NA
	Copper	mg/kg	82000.00	42.30	99.90	NA	138.00	65.80	42.00	20.80	24.50	28.10	22.90	NA
	Iron	mg/kg	610000.00	36700.00	68100.00	NA	58100.00	48000.00	81500.00	7180.00	32500.00	26800.00	41200.00	NA
	Lead	mg/kg		121.00	432.00	NA	54.70	76.60	55.10	11.30	51.70	12.10	ND	NA
	Magnesium	mg/kg		8220.00	26700.00	NA	27700.00	3490.00	4350.00	474.00	4320.00	15000.00	20300.00	NA
	Manganese	mg/kg	47000.00	2570.00	6600.00	NA	2370.00	376.00	1620.00	94.10	313.00	471.00	7360.00	NA
	Mercury	mg/kg	610.00	ND	ND	NA	15.20	0.98	0.77	2.78	ND	ND	ND	NA
	Nickel	mg/kg	41000.00	12.50	26.10	NA	319.00	36.00	21.70	6.44	31.80	26.30	8.49	NA
	Potassium	mg/kg		1880.00	1950.00	NA	2470.00	1110.00	1780.00	ND	2220.00	2080.00	2460.00	NA
	Selenium	mg/kg	10000.00	2.44	ND	NA	5.67	ND	4.12	ND	ND	ND	ND	NA
	Silver	mg/kg	10000.00	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	NA
	Sodium	mg/kg		830.00	688.00	NA	702.00	182.00	1190.00	121.00	142.00	252.00	763.00	NA
	Thallium	mg/kg		ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	NA
	Vanadium	mg/kg	14000.00	14.80	26.10	NA	32.10	21.00	20.80	ND	26.80	18.80	12.00	NA
	Zinc	mg/kg	610000.00	181.00	1750.00	NA	504.00	143.00	657.00	21.90	232.00	70.90	26.10	NA
	Total Cyanide	mg/kg		191.00	97.30	NA	800.00	290.00	1.97	24.50	ND	ND	106.00	198.00
	Sulfide Reactivity	mg/kg		NA	NA	NA	ND	ND	NA	NA	NA	NA	NA	NA
	Cyanide Reactivity	mg/kg		NA	NA	NA	ND	ND	NA	NA	NA	NA	NA	NA

Table B-2
Complete Analytical Results
Soil Samples

			SAMPLE NUMBER										
	UNITS	USEPA RBC[1]	A2B170204	A2B210204	A2B240205	A2B250608	A2B251012	A2B280709	A2B310204	A2B311012	A2B321618	A2B350204	A2-B85 4-6
TCL VOCs Acetone	mg/kg	200000.00	ND	ND	ND	0.25	0.07	ND	ND	ND	ND	ND	NA
Benzene	mg/kg	200.00	ND	ND	ND	1.80	0.04	54.00	ND	15.00	0.01	0.01	ND
Bromodichloromethane	mg/kg	92.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Bromoform	mg/kg	720.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Bromomethane	mg/kg	2900.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2-Butanone (MEK)	mg/kg	1000000.00	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	NA
Carbon Disulfide	mg/kg	200000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Carbon Tetrachloride	mg/kg	44.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Chlorobenzene	mg/kg	41000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Chloroethane	mg/kg	820000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Chloroform	mg/kg	940	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Chloromethane	mg/kg	440.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Dibromochloromethane	mg/kg	68.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
1,1-Dichloroethane	mg/kg	200000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
1,2-Dichloroethane	mg/kg	63.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
1,1-Dichloroethene	mg/kg	9.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
cis-1,2-Dichloroethene	mg/kg	20000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
trans-1,2-Dichloroethene	mg/kg	41000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
1,2-Dichloropropane	mg/kg	84.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
cis-1,3-Dichloropropene	mg/kg	33.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
trans-1,3-Dichloropropene	mg/kg	33.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Ethylbenzene	mg/kg	200000.00	ND	ND	ND	ND	ND	22.00	ND	2.90	ND	ND	11.00
2-Hexanone	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Methylene Chloride	mg/kg	760.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
4-Methyl-2-Pentanone (MIBK)	mg/kg	160000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Styrene	mg/kg	410000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
1,1,2,2-Tetrachloroethane	mg/kg	220.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Tetrachloroethene	mg/kg	110.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	NA
Toluene	mg/kg	410000.00	ND	ND	ND	ND	ND	200.00	ND	4.20	0.01	ND	20.00
1,1,1-Trichloroethane	mg/kg	72000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
1,1,2-Trichloroethane	mg/kg	100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Trichloroethene	mg/kg	520.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Vinyl Chloride	mg/kg	3.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
o-Xylene*	mg/kg	1000000.00	ND	ND	ND	ND	ND	89.00	ND	6.40	ND	ND	84.00
m+p-Xylene*	mg/kg	1000000.00	ND	ND	ND	ND	ND	340.00	ND	18.00	ND	ND	94.00
Total VOCs	**mg/kg**		**ND**	**ND**	**ND**	**2.05**	**0.13**	**705.00**	**ND**	**46.50**	**0.02**	**0.03**	**209.00**
Total BTEX	**mg/kg**		**ND**	**ND**	**ND**	**1.80**	**0.04**	**705.00**	**ND**	**46.50**	**0.02**	**0.01**	**209.00**

Table B-2
Complete Analytical Results
Soil Samples

			SAMPLE NUMBER										
	UNITS	USEPA RBC[1]	A2B170204	A2B210204	A2B240205	A2B250608	A2B251012	A2B280709	A2B310204	A2B311012	A2B321618	A2B350204	A2-B85 4-6
TCL SVOCs** Acenaphthene	mg/kg	120000.00	ND	49.00	ND	6.30	ND	ND	ND	ND	ND	ND	8.20
Acenaphthylene	mg/kg		ND	90.00	13.00	25.00	ND	ND	28.00	2.40	ND	55.00	29.00
Anthracene	mg/kg	610000.00	ND	110.00	9.80	42.00	ND	ND	26.00	2.10	ND	41.00	57.00
Benzo(a)anthracene	mg/kg	7.80	ND	110.00	22.00	67.00	ND	ND	28.00	1.40	ND	39.00	170.00
Benzo(a)pyrene	mg/kg	0.78	6.30	110.00	24.00	56.00	ND	ND	24.00	1.10	ND	39.00	94.00
Benzo(b)fluoranthene	mg/kg	7.80	7.90	110.00	31.00	82.00	ND	ND	31.00	1.40	ND	41.00	150.00
Benzo(g,h,i)perylene	mg/kg		5.60	48.00	7.60	23.00	ND	ND	ND	ND	ND	21.00	43.00
Benzo(k)fluoranthene	mg/kg	78.00	ND	61.00	13.00	30.00	ND	ND	14.00	0.70	ND	19.00	93.00
Benzyl Alcohol	mg/kg	610000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Butyl Benzyl Phthalate	mg/kg	410000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
di-n-Butylphthalate	mg/kg	200000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Carbazole	mg/kg	290.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Indeno(1,2,3-cd)pyrene	mg/kg	7.80	5.30	48.00	9.10	26.00	ND	ND	13.00	ND	ND	19.00	50.00
4-Chloroaniline	mg/kg	8200.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
bis(-2-Chloroethoxy)methane	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
bis(2-Chloroethyl)ether	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2-Chloronaphthalene	mg/kg	160000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2-Chlorophenol	mg/kg	10000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2,2'-oxybis(1-Chloropropane)	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Chrysene	mg/kg	780.00	ND	100.00	24.00	63.00	ND	ND	27.00	1.40	ND	34.00	140.00
Dibenzo(a,h)anthracene	mg/kg	0.78	ND	ND	ND	10.00	ND	ND	ND	ND	ND	5.30	18.00
Dibenzofuran	mg/kg	8200.00	ND	63.00	ND	19.00	ND	ND	13.00	1.60	ND	18.00	NA
1,3-Dichlorobenzene	mg/kg	180000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
1,2-Dichlorobenzene	mg/kg	180000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
1,4-Dichlorobenzene	mg/kg	240.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
3,3'-dichlorobenzidine	mg/kg	13.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2,4-Dichlorophenol	mg/kg	6100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Diethylphthalate	mg/kg	1000000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Dimethyl phthalate	mg/kg	1000000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2,4-Dimethylphenol	mg/kg	41000.00	ND	ND	ND	ND	ND	ND	ND	2.30	ND	ND	NA
2,4-Dinitrophenol	mg/kg	4100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2,4-Dinitrotoluene	mg/kg	4100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2,6-Dinitrotoluene	mg/kg	2000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
bis(2-ethylhexyl)phthalate	mg/kg	410.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Fluoranthene	mg/kg	82000.00	7.00	310.00	55.00	120.00	1.00	ND	60.00	2.90	ND	100.00	500.00
Fluorene	mg/kg	82000.00	ND	110.00	8.30	33.00	ND	ND	23.00	2.60	ND	31.00	86.00
Hexachlorobenzene	mg/kg	3.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Hexachlorobutadiene	mg/kg	73.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Hexachlorocyclopentadiene	mg/kg	14000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Hexachloroethane	mg/kg	410.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Isophorone	mg/kg	6000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2-Methylnaphthalene	mg/kg		ND	ND	ND	14.00	ND	29.00	22.00	3.80	ND	ND	NA
4,6-dinitro-2-Methylphenol	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
4-chloro-3-Methylphenol	mg/kg	100000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA

Table B-2
Complete Analytical Results
Soil Samples

			SAMPLE NUMBER										
	UNITS	USEPA RBC[1]	A2B170204	A2B210204	A2B240205	A2B250608	A2B251012	A2B280709	A2B310204	A2B311012	A2B321618	A2B350204	A2-B85 4-6
2-Methylphenol	mg/kg	100000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
4-Methylphenol	mg/kg	10000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Naphthalene	mg/kg	82000.00	ND	110.00	6.40	58.00	ND	48.00	270.00	52.00	ND	7.90	150.00
2-Nitroaniline	mg/kg	120.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
3-Nitroaniline	mg/kg	6100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
4-Nitroaniline	mg/kg	6100.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Nitrobenzene	mg/kg	1000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2-Nitrophenol	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
4-Nitrophenol	mg/kg	130000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
n-Nitrosodimethylamine	mg/kg	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
n-Nitrosodiphenylamine	mg/kg	1200.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
di-n-octylphthalate	mg/kg	41000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Pentachlorophenol	mg/kg	48.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Phenanthrene	mg/kg	610000.00	ND	280.00	47.00	110.00	0.91	ND	64.00	5.40	ND	81.00	370.00
Phenol	mg/kg	1000000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
4-bromophenyl-Phenylether	mg/kg	120000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
4-chlorophenyl-Phenylether	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
n-Nitroso-di-n-propylamine	mg/kg	0.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Pyrene	mg/kg	61000.00	5.40	220.00	40.00	110.00	0.67	ND	45.00	2.40	ND	83.00	300.00
1,2,4-Trichlorobenzene	mg/kg	20000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2,4,6-Trichlorophenol	mg/kg	520.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
2,4,5-Trichlorophenol	mg/kg	20000.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Total SVOCs	**mg/kg**		**37.50**	**1929.00**	**310.20**	**894.30**	**2.58**	**77.00**	**688.00**	**83.50**	**ND**	**634.20**	**2258.20**
Total PAHs	mg/kg		37.50	1866.00	310.20	861.30	2.58	48.00	653.00	75.80	ND	616.20	2258.20
TCL PCBs 1016	mg/kg	140.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1221	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1232	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1242	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1248	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1254	mg/kg	41.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1260	mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

[1] USEPA Region III Risk Based Concentrations for soil ingestion at industrial sites

* RBC value is for total Xylenes

NA Not Analyzed

ND Not Detected

BTEX compounds listed in blue.

PAH compounds listed in red.

Table B-3
Complete Analytical Results
Groundwater Samples
Donner-Hanna Coke Plant

		UNITS	NYSDEC GW Stds[1]	SAMPLE NUMBER A2-P1	A2-P11
METALS	Aluminum	mg/L	NA	0.713	0.122
	Antimony	mg/L	NA	ND	ND
	Arsenic	mg/L	0.025	0.011	ND
	Barium	mg/L	1	0.088	ND
	Beryllium	mg/L	NA	ND	ND
	Cadmium	mg/L	0.088	ND	ND
	Calcium	mg/L	NA	427.000	137.000
	Chromium	mg/L	0.05	ND	ND
	Cobalt	mg/L	NA	ND	ND
	Copper	mg/L	0.2	ND	ND
	Iron	mg/L	0.3	2.110	0.610
	Lead	mg/L	0.025	ND	ND
	Magnesium	mg/L	NA	31.000	42.200
	Manganese	mg/L	0.3	0.523	0.505
	Mercury	mg/L	0.002	ND	ND
	Nickel	mg/L	NA	ND	ND
	Potassium	mg/L	NA	10.900	5.520
	Selenium	mg/L	0.01	0.017	0.016
	Silver	mg/L	0.05	ND	ND
	Sodium	mg/L	20	104.000	48.500
	Thallium	mg/L	NA	ND	ND
	Vanadium	mg/L	NA	ND	ND
	Zinc	mg/L	0.3	0.020	0.119
	Total Cyanide	mg/L	0.1	0.212	1.250

Table B-3
Complete Analytical Results
Groundwater Samples
Donner-Hanna Coke Plant

		UNITS	NYSDEC GW Stds[1]	SAMPLE NUMBER A2-P1	A2-P11
TCL VOCs	Acetone	mg/L	0.05	ND	ND
	Benzene	mg/L	0.0007	12.000	0.086
	Bromodichloromethane	mg/L	NA	ND	ND
	Bromoform	mg/L	NA	ND	ND
	Bromomethane	mg/L	NA	ND	ND
	2-Butanone (MEK)	mg/L	0.05	ND	ND
	Carbon Disulfide	mg/L	0.05	ND	ND
	Carbon Tetrachloride	mg/L	0.005	ND	ND
	Chlorobenzene	mg/L	0.005	ND	ND
	Chloroethane	mg/L	0.05	ND	ND
	Chloroform	mg/L	0.007	ND	ND
	Chloromethane	mg/L	NA	ND	ND
	Dibromochloromethane	mg/L	0.05	ND	ND
	1,1-Dichloroethane	mg/L	0.005	ND	ND
	1,2-Dichloroethane	mg/L	0.005	ND	ND
	1,1-Dichloroethene	mg/L	0.005	ND	ND
	cis-1,2-Dichloroethene	mg/L	NA	ND	ND
	trans-1,2-Dichloroethene	mg/L	0.005	ND	ND
	1,2-Dichloropropane	mg/L	NA	ND	ND
	cis-1,3-Dichloropropene	mg/L	NA	ND	ND
	trans-1,3-Dichloropropene	mg/L	NA	ND	ND
	Ethylbenzene	mg/L	0.005	ND	ND
	2-Hexanone	mg/L	NA	ND	ND
	Methylene Chloride	mg/L	0.005	ND	ND
	4-Methyl-2-Pentanone (MIBK)	mg/L	0.05	ND	ND
	Styrene	mg/L	NA	ND	ND
	1,1,2,2-Tetrachloroethane	mg/L	0.005	ND	ND
	Tetrachloroethene	mg/L	0.005	ND	ND
	Toluene	mg/L	0.005	2.500	0.028
	1,1,1-Trichloroethane	mg/L	0.005	ND	ND
	1,1,2-Trichloroethane	mg/L	0.005	ND	ND
	Trichloroethene	mg/L	0.005	ND	ND
	Vinyl Chloride	mg/L	0.002	ND	ND
	o-Xylene	mg/L	0.005*	ND	ND
	m+p-Xylene	mg/L	0.005*	2.000	0.005
	Total VOCs	**mg/L**		**16.500**	**0.119**
	Total BTEX	**mg/L**		**16.500**	**0.119**

Table B-3
Complete Analytical Results
Groundwater Samples
Donner-Hanna Coke Plant

		UNITS	NYSDEC GW Stds[1]	SAMPLE NUMBER A2-P1	A2-P11
TCL SVOCs	Acenaphthene	mg/L	0.02	ND	ND
	Acenaphthylene	mg/L	0.02	ND	0.021
	Anthracene	mg/L	0.05	ND	0.006
	Benzo(a)anthracene	mg/L	0.000002	ND	ND
	Benzo(a)pyrene	mg/L	0.000002	ND	ND
	Benzo(b)fluoranthene	mg/L	0.000002	ND	0.007
	Benzo(g,h,i)perylene	mg/L	0.005	ND	ND
	Benzo(k)fluoranthene	mg/L	0.000002	ND	ND
	Benzyl Alcohol	mg/L	NA	ND	ND
	Butyl Benzyl Phthalate	mg/L	0.05	ND	ND
	di-n-Butylphthalate	mg/L	0.05	ND	ND
	Carbazole	mg/L	NA	0.290	0.021
	Indeno(1,2,3-cd)pyrene	mg/L	0.000002	ND	ND
	4-Chloroaniline	mg/L	0.005	ND	ND
	bis(-2-Chloroethoxy)methane	mg/L	NA	ND	ND
	bis(2-Chloroethyl)ether	mg/L	NA	ND	ND
	2-Chloronaphthalene	mg/L	NA	ND	ND
	2-Chlorophenol	mg/L	0.05	ND	ND
	2,2'-oxybis(1-Chloropropane)	mg/L	NA	ND	ND
	Chrysene	mg/L	0.000002	ND	ND
	Dibenzo(a,h)anthracene	mg/L	0.05	ND	ND
	Dibenzofuran	mg/L	0.005	ND	0.006
	1,3-Dichlorobenzene	mg/L	NA	ND	ND
	1,2-Dichlorobenzene	mg/L	0.0047[2]	ND	ND
	1,4-Dichlorobenzene	mg/L	0.0047[2]	ND	ND
	3,3'-dichlorobenzidine	mg/L	NA	ND	ND
	2,4-Dichlorophenol	mg/L	0.001	ND	ND
	Diethylphthalate	mg/L	0.05	ND	ND
	Dimethyl phthalate	mg/L	0.05	ND	ND
	2,4-Dimethylphenol	mg/L	NA	0.640	ND
	2,4-Dinitrophenol	mg/L	0.005	ND	ND
	2,4-Dinitrotoluene	mg/L	NA	ND	ND
	2,6-Dinitrotoluene	mg/L	0.005	ND	ND
	bis(2-ethylhexyl)phthalate	mg/L	0.05	ND	ND
	Fluoranthene	mg/L	0.05	0.340	0.012
	Fluorene	mg/L	0.05	0.260	0.007

Table B-3
Complete Analytical Results
Groundwater Samples
Donner-Hanna Coke Plant

	UNITS	NYSDEC GW Stds[1]	SAMPLE NUMBER A2-P1	A2-P11
Hexachlorobenzene	mg/L	0.00035	ND	ND
Hexachlorobutadiene	mg/L	NA	ND	ND
Hexachlorocyclopentadiene	mg/L	NA	ND	ND
Hexachloroethane	mg/L	NA	ND	ND
Isophorone	mg/L	0.05	ND	ND
2-Methylnaphthalene	mg/L	0.05	0.570	0.015
4,6-dinitro-2-Methylphenol	mg/L	NA	ND	ND
4-chloro-3-Methylphenol	mg/L	0.005	ND	ND
2-Methylphenol	mg/L	0.005	0.950	ND
4-Methylphenol	mg/L	0.05	ND	ND
Naphthalene	mg/L	0.01	6.000	0.400
2-Nitroaniline	mg/L	0.005	ND	ND
3-Nitroaniline	mg/L	NA	ND	ND
4-Nitroaniline	mg/L	0.005	ND	ND
Nitrobenzene	mg/L	0.005	ND	ND
2-Nitrophenol	mg/L	0.005	ND	ND
4-Nitrophenol	mg/L	0.005	ND	ND
n-Nitrosodimethylamine	mg/L	NA	ND	ND
n-Nitrosodiphenylamine	mg/L	NA	ND	ND
di-n-octylphthalate	mg/L	0.05	ND	ND
Pentachlorophenol	mg/L	0.001	ND	ND
Phenanthrene	mg/L	0.05	0.550	0.014
Phenol	mg/L	0.001	4.500	ND
4-bromophenyl-Phenylether	mg/L	NA	ND	ND
4-chlorophenyl-Phenylether	mg/L	NA	ND	ND
n-Nitroso-di-n-propylamine	mg/L	NA	ND	ND
Pyrene	mg/L	0.05	ND	0.010
1,2,4-Trichlorobenzene	mg/L	NA	ND	ND
2,4,6-Trichlorophenol	mg/L	NA	ND	ND
2,4,5-Trichlorophenol	mg/L	0.001	ND	ND
Total SVOCs	**mg/L**		**14.100**	**0.519**
Total PAHs	**mg/L**		**7.150**	**0.476**

Notes:
[1] NY State Dept. of Env. Conservation Class GA Groundwater Quality Standards
[2] Applies to sum of para (1,4-) and ortho (1,2-) isomers only.
* GW Standards value is for total Xylenes
NA = Not Available
ND = Not Detected
BTEX compounds listed in blue
PAH compounds listed in red

MALCOLM PIRNIE

ATTACHMENT B-4

- **WELL CONSTRUCTION DIAGRAMS**
  - **Area I**
  - **Area III**
  - **Area IV**

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DHMW-1

PROJECT LTV STEEL | START DATE 3/5/97 | END DATE

PROJECT NO. 0848-263 | FIELD GEOLOGIST J.D. Hilton

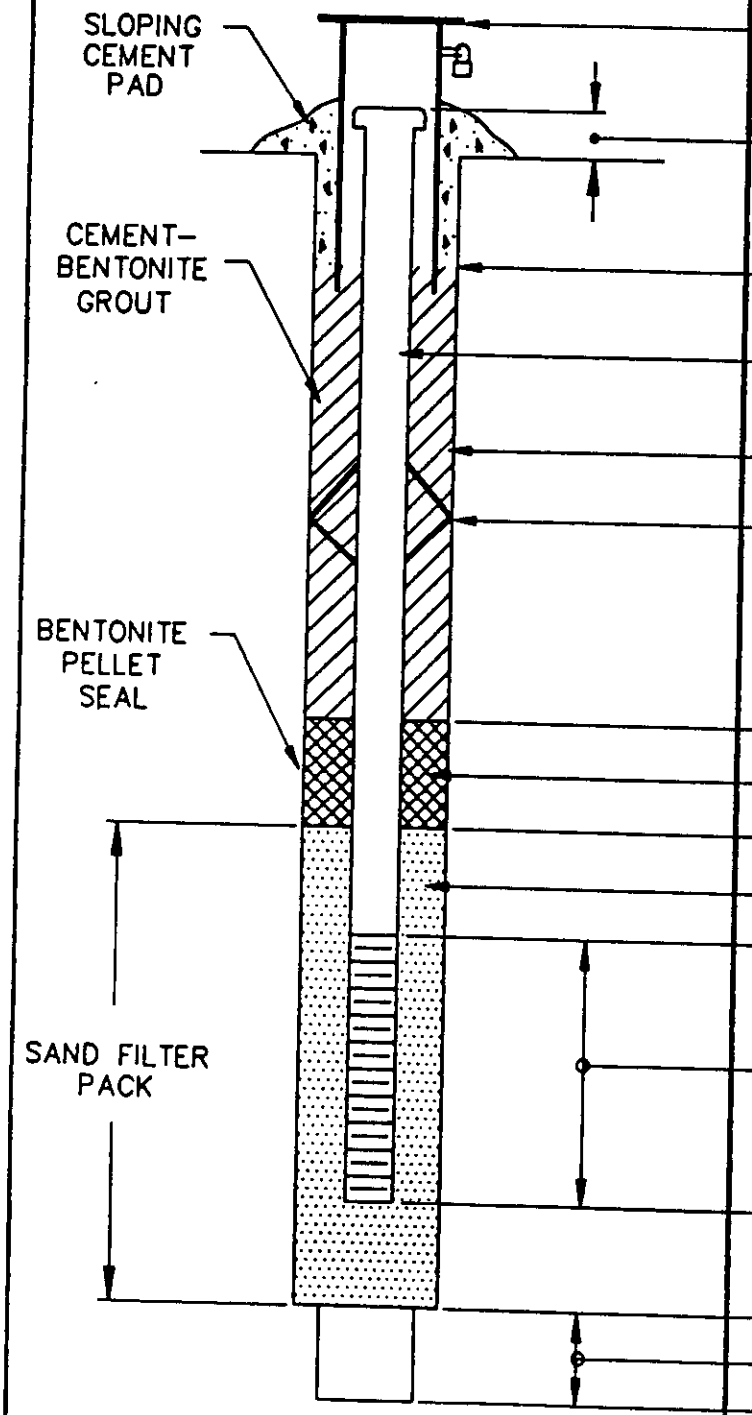
LOCATION DONNER-HANNA Site

DRILLING CO. Bato Dale

DRILLER(S) L. Schroeder

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING N/A

LOCKED? X YES ___ NO

STICK-UP 2.0

DEPTH TO TOP OF GROUT/, BOTTOM OF CEMENT 3'

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 6.0'

PELLET SIZE 3/8" pellets

DEPTH 8.0

SAND SIZE 00 N

DEPTH 8.0

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 13.0

DEPTH 13.0

BACKFILL MATERIAL Native Silt

BOTTOM OF BOREHOLE 14

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DHMW-1

PROJECT LTV STEEL | START DATE 3/5/97 | END DATE 3/5/97

PROJECT NO. 0848-263 | FIELD GEOLOGIST J.P. Hilton

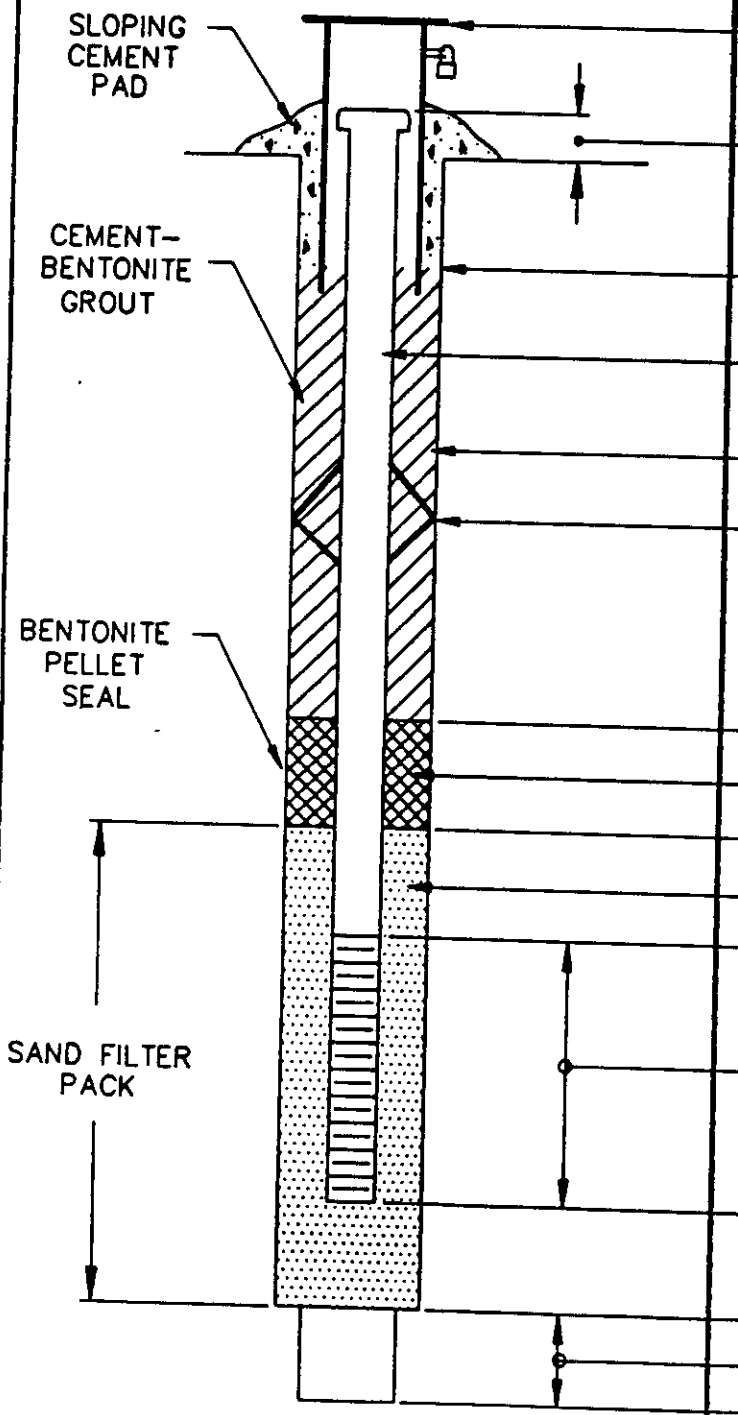
LOCATION DONNER HANNA Site

DRILLING CO. BRHO DRLG

DRILLER(S) L. Schroeder

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES __ NO

STICK-UP _____

DEPTH TO TOP OF GROUT/surface BOTTOM OF CEMENT 1.0

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 1.0'

PELLET SIZE 3/8"

DEPTH 2.0'

SAND SIZE OON

DEPTH 2.0

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 7.0

DEPTH 7.0'

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 7.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DHMW-2

PROJECT LTV Steel START DATE 3/7/97 END DATE 3/7/97

PROJECT NO. 0848-263 FIELD GEOLOGIST J.P. Hillis

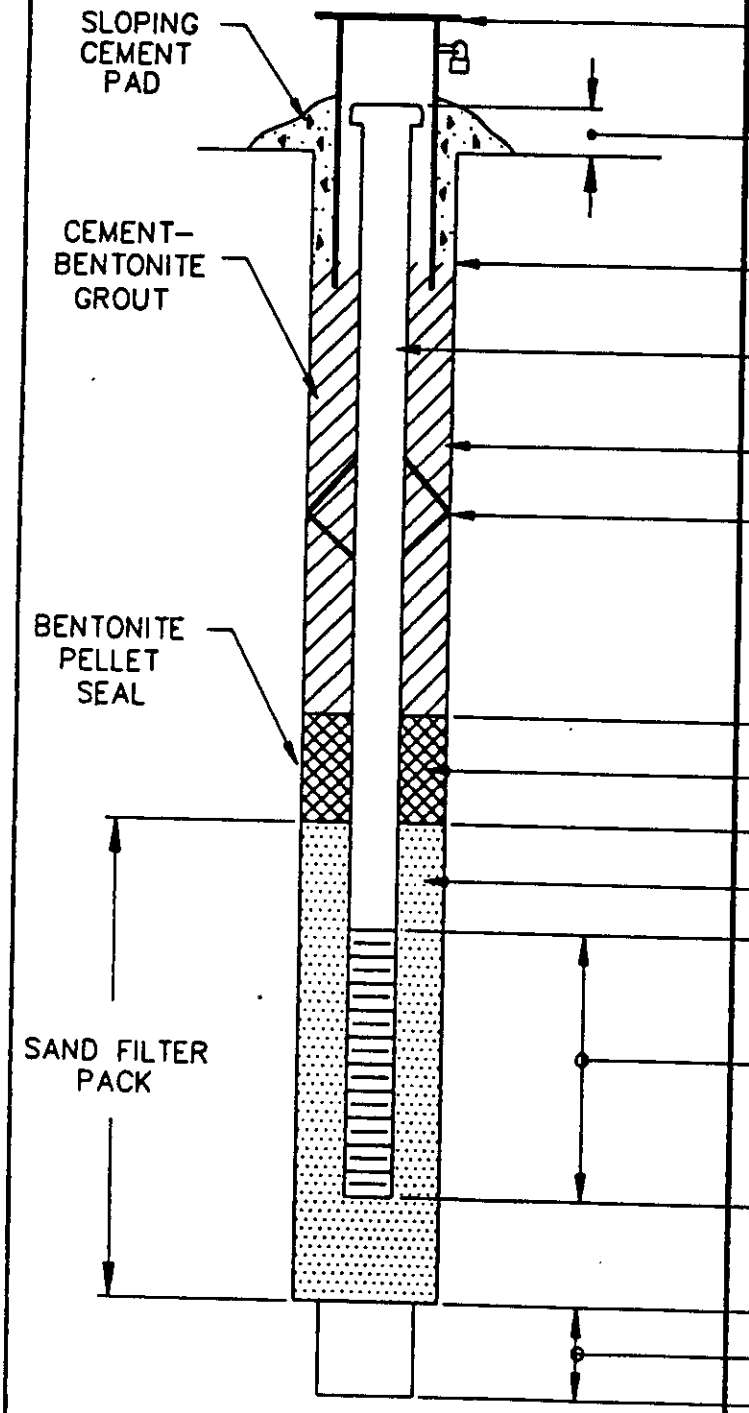
LOCATION Downer-Hanna

DRILLING CO. Bflo Drlg

DRILLER(S) L. Schooder

DRILLING METHOD(S) 4¼" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING N/A

LOCKED? X YES ___ NO

STICK-UP 2.0'

DEPTH TO TOP OF GROUT/surface BOTTOM OF CEMENT 0.0'

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 6.0'

PELLET SIZE 3/8"

DEPTH 8.0

SAND SIZE 00N

DEPTH 8.0

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 13.0

DEPTH 13.0

BACKFILL MATERIAL Native cuttings

BOTTOM OF BOREHOLE 14.0

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DHMW-2

PROJECT LTV STEEL | START DATE 3/7/97 | END DATE 3/7/97

PROJECT NO. 0848-263 | FIELD GEOLOGIST J.P. Hilbo

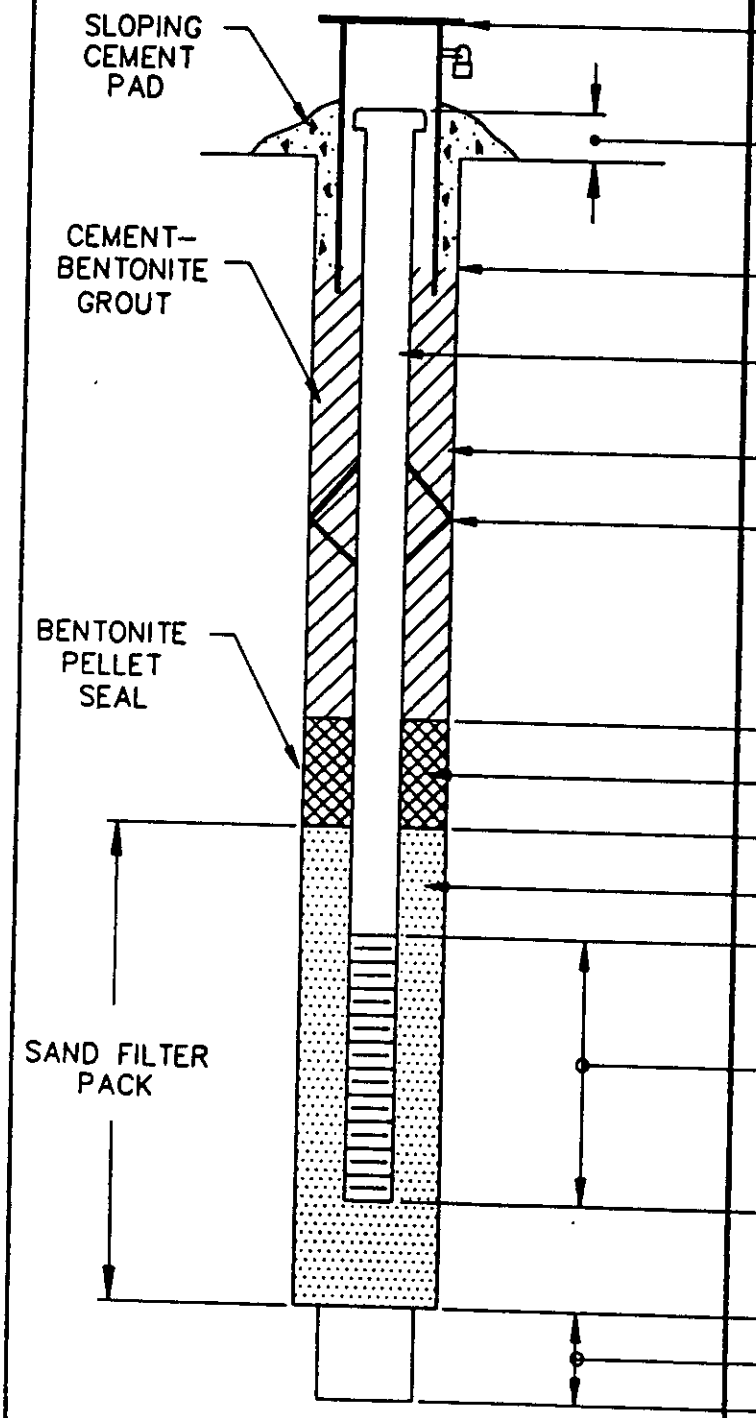
LOCATION Downer - Hanna

DRILLING CO. BHo Delo

DRILLER(S) L. Schroder

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES __ NO

STICK-UP 2.0'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT Surface

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 1.0'

PELLET SIZE 3/8"

DEPTH 2.0'

SAND SIZE 00 N

DEPTH 2.0'

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 7.0'

DEPTH 7.0'

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 7.0

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DHMW-3

PROJECT LTV. Steel START DATE 3/10 END DATE 3/10

PROJECT NO. 0848-263 FIELD GEOLOGIST J.P. Hilton

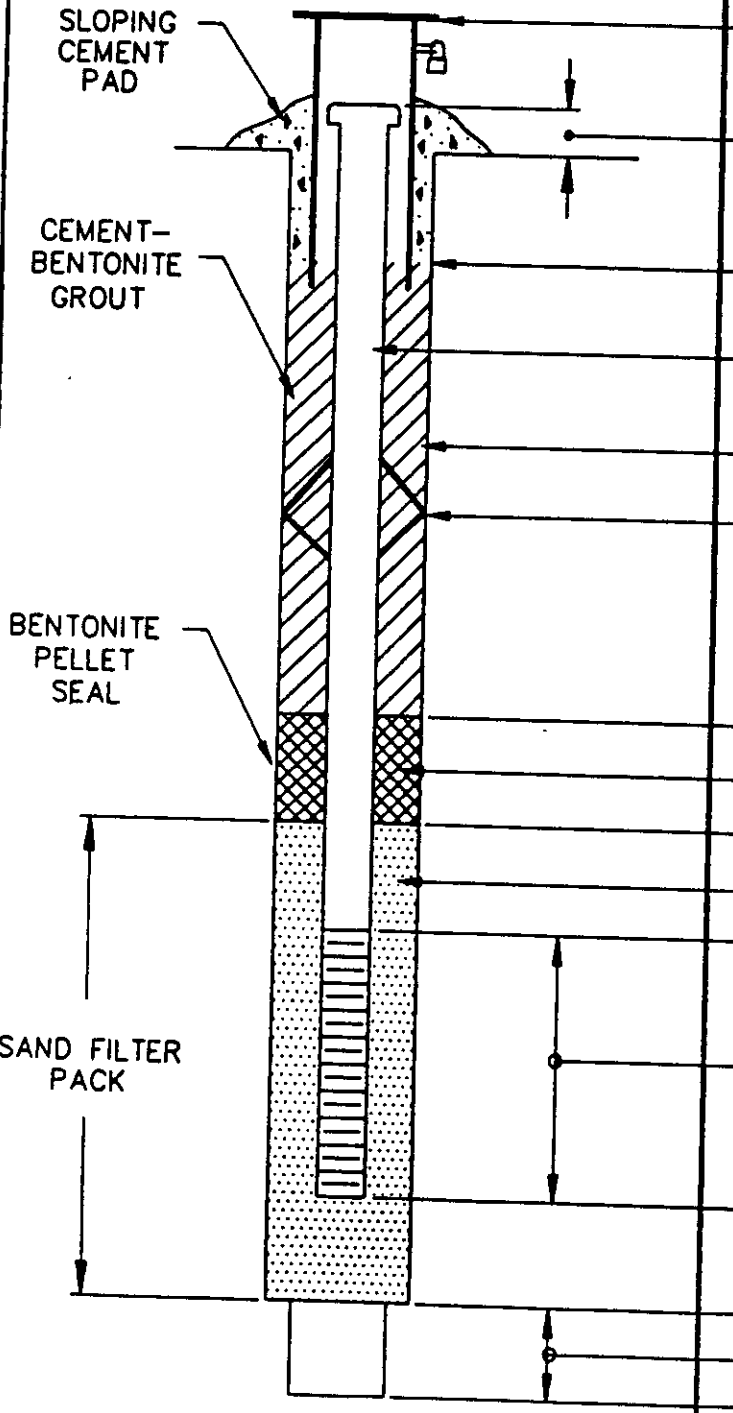
LOCATION DONNER - HANNA

DRILLING CO. BR&D Drlg

DRILLER(S) L. Schroder

DRILLING METHOD(S) 4¼" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES __ NO

STICK-UP 2.

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT Surface

RISER DIAMETER AND MATERIAL 2" Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 5.0

PELLET SIZE 3/8"

DEPTH 2.0

SAND SIZE OON

DEPTH 2.3

SCREEN DIAMETER, 2"
SLOT SIZE, .006
AND MATERIAL Sch 40 PVC

DEPTH 12.3

DEPTH 12.3

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 12.3

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DHMW-3

PROJECT ATV Steel | START DATE 3/7 | END DATE 3/7

PROJECT NO. 0848-203 | FIELD GEOLOGIST J.P. Hilton

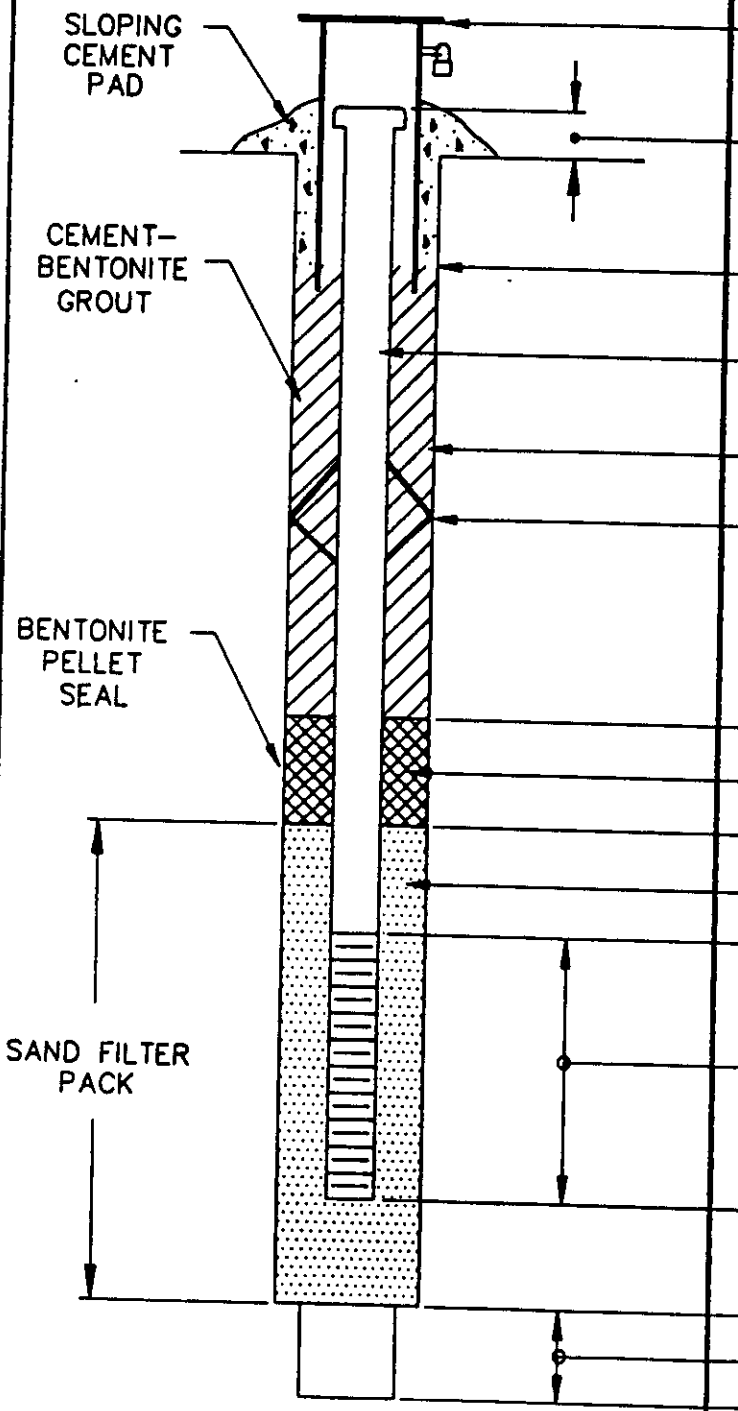
LOCATION Dover - Hanna

DRILLING CO. BAlo Dalg

DRILLER(S) L. Schoder

DRILLING METHOD(S) 4¼" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES ___ NO

STICK-UP ___

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT Surface

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 6.0'

PELLET SIZE 3/8"

DEPTH 7.5

SAND SIZE OON

DEPTH 7.7

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 12.7

DEPTH 12.7

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 12.7

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DNMW-4

PROJECT LTV Steel | START DATE 3/11/97 | END DATE 3/11/97

PROJECT NO. 0948-263 | FIELD GEOLOGIST J.D. Hilton

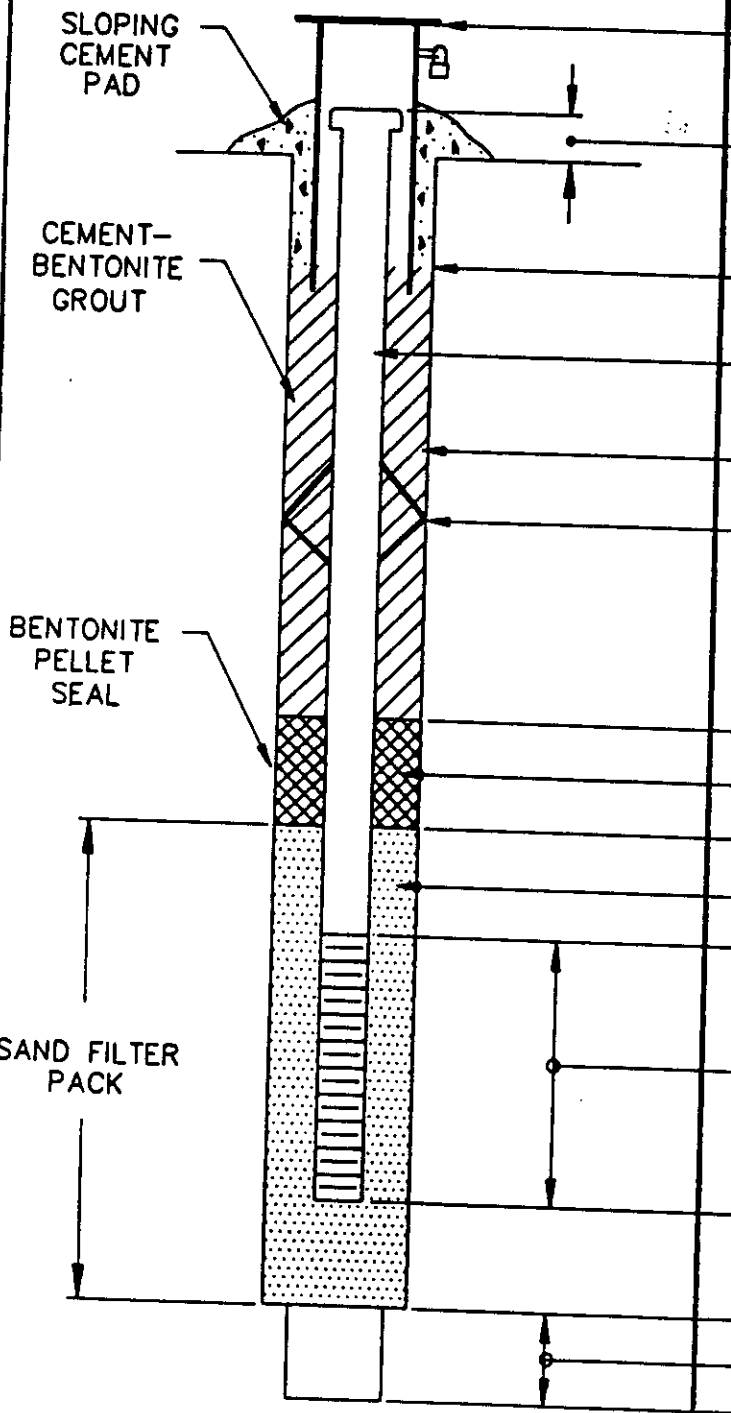
LOCATION Donner-Hanna

DRILLING CO. BRIO Drilling

DRILLER(S) L. Schroder

DRILLING METHOD(S) 4¼" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES __ NO

STICK-UP 2.0

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT Surface

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 3.0'

PELLET SIZE 3/8"

DEPTH 5.5

SAND SIZE OON

DEPTH 7.0

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 12.0

DEPTH 12.2

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 14.2

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DH(MW)-5

PROJECT LTV-Steel START DATE 3/12/97 END DATE 3/12/97

PROJECT NO. 0848-263 FIELD GEOLOGIST J.P. Hilton

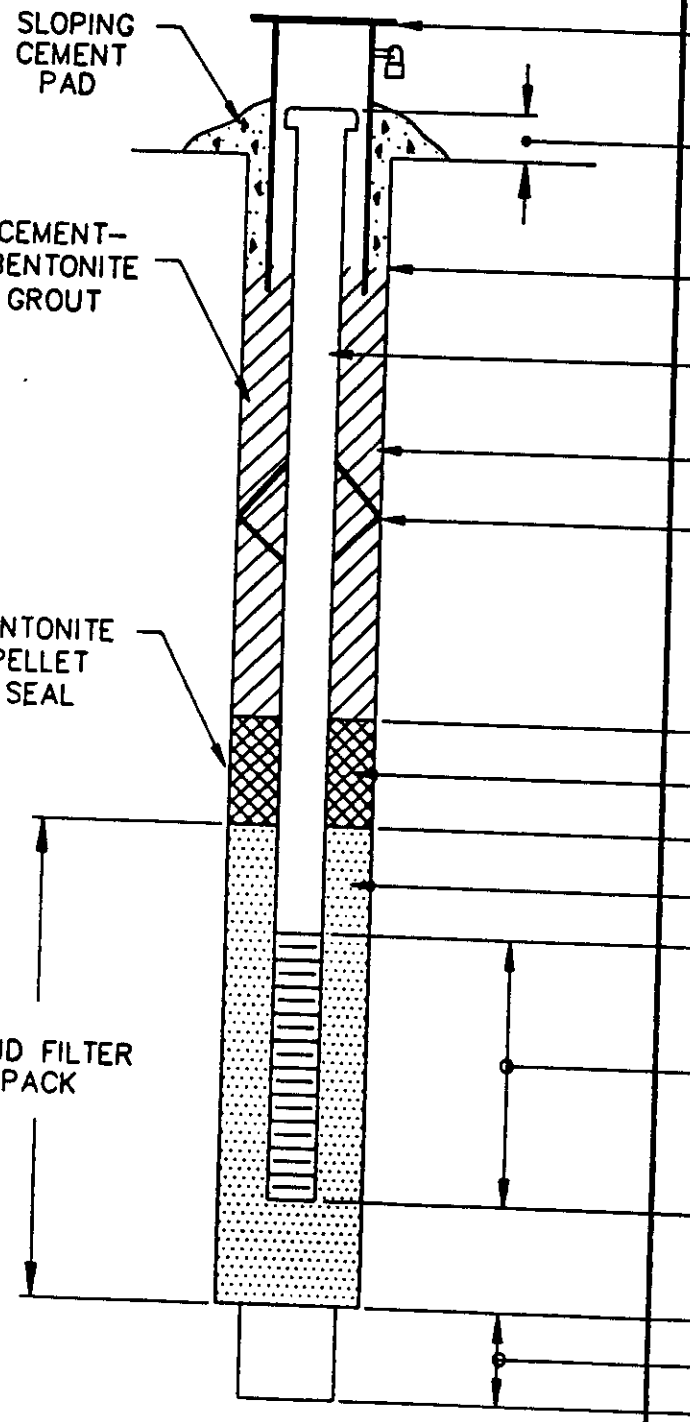
LOCATION Donree - Hanna

DRILLING CO. Buffalo Drilling

DRILLER(S) L. Schroder

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING

LOCKED? X YES __ NO

STICK-UP 2.0'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT Surface

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 3.0'

PELLET SIZE 3/8 chips

DEPTH 5.0

SAND SIZE #2N

DEPTH 7.0

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 12.0

DEPTH 12.0

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 12.0

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DHMW-6

PROJECT LTV Steel START DATE 3/12/97 END DATE 3/12/97

PROJECT NO. 0848-263 FIELD GEOLOGIST J.P. Hilton

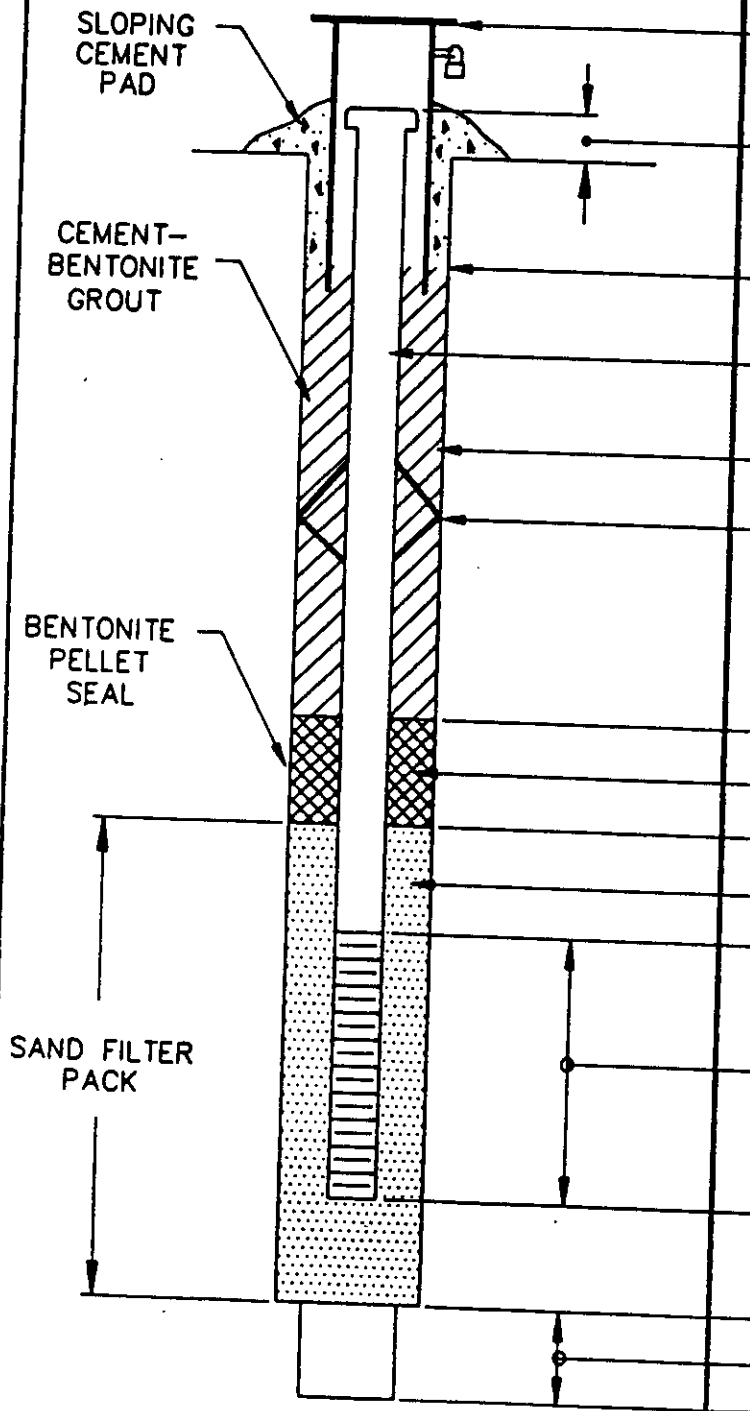
LOCATION Donner-Hanna

DRILLING CO. BR10 DeTe

DRILLER(S) L. Schroder

DRILLING METHOD(S) 4¼" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES __ NO

STICK-UP 2.0'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT Surface

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 2.0'

PELLET SIZE 3/8"

DEPTH 4.0'

SAND SIZE 00 N

DEPTH 6.0

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 11.0

DEPTH 11.3

BACKFILL MATERIAL 00 N SAND

BOTTOM OF BOREHOLE 12.3

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. A3-SB-2

PROJECT _____ START DATE 3/14/91 END DATE 3/14/91

PROJECT NO. _____ FIELD GEOLOGIST _____

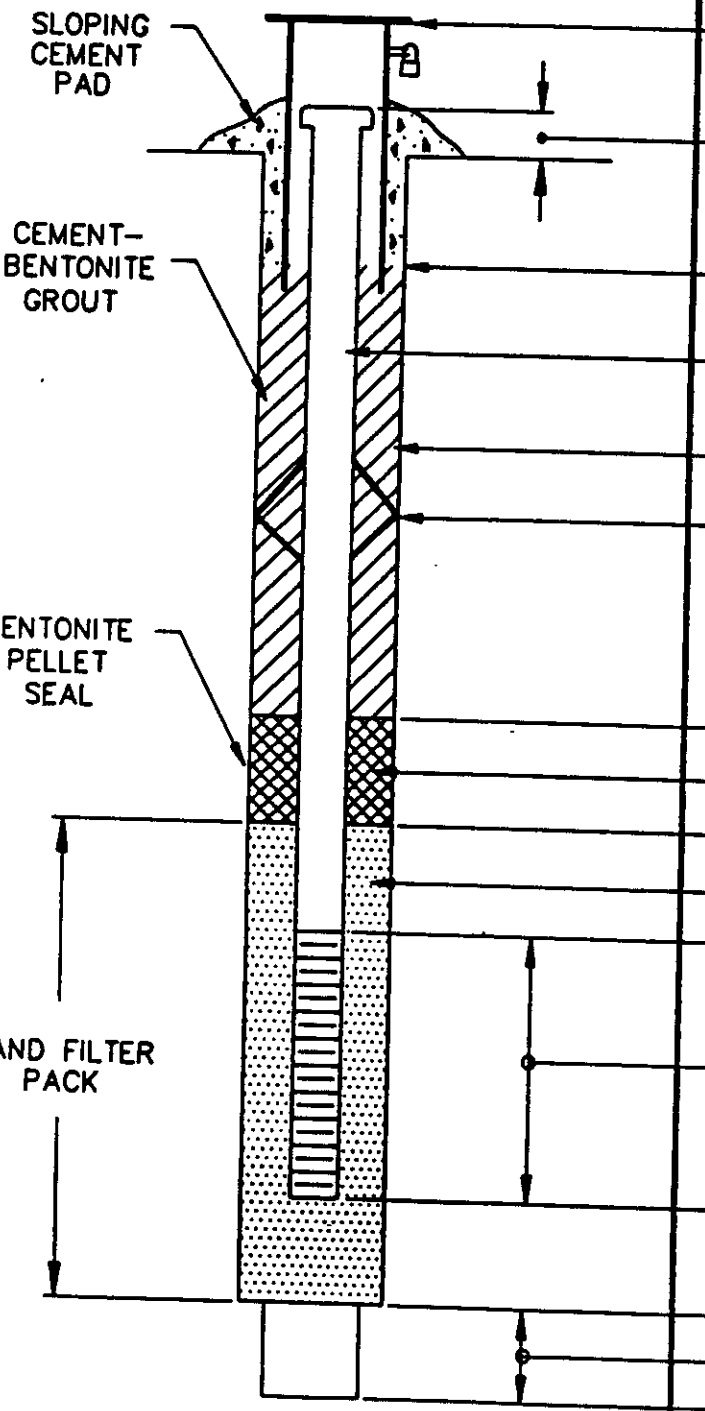
LOCATION Warehouse Area 3

DRILLING CO. _____

DRILLER(S) _____

DRILLING METHOD(S) _____

DEVELOPMENT METHOD(S) _____



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING _____

LOCKED? X YES __ NO

STICK-UP 2.5'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT NA

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 0.0

PELLET SIZE 3/8

DEPTH 2.0

SAND SIZE OON

DEPTH 2.0

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 7.0

DEPTH 7.0

BACKFILL MATERIAL Sand

BOTTOM OF BOREHOLE 8.0

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. A3-SB-

PROJECT _____ START DATE _____ END DATE _____

PROJECT NO. _____ FIELD GEOLOGIST _____

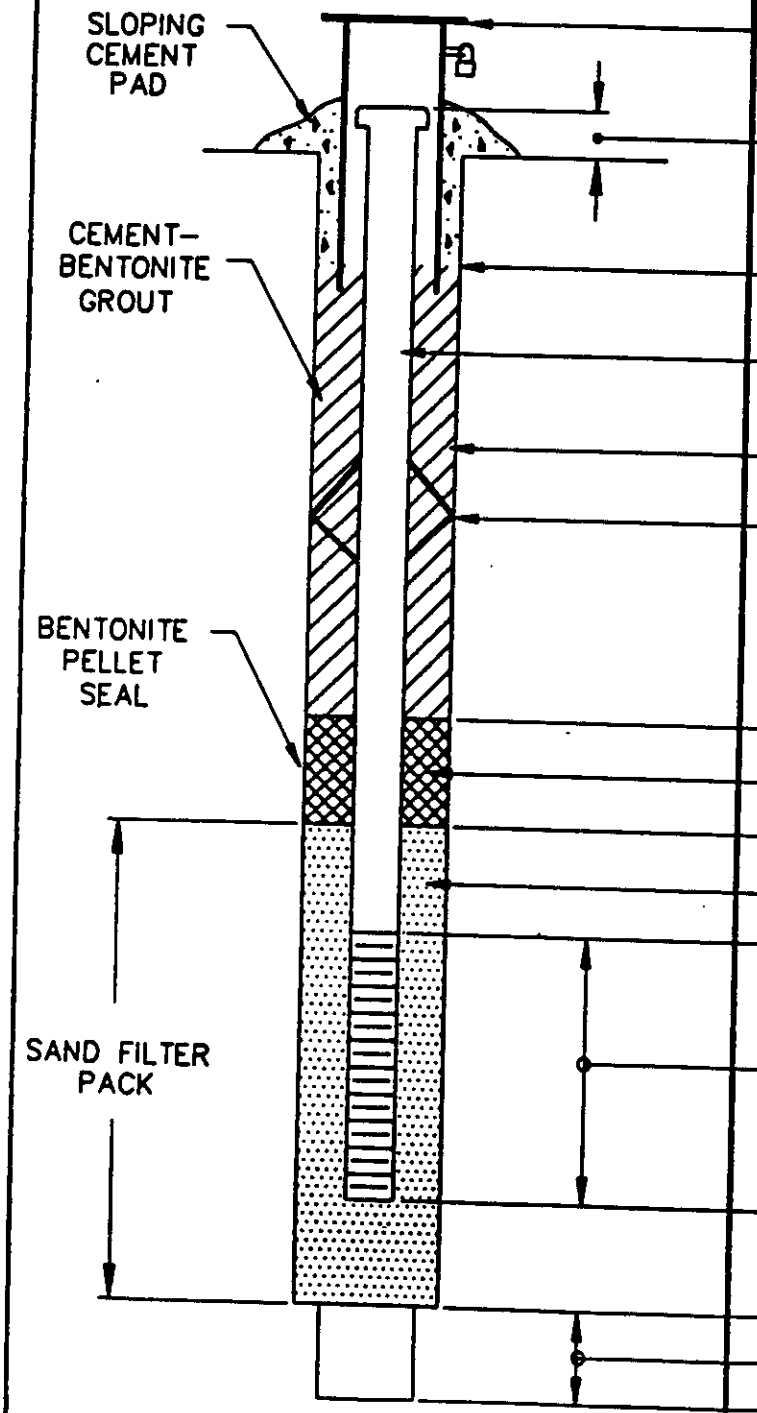
LOCATION _____

DRILLING CO. _____

DRILLER(S) _____

DRILLING METHOD(S) _____

DEVELOPMENT METHOD(S) _____



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES ___ NO

STICK-UP 2.0'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT NA

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH Surface

PELLET SIZE 3/8"

DEPTH 3.0'

SAND SIZE OON

DEPTH 3.0'

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 8.0'

DEPTH 8.0'

BACKFILL MATERIAL SAND

BOTTOM OF BOREHOLE 10'

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. A1-SB-A2

PROJECT LTV PH I/PH II START DATE 3/25/97 END DATE 3/25/97

PROJECT NO. 0848-263 FIELD GEOLOGIST J.P. Hillyard

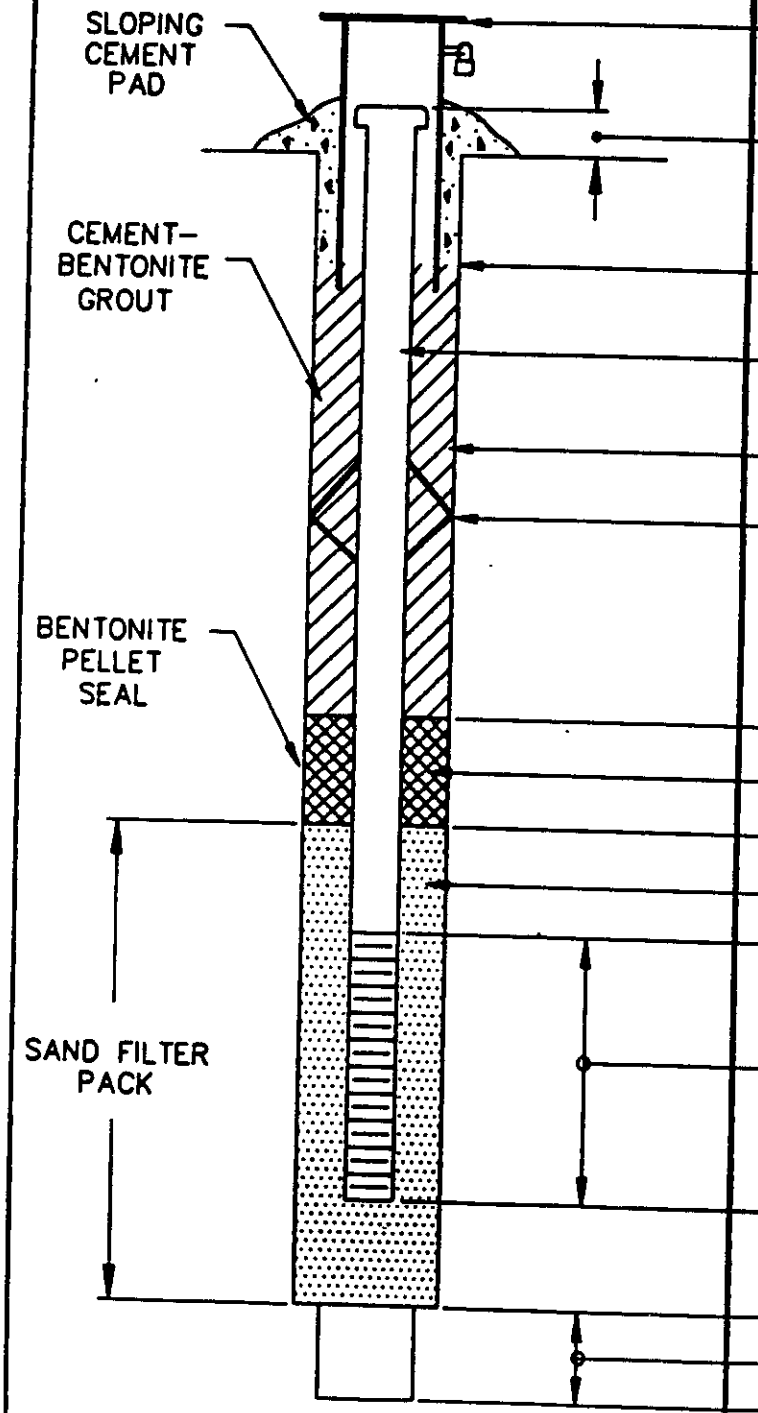
LOCATION Area I Republic/LTV Steel Plant

DRILLING CO. BBlo Delo

DRILLER(S) L. Schramm

DRILLING METHOD(S) 4¼" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES __ NO

STICK-UP 2.0'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT Native Cuttings

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC.

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 8.0'

PELLET SIZE 3/8"

DEPTH 10.0

SAND SIZE OON

DEPTH 12.0

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 17.0

DEPTH 17.0

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 17.2

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. A1-SB-F2

PROJECT LTV Steel START DATE 3/2/97 END DATE 3/2/97

PROJECT NO. 0848-263 FIELD GEOLOGIST J.P. Hollow

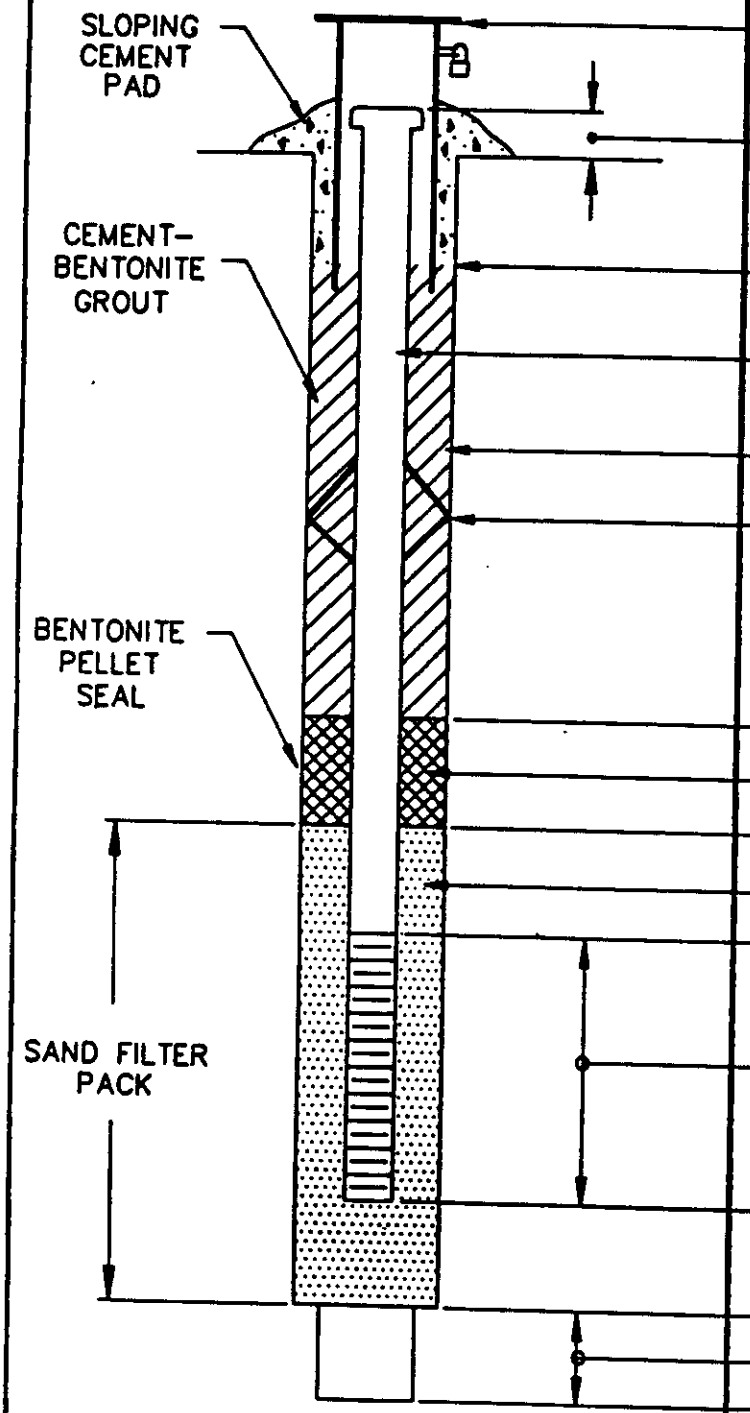
LOCATION LTV/Republic Steel Plant

DRILLING CO. BA. Delo

DRILLER(S) L. Schroder

DRILLING METHOD(S) 4¼ HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES ___ NO

STICK-UP 2.0'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT ____

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 3.0'

PELLET SIZE 3/8"

DEPTH 5.0'

SAND SIZE 00N

DEPTH 8.0'

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 13.0

DEPTH 14.0

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 14.0

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. A1-SB-1K

PROJECT LTV PH I/PH II START DATE 3/19/97 END DATE 3/19/97

PROJECT NO. 0848 263 FIELD GEOLOGIST J.P. Hilton

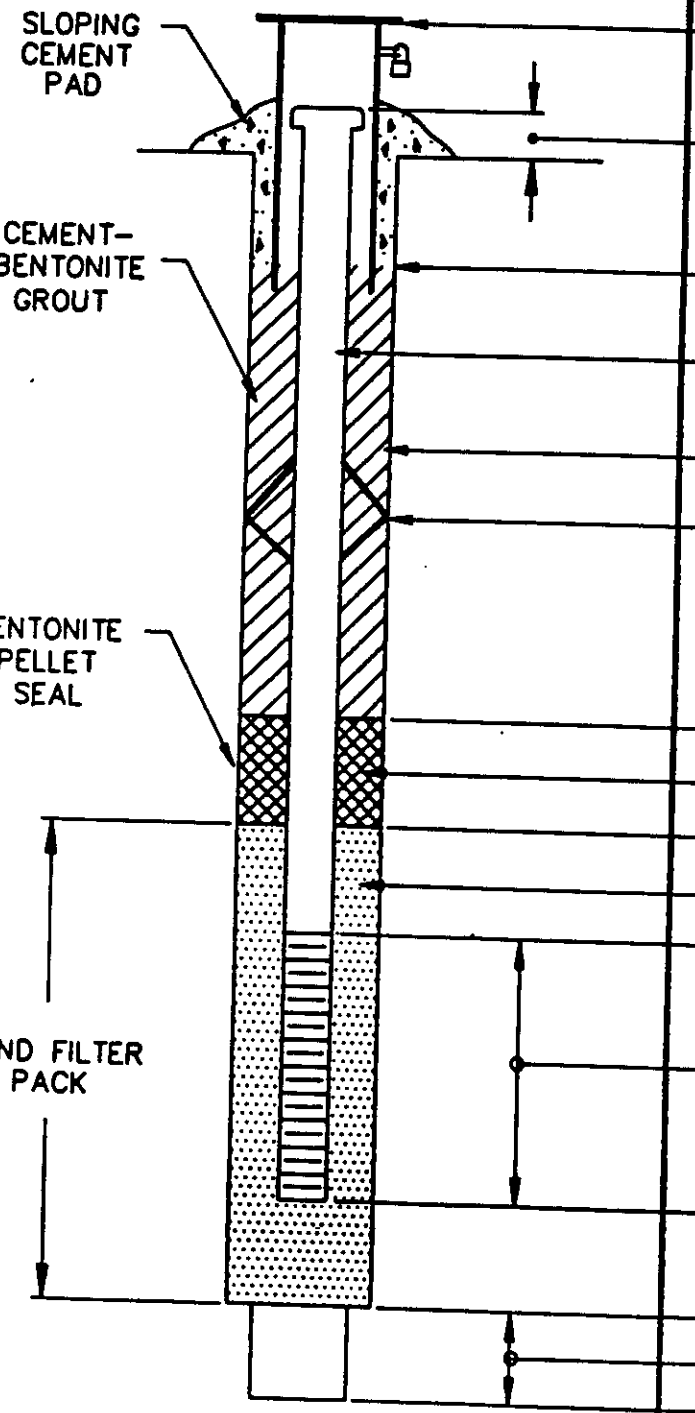
LOCATION Area I LTV/Republic Steel Plant

DRILLING CO. _____

DRILLER(S) _____

DRILLING METHOD(S) _____

DEVELOPMENT METHOD(S) _____



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES __ NO

STICK-UP 2.0'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT _____

RISER DIAMETER 2" AND MATERIAL Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 2.0'

PELLET SIZE 3/8"

DEPTH 4.0

SAND SIZE 00 N

DEPTH 6.0

SCREEN DIAMETER, 2" SLOT SIZE, .006 AND MATERIAL Sch 40 PVC

DEPTH 11.0

DEPTH 11.0

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 11.0

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. A1-SB-M

PROJECT LTV Plt E/Plt 2 START DATE 3/19/97 END DATE 3/19/97

PROJECT NO. 084B-263 FIELD GEOLOGIST J.P. Hilton

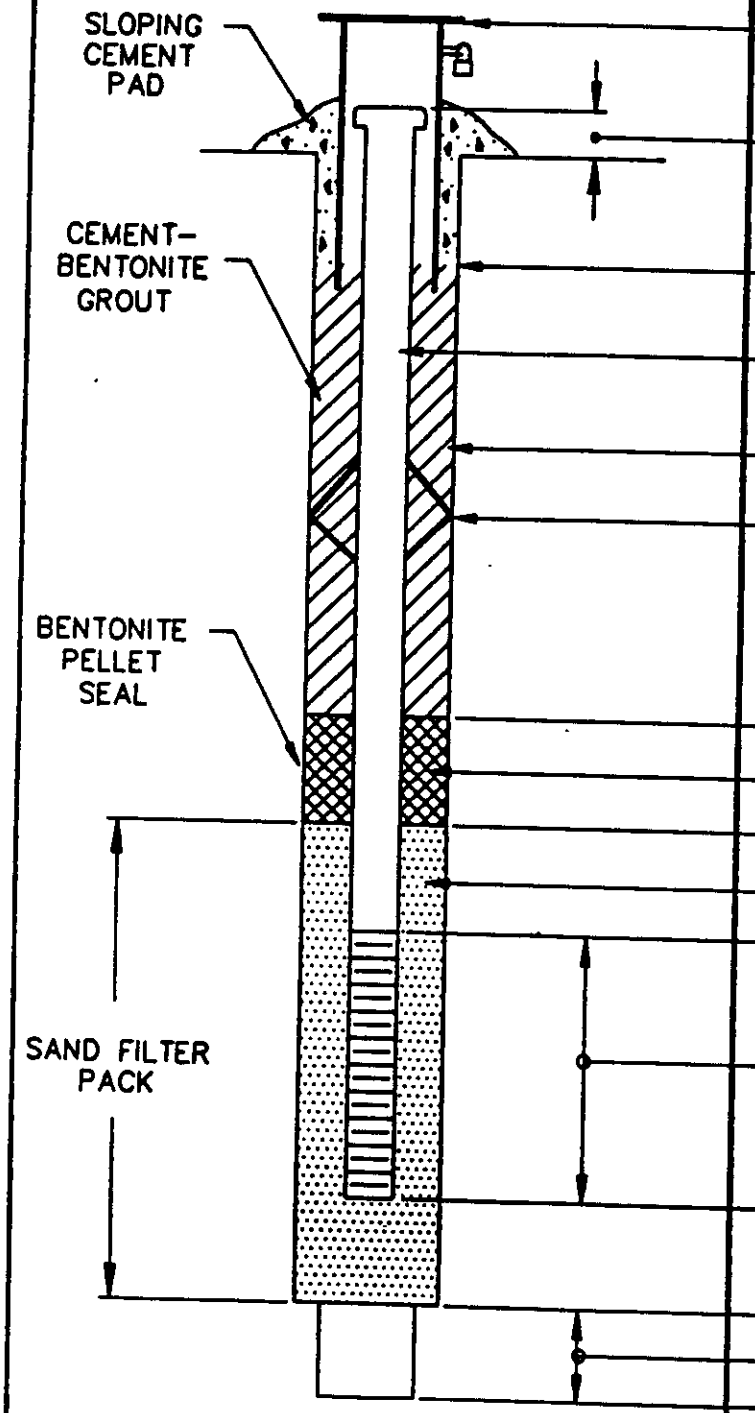
LOCATION Area I LTV/Republic Steel Plant

DRILLING CO. BAld Drlg

DRILLER(S) L. Schroder

DRILLING METHOD(S) 4¼" HSA

DEVELOPMENT METHOD(S)



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING N/A

LOCKED? X YES ___ NO

STICK-UP 2.0'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT Surface

RISER DIAMETER AND MATERIAL 2" Sch 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS NA

DEPTH 3.5

PELLET SIZE 3/8" chips

DEPTH 5.5

SAND SIZE #0N

DEPTH 7.8

SCREEN DIAMETER, 2"
SLOT SIZE, .006
AND MATERIAL Sch 40 PVC

DEPTH 12.8

DEPTH 12.8

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 12.8

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

ATTACHMENT B-5

- **FIELD STRATIGRAPHIC BOREHOLE LOGS**

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-A3, A1

STARTED 14:00 @ 3/25 19 97

FINISHED _____ @ _____ 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	Hosp TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill 1	0.4	8 9	13 18 11 18	1.4/ 2.0	SAT	.7 Fill SAND and Gravel Dark Brn Fine grain, F-Crs Gravel, slag and brick 1.9 Fill Med-Dark Silt, brick, some oil-like staining, moist	Advanced augers to 8' bgs prior to sampling @ SB-A3
slight oil 2	—	10 11	30 100 — —	.4/ 0.6		.4 Fill Slag and Crs Gravel, slight oil staining	SAT
12.2 silt 3	3.8	12 13	7 4 3 3	1.3/ 2.0		.2 Fill As above 1.1 Silt dark gray-black, trace clay, plant organics	
		14					
1	0.2	8 9	10 50 78 100	1.2/ 1.7		1.2 Fill SAND and Gravel, Med-Dark Brown Fine Sand w/ Crs Gravel and Slag, Sulfur Odor	Augers to 8' bgs prior to sampling @ SB-A1
Fill 2	9.4	10 11	33 34 14 14	1.1/ 2.0		.8 Fill As above w/ oil/TAR and all textures sharp contact w/ .3 Silt, dark gray-black	
10.8 silt 3		12 13					
		14					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-A2W

STARTED 10:10 AM 3/25 19 97

FINISHED 13:30 PM 3/25 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	HOSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2	0 1	9 31 32 16	1.5/2.0	SCND 0.2	1.5 Fill SAND AND Gravel, Med BRN Fine Med grain w/ Crs Gravel, cobbles and Slag 23" dia	DRY
2	0.2	2 3	18 32 60 100	.9/1.7	0.2	.9 Fill As Above	Spoon refusal @ 3.7'
3	0.2	4 5	13 37 35 25	1.2/2.0	0.2	1.2 Fill SAND & Gravel w/ slag, metal, cobbles and boulders 7" dia	DRY
4	0.4	6 7	8 10 13 11	1.3/2.0	0.2	.9 Fill DK brown SAND & Gravel as above .4 Fill SAND, LT Brown, some Gravel, Slag	DRY
5	0.6	8 9	33 100	.7/.7	1.2	.3 Fill As Above .4 Fill w/ Oil/TAR on all surfaces	
6	12.6	10 11	50 100	.1/.7	0.4	.7 Fill Gravel and Slag w/ oil/TAR on All surfaces	
7	12.8	12 13	15 65 100	1.2/1.3	4.6	1.2 Fill SAND and Gravel w/ heavy oil/TAR staining on all surfaces	SAT
8	34.0	14 15	50/3" 13 3 2	1.5/2.0	6.2	.7 Fill SAND & Gravel w/ Oil/TAR .8 SAND Med-DK Brn, Fine grain w/ some Silt, oil throughout	SAT Advanced Augers to 17' to install 2" well

Fill 8.3 Fill w/ Oil 14.7 SAND & Silt

W

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-B1, B3

STARTED 10:45 AM 3/26 19 97

FINISHED 11:10 AM 3/26 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Oder, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill							
1	—	10 11	— 19 8 11	.3/1.5	0.2	.2 Slag w/ Construction debris .1 Silt gray-black, slight oil-like staining	Advanced Augers to 12' through slag & construction debris prior to sampling @ B1
12.2 SAND	2	1.2	12 13 14	7 4 7 11	1.7/2.0	0.2	.2 Silt and Gravel, gray-black, sharp contact w/ 1.5 SAND Med brown, Fine-Med grain, trace Silt	Composite sample @ 12-12.5

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-B2

STARTED 09:00 AM 3/26 19 97

FINISHED 10:30 AM 3/26 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	HDSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	8.2	0 1	15 100 – –	.9/.9	0.2	.9 Fill Gravel, dark brown fine SAND, f-crs, sub-rnd Gravel	SPOON refusal @ 0.9' bgs Moist
2	4.4	2 3	25 100 – –	1.0/1.0	0.2	1.0 Fill SAND & Gravel A/A w/ black oil-like staining @ 2.5-3.4' Slag	DRY-Moist
3	NA	4 5		–/–	NA	Advanced augers to 6' through Apparent Slag & construction debris	
4	0.8	6 7	27 100 – –	.8/.8	2.2	.8 Slag & Gravel w/ cobbles > 3" dia	Moist - SAT
5	0.6	8 9	30 100 – –	0.2/.6	0.2	.2 Fill, Slag	Moist - SAT
6	0.6	10 11	100 – – –	.2/.3	0.2	.2 Fill, Slag	
12.4 Silt	Smpl	12 13	14 6 6 8	1.5/2.0	1.6	.4 Fill Slag w/ Gravel sharp contact 1.1 Silt black w/ oil staining	SAT Sampled for Moist TCL VOCs
8		14 15		/			Composites SVOCs MTS CN @ 10:20 @ 12-14'

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

BOREHOLE NO. A1-SB-B3

STARTED @ 3/26 19 97

FINISHED @ 3/26 19 97

ELEVATIONS: DATUM _____

Fill
10.5
Silt

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		10 11	10 12 4 3	1.1/ 2.0		.5 Fill Gravel and Slag, cbs to 2" dia, sharp contact w/ .6 Silt Med Brown, trace clay	Advanced augers to 10' bgs prior to sampling Moist
2		12 13		/			
		14					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV Steel
PROJECT Phase II Investigation
LOCATION Steel Plant Site - Area 1
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4¼" HSA
ROCK Hand Auger

JOB NO. 0848-263-300

LOGGED BY BCH

CORE DIA. 5½"

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-C01
STARTED 3 M 27 19 97
FINISHED 3 M 27 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MONITORING INSTR. NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
		0				augered to 7.0', refusal	
FILL						~~Moved location~~ piled augers, replaced teeth on lead, augered again	
		10				augered to 10.0'	
10.5		10	16			0.3 FILL, Sharp contact w/ Dk. (black) product	HS: 144 ppm
Native	1		5	1.6	8.0	1.3 Dk grey/black Silt tr. CLAY grading to F. SAND	sample taken for @ 11:40
			5	/			composite C-4, C-3
		12	6	2.0			

Sheet No. ____ of ____

Start: 10:00
end: 12:00

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel
PROJECT Phase II Investigation
LOCATION Steel Plant Site - Area 1
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK Hosp Hole

JOB NO. 0848-263-300
LOGGED BY BCH
CORE DIA. 8 1/2"

BOREHOLE NO. A1-SB-C2
STARTED 3 M 27 19 97
FINISHED 3 M 27 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE ZONE NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 2	4 5 22 30	1.5/2.0	0.0	0.3 DK Brown SILT and GRAVEL, dense, moist 0.9 Orange brown f-med SAND, dense, moist, some roots 0.3 same SAND A/A, w/ GRAVEL	
2		2 4	16 55 100-1	0.5/1.0	2.0	Dense dk Brown/Black SILT w/ Slag	HS: 1000 ppm
3		4 6				In Slag - augered to 6.0'	
4		6 8	42 23 42 95	1.6/2.0	26	0.3 DK Grey/Black SILT and F SAND w/ Slag 0.3 Dense Slag w/ some SILT, moist - dry 0.3 large piece of Slag dry 0.7 Dense Slag w/ some SILT, moist, black metallic color w/ rust	HS: 480 ppm
Fill 5		8 10	62 100-3	0.6/1.0	100	same A/A, Slag, dry-moist	HS: 540 ppm
6		10 12	27 70 42 40	0.4/2.0	—	Slag found in shoe - little to no recovery	
±12.0							
Silt/sand 7		12 14	9 16 9 6	0.8/2.0	480	Dense DK Brown/Black SILT w/ GRAVEL, some Slag grading to Orange Brown, then lt Brown dense Coarse SAND moist, large pieces of Slag	HS: 400 ppm [redacted] Sample taken - VOC @ 10:45 A1-SB-C2 (12-14) composite C1, C3
8		14 16	10 39 31 1	0.0/2.0	—	no recovery	

Sheet No. ____ of ____

Start: 9:45
End:

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY BCH

METHOD OF BORING: SOIL _____

ROCK HDSP Hwy CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-C2

STARTED 3 M 27 19 97

FINISHED 3 M 27 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
9		16 18	8 10 8 6	2.0/2.0	202	0.8 Dense Black coarse SAND w/ Slag GRAVEL, Some SILT and CLAY, dense, wet-moist 0.8 Dk Grey/Black & SILT and F. SAND, dense, moist 0.4 Dk Grey CLAY and some SILT, Stratified w/ black thin bands	HS: 160 ppm Composite C1, C2, C3

Sheet No. ____ of ____

pmd 10:51

MALCOLM PIRNIE

CLIENT HTV Steel
PROJECT Phase II Investigation
LOCATION Steel Plant Site - Area 1
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA
ROCK HDSP Hoist

JOB NO. 0848-263-300
LOGGED BY BCH
CORE DIA. 8 1/2"

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-C3
STARTED 3 M 27 19 97
FINISHED 3 M 27 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE IN-HG	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
		0				Augered to 7.0' refusal moved location 15' SW, augered 10.0'	
		10					
B		0				Spoon refusal augered to 11.0', refusal, concrete pad @ 10.0' moved location 25' E, augered to 5.0' ± refusal moved location 25' E, augered to 1.0 - refusal Moved location 5' E, augered to 1.0 - refusal moved location 10' SW augered to 1.0 - refusal moved location 30' NW of original location, augered to 8.0'	
		5					
1		0 2 4 6 8 10	12 13 13 10	1.0 2.0	1.2	GRAVEL and F. SAND, trace - little SILT, wood, plastic, wet (clarifier sludge)	HS: 26 ppm
2		10 12	11 8 9 10	0.7 2.0	2.0	Glass, brick, wire, GRAVEL, concrete, wet	HS: 13 ppm
3		12 14	14 23 10 17	0.7 2.0	—	same A/A, wood	
4		14 16	45 11 12 17	1.0 2.0	1.4	same A/A, wl F SAND	

Sheet No. ____ of ____

Start: 13:00
end: 15:40

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____ BOREHOLE NO. A1-SB-D3/D1

CONTRACTOR _____ LOGGED BY _____ STARTED 14:35 PM 3/26 19 97

METHOD OF BORING: SOIL _____ FINISHED _____ M _____ 19 97

ROCK _____ CORE DIA. _____ ELEVATIONS: DATUM _____

SAMPLE NO.	Hosp TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill 10.2 Silt & Sand 1	1.2	10	8	1.3/2.0	SCAN 68	.2 Fill Gravel and SAND, MOD Brown-gray Co, sharp interface 1.1 Silt and SAND, black-gray oil stain throughout	Advanced Augers to 10' prior to Sampling @ D3
2		12		/			Collected VOCs @ 14:40 @ 10-12'
		13					SAMPLED D3 VOCs 10-12 Composite 10-14
		14					
						Advanced augers to 8' @ original D1 location — Auger refusal, moved location 15' South	
Fill 1	0.2	10	6	1.1/2.0	0.2	1.1 Fill Gravel F-CGS, black	SB-D1
		11	3				
			3				
12.2 Silt 2	0.2	12	5	.7/2.0	0.2	.2 Fill A/A .5 Silt dark gray, trace Clay, carbonized plant fragments	SAT
		13	5				
			5				

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-D2

STARTED 13:00 3/26 19 97

FINISHED 14:30 3/26 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE (Hand Split)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2	0 1	32 100 – –	.7/.8	SAW 0.2	.7 Fill Silt Med Brn, w/some Crs Gravel, Slag, metal debris	Spoon refusal @ 0.8' bgs DRY
2	0.2	2 3	14 16 27 31	1.3/2.0	0.2	.5 Fill, Construction debris, red brick, slag, metal debris .8 Fill SAND dark brown-red F-Med, grading to black w/some slag Crs Gravel	Moist Wet
3	0.2	4 5	20 100 – –	.4/.7	0.3	.4 Fill Construction debris, red brick, slag w/metal rebar	Spoon refusal @ 4.7'
4	0.2	6 7	13 8 8 8	.9/2.0	0.2	.8 Fill As above w/black cinders, slag	Moist
5	–	8 9	100 – –	–/–	–	No Sample Recovery @ 9-10 interval drilling character indicative of large diameter debris, Augered to 10'	
6	0.4	10 11	39 21 100 –	1.0/1.1	0.2	1.0 Gravel AND SAND, Lt-Med brown, fine, w/trace Silt Auger refusal @ 11.5' bgs mined borehole	Spoon refusal @ approx 11.1' bgs
7	0.4	12 13	10 5 5 7	1.2/2.0	0.2	.4 Gravel w/SAND & Slag .8 Silt Med-Drk gray, trace-little Clay, carbonized plant debris	13' South SAT 14:10 Collected composite SVOCs MPLs @ 12-14' CN
8		14 15		–/–			

Fill / Silt & clay

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-E1/E3

STARTED 15:30 PM 3/24 19 97

FINISHED 15:45 PM 3/24 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE (MDSP)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2'	4 5	17 11 6 5	1.1/2.0	0.3	1.1 Fill, Silt and SAND, dark brown, some fine Gravel	Advanced Augers to 4.0' prior to Sampling @ Moist-WET A1-SB-E1
2	0.4	6 7 8	5 6 10 8	1.0/2.0	0.2	1.0 Fill Silt and SAND As above w/ some Slag & Scs Gravel, Cobbles /> 3" dia	SAT
		8				E3	
						↓	Advanced Augers to 4.0' prior to Sampling
1	0.4	4 5	30 100 — —	.5/.8	0.0	.5 Fill SANDSTONE Cobble, White-tan, Crs	Spoon refusal @ approx 4.5'
	0.4	6 7	15 29 13 9	1.0/2.0	0.3	.6 Fill SANDSTONE A/A 1.0 SAND, green-blue .3 SANDSTONE and Fine Gravel	Sampled for SVOC MTLS & CN @ 7-8'
		8					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____ ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-E2

STARTED 1:30 PM 3/24 19 97

FINISHED _____ M 3/24 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	HDSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2	0 1	61 100 – –	.5 / .7	SCAN 0.0	.5 Fill Silt dark brown w/ clay	Spoon refusal @ .7' 100 CNT/.2'
Fill 2	NA	2 3	100 – – –	/ .3	–	No Recovery	Spoon refusal @ 2.3' drilling indicative of RR ballast is crushed stone
3	0.2	4 5	24 13 8 5	1.3 / 2.0	0.4	.3 Fill SAND & Gravel LT Gray, sharp contact 1.0 Fill Silt dark brown w/ Some Fine Black SAND, pebbles odor	Sampled for VOCs @ 3:05
4	0.2	6 7	3 3 5 4	.5 / 2.0	0.2	.5 Fill SAND and Silt dark brown-black, loose, fine SAND, trace fine Gravel	SATURATED
0.3 day w/ Silt 5	0.4	8 9	3 2 2 2	1.3 / 2.0	0.2	.3 Fill SAND and Silt, Med Brown-gray, fine-Med SAND w/ trace fine Gravel 1.0 Clay, Med-gray-black, trace-/, HV Silt, trace fine Gravel, plant fragments	Silt
6		10 11		/			Sampled VOCs E2 - 4-6'
7		12 13		/			Composite 1.0 – 5.0
8		14 15		/			

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-F1

STARTED 13:10 hr 3/21 19 97

FINISHED 14:00 hr 3/21 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill 1	0.2	2 3	7 60 100 —	1.0 1.3		Fill 1.0 Silt dark-brown black, with iron, slag, Crs Gravel	Advanced Augers to 4.0' prior to samplings Spoon refusal @ 3.3'
4.2 Clay 2	0.2	4 5 6	3 2 5 2	.5 2.0		.2 Fill A/A. .3 Clay dark gray-black, grading to gray-yellow/mottled, trace Silt	14:00 Collected Composite Sample @ 4-6'. Ran SVOC MTLs CN

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-FZW

STARTED 11:00 AM 3/21 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.0	0 1	27 100 – –	.3/.9	SAM dry	Fill SAND AND Gravel, F-Crs w/ Crs Gravel and Slag	Spoon refusal @ 0.9' bgs
2	NA	2 3	100 – – –	0.0/.4		Slag cobble plugged spoon shoe, No Recovery Augered through Slag/Gravel debris to 4.0'	Spoon refusal
3	0.2	4 5	9 9 7 9	1.2/2.0	0.2	.2 Fill Silt gray-black w/trace fine gravel sharp contact w/ 1.0 Silt Med brown, w/ Fine SAND laminae	Moist Composite VOC MTS @ 11:30
4	0.2	6 7	17 12 15 19	1.8/2.0	0.2	1.8 Silt yellow-gray w/ little-Some Clay, stiff, weak plasticity	WET
5	0.0	8 9	4 5 6 8	1.6/2.0	0.2	1.6 Silt yellow-gray, mottled, little-Some clay, grading downward @ Approx 8.6 w/ little Fine SAND	SAT
6	0.0	10 11	5 10 10 9	1.5/2.0	0.2	1.5 Clay and Silt yellow-brown, trace-little fine SAND	Moist-wet
7	0.0	12 13	2 1 2 1	.3/2.0	0.2	.3 Clay yellow-gray, trace-little Silt	
8		14 15		/			

Fill

4.2 - Silt w/ Clay

W

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-G1

STARTED 8:30 AM 3/24 19 97

FINISHED 9:35 AM 3/24 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	1.7	0 1	24 29 43 61	1.4/2.0	SAW 0.2	1.4 Fill, Slag, iron ore, Fine-Crs Gravel, Metal debris	DRY
2	2.5	2 3	100/— — —	.2/.4	0.2	.2 Fill As Above	Spoon refusal @ approx 2.5' Advanced augers through fill to depth of 6' bgs, NO sample taken @ 4-6' interval
3	NA	4 5		—/—	NA		
4	2.4	6 7	7 12 10 9	1.2/2.0	0.2	1.2 Fill Slag and Coke, to 1" diameter	SATURATED
5	1.0	8 9	12 12 8 14	1.0/2.0	0.2	1.0 Fill Slag, iron ore, Silt and fine sand red-ochre color, w/ Crs Gravel to ≥ 3" diameter	SAT Collected 8-10' for SVOCs MTLs CN @ 9:10
6	.4	10 11	26 9 12 13	1.6/2.0	0.2	1.4 Fill, red-ochre fine-Crs Gravel w/Silt & tan-SANDSTONE cobbles & native soil content .5 CLAY Mud-DK Gray, trace-little Silt w/ carbonized plant fragments	SAT Moist 69120 VOCs
7		12 13		/2.0			
8		14 15		/			

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-62

STARTED _____ M _____ 19 97

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE (HDSP)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	D&C	0 1	23 65 28 20	.7 / 2.0	SCAN 0.2	.7 FILL SAND and Gravel Brn-Grs MED brown w/ pellet sized Slag	Dry
2	-	2 3	- - -	NS / NS	-	Augered thorough concrete rubble w/ Slag to 4' Auger refusal @ Approx 5' bgs Moved borehole location 10' North	
3	NA	4 5		/		Advanced augers to 8' prior to sampl.; @ B2 location #2	
4	NA	6 7		/		Drilling character indicative of slag & concrete	
5	NA	8 9	100 - -	0.3 / .2	-	Spoon refusal @ 8.2', No recovery	SAT
6		10 11		/			Moved borehole location 4', unable to advance augers/sample below slab & Slag @ 8-10'
7		12 13		/		Unable to obtain Composite sample @ B2 location due to texture of fill	
8		14 15		/			

Sheet No. 1 of _____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

BOREHOLE NO. A1-SB-N1

STARTED 8:30 AM 3/21 19 97

FINISHED 10:00 AM 3/21 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.4	0 1	21 100 – –	.7/.9	SCAN 0.2	.7 Fill Pelletized slag and SAND, LT gray brown, loose, f-Crs w/ Some f Gravel	Spoon refusal @ .9' bgs
2	0.4	2 3	17 23 27 19	.6/2.0	0.2	.6 Fill SAND and Gravel f-Crs, brown-dark brown-red, fine Gravel to ½" dia	dry
3	0.6	4 5	9 14 20 16	.4/2.0	0.2	.4 Fill SAND and Gravel as above w/ cobbles, brick > 3" dia	Moist - WET
4	0.3	6 7	3 10 14 15	.5/2.0	0.2	.5 Fill SAND and Gravel, dark brown-red fine grain w/ Fine-Crs Gravel w/ cobbles > 3" dia	SATURATED
5	0.2	8 9	11 18 10 20	1.3/2.0	0.4	1.3 Fill SAND and Gravel as above w/ dark red-black fine SAND having oil/creosote-like sheen @ approx 9.0-9.2	SAT Sampled for TCL VOCs @ 9:15 9.0-9.5
6	0.2	10 11	6 11 20 12	.7/2.0	0.2	.7 Fill SAND/Slag Crs grain w/ red brick	SAT
7		12 13	10 9 7 7	1.2/2.0		.3 Fill SAND and Gravel, dark red-brown, f-Crs, w/ Some brick, sharp contact w/ .9 Clay yellow-brown, soft, w/ little Silt	SAT
8		14 15		/			Collected Fill @ 8-10 for Composite SVOC MTBS, CN

Sheet No. 1 of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-Hz

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Oder, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.5ft	8 9	8 10 13 8	1.1/2.0	0.2	1.1 Red-purple SAND and Gravel w/ brown silt matrix, fine grained, some Gravel	Augered to 8.0' prior to sampling Composite 8-10' interval w/ HA C 10:25 for SVOCs MTBEs, CN
		10					

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-I1

STARTED 3/20 19 97

FINISHED _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE (HSSP)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.6	0 1	20 36 77 100	1.1/1.6	SAT 0.2	Fill, SAND brown-black F-Med, and Slag w/black iron cinders	Spoon refusal @ 1.6'
2		2 3		/	NA	Augered 2-4' through Slag and Crs Gravel	
3		4 5		/	NA	Augered to 8', to advance Augers through Gravel (RR ballast)	
4		6 7		/	NA		
5	0.6	8 9	45 105 — —	.8/.0		.8 Gravel, crushed stone	Spoon refusal @ 8.8' SATURATED
6	0.2	10 11	17 38 28 11	1.0/2.0	0.2	1.0 Slag and Crushed stone, Slag cobble in spoon typ crushed spoon to slag, Probable slag/clay contact at approx 11.6'bgs	SAT.
7		12 13	7 5 10 10	.5/2.0		.5 Clay dark gray-brown, stiff, mild plasticity trace Silt	Moist
8		14 15		/			

Ground Fill

D.5-11 Clay

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____ ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-I2

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE (HSA)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.4	4 5	17 35 11 9	.6/2.0	SAM 0.2	.6 Fill SAND and Gravel dark brown c-f SAND - Moist	Augered to 4.0' prior to split spoon Sampling / Slag & Gravel
2	0.2	6 7	8 5 6 5	1.5/2.0	0.2	.3 Fill SAND and Gravel as above 1.2 Clay Fill tan-brown, plastic w/ c-f SAND partic's, WOOD and fine-c/s Gravel	
3	0.2	8 9	5 6 7 11	1.1/2.0	0.4	.8 Clay Fill as above, sharp contact w/ .3 SAND and Silt dark gray-black, trace Clay	Sample 8.5-9.0 for VOCs @ 15:30
4	0.2	10 11	4 4 6 10	1.4/2.0	0.2	2.4 Silt w/ some Clay	Composited I1, I2 for SVOC MDs CN @ 15:30
		12					10-13' Interval

8.8

W

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. AB A1-SB-J1

STARTED 09:00 AM/PM 3/20 19 97

FINISHED 10:30 AM/PM 3/20 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	—	0 1	100	1.0/.3	SAND 0.2	No sample - spoon refusal due to slag at surface	Augered to 2' to begin sampling
2	0.2	2 3	9 3 10 5 — —	.7/.8	0.6	.7 Fill SAND dark brown-black, fine-Crs w/ little Fine Gravel, slag, little-Some Silt/Ash, occasional red brick very dense	DRY
3	—	4 5	20 1 20 16 13	0.0/2.0	—	0.0 No recovery	
4	0.6	6 7	5 4 4 5	1.0/2.0	0.2	1.0 Fill SAND AND Gravel, Med brown f-Crs w/ Fine Gravel, brick, Wood	SAT.
5	0.8	8 9	6 5 8 46	.6/2.0	0.4	.6 Gravel - Fine - Crs w/ trace SAND w/ trace Wood slight oil sheen on gravel surface	SAT ~~Maybe Fill material deposit~~
6	0.2	10 11	10 0 — — —	.4/.4		.4 Gravel & Slag - Crs	Augered through debris @ 10 - 11' bgs
7	0.6	12 13	13 19 17 19	1.0/2.0		1.0 Silt gray-yellow w/ Clay	
8		14 15		/			

Fill

Foundation Slag 12"

Silty Clay

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____ ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-J2

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	HDSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill 1	0.2	0 1	13 25 32 37	1.2/2.0	SAM 0.2	.5 SAND AND Silt, Red-brown, Fine-Crs trace Gravel .7 Fill BLACK CINDERS, Slag, iron precipitate	DRY
2	0.6	2 3	14 98 24 47	1.7/2.0	0.2	.2 Fill, Iron precipitate, black-gray, SAND Fine-Crs, dense compacted, trace Wood, Slag	DRY
3	0.4	4 5	11 100 – –	.7/.8	0.2	.7 Fill Slag AND Crs Gravel	Spoon refusal @ 4.8'
4	5.6	6 7	80 100 – –	.4/.6	0.2	.4 Fill Fine-Crs Gravel, trace-little Fine SAND	Spoon Refusal @ 6.6'
5	16.4	8 9	18 100 – –	.6/.7	0.2	.6 Gravel Fine-Crs w/trace Fine SAND	Spoon Refusal @ 8.7' Sampled 8-8.5' for VOCs @ 12:00
10.4 CLAY 6	17.2	10 11	6 6 11 18	1.1/2.0	1.4	.4 Gravel AND Crs SAND w/ black oil staining @ Clay interface 1.0 Clay Gray-brown, weak plasticity, stiff, trace Silt	SAT slight odor
7		12 13		/			Sampled 10-12' interval for SVOCs MTLS CN
8		14 15		/			

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-K1/K3

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	HSP	6 7 8	3 3 5 4	.4/2.0	SM 0.8	.4 SAND AND Gravel brown fine grain w/ fine-Crs Gravel, Oil staining on Gravel surfaces	Advanced Augers to 6.0' prior to split-spoon sampling @ K-1
							Composite for SVOCs @ 14:36 MTLS
1		6.5 7.5 8.5	56 46 26 9	/2.0			Augered to 8' prior to sampling @ K3
1	8.4	8 9 10	9 6 10 12	1.2/2.0	1.4	.2 FILL SAND AND Gravel, black oil stained, Sharp contact w/ 1.0 CLAY black-gray w/ oil staining to approx 8.6', grading to brown-gray Mottling, trace Silt	Composite Sample @ 15:15 Moist for SVOC MTLS

8.2 CLAY

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT ______ JOB NO. ______

PROJECT ______

LOCATION ______ BOREHOLE NO. A1-SB-K2

CONTRACTOR ______ LOGGED BY ______ STARTED 12:45 PM 3/19 19 97

METHOD OF BORING: SOIL ______ FINISHED 13: M 3/19 19 97

ROCK ______ CORE DIA. ______ ELEVATIONS: DATUM ______

SAMPLE NO.	TYPE (HDSP)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2	0 1	13 25 26 15	1.4/2.0	SCAN 0.2	1.4 Fill Silt Mod-Dark brown, slag, and some fine Gravel	DRY
2	1.3	2 3	13 9 8 9	.9/2.0	0.2	.9 Fill Silt and limestone w/ fine-Crs Gravel	DRY
3	0.2	4 5	3 7 20 41	1.1/2.0	0.2	1.1 Fill SAND AND Gravel, Fine-Med Red-black, w/ tr-little Silt (BOF dust) Some fine Gravel	SAT @ 5' bgs
4	9.2	6 7	3 4 7 8	1.0/2.0	2.4	0.8 Fill SAND, Silt AND CLAY, gray-black w/ sharp contact w/ .2 Fill Gravel AND SAND, Black	SAT Heavy tar #6 Oil W/ tarry consistency (Poss.)
5	6.8	8 9	4 5 6 6	1.5/2.0	0.6	.3 Fill GRAVEL AND SAND w/ TAR staining & oil sharp contact w/ 1.2 Clay Olive-brown, mottled w/ tr-little Silt, oil blebs through out	Sampled K2 for VOCs @ 13:10
6		10 11	3 3 4 8	1.3/2.1	0.4	1.3 CLAY olive-brown mottled, stiff w/ tr-little Silt	Moist
7		12 13		/			
8		14 15		/			

Left margin: Fill; 7.0 TAR Fill 8.3; CLAY

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

FIELD BOREHOLE LOG

PROJECT _____

LOCATION _____ BOREHOLE NO. A1-SB-M1

CONTRACTOR _____ LOGGED BY J.P. Hilton STARTED _____ M _____ 19 _____

METHOD OF BORING: SOIL _____ FINISHED _____ M _____ 19 _____

ROCK _____ CORE DIA. _____ ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		5 6 7	14 100 – –	.5 / .8	SCM 0.2	.5 Fill Silt Moderate brown, w/ some Fine Gravel, cobbles >3" dia	Augered to 5' prior to sampling Bar Composite SVOC, MTBE sample Spoon refusal @ 5.8' • Advanced augers to 6'
2		6 7 8	100 – – –	3 / .3	0.2	.3 Fill Silt and Gravel as above	Composite 6.0-6.5' sample w/ SB-M2 interval Sampled for SVOCs MTBE, CAS

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

BOREHOLE NO. A1-SB-MZ

STARTED 9:25 A 3/19 19 97

FINISHED 11.00 A 3/19 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.8	0 1	13 32 48 35	1.6/2.0	SCW 0.2	1.6 Fill Silt and F SAND, dark brown-black, w/trace Gravel, coal, brick	DRY - Moist
2	0.4	2 3	44 76 60 90	1.5/2.0	0.2	1.5 Fill dark-brown Silt w/SAND and Fine Gravel As above, grading downward to black discoloration	DRY - Moist Moist - Wet
3	0.4	4 5	18 25 19 19	1.2/2.0	0.3	.5 Fill Silt w/SAND & Gravel As above sharp contact w/ .7 Fill SAND and Silt dark brown, Fine, loose SAND AND BOF dust ?	Wet Wet - SAT
6.5 CLAY 4	0.2	6 7	12 7 7 10	1.3/2.0	0.2	.5 Fill SAND and Silt w/ trace Fine Gravel .8 CLAY dark-grey-black, grading downward to Med brown w/trace Silt	Simp1 6-6.5 VOC @ 1015 Composite 6-6.5 for SVOC, MTLS, CN
5	0.0	8 9	3 5 7 9	1.4/2.0	0.2	1.4 CLAY brown-gray mottled, trace Silt	Moist
6	0.0	10 11	3 4 5 7	1.1/2.0	0.2	1.1 CLAY As Above	Moist
7		12 13	2 3 3 4	/		H.O level in BAlo River @ Approx 10.8' bgs	
8		14 15		/			

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-1

STARTED 09:30 AM 3/27 19 97

FINISHED 09:45 AM 3/27 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
	N/A	10	100	2/.3		Unable to advance augers to depth greater than 10.5'. Split-spoon sample indicates metallic slag	Borehole located 50' North of boring A1-SB-B2
	—	11	—				Advanced augers to 10' bgs prior to sampling. Augered through fill & slag
		12				Auger refusal	
		13					
		14					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

BOREHOLE NO. A1-SB-2

STARTED 09:30 AM/PM 3/27 19 97

FINISHED 09:15 AM/PM 3/27 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	8	.2/2.0	-	.2 Fill SAND and Gravel w/ Silt	Advanced Augers to 10'
			11				
		11	9				
			11				
2	0.2	12	14	.8/2.0	0.2	.4 Fill Silt gray-black, trace Fine Gravel	Moist
			11				
		13	14			.3 Silt, light-Med brown	
			11				
		14					

Fill 1.4 Silt

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____ ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-3

STARTED 10:00 AM 3/27 19 97

FINISHED 11:00 M 3/27 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE (HAND SP)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	1.2	8 9 9	100 – – –	.3/2.0	SEM 0.4	Spoon refusal in Fill & construction debris .3 SAND brown, fine grain w/ bricks, F-Crs Gravel	Advanced augers to 8' bgs prior to split-spoon sampling
2		10 11				Moved borehole location - see below	
3		12				Augered through Fill @ 9'	
	1.4	9 10	8 3 4 5	1.4/2.0	2.0	.4 Fill SAND Dark brown, F-Med w/ some Fine Gravel 1.0 Silt Dark grey-black, trace clay w/ some carbonized plant organics	Moist No significant oil & contact, strong odor
		11					
						Note: Auger refusal @ original A1-SB-3 location @ depth of 10', moved borehole to 45' East of SB-03 approx 50' South of Grid stake 11,700 N, 8950 E	
						• Oil stained cutting @ 5'-6' interval - headspace @ 9.4 Brown-Black Sand, med grain w/ some Fine Gravel, oil/Benzene odor	

Fill 0'-9.4'

Silt 9.4'+

Sheet No. ____ of ____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

BOREHOLE NO. A1-SB-A

STARTED 11:15 AM 3/27 19 97

FINISHED 11:40 AM 3/27 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE (HDSP)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2'	9 10 11	23 4 4 5	1.3/2.0	SAM 0.3	1.3 Fill Gravel, Fine, w/slag, med-crs SAND Augered to 12'	Augered to 9' prior to sampling SATURATED
2	6.8'	12 13 14	3 4 4 21	1.2/2.0	4.6	.3 Fill Gravel AS Above .9 Silt Black w/ Little Crs Gravel, Saturated w/oil, Significant ODOR	

Gravel Fill

12.3 Silt w/Gravel (oil)

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

BOREHOLE NO. A1-SB-5

STARTED 12:45 PM 3/27 19 97

FINISHED 13:05 PM 3/27 19 97

ELEVATIONS: DATUM _____

Fill 6.3

SAMPLE NO.	TYPE (HDSP)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Oder, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	2.2	6	14	1.1/2.0	GRAVEL	.3 Gravel (Fill) w/ Brown Fine SAND	Advanced augers to 6' prior to spoon sampling
		7	10		1.4	black oil/tar (.1) thick oil content @ .8 Silt black-gray, trace clay grading	
			11			downward to brown-gray Silty Clay	Moist
2		8		/			
		9					
3		10		/			
		11					
		12					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-6

STARTED 13:10 hr 3/27 19 97

FINISHED _____ hr 3/27 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill 0-4 Silt							
1	0.4	6	4	1.2/2.0		4 SAND and Gravel, Med Brn, F-Med grain w/ brown-green Slag, Cls Gravel, sharp cntct	Advanced augers to 6' prior to sampling
		8	4			8 Silt dark gray-black, trace Clay, carbonized plant fragments	
			10				
			11				
2		6		/			Borehole located approx 140'-145' North (upriver) of Acid Stake 10,100 N, 8150 E
		9					
		10					Clean

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A1-SB-7

STARTED 13:30 PM 3/27 19 97

FINISHED 14:30 PM 3/27 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Oder, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		4 5	100 — —	1.4/1.4	SCAN 0.2	.4 Fill Gravel and Crushed Stone	Advanced Augers to 4' bgs prior to sampling Speed reduced @ 4.5'
2	0.2	6 7	10 8 8 14	1.4/2.0	0.2	1.4 Fill Gravel and F Brown SAND w/ slag cobbles > 3" dia	SAT.
3	0.4	8 9	5 5 11 10	1.5/2.0	0.2	1.5 Fill Silt, Clay and Gravel w/ Fine black SAND	Moist
4	0.4	10 11	6 6 5 5	1.2/2.0	0.3	1.2 Fill Clay and Silt, dark gray-black w/ Crs Gravel and Coal, trace Black Fine SAND	Moist
5	0.4	12 13 14	5 6 6 12	2.0/2.0		.3 Fill Clay and Silt as above .7 Silt Dark Gray-brown, trace-little Clay and Fine SAND, sharp contact w/ 1.0 SAND Dark gray, Med Grain	Moist SAT.
							Borehole located 70' North of West side of North gate leading into Area 1
							• Approx 15' N of concrete ramp footing

12.3 Silt & SAND

Fill

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT Phase I / Phase II
LOCATION LTV Coke Plant
CONTRACTOR BRIO Delco
METHOD OF BORING: SOIL 4 1/4" HSA ROCK
JOB NO. 0848 263
LOGGED BY J.P. Hilton
CORE DIA.
BOREHOLE NO. AZ-SB-25
STARTED 14:00 PM 3/17 19 97
FINISHED L PM 3/17 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE (HSA)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1			SAND	Augered 0-4' prior to split spoon sampling	
2		2 3				Fill	
3	1.6	4 5	4 6 13 11	11/2.0	0.2	.5 Silt lt red-brown, trace clay, fine Gravel, sharp contact w/ .6 Silt lt gray-brown w/ demolition debris mi brick	SAT-rafes
4	5.8	6 7	14 20 14 10	13/2.0	1.4	.3 Silt lt gray-brown w/ 3" cobble, oil blebs/saturate 1.0 Silt and vf Sand, black w/ yellow-brown clay-like lenses, Fe stained parting	Samples AZ-B-25 0608 for VOC, SVOC, MTLs, TCLP ACBs, Reactivity CN
5	7.0	8 9	5 6 8 8	.8/2.0	0.6	.6 Silt and Sand Fill A/A w/ black oily layer at Fill / Silt native interface .2 Silt dk lt gray-brown	SAT Moist - possible Native Soil
6	1.8	10 11	4 4 8 10	1.2/2.0	0.4	.2 Silt A/A grading to 1.0 Silt and Clay dark gray-brown, stiff w/ carbonized plant organics	Samples as above AZ B'25-1012 analyses A/A
7		12 13		/			
8		14 15		/			

Sheet No. 1 of

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. 12-SB-50

STARTED _____ M _____ 19 97

FINISHED _____ M _____ 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE (Hand)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO. (Lab)	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	3.2	0 1	53 12 9 9	1.5/2.0	1.5	1.5 Coke/Coal w/ silt black	Adjacent to Eastern Creosote odor
2	0.8	2 3	5 5 4 5	1.6/2.0	20-30	1.6 Fill w/ Coke + Coal as black silty sand as above	WET - SAT @ approx 3' ODOR
3	0.2	4 5	5 3 4 4	1.1/2.0	5-10	1.1 Fill SAND w/ black cinders, fine-crs gravel w/loose fine Gravel & slag	SAT. Slight odor
4	0.2	6 7	4 3 4 2	1.7/2.0		.7 Fill SAND w/ Gravel A/A	located 100' west of SG-109
5		8 9		/			
		10					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____ ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. AZ-SB-51

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE (Hp/SP)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.0	0 1 2	16 10 28 22	.8/2.0	SLMW 1.2	.6 FILL SAND and Silt brown-red, fine grain w/ slag cobbles to >3" dia	Location 35' SE of Terminal Basin utility pole dry-moist
2	—	2 3	6 4 4 13	.2/2.0	<1	.2 Slag cobble No Recovery	SATURATED
3	0.0	4 5	4 2 3 3	.4/2.0	<1	.4 Fill Gravel and slag, loose, No odor	
4		6 7		/			
5		8 9		/			
		10					

Sheet No. _____ of _____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A2-SB-52

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	HOSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	D.O	0	9	1.5/2.0	SAW 0.4	1.5 Fill Brown-black SAND & Gravel loose, slag	
		1	50/4"				
2	D.B	2	7	1.6/2.0	20.D	1.4 Fill Brown-black SAND w/Silt, trace fine Gravel	
		3	7			1.2 SAND & Gravel fill, black, slight oil staining, creosote-oil odor	free product
3		4					stopped drilling @ 5.0'
		5					
4		6					
		7					
5		8					
		9					
6		10					

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A2-SB-53

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	680	0	10	1.7 / 2.0	SAW 150 to 200	0.4 Fill Brown-black SAND AND Silt w/ trace-little fine Gravel	Advanced to grade Stake #219
			13				
		1	18			1.3 Fill SAND w/ Fine Gravel, Oil / Brownish Free product, Strong odor	9700 E
			13				8150 E
2		2		/			
		3					
3		4		/			
		5					
4		6		/			
		7					
5		8		/			
		9					
6		10					

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A2-SB-54

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	HOSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	8.4	0 1 1 2	10 13 15 6	1.6/2.0	SAW 3.0	.8 Fill SAND and Gravel, black-red, fine-crs w/ fine Gravel, slight moist .8 Silt Fill, Dark brown-black, w/ fine Sand	w/slight odor WET-SAT Strong odor
2	200	2 3 4	2 2 2 2	1.1/2.0	20-30	1.1 Silt Fill as above w/ black staining	Strong odor & sheen
3	420	4 5 6	2 3 9 11	1.5/2.0	200-10	.3 Silt As above .5 Silt black-brown w/ tar-like free product .7 Gravel/Slag Fill w/ free product, tar, creosote	
4		6 7		/			
5		8 9					
		10					

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____ ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A2-SB-55

STARTED 09:00 AM 3/18 19 97

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	HDSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	2.6	0 1	13 10 7 7	1.5/2.0	SAND 1.4	.5 Fill SAND AND GRAVEL, BLACK FINE-CRS GRADING TO 1.0 CLAY W/ LITTLE SILT, TRACE GRAVEL & SLAG RED-BROWN STIFF	MOIST W/ LIGHT OIL & BENZENE ODOR
2	9.5	2 3	7 11 13 8	.8/2.0	2.8	.3 SILT BROWN-BLACK, W/ FINE SAND .5 SAND AND GRAVEL, W/ LITTLE GRAVEL, BLACK, IMPREGNATED W/ OIL & TAR	STAINED SAT.
3	12.2	4 5	6 7 7 6	1.3/2.0	20.3	1.3 SAND AND GRAVEL AS ABOVE, SATURATED W/ TAR & HEAVY OIL	SAT.
4		6 7		/			
5		8 9		/			
		10					

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. AZ-SB-56

STARTED 9:35 A 3/10 19 97

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE (ASTM)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	2.2	0	11	1.1/2.0	Sand 0.4	.5 Fill Silt brown, AND Concrete, sharp contact w/	DRY
		1	14			.6 Fill Silt dark brown w/ little fine Sand trace - little f-Crs Gravel, slight odor	Moist
			30				
			11				
Fill 2	3.6	2	7	1.3/2.0	5.2	1.3 Fill Silt and SAND w/ Gravel as above grading to black color w/ depth AND Contaminated w/ tar/oil	SAT
			10				Strong odor
		3	12				
			11				
3	12.6	4	8	1.1/2.0	0.8	.5 Fill Silt w/ SAND AND Gravel A/A, black sharp contact @ 4.5' w/	SAT
		5	11			.6 SAND AND Gravel Brown - black, F-Crs w/ less tar/oil contamination	
			15				
			20				
4	15.0	6	14	.4/2.0	0.6	.4 SAND AND Gravel As Above	SAT
			26				
		7	16				
			9				
8.2 CLAY 5	0.8	8	3	1.0/2.0	0.2	.2 SAND AND Gravel A/A w/ slight odor sharp contact w/	SAT
		9	4			.8 Clay Lt-Med Gray, trace - little Silt	Moist
			3				
			5				
		10					

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING : SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A2-SB-57

STARTED 10:45 AM 3/18 19 97

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	110	0	9	1.6	SAM	.2 Silt dark brown w/ tr-little F SAND	located 50' South of SG-110
			45			1.4 SAND (SLAG?) Green-blue, Med-Crs	Sampled 0-2 @ 11:00
		1	51	2.0	50	slight odor	TCLP
			47				
2	380	2	6	1.6		1.6 SAND like Slag, blue-green, Fine-Crs	
			15		5-10	w/odor, densely compacted	
		3	34	2.0			
			53				
3	220	4	12	1.5		.5 GREEN SAND like Slag A/A	SATURATED w/ light oil
			35			1.0 BROWN Crs SAND and Fine GRAVEL	
		5	16	2.0	110		
			6				
4	260	6	8	1.6		.6 SAND like Slag, blue Green, dense,	SAT
			10		7200	w/ tar/oil throughout	
		7	29	2.0		1.0 SAND AND GRAVEL, black, Med-Crs,	
			7			w/ F-Crs Gravel, Tar throughout	
5		8		/			
		9					
		10					

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____ ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. AZ-SB-38

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Oder, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	102	0 1	6 10 68 30	1.5/2.0	SAM 1.5	.3 SILT AND SAND brown-black, fine grain 1.0 SAND orange-brown, Fe stained, fine-med .2 SAND black, fine-med	Located boring w SB-123 •MOVED 5' South due to auger refusal Moist-Wet
2	360	2 3	10 17 45 59	1.5/2.0	170	1.5 SAND-like blue-green slag, dense SATURATED w/ light oil	
3	320	4 5	83 99 100 100	1.6/1.7	180	1.6 SAND like slag, yellow-green, crs, dense,	SAT. w/ light oil Spoon refusal 100 cnt/.2' @ 5.7
4		6 7		/			
5		8 9		/			
		10					

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A2-SB-59

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.4	0 1 1	7 11 7	1.0/2.0	1.2	1.0 Fill Silt dark brown, little-Some F-Med SAND, trace fine Gravel, grading to black color @ 1'	Moist Slight odor
2	0.6	2 3 4	8 4 2 4	1.7/2.0	0.4	.3 Fill Silt, dark-brown AS Above sharp contact w/ 1.4 Fill SAND, Lt brown, Med-Crs, loose w/ sheen @ top of H2O table	WET SAT @ Appox 2.5
3	4.8	4 5	WOH 2 2 3	1.3/2.0	1.4	0.6 Fill SAND, Lt Brown AS above, F-Crs sharp contact w/ 0.7 Fill SAND Black-gray, Fine-Med w/ Apparent staining, Sulfur odor	SAT.
4	22	6 7	4 6 7 16	1.2/2.0	0.7	1.2 SAND Lt gray-brown to black Fine-Crs grained, trace-little Fine-Crs Gravel	SAT
5	15.4	8 9 10	3 5 5 5	1.1/2.0	2.0	1.1 SAND Lt gray-brown w/ black organic sandy partings, F-Crs grain, Sulfur odor	SAT
							Borehole located 80' North of Grid Stake N 9700 E 8150

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Buffalo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DA2 B-60
STARTED M 2/18 19 97
FINISHED M 3/ 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.4	0 1	12 20 16 11	1.6/2.0	0.2	.8 Silt dark brown, little F SAND, tr-little fine Gravel sharp contact w/ .8 Silt brown-black, trace-little F SAND AND Gravel	location 15' North of B-54
2	10.8	2 3	9 33 21 7	.7/2.0	1.8	.7 SAND AND Gravel dark gray-black, F-Crs grained w/ trace-little F-Crs Gravel slight sheen & ODOR @ H2O table	SATURATED
3	6.2	4 5	12 14 10 6	1.3/2.0	14.4	1.3 SAND dark gray-brown grading downward to black-gray, F-Crs, strong ODOR of tar/creosote, tarry @ approx 5.5'	SAT.
4	46 17.4	6 7	6 9 15 20	1.4/2.0	20.30	.6 SAND AS Above w/ little Fine Gravel pockets, sharp contact w/ .8 SAND lt Brown-white, Med-Crs, loose	Strong light oil ODOR @ dark/light SAND contact
5	4.2	8 9 10 11	8 25 20	1.5/2.0	12.2	.4 SAND black, F-Med, tarry .2 SAND lt brown-tan, Med-Crs .6 SAND-like Slag blue-green, compacted, Med-Crs .3 SAND Orange-black Fine-Med,	Slight-Strong creosote/Tar ODOR
6		10 11		/			
7		12 13		/			
8		14 15		/			

Sheet No. ____ of ____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV Steel
PROJECT PH I / PH II
LOCATION Warehouse A-3
CONTRACTOR B&L Drlg
METHOD OF BORING : SOIL 3¼" HSA ROCK
JOB NO. 0348263
LOGGED BY J.P. Hilton
CORE DIA.
BOREHOLE NO. A3-SB-1
STARTED 15:00 M 3/13 19 97
FINISHED M 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	HDSP 0.4	0	3	1.3/1.3		1.3 Coke, tar, slag, black silt	Spoon refusal @ 1.4' bgs
		1	23				Creosote-like odor
			100				Oil sheen
			–				
2	0.4	2	16	.9/1.7		.9 Coke and pelletized slag, slight odor	
		3	49				
			50				
			100				
3	5.2	4	25	1.4/2.0		.4 Coke w/ tar	100cnt/1.2' @ 1.7
			15			1.0 TAR black, pliable, semi-hard	
		5	11				
			4				
4	0.4	6	5	1.5/2.0		.3 Silt dark gray-brown grading to	
		7	4			.4 Clay-gray-black w/ plant roots	Probable Water @ 5.5'
			7			.8 SAND brown-orange w/ saturated	
		8	9			gray interbed @ 6.4-6.9	
5	D.T.		6	0.0/2.0		No Recovery	Wet-Moist
		9	3				
			4				
6	0.2	10	4	.8/2.0		.8 Silt Med gray-brown, trace clay	
			5				
		11	3				
			5				Moist
7		12					
		13					
8		14					
		15					

Boring No. 1 of 1

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT PIT I / PIT II
LOCATION Warehouse Area
CONTRACTOR
METHOD OF BORING: SOIL 3¼" HSA ROCK
JOB NO. 00483 263
LOGGED BY J.P. Hilton
CORE DIA.
BOREHOLE NO. A3SB-2
STARTED 12:45 PM 3/13 19 97
FINISHED M 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE (HSA)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	1.4	0	23	1.5/2.0		1.3 Slag and River Gravel, lightest in color, dry	Dry
			22			.2 Silty sand and Gravel, brown, fine w/ fine sub-rounded gravel, trace-little silt	
		1	14				
			26				
2	1.6	2	15	.9/2.0		.8 Fill ceramic brick, Crs Gravel, Slag loose w/ debris ≥ 3"	Wet - SAT
			17				
		3	19				
			16				
3	2.8	4	19	.6/2.0		.6 Fill As above w/ brick and slag (Gravel)	SATURATED
			9				
		5	14				
			11				
4	0.6	6	16	.4/1.2		.4 Fill Gravel Fine-Crs w/ slag, little recovery due to wood in borehole @ approx 7' bgs	Spoon refusal @ 7.2' (wood)
		7	100				
			-				
5	~~1.6~~	8	15	0.0/2.0		No Recovery	
			13				
		9	15				
			17				
6	0.4	10	2	1.5/2.0		.2 Clay gray-black w/ silt, plant tissue	wet
			6			1.1 SAND orange-brown, fine w/ little silt	
		11	6			.2 SAND brown, F-med w/ trace-little silt	Wet - moist
			5				
7	0.2	12	2	1.7/2.0		.5 SAND brown, Fine-Crs, loose sharp contact w/	Sat
			2			1.5 Silt brown-gray w/ trace clay, gradual to	
		13	4			.7 Clay gray, stiff, wet, plastic	
			7				
8	/	14	3	0.0/2.0		No Recovery	
			4				
		15	5				
			9				

Sheet No. 1 of

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____ ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A3-SB-2

STARTED _____ M _____ 19 _____

FINISHED _____ M _____ 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
9	0.4	16 17	10 10 11 15	1.8/2.0		1.8 Silt gray w/ trace clay and fine sand	
10	0.2	18 19	2 4 4 7	1.9/2.0		1.9 Silt med gray w/ little - some clay	
11	0.2	20 21	4 5 8 9	1.7/2.0		1.7 Silt w/ little clay as laminae	
12	0.0	22 23	7 9 11 9	0.0/2.0		0.0 No Recovery	
13	0.0	24 25	3 2 2 2	2.0/2.0		2.0 Clay, gray, soft, slight plasticity	Top Caving layer
14	0.0	26 27	2 2 2 2	1.5/2.0		1.5 Clay, med gray AS above	
15		28 29		/			
16		30 31		/			

Sheet No. 2 of _____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT ______
PROJECT ______
LOCATION ______
CONTRACTOR ______
METHOD OF BORING: SOIL ______ ROCK ______

JOB NO. ______
LOGGED BY ______
CORE DIA. ______

BOREHOLE NO. A3-SB3 (UW)
STARTED 10:00 A 3/14 1997
FINISHED 10:45 A 3/14 1997
ELEVATIONS: DATUM ______

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2	0	6	1.5/2.0		1.0 Pelletized slag, gray-brown, sharp contact w/	SAT
		1	28, 35, 19			.5 SAND AND COKE black fine-med, w/ breeze	
2	0.0	2	7, 4	1.5/2.0		.4 Fill Gravel and gray fine-crs SAND sharp contact w/	
		3	6, 6			1.1 CLAY AND SILT gray to gray-brown trace-little silt	
3	0.0	4	2, 3	1.4/2.0		1.4 Clay w/silt as above, mottled	
		5	5, 10				
4	0.0	6	6, 2	1.0/2.0		1.0 Clay w/ silt A/A	SAMPLES 1-1.5' interval for BTEX PAH TCN
		7	2, 3				@10:15
5		8					
		9					
6		10					
		11					
7		12					
		13					
8		14					
		15					

Fill 2.4 clay w/silt

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____

ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A3-SB-4

STARTED 14:35 P M 3/14 19 97

FINISHED 15:15 P M 3/14 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill 1	0.0	0	20	1.6/2.0		Fill, 3" SAND, brown-gray, fine-crs w/ fine Gravel	
		1	47			1.3 Brick, red w/ slag	
			34				
			69				
3.0' lost 2	0.0	2	21	1.2/2.0		Fill 1.2 A/A	
			10				
		3	4				
		4	4				
clay w/ silt 3	NA Smpl	4	2	1.6/2.0		.2 Fill Clay trs Silt w/ Crs Gravel, brick	SAMPLED VOC SVOC TAL METALS, CN BTEX, PAH
			6			1.4 Clay gray-brown, mottled	
		5	8				
			8				
4	0.0	6	4	1.4/2.0		1.4 Clay, gray, mottled, trace Silt grading downward w/ trace Sand yellow-brown color	
			4				
		7	6				
			7				
5	0.0	8	7	1.7/2.0		.6 Clay w/ trace Silt, F. Sand A/A	
			9			.6 SAND gray, fine-med w/ tr fine Gravel loose	
		9	7			.5 Clay gray, trace Silt	
			6				
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____ LOGGED BY _____

METHOD OF BORING: SOIL _____ ROCK _____ CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A3-SB-5

STARTED 14:00 hr 3/14 19 97

FINISHED 14:30 hr 3/14 19 97

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	0.2	0 1	6 15 11 30	1.2/2.0		.4 SAND MED brown F-MED w/ fine Gravel .8 SAND black, compacted, Fine-Cs w/ little fine Gravel & Crushed stone	SAT
2	0.0	2 3	20 37 32 10	1.3/2.0		1.3 SAND w/ GRAVEL, dark brown - black, Coke, Coal, brick and Slag	SAT
3	0.2	4 5	4 5 7 9	1.4/2.0		.4 FILL SAND AND Gravel M/F, sharp contact w/ 1.0 CLAY gray-brown w/ tr Silt	SAT Moist
4	0.0	6 7	3 3 5 6	9/2.0		0.9 CLAY yellow-gray, mottled tr Silt tr little SAND increasing w/depth	Moist
5	0.0	8 9	6 4 5 4	1.4/2.0		1.4 SAND brown-olive, fine-MED w/ trace fine sub-rnd gravel, trace-little Silt,	SAT
6		10 11		/			
7		12 13		/			
8		14 15		/			

Sheet No. 1 of _____

MALCOLM PIRNIE

CLIENT _____ JOB NO. _____

PROJECT _____

LOCATION _____

CONTRACTOR _____

METHOD OF BORING : SOIL _____ ROCK _____

LOGGED BY _____

CORE DIA. _____

FIELD BOREHOLE LOG

BOREHOLE NO. A3-SB-6

STARTED 12:30 PM 3/14 19 97

FINISHED _____ M 3/14 19 _____

ELEVATIONS: DATUM _____

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill 1	0.1	0	2	1.4/2.0		.5 SAND Med brown, Fine - Med grain w/ little Gravel, sharp contact w/ .9 Fill, Coke, coal, black cinders, fine SAND	.5 - 1.0 strong H2S; Slight Sulfur Odor
		1	18 39 25				
2	0.4	2	7	1.2/1.4		1.2 SAND AND Gravel fine - Crs grain w/ fine sub-rnd Gravel to 1/2", black w/ Apparent staining @ 2.9 - 3.2', gray-white color @ 3.6 - 3.8	Spoon refusal @ 3.3' bgs
		3	57 100 —				TAL VOC, SVOC, MTLs, CN, PCB Sampled 2.5-3.0 @ 12:45 SAT
3 2.0 Clay	0.2	4	35 17	1.3/2.0		1.5 SAND AND Gravel, black, loose, fine - Crs sharp contact w/ .3 Clay dark gray-black w/ tr - little Silt	
		5	5 4				
4	0.2	6	2 2	1.1/2.0		1.1 Clay gray-brown, mottled w/ tr - little Silt	Moist
		7	4 5				
5	0.0	8	2 2	1.5/2.0		.9 SAND yellow-brown, fine little - some Silt .6 SAND, gray-brown, Fine - Med, loose w/ trace - little Gravel	Moist SAT.
		9	1 2				
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK
JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.
BOREHOLE NO. DH B - 1
STARTED 11:45 AM 3/5 19 97
FINISHED 12:30 PM 3/5 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	2	2.0		2.0 Coke black, breeze w/ some fines Fe staining @ approx 1.0'	wet
			8				
		1	12	2.0			
			10				
2	0.2	2	20	.9		.2 Coke as above	SATURATED
			20			.7 Fill, red-brick, concrete, gray-black med sand	
		3	11	2.0			
			7				
3	0.4	4	8	2.0		2.0 Coke w/ little - some red brick, trace - little slag, breeze - fines	SATURATED
			17				
		5	37	2.0			
			42				
4	0.4	6	2	2.0		.3 Coke breeze w/ black fines, sharp contact w/	
			2				
		7	10	2.0		1.3 Clay, dark gray w/ some Fe stained silt w/ depth, slight sheen, some plasticity	Sampled B-1 6-8'
			11				
5		8					
		9					
6		10					
		11					
7		12					
		13					
8		14					
		15					

Coke w/ brick
6.3
clay

Sheet No. ____ of ____

MALCOLM

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING : SOIL 4 1/4" HSA ROCK

JOB NO. DB4B-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B - 3

STARTED 9:05 A 3/6 19 97

FINISHED 9:15 A 3/6 19 97

ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	6	1.4 / 2.0		.4 Coke Nut and breeze w/ black fine gravel to	Moist
		1	4			1.0 Silt dark brown-black, trace-little slag, red brick	
			3				
			3				
2	1.2	2	4	.7 / 2.0		.7 Fill Mod Brown Silt, trace vf SAND Red, fire brick, slag, Cos Gravel	Moist-Wet
		3	3				
			4				
.4.2							0 HNu scan
3	1.4	4	3	1.4 / 2.0		1.1 MEDIUM GRAY-brown Silt, little fine gravel, trace coal,	Wet-Sat.
Gravel w/silt		5	5				
			12				
4	2.6	6	1	1.0 / 2.0		1.0 Silt Gray w/ trace-little Gravel grading to fine SAND & Clay, Peat parting	SAT
Silt ↓ Peat		7	2				Augered to 4'
			3				
5		8		/			
		9					
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. ____ of ____

MALCOLM

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA
ROCK

JOB NO. 0848-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-4
STARTED 10:40 AM 3/6 19 97
FINISHED 11:15 AM 3/6 19 97
ELEVATIONS: DATUM

SAMPLE NO.	HNu HPSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1 2	2 7 11 11	2.0 2.0		1.0 Coke breeze, loose 1.0 Coke breeze w/ dark brown SILT compacted	
2	0.2	2 3 4	10 6 5 4	1.5 2.0		1.5 Coke and brown slag-like debris w/ some silt, cobbles >3" dia	SATURATED
3		4 5	8 60 100 -	1.2 1.3		1.2 Coke breeze and carbonal fines w/ some slag and silt, white calcite like material	spoon refusal @ approx 5'
4	NA	6 7	7 1 1 3	2.0		TRACE Silty clay Drilling & Sampling character indicate base of Coke at approx 6.0-6.5'	No Sample Recovery 2 & 3" spoons Augered to 6'
5		8 9					
6		10 11					
7		12 13					
8		14 15					

Coke
w/silt
slag cobbles
6.0
silty clay

Sheet No. ____ of ____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. DB4B-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B - 5
STARTED 10:05 AM 3/6 19 97
FINISHED 10:25 AM 3/6 19 97
ELEVATIONS: DATUM

SAMPLE NO.	HW HDSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1	3 3 7 10	1.3/2.0		.9 Coke and Silt, breeze w/ fines .4 Silt brown w/ breeze coke, slag	Moist
Coke w/ Silt 2		2 3	10 8 7 8	2.0/2.0		2.0 Silt and Coke breeze w/ black carbon fines, trace slag, concrete	SATURATED
3		4 5	6 4 3 3	2.0/2.0		2.0 Coke, black breeze w/ fines	
6.4 clay w/ Silt 4	8.4	6 7	1 WOH WOH 2	1.0/2.0		.4 Coke as above .6 Clay and Silt DARK gray, stiff, Moist	Augered to 4.8'
5		8 9		/			
6		10 11		/			
7		12 13		/			
8		14 15		/			

Sheet No. ____ of ____

MALCOLM

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK
JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B - 6
STARTED 09:30 AM 3/4 19 97
FINISHED 10:00 AM 3/6 19 97
ELEVATIONS: DATUM

SAMPLE NO.	AND/OR TYPE*	DEPTH	BLOWS "N"	RECOVERY in	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	—	0 1	3 3 5 12	1.3 2.2		.4 Coke black, breeze and fines grading to .7 Coke and dark brown Silt, trace slag	
2	—	2 3	23 26 20 17	2.0 2.0		2.0 Coke black breeze and fines, trace slag	SATURATED
3	—	4 5	4 7 9 9	1.0 2.0		1.0 Coke black nut and breeze	SATURATED
4	2.2	6 7	4 1 1 3	1.5 2.0		.6 Coke as above .4 Peat Black plant debris, fibrous .5 Silt Gray-black, trace-little clay	SAT.
5		8 9				SAMPLED Co.S - 6.0' interval for TCL VOC, SVOC, METALS	Augered to 4.0'
6		10 11					
7		12 13					
8		14 15					

6.6 Peat & Silty Clay

Sheet No. 1 of 1

MALCOLM

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK
JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.
BOREHOLE NO. DH B-7
STARTED 8:20 A M 3/11 19 97
FINISHED 8:40 A M 3/11 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1	13 6 5 4	2/2.0		.2 Fill, slag w/ brick construction debris	SAT.
2		2 3	7 7 7 8	1.7/2.0		.8 Coke black carbon fines, sharp contact w/ .9 Fill clay w/ little brick and slag	SAT
3	0.2	4 5	1 1 2 1	1.7/2.0		.5 Fill dark black-brown med SAND w/ white-brown crs SAND, brick, slag .2 Peat black-brown, plant debris 1.0 Silt dark gray w/ roots	Moist - wet
4		6 7					Augered to 4.0' (3) 3" spoons
5		8 9					
6		10 11					
7		12 13					
8		14 15					

Sheet No. 1 of 1

MALCOLM

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA / ROCK
JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.
BOREHOLE NO. DH B - 8
STARTED 8:45 AM 3/11 19 97
FINISHED 9:00 AM 3/11 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill 1		0	3	1.1		.6 Silt dark gray-brown w/ plant debris	WET - SAT
			5			.5 Fill Silt w/ coke and slag	
		1	10	2.0			
			14				
2		2	21	0.0		No Recovery	-
			11				
		3	11	2.0			
			4				
4.2 Fill / Clay 3	0.2'	4	2	1.6		.2 Fill Light brown-yellow Crs SAND	
			2			.2 Peat dark brown plant debris w/ Silt	
		5	4	2.0		.3 Silt gray-brown w/ mottles grading to	
			7			.9 CLAY Med Gray, soft grading to stiff Silty Clay	Moist, mottled
Sandy Clay 4		6				Samples TCL VOC	Augered to 4'
		7				SVOC	
						MTLS	(3) 3" spoons
5		8				@ 10:20	
		9				@ 4.0 - 4.5'	
6		10					
		11					
7		12					
		13					
8		14					
		15					

Sheet No. 1 of 1

MALCOLM

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA
ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B - 9
STARTED 9:35 A 3/11 19 97
FINISHED 9:50 A 3/11 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1 2	3 6 18 31	1.1 2.0		.5 Silt dark gray-brown w/ plant debris 1.6 Fill Silt dark brown w/ concrete debris Crs Gravel	SAT
2		2 3 4 6	17 9 8	00 2.0		No Recovery	
3	0.3	4 5 6	3 4 4	1.2 2.0		.3 Fill Silt dark gray w/ brick .9 Clay gray-brown mottled w/ little Silt	Moist
4		6 7					Augered to 4.0! (3) 3" spoons
5		8 9					
6		10 11					
7		12 13					
8		14 15					

Silt Fill
4.3 Clay

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. DB4B-263
LOGGED BY J.P. Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-10
STARTED 9:50 AM 3/11 19 97
FINISHED 10:30 AM 3/11 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
		0	5	1.16		.6 Silt Brown - Green/black w/trace brick	SAT
1			12			1.0 Coke black breeze and Carbon Fines	
		1	15	2.0			
			20				
		2	20	2.0		1.1 Coke A/a w/sand and Gravel	* TCLP VOC, SVOC
2			28			.9 Sand and Gravel black fine - med, w/fine Gravel, trace - little Silt	10:00 @2.5'-3.0'
		3	30	2.0			Strong odor, tar-like w/creosote
			17				
		4	9	.3		.3 Slag-like brick cobble ≥3" dia	
3			8				
		5	5	2.0			
			6				
	0.6	6	5	1.7		.3 Peat black-gray w/ little Silt, grading to	
4			7			1.1 Clay gray-brown w/ trace - little Silt,	Moist
		7	7	2.0		.3 Silt and fine Sand yellow brown	Moist-Wet
			9			trace Clay	
		8					
5			9				Augered to 4.0'
							(4) 3" spoons
		10					
6			11				
		12					
7			13				
		14					
8			15				

Silt .6
Coke 1.0
Fill 6.0

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING : SOIL 4 1/4" HSA

ROCK

JOB NO. 0848-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-11

STARTED 09:15 AM 3/11 19 97

FINISHED 09:30 AM 3/11 19 97

ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1	3 7 4 4	1.2 2.0		.5 Silt brown-gray w/ little fine SAND .7 Fill Lt BROWN MED SAND w/ CLAY AND Concrete debris	SAT
2		2 3	17 9 8 5	1.0 2.0		1.0 Fill Lt brown-yellow Clay w/ Silt, Concrete debris	SAT
3	0.2	4 5	2 3 3 7	1.6 2.0		.2 Fill As above sharp contact w/ .1 Peat black-gray some silt .5 Silt MED-DARK GRAY w/ rootlets grading to .8 Clay gray, little Silt grading to mottled brown	Moist
4		6 7					Augered to 4.0' (3) 3" spoons
5		8 9					
6		10 11					
7		12 13					
8		14 15					

Silt 4.2

Fill w/ Clay

Silt w/ Clay

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING : SOIL 4 1/4" HSA ROCK

JOB NO. DB4B-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B-12
STARTED 14:30 hr 3/10 19 97
FINISHED 14:50 hr 3/10 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Oder, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1	11 30 31 18	1.6/2.0		1.6 Fill flag, red brick, construction debris	
Fill 2		2 3	80 100 -	.6/.6		.6 Fill Construction debris, brick	
4.2 Silt 3	0.4	4 5	9 4 2 3	1.3/2.0		.2 Fill as above, sharp contact .2 Peat black w/ plant debris .9 Silt dark gray w/ plant debris	Moist
4		6 7		/			
5		8 9		/			
6		10 11		/			
7		12 13		/			
8		14 15		/			

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-14
STARTED 15:20 PM 3/6 19 97
FINISHED 15:30 M 3/6 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1	6 24 11 8	2.0/2.0		2.0 Coke breeze - Foundry size	WET
2		2 3	9 10 10 12	2.0/2.0		1.3 Coke breeze & fines .7 TAR	SATURATED
3		4 5	12 13 5 5	2.0/2.0		.6 TAR grading to 1.4 Coke	Augered to 4' Smpld to 8
4 (6.2 - Silt w/ Peat)	120.	6 7	1 1 1 1	.4/2.0		.2 coke fines .4 Silt And Peat brown-black	3 3" spoons 1 2" spoon
5		8 9		/			
6		10 11		/			
7		12 13		/			
8		14 15		/			

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING: SOIL 4 1/4" HSA

ROCK

JOB NO. 0848-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-15

STARTED 12:45 PM 3/6 19 97

FINISHED 1:00 PM 3/6 19 97

ELEVATIONS: DATUM

SAMPLE NO.	TYPE (Hand Auger)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	3	2.0 / 2.0		2.0 Coke breeze w/ black carbon fines, trace red brick	SATURATED
			10				
		1	27				
			17				
2		2	10	2.0 / 2.0		2.0 Coke breeze and nut w/ carbon fines, trace - little slag w/ cobbles > 3" dia	SATURATED
			5				
		3	5				
			5				
3		4	3	1.6 / 2.0		1.6 Coke breeze w/ fines as above	Saturated
			2				
		5	2				
			2				
6.0							
4 (Clay w/ silt)	14.8	6	1	1.2 / 2.0		1.2 CLAY dark gray, stiff, dense w/ trace silt	SATURATED
			1				Augered to 4.8'
		7	2				3-3" 1-2"
			4				
5		8		/			
		9					
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. DB4B-263
LOGGED BY J.P. HILTON
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-16
STARTED 1:05 PM 3/6 19 97
FINISHED 1:25 PM 3/6 19 97
ELEVATIONS: DATUM

SAMPLE NO.	HNu HDSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	5	2.0 / 2.0		2.0 Coke Nut & breeze w/ black carbon fines, trace-little Silt, red brick	SATURATED
			11				
		1	11				
			14				
2		2	17	2.0 / 2.0		2.0 Coke breeze & black carbon fines some interstitial iron staining as above	SATURATED
			12				
		3	10				
			12				
3		4	3	2.0 / 2.0		2.0 Coke as above, strong creosote-chemical odor, trace slag w. base	3" per HNu scan
			5				
		5	5				
			6				
6.0 Silt 4	1.2	6	2	1.1 / 20		1.1 Silt dark gray-black, trace clay w/ trace peat	SAT.
			2				
		7	2				
			2				
5		8		/			Augered to 4'
		9					(3) 3" 1 (2")
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING : SOIL 4 1/4" HSA

ROCK

JOB NO. 0848-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-17

STARTED 15:00 hr 3/6 19 97

FINISHED 15:10 hr 3/6 19 97

ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Coke 1		0	4	2.0 / 2.0		2.0 Coke Breeze & Fines	
			11				
		1	22				
			4				
2.5 Tar 4.0 Coke 6.0 Silt 2		2	12	2.0 / 2.0		.5 Coke	
			24			1.5 Tar and Silt	
		3	27				
			26				
3		4	7	2.0 / 2.0		Coke breeze w/ coal & fines	
			9				
		5	10				
			10				
4	NA	6	3	.2 / 2.0		.2 Silt dark brown - black w/ peat	Augered to 4.0'
			2				(3) 3"
		7	1				1 2"
			1				
5		8		/			
		9					
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. ____ of ____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK
JOB NO. DB4B-263
LOGGED BY J.P. Hilton
CORE DIA.
BOREHOLE NO. DH B-18
STARTED 15:40 PM 3/6 19 97
FINISHED 16:00 PM 3/6 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
		0	2	2.0		1.3 Coke breeze - nut w/ carbon fines	SATURATED
1			15			1.6 Slag and Crs Gravel, orange-brown	
		1	27	2.0			
			18				
2		2	19	1.4		1.4 SLAG AND GRAVEL to > 3" dia	SATURATED
			15				
		3	15	2.0			
			16				
3	S.4	4	9	1.2		.3 SLAG AND Gravel A/A	SAT.
			6			.9 Peat Brown-Black w/ plant debris	
		5	3	2.0		.5 Silt gray-brown	
			3				
4	16'	6	2	1.0		1.0 Silt and Clay Yellow-brown, stiff w/ some plasticity	Augered to 4'
			2				3 3"
		7	3	2.0			1 2"
			3				
5		8					
		9					
6		10					
		11					
7		12					
		13					
8		14					
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B-20
STARTED 14:00 hr 3/10 19 97
FINISHED 14:25 hr 3/10 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1	6 22 36 60	1.4/2.0		.5 Coke and Slag .3 Silt orange-brown w/ slag and Crs Gravel .6 Slag and crushed Stone	
2		2 3	19 59 28 19	1.7/2.0		1.7 Slag and crushed stone as Crs Gravel	
4.0							
dM 3	1.6	4 5	9 6 7 9	.4/2.0		.4 Clay gray-brown, mottled w/ trace Silt, stiff, weak plasticity	Moist
w/sand 4	0.6	6 7	5 8 8 8	1.1/2.0		.4 Clay w/ Silt as above, grading to .7 SAND orange-brown, little Silt, trace Clay	Moist-Wet
5		8 9		/			Augered to 4.0' 3 (3") spoons 1 2" spoon
6		10 11		/			
7		12 13		/			
8		14 15		/			

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING : SOIL 4 1/4" HSA

ROCK

JOB NO. 0848-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-21

STARTED 13:30 PM 3/11 19 97

FINISHED 14:00 PM 3/11 19 97

ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	7	1.6 / 2.0		1.3 Coke Nut - fragments w/ fines, sharp contact w/	
			19				
		1	20			.3 Silt brown-black w/ trace Coke and slag	
			16				
2		2	17	1.2 / 1.2		.8 Clay brown-gray w/ Silt and Coke	
			20			.4 Coke breeze w/ trace-little red brick and slag	
		3	100				Spoon refusal @ 3.2'
			-				
3		4	60	0.0 / 2.0		No Recovery	Moved Rig-Hand Augered to 5' to take Sample 5-7'
			32				
		5	5				
			5				
4	NA	6	32	1.2 / 2.0		.7 Fill Slag and Crs Gravel, sharp contact w/	Sampled 5-7' 5.7-6.0 TCL VOC SVOC MTLS @ 13:45
			11				
		7	4			.5 Clay brown-yellow, stiff, dense, moist	
			8				
5		8		/			
		9					
6		10		/			Augered 10' total w/ (4) 3" spoons
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 084B-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-22
STARTED 13:05 hr 3/11 19 97
FINISHED 13:20 hr 3/11 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill w/ coke		0	7	1.3 / 2.0		1.3 Fill Silt brown-black w/ Fe staining, w/ little coke breeze - nut, trace slag	Wet - Sat
1		1	8				
			12				
			11				
2		2	11	1.5 / 2.0		1.4 Coke breeze - foundry w/ black carbon fines	
			7				
4.0		3	8			.1 Coke w/ trace brown clay & Silt	
			16				
Silt w/debris	Fill	4	3	1.3 / 2.0		.6 Silt w/ Coke black, trace - little red brick trace peat	
3	4PM 0.3		3				
6.0		5	2			.7 Silt dark gray-black w/ glass, brick slag	
Native clay w/ silt			2				
4	0.3	6	3	1.4 / 2.0		.5 Clay gray, trace - little Silt	
			4			.9 Silt yellow-gray mottled w/ trace - little Sand w/ depth	Moist
		7	5				
			8				
5		8		/			Augered to 4.0'
		9					(3) 3" spoons 1 2" spoon
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B - 23
STARTED 14:35 PM 3/11 19 97
FINISHED 15:15 PM 3/11 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	5	0.9 / 0.9		.9 Coke breeze w/ fines, wood in bottom pkg	Spoon refusal @ 0.9'
			100				
		1	-				
			-				
2		2	22	1.5 / 2.0		.5 Fill Coke w/ slag	
			37			1.0 Fill Green-gray sandy Gravel like material	
		3	38			2" hvy - chemical odor	TCLP 2.5-3.5 14:50
			23				VOC, SVOC
3		4	12	.2 / 2.0		.2 Fill black silt and slag	
			7				
		5	3				
			2				
4	22.0	6	3	.8 / 2.0		.6 SAND and SILT black w/ oil-like creosote	TCLP VOC
			5				SVOC 6.0-6.5
		7	7			.2 Clay brown-black	@ 15'.00
			5				
5		8		/		Augered to 4'	
		9				(4) 3" spoons	
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

6.6 clay
Fill w/ debris
Coke 1.2

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING : SOIL 4 1/4" HSA

ROCK

JOB NO. 0848-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-24

STARTED 14:10 PM 3/11 19 97

FINISHED 14:30 PM 3/11 19 97

ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Coke w/slag 2.2	1	0	3	2.0		2.0 Coke breeze - nut w/ carbon fines trace - little slag	Wet - Moist
			10				
		1	18	2.0			
			24				
	2	2	33	1.5		.2 Coke as above	SAT
			95			1.3 Fill Cinders, slag, white - Alabaster like material, brick, carbon fines	
		3	71	2.0			
			52				
4.5 Peat Silt w/ clay	3	4	14	1.6		.5 Fill loose cinders, brick as above	SAT.
	0.6		5			.1 Peat black - carbonized	
		5	4	2.0		.5 Silt dark gray-brown w/ carbonized plants	
			7			.4 Clay brown-gray w/ trace - little Silt	
	4	6					Augered to 4.0'.
		7					(3) 3" spoons
	5	8					
		9					
	6	10					
		11					
	7	12					
		13					
	8	14					
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING : SOIL 4 1/4" HSA
ROCK

JOB NO. 0848-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-25
STARTED 13:30 hrs 3/10 19 97
FINISHED 14:00 hrs 3/10 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Coke 1		0 1	4 8 11 9	15/2.0		1.5 Coke Nut - breeze w/ carbon Brn	
w/slag 2		2 3	11 100 – –	.6/.6		.6 Coke and Slag w/ Cobbles > 3" dia breeze - foundry size coke	Spoon refusal @ 2.6'
4.7 Silt w/Peat 3	1.0	4 5 6	20 4	15/2.0		.7 Fill Coke w/slag and Crs SAND, sharp contact w/ .6 Silt and Peat, dark brown-grey .2 Silt dark grey w/ some clay	Augered to 4' 3 (3") Spoons
Silt 4		6 7		/			
5		8 9		/			
6		10 11		/			
7		12 13		/			
8		14 15		/			

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK
JOB NO. DB4B-263
LOGGED BY J.P. Hilton
CORE DIA.
BOREHOLE NO. DH B -26
STARTED 11:30 AM 3/7 19 97
FINISHED 12:00 PM 3/7 19 97
ELEVATIONS: DATUM

SAMPLE NO.	HAND TYPE SPT	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Coke 1.0 Slag Fill		0	6	1.4 / 2.0		1.0 Coke Nut - Foundry w/ Mixed .4 Slag w/ Crs Gravel	SAT
1		1	20 50 45				
2		2	76	.9 / .9		.9 Slag w/ Crs Gravel to Cobbles > 3" dia	2" dia Refusal @ 2.9'
		3	100 — —				
4.5 Coke 6.0 Silt w/ Peat		4	20	1.6 / 2.0		.6 Slag w/ Cobbles > 3" dia 1.0 Coke and Slag	Augers to 4' Split to 8' (4) 3" Spoons
3		5	75 33 10				
4	14D	6	2	1.8 / 2.0		1.0 Silt and Peat DARK gray - brown grading to .8 Silt orange - brown w/ trace Clay	
		7	3 5 4				
5		8		/			
		9					
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING : SOIL 4 1/4" HSA

ROCK

JOB NO. 0848-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B - 28

STARTED 1:30 PM 3/6 19 97

FINISHED 2:05 PM 3/6 19 97

ELEVATIONS: DATUM

SAMPLE NO.	HNu Reading / TYPE of Sample	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Coke 1		0	5	2.0 / 2.0		2.0 Coke breeze - foundry size w/ black carbon fines	WET
			9				
		1	12				
			24				
2		2	18	1.4 / 2.0		1.4 Coke breeze w/ silt carbon fines, red brick	SATURATED
			30				
		3	32				
			22				
w/ silt 3		4	3	1.2 / 2.0		1.2 Coke black carbon fines / breeze	SAT
			5				
		5	6				
			16				
6.4 Silt w/ Peat 4	300.	6	4	1.1 / 2.0		.4 Coke, fines	
			2				
		7	1			.7 Silt grey-brown w/ Peat as brown plant tissue	
			2				
5		8		/			
		9					
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B -29
STARTED 2:30 PM 3/6 19 97
FINISHED 2:50 PM 3/6 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE (SPLIT SPOON, HDSP, NA)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
coke / Fill 1		0	4	1.5 / 2.0		.4 Coke 1.1 Silt dark brown w/ Fine-Med SAND oxidized, little-some Fine-Crs Gravel	
		1	11 13				
coke 2		2	15 16	2.0 / 2.0		2.0 Coke breeze & Nut w/ carbon fines	
		3	17 20				
coke 3		4	9 12	2.0 / 2.0		2.0 Coke as above	
		5	17 12				
6.2 Silt 4	NA	6	4 3	.8 / 2.0		.2 Coke .6 Silt dark brown-gray, w/ trace clay & Peat, strong chemical odor	
		7	3 3				
5		8		/		6.5-7.0' Sampled TCL VOC SVOC MTLS @ 14:50	Augered to 4.0' 3 (0-1') 1 (2-11)
		9					
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. ____ of ____

MALCOLM PIRNIE

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 084B-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-30
STARTED 13:00 @ 3/7 19 97
FINISHED 13:20 @ 3/7 19 97
ELEVATIONS: DATUM

SAMPLE NO.	HNU HOSP TYPE	DEPTH	BLOWS "N"	RECOVERY *	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Coke 2.6 Slag Fill		0	7	2.0		2.0 Coke Nut - Foundry	SAT breaks
1			9				
		1	17	2.0			
			50				
2		2	25	.6		.6 Coke w/ cobble sized Slag > 3" dia	Spoon Refusal @ 2.6
			100				
		3	—	.8			
			—				
3		4	66	1.2		1.2 Coke w/ Slag Cobbles	SAT
			64				
6.0 Clay & Silt		5	8	2.0			
			3				
4	22.	6	3	2.0		2.0 Clay gray-brown w/ some silt, trace plant (Root) debris	Moist - Wet
			8				
		7	4	2.0			
			6				
5		8				Sampled for VOC SVOC MTLs 6 - 6.5	Augered to 4.0'
		9					3 3" Spoons 1 2" "
6		10					
		11					
7		12					
		13					
8		14					
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA
ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B -31
STARTED 12:55 PM 3/10 19 97
FINISHED 13:25 PM 3/10 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	8	.6/1.6		.6 Slag And Coke	Spoon Refusal @ .6'
			100				
		1	—				Auger refusal @ 1.0'
			—				Moves borehole
Slag Fill							
2		2	40	.6/1.7		.6 Slag w/ Limestone - crushed stone	Spoon Refusal @ 2.7'
			100				
		3	—				
			—				
4.1							
Silt	3"	4	9	1.2/2.0		.1 SLAG FILL AS Above	Augers to 4.0'
3			3			1.1 Silt dark gray w/ some plant debris,	
		5	3			grading downwards w/ little - Some Clay	3 (3") spoons
			7				
w/clay		6					
4		7					
5		8					
		9					
6		10					
		11					
7		12					
		13					
8		14					
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK
JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.
BOREHOLE NO. DH B-32
STARTED 8:45 @ 3/12 19 97
FINISHED 9:25 @ 3/12 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Coke 1		0	5	1.1 / 2.0		1.1 Coke breeze-nut w/Carbon fines	SATURATED
			7				
		1	7				
			9				
w/ Slag 2		2	100	0.0 / .4		No Sample Recovery. Auger drill cuttings indicate Gravel size Coke and Slag	Spoon Refusal @ 2.4'
			-				
		3	-				
4.7 clay w/ silt 3		4	9	1.3 / 2.0		.7 Coke breeze-nut w/ little Slag sharp contact w/	SAT.
			6				
		5	5			.6 Clay yellow-brown w/ little Silt	Moist
			5				
4		6		/			
		7					
5		8		/			
		9					
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING : SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B-33
STARTED 09:30 @ 3/12 19 97
FINISHED @ 3/12 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	8	1.3		1.3 Coke breeze - nut w/ cached Rocks	SATURATED
			14				
		1	25	2.0			
Coke			30				
2		2	100	.2		.2 Coke As above	Spoon Refusal @ 2.2'
			-				
		3	-	.2			
			-				
4.3		4	10	1.4		.3 Coke A/A, sharp contact w/	Augered to 4'
3			5			1.1 Clay gray, stiff w/ weak plasticity	
Clay		5	5	2.0		grading to brown-gray Silty Clay w/ depth	(3) 3" spoons
			9				
w/Silt	4	6					
		7					
5		8					
		9					
6		10					
		11					
7		12					
		13					
8		14					
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. DB4B-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-34

STARTED 11:20 AM 3/12 19 97

FINISHED 11:40 AM 3/12 19 97

ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
						Coke	
						1.2	
1		0	13	1.5		1.2 Coke breeze - Wet	DRY - Moist
			18			.3 SILT AND SAND, black, fine grain w/ slight tar-creosote odor	
		1	23	2.0			
Fill			24				
2		2	14	1.4		1.4 Fill, COKE AND CRS SAND, black, w/ yellow fine brick,	
			10				tar-like odor, sulfur
		3	10	2.0			
			26				
4.0							
CW		4	3	.2		.2 clay dark gray-black w/ trace Silt	
3	0.4		4				
w/		5	6	2.0			
Silt			6				
4		6	5	1.5		.5 CLAY olive gray-brown, mottled, sharp contact w/	Moist
			5				
		7	7	2.0		1.0 SAND brown-yellow mottled, fine-med w/ little Silt	Moist
			8				
5		8					
		9					
6		10					
		11					
7		12					
		13					
8		14					
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING : SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B-35
STARTED 12:45 h 3/12 19 97
FINISHED 13:00 h 3/12 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1 2	2 3 12 15	1.3 2.0		1.3 Coke breeze - Nut w/ Carbon Rivets trace red brick	Saturated
Coke							
2		2 3	32 100 — —	.9 .8		.8 Coke as above	Spoon refusal @ 2.8' bgs
4.1							
3		4 5	8 5 9 13	1.6 2.0		@ 4.1 Coke A/It Strip Contact w/ 1.5 Silt gray-brown mottled w/ trace Clay	Moist
silt w/ clay							
4		6 7					
5		8 9					
6		10 11					
7		12 13					
8		14 15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4¼" HSA ROCK

JOB NO. 084B-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B-36
STARTED 13:05 hr 3/12 19 97
FINISHED 13:45 hr 3/12 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1 (Coke)		0 1	6 11 13 18	1.5 2.0		1.5 Coke breeze - Nut, Carbon fines, trace brick, slag	SAT.
2 (2.4 Slag)		2 3	33 100 — —	.8 .8		.4 Coke A/A .4 Slag and is Gravel to crushed stone and brick debris	Spoon Refusal @ 2.8'
3 (4.2 Clay)		4 5	3 6 11 12	1.5 2.0		.2 Slag w/ coke 1.3 Clay med gray, trace silt grading downward to yellow-brown silty clay	Moist. Wet.
4		6 7				Sample TCL VOCs @ 13:25 SVOCs MTLs 4.2-4.7	Augered to 4' (3) 3" spoons
5		8 9					
6		10 11					
7		12 13					
8		14 15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B-37
STARTED 11:05 AM 3/10 19 97
FINISHED 11:35 AM 3/10 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Silt 1.0 → 1		0	3	1.2		1.0 SILT black w/ fine SAND (packed) Some Coke, sharp contact w/ SLAG	Spoon refusal @ depth of 1.6' bgs
			32				
		1	22	1.6		.2 SLAG w/ brown-black Silt	
			50				
SLAG 1.9 → 2		2	38	.9		.9 SLAG w/ limestone, fine SAND and Silt	Spoon refusal @ 2.9'
			100				
		3		.9			
4.4 CLAY → 3	1.0	4	8	1.3		.4 SLAG w/ Crs Gravel fill, sharp contact w/	Augered to 4'
		5	5				
			6	2.0		.9 Clay gray-brown, mottled w/ trace Silt, stiff, dense w/ weak plasticity	(3) 3" spoons
		5	9				
4		6					
		7					
5		8					
		9					
6		10					
		11					
7		12					
		13					
8		14					
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING : SOIL 4 1/4" HSA

ROCK

JOB NO. 0848-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B - 38

STARTED 14:15 3/7 19 97

FINISHED 14:30 3/7 19 97

ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Coke 2.5	1	0	3	2.0 / 2.0		2.0 Coke breeze - MAT w/ carbon fines	SATURATED
			20				
		1	27				
			30				
coke & Slag ≈5.5 Silt clay	2	2	32	.9 / .9		.9 Coke as above grading to Slag and Coke w/ Cobbles > 3" dia	Spoon refusal @ 2.9'
			100				
		3	-				
			-				
	3	4	20	.8 / 2.0		.8 Slag cobbles > 3" dia	SAT.
			50				
		5	5				
			4				
	4	6	3	.7 / 2.0		.7 Silt yellow brown mottled, w/ trace - little clay	Augered to 4'
	18.2		4				
		7	5				(3) 3" spoons
			7				1 2" spoon
	5	8		/			
		9					
	6	10		/			
		11					
	7	12		/			
		13					
	8	14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. DB4B-263
LOGGED BY J.P. Hilton
CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B-39
STARTED 13:30 M 3/7 19 97
FINISHED 14:00 M 3/7 19 97
ELEVATIONS: DATUM

SAMPLE NO.	HNU / HDSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	13	1.7		1.0 FILL SAND / Limestone Crs Grnd, Brown w/ fine Gravel, sharp contact w/	
			65			.7 Silt, Red-brown, fine SAND, dense	Moist
		1	37	2.0			
			26				
2		2	15	2.0		2.0 Fill SAND AND GRAVEL, RED-GRAY fine-MED SAND w/ Crs Gravel (Coke) or Slag	TCLP VOC
			25				SVOC - 2.5-3.0
		3	23	2.0			@ 13:45
			13				
3		4	7	2.0		2.0 FILL SAND AND GRAVEL, RED-brown As above, moist	
			10				
		5	7	2.0			
			5				
4	12.0	6	4	1.4		1.1 Fill w/ SAND AND Gravel As above	
			4			.3 Peat / Black CARbon	Chemical ODOR
		7	3	2.0			
			2				
5	76.0	8	2	1.8		1.1 CLAY AND SILT gray-brown	Augered to 8'
			2			.7 Silt yellow-brown, stiff, trace-little CLAY	3 3" Spoons
		9	3	2.0			2 2" Spoons
			6				
6		10					
		11					
7		12					
		13					
8		14					
		15					

SAND + Gravel Fill w/ Slag

±90' CLAY & SILT

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. DB4B-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH B -40

STARTED 2:05 PM 3/6 19 97

FINISHED 2:30 PM 3/6 19 97

ELEVATIONS: DATUM

SAMPLE NO.	TYPE (HNU HDSP)	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1	17 24 50 43	2.0/2.0		.6 Coke breeze .5 TAR .9 Coke breeze & unit coke	WET
Coke 2		2 3	15 16 15 13	2.0/2.0		2.0 Coke breeze & fines Strong creosote ODOR	SATURATED
S.O - Sludge - O 3		4 5	9 9 5 5	1.6/2.0		.9 Coke as above .6 Sludge, lime-like w/ fine gravel, sand Minor Fe staining (@ Approx 5'	SAT.
Peat & Silt 4	SH	6 7	1 1 1 2	.7/2.0		.7 Silt dark brown-gray w/ Peat strong sulfur-chemical ODOR	SAT
5		8 9		/			Augered to 4' (3) 3" 1 2"
6		10 11		/			
7		12 13		/			
8		14 15		/			

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B-41
STARTED 10:00 AM 3/10 19 97
FINISHED 10:30 AM 3/10 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill 1.3 1		0	26	1.7 / 2.0		1.3 Fill, Lt Gray SAND & Gravel (Slag) loose, Sharp Contact w/ .4 Silt brown-black, w/ Coke,	Strong Sulfur, H2S Odor
		1	13				
			18				
			7				
Coke w/ Silt 2		2	7	2.0 / 2.0		2.0 Coke w/ Coal, dark-brown black appears to be leached from 2.0-3.3, breeze -	Nat
			9				
		3	9				
			9				
3		4	3	1.3 / 2.0		1.2 Coke w/ trace - little Silt fill As interbeds	
			4				
		5	4				
			7				
36.5 4	NA	6	3	8 / 2.0		.5 Coke .3 Clay, yellow-gray mottled w/ trace Silt	Samples @ 10:20 for TCL VOC SVOC MTLS, CN
		7	3				
			4				
5		8		/			Augered to 41 (4) 3" spoons
		9					
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING : SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B-42
STARTED 10:35 AM 3/10 19 97
FINISHED 11:00 AM 3/10 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Coke 1.2 Slag w/coke	1	0 1	7 8 9 54	1.2/2.0		1.0 Coke black breeze-mix w/carbon fines, .2 Slag w/ some coke	
	2	2 3	32 100 – –	.4/.7		.4 Slag w/ Crs Gravel and crushed Stone, little coke	Spoon refusal @ approx 2.7' bgs
4.3 Silt	3	4 5	9 4 4 8	1.4/2.0		.3 Slag w/ silt, dark gray-black grading to 1.1 Silt gray-brown, mottles, trace-little clay w/ depth	
Silt w/ Clay	4	6 7		/			Augered to 4'. 3 (3") spoons
	5	8 9		/			
	6	10 11		/			
	7	12 13		/			
	8	14 15		/			

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA
ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B-43
STARTED 13:50 @ 3/12 19 97
FINISHED 14:15 @ 3/12 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
coke 1		0	4	1.4 / 2.0		1.4 Coke breeze and carbon fines	
			3				
		1	3				
			4				
2		2	20	1.3 / 1.3		1.3 Coke a/a w/ little-some silt and carbon fines	Spoon refusal @ 3.3'
			33				
		3	100				
4.3 clay 3	0.0	4	11	1.2 / 2.0		.3 Coke a/a, sharp contact w/ .9 Clay, gray-black, stiff w/ fines-little silt	Moist
			7				
		5	11				
			15				
4		6		/			
		7					
5		8		/			
		9					
6		10		/			
		11					
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH B-44
STARTED 14:15 PM 3/12 19 97
FINISHED PM 3/12 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	12	1.5 / 2.0		1.5 Coke breeze-Nut w/Carbon fines trace slag, black-gray Silt	Wet
		1	16				
			34				
			31				
2		2	10	1.5 / 2.0		1.2 Fill Silt and fine SAND trace-little slag, fine-crs Gravel, black sulfur odor, sharp contact w/ .3 Peat / Plant Debris, SAND and Silt	WET - SATURATED
			21				
		3	13				
			9				
3		4	8	1.6 / 2.0		1.6 Silt dark gray, w/trace clay w/depth	Moist
			4				
		5	7				
			8				
4		6					
		7					
5		8					
		9					
6		10					
		11					
7		12					
		13					
8		14					
		15					

Coke 2.0 Fill Silt w/Sand 3.5 Silt w/Tr Clay

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA Coke Yard
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK
JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.
BOREHOLE NO. DHMW - 1
STARTED 13.30 H 3/5 19 97
FINISHED M 3/5 19 97
ELEVATIONS: DATUM

SAMPLE NO.	HNu Head Space TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1	3.8	0 1	4 5 12 15	2.0/2.0		1.3 COKE AND Silt, breeze and black fines w/ some green-brown silt, strong creosote odor	10 ppm HNu scan over 3 spoon
2	—	2 3	7 15 13 12	.8/2.0		.8 Coke black, breeze w/ fines	SAT.
3	—	4 5	4 2 3 3	1.7/2.0		.6 Coke As above w/ strong chemical odor .7 Silt and Sand green-brown, med grain .4 Coke breeze and black fines	SAT 3-5 ppm scan
4	12.6	6 7	1 1 2 4	1.1/2.0		.4 Peat, brown fibrous w/ some black silt .7 grading to Silt w/ trace Sand, some clay	
5	—	8 9	2 3 5 7	1.7/2.0		.8 Silt gray w/ little - some clay .3 clay brown-gray, fg stained, some plasticity .6 SAND gray-brown, fine-med w/ trace-little Silt	SAT w/ odor
6	—	10 11	2 3 4 4	2.0/2.0		1.8 Silt and fine Sand, brown-gray, mottled chemical odor	WET
7	1.6	12 13	2 4 5 13	20/2.0		2.0 Silt tan-brown, trace-little clay, trace fine Sand	
8		14 15		/			

C: 0 Peat w/ Silt w/ Sand Clay

Sheet No. ____ of ____

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DHMW-2
STARTED 9:30 AM 3/7 19 97
FINISHED 10:30 AM 3/7 19 97
ELEVATIONS: DATUM

SAMPLE NO.	HNU HDSP TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 I	7 10 19 22	2.0 2.0		2.0 Coke breeze - Nut w/fines	SAT
2		2 3	46 36 32 33	1.7 2.0		.2 Coke As Above 1.5 Fill Cobbles, red brick > 3" dia w/silt and fine SAND	SAT
3		4 5	11 11 6 4	1.7 2.0		1.4 Fill As Above .3 Peat and Silt w/ trace - little clay	Sampled for VOCs SVOCs 5.5-6.0 MTLS
4	1.2	6 7	2 2 3 4	1.2 2.0		1.2 CLAY gray-brown mottled, stiff w/little silt	Moist
5	0.2	8 9	8 5 5 6	1.3 2.0		.9 CLAY w/ some silt, brown-orange grading to .4 clay gray-brown, trace silt	Moist
6	0.8	10 11	6 6 8 9	1.2 2.0		1.2 Silt gray-brown mottled, trace clay	Moist
7	1.4	12 13	4 4 3 6	1.0 2.0		1.0 Silt and Clay, soft, weak plasticity, gray-gray-brown	Wet
8		14 15					

Coke 1.2
Fill 2.2
5.4 Peat w/ Clay

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH MW-3
STARTED 14:50 hr 3/7 19 97
FINISHED 15:50 hr 3/7 19 97
ELEVATIONS: DATUM

SAMPLE NO.	Hilti HD50 TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Fill 1		0	32	.7/1.9		Gravel Fill & SAND Gray, Crs, Frozen w/ Cobbles > 3" dia	Spoon Refusal @ 0'
		1	100/—				
Slag 2		2		—/—		Slag & Fill through 2-4' interval No sample taken, Slag to > 4" dia	SAT
		3					
=S.o Silt & Clay 3		4	7	0.0/2.0		No Recovery, Slag Cobble in shoe button	SAT
		5	7/10/15				
4	3.6	6	12	1.6/2.0		.7 Silt yellow-brown, little clay, gradiy to .9 SAND brown-yellow, fine-med, little Silt	
		7	19/21/15				SAT
5	4.4	8	2	1.3/2.0		1.3 Silt and Clay, gray-brown, weak plasticity	SAT
		9	3/4/3				
6	1.8	10	4	1.8/2.0		1.8 Silt and Clay As Above w/ trace fine SAND as parting Approx 10.1 - 10.3	SAT
		11	4/6/9				
7	0.8	12	3	2.0/2.0		.2 Silt w/ fine SAND Gray 1.8 Silt w/ trace - little Clay	Moist
		13	5/7/9				
8		14		—/—			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH MW-4
STARTED 11:30 AM 3/11 19 97
FINISHED 12:15 AM 3/11 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0 1 2	3 5 7 5	1.4/2.0		1.4 Coke breeze - dust w/ little - some Silt and black carbon fines	SAT.
2		2 3 4	3 5 3 3	1.5/2.0		.3 Coke w/ Silt N/A .6 Silt dark brown w/ little fine SAND, blue-green fine SAND .6 Peat dark brown, some Silt and fine SAND	TCLP 2.5-3.0 11:30 VOC, SVOC
3	0.3	4 5 6	3 3 5 9	1.4/2.0		1.1 CLAY GRAY-brown, mottled w/ little - some Silt, trace fine SAND, grading to .3 SAND gray-brown, fine w/ some Silt	Wet - SAT
4	0.3	6 7 8	3 3 4 4	1.6/2.0		1.6 SAND lt brown-olive, mottled, fine-med w/ trace - little Silt	SAT
5	0.~	8 9 10	3 4 7 9	1.9/2.0		1.0 SAND Med Brown, Med grain, loose w/ trace Silt, sharp contact w/ .9 CLAY GRAY, moderate plasticity w/ trace Silt	SAT Mois T
6	0.2	10 11 12	2 3 3 5	1.8/2.0		1.5 Silt gray w/ trace - little clay grading downwards to .3 CLAY GRAY, Stiff w/ some Silt	Moist - wet
7	0.2	12 13 14	5 6 6 8	1.9/2.0		1.9 Silt gray w/ little clay as laminae	Moist
8		14 15		/			

Sheet No. 1 of 1

MALCOLM PIRNIE

FIELD BOREHOLE LOG

CLIENT LTV STEEL
PROJECT So. Bflo Phase I / Phase II
LOCATION DONNER - HANNA
CONTRACTOR Buffalo Drilling
METHOD OF BORING: SOIL 4 1/4" HSA
ROCK

JOB NO. 0848-263
LOGGED BY J.P. Hilton
CORE DIA.

BOREHOLE NO. DH MW-5
STARTED 10:20 AM 3/12 19 97
FINISHED 11:15 AM 3/12 19 97
ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
Coke 1.0 Fill Silt	1	0 1	6 16 30 30	1.5/2.0		1.0 Coke, breeze-nut and Carbon fines .5 Silt black carbon-like, stony, tar-creosote odor, trace slag, coke	SATURATED
Silt	2	2 3	15 4 17 31	1.2/2.0		.4 Silt As above w/ wood, metal debris .5 Clay brown-gray w/ brick, wood .3 Silt black-gray, brick, trace-little fine sand	Wet
4.3 Clay	3	4 5	8 4 4 4	1.0/2.0		.3 Silt Fill As above .2 peat black-gray, grading to .5 Clay Med-Grey w/ trace Silt	TCL VOC @ 4.5-5.0 SVOC MTLS
SAND Silt	4	6 7	4 5 5 7	1.2/2.0		1.0 Clay gray-brown mottled grading downward to Silty Clay .2 Silt yellow-brown w/ little fine SAND	Moist SAT
	5	8 9	7 3 4 4	1.1/2.0		.4 SAND yellow-brown, fine w/ trace-little Silt .7 Silt yellow-brown mottled w/ little Clay	SAT Moist
	6	10 11	4 4 6 9	1.6/2.0		1.6 Silt yellow-brown A/A w/ trace clay	Moist
	7	12 13		/			
	8	14 15		/			

5
6
7
11
12

Sheet No. 1 of 1

MALCOLM PIRNIE

CLIENT LTV STEEL

PROJECT So. Bflo Phase I / Phase II

LOCATION DONNER - HANNA

CONTRACTOR Buffalo Drilling

METHOD OF BORING : SOIL 4 1/4" HSA

ROCK

JOB NO. 0848-263

LOGGED BY J.P. Hilton

CORE DIA.

FIELD BOREHOLE LOG

BOREHOLE NO. DH MW - 6

STARTED 14:40 PM 3/12 19 97

FINISHED 15:45 PM 3/12 19 97

ELEVATIONS: DATUM

SAMPLE NO.	TYPE	DEPTH	BLOWS "N"	RECOVERY %	MOISTURE TIN NO.	SAMPLE DESCRIPTION: Color, Texture Classification, Compactness/Consistency, Moisture Condition, Weathering/Fracturing, Inclusions, Odor, Etc.	NOTES: Boring, Testing and Sampling Procedures, Water Loss and Gain Drilling and Testing Equipment, Etc.
1		0	3	1.5 / 2.0		1.5 Coke breeze - nut, Carbon fines	
			3				
		1	5				
			13				
2	D	2	11	1.4 / 2.0		1.0 Coke breeze and Med-Crs Black SAND, fill w/ gray interbed, sharp contact w/	
			22				
3.0 Peat w/slag coke CLAY		3	24			.4 Peat/wood plant tissue, trace coke, slag	possible fill/Native contact @ 3.0'
			10				4.0
3		4	3	1.6 / 2.0		1.6 CLAY gray w/trace Silt, stiff	Moist
			5			grading downward to yellow-brown	
		5	6			mottled	6
			11				
4		6	3	1.7 / 2.0		.7 Clay A/A,	Moist
			5			.5 SAND yellow-brown fine-Med w/little-Some Silt	Moist
		7	6				
			6			.5 Silt yellow-brown, trace Clay, stiff	Wet
5		8	7	1.8 / 2.0		1.8 Silt As Above	Moist
			7				
		9	12				
			12				
6		10	4	0.0 / 2.0		No Sample Recovery	-
			7				
		11	10				
			10				
7		12		/			
		13					
8		14		/			
		15					

Sheet No. 1 of 1

MALCOLM PIRNIE

MALCOLM PIRNIE

ATTACHMENT B-6

- **WELL DEVELOPMENT LOGS**

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: 4/1/97

WELL NO.: DHMW-1

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 15.

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 4.37

(4) **VOLUME OF WATER IN CASING (gal.):** 1.8

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial	2.5	5.0	7.5							
pH	6.1	6.2	6.2	6.2							
CONDUCTIVITY	2700	2630	3040	3220							
TEMPERATURE											
TURBIDITY	84	7100	7100	7100							
APPEARANCE	WATER CLOUDY	MUDDY	MUDDY	MUDDY							

COMMENTS:
- Developed w/ 1¼" disposable bailer
- Well capable of bailing to "dryness"

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: 4/1/97

WELL NO.: DH11W-1A

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 9.5

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 4.38

(4) **VOLUME OF WATER IN CASING (gal.):** .9

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ **GAL.**

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	2.5	5.0	7.5	10.0						
pH	6.6	6.7	6.7	6.7	6.7						
CONDUCTIVITY	2490	2470	2500	2470	2390						
TEMPERATURE	~	~	~	~	~						
TURBIDITY	76	>100	>100	>100	>100						
APPEARANCE	Amber cloudy	black cloudy	black cloudy	black cloudy	black cloudy						

COMMENTS:
- Developed w/ 1¼" bailer
- Well recharges immediately

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: 4/1/97

WELL NO.: DH/MW-2

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** ~~15.32~~

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 2.61

(4) **VOLUME OF WATER IN CASING (gal.):** 2.2

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	2.5	5.0								
pH	6.7	6.5	6.5								
CONDUCTIVITY	2090	2400	2550								
TEMPERATURE											
TURBIDITY	81	710	710								
APPEARANCE	cloudy	muddy	Dark Brn muddy								

COMMENTS:
- Developed w/ 1¼ bailer
- Well bails "dry", recharge slow

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: DHMW-2A

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 8.09

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 2.67

(4) **VOLUME OF WATER IN CASING (gal.):** 1.1

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}]$ = _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	5.0	12	18							
pH	7.2	7.4	7.6	7.4							
CONDUCTIVITY	990	500	480	600	~~250~~						
TEMPERATURE	-	-	-	-							
TURBIDITY	>100	7100	7100	7100							
APPEARANCE	cloudy	DK Gray cloudy	DK Gray muddy	DK Gray							

COMMENTS:
- Developed w/ 1¼" bailer
- recharge immediate

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: DHMW-3

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 14.77

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 2.33

(4) **VOLUME OF WATER IN CASING (gal.):** 2.1

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	5	10.0								
pH	3.9	3.7	3.7								
CONDUCTIVITY	13,160	34,100	34,300								
TEMPERATURE	-	-	-								
TURBIDITY	14	>100	<50								
APPEARANCE	yellow clear	yellow muddy	clear yellow								

COMMENTS: Developed w/ 1 1/4" bailer

* well recharge moderate

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: DHMW-3A

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 9.32

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 2.31

(4) **VOLUME OF WATER IN CASING (gal.):** 1.2

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ **GAL.**

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	2.5	5.0	10.0							
pH	6.2	6.0	6.8	9.2							
CONDUCTIVITY	3900	5950	2300	2690							
TEMPERATURE											
TURBIDITY	7100	7100	7100	7100							
APPEARANCE	DK gray/ muddy	DK Gray	Lt Gray Clear	Lt Gray Clear							

COMMENTS:
- Developed w/ 1¼" bailer
- pH change @ 10 gal, water becomes green when mixed w/ "fresher" water
- Well recharge - moderate

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: DHMW-4

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 14.53

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 2.24

(4) **VOLUME OF WATER IN CASING (gal.):** 2.1

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ **GAL.**

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	IN. HW	5	10	15	20						
pH	6.4	6.3	6.4	6.3	6.5						
CONDUCTIVITY	1575	1577	1624	1656	1720						
TEMPERATURE	–										
TURBIDITY	>100	7100	7100	7100	7100						
APPEARANCE	yellow cloudy	muddy yellow	muddy yellow brn	yellow silty	yellow silty clearing						

COMMENTS: • Developed w/ 1¼" bailer

• recharge - immediate

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: DHMW-5

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 14.21

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 2.78

(4) **VOLUME OF WATER IN CASING (gal.):** 1.9

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	5	10	15							
pH	6.8	6.5	6.6	6.6							
CONDUCTIVITY	2020	1970	2060	2070							
TEMPERATURE	-	-									
TURBIDITY	<5°	>100	100°	>100							
APPEARANCE	clear	MUDDY	MUDDY DK GRAY	DK GRAY MUDDY							

COMMENTS:
- Developed w/ 1¼" bailer
- Moderate recharge

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: DHMW-6

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 12.9

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 2.32

(4) **VOLUME OF WATER IN CASING (gal.):** 1.8

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ **GAL.**

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	5	10								
pH	6.6	6.5	6.5								
CONDUCTIVITY	2050	2310	2360								
TEMPERATURE	—										
TURBIDITY	>100	>100	>100								
APPEARANCE	yellow brn silty	yellow brn silty	yellow brn cleaning								

COMMENTS:
- Developed w/ 1¼" bailer
- Moderate recharge, well can be bailed to "dryness"

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: GW-4

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 15.55

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 5.84

(4) **VOLUME OF WATER IN CASING (gal.):** 1.7

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial	5	10	15	20						
pH	3.2	5.5	5.7	5.4	5.6						
CONDUCTIVITY	2780	7310	4710	6020	5020						
TEMPERATURE	—	—	—	—	—						
TURBIDITY	7100	7100	7100	7100	7100						
APPEARANCE	Amber cloudy	Rust color yellow	Rusty cloudy	Rusty cloudy	Rusty clearing						

COMMENTS:
- Developed w/ 1 1/4" bailer
- Moderate - fast recharge

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: A3-SB-3

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 9.35

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 1.41

(4) **VOLUME OF WATER IN CASING (gal.):** 1.3

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ **GAL.**

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	3	5								
pH	9.8	8.7	9.1								
CONDUCTIVITY	1670	2140	1910								
TEMPERATURE	–	–	–								
TURBIDITY	7100	7100	7100								
APPEARANCE	black cloudy	black	black silty								

COMMENTS:
- Developed w/ 1 1/4" bailer
- Well bails to "dryness", slow recharge

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: A3-SB-6

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 10.3

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 1.76

(4) **VOLUME OF WATER IN CASING (gal.):** 1.5

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

V = 0.0408 [(2)^2 x { (1) - (3) }] = _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial	5	10	15							
pH	9.2	10.1	10.4	10.0							
CONDUCTIVITY	1210	1310	1320	1360							
TEMPERATURE	~	~	~	~							
TURBIDITY	>100	>100	>100	<100							
APPEARANCE	gray black Turbid	black silty	black cloudy	clearing gray							

COMMENTS:
- Developed w/ 1¼" bailer
- Well bails to dry/recs w/ slow-moderate recharge

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: LTV Steel - Phase II Site Investigation, Denver Hanna Coke Plant

PROJECT NO.: 0848-263-300

STAFF: BEH, BS (ICF Kaiser)

DATE: 3/17/97

WELL NO.: AZ-P1

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 12.0

(2) **CASING INTERNAL DIAMETER (in.):** 2

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 6.43

(4) **VOLUME OF WATER IN CASING (gal.):** 1.0

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ 0.95 GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	9:00 1.0	9:04 2.0	9:06 3.0	9:11 5.0	9:15 7.0	9:18 8.0	9:21 9.0	9:27 12.0			
pH	9.30	9.40	9.40	9.30	9.30	9.30	9.32	9.28			
CONDUCTIVITY	3520	3250	3170	3010	2930	2950	2990	2930			
TEMPERATURE	—	—	—	—	—	—	—	—			
TURBIDITY	>100	>100	>100	>100	>100	>100	>100	>100			
APPEARANCE	black sheen	→	→	→	→ clearing	→	→	→			

clearing up ↓ Purged dry

COMMENTS:

start: 8:54
end: 9:27

* Sheen on purged water
* strong creosote/petroleum odor

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: AZ-P-11

(1) TOTAL CASING AND SCREEN LENGTH (ft.): _____

(2) CASING INTERNAL DIAMETER (in.): 2"

(3) WATER LEVEL BELOW TOP OF CASING (ft.): _____

(4) VOLUME OF WATER IN CASING (gal.): _____

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	15										
pH	–										
CONDUCTIVITY	–										
TEMPERATURE	–										
TURBIDITY	>100										
APPEARANCE	black										

COMMENTS: • Purged 15 gal., sign. hint odor (benzene), did not measure H_2O level or take parameters, given equipment for add'l well development, sediment - black will settle quickly

• recharge – immediate

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: A1-SB-A2

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** _____

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 11.39

(4) **VOLUME OF WATER IN CASING (gal.):** _____

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	10	20								
pH	11.1	10.9	10.8								
CONDUCTIVITY	1015	840	902								
TEMPERATURE	–	–	–								
TURBIDITY	7100	7100	7100								
APPEARANCE	DK cloudy	DK cloudy	DK cloudy								

COMMENTS:
- Developed w/ 1¼" bailer,
- Slight - Moderate oil sheen w/ blebs on H_2O purge surface
- recharge - immediate

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: A1-SB-F2

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 15.35

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 8.71

(4) **VOLUME OF WATER IN CASING (gal.):** 1.1

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

V = 0.0408 [(2)^2 x { (1) - (3) }] = _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	3	5								
pH	8.8	8.1	8.3								
CONDUCTIVITY	1250	1045	1085								
TEMPERATURE	–	–	–								
TURBIDITY	>100	7100	7100								
APPEARANCE	cloudy brn	grey muddy	gry-brn muddy								

COMMENTS: • Developed w/ 1¼" bailer
• well purged to "dryness", recharge very slow

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: A1-SB-K2

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 13.0

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 6.12

(4) **VOLUME OF WATER IN CASING (gal.):** 1.2

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}]$ = _____ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	20									
pH	–	–									
CONDUCTIVITY	–	–									
TEMPERATURE	–	–									
TURBIDITY	-	>100									
APPEARANCE	-	oily dk gray-blk									

COMMENTS:
- Developed w/ 1 1/4" bailer
- Significant amount of #6 oil on purge water surface, did not use meters for purposes of cleaning equipment
- recharge - immediate, purged 20 gal

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: _____

PROJECT NO. : _____

STAFF: _____

DATE: _____

WELL NO.: A1-SB-MZ

(1) **TOTAL CASING AND SCREEN LENGTH (ft.):** 14.9

(2) **CASING INTERNAL DIAMETER (in.):** 2"

(3) **WATER LEVEL BELOW TOP OF CASING (ft.):** 7.0

(4) **VOLUME OF WATER IN CASING (gal.):** 1.3

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ _____ **GAL.**

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	3	6								
pH	6.2	6.4	6.3								
CONDUCTIVITY	640	640	640								
TEMPERATURE	—	—	—								
TURBIDITY	<50	>100	>100								
APPEARANCE	clear	brown turbid	Turbid brown								

COMMENTS: • Developed w/ 1¼" bailer

• Recharge - slow

MALCOLM PIRNIE

ATTACHMENT B-7

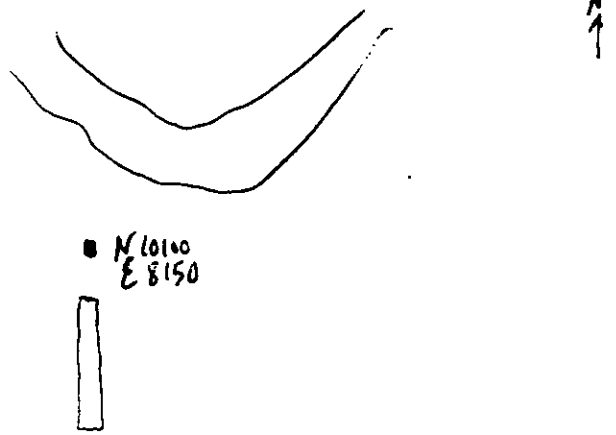
- **TEST PIT EXCAVATION LOGS**

FIELD TEST PIT LOG

PROJECT: _____
PROJECT NO _____
CLIENT: _____
LOCATION: TP-1
LT Steel Plant

EXCAVATION DATES: 3/19/97
EXCAVATION METHOD: Backhoe
LOGGED/CHECKED BY: BCH
start: 9:20
end: 9:50

TEST PIT LOCATION



NOT TO SCALE

TEST PIT CROSS SECTION
GRADE _____ _____

NOT TO SCALE

DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
0-2.1	Orange/Brown f-med SAND, dense, moist		—	—	
2.1-2.7	Black med-coarse SAND and GRAVEL, brick, dense, moist-wet				Water @ 2.4'
2.7	Concrete				
	Trenched moving South edge of concrete 40' from N 10160 E 8150				
	Some sheen on water				
	2.5 Orange/Brown SAND tapers off				
	Becomes: DK Grey/Black SILT and f-SAND w/ Concrete, bricks, rebar				
	no obvious contamination in soil or on water surface				
	no obvious odors				
	Trench was ~ 35' long 2.5 - 3.0' deep				

BGS - BELOW GROUND SURFACE

MALCOLM PIRNIE

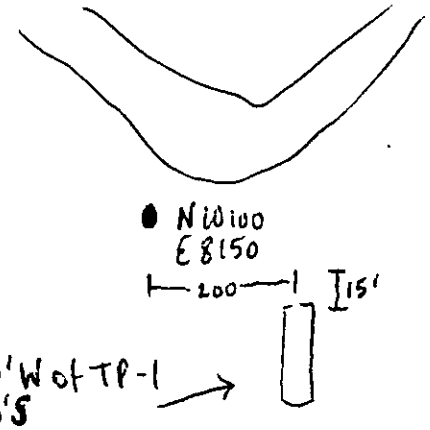
SHEET ___ OF ___

FIELD TEST PIT LOG

PROJECT: _____
PROJECT NO _____
CLIENT: _____
LOCATION: TP-2
ETV Steel Plant

EXCAVATION DATES: 3/19/97
EXCAVATION METHOD: Backhoe
LOGGED/CHECKED BY: BCH
Start: 9:50
End: 10:20

TEST PIT LOCATION



NOT TO SCALE

TEST PIT CROSS SECTION

GRADE _____ _____

NOT TO SCALE

DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
0 - 1.4	Black, dense f- med SAND w/				water @ 1.8'
	med GRAVEL, brick (red + tinnage)				
1.4 - 4.0	med GRAVEL w/ some coarse SAND				
	Black, wet, rubber circline hose				
	strong creosote odor				
	20' S of EW line - possible pipe				
	↓				
	Terminates to				
	Concrete w/				
	rebar wrapped				
	around it				
	Trench was 20' long				
	4.0' deep				
	No obvious contamination in soil or				
	on water surface				
	Creosote odor was noted				
	BGS - BELOW GROUND SURFACE				

MALCOLM PIRNIE

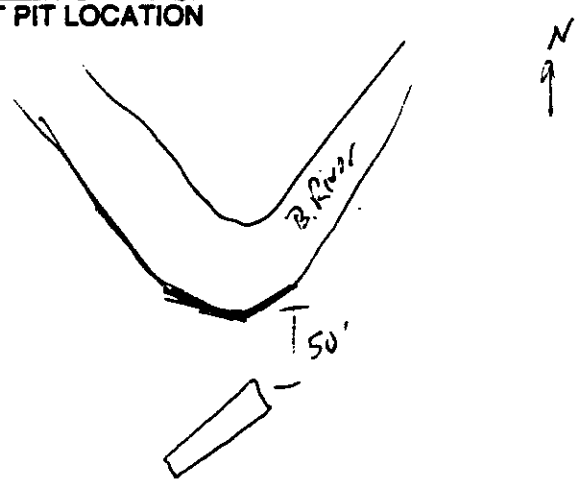
SHEET ___ OF ___

FIELD TEST PIT LOG

PROJECT: _____
PROJECT NO _____
CLIENT: _____
LOCATION: TP-3
LTV Steel Plant

EXCAVATION DATES: 3/19/97
EXCAVATION METHOD: Backhoe
LOGGED/CHECKED BY: BCH
start: 10:20
end: 11:35

TEST PIT LOCATION



NOT TO SCALE

TEST PIT CROSS SECTION

GRADE _____ _____ ft

NOT TO SCALE

DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
0 - 1.7	DK Brown, dense, SAND and GRAVEL, dry, slag, brick				depth to water from river wall 8.85'
1.7 - 2.3	DK grey / Orange Brown dense CLAY w/ 1/2 GRAVEL (concrete?), very hard, dry - mostly DK Brown med-coarse SAND + GRAVEL, slag, brick (furnace + red) (crystalizing)				
2.3	white ash w/ Black oil staining, no odor				
1.7 - 2.3	Large sub-angular GRAVEL w/ coarse SAND				
2.3 - 3.4	White/Grey, Black ASH, some Orange				
3.4 - 4.5	Black ash				water @ 4.5'
	BGS - BELOW GROUND SURFACE				

MALCOLM PIRNIE

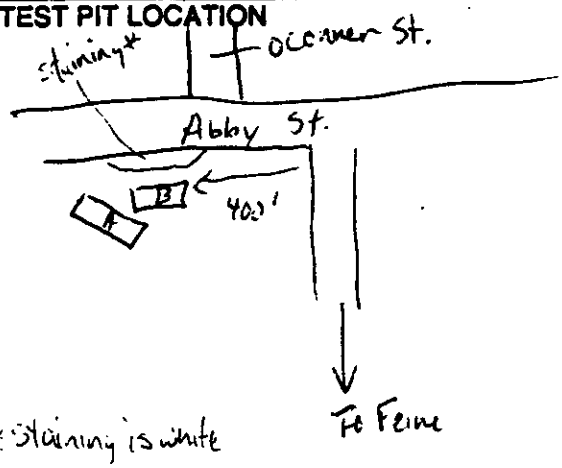
SHEET ___ OF ___

FIELD TEST PIT LOG

PROJECT:
PROJECT NO
CLIENT:
LOCATION: TP-4
LTV Steel Plant

EXCAVATION DATES: 3/19/97
EXCAVATION METHOD: Backhoe
LOGGED/CHECKED BY: BCH
Start: 11:35
End: 12:20

TEST PIT LOCATION



* Staining is white

NOT TO SCALE

TEST PIT CROSS SECTION

GRADE _____ ft

NOT TO SCALE

	DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
A	0-2.0	Red/Brown SILT and f. SAND, some CLAY dense				
	2-5.0	Dense DK Brown, Orange Brown SILT and f SAND w/ some CLAY Black GRAVEL, some staining / concrete, backhoe refusal				Sample taken @ 12:10 A1-TP4 [redacted] TCL VOC's TCL SVOC's/PCBS TAL metals + CN
		dry - moist → wood, coal, slag etc				
B	0-1.0	Dense Red/Brown CLAY w/ SILT				
	1.0-1.7	Dense, DK grey/black GRAVEL w/ concrete, slag material, wet V. hard cemented - refusal @ 2.0' white ash - furnace bricks				
		A 20' long ~5' deep				
		B 15' long ~2.0 deep				
		BGS - BELOW GROUND SURFACE				

MALCOLM PIRNIE

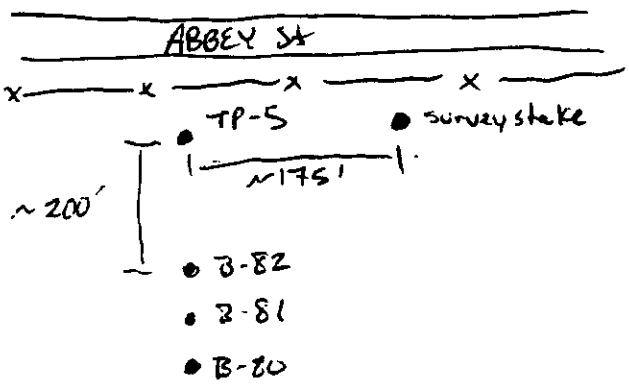
SHEET ___ OF ___

FIELD TEST PIT LOG

PROJECT: _____
PROJECT NO _____
CLIENT: _____
LOCATION: TP-5
Donner Hanna Coke Plant

EXCAVATION DATES: 3/19/97
EXCAVATION METHOD: Back Loe
LOGGED/CHECKED BY: BCH
Start: 13:40
end: 14:15

TEST PIT LOCATION



NOT TO SCALE

TEST PIT CROSS SECTION

GRADE _____ ft

[redacted]

NOT TO SCALE

DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
0-1.4	Black ash, glass, brick, cement - Fill				
[redacted]	[redacted] dense, moist				
					sample time: 14 10
1.4-7.25	Brown, dense CLAY and SILT w/ f-med SAND, some black ash, red brick, cement (CLAY + FILL), moist - wet				sample depth @ 7.25'
				X	A2-TP5,6 → metals, PCB, semi
				X	A2-TP5 → VOC
	glass, coal				
					[redacted]
	total depth 7.75				TCL VOC's
	refusal - concrete pad				TCL SVOC's/PCB's
					TAL metals + CN
					composited w/ TP-6
					sample time: 14:45
	BGS - BELOW GROUND SURFACE				

MALCOLM PIRNIE

SHEET ___ OF ___

FIELD TEST PIT LOG

PROJECT: _____
PROJECT NO _____
CLIENT: _____
LOCATION: TP-6
Donner Hanna Coke Plant

EXCAVATION DATES: 3/19/97
EXCAVATION METHOD: Backhoe
LOGGED/CHECKED BY: PCH
Start: 14:15
end: 14:50

TEST PIT LOCATION

NOT TO SCALE

TEST PIT CROSS SECTION
GRADE _____ _____ ft

NOT TO SCALE

DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
0 - 7.35	Dense, Lt Brown CLAY w/ DK Brown Black SILT and f. SAND. large cement pieces, red brick black organic @ depth				water seeping in @ 6.0'
					Sample depth @ 7.35
					VOC taken 14:30
					comp. metals, PCB/semi-VOC's w/ TP-5
				→ A2-TP6	VOC
				— A2-TP5,6	semi-V, PCB metals
					TCL VOC's
					TCL SVOC's/PCB's
					TAL Metals + CN
					Sample time: 14:40
					sample time: 14:45
	BGS – BELOW GROUND SURFACE				

MALCOLM PIRNIE

SHEET ___ OF ___

FIELD TEST PIT LOG

PROJECT: _____
PROJECT NO _____
CLIENT: _____
LOCATION: TP-7 Warehouse

EXCAVATION DATES: 3/20/97
EXCAVATION METHOD: Backhoe
LOGGED/CHECKED BY: BCH
start 10:00
end 10:35

TEST PIT LOCATION

see map of former warehouse site
⊥ to fence
~ 50'

20' long
9.5' deep

NOT TO SCALE

TEST PIT CROSS SECTION

GRADE _____ ⊥

NOT TO SCALE

DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
0-3.2	Dk Brown SILT and f. SAND w/ red brick, cement, wood, furnace brick, dense				
3.2-4.0	Same A/A with CLAY, dense				* Blind Duplicate Taken
4.0-5.4	Black, SILT and f SAND w/ CLAY coal, brick, odor, dense	HS: 62 ppm			Sample taken @ 10:15 A3-TP7
5.4-7.6	Olive Green SILT and CLAY w/ some f SAND, dense, moist				
7.6-	lt Brown/orange Brown, Gray CLAY				
	Total depth 9.35				

BGS – BELOW GROUND SURFACE

MALCOLM PIRNIE

SHEET ___ OF ___

FIELD TEST PIT LOG

PROJECT: _____
PROJECT NO _____
CLIENT: _____
LOCATION: TP-8 Warehouse

EXCAVATION DATES: 3/20/97
EXCAVATION METHOD: Bac Khoe
LOGGED/CHECKED BY: SCH
Start: 10:35
end: 11:15

TEST PIT LOCATION

35' ⊥ to fence
see map for location

150' long
9.0' deep

NOT TO SCALE

TEST PIT CROSS SECTION

GRADE _____ ⊥

NOT TO SCALE

DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
0-1.8	Brown, dense SILT w/ f. SAND				
	slag, bricks, rebar, sheet metal				
1.8-4.2	Lt Brown A/A w/ more f. SAND				sample depth @ 6.8
	or CLAY, moist				sample time 10:55
4.2-9.0	same A/A				
					A3-TP8
	concrete slab @ 9.0' - refusal				

BGS - BELOW GROUND SURFACE

MALCOLM PIRNIE

SHEET ___ OF ___

FIELD TEST PIT LOG

PROJECT: _____
PROJECT NO _____
CLIENT: _____
LOCATION: TP-9

EXCAVATION DATES: 3/20/97
EXCAVATION METHOD: Backhoe
LOGGED/CHECKED BY: JCH
Start: 9:00
end: 9:40

TEST PIT LOCATION
25' S of A1-SB1C3

6.2'

NOT TO SCALE

TEST PIT CROSS SECTION
GRADE _____ _____

NOT TO SCALE

DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
0-4.3	DK Brown SILT and f SAND w/ furnace bricks, cement, rebar etc.				
	Blue/green compacted SAND (concrete AG				
	-large piece of SLAG at N end.				water @ 3.5'
	-large piece of concrete w/ rebar at S end				
	Refusal due to concrete foundation				
	total depth: 4.3'				
	↓				
	runs in a SE direction				
	BGS - BELOW GROUND SURFACE				

MALCOLM PIRNIE

SHEET ___ OF ___

FIELD TEST PIT LOG

PROJECT: _____
PROJECT NO _____
CLIENT: _____
LOCATION: TP-10

EXCAVATION DATES: 3/20/97
EXCAVATION METHOD: Backhoe
LOGGED/CHECKED BY: ~~BCH~~ BCH

TEST PIT LOCATION

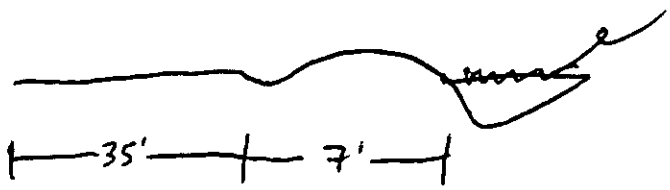
See map of plant site

FROM N 10100
E 8150
170'W, 44'S
SE direction

NOT TO SCALE

TEST PIT CROSS SECTION

GRADE



NOT TO SCALE

DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
0-2.2	Dk Brown/Black SILT w/ f. SAND and GRAVEL, brick, slag, white ash, glass, dense, dry				
2.2-3.5	med-large GRAVEL (slag) w/ some SILT + SAND A/A				
3.5-4.0	Lt Brown CLAY, dense				
4.0	Concrete SLAB				
	Continued location in a SE direction				
	at 3', Pipe was found 2" steel 1" steel wood				
	Edge of concrete 35' SE of start point				
	4" more is edge of wall foundation				
	just off edge of wall foundation				
4.0-4.5	Red/Black SILT and f. SAND, odor, moist, dense, some black tar				HS: 39 ppm Sample taken 13:35
4.5-5.8	~~Red~~ Black tar, v. strong odor Red CLAY, dense, moist (moist)				HS: 108 ppm HS: 70 ppm
5.8+	Dk Grey CLAY, dense, moist oozing tar/oil on top				HS: 72 ppm
	BGS - BELOW GROUND SURFACE				

MALCOLM PIRNIE

SHEET ___ OF ___

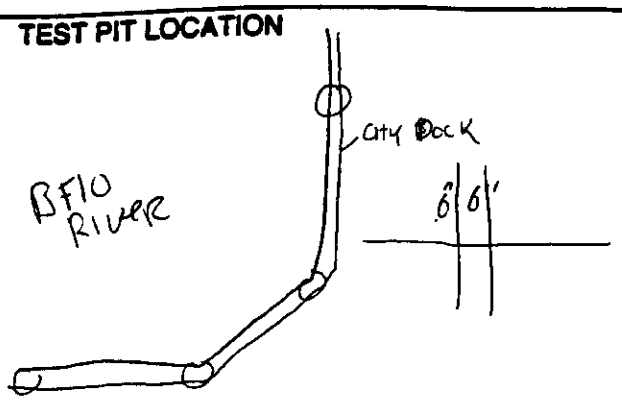
-over-

FIELD TEST PIT LOG

PROJECT: _____
PROJECT NO _____
CLIENT: LTV
LOCATION: TP-11 - E 8434 N 10310

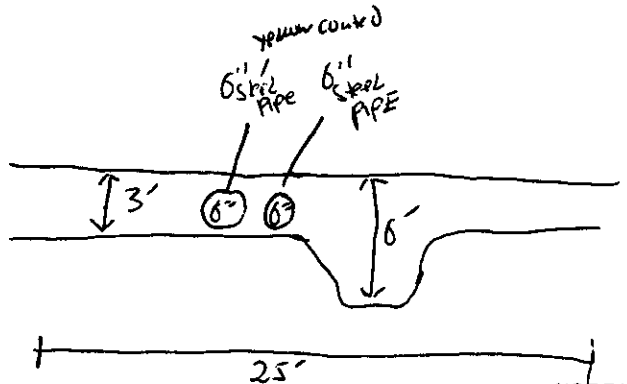
EXCAVATION DATES: 3/21/97
EXCAVATION METHOD: BACKHOE
LOGGED/CHECKED BY: CLD

TEST PIT LOCATION



NOT TO SCALE

TEST PIT CROSS SECTION
GRADE _____ _____



NOT TO SCALE

DEPTH BGS	SOIL DESCRIPTION	GRAPHIC LOG	PHOTOS Y/N	SAMPLES	COMMENTS (INCLUDE SEEPAGE HORIZONS)
0-3'	SLAG material w/ IRON ORE		Y	~	
	BLACK FILL material w/ concrete				
3-6'	BLACK FILL material w/ SLAG		Y	~	
	CHUNKS OF IRON ORE				

BGS – BELOW GROUND SURFACE

MALCOLM PIRNIE

SHEET ___ OF ___

on BACK