NUS CORPORATION
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FIELD INVESTIGATION TEAM ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCES FACILITIES — ZONE I

NUS CORPORATION
SUPERFUND DIVISION

BBA000004

TIERRA-B-017579

02-9004-37-SI
REV. NO. 0

FINAL DRAFT
SITE INSPECTION REPORT
ELIZABETH COAL GAS SITE #1
ELIZABETH, NEW JERSEY

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-9004-37
CONTRACT NO. 68-01-7346

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

JUNE 22, 1990

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY:

DAVID GRUPP
PROJECT MANAGER

RICHARD M. SEPTINO
SITE MANAGER

REVIEWED/APPROVED BY:

for RN

RONALD M. NAMAN
FIT OFFICE MANAGER

TIERRA-B-017580

SITE INSPECTION REPORT: LEVEL I

PART I: SITE INFORMATION

1. Site Name/Alias Elizabeth Coal Gas Site #1

   Street 3rd Ave. Between South 2nd St. and Delaware St.

   City Elizabeth State New Jersey Zip 07200

2. County Union County Code 39 Cong. Dist. 7

3 EPA ID No. NJD981082894

4. Block No. 5 Lot No. 1381

5. Latitude 40° 38' 49"N Longitude 74° 11' 56"W

   USGS Quad. Elizabeth, New Jersey

6. Owner Elizabethtown Gas Light Co. Tel. No. (201) 289-5000

   Street One Elizabeth Plaza

   City Elizabeth State New Jersey Zip 08830

7. Operator Elizabethtown Gas Light Co. Tel. No. (201) 289-5000

   Street One Elizabeth Plaza

   City Elizabeth State New Jersey Zip 08830

8. Type of Ownership

   ☒ Private ☐ Federal ☐ State
   ☐ County ☐ Municipal ☐ Unknown ☐ Other ______

9. Owner/Operator Notification on File

   ☐ RCRA 3001 Date ______ ☒ CERCLA 103c* Date September 19, 1983
   ☐ None ☐ Unknown

*Note: A copy of an official CERCLA 103c form is not available. This information is based on the letter enclosed in Ref. No. 20.

10. Permit Information

Permit	Permit No.	Date Issued	Expiration Date	Comments
N/A				

11. Site Status

    ☒ Active ☐ Inactive ☐ Unknown

12. Years of Operation 1857 to Present

12. Identify the types of waste units (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Management Areas

Waste Unit No.	Waste Unit Type	Facility Name for Unit
1	Unlined Pits	Waste Pits
2	Aboveground Containers	Concrete Bins
3	Aboveground Tanks	Oil Tanks
4	Aboveground Tank	Unused Oil Tank

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.

There is an expansion tank located on site that is reported to be used for water storage. The use of this water is unknown. A battery of aboveground propane storage tanks is located in the southwest corner of the property. A railroad spur exists on the northwest portion of the property. During an NUS Region 2 FIT off-site reconnaissance, a number of railroad tanker cars were seen parked on this spur. The contents or condition of these tanker cars is unknown.

13. Information available from

Contact Amy Brochu — Agency U.S. EPA — Tel. No. (201) 906-6802

Preparer Richard Settino — Agency NUS Corp. Region 2 FIT — Date June 22, 1990

PART II: WASTE SOURCE INFORMATION

Wastes produced on site were the result of gasification processes using coal, coke, and oil, as appropriate. These wastes typically include ammonia, ammonium sulfate, sulfur, coke, coal tar, coal tar pitch, clinker, and light oils. The coal tars may contain significant concentrations of pyrene, anthracene, and other polynuclear aromatic hydrocarbons (PAHs), including known or suspected carcinogens (Ref. No. 1, p. 4). Actual waste handling practices that occurred at the plant are largely unknown but areas of the yard were reported to be designated for waste storage. Concrete bins were used to separate and store tar, and oils were kept in aboveground tanks. Leaks or spills associated with these waste units are unknown. Wastes were also reported to be disposed of on site in several unlined pits. Poor grade tar and spent oil were most likely dumped on site. Evidence of this has reportedly been observed in the center of the property where the coal and coke piles were located (Ref. No. 1, p. 12). During an NUS Corp. Region 2 FIT off-site reconnaissance conducted on May 18, 1990, no evidence of waste or waste pits could be seen (Ref. No. 2). These pits have been reported to be underlain by relatively impermeable clay; test hole and test pit logs indicate the presence of wastes, including tar, clinker, coal, ash, and coke, underlain by layers of clay and silt (Ref. No. 6). No remedial action has been taken except for filtration of storm water runoff.

The manufacturing plant and most of the buildings were removed from the site in 1978 (Ref. No. 1, p. 12). The remaining potential hazardous substance sources in current use on site include two expandable gas holders, a liquified natural gas (LNG) storage tank, and an unused oil tank (Ref. Nos. 1, p. 12; 2). During the NUS Corp. Region 2 FIT off-site reconnaissance an earthen berm approximately 15 feet in height was noted around the LNG tank. Also, during the reconnaissance, a berm was noted around the unused oil tank (Ref. No. 2). An aerial photo of the area from 1940 shows this berm to have been in existence at that time (Ref. No. 3). The present condition of the oil tank and when its use was discontinued is unknown. The exact quantity of waste deposited on site, as well as the size or capacity of various smaller tanks and pits that currently exist or formerly existed on site, is unknown (Ref. Nos. 1, 2, 3).

PART III: PRE-EXISTENT ANALYTICAL DATA

There are no known pre-existent analytical results available for the Elizabeth Coal Gas Site #1. During the NUS Corp. Region 2 FIT off-site reconnaissance, three monitoring wells were noted on site. There are no known data available for these monitoring wells.

PART IV: SITE INSPECTION SAMPLE RESULTS

NUS Corporation Region 2 FIT did not conduct a sampling site inspection at the Elizabeth Coal Gas Site #1.

PART V: HAZARD ASSESSMENT

GROUNDWATER ROUTE

1. **Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

It has been reported that poor quality tars and oils have been deposited in unlined pits on site in the past. Test hole and test pit logs confirm the presence of buried gasification wastes. These waste pits present a high potential for groundwater contamination since contaminants could leach through the soil to groundwater. The actual amount of waste deposited and the contaminants contained in the waste is unknown. Suspected contaminants include pyrene, anthracene, and other PAHs.

There is little potential for release to groundwater to occur from existing operations on site. The site is used for gas storage and distribution and is no longer used for manufacturing. There have been no reported releases from any of the existing tanks or gas holders.

Ref. Nos. 1, pp. 4, 12; 2; 6

2. **Describe the aquifer of concern; include information such as depth, thickness, geologic composition, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

The aquifer of concern is the Passaic Formation, which was formerly known as the Brunswick Formation. The Passaic Formation is the most extensive and important aquifer in Union County. It is located from 15 to 30 feet below the ground surface in the vicinity of the site. The bedrock is composed of thin-bedded shales, mudstones, and sandstones which range in thickness from 6,000 to 8,000 feet. The permeability of shale is 10^{-7} cm/sec. Overlying a majority of the Passaic Formation is a stratum of unconsolidated glacial sediments, consisting of clay, silt, sand, gravel, and boulders. The permeability of the glacial till and silty clay is 10^{-5} to 10^{-7} cm/sec. The thickness of these sediments generally ranges from 0 to 200 feet. Groundwater within the aquifer of concern occurs along joints and fracture zones which decrease in volume with depth. The permeability of fractured shale is 10^{-3} to 10^{-5}. Pump tests indicate joints and fractures which strike parallel to the strike of the bedding (southwest to northeast) are better developed and interconnected than those which strike in other directions. Groundwater in the area exists under confined and unconfined conditions resulting in both artesian and water table conditions, respectively. The confining layers consist of silt and clay beds. There is direct regional hydraulic connection between the glacial deposits and the bedrock, and also with adjacent surface water. The local groundwater flow is presumed to be southwest toward the Elizabeth River.

Ref. Nos. 4, 5, 6, 7

3. **Is a designated sole source aquifer within 3 miles of the site?**

A sole source aquifer has not been designated within 3 miles of the site.

Ref. No. 22

4. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

On-site test pits and soil borings indicate that wastes associated with coal gasification exist at depths ranging from 1 to 8 feet. Groundwater has been observed in these soil borings and test pits to exist from 1 to greater than 15 feet beneath the site; therefore, wastes deposited on site are in contact with groundwater in the overlying strata of the Passaic Formation. The groundwater in these strata are hydraulically connected with the Passaic Formation.

Ref. No. 6

5. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?**

The permeability value for overburden sediments consisting of glacial till and silty clay is estimated to be 10^{-5} to 10^{-7} cm/sec.

Ref. No. 7

6. **What is the net precipitation for the area?**

The net annual precipitation for the area is approximately 12 inches.

Ref. No. 7

7. **Identify uses of groundwater within 3 miles of the site (i.e., private drinking source, municipal source, commercial, industrial, irrigation, unusable).**

Groundwater within 3 miles of the site is used only for commercial and industrial purposes. There are no known wells used for drinking or irrigation purposes within 3 miles of the site. All wells that exist within 3 miles of the site are reported to be closed.

Ref. Nos. 8-12, 17, 21

8. **What is the distance to and depth of the nearest well that is currently used for drinking or irrigation purposes?**

There are no known wells currently used for drinking or irrigation purposes within 3 miles of the site. All wells that do exist within 3 miles of the site have been reported to be closed.

Ref. Nos. 8-12, 17, 21

9. **Identify the population served by the aquifer of concern within a 3-mile radius of the site.**

There are no people known to be served by the aquifer of concern within 3 miles of the site. All public supply water is supplied by the Elizabethtown Water Company and the City of Newark Water Department. These utilities receive water from reservoirs outside the 3-mile radius of the site.

Ref. Nos. 8-12, 17, 21

SURFACE WATER ROUTE

10. **Describe the likelihood of a release of contaminant(s) to surface water as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminants to the facility.**

There is potential for a release of contaminants to surface water in runoff from the facility to have occurred as a result of past coal gas production. Coke and coal were stored in piles on site. Ammonia liquor, a waste product of coal gasification, was generally disposed of prior to 1950 by mixing with cooling water and discharging to the nearest waterway. It is also possible that oils and tar leaked or were spilled on to the ground surface and subsequently migrated to the Elizabeth River via surface runoff. It is reported that the U.S. Army Corps of Engineers built a 12 to 15 foot high embankment between the river and the site. It is unknown if this embankment prevents runoff migration from the site. Storm drains in the area do not discharge directly to surface water. Stormwater runoff is discharged to the sanitary sewer and subsequently treated. Presently, stormwater runoff is reported to be filtered before it leaves the site.

There have been no reported releases of contaminants to surface water. However, groundwater is presumed to flow to, and be in direct hydraulic connection with, the Elizabeth River. Wastes deposited on site are known to be in contact with groundwater underlying the site. Therefore, there is a potential for a release of contaminants to surface water through groundwater.

Ref. Nos. 1, pp. 4, 12, 19; 2; 6; 19

11. **Identify and locate the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.**

The Elizabeth River creates the southwest boundary of the site. This is the nearest downslope surface water. There is significant tidal influence on the river at this point. It is reported that the U.S. Army Corps of Engineers built a 12 to 15 foot high embankment between the river and the site. It is unknown if this embankment prevents runoff migration from the site. Storm drains in the area do not discharge directly to surface water and stormwater is reported to be filtered before it leaves the site. The Elizabeth River joins the Arthur Kill within 1 mile of the site.

Ref. Nos. 1, p. 13; 2; 13; 19

12. **What is the facility slope in percent? (Facility slope is measured from the highest point of deposited hazardous waste to the most downhill point of the waste area or to where contamination is detected.)**

The facility slope is less than 3 percent.

Ref. Nos. 2, 13

13. **What is the slope of the intervening terrain in percent? (Intervening terrain slope is measured from the most downhill point of the waste area to the probable point of entry to surface water.)**

The Elizabeth River borders the site to the southwest; therefore, the site is in contact with surface water.

Ref. Nos. 2, 13

14. **What is the 1-year 24-hour rainfall?**

The 1-year 24-hour rainfall for the region is approximately 2.75 inches.

Ref. No. 7

15. **What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.**

The Elizabeth River, which is in contact with the site at its southwest boundary, is less than 1,000 feet from suspected waste source areas.

Ref. Nos. 2, 13

16. **Identify uses of surface waters within 3 miles downstream of the site (i.e., drinking, irrigation, recreation, commercial, industrial, not used).**

The Elizabeth River and the Arthur Kill are both classified as SE3 waterways in the vicinity of the site. Designated uses include secondary contact recreation, maintenance and migration of food populations, migration of diadromous fish, maintenance of wildlife, and any other reasonable uses.

Ref. No. 14

17. **Describe any wetlands, greater than 5 acres in area, within 2 miles downstream of the site. Include whether it is a freshwater or coastal wetland.**

A tidally influenced coastal wetland just over 5 acres in area is located approximately 0.25 mile downstream of the site. The wetland is classified as an emergent, intertidal, estuarine wetland.

Ref. Nos. 13, 15

18. **Describe any critical habitats of federally listed endangered species within 2 miles of the site along the migration path.**

There are no critical habitats of federally listed endangered species located within 2 miles of the site.

Ref. No. 16

19. **What is the distance to the nearest sensitive environment along or contiguous to the migration path (if any exist within 2 miles)?**

A 5-acre tidally influenced coastal wetland is located approximately 0.25 mile downstream of the site. This wetland is classified as an emergent, intertidal, estuarine wetland.

Ref. Nos. 13, 15

20. **Identify the population served or acres of food crops irrigated by surface water intakes within 3 miles downstream of the site and the distance to the intake(s).**

There are no known surface water intakes used for drinking or irrigation within 3 miles downstream of the site. All public supply water is supplied by the Elizabethtown Water Company and the City of Newark Water Department. Both of these use reservoirs located outside the 3-mile radius of the site.

Ref. Nos. 8-12, 17

21. **What is the state water quality classification of the water body of concern?**

The Elizabeth River and the Arthur Kill are both classified as SE3 waterways in the vicinity of the site.

Ref. No. 14

22. **Describe any apparent biota contamination that is attributable to the site.**

No apparent biota contamination was observed during the NUS Corp. Region 2 FIT off-site reconnaissance conducted on May 18, 1990.

Ref. No. 2

AIR ROUTE

23. **Describe the likelihood of a release of contaminant(s) to the air as follows: observed, alleged, potential, none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

There is low potential for a release of contaminants to air. The site is presently used as a system dispatch center, and for storage and distribution of winter peaking supplies of liquified natural gas (LNG) and propane. It is no longer used for manufacturing. The unlined pits used for waste disposal in the past are reported to be buried on site. During the NUS Corp. Region 2 FIT off-site reconnaissance all tanks on site, with the exception of the unused oil tank, were observed to be well maintained. There have been no reported releases to air associated with the facility.

Ref. Nos. 1, 2

24. **What is the population within a 4-mile radius of the site?**

The population within a 4-mile radius of the site is approximately 272,000.

Ref. No. 18

FIRE AND EXPLOSION

25. **Describe the potential for a fire or explosion to occur with respect to the hazardous substance(s) known or suspected to be present on site. Identify the hazardous substance(s) and the method of storage or containment associated with each.**

The potential for a fire or explosion to occur with respect to hazardous substances suspected to be present at the facility is low. The unlined pits that were used for prior waste disposal are reported to be buried on site. During the NUS Corp. Region 2 FIT off-site reconnaissance all tanks on site, with the exception of the unused oil tank, were observed to be well maintained. There have been no fires or explosions known to have occurred at the site.

Ref. Nos. 1, 2

26. **What is the population within a 2-mile radius of the hazardous substance(s) at the facility?**

The population within a 2-mile radius of the site is approximately 74,200.

Ref. No. 18

DIRECT CONTACT/ON-SITE EXPOSURE

27. **Describe the potential for direct contact with hazardous substance(s) stored in any of the waste units on site or deposited in on-site soils. Identify the hazardous substance(s) and the accessibility of the waste unit.**

    There is little potential for direct contact with the hazardous substances possibly deposited in on-site soils. The site is completely surrounded by an 8-foot barbed wire fence. There is a 24-hour guard on duty, and plant personnel monitor a closed circuit television scan of the plant entrance. Wastes deposited on site are reported to be buried in unlined pits and the yard is mostly covered by crushed stone and fill. During the NUS Corp. Region 2 FIT off-site reconnaissance no wastes associated with coal gasification were observed on site.

    Ref. Nos. 1, 2

28. **How many residents live on a property whose boundaries encompass any part of an area contaminated by the site?**

    There are no residential properties whose boundaries encompass any part of an area contaminated by the site.

    Ref. Nos. 2, 13

29. **What is the population within a 1-mile radius of the site?**

    The population within a 1-mile radius of the site is approximately 32,300.

    Ref. No. 18

PART VII: SITE SUMMARY AND RECOMMENDATIONS

The Elizabeth Coal Gas Site #1 is an active facility located on 3rd Avenue in Elizabeth, New Jersey. The site is comprised of approximately 25 acres which are presently used for gas storage and transfer as well as a computer center and an industrial field operations base.

The site has been owned and operated by Elizabethtown Gas Light Company since 1857. From 1857 to 1911 the facility was used to manufacture coal gas. From approximately 1912 to 1952 carbureted water gas was produced on the site daily, and for peak shaving only from 1952 to 1971 (Ref. No. 20). The manufacturing plant and most of the buildings were removed from the site in 1978. Approximately half of the original site has been sold and is now used by a trucking company. Aerial photographs from 1940 suggest that this half of the site was not used in the coal gasification process. The remaining structures are used primarily for gas mixing, distribution and storage.

Actual waste handling practices used at the plant during the time of coal gas production are largely unknown. It is known, however, that areas of the yard were designated for waste storage. Coal and coke were stored in large piles in the center of the property. Concrete bins were used to separate and store tars, and other oils were kept in aboveground tanks. Tars were removed from the site and sold to asphalt companies and a refinery. Materials which were not marketable, such as poor quality tars and oils, were probably deposited on site in unlined pits. There is reported evidence of these products in the center of the property. It was believed, during the time of gas production, that the coal and coke piles would act as a filter on these waste materials (Ref. No. 1, p. 12). Test pit logs from 1973 and soil boring logs from 1980 indicate that wastes associated with coal gasification have been deposited in on-site soils (Ref. No. 6). Because the material is believed to be underlain by a layer of relatively impermeable clay, no remedial action has been reported to have occurred at the site with the exception of filtration of stormwater runoff (Ref. No. 1, p. 13).

The site is completely surrounded with a barbed wire fence. There is a guard on duty 24 hours a day and plant personnel monitor a closed circuit television scan of the plant's main entrance. There is no known source of potable water supply within 3 miles of the site. Groundwater within 3 miles is not used for drinking or irrigation and there are no known surface water intakes within 3 miles downstream of the site. Storm drains in the area do not discharge directly to surface water. No exposed wastes were observed to be present on the site and no actual hazardous conditions have been documented. The facility no longer manufactures gas and is used only for gas storage and distribution. For the reasons mentioned above, a recommendation of **NO FURTHER REMEDIAL ACTION PLANNED** under CERCLA/SARA is given for the Elizabeth Coal Gas Site #1.

Elizabethtown Gas

One Elizabethtown Plaza
PO Box 3175
Union, New Jersey 07083

908 289 5000 phone
www.elizabethtowngas.com

FEB - 1 2007

January 30, 2007

CERTIFIED MAIL
RETURN RECEIPT REQUETSED
Mr. Raymond Pinkstone
New Jersey Department of
Environmental Protection
Bureau of Case Management
401 East State Street, CN 028
Trenton, New Jersey 08625-0028

Re: Erie Street Former Manufactured Gas Plant Site
Elizabeth, Union County, New Jersey

Dear Mr. Pinkstone:

Enclosed for you information is a project summary prepared by GEI Consultants (GEI), dated January 25, 2007, which documents the actions taken to date regarding the flow of impacted storm water from the above referenced site. We are currently moving forward with scheduling the additional activities recommended by GEI in the recommendation section of the summary. I will keep you informed of these actions as they are implemented. Please contact me at (908) 662-8205 if you should have any questions or require additional information.

Very truly yours,

Steven L. Cook
Senior Environmental
Specialist

ENCLOSURE
xc: T. Goodson
File

BBA000016

TIERRA-B-017591

GEI Consultants

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Suite 306
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Ph. (856) 910-9750
Fax (856) 910-9751

Memorandum

To: Steven Cook, *Project Manager, AGL Resources*

From: Christopher Dailey, P.E., *GEI Consultants, Inc.*

Subject: Project Summary for Water Drainage Issue
Drainage Basin and Outlet to Elizabeth River
Erie Street Former MGP Site
Elizabeth, New Jersey

Date: January 25, 2007

The purpose of this memorandum is to document efforts taken to stop the flow of impacted stormwater entering the Elizabeth River from the site and document current site conditions. As you know, GEI confirmed a discharge of impacted stormwater to the Elizabeth River with laboratory analytical results that reported a benzene concentration of 8.1 parts per billion (ppb), collected below an outfall that collects stormwater drainage from the property. The source of this stormwater discharge was a drainage basin located in the upper reaches of a swale that runs between the property boundary and the flood control berm that lines the Elizabeth River. The swale runs the length of the Elizabeth River from the Conrail Lines in the northwest portion of the property to the inlet to the Arthur Kill located approximately ½ mile to the southeast. Stormwater flow from the upper reaches of the swale between the Conrail line and approximately the northern third of the back portion of the property appear to drain into the swale before the water enters the drainage basin and the outlet to the Elizabeth River. A stormwater collection system is also located on the back portion of the property which is believed to lead into the drainage basin; however, the site drainage system has been closed off for some time and is believed to have been abandoned.

Our original efforts to stop the flow of water entering the river were focused on closing the valve located on top of the flood control berm between the stormwater collection basin in the swale and the outlet. This valve is owned by the City of Elizabeth however it is maintained under contract by E'town Services, LLC, an affiliate of New Jersey American Water. Elizabethtown Gas (ETG) met with a supervisor from E'town Services at the site to discuss concerns over potential flood impacts by closing the valve and to visually inspect the valve. It was determined that due to its age and lack of maintenance, the valve was not functional and that, even it could be made functional, it would not be effective in stopping the flow of stormwwater from entering the outfall from the drainage basin.

Activities Conducted

In an attempt to control the flow of impacted stormwater in the swale, ETG directed an environmental contractor, Veolia Environmental Services (Veolia), to clean out the offsite drainage swale which appeared to be backed up with stagnant water and sediment. Veolia began swale cleanout operations on January 2, 2007. Veolia pumped out stagnate water from the swale near the drainage basin which resulted in stopping the discharge to the drainage basin and the river. Approximately 15,000 gallons of water were pumped out of the swale into tanker trucks for offsite treatment and disposal. GEI inspected the outlet and the Elizabeth River on January 3, 2007 and confirmed that the flow of water to the outlet from the basin had stopped. At that time, no visible signs of impacts to the river were observed. Because flow was stopped at the basin and no continuing flow was observed at the outlet, it was determined that the water leaving the drainage swale and entering the basin is the primary source of stormwater flow that was observed leaving the outlet.

Once the flow of water leading into the offsite drainage basin from the swale had been stopped, Veolia continued to clean out the swale using a vactor truck to remove any remaining standing water and sediment that has accumulated in the swale. During this process approximately 50 foot sections of the swale were diked off to prevent the further spread of impacted water and sediments and any sediments or debris encountered in the trench were removed and staged on the property before disposal. The entire length of the swale between the property boundary and the flood control berm was cleaned using this approach. A total of approximately 48 cubic yards of sediments and debris were removed from the bottom and sides of the swale for offsite treatment and disposal. An inspection of the swale reveled that it was lined with asphalt and that the asphalt was deteriorated in some areas. Subsequent to cleaning out the swale, a berm was constructed along the length of the property line from the drainage basin to the southeast property boundary with pigs and gravel. This berm replaced an existing berm that had become deteriorated. The purpose of the new berm is to stop any surface flow of stormwater from entering the swale and drainage basin. In addition, sorbent material was placed around the basin itself to prevent any product from entering the basin.

GEI inspected the progress of this operation on January 5, 2007 and confirmed that no flow of water to the outlet was occurring and that no visible signs of MGP impacts were observed along the portions of the drainage swale that had been cleaned. It was observed that stormwater flow along the swale appeared to flow toward the drainage basin on the northwest corner of the property for the upper 1/3 of the swale with the remainder 2/3 of the swale draining to a low area located south of the property at the end of Second Street. A slight sheen was observed in the collection area to the south of the property, however, it is unknown if the sheen was related to the site. It appears that the swale to the south of the site property boundary is also backed up with sediment and debris from Second Street and Bilkays Express.

During the week of January 8^{th}, Veolia continued work on the swale until a significant rainfall event occurred on January 10, 2007 and continued through the remainder of the week. During this time, a slow but steady flow of rainwater was observed entering the drainage basin from the swale. Water flow to the outlet to the Elizabeth River had resumed at a 1-2 gallon per minute (gpm) rate. While rainwater was collecting in the swale, no surface flow was observed entering the trench over the berms that were constructed on the property and no visual evidence of MGP impacts was observed in the swale, the drainage basin or the Elizabeth River outlet.

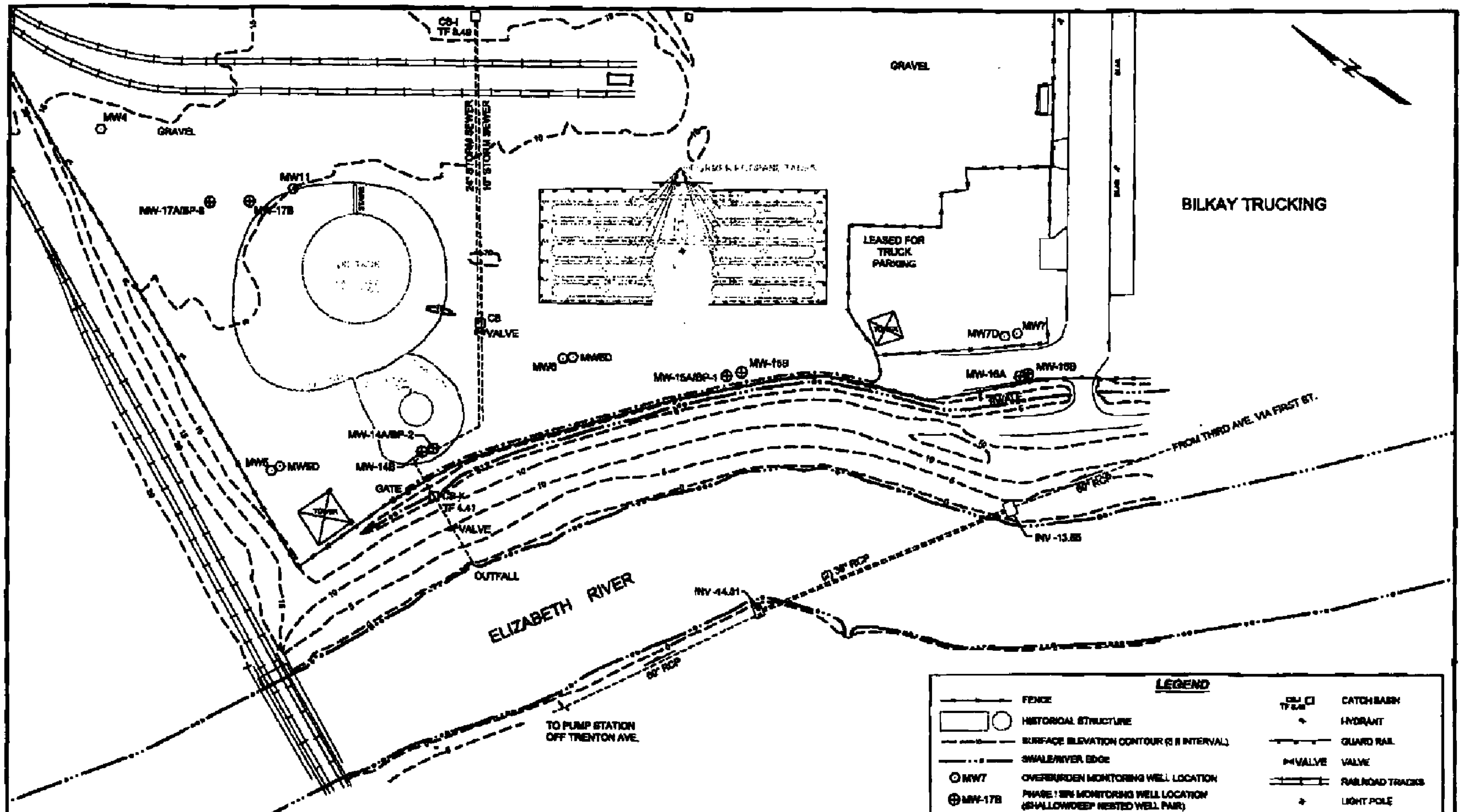
The following Monday, January 15, 2007, subsequent to a prolonged period of rain, GEI entered the property to inspect the swale and sample the water coming from the outlet to the Elizabeth River. Upon inspecting the swale, a sheen was observed in the swale along the length of the property. The sheen may have been associated with Veolia's operation of heavy equipment during the construction of the berm and regarding of the site area adjacent to the swale during wet weather earlier that day, as no sheen was observed the week before. Although water was entering the drainage basin from the swale, the sorbent material placed around the drainage basin appeared to be stopping product from entering the river. An inspection of the drainage outlet reveled that the river was under high tide and the outlet was submerged at the time of the inspection. To assess the contaminant levels entering the outlet, GEI collected a sample of water entering the drainage basin and sent the sample to IAL Analytical Laboratory for VO+10 analyses. Analytical results of this sampling event revealed that concentrations of benzene were reported at 6.73 ppb which is below the initial sampling results of 8.1 ppb, but still above the surface water standard for saline water of 3.3 ppb.

Recommendations

While the actions taken to date have controlled the drainage of water from the swale into the basin and subsequently into the river during dry conditions, there remains the potential for an impacted stormwater discharge from the swale to the river during heavy or prolonged rain events. In order to control the discharge to the river from the outlet during periods of heavy or prolonged rain, the drainage outlet would need to be closed off entirely and the swale dammed up to the south to prevent the flow of impacted water from continuing to drain to the south towards the Bilkay's Express property. This has the potential to cause drainage problems in the back portion of the property. Therefore, before the outlet is blocked, GEI recommends that the back portion of the property be surveyed and that groundwater flow be monitored to predict the effects of blocking off the outlet and damming the swale. Once the outlet is blocked, rainfall, drainage and surface and groundwater conditions on the back portion of the property should be monitored closely. If the drainage area served by the outlet is adversely impacted by flooding, then GEI will work with ETG to develop options for handling stormwater discharges on the property to prevent flooding.

ATTACHMENT A

Site Plan



SOURCES:

1. BASE MAP FROM ERIE STREET FORMER MGP SITE - ELIZABETH, NEW JERSEY - ELIZABETHTOWN GAS CO. DATE: [illegible] BY DAMES & MOORE, INC. CRANFORD, NEW JERSEY.
2. BRICK SEWER AND 60" RCP INFORMATION TAKEN FROM A PLAN ENTITLED "ELIZABETH SEWERAGE PLANS SECTION N-9", DATED APRIL 1921 AND REVISED JUNE 19[illegible].
3. FLUSHING MODULE INFORMATION TAKEN FROM A PLAN ENTITLED "OVERFLOW POLLUTION ABATEMENT PROGRAM - INITIAL PHASE - FLUSHING AND STORAGE MODULES", CONTACT 21, RECORD DRAWING 3, AS-BUILT [illegible].

ERIE STREET FORMER MGP SITE ELIZABETH, NEW JERSEY	GEI Consultants	SITE LAYOUT
NUI ELIZABETHTOWN GAS	Project 064770-1140	January 2007 — Figure 1

ATTACHMENT B

GEI Field Notes

8

12.5.2006 WEATHER LOW 40's CLOUDY

ELLIS ST. RIVER INSPECTION

14^{00} ONSITE

14^{20} WALK (ALONG) AROUND RIVER BANK
(BASED ON SALTWATERTIDES.COM)
AT 14^{52} LOWTIDE, -0.7 (HEIGHT IN FT)
MOON VISIBILITY 99%

14^{30} NOTICE BERM AREA NEAR FLOODGATE
CUT TREES, SHRUBS/HIGH GRASS CLIPPED.

14^{45} Photo documentation along river.
Noticed some sort of sheen in front of FLOODGATE. (Organic, Petroleum ?)

- ALSO FOR THE 1st time NOTICED WATER FLOWING FROM FLOODGATE INTO THE RIVER.

15^{25} OFFSITE

9

12.6.2006 WEATHER MID 40's CLOUDY

14^{00} ONSITE (SERKEN)
CHRIS BAILEY (GZI)
STEVE COOK (AGL)

INSPECTING RIVER, SOURCE OF SHEEN (POSSIBLY)
INSPECTING BOTH SIDES OF BERM.
(PHOTO DOCUMENTATION)

14^{30} GSI CONDUCTED NJDEP SHEEN TEST.
NO SHEEN IS EVIDENT.
- NO EVIDENCE OF ANY SHEEN VISIBLE IN AREA OF FLOODGATE. (VISUALLY)

15^{00} COLLECT SURFACE WATER SAMPLE FROM LOCATION DOWNSTREAM OF FLOODGATE & SITE.

15^{15} COLLECT SURFACE WATER SAMPLES FROM IN FRONT OF OUTFALL (FLOOD GATE)
- SAMPLES FOR VOC'S, SVOC'S

12 · 6 · 2006

15[40] inspected area of drain ~~near~~ other side of floodgate (over berm near the sites fenceline)

15[50] setup temporary measurement around drain. ~~The present is not~~

16[15] offsite

12 · 6 · 06

- Based on inspection along ditch adjacent to site similar sheens observed were organic, scum-like, & possibly mix of sewage-like.

- Based on discussion with S. Cook (AGL), Mike Redding (AEL), C. Daily (GSI)

Mike Redding stated that ditch area was sampled previously. The results came back with no detection of contaminants.

12.21.2006 WEATHER: CLOUDY MID 40's

14^{15} ONSITE
w/ RAY (AGL)

INSPECTING FLOW RATE OF WATER FROM OUTFALL TO RIVER.
- APPROXIMATELY 0.5 - 1.0 gallon per min

14^{45} VEOLIA ENV. ONSITE
STEVE COOK (AGL ONSITE

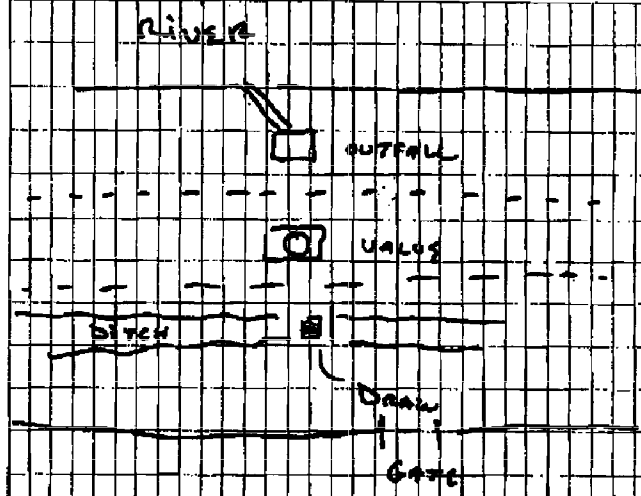
- The plan is to pump out dry the ditch & remove sediment.

- Steve Cook will DISCUSS WITH THE CITY ABOUT CLOSING THE VALVE.

(Photo-document observed)

-16^{15} OFFSITE

12.21.2006



- NOT TO SCALE -

1/3/2007 WEATHER CLOUDY MID 40s?

ONSITE 13[30]

VEOLIA ENV. ONSITE ALREADY

Berming soil inside fencing & removing pigs (previously installed) along fencing to absorb any contaminants going North.

- Transfer 32 cu yards of soil sedim & removed from ditch.

- 5K-gallon truck pumped water from ditch

Approximately from drain 200' of the ditch has been cleaned.

- OBSERVED CLEAR AREAS (Photodocumented)

14[15] Steve Cook ONSITE
OPEN GATE WALK AROUND SITE.

15[00] OFFSITE

1/5/2007 WEATHER 40's CLOUDY Rainy

13[30] ONSITE

- INSPECT DITCH DURING RAIN EVENT
- VEOLIA ENV. NOT WORKING TODAY

Ditch Vacuumed areas, look clean & faint odors.

- Photodocumented along ditch

14[30] INSPECT OUTFALL LOCATED AT adjacent property.

observed visually a sheen near outfall and moderate odors.

15[30] Offsite

1/15/07 Cloudy 40s

1415 Chris Dailey arrived on-site and met Steven Cook with ETG

1430 Inspected drainage swale with Steven Cook. A light sheen of product was observed in the swale and the swale was full of water and emptying into the drainage basin. Continued the inspection of the swale along the property boundary. Visible impacts observed.

14:55 Inspected drainage basin and outlet to the Elizabeth River. Basin was filling with water from both the swale and tides in the river. The outlet along the river was submerged, but discolored water was observed leaving the outlet. No sheen

1/15/07

was observed along the river banks

15:10 The berm that was constructed on the property was inspected and appeared to be containing any surface water flow.

1520 A sample was collected of the water that was collecting in the drainage basin located in the swale and was labled SW-1.

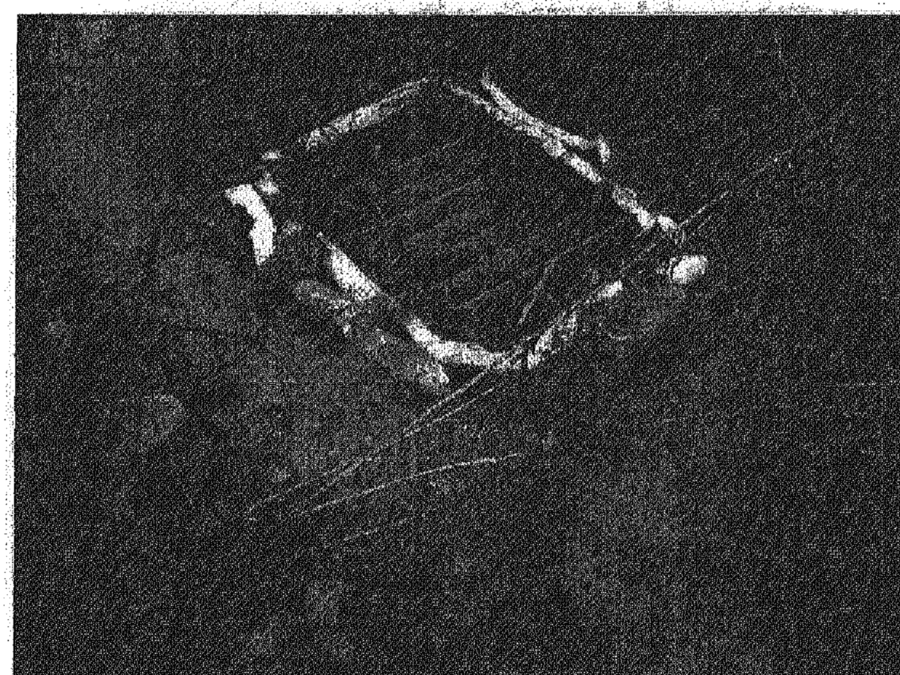
1600 Went offsite and inspected drainage at the end of Second Street. Visual impacts observed.

1610 Chris Dailey Left Site

ATTACHMENT C

Photographs

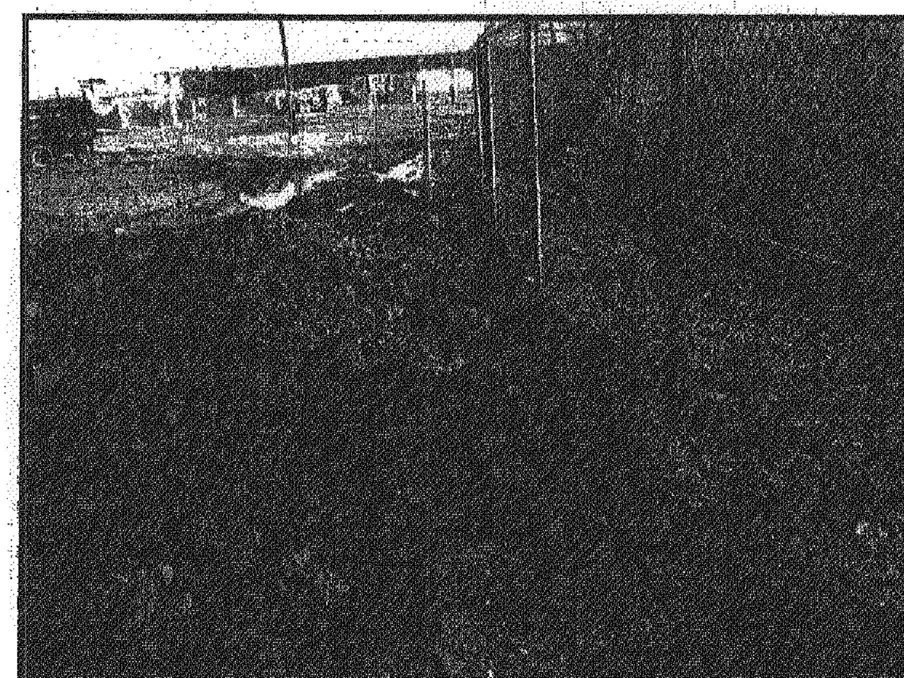
PHOTOGRAPH 1
12/21/06 – Photo of drainage outlet into Elizabeth River.



PHOTOGRAPH 2
12/21/06 – Photo of drainage basin that leads to river outfall.

ETG/ERE ST/STORM SEWER INVESTIGATION/PHOTOS.PPT

PHOTOGRAPH 3
1/3/07- Drainage swale pumped out stopping flow into river.



PHOTOGRAPH 4
1/3/07 – Surface area inside property leading towards trench.

ETG/ERIE ST/STORM SEWER INVESTIGATION/PHOTOS.PPT

PHOTOGRAPH 5
1/5/07 – Outlet to Elizabeth River, No flow observed.

PHOTOGRAPH 6
1/5/07 - Drainage basin no water observed flowing toward basin.

ETG/ERIE ST/STORM SEWER INVESTIGATION/PHOTOS.PPT

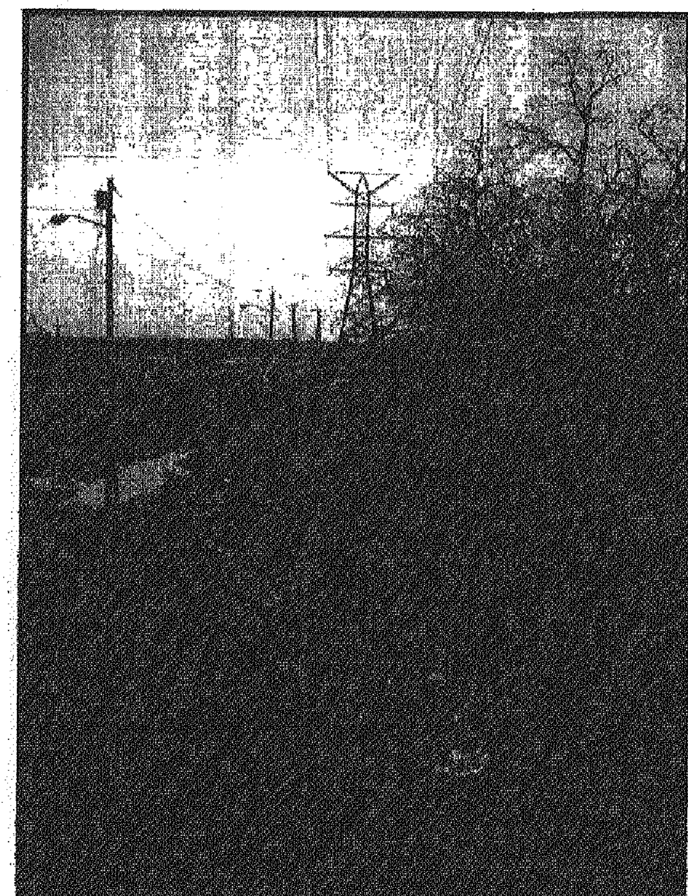
PHOTOGRAPH 7

1/5/07 – Drained swale leading to basin. Sediment build up identified in bottom of trench.

ETG/ERIE ST/STORM SEWER INVESTIGATION/PHOTOS.PPT

PHOTOGRAPH 8

1/5/07 - Drainage swale in areas where sediment is being removed.



PHOTOGRAPH 9

1/5/07 – Area along fence line bermed to prevent surface water flow from entering the drainage swale.

PHOTOGRAPH 10

1/15//07 – Water leading to drainage basin. Slight sheen observed on water. Discharge into basin ~ 1 gpm.

ETG\ERIE 31\STORM SEWER INVESTIGATON\PHOTOS.PPT

PHOTOGRAPH 11

1/15/07 – Drainage swale after 2-3 days of steady rain. Slight sheen observed on water.

ATTACHMENT D

Analytical Summary

INTEGRATED ANALYTICAL LABORATORIES, LLC.

SUMMARY REPORT
Client: GEI Consultants, Inc.
Project: ERIE ST MGP
Lab Case No.: E06-13471

Lab ID:	**13471-001**			**13471-002**			**00553-001**		
Client ID:	**SW-1**			**SW-2**			**SW-1**		
Location:	**Upstream**			**At Outlet**			**Drainage Basin**		
Matrix:	**Aqueous**			**Aqueous**			**Aqueous**		
Sampled Date	**12/6/06**			**12/6/06**			**1/15/07**		
PARAMETER(Units)	Conc	Q	MDL	Conc	Q	MDL	Conc	Q	MDL
Volatiles (Units)	*(ug/L-ppb)*			*(ug/L-ppb)*			*(ug/L-ppb)*		
Benzene	0.716		0.400	**8.10**		0.400	**6.73**		0.420
Trichloroethene	0.522		0.400	ND		0.400	ND		0.460
Tetrachloroethene	0.646		0.490	ND		0.490	ND		0.420
Ethylbenzene	ND		0.370	0.489		0.370	2.59		0.330
Total Xylenes	ND		0.960	ND		0.960	2.40		0.960
TOTAL VO's:	1.88			8.59			11.7		
TOTAL TIC's:	ND			25.3			34.3		
TOTAL VO's & TIC's:	1.88			33.9			46.0		
***Semivolatiles - BN (Units)**	*(ug/L-ppb)*			*(ug/L-ppb)*			*(ug/L-ppb)*		
Naphthalene	1.48		0.158	1.12		0.158	NA		
Acenaphthene	ND		0.170	1.40		0.170	NA		
Fluorene	ND		0.256	0.985		0.256	NA		
TOTAL BN'S:	1.48			3.51			NA		
TOTAL TIC's:	ND			ND			NA		
TOTAL BN'S & TIC's:	1.48			3.51			NA		

ND = Analyzed for but Not Detected at the MDL
NA = Not Analyzed
*Result from Sims Analysis
Bold results exceed standard

GEI Consultants

March 30, 2007
Project # 964770-1130

Geotechnical
Environmental and
Water Resources
Engineering

Raymond Pinkstone, Case Manager
Bureau of Case Management
New Jersey Department of Environmental Protection
PO Box 028
401 East State Street
Trenton, NJ 08625

RE: Phase I Supplemental Remedial Investigation Report
Elizabethtown Gas Company
Erie Street Former MGP Site
Elizabeth, Union County, New Jersey

Dear Mr. Pinkstone:

In accordance with the schedule provided to the New Jersey Department of Environmental Protection (NJDEP) by Elizabethtown Gas (ETG) and the Department's March 22, 2007 schedule approval letter. GEI Consultants, Inc. on behalf of our client ETG, submits the enclosed copies of the above referenced report to the NJDEP for review. We have included one complete copy of the report with Data Validation (Volume III) and 3 copies that include the main report Volume I and supporting Appendixes (Volume II). The Phase I Supplemental Remedial Investigation (Phase I Supplemental RI) Report was originally submitted to the NJDEP in May, 2001. After the report was submitted in May 2001 some discrepancies were found regarding the validation results of the analytical data. As such, certain sections of the report were corrected and those corrections were submitted to the department on January 21, 2004. The enclosed report includes all the corrected data.

To expedite your review of the report and the conditions at the Erie Street former MGP, we suggest a meeting with you to walk you through the site history and results of the Supplemental Phase I RI. In addition, we wanted to discuss issues related to the inspection and diversion of stormwater away from the Elizabeth River that is planned.

The weeks of April 16 or April 23, 2007 are good for GEI and ETG to meet with you. If this time frame is not convenient for you then let us know and we can select a better time.. If you have any questions or wish any further information in the meantime, please do not hesitate to contact myself at 856-910-9750 or Steven Cook with ETG at 908-662-8205..

Very truly yours,

GEI Consultants, Inc.

Christopher W. Dailey, P.E.
Senior Project Manager

www.geiconsultants.com

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7905 Browning Road, Suite 306, Pennsauken, New Jersey 08109
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GEI Consultants

Geotechnical
Environmental and
Water Resources
Engineering

Phase I Supplemental Remedial Investigation Report

Erie Street

Elizabeth, New Jersey

Volume I
Text, Tables, Figures, Plates

Submitted to:
NUI Elizabethtown Gas
One Elizabethtown Plaza
Union, NJ 07083-1975

Submitted by:
GEI Consultants, Inc.
455 Winding Brook Drive, Suite 201
Glastonbury, CT 06033
860-368-5300

April 27, 2001 (corrected January 21, 2004)
Project 964770-1130

Table of Contents

TABLES

Note: **Bold** indicates the table was corrected in January 2004.

FIGURES

Note: **Bold** indicates the figure was corrected in January 2004.

PLATES

APPENDICES

Note: **Bold** indicates the Plate or Appendix was corrected in January 2004.

J:\WPROC\Project\elg\ERIE-ST\PHASE1\SI Report\SI Report, corrected Jan 04-R.doc

Executive Summary

The Memorandum of Agreement (MOA) between NUI Elizabethtown Gas (ETG) and the New Jersey Department of Environmental Protection (Department) signed on June 23, 1992 requires that a remedial investigation and remedial action be conducted at the Erie Street former manufactured gas plant (MGP) site. Although several previous investigations were performed at the site, ETG contracted GEI Consultants, Inc. (GEI) to perform a Phase I Supplemental Remedial Investigation (SRI) to resolve data gaps remaining from previous investigations. This report presents historical as well as recent site investigation activities and results.

The overall objectives of the Phase I SRI are to:

- Further characterize the hydrogeologic regime at the site
- Complete delineation of surface-soil impacts or determine necessity for background surface soil evaluation.
- Complete characterization and delineation of subsurface-soil impacts
- Further characterize the nature and extent of groundwater impacts
- Investigate the Elizabeth River sediment and surface water quality in the vicinity of the site.

Hydrogeologic Regime

The hydrogeologic regime was further characterized at the site. Groundwater is present in and was evaluated in two zones in the overburden and within the shallow bedrock beneath the site. The overburden at the site was divided into A and B zones. The A zone is situated above the peat (where present) and is under unconfined conditions. The B zone is situated below the peat (where present) and is under semi-confined conditions. Groundwater elevations are consistently higher in the A zone than the B zone. Groundwater in the A zone flows southeast towards the Elizabeth River, east towards South Second Street and north towards Third Avenue. Groundwater in the B zone flows southeast towards the Elizabeth River in the southern two-thirds of the site and has a relatively flat gradient in the northern one-third of the site. Based on groundwater and surface water elevation measurements, groundwater in the overburden A and B zones appears to be connected to the Elizabeth River, however, local discharge may be impeded by the presence of steel sheet piling within

the core of the flood control berm adjacent to the site. Groundwater in the shallow bedrock is under confined conditions and flows southeast towards the Elizabeth River. Groundwater elevation in the shallow bedrock is generally less than groundwater elevation in the overburden. The degree of connection between the overburden and shallow bedrock is based on the permeability of the intervening deposits and varies widely across the site. Tidal impacts on groundwater levels are most prevalent in the shallow bedrock but are not of sufficient magnitude to affect groundwater flow direction in the overburden or shallow bedrock.

Surface-Soil Evaluation

The analytical results for surface-soil samples indicate the presence of VOCs, PAHs, and metals in excess of the NJDEP soil cleanup criteria on the site and adjacent to the site. Impacts detected adjacent to the site are typical of urban settings. Based on the distribution and magnitude of compounds detected in surface-soil samples, the surface-soil impacts associated with the site have been delineated and no further evaluation is necessary.

Subsurface-Soil Evaluation

Product (sheen, NAPL, residual product, or free product) was noted in the subsurface across the site and appears to be concentrated in the former production area in the north-northwestern portion of the site, in the vicinity of the former oil storage area in the southwestern corner of the site, and along the southern site boundary adjacent to the Elizabeth River. Product was not observed in the Elizabeth River sediments adjacent to the former MGP site. Based on NAPL surveys performed in onsite monitoring wells, the product noted in test pit, boring and monitoring well logs is not present as mobile product in significant quantities except potentially in the former oil storage area in the southwestern portion of the site.

VOCs, PAHs, and various metals are present in subsurface soils at concentrations exceeding the NJDEP soil cleanup criteria. The analytical results for subsurface-soil samples indicate that the horizontal/lateral delineation of subsurface-soil impacts is complete to the north of the site along Third Avenue and along the northern portion of South Second Street. Horizontal/lateral delineation of subsurface soil impacts has not been completed east of the site along the southern portion of South Second Street or west of the site along the Central Railroad of New Jersey. Subsurface-soil impacts are present to the southern boundary of the site however no product was noted in the river sediments adjacent to the site. Therefore, delineation of subsurface-soil impacts to the south is considered complete.

The analytical results for subsurface-soil samples indicate that subsurface soil impacts have been vertically delineated at the site. In general, subsurface-soil impacts (soils with compounds exceeding NJDEP soil cleanup criteria) are present in the fill and upper peat (or upper till where peat is absent) at the site. Subsurface-soil impacts, noted in the deeper portion of the till and/or within the upper residual soil/weathered bedrock were limited to an area adjacent to and west of the former 340,000 cf gas holder (MW-2D, MW-9D, and MW-22B), and in the vicinity of the former gas oil/oil tanks (MW-17B). Subsurface-soil delineation is considered complete at these locations since bedrock is at or within a few feet of sample intervals collected from these locations.

Groundwater Evaluation

The analytical results for shallow overburden A zone groundwater indicate that BTEX, PAHs, some metals, and cyanide are present at concentrations exceeding the NJDEP GWQC. Based on the distribution of these compounds it is apparent that impacts onsite have been delineated to the north-northeast of the site north of Third Avenue. Impacts have not been delineated to the east towards Bilkay's Trucking facility. Impacts are present along the western property boundary, however, based on the groundwater flow direction from west to east the western groundwater impacts generally are delineated. Groundwater impacts in the overburden A zone are present along the southern site boundary adjacent to the Elizabeth River. Groundwater in the overburden A zone likely discharges to the Elizabeth River, however, such discharge may be impeded by the presence of steel sheet piling within the core of the flood control berm adjacent to the site. Surface water samples collected from the Elizabeth River adjacent to the site indicate that the overburden A zone groundwater is not impacting the surface water quality in the Elizabeth River.

The analytical result for the deeper overburden B zone groundwater indicate that BTEX, PAHs, some metals, and cyanide are present at concentrations exceeding the NJDEP GWQC but are not as widespread as those in the overburden A zone. Based on the distribution of these compounds, groundwater impacts in the overburden B zone are delineated to the north and east of the site except for the presence of various metals and cyanide. Groundwater impacts are present along the western property boundary however based on the groundwater flow direction the western impacts are generally delineated. One well adjacent to the river contained concentrations of organics exceeding the NJDEP GWQC. Otherwise, only various metals and cyanide were detected at concentrations exceeding the NJDEP GWQC along the southern property boundary. Overburden B zone groundwater likely discharges to the Elizabeth River, however, such discharge may again be impeded by the presence of steel sheet piling within the core of the flood control berm. Surface water samples collected from the Elizabeth River adjacent to the site indicate that the overburden B zone groundwater is not impacting the surface water quality in the Elizabeth River.

The shallow bedrock groundwater analytical results indicate that VOCs, PAHs, various metals, and cyanide are present at concentrations exceeding the NJDEP GWQC. Shallow bedrock groundwater impacts are present in the vicinity of the former 340,000-cf holder and extend downgradient to MW-8D. Based on the analytical data, it does not appear that organic impacts in the shallow groundwater beneath the site extend to the southern property boundary, except possibly at MW-5D (which may have a separate source). Based on the shallow bedrock groundwater flow direction it appears that the western and northern groundwater impacts are delineated. Organic shallow bedrock groundwater impacts may extend further east of MW-8D and south of MW-5D and inorganic shallow bedrock groundwater impacts may extend further east of MW-8D and south of the Elizabeth River (MW-5D, MW-6D, and MW-7D).

Elizabeth River Sediment and Surface Water Evaluation

The Elizabeth River sediment analytical data indicate the presence of VOC, SVOCs, pesticides, PCBs, dioxin, and metals. Based on a comparison of the analytical results with NOAA ER-L and ER-M values, SVOCs, pesticides, PCBs, and metals were detected at elevated concentrations. There are no ER-L or ER-M values for VOCs, dioxin, and various metals. The distribution of the compounds detected in the Elizabeth River indicates that the Erie Street former MGP site is not the source of the compounds detected. Rather, the data clearly illustrate the conclusions stated in the Elizabeth River Sediment Evaluation (Appendix G of the September 27, 1999 SRIWP), that the Elizabeth River has drained a highly industrial area for over a century that has impacted sediments, and that there were and are many potential sources of impacts to sediment in the Elizabeth River, based on historical and current land use along the Elizabeth River and surrounding water bodies. This is further illustrated by the detection of compounds such as chlorinated VOCs, pesticides, PCBs, dioxin, and some metals in river sediments that are not present at the Erie Street former MGP site. Therefore, evaluation of the impact of the Erie Street former MGP site on the Elizabeth River sediments is considered complete.

Analytical results for surface water samples collected from the Elizabeth River indicate that no compounds were detected above the SE-3 SWQC in any of the surface water samples collected except for the furthest downstream sample collected at SW-1 (Transect 1). The surface water sample collected at SW-1 contained concentrations of arsenic and thallium that exceeded the SW-3 SWQC standards. The analytical results do not indicate a trend in the surface water quality along the section of the river evaluated and do not indicate that the former MGP site is impacting the surface water quality of the Elizabeth River.

Based on the findings of the Phase I SRI and previous investigations, additional remedial investigation work is recommended to complete the remedial investigation of the site. This work includes:

Additional subsurface soil and groundwater impact delineation as listed below:

- Subsurface soil to the west along the rail line and to the east of South Second Street.
- Overburden A and B zone groundwater to the east of South Second Street.
- Shallow bedrock groundwater to the east of South Second Street and south of the Elizabeth River.

An additional offsite-upgradient shallow bedrock monitoring well is recommended to evaluate background shallow bedrock groundwater quality in the site vicinity.

Based on groundwater hydrology and groundwater quality data obtained during the Phase I SRI, it is also recommended that previous investigation monitoring wells MW-4, MW-5, MW-6, MW-7, MW-9, MW-10, MW-12, and BP-3 be abandoned to prevent further potential cross-contamination between the overburden A and B zones and to provide better hydraulic information. Additionally, monitoring wells MW-11 and MW-13 can be abandoned as overburdened wells were installed in their vicinity during the Phase I SRI.

It is recommended that the two production wells be abandoned when the monitoring wells are abandoned.

1. Introduction

NUI Elizabethtown Gas (ETG) entered into a Memorandum of Agreement (MOA) with the New Jersey Department of Environmental Protection (the Department) on June 23, 1992. The MOA required that a remedial investigation and remedial action be conducted at the Erie Street former manufactured gas plant (MGP) site. Numerous investigations were previously completed at the site; however, data gaps remained. ETG contracted GEI Consultants, Inc. (GEI) to perform a Phase I Supplemental Remedial Investigation (SRI) to resolve data gaps at the Erie Street former MGP Site.

This Phase I SRI report presents historical as well as recent site investigation activities and results. The recent site investigation activities are a result of implementing the Phase I SRI Work Plan (SRIWP) that was developed by ETG and GEI, working with the Department. The Phase I SRIWP development began after a meeting with the Department, held on November 20, 1996, to discuss the next phase of work to be performed for the site. ETG developed a draft Phase I SRIWP, based on discussions in the November 20, 1996 meeting, and submitted the Phase I SRIWP to the Department on January 13, 1997. ETG received comments on the Phase I SRIWP from the Department in June 1997. In general, the Department's June 1997 comments dealt with dividing the site into areas of concern (AOCs), additional sampling for horizontal and vertical delineation of soil, dense nonaqueous phase liquid (DNAPL) investigation and delineation, Elizabeth River investigation, and off-site delineation issues. ETG responded to the Department's comments with a response letter dated August 19, 1997. ETG's response stated that they considered the site to be one AOC, based on previous sampling results, and that there was no technical basis for dividing the site into AOCs at the time. ETG's position on off-site surface-soil sampling, as discussed in the November 20, 1996 meeting, was one of concern that off-site sampling may produce results that are not indicative of site impacts, but are impacts from diffuse anthropogenic sources. The Department suggested a background soil evaluation and ETG presented a scope for the background soil evaluation in the revised January 1997 Phase I SRIWP. ETG stated that the proposed work plan included adequate sampling to delineate horizontal and vertical delineation of site impacts and to evaluate DNAPL. Finally, ETG expressed concern that sampling of sediment in the Elizabeth River would not be representative of the Erie Street site impacts and provided historical information to support this concern in the January 1997 Phase I SRIWP.

On December 11, 1997, an unscheduled meeting was held on the Erie Street former MGP site with Matt Turner (the Department case manager at the time), and discussions were held regarding ETG's response to the Department's comments on the January 13, 1997 Phase I SRIWP. The discussions centered on site groundwater investigations, off-site surface-soil sampling, dividing the site into AOCs, and river investigations. As a result of this meeting, ETG submitted a letter to the Department, dated December 30, 1997, that re-emphasized ETG's position on these specific issues. ETG received a comment letter from the Department dated February 20, 1998 responding to ETG's August 19, 1997 letter. The Department's comments focused on developing AOCs, off-site soil sampling, DNAPL investigations, and river investigations. ETG responded with a letter to the Department on March 10, 1998, restating the rationale for their positions and requesting a meeting to resolve these issues. Although ETG strongly disagreed with the approach, they decided to divide the site into AOCs to allow the on-site investigation to proceed.

On March 24, 1998, a meeting was held among ETG, the Department, and GEI to discuss the issues presented above. ETG submitted a letter, dated April 13, 1998, stating that they would resubmit the revised Phase I SRIWP to the Department on or about May 8, 1998. ETG transmitted the revised Phase I SRIWP to the Department on May 7, 1998. The Department provided comments on the May 7, 1998 Phase I SRIWP to ETG via a comment letter dated November 20, 1998. The Department conditionally accepted the Phase I SRIWP pending the addition of a river investigation and additional on-site soil characterization sampling and analysis (in addition to visual inspection). There were also several new comments that had not been discussed in previous meetings or correspondence, such as analyzing soil samples for total petroleum hydrocarbons (TPH).

ETG provided a response letter, dated March 23, 1999, to the Department's November 28, 1998 comment letter, including clarification of the plan to visually delineate product and analyze soil samples collected below impacts to verify vertical extent as discussed in the March 24, 1998 meeting; the rationale for not analyzing soil samples for TPH; and amendment of the work plan to include Elizabeth River sediment and surface water sampling. ETG included revisions and corrections to the May 7, 1998 Phase I SRIWP as attachments to the comment letter, rather than reissuing four volumes of the Phase I SRIWP. The letter concluded with ETG providing the Department with written notice that they intended to initiate the field program on or about April 26, 1999. On April 16, 1999, ETG contacted the Department as notification that the field work was scheduled to begin at the site on April 26, 1999. The Department stated that they would prefer that ETG postpone field activities pending final Department approval of the Phase I SRIWP, but that ETG could proceed at risk. On April 22, 1999, ETG sent a letter to the Department confirming that the Department had expressed its strong preference that ETG not proceed with the implementation of any portion of the field activities until receiving written approval of the Phase I SRIWP from the Department.

The Department sent ETG a letter responding to ETG's March 23, 1999 response letter on June 29, 1999. This letter conditionally accepted the March 23, 1999 revisions to the Phase I SRIWP pending the incorporation of additional soil samples for characterization purposes. On August 17, 1999, a meeting was held with ETG, the Department (new case manager Gary Lipsius and Ann Hayton), and GEI. The purpose of the meeting was to provide project background information to the new Department case manager. As a result of this meeting, the Phase I SRIWP was revised and resubmitted by ETG to the Department on September 27, 1999. The revised Phase I SRIWP included the addition of a significant number of soil characterization and vertical delineation samples. The cover letter to the Phase I SRWIP submission to the Department from ETG stated that the field activities would commence on or about October 25, 1999 as had been discussed in a previous telephone conversation on September 29, 1999. ETG notified the Department, by letter dated October 28, 1999, that field activities would be initiated on November 15, 1999. Copies of the correspondence summarized above (without attachments and reports) are included in Appendix A of this report.

Based on the data gaps identified from previous investigations and the comments and concerns of the Department, as detailed in the correspondence summarized above, the overall objectives of this Phase I SRI are to:

- Complete characterization and delineation of surface-soil impacts
- Complete characterization and delineation of subsurface-soil impacts
- Further characterize the hydrogeologic regime at the site
- Further characterize the nature and extent of groundwater impacts
- Investigate the Elizabeth River sediment and surface water quality

1.1 Report Organization

This Phase I SRI Report (SRIR) is organized into the following sections.

Volume I.
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2. Site Background

2.1 Site Location and Description

The ETG Erie Street facility, covering approximately 24.5 acres, is presently used for storage, transfer, and distribution of liquid natural gas (LNG). Parts of the facility in the southeastern corner and along the central portion of the northern property boundary are leased for truck parking only. The facility is located in a mixed commercial, residential, and industrial district of Elizabeth, New Jersey. The site is bounded on the north by Third Avenue and private residences; on the east by Bilkay's Trucking Company; on the south by the Elizabeth River; and on the west by Conrail railroad tracks and the New Jersey Turnpike (NJTP). A site location map and a site plan are presented in Figure 1 and Plate 1, respectively.

2.2 Previous Investigations

Extensive remedial investigations have been conducted on the site since 1984. These investigations have been documented and submitted to NJDEP in the following three reports.

1. *Final Report, Site Investigation, Erie Street Site*. Dames and Moore, Cranford, New Jersey, February 23, 1989. (Dames & Moore, 1989)

2. *Pre-Design Investigations Report (Tasks 1-5)*. Dames & Moore, Cranford, New Jersey, March 3, 1993. (Dames & Moore, 1993)

3. *Pre-Design Studies Report, Erie Street Facility, Elizabethtown Gas Company*. Dames & Moore, Cranford, New Jersey, January 31, 1994. (Dames & Moore, 1994)

The results of these investigations were summarized and consolidated in the September 27, 1999 Phase I SRIWP. The results of these previous investigations are incorporated in Section 5 of this Phase I SRIR, as appropriate. The site history, surrounding land use, and other information presented in this section are based on information included in the previous investigation results. These subsections also were included in the September 27, 1999 Phase I SRIWP.

2.3 Site History

Prior to serving in its present capacity, the facility served as a water gas manufacturing plant from approximately 1895 to 1952. In 1952, the plant was retrofitted to manufacture oil gas.

The oil gas manufacturing process ceased circa 1974, after which the facility was used as a storage and transfer facility for LNG and propane, and as an administrative control center for gas distribution.

Buildings and structures associated with gas manufacturing operations were clustered in the northern portion of the site, along Third Avenue. The majority of the structures associated with the former gas manufacturing process have since been removed; former MGP-related structures still existing at the site include two office buildings.

The course of the Elizabeth River, which borders the site to the southwest, was modified during the late 1970s and early 1980s by the United States Army Corps of Engineers (COE). The channel was re-aligned to run approximately west-east, and flood control embankments, containing a steel sheet-pile core, were constructed along the river as part of its flood control program in the City of Elizabeth. As part of the realignment process, the COE acquired a small portion of the property located at the southeastern section of the former site.

The historical review of the ETG Erie Street facility as summarized herein is based on the following list of Sanborn Fire Insurance (Sanborn) maps, aerial photographs, and site plans as obtained and interpreted by Dames & Moore. Copies of the Sanborn maps, aerial photographs, and the site plans, as well as the detailed description of specific facility alterations (additions and removals), are provided in the Dames & Moore 1994 report. A compilation of historical site structures is provided on Plate 1.

Sanborn Maps	Aerial Photographs	Site Plans
1903	April 1940	April 1949
1922	February 1951	June 1950
1951	April 1959	January 1955
1963	April 1961	May 1973
1969	December 1966	
1980	April 1976	
	April 1979	
	March 1991	

In 1889, the Metropolitan Gas Light Company (MGLC) initiated gas-manufacturing activities at the Erie Street site. At this time, the MGP property occupied a total area of 2 acres, located between Third Avenue (to the northeast), Erie Street (to the northwest), Florida Street (to the southeast), and Fourth Avenue (to the southwest).

In 1892, the Elizabethtown Gas Light Company (EGLC) purchased the MGLC MGP property and additional properties to the west-southwest. By 1903, the subject site extended between Third Avenue, Florida Street, Fourth Avenue, and Erie Street. It should be noted that Fourth Avenue and the extension of the streets traversing the site between Third and Fourth Avenues were paper roads (i.e., not physically present). MGP-related structures existing at this time included a small office building, a retort/purifier house, one 340,000-cubic-foot (cf) gas holder, one 30,000-cf relief holder, two drip shanties, a storage shed, and a railroad siding.

A facility-owned and operated by the New York Chemical Company was situated to the west of the MGP site between Third Avenue, Florida Street, Fourth Avenue, and Erie Street. Anatron Chemical Company existed to the west between the A&E Railroad, Baltic Avenue, Third Avenue, and Fourth Avenue. A one-story house/shed was shown at the southwestern corner of Third Avenue and Geneva Avenue.

By 1922, the Sanborn maps indicate ETG's property extended between Florida Street, the Elizabeth River, Delaware Street, and Third Avenue. The 1922 Sanborn map also indicate the expansion of site operations and facilities (see Dames & Moore 1994 report for details).

The map indicates that timber was stored on the former New York Chemical Company property, located west of the MGP site. Furnace houses located in the center of this property were dismantled. The A&E Railroad, located on the western boundary of the New York Chemical Company property, was changed to CRR of New Jersey.

Kalbfleish Corporation replaced Anatron Chemical Company, which was located on the western side of the CRR of New Jersey property, between Baltic Avenue, Third Avenue, and Fourth Avenue. Anatron Chemical Company installations shown on the 1922 Sanborn map included sulfuric acid chambers, a sulfur pile, hydrochloric acid chambers, a sulfate of soda tank (southern segment of the property), and sulfuric acid storage (northeastern segment of the property).

The 1940 aerial photograph indicated that significant expansion of facilities took place between 1922 and 1940 (see Dames & Moore 1994 report for details).

The areal extent of the Elizabeth Consolidated Gas Company former MGP property was further extended to the west by the inclusion of the adjacent former New York Chemical Company property. A storage house (located near the northwestern boundary of the property, oriented parallel to the CRR of New Jersey) was shown in this portion of site. The storage house was constructed sometime between 1922 and 1940. It is unknown whether this structure was present on the property prior to ownership by Elizabethtown Consolidated Gas Company. Two gas holders were constructed (1928) on the northwest corner of the property adjacent to Third Avenue and South Second Street.

Between 1940 and 1951, additional facilities including a 10-million-cf holder (Holder No. 8), were constructed. To the west of the property, adjacent to the western side of the CRR of New Jersey, construction of the New Jersey Turnpike was underway.

Between 1951 and 1963, there were no significant changes on the Erie Street site. The four purifiers located southeast of the 1-million-cf gas holder were dismantled between 1955 and 1961 and a switch house was built in their place. Also during this time period, the 300,000-cf relief holder north of the 3-million-cf gas holder was removed from the site. No changes were observed in the site between 1961 and 1963.

Between 1963 and 1966, an aerial photograph indicated that property boundaries and site structures do not appear to have been changed since 1961, with the exception of the rail spur. This photograph indicated that the railway line traversing the site east-west and the center of the facility was removed.

Between 1966 and 1969, no visible modifications were made to the facility.

By 1976, the LNG tank and associated berm was installed and the existing railroad spur was in place. Many of the site structures were removed or dismantled during the period between 1969 and 1976. Bilkay's Trucking Company, a transportation company, started operating on the adjacent property to the east of the ETG property, across South Second Street.

Between 1976 and 1980, aerial photographs and Sanborn maps indicate additional removal of MGP-related structures at the site (see Dames & Moore 1994 report for details) and realignment of the Elizabeth River was in progress to the east of the site at the southern boundary of the Bilkay Express property.

By 1991, most remaining MGP-related structures were dismantled with the exception of three gas holders on the northeast corner of the property. A portion of the property located in the southeastern corner was leased to Bilkay's for use as a parking lot. The mid-northeast section of the site, adjacent to Third Avenue, was also leased for truck parking. Realignment of the Elizabeth River, adjacent to the site, was completed.

The three remaining gas holders were dismantled and removed from the site in 1997 and 1998. Dismantling of the propane gas distribution/storage system was initiated in late 1999/early 2000.

3. Physical Conditions of the Site and Surroundings

3.1 Topography

The Erie Street site was surveyed by the RBA Group of Morristown, New Jersey, a New Jersey-licensed surveyor, during the 1993 Dames & Moore investigation. The surveyor mapped the locations of the on-site monitoring wells, test borings, test pits, cone-penetration tests, and piezometers for their horizontal and vertical locations. The positions of these locations were measured in coordinates referenced to New Jersey State Plane Coordinate System, NAD 83, and the elevations were referenced to the National Geodetic Vertical Datum (NGVD 1929 Datum). The vertical datum was transferred from geodetic benchmark NJGS Disk R-37.

A base map was prepared at a scale of 1 inch equals 50 feet, covering the site and surrounding area extending from the Elizabeth River to Third Avenue, and from South Second Street to the railroad tracks of the Central Railroad of New Jersey. Topographic contours were generated from spot elevations obtained at 50-foot grid intersections to the nearest one-hundredth (0.01) foot in paved areas, and to the nearest one-tenth (0.10) foot in unpaved areas. Plate 2 illustrates the topographic contours for the site.

The site gently slopes towards the Elizabeth River from an elevation of approximately 9.5 feet above mean sea level (MSL) in the northern portion of the site to an elevation of approximately 7 feet above MSL in the southern portion of the site. An exception to this terrain is a portion of the site centrally located along the western boundary where an earthen fill embankment, which carries a railroad spur onto the site, is present at approximately 15 to 20 feet higher than the grade of the surrounding areas. The southern portion of this fill embankment slopes down to an elevation of approximately 15 feet above MSL, and extends into the center of the site where it serves as a railroad embankment.

3.2 Surrounding Land Use

In 1993, Dames & Moore reviewed the land use within a 1,000-foot radius around the site using information gathered from City of Elizabeth Zoning Maps, and the Elizabeth Tax Assessor's Office, as well as from observations made during a cursory field inspection. The official use of properties within a 1,000-foot radius was obtained from the City of Elizabeth based on the actual lot number, and is provided in two maps in Appendix C.

Maps and listings obtained from the Elizabeth Tax Assessor's Office indicate that there are a total of 431 real properties within the search area. These properties include eight industrial (Code 4B) and 34 commercial (Code 4A) facilities, and 389 units classified as other, including vacant land, residential farm (regular and qualified), apartment, schools, public properties, church/charitable properties, cemeteries/graveyards, and other exempt properties (Codes 1, 2, 3A/B, 4E, 15A/B/C/D/E/F).

The Erie Street facility is zoned as M-2, as shown on the Zone of the City of Elizabeth, New Jersey (amended June 30, 1971). As per the city code used in identifying various areas, the areas designated as Zone M-2 can be used as follows.

- Auto-related services
- Selected commercial and light manufacturing
- Wholesale and storage
- Distribution and trucking
- Light manufacturing
- General industrial

The Bilkay's Trucking facility, located to the east of the ETG facility and extending to First Street, is also zoned as M-2. The area to the east of First Street up to the Elizabeth River is also zoned as M-2.

A portion of the land north of Bilkay's Trucking facility, extending to the north of Third Avenue and east of South Second Street, is designated as Zone M-1, which could be used for all the purposes listed for M-2, except "general industrial." A block of land north of Second Avenue and east of South Second Street is designated as R-3, a designation used for single/multi-residential dwellings.

The area north of the ETG facility enclosed between Merritt Avenue, South Second Street, Third Avenue, and Lt. Glenn Zamorski Street is zoned as C-l/R-2. Properties with this designation could be used as single and two-family dwellings, as well as for professional offices and neighborhood and local convenience, general, and specialty retail stores.

The New Jersey Turnpike (NJTP) is located approximately 500 feet to the west of the site. The area to the west of the NJTP is zoned as residential (R-2 and R-3). An auto-related service center, a motel, and an NJTP yard are located between Trenton Avenue and the NJTP to the west of the NJTP.

The area to the south of the ETG site, across the Elizabeth River, is occupied by the Joint Meeting Wastewater Treatment Plant.

To evaluate the presence of sites with potential environmental concerns within the surrounding area, an environmental database search was performed by Environmental Data

Resources (EDR) for Dames & Moore. The EDR report presents maps showing facilities within 1 mile of the Erie Street site and the locations of the sites within a 1-mile radius of the site with existing or potential environmental concerns that are subject to regulatory action. This report is included in Appendix C.

The Elizabeth River runs along the site's southern boundary. The river is subject to the provisions of NJAC 7:9-4, Surface Water Quality Standards, which establishes rules by which NJDEP classifies surface water bodies, provides for their designated uses, and develops policy for protecting surface water bodies.

In accordance with Surface Water Quality Standards, the Elizabeth River has been classified as an SE-3 class waterway. The "SE" designation is the surface water classification applied to saline waters of estuaries, and the "3" indicates water with the fewest designated uses of the SE class. As such, designated uses of the Elizabeth River are restricted to the following.

- Secondary contact recreation
- Maintenance and migration of fish populations
- Migration of diadromous fish
- Maintenance of wildlife
- Any other reasonable use

Less restrictive designated uses for SE-1 and SE-2 classified waters include primary contact recreation, shellfish harvesting and maintenance, and migration and propagation of natural and established biota. These less restrictive uses are not applicable to the Elizabeth River.

3.3 Wetlands Review

In 1993, Dames & Moore evaluated the potential presence of wetlands in the site vicinity by contacting appropriate NJDEP offices and federal agencies, performing a field inspection, and reviewing the following documents and maps pertaining to this area.

- Environmentally Sensitive Areas Guidance Document, prepared by the NJDEP

- National Wetlands Inventory Map, prepared by the U.S. Department of the Interior, Fish and Wildlife Services

- Freshwater Wetlands Map for Elizabeth SW, prepared by the NJDEP

- Flood Insurance Rate Map

- Aerial photographs

Copies of the maps are provided in Appendix D of the Dames & Moore 1994 report.

Based on Dames & Moore's review of these documents, maps, photographs, and the field inspection, no wetlands were determined to be present at or in the vicinity of the site, except for the Elizabeth River.

3.4 Regional Setting

The regional setting information reported herein was reported in the 1993 Site Investigation Report (Dames and Moore, 1993). The Erie Street former MGP site is located in Elizabeth, Union County, New Jersey. Union County lies within the Piedmont Plateau physiographic province. The province is characterized as a region of low-lying plains and gently sloping hills with occasional basalt ridges. Altitudes range from approximately 550 feet along the Watchung basalt ridges to sea level at the Arthur Kill near the site area. Topography and surficial features are primarily the result of Quaternary glacial events, which both scoured the existing bedrock surfaces and deposited a mantle of lacustrine deposits. In the Elizabeth area, the glacial deposits are reported to be primarily ground moraine deposits (till that was deposited from below the glaciers as the ice retreated). Bedrock underlying the site consists of the Triassic Brunswick Formation, which consists of soft red shales and sandstones and serves as the most important aquifer in the county. However, no public water supply well fields tapping the bedrock are reported in the City of Elizabeth. Reportedly, valley fill deposits (glacial soils and gravels that accumulated in ancient bedrock valleys) serve as additional sources of groundwater in the county. Several drainage basins are located in Union County. The site lies within the Elizabeth River basin, which encompasses the majority of Elizabeth.

3.5 Local Water Supply and Well Search

Public water in the vicinity of the site is provided by the City of Elizabeth Water Department. According to the New Jersey Municipal Data Book (1990 Edition), all city water is provided by two municipal sources. The city water is supplied from two surface water reservoirs (Spruce Run Reservoir and Round Valley Reservoir). According to discussions with representatives of the City of Elizabeth Water Department, City Engineer and Health Department, no information about domestic wells in the area is on file with the City of Elizabeth. Furthermore, based on discussions with the City of Elizabeth Tax Assessor's Office, the two residential properties with reported domestic wells are connected to city water and are presently owned by A. Mazza (property with Well 21, located at 328 Palmer Street) and by C.B. Sortino (property with Well 22, located at 327 Redcliff Street).

Notwithstanding, a well search was performed by Dames & Moore to characterize the type and distribution of existing wells within a ½-mile radius of the facility. The well search was primarily based on records provided by the NJDEP Bureau of Water Allocation. Two hundred off-site monitoring/exploration wells/piezometers/test borings, one recovery well, and six production wells were identified within approximately ½ mile of the facility. A summary of well construction details, NJDEP well records, and a well location map are provided in the Dames & Moore 1994 report.

All of the six production wells identified in the well search are bedrock wells. All other wells (i.e., monitoring wells, piezometers, recovery wells) are overburden wells. The total depths of the six production wells range from 92 to 467 feet. Four wells (wells 51, 94, 95, and 150) out of the six production wells were reported to have been installed for industrial use. The other two production wells (wells 21 and 22) were reported as domestic wells. With the exception of well 51, all of the industrial wells are located side gradient or upgradient of the site. Well 51 is located approximately ½ mile downgradient of the site, south of the Elizabeth River, which is classified as Class SE3 surface water (i.e., saline water). The two reported domestic wells are located in residential properties upgradient of the site.

In 1994, subsequent to this well search, the Department identified four production wells on the Erie Street MGP site. ETG was previously unaware of these wells, and attempted to gather documentation regarding the wells and to identify their locations. The well driller was contacted and notes from the well installation were retrieved. Historic site plans were reviewed and two of the four wells were preliminarily located. Based on the driller's notes regarding low (2 gallons per minute [gpm]) to no (0) gpm) well yield for two of the four wells, it is ETG's belief that, although permits were obtained for the installation of four wells, only two were actually installed. The existence and location of the two wells identified on historic site plans were confirmed by field inspection in February 1995 and in 1999. The two wells located on site were designated FW-1 and FW-2. FW-1, located approximately 200 feet south of the gate house in the northern portion of the site, had an 8-inch-diameter steel casing, the top of which was approximately 2 feet below land surface (bls). The well depth and water level were 102.4 feet and 3.5 feet below the top of casing, respectively. FW-2, located approximately 80 feet north of FW-1 in the area leased for truck parking, also had an 8-inch steel casing, the top of which was approximately 0.8 foot bls. The casing was filled with brick and rubble to a depth of at least 1.5 feet. FW-2 could not be probed deeper than 1.5 feet below the top of the casing. Both wells were marked with traffic cones and the soil excavated to locate the wells was backfilled around the wells. The abandonment of these two wells will be performed concurrently with the abandonment of specific previous investigation monitoring wells.

4. Phase I SRI Site Activities

Phase I SRI field investigations were initiated at the Erie Street former MGP site in November 1999. These investigations were conducted in accordance with the NJDEP-approved Phase I SRIWP, dated September 27, 1999. Additional investigative work, which was beyond the scope proposed in the Phase I SRIWP, was conducted to address site conditions observed during implementation of the Phase I SRI field sampling program. Field activities for this investigation included exploratory test trenching, soil boring drilling, monitoring well installation, soil, sediment, surface water, and groundwater sampling and laboratory analysis, groundwater level monitoring, and a tidal survey. This work was completed during various field events that occurred between November 1999 through February 2001, as summarized in the following discussions. The Phase I SRI sample locations referenced below are illustrated on Plate 1.

November 15, 1999 through February 25, 2000

The first field event began November 15, 1999 and extended to February 25, 2000. This event began with the drilling of soil borings B-24, B-34, B-33, B-12, B-29, and B-30 to assess subsurface stratigraphic conditions such that the vertical and horizontal positioning of future monitoring wells to be installed at the site could be determined. Specifically, the soil borings were advanced to determine whether a previously reported peat layer was continuous or whether a silt/clay layer merges with the peat to form a continuous confining unit across the site, and to determine the general stratigraphic units that should be screened with monitoring wells to evaluate the groundwater quality and distribution of impacts at the site. After the soil borings were drilled, monitoring wells MW-15B, MW-16B, MW-16A, MW-20A, MW-14B, MW-19A, MW-17B, MW-18B, MW-22A, MW-21B, MW-22B, MW-19B, MW-9D, MW-21A were installed between November 29, 1999 and December 21, 1999. Monitoring well pair MW-23A/23B was not installed as proposed due to thin overburden in the northeastern corner of the site. It was decided that existing well MW-3 would be sufficient to evaluate overburden groundwater quality in this area of the site.

Soil boring and monitoring well locations are illustrated on Plate 1. Soil boring and monitoring well construction logs are provided in Appendix B. Copies of soil boring and well construction logs from previous investigations are also provided in Appendix B.

Sixty-six test pits were excavated at the site between January 5, 2000 and February 7, 2000 to visually characterize/delineate soil conditions. As requested by the Department, samples of visibly impacted soil were collected from various locations and submitted for analytical testing. Such testing was requested by the Department to determine the range in concentration of MGP-related constituents present at the site. Test pits in the general order of excavation, include the following: TP-27, TP-32, TP-35, TP-47, TP-48, TP-49, TP-50, TP-54, TP-55, TP-65, TP-66, TP-37, TP-38, TP-39, TP-40, TP-41, TP-42, TP-44A, TP-44B, TP-72, TP-39A, TP-70, TP-71A, TP-71B, TP-16A, TP-16B, TP-18, TP-19, TP-15, TP-17, TP-17A, TP-22, TP-23, TP-23A, TP-64, TP-68/69, TP-30, TP-56, TP-57, TP-57A, TP-59, TP-24, TP-25, TP-26, TP-28, TP-29, TP-43, TP-45(A&B), TP-46, TP-33, TP-36, TP-36A, TP-51, TP-31, TP-73, TP-75, TP-34, TP-34A, TP-60, TP-61, TP-62, TP-62A, TP-63, TP-B-5, and TP-B –6. A test pit was excavated in the vicinity of a former tar separator and was identified as TP-TS-2.

Subsequent to test trenching activities, additional soil borings were drilled to complete soil characterization and delineation at the site as proposed in the work plan. Such borings include B-35, B-22, B-23, B-15, B-11, B-14, and B-16. Additional borings SB-TP-39/TP-39A, SB-TP-30, SB-TP-75, SB-TP-14, and SB-TP-25 that were not identified in the work plan were drilled to delineate the vertical extent of impacts observed in the corresponding test pits.

Soil samples were collected for laboratory analysis during test pitting, soil boring, and monitoring well installation activities . Table 1 provides a summary of the soil samples collected, the rationale for their collection, and a summary of the analyses performed. QA/QC samples are summarized in Table 2. The observations recorded during the excavation of test pits are summarized in Table 3. The hydrogeologic data generated from the soil boring, monitoring well installation, and test pit activities are presented in subsections 5.1 and 5.2 of this report. The subsurface-soil analytical results are presented and discussed in subsection 5.3 of this report.

May 22, 2000 and June 9, 2000

Between May 22, 2000 and June 9, 2000, the potential presence of nonaqueous phase liquid (NAPL) was investigated and water levels were measured in the following monitoring wells and piezometers: MW-1, MW-1D, MW-2, MW-2D, MW-3, MW-4, MW-5, MW-5D, MW-6, MW-6D, MW-7, MW-7D, MW-8, MW-8D, MW-9, MW-9D, MW-11, MW-12, MW-13, MW-14A(BP-2), MW14B, MW-15A(BP-1), MW-15B, MW-16A, MW-16B, MW-17A(BP-8), MW-17B, MW-18A(BP-4), MW-18B, MW-19A, MW-19B, MW-20A, MW-20B(BP-6), MW-21A, MW-21B, MW-22A, MW-22B, BP-3, BP-5, and BP-7.

Groundwater samples were collected during the same time period from the following wells: MW-1D, MW-2D, MW-5D, MW-6D, MW-7D, MW-8D, MW-9D, MW-14A, MW-14B, MW-15A, MW-15B, MW-16A, MW-16B, MW-17A, MW-17B, MW-18A, MW-18B, MW-19A, MW-19B, MW-20A, MW-20B, MW-21A, MW-21B, MW-22A, and MW-22B.

The groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX), target compound list (TCL) base-neutral semivolatile organic compounds plus 15 tentatively identified compounds (BNs + 15), target analyte list (TAL) metals, total cyanide, and amenable cyanide. The QA/QC sampling is summarized in Table 2. The hydrogeologic data generated from these activities are summarized and presented in subsections 5.1 and 5.2 of this report. The groundwater analytical results are summarized and discussed in subsection 5.3 of this report.

June 26 and July 7, 2000

The Elizabeth River surface water and sediment sampling investigation was performed between June 26 and July 7, 2000. One set of surface water samples was collected at the approximate mid-point of each of seven transects, starting at the farthest downstream location, for a total of seven surface water samples. Surface water sampling was scheduled to correspond with the low ebb-tide event. Sediment samples were collected from four locations along each of seven transects (see Plate 1). Two depth intervals were sampled at each of the four locations on each transect for a total of 56 sediment samples. The sediment and surface water samples were analyzed for: TCL volatile organic compounds (VOCs), TCL semivolatile organic compounds and 15 tentatively identified compounds (SVOCs + 15), total cyanide, TAL metals, pesticides, polychlorinated biphenyls (PCBs), herbicides, total organic carbon (TOC), and dioxin.

The QA/QC samples are summarized in Table 2. The observations noted during sampling and the sediment and surface water analytical results are summarized and discussed in subsection 5.3 of this report.

August 21 and August 25, 2000

Between August 21, 2000 and August 25, 2000, water levels were measured in the following monitoring wells and piezometers: MW-1, MW-1D, MW-2, MW-2D, MW-3, MW-4, MW-5, MW-5D, MW-6, MW-6D, MW-7, MW-7D, MW-8, MW-8D, MW-9, MW-9D, MW-10, MW-11, MW-12, MW-13, MW-14A(BP-2), MW-14B, MW-15A(BP-1), MW-15B, MW-16A, MW-16B, MW-17A(BP-8), MW-17B, MW-18A(BP-4), MW-18B, MW-19A, MW-19B, MW-20A, MW-20B(BP-6), MW-21A, MW-21B, MW-22A, MW-22B, BP-3, and BP-7. The results of this survey are presented and discussed in subsection 5.3 of this report.

In addition, the need for additional monitoring wells north of Third Avenue was identified to better evaluate shallow groundwater flow direction north of the site. Therefore, property owners north of Third Avenue were identified from tax assessor maps for well permit purposes.

November 20, 2000 through February 21, 2001

Access to drill soil borings located along South Second Street was approved by the City of Elizabeth on October 13, 2000. Therefore, beginning November 20, 2000, borings B-17, B-

18, B-19, B-20, and B-21 were drilled along South Second Street as specified in the September 27, 1999 Phase I SRIWP.

In addition, GEI determined the need to further evaluate the contents, structure, and integrity of two subsurface holder structures on site. Therefore, borings HB-1, HB-1A, HB-2, HB-3, and HB-4 were drilled at the locations illustrated on Plate 1. GEI also identified the need for additional vertical delineation data based on a cursory review of analytical and geologic data collected during the first field event. Therefore, borings VB-1, VB-2, VB-3, and VB-4 were drilled at the locations illustrated on Plate 1. Based on preliminary groundwater elevation contour maps, six additional monitoring wells were installed north of Third Avenue to better define groundwater flow direction. The new wells installed north of Third Avenue include MW-23A, MW-23B, MW-24A, MW-24B, MW-25A, and MW-26A.

Soil boring and monitoring well construction logs are included in Appendix B. Subsurface-soil analytical sampling rationale is provided in Table 1, along with a summary of the analyses performed on each sample. The QA/QC sampling is summarized in Table 2. The analytical and hydrogeologic data from these activities are summarized and presented in subsections 5.1 through 5.3 of this report.

To evaluate the extent of potential surface impacts and to evaluate surface-soil quality near the site, surface-soil samples SS-1, SS-2, SS-3, SS-4, and SS-5 were collected from grassy medians between the sidewalk and curb on the northern side of Third Avenue. Surface-soil samples could not be collected along the southern side of Third Avenue due to the paved surface. All surface soil samples were analyzed for BTEX, BNs + 15, TAL metals, total cyanide, and amenable cyanide. The analytical results are summarized and discussed in subsection 5.3 of this report.

Beginning January 8, 2001, groundwater samples were collected from the monitoring wells sampled in May 2000, as well as from the following additional wells: MW-3, MW-23A, MW-23B, MW-24, MW-24A, MW-25A, and MW-26A. Prior to sampling, water levels were measured and the potential presence of NAPL was evaluated in each monitoring well. The groundwater samples were analyzed for the same parameters as in the May 2000 sampling event. The hydrologic and analytical data are summarized and discussed in subsections 5.2 and 5.3 of this report.

During the week of January 22, 2001, a tidal survey was performed using pressure transducers installed in several monitoring wells, two catch basins, and the Elizabeth River. The tidal survey results are presented in subsection 5.2 of this report.

On February 21, 2000, water levels were measured and the potential presence of NAPL was evaluated all monitoring wells at the site. These data were compiled and are presented in subsections 5.2 and 5.3 of this report.

Deviations from September 27, 1999 Phase I SRIWP

Several proposed activities were not completed as described in the September 27, 1999 Phase I SRIWP due to site conditions or access issues and several additional investigation activities were performed based on site observations. A summary of these deviations from the September 27, 1999 Phase I SRIWP is as follows.

Surface-soil samples proposed in the Phase I SRIWP immediately adjacent to the site (i.e., south side of Third Avenue) were not collected due to paving. However, five surface-soil samples (SS-1 through SS-5) were collected from the grassy medians between the sidewalk and curb on the northern side of Third Avenue.

Borings B-25 through B-28 were not completed along the western site boundary because access has not been obtained from Central Railroad of New Jersey. Access negotiations with the railroad are currently in progress. Boring B-13 could not be drilled due to the abundance of underground and overhead utilities. Proposed nested pair of monitoring wells MW-23A/B were not installed in the northeastern portion of the site because the overburden was not of sufficient thickness to warrant additional wells in this area of the site. Previously installed monitoring well MW-3 will be used to evaluate overburden groundwater quality in this portion of the site.

Several test pits and borings could not be drilled due to conflicts with multiple underground or overhead utilities and on-site structures. These sample locations include B-31, B-32, B-13, TP-21, TP-20, TP-74, TP-53, TP-52, and TP-58. Test Pit 14 was not excavated but was replaced with boring SB-TP-14 and TP-B5. Test Pit 67 was not excavated but was replaced with angle borings HB-1 and HB-1A and boring B-30.

As described previously, several additional borings (SB-TPs and VBs) were drilled to delineate the vertical extent of impacts observed in test pits and in other areas of the site. Several borings (HBs) were drilled to evaluate the contents, structures, and integrity of two subsurface gas holders. Several additional monitoring wells were installed to better evaluate the direction of groundwater flow.

4.1 Field Activity Methodologies

4.1.1 Soil Boring, Monitoring Well Installation/Development and Subsurface-Soil Sampling

All drilling activities conducted from November 1999 through February 2000 were performed by Talon Drilling, Inc. of Trenton, New Jersey. All drilling activities conducted from November 2000 through January 2001 were performed by Uni-Tech Drilling of Malaga, New Jersey.

Soil borings B-33, B-34, B-35, B-12, B-30, SB-29, B-22, B-23, B-14, B-15, SB-16, SB-TP39, SB-TP30, SB-TP75, SB-TP14, and SB-TP25 were advanced using a truck-mounted drill rig equipped with a pneumatic direct-push sampler. A 2-foot by 3-inch macrosampler equipped with dedicated, disposable, acetate liners was advanced ahead of 3¼-inch temporary casing.

Soil borings B-17, B-18, B-19, B-20, B-21, B-24, B-34, VB-1, VB-2, VB-3, VB-4, HB-1, HB-1A, HB-2, HB-3, HB-4, and monitoring wells MW-19A, MW20A, MW-21A, MW-21B, MW-22A, MW-23A, MW-23B, MW-24A, MW-24B, MW-25A, and MW-26A were advanced using a truck-mounted drill rig and hollow-stem auger (HSA) drilling methods. Soil samples were collected using 2-foot by 3-inch stainless-steel split spoons. All soil borings were tremie-grouted from bottom to top upon completion. Displaced groundwater was collected in 55-gallon drums and stored on site for subsequent off-site disposal.

Soil borings for monitoring wells MW-14B, MW-15B, MW-16B, MW-17B, MW-18B, MW-19B, and MW-22B required the installation of an outer casing to prevent the downward migration of impacted soils. HSA drilling methods and continuous split-spoon sampling were conducted from ground surface until a confining unit was encountered (peat layer) at which point a steel outer casing was installed. Outer casings were installed using 12¼-inch inside diameter (I.D.) augers advanced approximately 1 to 2 feet into the peat layer. Ten-inch outside diameter (O.D.) steel casing was inserted into the borehole and tremie grouted into position. Outer casings were allowed to set for a minimum of 48 hours prior to continuation of sampling. Upon installation of the outer casings, soil borings were advanced using 4¼-inch hollow-stem auger (HSA) and continuous split-spoon sampling.

Monitoring wells MW-14B, MW-15B, MW-16A, MW-16B, MW-17B, MW-18B, MW-19A, MW-19B, MW-20A, MW-21A, MW-21B, MW-22A, and MW-22B were installed by Talon Drilling, Inc. using 4-inch diameter, Schedule 40 polyvinyl chloride (PVC) casing, 20-slot PVC screens. The wells were constructed with a sand filter pack, sand choke, and bentonite grout, according to Department guidelines.

Monitoring wells MW-23A, MW-23B, MW-24A, MW-24B, MW-25A, and MW-26A were installed by Uni-Tech Drilling, Inc. using 2-inch diameter, Schedule 40 PVC casing, 20-slot PVC screens. The wells were constructed with a sand filter pack, sand choke, and bentonite grout according to Department guidelines.

During the installation of shallow bedrock monitoring well MW-9D, overburden soil sampling was completed using traditional hollow-stem auger drilling methodologies. HSAs were advanced and soils were sampled continuously using 3-inch diameter, 2-foot long split spoons. Competent bedrock was encountered at approximately 28 feet bls, at which point a 6-inch diameter steel casing was advanced approximately 4 feet into the competent rock and pressure grouted into place. The casing was allowed to set for 72 hours prior to continuing. A roller bit was advanced 2 feet below the casing, and a 10-foot core was collected from 34 to 44 feet bls, using a 21/2-inch core barrel. The 10-foot core (100% recovery) consisted of brown siltstone with few fractures, no staining, and no odors was collected. After the core was removed, the core barrel hole was reamed out to a diameter of 6 inches, using a tricone roller bit.

Subsurface stratigraphy was logged and soil conditions were evaluated through visual and olfactory screening and portable field screening instruments (photoionization [PID] and/or flame ionization detector [FID]). As specified in the Phase I SRIWP, the presence of product was noted using the following visual and olfactory definitions. Two additional categories were, however, added during implementation of the Phase I SRI field program. These two categories include "oil" and "tar".

- **Stained Soil.** Soil that is stained a color differing from the color of non-impacted soil or fill material observed in the area is defined as stained soil. The color and consistency of the staining should be identified (i.e., wet silty sand stained black, grading to dark brown at bottom of interval). Samples exhibiting sheens and/or product as described below should not be identified as stained.

- **Sheens.** Sheens are typically identified by soils displaying iridescence. Sheens are typically noted in moist to wet soil that has marginal product present (i.e., more than stained but no significant separate product phase).

- **Residual Product.** Residual product is NAPL that exists in the subsurface at less than pore space residual saturation levels; therefore, it is held in soil pore spaces by capillary forces. Residual product will remain trapped within the pores of the porous media unless the viscous forces are greater than the capillary forces holding the product in the pores. Capillary pressure will also be reduced if the soil is disturbed, releasing the residual product from the pore spaces. Residual product can be identified as discrete zones of product within discrete pore spaces of soil. If possible, the product should be identified as tar, oil, or other.

- **Free-Phase Product.** Free-product is NAPL that exists in the subsurface in a volume greater than the pore space residual saturation volume; therefore, it exists in the subsurface with a positive pressure such that it can flow through the subsurface. Free-phase product will flow through the subsurface until a confining unit is reached. If possible, the product should be identified as tar, oil, or other.

- **Oil.** During the Phase I SRI field investigation, the term "oil" was used to characterize free and/or residual product that exhibited a distinct fuel oil or diesel fuel type odor, distinctly different from MGP-related odors/impacts. The use of the term oil as it is applied, should be considered subjective and is based solely on the experience of the field personnel.

- **Tar.** During the Phase I SRI field investigation the term "tar" was used to characterize free and/or residual oily product that exhibited a distinct coal tar type odor. Generally gold, brown, or black in color. The use of the term tar as it is applied, should be considered subjective and is based solely on the experience of the field personnel.

- **Solid Tar.** Product that is present in the solid or semi-solid phase is defined as solid tar. The extent of the solid tar should be identified (i.e., small pieces of solid tar should be differentiated from a layer of solid tar).

- **Purifier Waste.** Purifier waste is brown/rust or blue/green wood chips or blue/green granular material. It is typically associated with a distinctive sulfur odor.

- **Odor.** Although odor is a very subjective sense, the degree of odor should be noted with as much consistency as possible. Odors should be identified as slight, moderate, or heavy. The type of odor should also be identified (i.e., sulfur or rotten eggs [purifier water]; naphthalene or moth balls [coal tar]; petroleum, oil, gasoline, etc.).

- **Instrument Readings.** Readings from a flame ionization detector (FID) and/or a photoionization detector (PID) will also be noted in the log for each test pit.

All sampling and drilling equipment decontamination was conducted in accordance with requirements set forth in the New Jersey *Field Sampling Procedures Manual* (1992).

After installation the wells were developed in accordance with New Jersey *Field Sampling Procedures Manual* (May 1992). All drill cuttings and waste fluids were collected in 55-gallon drums and secured on site prior to disposal. The location and elevation of the top of the inner casings of the wells were surveyed by the RBA Group following well development.

4.1.2 Test Pit Excavation and Subsurface-Soil Sampling

All test pits were excavated using a John Deere model 410D backhoe equipped with a 3-foot-wide bucket. Soil samples were collected either using a telescoping stainless-steel sampling tool or directly from the test pit side wall using a stainless-steel spoon. All test pit sampling equipment was decontaminated prior to each use.

4.1.3 Groundwater Level Measurement, DNAPL Evaluation, and Groundwater Sample Collection

Water level measurements were performed in site monitoring wells. Prior to water level measurements, all monitoring wells were located, the expandable caps were removed, and the static water wells were allowed to equilibrate for a minimum of one hour. Water levels were measured to the nearest 0.01 foot using a Solinst water level meter Model 101. Measurements for the presence of DNAPL and/or light nonaqueous phase liquid (LNAPL) were performed using a Solinst interface probe Model 122.

Groundwater sampling was conducted in accordance with NJDEP-approved procedures. Before the collection of groundwater samples, static water levels and well depths were measured. Prior to sampling, a minimum of three well volumes was purged from each well to ensure proper water quality. During purging activities, pH, conductivity, turbidity, temperature, dissolved oxygen, and ORP were recorded using a Horiba U-22 water quality meter. Well evacuation data were tabulated and are provided in subsection 5.3 of this report. Shallow wells were purged using a peristaltic pump and disposable tubing. Deep wells were purged using a submersible pump (Redi-Flo 2). VOC samples were collected using disposable polyethylene bailers. All other parameters were collected via the sampling equipment. The use of disposable tubing and bailers for sampling negated the need for field decontamination. The submersible pump was decontaminated prior to being used and after each well was purged. Analytical data collected during prior sampling events were used to determine sampling order. Wells were sampled according to the level of contamination, with the least impacted wells being sampled first.

4.1.4 Elizabeth River Sediment and Surface Water Sampling

Sediment sampling was performed by Ocean Surveys, Inc. of Old Saybrook, Connecticut. Sediment sampling was completed using a 20-foot pontoon style boat equipped with a tripod and vibra-core type sampler. Sediment samples were collected in a thin-walled aluminum core barrel fitted with a dedicated disposable acetate liner. Ten-foot-long core barrels were advanced through the sediment at each sampling point to a depth of 6 feet or until the sampler could no longer be advanced (refusal). The acetate liners and samples were removed from the core barrel, cut to length, and the ends were capped and labeled. Samples were transported to shore where they were logged and sediment conditions were evaluated through visual and olfactory observations and field instrument readings (PID). Sample locations were recorded using GPS.

4.1.5 Tidal Survey

A tidal survey was completed at the site in January 2001. Pressure transducers were installed in monitoring wells MW-1D, MW-5D, MW-14A, MW-14B, MW-18A, MW-18B, MW-19A, MW-19B, MW-21A, MW-21B. Pressure transducers were also placed in two catch basins: CB-1 was installed in the catch basin located adjacent to MW-14A, and CB-2 was installed in a catch basin located next to the Control Room. An additional pressure transducer was installed in the Elizabeth Channel located adjacent to the site. The tidal survey was conducted for a minimum of 72 hours at each location.

4.1.6 Surface-Soil Sample Collection

Surface soil samples were collected using split-spoon samplers. Surface-soil samples collected in the grassy medians north of Third Avenue were collected by hammering 2-foot long, 2-inch diameter split spoons in the ground with a sledgehammer. Surface-soil samples from the 0- to 2-foot interval were collected from borings with split spoons and a drill rig.

4.1.7 Data Validation

NJDEP Reduced Deliverable QA/QC documentation was requested for all analytical work. In accordance with the NJDEP-approved Phase I SRIWP, in-house data validation was performed by a qualified chemist on all analytical results received from the laboratory to ensure that:

- Data packages are complete
- Holding times have been met
- Blanks are reviewed
- Data are qualified if validation indicates that the sample results do not meet strict quality assurance objectives
- Generally, that the analytical data are complete, reliable, and of high quality

This approach ensures the overall quality and completeness of the project's analytical program. All analytical results received from STL of Monroe, Connecticut, were received in both hard copy form and in digital format. Analytical results tables were generated electronically from the digital data to minimize the risks associated with the transcription process. All final tables were crosschecked with original hard copy data to ensure completeness. All analytical data were reviewed in accordance with the following documents.

- *Quality Assurance Data Validation of Analytical Deliverables - TAL - Organics,* SOP Number 5.A.13

- *Quality Assurance Data Validation of Analytical Deliverables - TAL - Inorganics,* SOP Number 5.A.02

Data validation reports are provided in Appendix D. In addition, all data will be transmitted to NJDEP electronically in accordance with the specified format.

Analytical quality control samples associated with the sediment sampling analytical results for benzene, DDT, and cyanide were outside acceptable reporting limits. Re-extraction and reanalysis by the laboratory confirmed that there was a sediment matrix interference. Associated nondetect samples were rejected and positive results were estimated. Validation results are reflected in the analytical data tables. The validation reports are included in Appendix D.

5. Phase I SRI Results (corrected January 2004)

5.1 Site Geology

GEI excavated 66 test pits, installed 20 monitoring wells, and drilled 32 borings during the Phase I SRI field activities. The geologic information gathered during these activities combined with the previous investigation data provide the basis of the geologic discussion provided herein. Sample locations are illustrated on Plate 1. Boring logs for the Phase I SRI borings/wells and from previous investigations are provided in Appendix B. A summary of observations recorded during Phase I SRI test pit excavation activities is provided in Table 3. Six geologic cross sections were developed based on the Phase I SRI and previous investigation data. Geologic cross-section locations are illustrated on Figure 2 and the geologic cross sections are presented as Figures 3 through 8. Soil impacts noted during test pit and drilling activities were described based on the definitions provided in subsection 4.1.1 of this report.

Based on GEI's field work and interpretation of previous investigation data, the materials encountered at the site in descending order (with increasing depth from the surface) generally consist of fill (the ground surface in many areas of the site is covered with crushed stone); semi-decomposed fibrous peat grading locally to peat with organic silts and clay; glacial till consisting of various proportions of coarse to fine sand, silts and clays; residual soils/weathered bedrock consisting of clayey silt and fine sand with frequent fragments of weathered bedrock (mudstone/siltstone), and bedrock (mudstone/siltstone). The site geology is divided into overburden soils and bedrock, which are discussed in subsections 5.1.1 and 5.1.2, respectively.

5.1.1 Site Overburden

The overburden at the site consists of fill; semi-decomposed fibrous peat grading locally to peat with organic silts and clay; glacial till; and residual soils/weathered bedrock.

The fill layer was encountered throughout the site and consisted of gray/black to reddish-brown medium to fine sand with various proportions of cobbles, gravel, silt and clay, along with miscellaneous debris, including fragments of concrete, steel, pipes, bricks, clinker, cinder, coke, slag, ash, lampblack, and wood chips. The fill material was generally noted to be locally stained in several areas, as well as impacted with oily and/or tarry material, sheen, and occasionally residual product. A summary of visible impacts is presented in subsection 5.3 of this report.

The thickness of the fill layer generally varied between 2 and 15 feet. The fill thickness was occasionally observed to exceed 20 feet, such as at MW-2D where a thickness of about 30 feet was noted, and at the center of the western side near the railroad spur, where it was estimated to be 20 feet at MW-18B. The large fill thickness around MW-2D is assumed to be related to the installation of the subsurface holder at this location.

Underlying the fill layer, a semi-decomposed, fibrous greenish/olive-gray to dark gray peat layer, grading to peat with occasional gray organic clayey lenses/intercalations, was encountered mainly across the southern two thirds of the site. The Phase I SRI field activities generally confirmed the extent of the peat as observed during previous investigations. Generally, the thickness of this layer is greatest within the southern portion of the site, gradually thinning out toward the north, where it was noted to be missing within the northern portion of the site, as shown on Figure 2 and Figures 3 through 8. The peat is not present in the northern one-third of the site and does not form a continuous confining unit beneath the site. The nature of organic silt and clay within the peat varied from non-plastic to plastic. The fibrous peat was relatively semi-decomposed. The consistency of this material was found to be very soft to medium stiff.

A layer of glacial deposits referred to as glacial till on the Phase I SRI boring/well logs was encountered underneath the peat layer in the southern portion and underneath the fill in the northern portion of the site. This layer consists of reddish-brown clayey silt and silty clay with varying proportions of coarse to fine gravel and some lenses of sand. The glacial material was generally encountered throughout the site and its thickness varied between 8 and 25 feet. The gravel encountered in this layer was heterogeneous, ranging from subangular to rounded. In the northwestern and north-central portion of the site, silt and/or very fine sand were observed above the till or immediately below the peat at locations B-22, B-23, B-24, B-30 and MW-22B. Cobbles and boulders were also suspected during drilling in the lower portions of the glacial deposits and relative densities increased with depth. The lower portion of this soil horizon appeared to be of very low permeability, as indicated by on-site borehole and laboratory permeability tests conducted during previous investigations.

Field investigations indicate that the glacial till gradually grades to and was frequently undifferentiated from residual soils formed from the weathering of underlying bedrock and older glacial material. The residual soils are referred to as weathered bedrock on the Phase I SRI boring logs and are reddish-brown clayey silt and fine sand with varying proportions of fragments of siltstone/mudstone. The thickness of this layer was estimated to range from 2 to 10 feet. Residual soils were not noted above bedrock in every boring log and, therefore, the unit is not illustrated as continuous on the cross-sections. The fragments of bedrock were reported to be soft within the upper layers, gradually grading to hard with increasing depth as bedrock was encountered. Also, the percent of fines gradually decreased with increasing depth, where only the fragments of bedrock were encountered near the surface of bedrock.

5.1.1.1 Subsurface Structures

Several test pits and borings were excavated/drilled to evaluate the potential presence, contents, and integrity of subsurface former MGP structures. The only subsurface structures encountered during the Phase I SRI include a former tar separator and one former gas holder. The former tar separator was encountered in test pit TP-TS-2 in the northwestern portion of the site. No tar was encountered in the separator; however, some soil within the separator was partially saturated with an oily residue. The sides and floor of the tar separator were constructed of 6-inch thick concrete. Several broken iron pipes were noted within the structure. The separator was encountered at approximately 1.5 feet bls and extended to approximately 6.5 feet bls.

The former 340,000-cf-gas holder situated northeast of the office building was encountered in test pits TP-63, TP-62A, and TP-61. Based on these test pits, it was determined that previously installed monitoring wells MW-2 and MW-2D are situated outside of the former holder structure. Previously, these wells were believed to have been drilled within the holder foundation. The holder foundation is constructed of brick and has a 0.5-foot thick concrete slab on top. The holder has a diameter of 100 feet. Three borings were drilled within the holder (HB-2, HB-3, and HB-4). A concrete slab was encountered at each of these locations between 8 and 10 feet bls. This slab, believed to be the holder bottom, was approximately 0.5- to 1.0-foot thick. Based on the boring and test pit observations, the holder contents include sand and gravel fill with numerous brick fragments, concrete pieces, and coal noted throughout. A thin layer (less than 0.2 foot) of asphalt-like material was encountered directly above the holder bottom. Soil samples collected below the holder bottom consisted of brown silty fine sand and silt with a trace of fine-to-medium grained gravel (subrounded). Visual and olfactory observations of this material indicated MGP-type impacts ranging from staining and residual product directly below the holder bottom, to slight odors and staining (HB-3(18-20)).

Three borings were advanced in an attempt to locate the former relief holder beneath the western portion of the office building. Based on historic maps, borings HB-1 and HB-1A were located within the limits of the former relief holder and were advanced to verify/observe any subsurface component of the historic structure (if still present). Field observations for these locations did not indicate the presence of a below grade holder. Soil boring B-30 was completed adjacent to the former holder location. Information collected from this soil boring was also used to support the presence/absence of the historic holder. Based on the findings of HB-1, HB-1A, and B-30, the existence of a subsurface holder at this location could not be verified or the holder was an above-grade holder (slab on grade).

5.1.2 Site Bedrock

Monitoring well MW-9D was the only boring/well drilled into the bedrock beneath the site during the Phase I SRI. Bedrock information provided herein is based on previous investigation reports. Bedrock of the Passaic Formation was encountered at the site underneath the residual soils. The bedrock consisted of yellowish-red to reddish-brown mudstone, thickly bedded to massive with possible small-scale wavy bedding, possibly due to roots or bioturbations. Numerous calcite-coated sand grains were found entrapped in segments of the bedrock. Hairline calcite veins were noted to be horizontal and oblique. Layers of greenish-gray mudstone were also noted. Generally, the bedrock was reported to be strong to very strong by Dames & Moore. The degree of weathering varied with depth, where the bedrock was noted to be highly to moderately weathered near the top of bedrock grading to moderately to slightly weathered at greater depths. Both near vertical and/or near horizontal fractures were noted with an intensity that generally decreased with depth in the previous investigations. The core collected from MW-9D indicated few fractures.

The elevation of the top of the competent bedrock surface ranges from a high of -3.8 NGVD feet in the east-northeast portion of the site (B-16) to a low of -20 feet NGVD in the central portion of the site (MW-2D in the northern portion and MW-6D and MW-15A/BP-1 in the southern portion). The elevation increases from the central portion of the site to the west to -11.1 feet NGVD at MW-1D in the northern corner of the site. In the southern portion of the site along the Elizabeth River, the top of the bedrock surface increases slightly from the center of the site to the west to an elevation of -17.4 feet NGVD at MW-5D.

5.2 Groundwater

Groundwater is present in the overburden and shallow bedrock beneath the site. Previous investigations treated the overburden groundwater as one unit. Previous investigation well construction diagrams and boring logs illustrate that several of the wells (MW-4, MW-5, MW-6, MW-7, MW-9, MW-10, MW-12, and BP-3) are screened across several strata, including fill, peat (where present), glacial deposits, and residual soils, making it difficult to relate the data collected from these wells, such as water level measurements and analytical results, to specific strata. Therefore, as part of the Phase I SRI, monitoring well pairs were installed in the overburden based on the presence of the peat unit. The shallow wells were screened above the peat and the deeper wells were screened below the peat. In the northern areas of the site where there is no peat, wells were screened at the same general elevation to evaluate hydraulics and groundwater quality within each zone. Wells screened above the peat zone were designated with 'A' and wells screen ed below the peat zone were designated with 'B'.

Twenty monitoring wells were installed during the Phase I SRI, including nine in the shallow overburden 'A' zone (MW-16A, MW-19A, MW-20A, MW-21A, MW-22A, MW-23A, MW-24A, MW-25A, and MW-26A), 10 in the deeper overburden 'B' zone (MW-14B, MW-15B, MW-16B, MW-17B, MW-18B, MW-19B, MW-21B, MW-22B, MW-23B, and MW-24B) and one in shallow bedrock (MW-9D). Where possible, new monitoring wells were paired with existing piezometers/wells to form nested pairs (BP-2 (renamed MW-14A) is paired with MW-14B, BP-1 (renamed MW-15A) is paired with MW-15B, BP-8 (renamed MW-17A) is paired with MW-17B, BP-4 (renamed MW-18A) is paired with MW-18B, and BP-6 (renamed MW-20B) is paired with MW-20A). Four rounds of groundwater level measurements were conducted during the Phase I SRI on May 23, 2000, August 22, 2000, January 8, 2001, and February 21, 2001. Two rounds of groundwater samples were collected in May 2000 and January 2001 and two rounds of NAPL evaluations were performed in May 2000 and February 2001.

Table 4 summarizes the top of casing (TOC) elevation, screen interval, geologic unit within the screen interval, depth to water measurements, and groundwater elevations for each of the monitoring wells for each measurement round. Other well construction details are available on the boring logs in Appendix B. Form Bs containing well location and elevation survey information for the wells installed during the Phase I SRI also are included in Appendix B. Table 4 also indicates the existing piezometers that were used to form nested pairs; these piezometers were renamed to indicate their well pairs. Table 5 summarizes the observations recorded during the NAPL evaluation. NAPL evaluation results are discussed in more detail in subsection 5.3 of this report.

5.2.1 Shallow Overburden (A Zone)

Groundwater within the shallow overburden is under unconfined conditions where the water table was encountered within the fill layer or within the upper portion of the glacial deposits (where peat is absent). Observations made during previous investigations and the Phase I SRI indicate that groundwater is likely to be present under local perched conditions (as noted in test pits within the northern and southeastern portions of the site). The groundwater was noted to be under localized semi-confined conditions (e.g., BP-8) in previous investigations. These perched and semi-confined conditions are likely related to the occurrence of discontinuous layers of varying permeability.

Based on the boring and test pit logs, the peat is absent in the northern portion of the site along Third Avenue as illustrated in Figure 3. However, silty clays and clayey silts that may be locally confining occasionally were reported on previous investigation and Phase I SRI boring logs where peat is absent. Based on observations during the Phase I SRI, these clayey silts/silty clays are not homogeneous or continuous and do not form a shallow continuous confining unit across the site.

Four rounds of water level measurements were performed during the Phase I SRI. Tabulated water level measurements are summarized in Table 4. In general, the groundwater elevations were highest in May 2000 and lowest in January 2001, with measurements fluctuating between 0.6 and 2 feet. Groundwater elevation contour maps for the shallow overburden (A zone) are presented in Figures 9 through 12. These maps indicate that groundwater elevations are highest along the western central portion of the site (MW-21A, MW-19A, and MW-18A), and that groundwater flows to the east across Third Avenue, southeast towards South Second Street, and south toward the Elizabeth River in a somewhat radial pattern. This groundwater flow pattern is similar to the groundwater flow in the overburden as described in previous investigations. (Tabulated water level measurements, well construction details, and overburden groundwater contour maps constructed by Dames & Moore from 1993 water level measurements were provided in Appendix D of the September 27, 1999 Phase I SRIWP.)

Based on the proximity of the Elizabeth River to the site, it would be expected that shallow site groundwater would flow across the entire site to the south-southeast towards the river rather than radially from the center of the site. A local source of recharge, is suggested by these contour maps, in the north-central portion of the site but the nature of this source has not been identified. The radial flow pattern is not a result of contouring data from wells screened in different strata or from wells screened across more than one stratum. Since the water levels used to generate these maps were collected in wells screened above the peat layer, where present, it does not appear that the presence of the peat layer which may be semi-confining/confining in the southern portion of the site results in the radial flow pattern in the shallow overburden (A zone). An old brick sewer approximately 3 feet by 4.5 feet is situated in Third Avenue north of the site. Based on a sewer plan that illustrates the elevation of the inverts of manholes along Third Avenue and the groundwater elevations in the northeastern portion of the site, it is believed that the sewer intercepts the groundwater in this area. For these reasons, it is surmised that the groundwater flow direction in the eastern-northeastern portion of the site may be affected by the presence of the brick sewer in Third Avenue.

5.2.2 Deeper Overburden (B Zone)

Groundwater within monitoring wells screened in the deeper overburden is primarily under semi-confined conditions where the potentiometric head rises above the peat layer (where present) into the fill layer, or is unconfined within the upper portion of the glacial deposits or fill material (where peat is absent in the northern portion of the site). As with the shallow overburden, deeper overburden water levels were highest in May 2000 and lowest in January 2001. Groundwater elevation contour maps for the deeper overburden (B zone) are presented in Figures 13 through 16. These maps indicate that groundwater in the deeper overburden generally flows south-southeast in the southern two-thirds of the site towards the Elizabeth River and to the east in the northern one-third of the site across Third Avenue. The groundwater gradient in the northern portion of the site is very flat and becomes steeper in the southern portion of the site near the river. On the January 2001 contour map, it appears that there may be a groundwater divide trending northwest-southeast across the site and groundwater in the northeast corner of the site flows east-northeast towards Third Avenue. In this area of the site, the overburden A and B zones are continuous and relatively thin (approximately 10 to 15 feet thick). This flow pattern may be related to the fact that the peat unit pinches out in this area so that the overburden A and B zones are continuous, and may be affected by the presence of the sewer in Third Avenue.

5.2.3 Overburden Permeability

Permeability testing was not performed as part of the Phase I SRI activities other than a shelby tube sample analyzed for permeability. The remaining permeability data presented herein is based on previous investigations and is restated from the September 27, 1999 Phase I SRIWP. Dames & Moore performed borehole permeability tests in April and May 1993 (detailed in the Dames & Moore 1994 report) at CB-1, BP-4, and BP-6 at depth intervals of 11 to 12.5 feet, 23 to 24.5 feet, and 14 to 16 feet below grade, respectively.

These tests were primarily intended to estimate the *in-situ* lateral hydraulic conductivities at a discrete location and to assess local variations of the hydraulic characteristics of the overburden. It should be noted that the bottom of the test section was open, thereby allowing for potential vertical flow. The vertical flow component was considered to be relatively negligible in comparison with the lateral flow in the analysis.

The results indicate that the estimated average of the lateral hydraulic conductivity for the test zones are 1.02 foot/day (3.6×10^{-4} cm/sec), 0.0053 foot/day (1.87×10^{-6} cm/sec), and 0.02 foot/day (7.27×10^{-6} cm/sec) for tests at CB-1, BP-4 and BP-6, respectively. These results indicate that, although both tests in CB-1 and BP-1 were performed on glacial deposits consisting primarily of fine-grained soils, the hydraulic conductivity varies locally by more than two orders of magnitude.

These estimates of the lateral hydraulic conductivity were compared with estimates of vertical hydraulic conductivity obtained from laboratory permeability testing. The laboratory tests were conducted on relatively undisturbed soil samples collected from locations coinciding with test sections where the borehole permeability tests at CB-1 and BP-4 were performed. This comparison indicates that the vertical hydraulic conductivity is smaller than the lateral hydraulic conductivity by nearly one order of magnitude for BP-4 soils, and by more than two orders of magnitude for CB-1 soils.

These estimates of the hydraulic conductivity indicate that the lower glacial/residual deposits and a portion of the upper glacial deposits are very slow-draining soils, which are likely to act as a semi-impervious barrier retarding groundwater flow, particularly along the vertical direction. This observation is further supported by the laboratory permeability test results for other soil samples collected from these horizons, where the vertical hydraulic conductivity was estimated to range from 1 x 10^{-6} to less than 1 x 10^{-7} cm/sec. The shelby tube sample collected from glacial till material during the Phase I SRI had a vertical hydraulic conductivity of 2.10 x 10^{-8} cm/sec which corresponds with previous investigation findings. The shelby tube permeability results are provided in Appendix E.

Five slug tests were performed by Dames & Moore during this investigation in overburden wells MW-5, MW-6, MW-7, MW-8, and MW-12. With the exception of MW-6, both falling head and rising head slug tests were performed. The field data and the curve matching of test results for all these tests are presented in the Dames & Moore 1994 report. A summary of the slug test data was presented in Appendix D of the September 27, 1999 Phase I SRIWP. It should be noted that the results from MW-5, MW-6, MW-7, and MW-12 represent the permeability of more than one stratum as the wells are screened across two or more strata.

The data were analyzed using the Bouwer and Rice (1976) method and the update by Bouwer (1989) for slug tests in unconfined aquifers. The curve matching of the test results using this method was carried out via a computer software called ISOAQXC, developed by Hydrologic, Inc. (Hydrologic, 1993). The results for both rising head and falling head tests were generally consistent. The average lateral hydraulic conductivity estimates varied between 2.4 x 10^{-4} to 2.5 x 10^{-2} cm/sec, indicating the wide spatial variations in the hydraulic characteristics of the overburden unit. Generally, these results indicate that the overburden unit within the southern portion of the site is more permeable than that in the northern portion of the site. However, zones of low permeability in the southern part of the site, such as that around MW-7 with a lateral hydraulic conductivity of about 5 x 10^{-4} cm/sec, should also be expected. It is pertinent to note that these results should be considered cautiously, since slug tests typically provide an approximate estimate of the lateral hydraulic conductivity of the soil immediately surrounding the test well.

Three aquifer performance tests were performed in overburden wells MW-11, MW-13 and MW-6. MW-6 is screened across the fill, peat, and sandy clay glacial deposits. MW-11 is screened solely in the fill unit. MW-13 is screened in the fill and in the upper portion of the glacial deposits (peat is absent in this location). Each test consisted of:

- the pre-pumping step-drawdown tests and long-term groundwater level monitoring;
- the pumping (drawdown) phase; and
- the recovery phase.

In addition, short-term well capacity pumping tests were conducted at several on-site wells during groundwater sampling. These step-drawdown and well capacity tests were conducted by Dames & Moore during the 1992 and 1993 investigations to evaluate the hydraulic response and efficiency, and to estimate the feasible pumping rates and specific capacity of the various wells tested. Estimates of sustainable yields and specific capacities were developed for on-site wells based on the results of these tests. These estimates were developed using empirical equations and techniques presented in Driscoll (1986). Estimates of the lateral hydraulic conductivity were developed by fitting the field drawdown data to appropriate type curves (i.e., Theis, Boulton/Neuman or Jacob). Summary tables and the preliminary analysis of data from the various step drawdown tests conducted during the three aquifer tests are presented in the Dames & Moore 1994 report.

5.2.4 Hydraulic Interaction Between the Overburden A and B Zones

The groundwater elevation in the overburden A zone is consistently higher than the groundwater elevation in the overburden B zone across the site. On the northern side of Third Avenue, the groundwater elevations measured in monitoring well pairs MW-23A/B and MW-24A/B indicate that the B zone level was higher than the A zone level in the February 2001 measurement event. In the southern portion of the site, the B zone overburden groundwater is semi-confined by the peat zone and the A and B zones are somewhat separated. In the northern portion of the site, the zones are continuous in the absence of the peat. The overburden A and B zones are indistinguishable in the northeastern corner of the site (MW-3), where the overburden is approximately 10 to 12 feet thick. Water levels in the overburden in this area of the site tend to be similar to overburden A zone water levels.

Based on a review of the groundwater elevations and flow directions in the overburden A and B zones, it is apparent that there are significant differences in these zones to warrant wells screened separately in each zone. Therefore previously installed monitoring wells and piezometers, which are screened across the peat zone (where present) and within both the overburden A and B zones should be abandoned to prevent mixing of the two zones and masking hydraulic characteristics. Monitoring wells and piezometers, which should be abandoned based on their construction, include MW-4, MW-5, MW-6, MW-7, MW-9, MW-10, MW-12, and BP-3.

5.2.5 Shallow Bedrock

Groundwater within the shallow bedrock is under confined conditions (where the static potentiometric surface is above the top of bedrock). Based on the Phase I SRI groundwater level measurements, groundwater elevations within the shallow bedrock were highest in May 2000 and lowest in January 2001. The potentiometric surface of the shallow bedrock is presented in Figures 17 through 20 for the four measurements periods. These maps indicate that groundwater flow in the shallow bedrock generally is to the south towards the Elizabeth River. The gradient is relatively flat in the northern two-thirds of the site and is steeper in the southern one-third of the site.

Field observations made during well development and groundwater sampling in previous investigations indicate that fractures intersecting bedrock well MW-2D may likely be discontinuous and not connected to fractures intersecting other on-site bedrock wells. Water level measurements in MW-2D indicate that the water level in the well was about 48 to 50 feet below the water level in other bedrock wells during previous investigations. In addition, bedrock well MW-2D was fully evacuated (dried) upon continuous pumping for a short period of time, even at pumping rates less than 0.2 gallon per minute (gpm) during previous investigations. During the Phase I SRI the water level in MW-2 was within 7 feet of land surface during the May 2000 measurement event, but was 44 and 55 feet bls during the August 2000 and February 2001 measurement events, respectively. The total depth of well MW-2D is 61 feet, which is approximately 20 feet deeper than the other site bedrock wells; its depth may account for the difference in water level and permeability.

5.2.6 Tidal Survey Results

A tidal survey was performed at the site in January 2001. During the survey, water levels were monitored continuously in the Elizabeth River, two catch basins (CB-1 and CB-2), four overburden A zone wells (MW-14A, MW-18A, MW-19A, and MW-21A), four overburden B zone wells (MW-14B, MW-18B, MW-19B, and MW-21B), and two shallow bedrock wells (MW-5D and MW-1D) for a minimum of 72 hours. Figure 21 illustrates the water level fluctuations for each of the points measured, except for MW-14A. The water levels in MW-14A were monitored for 72 hours after the 72-hour period in which the other wells were monitored. Tidal Survey data are compiled in Appendix F.

Figure 22 illustrates the river water level fluctuations and the catch basin water level fluctuations. Catch basin CB-1 illustrates the same tidal fluctuation as the river. Catch basin CB-2, located in the center of the site, is not connected to the same storm sewer system as CB-1 and shows no tidal effect. This catch basin was monitored to evaluate whether the relatively high groundwater elevations in the A zone in this area of the site were related to tidal fluctuations.

Figure 23 illustrates the river water level fluctuations and A zone monitoring well water level fluctuations. Although MW-14A is not illustrated on this graph because it was monitored during a different timeframe, review of the data from MW-14A indicates that the water level in MW-14A is tidally influenced and showed a maximum change of 0.4 foot over the measurement period. The water level in monitoring well MW-18A (approximately halfway between the Elizabeth River and Third Avenue) shows very minimal tidal effects (maximum fluctuation of 0.069 feet). The water level in MW-21A (in the northern corner of the site near Third Avenue) does not show tidal effects. Based on this figure, it is apparent that tidal influence does not extend to the northern property boundary in the overburden A zone. Therefore tidal impacts have minimal effect on groundwater flow direction in the overburden A zone and are not causing the eastern-northeastern groundwater flow direction observed in the eastern-northeast portion of the site in the overburden A zone.

The water level fluctuation curve for MW-19A does not appear to be impacted by the tidal fluctuations in the river adjacent to the site. Rather, the curve for MW-19A appears cyclical but not sinusoidal. In addition, the magnitude of change in the water level in MW-19A (1.8 feet) is greater than any other tidal-related groundwater fluctuation recorded on site. Current site activities are being reviewed to evaluate potential causes for the water level fluctuations recorded in MW-19A. The cause of the groundwater level fluctuations may also be the cause of the relatively high water level measured in this area of the site and may contribute to the apparent radial groundwater flow pattern in the overburden A zone.

Figure 24 illustrates the river water level fluctuations and B zone monitoring well water level fluctuations. Monitoring wells MW-14B, MW-18B, and MW-21B show tidal impacts at varying degrees. MW-14B, adjacent to the river, shows the greatest impact (1.7 feet); MW-18B, in the center of the site, shows moderate change (0.6 foot); and MW-21B, the furthest B zone well from the river monitored during the tidal survey, shows a moderate impact (0.6 foot). The variable impacts likely are related to the discontinuous lenses of silty/clay and sandy silt with varying permeabilities that are present in the overburden, and the distance of the well from the river. The water level fluctuation curve for MW-19B seems to show some of the same effects as the MW-19A curve, but to a much lesser degree. It is apparent that tidal influence in the overburden B zone extends to the northern property boundary. However, based on the tide-related overburden B zone groundwater level fluctuation in the northern portion of the site (0.6 foot) and the horizontal gradient in the overburden B zone in the southern half of the site, the tidal influence does not appear great enough to cause a groundwater flow direction reversal in the overburden B zone, but may contribute to the flat gradient in the northern part of the site.

Figure 25 illustrates the river water level fluctuations and shallow bedrock zone monitoring well water level fluctuations. Water levels in MW-5D adjacent to the river and in MW-1D adjacent to Third Avenue are clearly affected by tidal changes. Cyclical variations of about 0.6 feet were observed. These fluctuations are concurrent with tidal fluctuations in the Elizabeth River without a significant time lag. The impacts noted in the bedrock wells are more pronounced than those observed in the overburden wells. Because the tidal impacts in shallow bedrock groundwater at the site are concurrent with tidal fluctuations in the river and are consistent across the site it does not appear the tidal impacts cause a groundwater flow direction reversal in the shallow bedrock beneath the site.

Figure 26 illustrates the river water level fluctuations and the water level fluctuations in all of the groundwater zones monitored at the site in the northern corner of the site. Tidal impacts are obvious in the overburden B zone and the bedrock zone, but not in the overburden A zone in this area of the site.

The shallow bedrock tidal survey impacts observed during the Phase I SRI are consistent with the tidal survey results presented in previous investigations. The overburden tidal impacts observed during the Phase I SRI vary from those reported in previous investigations. Phase I SRI data indicate that the overburden B zone is impacted by tides across the site and the overburden A zone is impacted by tides along the southern site boundary adjacent to the river. Previous investigations reported that tidal influence in the overburden at the site was not noticeable. The different observations likely are due to varying well construction of the wells used in the tidal surveys. Some of the overburden wells monitored for tidal impacts during the previous investigations were screened across several strata, which may have masked the tidal impacts in the overburden.

5.2.7 Hydraulic Interaction Between the Overburden and the Shallow Bedrock

The various water level measurements conducted at on-site wells indicate that the groundwater elevation within the overburden is higher than the groundwater elevation in the shallow bedrock. The difference in elevation (except for the couplet MW-2 and MW-2D), ranged between 0.6 and 3 feet, based on the well location and the time of measurement due to the tidal effect. Generally, this difference appears to be more pronounced within the northern portion of the site. Once during the Phase I SRI, the potentiometric surface of groundwater in bedrock well MW-7D was noted to be higher than the groundwater elevation in overburden well MW-7.

Although the connectivity of groundwater in the overburden with that in the shallow bedrock has not been fully investigated, a localized hydraulic connection between the two water-bearing units was noted during previous investigations. This was observed during the pumping test in MW-6, where the water level in MW-6D seems to have responded to pumping, during both the pumping and recovery phases. The degree of connectivity is likely to be associated with the degree of perviousness of the intervening glacial/residual deposits and the upper decomposed/fractured bedrock portions, which appear to vary widely throughout the site.

5.3 Nature and Extent of Site Impacts

Phase I SRI and previous investigation analytical data and field observations are compiled in this section to describe the nature and extent of site-related impacts. Previous investigation locations were not based on AOCs. Phase I SRI sample locations were based on AOCs as requested by the Department. The purpose of developing AOCs, according to the Department, was to evaluate the extent of impacts associated with each individual AOC. The Phase I SRI and previous investigation visual observations of soil impacts and soil analytical results have been compiled and are graphically summarized on Plate 3. All sample identification numbers and symbols illustrated in any color except black on Plate 3 indicate that visible impacts were observed at that location. Visible impacts include staining, sheen, residual product, and free product. Additionally, if an analytical sample was collected of the impact and concentrations of any compound analyzed exceeded any of the Department soil cleanup criteria, it is illustrated in brown. Based on this graphical summary of the data collected at the site to date, it is apparent that almost the entire site has been impacted by former site activities. Although some AOCs have less impacts, in general the types of contaminants, their concentrations, and their visible presence does not distinguish one AOC from another. In addition, non-impacted zones of sufficient size to be excluded from future remedial actions were not encountered between AOCs during the investigation. Therefore, the results of the combined Phase I SRI and previous investigations are not presented by AOC in the following subsections. Rather, the data are presented for the site as a whole (the site itself is one AOC) and are subdivided by media (i.e., surface soil, subsurface soil, groundwater, and river sediments and surface water).

5.3.1 Surface Soils

Ten surface-soil samples were collected during the Phase I SRI (not including QA/QC samples) and analyzed for the parameters summarized in Section 4 of this report. Twelve surface-soil samples were collected during previous investigations (not including QA/QC samples) and were analyzed for the parameters summarized in Table 2-3 of the September 27, 1999 Phase I SRIWP, a copy of which is provided in Appendix G of this report. Table 6 provides the analytical results for the surface-soil samples collected during the Phase I SRI. Table 2-2 in Appendix G of this report provides the analytical results for the surface-soil samples collected during previous investigations. These tables are summary tables and list only analytes that were detected in at least one sample. The analytical results are compared to the New Jersey Department of Environmental Protection (NJDEP) soil cleanup criteria consisting of impact to groundwater (IGW) residential (RDC) and non-residential (NRDC) criteria. Plate 4 illustrates the Phase I SRI and previous investigation surface-soil sample locations and analytes that were detected at concentrations exceeding any of the NJDEP soil cleanup criteria.

The analytical results for the surface-soil samples collected to date indicate the presence of VOCs, PAHs, and metals in excess of NJDEP criteria. Although total cyanide was detected at 11 of the 20 samples analyzed for cyanide, none of the detected concentrations exceeded NJDEP criteria. Benzene was the only VOC that exceeded the criteria at two of 22 locations (SS-1 and DTP-11). PAHs were detected at concentrations exceeding the NJDEP criteria at all but 5 of the 22 surface-soil sample locations.

Previous investigation analytical results for metals in surface soils indicated the presence of arsenic and lead above the criteria. The concentrations of arsenic ranged between 6.8 and 190 parts per million (ppm). Lead concentrations ranged from 33.4 to 1,720 ppm. Arsenic and lead were not detected at concentrations exceeding criteria in surface-soil samples collected during the Phase I SRI. Copper was the only metal that exceeded its RDC criteria of 600 ppm in one sample (B-21 at a concentration of 1730 ppm.).

Previous investigation analytical results for total phenols and TPH indicate the presence of these compounds in the surface soils. Phenols were detected in two of the samples analyzed and TPH was detected in six of the samples analyzed.

The purpose of the surface-soil sample collection and analysis was to determine the horizontal extent of surface-soil impacts associated with the site. Surface-soil impacts (exceedances of NJDEP RDC criteria) are present north of the site on the northern side of Third Avenue, east-southeast of the site along South Second Street, and along the western property boundary abutting the Central Railroad of New Jersey. As stated in correspondence to the Department (referenced in Section 1 of this report), the difficulty with obtaining surface-soil samples off site is determining whether detected impacts are site related or from diffuse anthropogenic sources. The isolated benzene hit detected in sample SS-1 north of Third Avenue does not appear to be site related, as benzene was not detected at concentrations exceeding the criterion in surface soils in the northern corner of the site near SS-1. The benzene detected in the SS-1 sample barely exceeds the RDC criterion and is an estimated concentration. The PAH concentrations detected in samples collected below the pavement on South Second Street and north of Third Avenue barely exceed the RDC criteria and are typical of urban background concentrations. The PAH concentrations detected in samples collected along the western property boundary are consistent with former site activities, but can also be related to the adjacent railroad. As discussed in previous meetings with the Department, delineation of surface-soil impacts to the west need not be performed due to the presence of and potential source from the adjacent rail line.

Based on the distribution and magnitude of compounds detected in surface-soil samples collected during the Phase I SRI and previous investigations, ETG believes that the surface-soil impacts associated with the site have been delineated and no further evaluation is necessary.

5.3.2 Subsurface Soils

Table 2-5 from the Phase I SRIWP (copy provided in Appendix G of this report) provides the analytical results for the subsurface soils collected during previous investigations. Forty-six subsurface-soil samples were collected during previous investigations (not including QA/QC samples) and analyzed for the parameters summarized in Table 2-6 of the September 27, 1999 Phase I SRIWP, a copy of which is also provided in Appendix G of this report.

Ninety-one subsurface-soil samples were collected during the Phase I SRI (not including QA/QC samples) and analyzed for the parameters summarized in Table 1. Table 1 also summarizes the rationale for collecting each of the 91 Phase I SRI subsurface-soil samples. Tables 7a, 7b, and 7c provide the analytical results for the subsurface-soil samples collected during the Phase I SRI from test pits, borings, and monitoring wells, respectively. These tables are summary tables and list only analytes that were detected in at least one sample. The analytical results are compared to the NJDEP RDC and NRDC soil cleanup criteria for all subsurface-soil samples collected below 2 feet bls. The analytical results for samples collected above the water table are also compared to the NJDEP IGW soil cleanup criteria. Tables 7a through 7c use an inverted triangle symbol next to the sample identification number to indicate sample intervals that are below the water table and hence were not compared to IGW criteria when shading concentrations that exceeded NJDEP criteria. Also if the method detection limit is above the applicable soil criteria but the result is non-detect then the result is considered non-detect. These results are highlighted in bold italicized text.

Due to the fact that there are analytical results for 137 subsurface-soil samples for this site, figures/plates using call-out boxes to summarize analytes that were detected at concentrations exceeding NJDEP criteria were not created because the sheer volume of data clutters the interpretation of the results. Alternatively, graphics were developed to illustrate locations where visual impacts were observed, the extent of product, and the location and delineation (horizontal and vertical) of areas with concentrations of compounds that exceed NJDEP soil cleanup criteria. Detailed analytical results for each sample are provided in the subsurface soil summary tables (Tables 7a, 7b, 7c and Table 2-5 in Appendix G).

Visible Subsurface-Soil Impact Characterization

Plate 3 illustrates Phase I SRI and previous investigation sample locations where visible impacts were noted during field activities. Visible impacts include staining, sheen, residual product, and free product. Detailed descriptions of visible impacts are provided in subsection 4.1.1 of this report. Plate 3 also illustrates where samples were collected for laboratory analysis to characterize the visible impacts. There are only two locations on Plate 3 where visual evidence of impacts was noted, yet the analytical results from the sample collected at that location did not contain concentrations of compounds exceeding NJDEP soil cleanup criteria. These samples were collected from previous investigation locations MW-11 and CB-3. In both of these instances samples were collected of slightly stained material. At all other locations where visible impacts were noted and analytical samples were collected, concentrations of one or more compounds detected exceeded NJDEP soil cleanup criteria. This is consistent with the nature of impacts at MGP sites.

Table 8 summarizes the analytical results for subsurface-soil samples that were collected during the Phase I SRI to document constituent concentrations in visibly impacted soil as requested by the Department. Table 8 illustrates that visibly impacted samples at the Erie Street former MGP site contain concentrations of BTEX and PAHs at concentrations exceeding the NJDEP criteria. Arsenic, antimony, lead, thallium, zinc, copper, mercury and nickel were detected at concentrations exceeding the NJDEP criteria. Cyanide was detected at only one location, MW-15B, exceeding the NJDEP criteria. Figures 27 through 32 illustrate visual and olfactory notations recorded during the Phase I SRI and previous investigation subsurface activities on the geologic cross sections of the site. These sections illustrate that the majority of impacts were noted in the fill material beneath the site. At a few locations, impacts were noted in the peat, till and weathered bedrock.

Areal Extent of Product

Plate 5 illustrates the areal extent of product observed at the Erie Street former MGP site. Product on this figure refers to sheen, residual product, and free product in accordance with the NJDEP definition of product. The fact that product is noted at specific locations does not imply that 'free product' or mobile product is present at these locations. Descriptions of the noted product are provided on the boring logs in Appendix B and in Phase I SRI test pit descriptions in Table 3. It is apparent from Plate 5 that product is present across the site and appears to be concentrated in the former production area in the north-northwestern portion of the site, in the vicinity of the former oil storage area in the southwestern corner of the site, and along the southern boundary adjacent to the Elizabeth River. Product was not observed in the Elizabeth River sediments adjacent to the Erie Street former MGP site during the river sediment and sampling activities.

Previous investigations reported that NAPL and tar globules had been observed in monitoring wells MW-2D, MW-5, and MW-5D. During the October 1984 investigation, no separate phase oil was detected in the bottom of any well; however, trace oil or tar globules were detected on the surface of the water table in wells MW-5 and MW-5D. Prior to the groundwater sampling performed in June 1992, a 2-foot layer of product was detected in monitoring well MW-5. During the 1994 investigation, 4 to 5 inches of product was observed in MW-5 and a few millimeters of product was noted in MW-2D.

The presence of NAPL at the Erie Street former MGP site was further evaluated by performing a NAPL survey in monitoring wells at the site using an interface probe. NAPL surveys were performed in February 1997 prior to the Phase I SRI and in May 2000 and February 2001 as part of the Phase I SRI. The results of these NAPL surveys are summarized in Table 5. The wells at the site that contained a measurable thickness of NAPL during any of the surveys include MW-2D, MW-5, MW-10, MW-11, MW-14A(BP-2), MW-15A(BP-1), MW-17A(BP-8) and MW-18A(BP-4), as summarized on Table 5. Indications of NAPL, including tar staining on the well casing, sheen on sediments in the base of the well, DNAPL blebs on probes, or droplets of DNAPL in the base of wells, were noted in MW-4 and MW-6. However, no measurable NAPL was noted in these wells.

DNAPL was only observed in one bedrock well (MW-2D) during one survey (1997) at a thickness of 0.04 foot. DNAPL was not measurable in MW-2D in May 2000 or February

2001. LNAPL and DNAPL were measurable in wells MW-10 and MW-11 during the 1997 survey. Subsequent surveys in these wells indicate that more than 1 foot of LNAPL is present in MW-10 and DNAPL is not present in MW-10. The thickness of NAPL in MW-10 could not be determined in February 2001 because the LNAPL coated the tape as it passed through the LNAPL interval. A thickness of 0.1 to 0.4 foot of DNAPL was measured in MW-11, but LNAPL was not noted in MW-11. DNAPL thickness in MW-5 was reported as 0.33 foot in 1997; however, DNAPL was not measurable in 2001. NAPL was not noted in MW-14A(BP-2), MW-15A(BP-1), MW-17A(BP-8), and MW-18A(BP-4) during the 1997 survey. NAPL was measurable in these wells in 2000 and 2001 as summarized on Table 5. Most notably, 1 to 2 feet of DNAPL was reported in MW-17A in the 2001 survey. The other noted monitoring wells contained less than 0.1 foot of measurable LNAPL or DNAPL.

Although DNAPL was not present at a measurable thickness in MW-2D, the groundwater sample collected from MW-2D in January 2001 contained droplets of DNAPL. The analytical results for the sample collected from this round characterize the product in this area of the site and are summarized in Table 7D. These results were not included in the groundwater analytical results as they are not considered representative of the groundwater quality.

Based on the NAPL survey, it appears that the product noted in test pit, boring, and monitoring well logs (the extent of which is illustrated on Plate 5) is not present as mobile product in significant quantities except in the vicinity of MW-17A and MW-10.

Analytical Results Compared to NJDEP Soil Cleanup Criteria

Plate 6 illustrates subsurface-soil analytical results that exceed NJDEP soil cleanup criteria. Analytical data used to generate this graphic are presented in Tables 7a, 7b, 7c, and Table 2-5 (in Appendix G). Figures 33 through 35 provide further detail on the distribution and the types of analytes that exceed the NJDEP criteria in subsurface soils at the site. Figures 33 through 35 illustrate subsurface-soil sample analytical results that exceed NJDEP criteria for BTEX, PAHs, and inorganics, respectively. The distribution of analytical results that indicate concentrations exceeding NJDEP criteria are further illustrated on the geologic cross sections for the site (Figures 3 through 8).

Based on these figures and tables, it is apparent that BTEX, PAHs, some metals, and cyanide are present not only at detectable concentrations in the subsurface beneath the site, but also at concentrations exceeding NJDEP soil cleanup criteria. These subsurface-soil exceedances are primarily within the shallow subsurface soils (fill) beneath the site. Exceptions were noted in locations of former structures such as the gas holder encountered north of the site office building (MW-2D and MW-9D), the former oil gas holder in the southwestern corner of the site (MW-17B), and B-22 near the former production area of the site. The metals detected at concentrations exceeding NJDEP criteria include antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, nickel, thallium, and zinc. These metals were not detected consistently in subsurface-soil samples. Barium (B-18(5-5.5) and MW-21(2-4)), mercury (MW-22(2-4)), nickel (MW-15B(6-8)), and zinc (TP-37(pipe) and MW-21(2-4)) were each only detected at concentrations exceeding standards once or twice at various sample locations. Arsenic, lead, and thallium were the metals detected at concentrations exceeding NJDEP criteria most frequently. Cyanide was detected at concentrations exceeding the RDC criteria in only one subsurface-soil sample collected at the site (MW-15B(6-8)).

Four samples were analyzed for phenols and TPH during previous investigations. Analytical results for total phenols and TPH indicate the presence of these compounds in the subsurface soils. Phenols (136 ppm) and TPH (14,500 ppm) were detected at 4.5 ft bls in TP-3, which is in the former oxide storage area. TPH were also detected at 3 ft bls in TP-8 near former Gas Holder No. 6.

Eighteen subsurface-soil samples were analyzed for TOC. Table 2-8 from the September 27, 1999 Phase I SRIWP (included in Appendix G of this report) presents all of the TOC data indicating sample location and depth of sample. The TOC in these soil samples ranged between 3,600 ppm and 280,000 ppm. TOC levels were elevated, even for soil samples where no VOCs or SVOCs were detected, indicating that the organic carbon detected is characteristic of the solid matrix of the soil particles and is not resulting from adsorption of petroleum hydrocarbons introduced into the subsurface (i.e., contamination). These levels of TOC are considered relatively high, indicating the high adsorption capacity of soils underlying the site for organic constituents. Generally, soil analytical results indicate that concentrations of organic constituents (i.e., VOCs and SVOCs) detected in soil samples collected from the fill were substantially higher than those detected in the underlying soils (glacial deposits), particularly those underlying the peat and the organic clay/silt layer. The migration of contamination appears to have been significantly retarded throughout the site overburden soils, by the relative imperviousness of the glacial deposits and the adsorption capacity of the soil, particularly within the peat and organic clays/silts, and clays within the fill.

Delineation and Characterization of Subsurface-Soil Impacts

The purpose of the subsurface-soil sampling efforts was to characterize and delineate the extent of subsurface-soil impacts at the site. Plate 6 and Table 8 summarize the characterization sample locations and analytical results. As stated previously, these data indicate that the impacts at the Erie Street former MGP site are frequently visible and generally exceed NJDEP criteria for BTEX, PAHs, and some metals, which is consistent with other MGP sites. Cyanide was detected in subsurface soils at a concentration exceeding the RDC criteria at only one location at the Erie Street former MGP site.

Based on Plates 3 and 6 and Figures 27 through 29, it is apparent that the horizontal/lateral delineation of subsurface-soil impacts is complete to the north of the site along Third Avenue and along the northern portion of South Second Street. Horizontal/lateral delineation of subsurface-soil impacts has not been completed east of the site along the southern portion of South Second Street or west of the site along the Central Railroad of New Jersey. Subsurface-soil impacts are present to the southern boundary of the site however no product was noted in the river sediments adjacent to the site. Therefore, delineation of subsurface-soil impacts to the south is considered complete.

Several borings were drilled at the site and several samples were collected for laboratory analysis during the Phase I SRI, specifically to delineate the vertical extent of observed/detected shallow impacts and to provide general vertical delineation coverage for the site. These borings/sample locations include B-11, B-22, B-23, B-29, B-30, B-33, B-35, SB-TP-25, SB-TP-30, SB-TP-39, SB-TP-75, VB-1, VB-2, VB-3, VB-4, MW-14B, MW-15B, MW-16B, MW-17B, MW-18B, MW-19B, MW-21B, MW-22B, MW-23B, and MW-24B. As illustrated on Figures 27 through 29, Plate 6 and the subsurface-soil analytical summary tables (7a through 7c and 2-5 in Appendix G) samples were collected at these locations that verify vertical delineation at the site. Geologic cross sections (Figures 3 through 8) also illustrate the analytical verification of vertical delineation of site impacts. Figures 27 through 32 also illustrate the visible vertical extent of site impacts. In general, subsurface-soil impacts exceeding NJDEP criteria are present in the fill and upper peat (or upper till where peat is absent) at the site. Subsurface-soil impacts were noted in the deeper portion of the till and/or within the upper residual soil/weathered bedrock at MW-2D and MW-9D adjacent to a former subsurface holder, and at MW-17B in the vicinity of a former gas oil/oil tank. Deeper till impacts were also noted in MW-22B. Subsurface-soil delineation is considered complete at these locations since bedrock is at or within a few feet of these sample intervals. Analytical verification of vertical delineation is complete above the residual soil/bedrock surface everywhere subsurface soils were investigated at the site, except as noted above.

5.3.3 Groundwater

Groundwater analytical results are presented for the overburden and shallow bedrock groundwater in this subsection. Groundwater samples were collected from newly installed overburden monitoring wells, five previously installed overburden piezometers (which are renamed and part of nested overburden pairs), and all bedrock monitoring wells during the Phase I SRI. The previously installed piezometers, which were sampled include BP-1 (MW-15A), BP-2 (MW-14A), BP-4 (MW-18A), BP-6 (MW-20B), and BP-8 (MW-17A). The only overburden monitoring well sampled during the Phase I SRI that was installed during previous investigations was MW-3, in the northeastern corner of the site. This well was used in place of a nested pair proposed in this area of the site in the Phase I SRIWP due to the decreased thickness of the overburden in this area of the site. Previously installed overburden monitoring wells were not sampled during the Phase I SRI because several of them were constructed with open screens across several strata. The previous investigation groundwater results are included in the discussion of groundwater quality presented in the following subsections.

As noted in subsection 5.2.4 of this report, several previously installed monitoring wells and one piezometer should be abandoned because they are screened throughout several strata and across the peat unit (where present). As is evident from the previous discussion of subsurface soil impacts, the majority of subsurface soil impacts are in the overburden A zone above the peat unit. The groundwater data described in this subsection illustrate that the majority of overburden groundwater impacts also are present in the overburden A zone. Therefore it is important to abandon wells constructed with screens across several strata from a groundwater quality standpoint as well as a hydraulic standpoint. The monitoring wells and piezometer recommended to be abandoned for groundwater hydraulic and quality purposes include MW-4, MW-5, MW-6, MW-7, MW-9, MW-10, MW-12, and BP-3.

5.3.3.1 Overburden A Zone Groundwater Quality

Groundwater samples were collected during the Phase I SRI in May 2000 and January 2001. The wells sampled and the parameters analyzed are summarized in Section 4 of this report. Groundwater analytical results for the overburden A and B zones are summarized in Table 10a. The analytical results on Table 10a and throughout this section are compared to the NJDEP Specific Groundwater Quality Criteria, Interim Specific Ground Water Quality Criteria and the practical quantitation limits all of which will be referred to as the groundwater quality criteria (GWQC). Groundwater analytical results for the overburden from previous investigations were summarized in Table 2-9 of the September 27, 1999 Phase I SRIWP. A copy of this table is provided in Appendix G of this report. Table 2-9 in Appendix G has been modified to reflect revisions and additions to the GWQC. These summary tables list only analytes that were detected in at least one sample. These tables were used to create Plate 7, which illustrates groundwater analytical results that exceed the GWQC. Plate 7 provides the Phase I SRI groundwater analytical results for the overburden A zone highlighted in black outline, and the previous investigation overburden groundwater analytical results highlighted in gray outline. The previous investigation overburden groundwater analytical results are gray because they are historic data and they were collected predominantly from wells screened throughout the overburden rather than in one stratum.

As illustrated in the tables and Plate 7, groundwater impacts are present in the overburden A zone at the site. These impacts include VOCs, PAHs, various metals, and cyanide. Benzene and ethylbenzene were the only VOCs detected in groundwater at concentrations exceeding the GWQC during the Phase I SRI and previous investigations. PAHs and dibenzofuran were the only SVOCs detected at concentrations exceeding the GWQC during the Phase I SRI and previous investigations. Various metals, including aluminum, antimony, arsenic, barium, beryllium, cadmium, iron, lead, manganese, silver, sodium, thallium, and zinc were detected in at least one groundwater sample collected from the overburden. Cyanide was detected in several on-site wells at concentrations exceeding the GWQC.

The highest concentrations of organics (BTEX and PAHs) detected in overburden A zone groundwater at the site were detected in the vicinity of the former 340,000-cf gas holder in monitoring well MW-2, adjacent to the LNG tank (MW-10), and in the vicinity of the former gas oil storage tank in the southwestern corner of the site (MW-4, MW-5, MW-17A, and MW-14A). The most prevalent metals detected at concentrations exceeding GWQC include aluminum, arsenic, iron, lead, manganese, and sodium. These metals were detected across the site; however, only aluminum, iron, manganese, and/or sodium were detected at concentrations exceeding GWQC north of Third Avenue. These metals are not typically or necessarily associated with MGP sites, are detected at locations where MGP-related organics are not detected, and are present off site. Cyanide was detected at concentrations exceeding GWQC at 12 of the 25 locations where groundwater was analyzed for cyanide during the Phase I SRI. No cyanide was detected above the GWQC in wells north of Third Avenue.

Ammonia and hardness were detected above the GWQC in four unfiltered overburden groundwater samples collected and analyzed during previous investigations. Generally, alkalinity, total dissolved solids (TDS), and total suspended solids (TSS) were also detected at elevated levels during previous investigations. Total dissolved solids were detected exceeding the standard in only unfiltered overburden groundwater sample MW-11 at concentrations of 879,000 µg/L. Analytical results for phenols and TPH indicated the presence of these compounds in the overburden groundwater in previous investigations.

Based on the distribution of compounds in overburden A zone groundwater at concentrations exceeding the GWQC, it is apparent that impacts on site have been delineated to the north of the site, north of Third Avenue. Impacts have not been delineated to the east towards Bilkay's Trucking Facility. Groundwater impacts are present along the western property boundary, however, since groundwater flows from the west across the site, the western groundwater impacts generally are delineated. Groundwater impacts in the overburden A zone are present along the southern site boundary adjacent to the Elizabeth River. Based on groundwater and river water elevations measured during the tidal survey, groundwater in the overburden A zone appears connected to the Elizabeth River, however, local discharge may be impeded by the presence of steel sheet piling within the core of the flood control berm adjacent to the site. The surface water samples collected from the Elizabeth River adjacent to the site during the Phase I SRI indicate that overburden A zone groundwater is not impacting the surface water quality in the Elizabeth River.

5.3.3.2 Overburden B Zone Groundwater Quality

The analytical results for groundwater samples collected from the overburden B zone during the Phase I SRI are summarized in Table 10a. This table lists only analytes that were detected in at least one sample. Plate 8 was generated from the data summarized in Table

10a and illustrates the distribution of compounds exceeding the GWQC. Organic (BTEX and PAH) impacts in the overburden B zone are not as widespread as those in the overburden A zone. Benzene was the only VOC detected at concentrations exceeding the GWQC. Naphthalene, 2-methylnaphthalene, benzo(k)fluoranthene, benzo(a)anthracene and benzo(a) pyrene were the only SVOCs detected above GWQC. These organics were only detected in groundwater in the overburden B zone collected from monitoring wells on approximately the western half of the site. Organics were not detected in groundwater collected from the overburden B zone north of Third Avenue.

Several metals were detected at concentrations exceeding the GWQC in overburden B zone groundwater, including aluminum, arsenic, antimony, iron, manganese, sodium, and thallium. The most prevalent metals present at concentrations exceeding the GWQC across the site are aluminum, iron, manganese, and sodium. These metals are not typically associated with MGP sites, are detected at locations where MGP-related organics are not detected, and are present off site. Aluminum, iron, and manganese were detected at concentrations exceeding the GWQC north of Third Avenue. Cyanide was detected at concentrations exceeding the GWQC in five of the 11 monitoring wells sampled to evaluate overburden B zone groundwater quality.

Except for the presence of various metals and cyanide, the groundwater impacts in the overburden B zone are delineated to the north and east of the site, based on the distribution of the data illustrated on Plate 8. Overburden B zone groundwater impacts are present along the western property boundary; however, based on the groundwater flow direction, the western impacts are generally delineated. One well adjacent to the river (MW-14B) contained concentrations of organics exceeding the GWQC. Otherwise, only various metals and cyanide were detected at concentrations exceeding the GWQC along the southern property boundary. Based on groundwater and river water elevations measured during the tidal survey, groundwater in the overburden B zone appears connected to the Elizabeth River, however, local discharge may again be impeded by the sheet pile core of the flood control berm. The analytical results of the surface water samples collected from the Elizabeth River adjacent to the site during the Phase I SRI indicate that the overburden B zone groundwater is not impacting the surface water quality of the Elizabeth River.

5.3.3.3 Shallow Bedrock Groundwater Quality

Shallow bedrock groundwater analytical sample results from samples collected during the Phase I SRI are summarized in Table 10b. These results are compared to the NJDEP GWQC. Shallow bedrock groundwater analytical results from previous investigations were summarized in Table 2-10 in the September 27, 1999 Phase I SRIWP. A copy of this table is provided in Appendix G of this report. This table has been modified to reflect updates to the GWQC since September 1999. The data in these tables were used to generate Plate 9, which illustrates the compounds detected in shallow bedrock groundwater at concentrations exceeding the NJDEP GWQC.

The shallow bedrock groundwater at the site contains VOCs, SVOCs, various metals, and cyanide at concentrations exceeding the GWQC. Benzene, ethylbenzene, and xylenes are the only VOCs that were detected at concentrations exceeding the GWQC. These compounds are consistently detected in the vicinity of the former 340,000-cf gas holder in the northern portion of the site (MW-9D and MW-2D). Benzene has been detected in the groundwater collected from MW-8D since its installation in 1993, although the concentration decreased an order of magnitude between 1993 and 2001. The other detections of VOCs in shallow bedrock groundwater are not consistent. Benzene and ethylbenzene were detected in MW-7D in the southeastern corner of the site in 1984, but have not been detected since then. Benzene was detected during one sampling event (June 2000) in MW-5D in the southwestern corner of the site, but was not detected in groundwater collected from MW-5D prior to 2000. Benzene was detected during the 1993 sampling event in MW-6D in the center of the southern site boundary, but has not been detected since then.

PAHs are the only SVOCs that were detected above NJDEP GWQC. PAHs were only detected in shallow bedrock groundwater samples collected from MW-2D and MW-9D adjacent to the former 340,000-cf gas holder however only the PAHs in MW-9D ground water exceeded the criteria.

Various metals were detected in shallow bedrock groundwater at concentrations exceeding the GWQC. These include aluminum, arsenic, cadmium, iron, manganese, sodium, and zinc. The most prevalent metals detected at concentrations exceeding the GWQC include iron, manganese, and sodium. These metals are not typically associated with MGP sites, are detected at locations where MGP-related organics are not detected, and are present off site.

Cyanide was detected in five of the seven locations where shallow bedrock groundwater samples were collected and analyzed for cyanide. Groundwater samples collected from monitoring wells MW-2D and MW-5D did not contain concentrations of cyanide exceeding the GWQC.

Analytical results from previous investigations for phenols and TPH indicate the presence only of phenols in the shallow bedrock groundwater. Phenols were detected in MW-7D.

Based on the distribution of shallow bedrock groundwater analytical data, it is apparent that shallow bedrock groundwater organic impacts are present in the vicinity of the former 340,000-cf gas holder and extend downgradient to MW-8D. Based on the data, it does not appear that organic impacts in the shallow groundwater beneath the site extend to the southern property boundary, except possibly at MW-5D. Based on the groundwater flow direction for the shallow bedrock (southeast), it appears that the western and northern groundwater impacts are delineated. Organic shallow bedrock groundwater impacts may extend further east of MW-8D and south of MW-5D and inorganic shallow bedrock groundwater impacts may extend further east of MW-8D and south of the Elizabeth River (south of MW-5D, MW-6D, and MW-7D).

5.3.4 Elizabeth River Sediments

Fifty-six sediment samples were collected from the Elizabeth River adjacent to and upstream and downstream of the Erie Street former MGP site. The sample locations are illustrated on Plate 1. Section 4 describes the sample collection methodology and the parameters for which the samples were analyzed. Observations recorded during the sediment sample collection are summarized in Table 11. Table 12 provides a summary of the analytical results for the sediment samples. Table 12 is a summary table and lists only analytes that were detected in at least one sediment sample. The sediment analytical results are compared to the National Oceanic and Atmospheric Administration (NOAA) sediment criteria: ER-L (effects range low) and ER-M (effects range medium) for marine sediments. Although the river is tidally influenced, upstream is to the west and downstream is to the east.

Based on a review of the analytical results table and the large volume of sediment data, plots of analytical data using callout boxes to summarize exceedances of ER-L and ER-M criteria were not generated. All of the types of compounds analyzed in sediment samples were detected at various concentrations and locations. Based on Table 12, PAHs, pesticides, PCBs, and metals are the compounds that were detected above NOAA criteria in the sediment samples collected during the Phase I SRI. There are no ER-L and ER-M standards for VOCs, semivolatile organic compounds other than PAHs, dioxin, insecticides, and cyanide. Since PCBs and pesticides were not found at the site during previous investigations, PAHs were chosen to assess any impact from the Erie Street former MGP site. PAHs were totaled and plotted to graphically illustrate the distribution of total PAHs in the river sediments adjacent to and upstream and downstream of the Erie Street former MGP site on Figure 36. PAH totals do not include non-detect values. Figure 36 shows that the highest concentration of total PAHs was detected in river sediments collected from transect 7, situated approximately 530 feet upstream of the Erie Street former MGP site. Total PAHs were detected at maximum concentrations of 3,178 ppm in the shallow sediments (0-0.5 foot below the riverbed) 10,474 ppm in the deeper sediments (2.0-4.5 feet below the riverbed). A distinct asphalt-like odor (distinctly different from MGP-related odors) was noted when sampling along this transect.

The lowest total PAH concentrations (less than 125 ppm) were detected in river sediments collected immediately upstream (transect 6) and immediately downstream (transect 2) of the Erie Street former MGP site. Total PAH concentrations adjacent to the former MGP site and the City of Elizabeth Sewage Treatment Plant were generally less than 150 ppm, except in one surficial and one deeper sediment sample collected along transect 5 (western corner of former MGP site) and one surficial sample collected along transect 4 (center of former MGP site). Total PAH concentrations downstream of the former MGP site at transect 1 are similar to those detected adjacent to the former MGP site. Based on the distribution of total PAH concentrations in the Elizabeth River sediments, it is evident that the former MGP site is not the source of the PAHs detected in the river sediments.

PCBs and pesticides were detected above ER-L and ER-M criteria in the majority of the transect samples as summarized in Table 12. Eleven soil samples and 13 groundwater samples were analyzed for PCBs and pesticides during the Tasks 1-5 Pre-Design Investigations (report dated March 31, 1993). One pesticide (4,4'DDT) was detected in two test pit soil samples (TP-11 and TP-11A) and one pesticide Beta-BHC was detected in one groundwater sample. Otherwise, PCBs and pesticides were not detected in soil or groundwater at the Erie Street former MGP site. Copies of these analytical results are provided in Appendix D of this report. Previous investigation sample locations are included on Plate 1 of this report. A review of previous investigation data for the Erie Street former MGP site illustrates that the former MGP site is not the source of the pesticides and PCBs detected in the Elizabeth River sediments.

A variety of VOCs were detected in the Elizabeth River sediment samples. There are no ER-L and ER-M standards for VOCs, hence none of the detected concentrations are noted as exceeding standards in Table 12. A review of the data indicates that the VOCs detected include benzene, toluene, ethylbenzene, xylene, styrene, carbon disulfide, chloroform, trichloroethene, 2-Hexanone, and tetrachloroethene. These compounds were detected at various concentrations along the river. The highest VOC concentrations were detected in samples collected from transect 7. Chloroform, trichloroethene, 2-Hexanone, and tetrachloroethene are not associated with former MGP activities and these compounds have not been identified on the former MGP site. Based on the types of VOCs detected and the distribution of VOC analytical results from samples collected along the river, it is evident the former MGP site is not the source of VOCs in the Elizabeth River.

Several metals were detected in the Elizabeth River sediment samples. These include aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc. As summarized in Table 12, ER-L and ER-M criteria have not been developed for 14 of these 23 metals. Transects 1 and 6 had the greatest number of metals detected at their highest concentrations (i.e., highest concentrations of antimony, arsenic, beryllium, potassium, selenium, silver, and thallium were detected in transect 1 and the highest concentrations of aluminum, beryllium, cobalt, iron, manganese, and vanadium were detected along transect 6). Transect 1 is located approximately 550 feet downstream of the former MGP site and Transect 6 is situated approximately 280 feet upstream of the former MGP site. Transect 4, situated perpendicular to the center of the southern property boundary of the former MGP site did not contain the highest concentration of any of the metals detected. The distribution of metal concentrations in the sediment samples collected from the Elizabeth River during the Phase I SRI does not indicate that the former MGP site is the source of metals in the river sediments.

The sediment samples were also analyzed for dioxins. Three dioxin/furan compounds were detected at various concentrations along six of the transects sampled, as summarized in Table 12. These compounds include tetrachlordibenzo-p-dioxin, tetrachlororordibenzofuran, and hexachlorodibenzofuran. The distribution of the dioxin concentrations does not indicate that the Erie Street former MGP site is a source of dioxin in river sediments.

As discussed in the September 27, 2000 Phase I SRIWP, assessing site impacts on the river sediments is complicated by the fact that the river drains a highly industrial area that has been industrial for a long period of time. It is evident that the river sediments are impacted by other sources, many of which have contaminants similar to those found at the Erie Street former MGP site. An additional complication is that the very nature of a river, especially an estuary, is a dynamic system in which sediments are transported and deposited in a continuous cycle. ETG prepared a report, the *Elizabeth River Sediment Evaluation*, that documents these issues for the Elizabeth River, and included the report as Appendix G of the Phase I SRIWP.

The report evaluation concluded that there were and are many potential sources of impacts to sediment in the Elizabeth River, based on historical and current land use along the Elizabeth River and surrounding water bodies. This is substantiated by the NJDEP's report on the Elizabeth River sediment quality and the detection of PAHs in the Arthur Kill. Several types and sources of current and historical information regarding the Elizabeth River and Arthur Kill overwhelmingly imply that there are many both identifiable and unidentifiable sources to the impacts detected in the Elizabeth River sediment. The data provided in the river evaluation report (Appendix G of the SRWIP) show that the Elizabeth River is an industrial river, which makes sediment sampling ineffective due to the certainty that all of the compounds detected will be the cumulative result of many sources and are not due to one or two properties. In addition, the realignment, filling, and construction associated with the ACOE flood control project make it virtually impossible to conclusively determine the source of Elizabeth River sediment contamination.

The sediment data collected during the Phase I SRI illustrate the points summarized above from the *Elizabeth River Sediment Evaluation* (Appendix G of the Phase I SRIWP). Although compounds that can be associated with the former MGP site (as well as other sources such as oil refineries) were detected in the river sediments, the distribution of the detected compounds indicates that the Erie Street former MGP site is not the source of the detected compounds. Additionally, several compounds that are not associated with MGP sites, and were not detected on the Erie Street former MGP site (such as chlorinated VOCs, pesticides, PCBs, dioxin, and some metals), were detected along many of the transects investigated. This confirms that the Elizabeth River sediments have been impacted by other sources. Therefore, evaluation of the impact of the Erie Street former MGP site is considered complete.

5.3.5 Elizabeth River Surface Water Quality

Seven surface water samples were collected from the Elizabeth River during the Phase I SRI. These samples were collected from the center of each transect during low tide events as the tide was receding. No visual observations of impacts were noted on the water surface during the surface water sample collection efforts. The surface water samples were analyzed for the parameters summarized in Section 4 of this report. The analytical results are summarized in Table 13. Table 13 lists only analytes that were detected in at least one surface water sample. The surface water analytical results are compared to the NJDEP Saline Estuary Class 3 Surface Water Quality Criteria (SE-3 SWQC).

Based on the data summarized in Table 13, it is apparent that no compounds were detected above the SE-3 SWQC in any of the surface water samples except the furthest downstream sample collected at SW-1 (along Transect 1). The surface water sample collected at SW-1 contained concentrations of arsenic and thallium that exceeded the SE-3 SWQC standards. Six VOCs, two PAHs, two herbicides, and several metals were detected at concentrations below the SE-3 SWQC. The analytical results do not indicate a trend in the surface water quality along the section of the river evaluated.

6. Summary and Conclusions

Based on the compilation of the previous investigation data and the Phase I SRI data, the following summary/conclusion statements can be made regarding the Erie Street former MGP site.

- The Erie Street facility covers approximately 24.5 acres and is located in a mixed commercial, residential, and industrial district of Elizabeth, New Jersey. The site is bounded by private residences, Bilkay's Trucking Facility, the Elizabeth River, and Conrail railroad tracks and the New Jersey Turnpike.
- The Erie Street facility is presently used for storage, transfer, and distribution of LNG and truck parking.
- The facility served as a water gas manufacturing plant from approximately 1895 to 1952 when it was retrofitted to manufacture oil gas which ceased circa 1974.
- No wetlands are present at or in the vicinity of the site except for the Elizabeth River which bounds the site to the south.
- Public water in the vicinity of the site is provided by the City of Elizabeth Water Department. All city water is provided by two surface water reservoirs (Spruce Run and Round Valley). A well survey did not identify potential receptors to overburden groundwater impacts at the site. One industrial bedrock well was identified approximately ½ mile south of the site.
- Two bedrock production wells were drilled on the Erie Street facility in the past. These wells are not used. They have been located and will be abandoned.
- The geologic materials encountered at the site generally consist of fill underlain by peat (in the southern 2/3 of the site), glacial deposits (till), and weathered bedrock/residual soil which make up the overburden beneath the site, and bedrock (Triassic Brunswick Formation – shale and siltstone).
- The peat zone is present in the southern two-thirds of the site. Silty clays and clayey silts are present in the northern one-third of the site where the peat is absent, however they are not laterally continuous or homogeneous and do not transition into the peat to form one continuous confining unit across the site.

- Groundwater is present in the overburden and the shallow bedrock beneath the site. The overburden groundwater was divided into two zones. The A zone is the shallow overburden zone above the peat (where present) and the B zone is the deeper overburden zone beneath the peat (where present).

- Groundwater within the shallow overburden A zone is under unconfined conditions. Overburden A zone groundwater generally flows from the western central portion of the site to the east-northeast toward Third Avenue, southeast across South Second Street and south to the Elizabeth River. It is presumed that the old brick sewer in Third Avenue causes the shallow groundwater in the northeast portion of the site to flow towards the northeast. Although the remaining shallow overburden groundwater flows to and is connected to the Elizabeth River, local discharge may be impeded by the steel sheet pile core within the flood control berm adjacent to the site.

- Groundwater within the deeper overburden B zone is under semi-confined conditions in the southern two-thirds of the site and under unconfined conditions in the northern one-third of the site where the peat is absent. Groundwater flow within the overburden B zone is generally to the south-southeast towards the Elizabeth River in the southern two-thirds of the site and to the east in the northern one-third of the site. This flow pattern may be related to the pinching out of the peat in the northern portion of the site the continuity of the A and B zones in the northern portion of the site, and/or the presence of the sewer in Third Avenue north of the site. Although groundwater in the overburden B zone flows toward and is connected to the Elizabeth River, local discharge may again be impeded by the sheet pile core of the flood control berm.

- The groundwater elevation in the overburden A zone is higher than the groundwater elevation in the overburden B zone across the site.

- Groundwater within the shallow bedrock is under confined conditions and generally flows to the south towards the Elizabeth River.

- In general, groundwater elevations in the overburden are greater than groundwater elevations in the shallow bedrock beneath the site. A localized hydraulic connection between the overburden and shallow bedrock groundwater was noted in previous investigations. The degree of connectivity is associated with the degree of perviousness of the intervening glacial/residual deposits and the upper decomposed/fractures bedrock portions, which appear to vary widely throughout the site.

- Tidal cycles affect groundwater elevations in the shallow bedrock and overburden B zone across the site. Tidal impacts were noted in the overburden A zone but do not extend across the site to Third Avenue. The tidal impacts on groundwater levels are not of sufficient magnitude to affect the groundwater flow direction in the overburden or bedrock at the site.

The surface and subsurface soils and the overburden and shallow bedrock groundwater quality have been impacted by the former MGP operations at the Erie Street facility as summarized below.

- The analytical results for surface-soil samples indicate the presence of VOCs, PAHs, and metals in excess of the NJDEP soil cleanup criteria. Based on the distribution and magnitude of compounds detected in surface-soil samples, ETG believes that the surface-soil impacts associated with the site have been delineated and no further evaluation is necessary.

- Visible impacts including staining, sheen, NAPL, residual product, and free product were noted in the subsurface soils across the site. At all but two locations where visible impacts were noted, analytical results indicate that subsurface soils contain compounds (BTEX, PAHs, and/or metals) that exceed the NJDEP soil cleanup criteria.

- Product (sheen, NAPL, residual or free) was noted in the subsurface across the site and appears to be concentrated in the former production area in the north-northwestern portion of the site, in the vicinity of the former oil storage area in the southwestern corner of the site, and along the southern site boundary adjacent to the Elizabeth River. Product was not observed in the Elizabeth River sediments adjacent to the former MGP site. Based on NAPL surveys performed in onsite monitoring wells, the product noted in test pit, boring and monitoring well logs is not present as mobile or free product in significant quantities except in the vicinity of MW-17A and MW-10.

- The analytical results for subsurface-soil samples indicate that the horizontal/lateral delineation of subsurface-soil impacts is complete to the north of the site along Third Avenue and along the northern portion of South Second Street. Horizontal/lateral delineation of subsurface soil impacts has not been completed east of the site along the southern portion of South Second Street or west of the site along the Central Railroad of New Jersey. Subsurface-soil impacts are present to the southern boundary of the site however no product was noted in the river sediments adjacent to the site. Therefore, delineation of subsurface-soil impacts to the south is considered complete.

- The analytical results for subsurface-soil samples indicate that subsurface soil impacts have been vertically delineate at the site. In general, subsurface-soil impacts (soils with compounds exceeding NJDEP soil cleanup criteria) are present in the fill and upper peat (or upper till where peat is absent) at the site. Subsurface-soil impacts noted in the deeper portion of the till and/or within the upper residual soil/weathered bedrock were limited to the area adjacent to and west of the former 340,000 cf gas holder (MW-2D, MW-9D, and MW-22B), and in the vicinity of the former gas oil/oil tanks (MW-17B). Subsurface-soil delineation is considered complete at these locations since bedrock is at or within a few feet of sample intervals collected from these locations.

- The analytical results for shallow overburden A zone groundwater indicate that BTEX, PAHs, some metals, and cyanide are present at concentrations exceeding the NJDEP GWQC. Based on the distribution of these compounds it is apparent that impacts onsite have been delineated to the north-northeast of the site north of Third Avenue. Impacts have not been delineated to the east towards Bilkay' s Trucking facility. Impacts are present along the western property boundary, however, based on the groundwater flow direction from west to east the western groundwater impacts generally are delineated. Groundwater impacts in the overburden A zone are present along the southern site boundary adjacent to the Elizabeth River. Although groundwater in the overburden A zone flows toward the Elizabeth River, surface water samples collected from the Elizabeth River adjacent to the site indicate that the overburden A zone groundwater is not impacting the surface water quality in the Elizabeth River.

- The analytical result for the deeper overburden B zone groundwater indicate that BTEX, PAHs, some metals, and cyanide are present at concentrations exceeding the NJDEP GWQC but are not as widespread as those in the overburden A zone. Based on the distribution of these compounds, groundwater impacts in the overburden B zone are delineated to the north and east of the site except for the presence of various metals and cyanide. Groundwater impacts are present along the western property boundary however based on the groundwater flow direction the western impacts are generally delineated. One well adjacent to the river contained concentrations of organics exceeding the NJDEP GWQC. Otherwise, only various metals and cyanide were detected at concentrations exceeding the NJDEP GWQC along the southern property boundary. Although overburden B zone groundwater flows toward the Elizabeth River, surface water samples collected from the Elizabeth River adjacent to the site indicate that overburden B zone groundwater is not impacting the surface water quality in the Elizabeth River.

- Due to the significant differences in overburden A and B zone groundwater hydraulics and quality, previously installed monitoring wells which are screened across the peat unit should be abandoned. These wells include MW-4, MW-5, MW-6, MW-7, MW-9, MW-10, MW-12, and BP-3. In addition, previous investigation monitoring wells MW-13 and MW-11 can be abandoned as they are in the vicinity of monitoring wells MW-15A and MW-17A, respectively which were installed during the Phase I SRI.

- The shallow bedrock groundwater analytical results indicate that VOCs, PAHs, various metals, and cyanide are present at concentrations exceeding the NJDEP GWQC. Shallow bedrock groundwater impacts are present in the vicinity of the former 340,000-cf holder and extend downgradient to MW-8D. Based on the analytical data, it does not appear that organic impacts in the shallow groundwater beneath the site extend to the southern property boundary, except possibly at MW-5D (which may have a separate source). Based on the shallow bedrock groundwater flow direction it appears that the western and northern groundwater impacts are delineated. Organic shallow bedrock groundwater impacts may extend further east of MW-8D and south of MW-5D and inorganic shallow bedrock groundwater impacts may extend further east of MW-8D and south of the Elizabeth River (MW-5D, MW-6D, and MW-7D).

- The Elizabeth River sediment analytical data indicate the presence of VOC, SVOCs, pesticides, PCBs, dioxin, and metals. Based on a comparison of the analytical results with NOAA ER-L and ER-M values, SVOCs, pesticides, PCBs, and metals were detected at elevated concentrations. There are no ER-L or ER-M values for VOCs, dioxin, and various metals. The distribution of the compounds detected in the Elizabeth River indicates that the Erie Street former MGP site is not the source of the compounds detected. Rather, the data clearly illustrate the conclusions stated in the Elizabeth River Sediment Evaluation (Appendix G of the September 27, 1999 Phase I SRIWP), that the Elizabeth River has drained a highly industrial area for over a century that has impacted sediments, and that there were and are many potential sources of impacts to sediment in the Elizabeth River, based on historical and current land use along the Elizabeth River and surrounding water bodies. This is further illustrated by the detection of compounds such as chlorinated VOCs, pesticides, PCBs, dioxin, and some metals in river sediments that are not present at the Erie Street former MGP site. Therefore, evaluation of the impact of the Erie Street former MGP site on the Elizabeth River sediments is considered complete.

- Analytical results for surface water samples collected from the Elizabeth River indicate that no compounds were detected above the SE-3 SWQC in any of the surface water samples collected except for the furthest downstream sample collected at SW-1 (Transect 1). The surface water sample collected at SW-1 contained concentrations of arsenic and thallium that exceeded the SW-3 SWQC standards. The analytical results do not indicate a trend in the surface water quality along the section of the river evaluated and do not indicate that the former MGP site is impacting the surface water quality of the Elizabeth River.

7. Recommendations

The following recommendations are made to complete the remedial investigation of the Erie Street former MGP site based on the combined results of the Phase I SRI and previous investigations.

- Complete subsurface soil delineation on the western portion of the site along the rail line and to the east of the site across South Second Street;
- Complete delineation of overburden A and B zone groundwater quality to the east of South Second Street;
- Complete delineation shallow bedrock groundwater to the east of South Second Street;
- An additional off site, upgradient shallow bedrock monitoring well is recommended to evaluate background shallow bedrock groundwater quality upgradient of the site;
- Abandonment of previous investigation monitoring wells MW-4, MW-5, MW-6, MW-7, MW-9, MW-10, MW-12, and BP-3 is recommended to prevent further potential cross-contamination between the overburden A and B zones and to provide better hydraulic information in the future. Monitoring wells MW-11 and MW-13 should also be abandoned as new wells were installed in their vicinity during the Phase I SRI.
- Abandonment of historic production wells is recommended to be performed in conjunction with the abandonment of the previous investigation monitoring wells noted above.

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TABLES

Tables

Table 1
Subsurface-Soil Sample Rationale
Erie Street Former MGP
Elizabeth, New Jersey

Sample Location ID	Sample Location	Location Rationale	Sample Designation (depth in feet below land surface)	Selected Sample Analytical Rationale	Analysis				
					BTEX	BNs+10	TAL Metals	Total Cyanide	Amenable Cyanide
Test Pits									
TP-17A	Located in the north-central portion of the site to the southwest of the Gate House within Area of Concern B-4	Test pit to characterize the nature and horizontal and vertical extent of potential impacts in the former purifying area	TP-17A (3)	Sample collected to characterize black-stained soils, residual product/slight oily product on gravels, and tar/oil odors at groundwater interface	•	•	•	•	
TP-22	Located to the east of the welding shop in Area of Concern B-6	Test pit to characterize subsurface-soil impacts to evaluate vertical and lateral extent of potential impacts in the former tar processing area	TP-22 (2.0-2.5)	Sample collected to characterize shallow fill material	•	•	•	•	
TP-24	Located to the south of the welding shop in Area of Concern B-6	Test pit to characterize the nature and vertical and horizontal extent of potential impacts adjacent to the former clarifying pit	TP-24 (6)	Sample collected to characterize black-stained fill material coated with tar/oily product	•	•	•	•	•
TP-33	Located in the southwestern portion of the site in Area of Concern C	Test pit to characterize the nature and extent of subsurface-soil impacts in the liquid fuel storage area of the site	TP-33 (5.5)	Sample collected to characterize black-stained fill and residual product	•	•	•	•	
TP-34	Located to the west of the Liquefied Methane Storage area in the western portion of the site within Area of Concern D-2	Test pit to characterize the nature and extent of potential subsurface-soil impacts in the former coal and coke pile at the site	TP-34 (10)	Sample collected to characterize black asphalt-like tar, soils with iridescent sheen, and residual tar product on gravel	•	•	•	•	•
TP-36A	Located in the southwestern portion of the site within Area of Concern C	Test pit to characterize the nature and extent of potential subsurface-soil impacts in the former liquid fuel storage area of the site	TP-36A (8)	Sample collected to characterize tar-saturated, black-stained soils	•	•	•	•	
TP-37	Located in the southwestern corner of the site adjacent to Area of Concern C	Test pit to characterize subsurface soils along the southwestern property boundary	TP-37 (3.0 -3.5)	Sample to characterize black-stained fill material	•	•	•	•	•
			TP-37PIPE	Sample to characterize contents within a piece of 12-inch diameter cast iron pipe	•	•	•	•	
TP-39	Test pit located in the southern portion of the site adjacent to the propane tanks between Areas of Concern C and D-4	Test pit to characterize potential subsurface-soil impacts between the former liquid fuel storage and oxide storage areas at the site	TP-39 (3-4)	Sample to characterize fill material encountered within the test pit (The log for this test pit was not complete.)	•	•	•	•	•

Table 1 (continued)
Subsurface-Soil Sample Rationale
Erie Street Former MGP
Elizabeth, New Jersey

Sample Location ID	Sample Location	Location Rationale	Sample Designation (depth in feet below land surface)	Selected Sample Analytical Rationale	Analysis: BTEX	Analysis: BNs+10	Analysis: TAL Metals	Analysis: Total Cyanide	Analysis: Amenable Cyanide
TP-39A	Test pit located in the southern portion of the site adjacent to the propane tanks between Areas of Concern C and D-4	Test pit to characterize potential subsurface soil impacts between the former liquid fuel storage and oxide storage areas at the site	TP-39A (4)	Sample to characterize black-stained fill with sheen and MGP/purifier odor	•	•	•	•	•
TP-49	Test pit located on the eastern edge of the site north of Area of Concern A-3	Test pit to characterize the nature and extent of potential subsurface-soil impacts in the vicinity of former holder 8	TP-49 (5.0 -5.5)	Sample to characterize soils with moderate-to-strong purifier odor	•	•	•	•	
TP-51	Test pit located in the northeastern corner of the site adjacent to Area of Concern A-2	Test pit to characterize the nature and extent of potential impacts in the vicinity of the former holder	TP-51 (3.5)/TP-51 (7.5)	Sample to characterize black-stained soils with moderate to strong diesel odor at 35 feet and soils to evaluate vertical extent at 7.5 feet	•	•	•	•	
TP-56	Test pit located in the northeastern portion of the site within Area of Concern A-7	Test pit to characterize the nature and extent of potential subsurface-soil impacts in the former purifying box area of the site	TP-56 (4-5)	Sample to characterize black-stained fill with strong purifier/ strong burnt MGP odor	•	•	•	•	•
TP-57A	Test pit located in the northeastern portion of the site	Test pit to characterize the nature and extent of potential subsurface-soil impacts in the former purifying box area of the site	TP-57A (3-4)	Sample to characterize soils below fill material at the peat layer	•	•	•	•	•
TP-68	Test pit located in the north-central portion of the site within Area of Concern B-3	Test pit to characterize the nature and extent of potential subsurface soil impacts in the former tar separator area of the site	TP-68 (3-4)	Sample to characterize black-stained fill with strong tar odor, heavy sheen, and gravel coated with liquid tar	•	•	•	•	
Monitoring Wells									
MW-14B	Located on the southwestern edge of the site along the Elizabeth River	Monitoring well to evaluate groundwater quality and hydrologic properties below the peat layer and above the bedrock in this area of the site	MW-14 (12-13)	Soil sample collected from below impacts observed in the fill above the peat to verify vertical extent of observed impacts	•	•	•	•	
			MW-14 (22-24)	Soil sample collected at the surface of the weathered bedrock. No impacts were observed at this interval	•	•	•	•	Not Sampled

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Table 1 (continued)
Subsurface-Soil Sample Rationale
Erie Street Former MGP
Elizabeth, New Jersey

Sample Location ID	Sample Location	Location Rationale	Sample Designation (depth in feet below land surface)	Selected Sample Analytical Rationale	Analysis: BTEX	Analysis: BNs+10	Analysis: TAL Metals	Analysis: Total Cyanide	Analysis: Amenable Cyanide
MW-15B	Located in the center of the southern property boundary along the Elizabeth River	Monitoring well to evaluate the groundwater quality and hydrologic properties below the peat layer and above the bedrock in this area of the site	MW-15 (6-8)/MW-15 (10-11)	Soil sample collected to evaluate soils with slight MGP odors below observed contamination (6-8') and to evaluate peat material (10-11')	•	•	•	•	•
			MW-15B (14-15)/ MW-15B (23-24)	Soil sample collected to evaluate the quality of the glacial till immediately below the peat (14-15') and the quality of soils at the weathered bedrock surface (23-24') Impacts were not observed at either of these intervals	•	•	•	•	
MW-16A	Located off site on a parcel owned by the City of Elizabeth adjacent to the southeastern portion of the property	Monitoring well to evaluate the groundwater quality and hydrologic properties above the peat layer between MW-7 and the Elizabeth River	MW-16A (8.0-8.5)	Soil sample collected to characterize stained soils observed above the peat	•	•	•	•	
MW-16B	Located off site on a parcel owned by the City of Elizabeth adjacent to the southeastern portion of the property	Monitoring well to evaluate the groundwater quality and hydrologic properties below the peat layer and above the bedrock between the site (MW-7) and the Elizabeth River	MW-16B (16-17)	Soil sample collected as specified in the September 27, 1999 SRIWP	•	•	•	•	
MW-17B	Located in the southwestern portion of the site adjacent to Area of Concern C	Monitoring well to evaluate the groundwater quality and hydrologic properties below the peat layer and above the bedrock in this area of the site	MW-17B (18-20)/ MW-17B (30-32)	Soil sample collected immediately below impacts observed in the peat to verify vertical extent of impacts and as specified in the September 27, 1999 SRIWP (18 to 20'), and to characterize soils with a slight MGP odor within the weathered bedrock (30-32')	•	•	•	•	
MW-18B	Located along the western edge of the site	Monitoring well to evaluate groundwater quality and hydrologic properties below the peat layer and above the bedrock in this area of the site	MW-18B (26-28)	Soil sample collected to verify vertical extent of impacts observed in overlying fill and peat material	•	•	•	•	
MW-19A	Located in the central portion of the site	Monitoring well to evaluate the groundwater quality and hydrologic properties above the peat in the center of the site	MW-19A (4-6)	Sample collected as specified in the September 27, 1999 SRIWP	•	•	•	•	•

Table 1 (continued)
Subsurface-Soil Sample Rationale
Erie Street Former MGP
Elizabeth, New Jersey

Sample Location ID	Sample Location	Location Rationale	Sample Designation (depth in feet below land surface)	Selected Sample Analytical Rationale	Analysis: BTEX	Analysis: BNs+10	Analysis: TAL Metals	Analysis: Total Cyanide	Analysis: Amenable Cyanide
MW-19B	Located in the central portion of the site, paired with MW-19A	Monitoring well to evaluate the groundwater quality and hydrologic properties below the peat and above bedrock in the center of the site	MW-19B (18-20)	Sample collected to evaluate soil quality and to delineate overburden impacts in the center of the site	•	•	•	•	
MW-21A/ MW-21B	Located in the northwestern corner of the site	Nested pair of monitoring wells to evaluate groundwater quality and hydrologic properties in this area of the site	MW-21 (2-4)/MW-21 (10-12)	Soil samples collected from 2-3 and 10-12 feet as specified in the September 27, 1999 SRIWP	•	•	•	•	
MW-22A/ MW-22B	Located in the north-central portion of the site	Nested pair of monitoring wells to evaluate groundwater quality and hydrologic properties in this area of the site	MW-22 (2-4)	Sample collected as specified in the September 27, 1999 SRIWP	•	•	•	•	•
			MW-22 (10-12)	Soil sample collected to characterize stain and tar material observed at this interval and as specified in the September 27, 1999 SRWIP	•	•	•	•	
			MW-22 (22-23)	Soil sample collected to verify the vertical extent of the overlying observed impacts	•	•	•	•	
MW-23A/B	Located on the eastern side of Florida Street north of Third Avenue	Nested pair of monitoring wells to evaluate groundwater quality and hydrologic properties north of the site	MW-23B (3-4)	Soil sample collected to delineate the horizontal extent of soil exceedances in B-14 from 3-4 feet bls	•	•	•	•	
			MW-23B (8-10)	Soil sample collected at the approximate groundwater interface due to the absence of visual/odor impacts	•	•	•	•	
			MW-23B (24-25)	Soil sample collected at the base of the boring to verify no soil impacts at this depth	•	•	•	•	
MW-24A/B	Located on the western side of Erie Street, north of Third Avenue	Nested pair of monitoring wells to evaluate groundwater quality and hydrologic properties north of the site	MW-24B (4-5)	Soil sample collected to delineate the horizontal extent of impacts observed in TP-63 between 2 and 8 feet bls	•	•	•	•	
			MW-24B (7-8)	Soil sample collected to delineate the horizontal extent of impacts observed in TP-63 between 2 and 8 feet bls	•	•	•	•	
			MW-24B (16-17)	Soil sample collected at the top of weathered bedrock to verify no soil impacts at this depth	•	•	•	•	

Table 1 (continued)
Subsurface-Soil Sample Rationale
Erie Street Former MGP
Elizabeth, New Jersey

Sample Location ID	Sample Location	Location Rationale	Sample Designation (depth in feet below land surface)	Selected Sample Analytical Rationale	Analysis: BTEX	Analysis: BNs+10	Analysis: TAL Metals	Analysis: Total Cyanide	Analysis: Amenable Cyanide
MW-25A	Located on the eastern side of Geneva Street, north of Third Avenue	Shallow monitoring well to evaluate groundwater quality and flow direction in the shallow overburden north of the site	MW-25A (4-5)	Soil sample collected to delineate the horizontal extent of impacts observed in TP-10 between 4 and 8 feet bls	•	•	•	•	
			MW-25A (6-7)	Soil sample collected to delineate the horizontal extent of impacts observed in TP-10 between 4 and 8 feet bls	•	•	•	•	
MW-26A	Located on the eastern side of Delaware Street, north of Third Avenue	Shallow monitoring well to evaluate groundwater quality and flow direction in the shallow overburden north of the site	MW-26A (3-4)	Soil sample collected at the groundwater interface	•	•	•	•	
			MW-26A (9-10)	Soil sample collected at the top of weathered bedrock to verify no soil impacts at this depth	•	•	•	•	
Borings									
B-11	Located in the southern portion of the site within Area of Concern D (Material Storage)	Boring to delineate the vertical extent of contamination at the site	B-11 (13-15)	Sample to evaluate slight hydrocarbon and staining noted at the apparent groundwater table	•	•	•	•	
			B-11 (19-20)	Sample to evaluate vertical extent of contamination	•	•	•	•	•
SB-12	Located adjacent to the current meter house in the eastern potion of the site adjacent to Area of Concern A-5 (Purifying Boxes)	Boring to delineate the vertical extent and to evaluate previous soil sample exceedances detected at the site	SB-12 (5-6)	Soil sample to evaluate vertical extent of contamination	•	•	•	•	•
			SB-12 (7.5-8)	Soil sample to evaluate vertical extent of contamination	•	•	•	•	
			SB-12 (13-14)	Soil sample to evaluate vertical extent of contamination	•	•	•	•	
B-14	Located off site adjacent to the northeastern portion of the site within Third Avenue Right-of-Way	Boring to delineate the vertical extent of contamination adjacent to the site	B-14 (3-4)	Sample to evaluate soils with fuel oil/diesel odors	•	•	•	•	•
B-15 (2-3)	Located off site adjacent to the northeastern portion of the site within Third Avenue Right-of-Way	Boring to delineate the vertical extent of contamination adjacent to the site	B-15 (2-3)/ B-15 (12-14)/ B-15 (20-22)/ B-15 (25-26)/ B-15 (26-28)	Soil sample to evaluate soils above observed contamination at 2-3' and 12-14'. Sample to evaluate soils with sweet odor at 20-22'/residual product at 25-26'/and weathered bedrock at 26 to 28'	•	•	•	•	

Table 1 (continued)
Subsurface-Soil Sample Rationale
Erie Street Former MGP
Elizabeth, New Jersey

Sample Location ID	Sample Location	Location Rationale	Sample Designation (depth in feet below land surface)	Selected Sample Analytical Rationale	Analysis: BTEX	BNs+10	TAL Metals	Total Cyanide	Amenable Cyanide
B-16	Located off site adjacent to the eastern portion of the site within Third Avenue Right-of-Way)	Boring to delineate the vertical extent of contamination adjacent to the site	B-16 (1-2)/B-16 (8-9)	Soil sample to evaluate shallow fill material/Sample to evaluate vertical extent of possible diesel fuel	•	•	•	•	
B-17	Located in South 2nd Street	Boring drilled to evaluate the extent of impacts to the east of the site	B-17 (3.5-4)	Soil sample collected as specified in the September 27, 1999 SRIWP		•			
			B-17 (7-8)	Soil sample collected to evaluate soil quality and to delineate overburden impacts in this area of the site	•	•	•	•	
B-18	Located in South 2nd Street	Boring drilled to evaluate the extent of impacts to the east of the site, including PAH exceedances from 5 - 5.5 feet bls in TP-49	B-18 (5-5.5)	Soil sample collected to evaluate the extent of PAH exceedances detected in this interval on site at TP-49	•	•	•	•	•
			B-18(9-10)	Soil sample collected to evaluate soil quality and to delineate overburden impacts in this area of the site	•	•	•	•	
B-19	Located in South 2nd Street	Boring drilled to evaluate the extent of impacts to the east of the site	B-19 (2-4)	Soil sample collected as specified in the September 27, 1999 SRIWP		•			
			B-19 (8-10)	Soil sample collected to evaluate soil quality and to delineate overburden impacts in this area of the site	•	•	•	•	
B-20	Located in South 2nd Street	Boring drilled to evaluate the extent of impacts to the east of the site	B-20 (5-6)	Soil sample collected to characterize the black stain and sheen observed from 4 to 8 feet bls at this location		•			
			B-20 (8-10)	Soil sample collected to verify visible vertical extent of overlying impacts	•	•	•	•	
B-21	Located in South 2nd Street	Boring drilled to delineate the extent of impacts to the east of the site	B-21 (6-7)	Soil sample collected to characterize stain and sheen observed at this location		•			•
			B-21 (8-9)	Soil sample collected to evaluate the extent of PAH exceedances detected in this interval in MW-16A/B	•	•	•	•	
			B-21 (13-14)	Soil sample collected to verify visible vertical extent of overlying impacts	•	•	•	•	

Table 1 (continued)
Subsurface-Soil Sample Rationale
Erie Street Former MGP
Elizabeth, New Jersey

Sample Location ID	Sample Location	Location Rationale	Sample Designation (depth in feet below land surface)	Selected Sample Analytical Rationale	Analysis: BTEX	Analysis: BNs+10	Analysis: TAL Metals	Analysis: Total Cyanide	Analysis: Amenable Cyanide
B-22	Located in the northern portion of the site within Area of Concern B-3 (tar separator)	Boring to delineate the vertical extent of contamination at the site	B-22 (21-22)	Sample to evaluate soil conditions below observed contamination	•	•	•	•	
B-23	Located in the northwestern portion of the site within Area of Concern B-6 (tar processing area, tar separator)	Boring to delineate the vertical extent of contamination at the site	B-23 (17-18)	Sample to evaluate soil conditions below observed contamination	•	•	•	•	
SB-29	Located in northern portion of the site within Area of Concern B-5 (large relief holder, tar tank, drip oil area)	Boring to delineate the vertical extent of contamination at the site	SB-29 (16-17)	Soil sample to evaluate vertical extent of contamination and to evaluate sweet MGP/gasoline odor	•	•	•	•	•
SB-30	Located in the central-northeast portion of the site adjacent to Area of Concern B-2 (small relief holder)	Boring to delineate the vertical extent of contamination at the site	SB-30 (24-25)	Soil sample to evaluate vertical extent of contamination and to evaluate slight odor	•	•	•	•	
B-33	Located in the central portion of the site adjacent to Areas of Concern D-2 and D-3 (coal and coke pile)	Boring to delineate the vertical extent of contamination at the site	SB-33 (13-14)/SB-33 (20-21)	Sample to evaluate soil conditions above observed tar impacts/Sample to evaluate soil conditions below tar impacts to determine vertical extent of contamination	•	•	•	•	
B-35	Located in the southwestern portion of the site within Area of Concern D-4 (oxide storage area)	Boring to delineate the vertical extent of contamination at the site	B-35 (16-18)	Sample to analyze slight sweet odor and to evaluate soils for vertical extent of contamination	•	•	•	•	
SB-TP-14	Located adjacent to test pit 14 location in the northern corner of the site adjacent to Area of Concern B-5 (former relief holder)	Boring completed adjacent to proposed GEI test pit 14 location to determine vertical and lateral extent of contamination at the site	SB-TP-14(15-16)	Soil sample to evaluate fill material with slight naphthalene odor	•	•	•	•	
SB-TP-25	Located adjacent to test pit 25 location in the northwestern portion of the site within Area of Concern B-6 (former clarifying pit)	Boring completed adjacent to GEI test pit 25 to determine vertical and lateral extent of contamination at the site	SB-TP-25 (13-15)	Soil sample to evaluate soils above observed contamination	•	•	•	•	

Table 1 (continued)
Subsurface-Soil Sample Rationale
Erie Street Former MGP
Elizabeth, New Jersey

Sample Location ID	Sample Location	Location Rationale	Sample Designation (depth in feet below land surface)	Selected Sample Analytical Rationale	Analysis BTEX	BNs+10	TAL Metals	Total Cyanide	Amenable Cyanide
SB-TP-30	Located adjacent to test pit 30 location in the north central area of the site adjacent to the liquefied methane storage area within Area of Concerns B and D-2 (former production area and material storage area)	Boring completed adjacent to GEI test pit 30 to determine vertical and lateral extent of contamination at the site	SB-TP-30 (20-21)	Soil sample to determine the vertical extent of contamination	•	•	•	•	
SB-TP-39	Located adjacent to test pit 39 location in the western portion of the site adjacent to Area of Concern C (liquid fuel storage area)	Boring completed adjacent to GEI test pit 39 to determine vertical and lateral extent of contamination at the site	SB-TP-39 (15-16)/SB-TP-39 (23-25)	Soil sample to evaluate soils with a very slight naphthalene odor and to delineate vertical extent of contamination at 15-16'/Soil sample to evaluate soils at the top of the bedrock at 23-25'	•	•	•	•	
SB-TP-75	Located adjacent to test pit 75 location in the central portion of the site within Area of Concern D-1 (drip oil area)	Boring completed adjacent to GEI test pit 75 to determine vertical and lateral extent of contamination at the site	SB-TP-75 (15-16)	Soil sample to determine the vertical extent of contamination	•	•	•	•	
HB-1	Angle boring drilled beneath the office building	Boring drilled to evaluate the presence, contents, structure, and integrity of the holder situated beneath the building	HB-1 (12-14)	Soil sample collected to characterize the MGP material observed at this depth	•	•	•	•	•
			HB-1 (23-24)	Soil sample collected at the top of the weathered bedrock where no visual impacts were noted	•	•	•	•	•
HB-3	Located in the former gas holder situated north of the office building	Boring drilled to evaluate the presence, contents, structure, and integrity of the holder	HB-3 (6-8)	Soil sample collected to evaluate soil quality and to delineate overburden impacts in this area of the site	•	•	•	•	•
			HB-3 (14-16)	Soil sample collected to characterize residual product observed from 5.5 to 16 feet bls	•	•	•	•	•

Table 1 (continued)
Subsurface-Soil Sample Rationale
Erie Street Former MGP
Elizabeth, New Jersey

Sample Location ID	Sample Location	Location Rationale	Sample Designation (depth in feet below land surface)	Selected Sample Analytical Rationale	Analysis: BTEX	Analysis: BNs+10	Analysis: TAL Metals	Analysis: Total Cyanide	Analysis: Amenable Cyanide
VB-1	Located in the southwestern corner of the site, west of the former oil tank	Boring drilled to evaluate vertical extent of impacts observed in TP-33, TP-36, TP-37, and MW-17B	VB-1 (17-18)	Soil sample collected below stain and sheen observed from 0-16 feet to verify visual vertical extent	•	•	•	•	•
			VB-1 (24-25)	Soil sample collected at the top of the weathered bedrock where no visual impacts were noted	•	•	•	•	•
VB-2	Located in the south-central portion of the site, south of the propane tanks	Boring drilled to delineate the vertical extent of impacts observed in B-34 and TP-39 and SB-TP-39	VB-2 (16-17)	Soil sample collected to evaluate soil quality and to delineate overburden impacts in this area of the site	•				
			VB-2 (22-24)	Soil sample collected to evaluate soil quality and to delineate overburden impacts in this area of the site	•				
VB-3	Located in the southern portion of the site, north of the truck parking area fence	Boring drilled to delineate the vertical extent of impacts in this area of the site	VB-3 (15-16)	Soil sample collected to evaluate vertical extent of impacts noted from 0-12 feet bls in this boring	•	•	•	•	•
VB-4	Located in the northeastern portion of the site, south of the former propane air plant	Boring drilled to delineate the vertical extent of impacts in this area of the site	VB-4 (6.5-7.5)	Soil sample collected to evaluate vertical extent of staining observed from 2 to 4.5 feet bls	•	•	•	•	•
			VB-4 (14-15)	Soil sample collected to evaluate soil quality and to delineate overburden impacts in this area of the site	•	•	•	•	•

Table 2
Sample Collection and Analytical Summary
Erie Street Former MGP Site

Medium	Sampling Method	Analytical Parameters	Number of Samples Collected: Primary Samples	Field Duplicates	Equipment Blanks	Ambient Blanks	Trip Blanks
Surface Soil (0-2" bgs)	2" Split-Spoon Soil Sampler	BTEX TCL BN SVOCs TAL Metals Cyanide	10	1	0	1 NA	1 NA
Subsurface Soil (>2' bgs)	3" Split Spoon or Direct Push/Acetate Liner from Borings	BTEX TCL BN SVOCs TAL Metals Cyanide	69[1]	7	7	14 NA	11 NA
	Grab Using Remote Test Pit Sampler from Test Pits	BTEX TCL BN SVOCs TAL Metals Cyanide	22[1]	2	1	5 NA	5 NA
Sediment	VibraCore Sampler/Boat	TCL VOCs TCL BN SVOCs Pesticides Herbicides PCBs TAL Metals Cyanide TOC Dioxins	56	1	1	NA	3 NA
Groundwater May-June 2000	Bailer Peristaltic or Submersible Pump	BTEX TCL BN SVOCs TAL Metals Cyanide	25	3	4	NA	4 NA
Groundwater January 2001	Bailer Peristaltic or Submersible Pump	BTEX TCL BN SVOCs TAL Metals Cyanide	31	2	7	NA	4 NA
Surface Water	Grab Sample	TCL VOCs TCL BN SVOCs Pesticides Herbicides PCBs TAL Metals Cyanide TOC Dioxins	7	1	1	NA	2 NA

Notes

Ambient Blanks - These are only used in conjunction with methanol preservation for soil samples
BTEX - Benzene, toluene, ethylbenzene, xylenes
TCL BN SVOCs - Target Compound List Base/Neutral Semivolatile Organic Compounds
TAL - Target Analyte List
Cyanide - Analysis for total cyanide was performed; if detected, analysis for amenable cyanide was performed
NA - Not applicable
[1] Ninety-one primary subsurface-soil samples were collected. Eighty-five of the 91 samples were analyzed for all the parameters listed. Eight of the 91 were analyzed for different combinations of analytes, as follows.
BTEX only (2 samples); TCL BNA SVOCs only (2 samples); PAHs only (1 sample);
TCL BN SVOCs, arsenic, and lead (1 sample); BTEX, TAL metals, PAHs, and cyanide (1 sample);
TCL BN SVOCs, TAL metals, and cyanide (1 sample). In addition, one of the 85 samples that was analyzed for all of the listed parameters was also analyzed for Diesel Range Organics (DRO).
PAHs - Polycyclic aromatic hydrocarbons
TCL VOCs - Target Compound List Volatile Organic Compounds
PCBs - Polychlorinated biphenyls
TOC - Total organic carbon

Table 3
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-15	0-1: 1-2: 2-2.5: 2.5-4: 4-5: 5-6:	Gravel Brown fine to coarse sand and gravel - fill; slight staining Same as above; fill - some bricks; black staining Same as above; tar (residual product) present at approximately 24 inches; cast iron pipe running along fence line (approximately 5 offset); wood at approximately 3 feet bls; heavy sheen on water collecting in trench; PID: 100-150 ppm Black-stained silts and very fine sand; moderate MGP odor Reddish-brown silts and very fine sand, some clay; PID: 0-10 ppm	
TP-16A	0-0.5: 0.5-3: 3-4: 4-7.5: 7.5-8:	Gravel Black-stained fill; strong MGP odor Reddish-brown silt and very fine sand, some clay; PID: 180-200 ppm Black-stained silts and clay; moderate to slight MGP odor Reddish-brown silt, some clay; no staining; slight odor	
TP-16B	0-4: 4-6:	Same as TP-16A Black-stained silts and clay; moderate MGP odor; water entering at 4 feet bls with sheen, PID: H.S. 3-4: 180-200 ppm	
TP-17	0-0.5: 0.5-1.5: 1.5-3.5: 3.5-7: 7-8:	Gravel Fill - brick fragments and fine to coarse sand and gravel; black-stained medium to coarse sand at 1.5 feet; slight sheen on soil; moist Black-stained fine sand; some roots noted; dry/slightly moist Brown very fine sand and silt; very slight MGP odor; slight staining Reddish-brown silt, some clay; no staining; no odors; dry	
TP-17A	0-1: 1-2.5: 2.5-3.5: 3.5-5:	Gravel Fill - bricks, brown sand and gravel Black-stained medium gravel and sand; wet; residual product noted on gravel; strong sheen on water in hole; slight oily product LNAPL noted tar/oil odor on gravel; PID: 50-100 ppm Brown fine sand and silt; water enters hole at surface and fills trench immediately; sheen on water in hole	Analytical Sample TP-17A(3) collected on 1/12/00

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-18	0-1: 1-6.5: 6.5-7: 6.8:	Gravel Fill - sand, gravel and bricks; slight staining; slight MGP odor; PID: 0-5 ppm Same as above; numerous bricks; large concrete piece at approximately 6.5 feet Liquid, moderate viscous tar seeps into pit from below; bricks coated with moderate viscous tar; PID: H.S. 150 ppm	
TP-19	0-0.5: 0.5-2:	Gravel Black stained fill - sand, gravel and bricks with iridescent sheen; moist; strong MGP odor; appears to be historic structure with numerous pipes; PID: 250 ppm Soil below approximately 3 feet is reddish-brown; silts, very fine sand with black staining (mottled); PID: 25-40 ppm	
TP-22	0-0.5: 0.5-1: 1-5:	Gravel Reddish-brown silt Fill - almost entirely brick; some sand; several wooden planks and metal sheeting; trace pieces of asbestos shingles; water in hole at approximately 4 feet bls; slight to moderate sheen; perched water above hole - clear, no sheen	Analytical Sample TP-22(2-2.5) collected on 1/12/00
TP-23	0-1: 1-2:	Gravel Fill - fine to coarse sand and gravel and bricks; stained black (1.5-2); moderate purifier odor; slab at 2 feet bls extending beyond test pit in both directions	
TP-23A	0-2: 2-3:	Same as TP-23 Fill - bricks, sand, and gravel; some pieces of steel and concrete; moderate burnt MGP odor; material stained black; moist, not wet	
TP-24	0-0.5: 0.5-2: 2-4.5: 4.5-6: 6-7:	Gravel Reddish-brown sand and silt, some gravel, some bricks Black-stained sand and gravel - fill, some brick/clinker; moist; moderate purifier odor Black gravel and clinker; strong diesel fuel odor; water at approximately 5 feet bls; LNAPL noted; PID: 400-500 ppm Gravel/clinker; wood debris coated with tar/oily product; PID: 200 ppm	Analytical Sample TP-24(6) collected on 1/13/00

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-25	0-0.5: 0.5-3: 3.5: ~5-5.5:	Gravel and sand Fill - brick, fine-grained sand and gravel; dry; slight purifier odor; slight staining; PID: 0-5 ppm Reddish-brown sand and gravel, some bricks Dark brown/black sand and gravel, some bricks; slight fuel oil type odor; moist; PID: 10-15 ppm; at ~5.5 feet bls brick and mortar "floor" slab extending beyond TP-25 in both directions	
TP-26	0-0.5: 0.5-3: 3-5.5: 5.5-8.5:	Gravel Dark brown sand and gravel - fill; some trace brick and concrete; slight staining; slight burnt odor Black sand and gravel, some bricks and wood debris Black gravel and clinker; wet - strong MGP/fuel oil odor gravel coated with oily residue; water at approximately 5.5-6 feet bls; sheen/LNAPL present; PID: 75-150 ppm	
TP-27		No log available	
TP-28	0-3: 3-6.5: 6.5-7.5: 7.5-8.5:	Reddish-brown fine sand and silt, fill; some concrete slabs; no staining; no odors; dry; PID: 0-1 ppm Tan/heavy brown fine to medium sand and pieces of concrete; one long piece of timber approximately 5 feet long (2x8x5); no staining, dry; no odors; PID: 0-1 ppm Same as above; moist; slight hydrocarbon odor Black-stained sand and gravel; wet; residual product noted on gravel; fuel oil/MGP (tar) odor; sheen on water; water at approximately 7.5 feet bls; PID: 35-50 ppm	
TP-29	0-0.5: 0.5-3: 3-7: 7-9: 9-11:	Gravel Reddish-brown sand, gravel, and bricks - fill; dry; no staining; slight purifier type odor Fill/riprap, sand/gravel, large pieces of stone and concrete, numerous pieces of wood (4x4); slight odor; slight staining on bricks Same as above with black staining; moderate MGP-tar-fuel oil odor Gravel; black with clinker; wet at approximately 10 feet	
TP-30	0-0.5: 0.5-1.5: 1.5-3.5: 3.5-4.5:	Sand and gravel Brown fine sand and gravel, trace brick fragments; dry; no odor; no staining; PID: 0 ppm Tan/light brown medium sand; moist; several slabs (brick/concrete walls?); soil/fill no odors; no staining Fill - black-stained sand and gravel; wet; slight hydrocarbon odor; PID: 3-5 ppm; sheen on water entering hole at approximately 3.5 bls	

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-31	0-0.5: 0.5-3: 3-5: 5-5.5	Black large gravel Fill - reddish-brown silty sand and gravel; numerous cracks; no staining; no odors; PID: 0 ppm Fill - black gravel and silty sand; moderate MGP odor; water entering the hole at approximately 4 feet bls; moderate sheen on water; PID: 10-120 ppm Dark brown-black fine sand and roots; similar material encountered at each pit location; water entering hole makes excavating below 5.5 feet too difficult; PID: ~20 ppm Moderate LNAPL on water in backhoe bucket from trench	
TP-32	0-0.5: 0.5-5:	Coarse black gravel Brown fine-to-coarse sand and gravel fill. Several bricks and pieces of concrete.	
TP-33	0-0.5: 0.5-1.5: 1.5-4.5: 4.5-4.6: 4.6-6:	Gravel and coarse sand; dry; no staining; no odors Fill - sand and gravel, some bricks and tubing Fill - concrete slabs (numerous) approximately 4'x4'x0.5'; no staining; very slight odor (hydrocarbon) Wet, black-stained silty clay; slight MGP odor; PID: 10-15 ppm Black-stained fill - gravel and sand and clinker; residual product noted on clinker and gravel; PID: 40-100 ppm Hole collapsed when attempting to dig below 6 feet; strong sheen on water; moderate odor (MGP tar/oil)	Analytical Sample TP-33(5.5) collected on 1/19/00
TP-34	0-0.5: 0.5-6.5: 6.5-10: 10-10.5:	Coarse black gravel Reddish-brown silty fine sand and gravel; dry; no staining; no odor; PID: 0 ppm Same as above; slight black staining on soil with trace wood fragments; no odor; dry; PID: 0 ppm Black asphalt-like tar, silty sand and fine gravel matrix; iridescent sheen on material; soft; moist; not wet; moderate asphalt odor; residual tar noted on fine-gravel pieces and pieces of coal; some very fine cloth-like membrane mixed with material; hole dug down to 10.5 feet - no water	Analytical Sample TP-34(10) collected on 2/2/00
TP-35		No log available	
TP-36	0-0.5: 0.5-2: 2-3: 3-5:	Gravel and sand fill Brown sand and gravel/some silty clay; fill - numerous bricks and concrete fragments; no staining; no odor Dark brown-black silty sand and gravel, some bricks; moist; slight hydrocarbon odor; not wet; several metal pipes Black gravel and sand; wet; strong MGP odor; tar/oil sheen on material and in hole; water at approximately 3-5 feet bls. Slight LNAPL noted; heavy sheen	

Table 3 (continued) Test Pit Descriptions Erie Street Former MGP Site			
Test Pit	**Depth (feet bls)**	**Description**	**Comments**
TP-36A	0-0.5: 0.5-2.5: 2.5-8.5: 8.8-9: 9-9.5:	Gravel and sand; no odors; no staining; dry Reddish-brown fine sand and silt, some bricks and gravel; dry; no staining; no odor; PID: 0 ppm Till - reddish-brown silt and clay, some fine gravel; very tight; slightly moist; no staining; hole left open - no water coming in from any depth; PID: 0 ppm Black-stained fine to medium gravel, some sand; tar saturated; water begins to come up from the bottom; black tar/water; PID: >100-200 ppm Peat and clay	Analytical Sample TP-36A(8) collected on 1/19/00
TP-37	0-0.5: 0.5-3: 3-3.5: 3.5: 3.5-4:	Gravel and fine brown sand Brown fine sand and gravel; fill and brick fragments/concrete; no odor; slight staining Same as above with intermittent pockets of black-stained spent coal and clinker Wood timber (4x4) and piece of 12-inch diameter cast iron pipe with elbow Black wood chips/root mass with iridescent sheen Hole fills with water very quickly	Analytical Sample TP-37(3-3.5) collected on 1/6/00 Analytical Sample TP-37 (pipe) collected on 1/6/00
TP-38	0-0.5: 0.5-2.5: 2.5-3: 3-5:	Gravel Fill - sand and gravel; concrete slab with rebar at 1 foot bls; approximately 7 feet thick; 6x6 foot; slight purifier odor Black wood chips; moderate to strong purifier odor; PID: 10 ppm; same material seen in TP-40 Black/brown gravel and clinker; some black sand; wet; slight purifier odor	
TP-39	0-0.5: 0.5-2: 2-4:	Gravel Fill - brown very fine sand, some gravel and bricks Fill - sand and gravel, some clinker. Moderate MGP odor	Analytical Sample TP-39(3-4) collected on 1/6/00
TP-39A	0-1: 1-2.5: 2.5-4.5:	Gravel Brown sand and gravel fill, some bricks and ash; PID: 0-5 ppm Fill - black stained gravel (fine to coarse), some clinker, trace sand; wet - sheen on water; moderate MGP/purifier odor; sheen on fill (3-4.5); large pieces of shale (4-4.5)	Analytical Sample TP-39A(4) collected on 1/6/00
TP-40	0-0.5: 0.5-2.5: 2.5-3: 3-4.5:	Gravel Fill - sand and gravel; some brings; dry; slight purifier odor; PID: 0-10 ppm Black wood chips; moderate to strong purifier odor; lampblack "ash" quality to black staining; <u>not</u> "oily"; wet; PID: 5-10 ppm; PID H.S. 7300 ppm Black gravel and clinker; wet; trench fills with water immediately upon digging below approximately 3 feet bls	

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-41	0-1: 1-3: 3-3.5: 3.5-6: 6-7.5:	Gravel; sorbent pads at 1 foot Fill - brown/black sand and gravel; some brick fragments and wood chips - purifier; plastic sheeting at 3 feet Light brown medium sand; moist, burnt color Black coarse sand-sized coal fragments; slight sheen on material Peat/meadow mat; water trickling into trench from approximately 6 feet; slight sheen on water; burnt odor at 6 feet; peat is dry with swampy odor	
TP-42	0-1: 1-2.5: 2.5-5:	Gravel Fill - brown/black sand and gravel; some brick fragments; moderate purifier odor Gravel-sized clinker; pea-sized to baseball sized clinker; very wet Trench filled with water immediately upon digging below approximately 2.5 feet bls Water is brown in color; no sheen; no odor	
TP-43	0-0.5: 0.5-4.5: 4.5-6: 6-6.5: 6.5-7.5:	Gravel Fill - fine to coarse brown/light brown sand and gravel, some bricks; depositional layering of fill (several layers of various shades of brown each approximately 0.5- to 1-inch thick; dry; slight purifier odor; slight staining; moist at approximately 4 feet bls Black-stained wood chips; very moist; strong to moderate purifier odor; PID: 50-75 ppm Black stained wood chips and taffy-like tar matrix; shiny appearance; slight sheen on water collecting/entering pit; PID: 75-125 ppm Clayey peat; gray/black swampy odor; moist; PID: 0-5 ppm	
TP-44A	0-2: 2-3: 3-4:	Gravel and crushed stone with perched water at surface; no odor, wet or sheen Fill - sand and gravel; brick fragments; black staining; wet Purifier waste, wood chips; black; occasionally saturated with oily material; sheen on water; moderate purifier/naphthalene odor; PID: HS 100-200 ppm; dense/tightly packed material; hole fills with water quickly; sheen on water	
TP-44B	0-1: 1-2: 2-4: 4-4.5: 4.5-6:	Gravel; dry, no odor; geotech membrane at approximately 0.5 feet bls Clean fill - sand, gravel, bricks Black fill, bricks, clinker, some purifier; moderate purifier odor; PID: 10-20 ppm; numerous 3/4-inch cables (steel) at approximately 4 feet bls; soil is moist not wet Purifier waste - black wood chips; moist not wet; PID: 10-20 ppm Black/gray silty clay; high plasticity; very moist; water trickling into trench from approximately 4 feet bls Hole open for approximately 15 minutes and no water in trench (<3 inches on bottom of trench)	

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-45A	0-0.5: 0.5-5: 5-5.5: 5.5-6.5:	Gravel Reddish-brown fill - sand and gravel, some bricks; dry; slight odor (purifier); no staining; PID: 0-2 ppm Black-stained wood chips; moist; purifier odor; PID: 5 ppm Gray peat and silty clay; "swampy odor"	
TP-45B	0*4: 4-6: 6-7:	Same as TP-45A; dry; slight staining Black-stained wood chips with blue sheen; moderate purifier/MGP odor; large clinker layer at approximately 4 feet; PID: 70-80 ppm Gray/black (staining) clayey peat; swampy odor; moist; PID: 0-2 ppm	
TP-46	0-0.5: 0.5-2.5: 2.5-3.5: 3.5-4.5: 4.5-5: 5.2-5.5:	Gravel Fill - numerous bricks, fine to coarse sand; partially stained black; moderate purifier odor; dry Fill - fine to coarse sand and gravel; staining noted on few bricks; moist, not wet Purifier waste - black wood chips; moist; moderate to strong burnt MGP/purifier odor Same as 3.5-4.5 with tar/wood chips matrix; taffy-like consistency; strong MGP odor naphthalene/purifier; large clinker noted; organic matter - tall weeds coated with tar, solid not liquid Brown/black clayey organic matter; moderate MGP odor; moist not wet	
TP-47	0-0.5: 0.5-1.5: 1.5-2.5: 2.5-6.5: 6.5-8:	Gravel Brown fine sand and gravel; no odor; no staining Olive/grey silty sand and fine gravel Black medium sand and wood chips; wet; moderate purifier odor; concrete debris at 4 feet; PID: 5-20 ppm Brown silty clay and fine sand; some rounded gravel; root matter at 8 feet (peat); no staining; no odors; water in trench; has slight odor; no sheening; "muddy" color; pipe located at 5 feet bls; plastic pipe approximately 8 inches in diameter; PID <1ppm	
TP-48	0-0.5: 0.5-3: 3-5: 4-4.5: 4.5-5.5:	Gravel Brown sand and medium gravel; dry; no staining; no odor Black-stained fill, clinker, wood chips, gravel; very wet; trace brick fragments; water table at 4 feet bls; trench fills with water immediately when digging below 4 feet; water; black; no sheening; PID: 300 ppm Wood chips; stained black Gray silty clay; slight odor; very tight plastic clay; moist not wet; PID: <1 ppm	

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-49	0-0.5: 0.5-4: 4.5-5.5: 5.5-6.5: 6.5-7.5:	Gravel Brown sand and gravel; dry; no staining; slight purifier odor Black "vegetative mat"; roots very wet; moderate to strong purifier odor; PID: 300 ppm Transitioning into gray silty clay; moist not wet; slight staining; moderate purifier odor Brown silty clay and fine sand; some fine to coarse gravel; no staining; slight odor; moist to wet Water in hole at approximately 4 to 5 feet bls; no sheen; muddy brown color; slight purifier odor; PID: 10 ppm	Analytical Sample TP-49 (5-5.5) collected on 1/6/00
TP-50	0-0.5: 0.5-4.5: 4.5-7: 7-8:	Gravel Fill; brown fine to coarse sand and gravel; some brick and coal fragments; dry; slight purifier odor Black/brown fill/sand and gravel/clay; some wood chips; some concrete "sloppy"; wet to moderate purifier odor; black gravel tar layer at approximately 6 feet bls; semi-solid tar (sample) Brown silty clay, trace sand and gravel; wet	
TP-51	0-3: 3-5: 5-8:	Fill - dark brown fine to coarse sand and gravel; dry; slight staining; slight hydrocarbon odor; PID: 0 ppm Same as above; moist; wet with black staining; moderate to strong diesel odor; PID: 10-35 ppm Reddish-brown silty sand and clay, some gravel (rounded and subrounded); till; PID: 0-2 ppm; very little water entering hole; no detectable sheen	Analytical Sample TP-51(3.5) collected on 1/19/00 Analytical Sample TP-51(7.5) collected on 1/19/00
TP-54	0-2: 2-2.5: 2.5-3: 3-4: 4-8:	Red/brown silty sand, some clay, trace gravel; no staining; wet at 2 feet bls Black-stained fill with coal and solid tar; lens is 1-inch thick; shiny/hard material Yellowish-red sand layer pinching out at eastern corner Brown/black fill; slab at 4 feet bls; PID: 0-5 ppm Fill - black sand, wood, and lampblack, some bricks; naphthalene odor and purifier odor; staining and sheen on water sheen on lampblack surface; PID 90 ppm	
TP-55	0-1: 1-2.5: 2.5-3: 3:	Gravel and medium tan sand; dry; no odor; no staining; PID: 0 ppm Tan medium sand; moist; slight MGP/naphthalene odor; moist; no staining Same as above; wet; slight odor; no staining; several pieces of concrete and large cobbles/boulders Refusal - concrete(?) stone(?); hole fills with water to approximately 2 feet bls; no sheen on water	

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-56	0-0.5:	Gravel	Analytical Sample TP-56(4-5) collected on 1/12/00
	0.5-3:	Brown fine to coarse sand, some gravel, some clay, fill; pieces of terra cotta pipe and plastic tubing at 3 feet bls; slight burnt MGP/purifier odor	
	3-5:	Black-stained fill, silty clay, some fine gravel; strong purifier/burnt MGP odor; moist; water very slowly entering hole at approximately 4 feet bls; sheen noted; large slab at 5 feet bls	
	5-6:	Black-stained silts/clays; trace sand/gravel; moist; strong burnt MGP odor; very moist, not wet; PID: >1000 ppm	
TP-57	0-0.5:	Gravel	
	0.5-1:	Brown fine to coarse sand and gravel; no staining; slight naphthalene odor; dry	
	1-3:	Brown fine to coarse sand and gravel mottled with black staining; slightly moist; slight moderate naphthalene odor	
	3-5:	Black-stained sand and gravel, some silts, some clay; strong naphthalene/tar odor; residual product noted on gravel; moist	
	6-8:	Reddish-brown silt with veins of residual tar noted; slightly moist	
	8-10:	Reddish-brown silt; slight to moderate MGP odor; soil not stained	
TP-57A	0-0.5:	Gravel	Analytical Sample TP-57A(3-4) collected on 1/13/00
	0.5-1:	Brown fine to coarse sand; no staining; no odor; dry	
	1-1.5:	Gravel	
	1.5-3:	Fill - brown, fine to coarse sand and gravel; some concrete and metal debris; moist; no odor; no staining	
	3-6:	Fine to coarse dark brown sand and gravel; wet; no staining; no odor; very thin peat/organic layer at 6 feet	
	6-7:	Brown silt and clay; moist; no staining; no odors	
	7-8:	Reddish-brown silt, some clay; no staining; no odors; PID: 0 ppm	
TP-59	0-2:	Gravel; PID: 0 ppm	
	2-3:	Large gravel and heavy brown fine to medium sand; moist to wet; PID: 0 ppm	
	3-4:	Light brown fine to medium sand; some gravel; wet; no staining; no sheen; very slight hydrocarbon odor; PID: 3-5 ppm; pit fills with water to approximately 2.5 feet bls immediately; can't dig below approximately 4 feet bls without hole collapsing; no sheen on water in hole Ivan/Jim/Steve - believe this was the location of an old gas tank; soil is fill material used to fill tank grave	

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-60	0-0.5: 0.5-4: 4-5: 5-6: 6-8: 8-9:	Gravel Intermittent layers of red-brown silty sand and dark brown fine to coarse sand and gravel; each layer is approximately 0.5-foot thick; slightly moist; slight hydrocarbon odor; no staining Black-stained sand and gravel; wet; strong diesel odor Dark brown sand and gravel; wet; moderate odor (diesel); slight staining Reddish-brown silty clay; wet; some gravel; slight naphthalene odor; no staining; till Same as above; till; no odor; no staining Water entering the hole from 4-8 feet bls; slight sheen on water	
TP-61	0-0.5: 0.5-3: 3-4: 4-4.5	Large black gravel Fill - sand and gravel, numerous brick fragments and concrete pieces; slight diesel fuel odor Light brown medium sand; moist; no staining; slight to moderate diesel fuel type odor; PID: 20 ppm Same as above, stained black; diesel/MGP odor; wet; PID: 20-40 ppm Holder is of brick construction with 0.5-foot concrete slab on top	
TP-62		No log available	
TP-62A		Upon completion of TP-61 and TP-63, we extrapolated the approximate location of the former 100-foot diameter holder by locating the center and swinging a 50-foot radius. Both MW-2 and MW-2D fell outside this radius. Supplemental test pit TP-62A was excavated to confirm the holder location. The holder is approximately 5 feet away from MW-2. Water inside the holder is approximately 2.5 feet bls with visible sheen and slight LNAPL.	
TP-63	0-1: 1-2: 2-8:	Large black gravel and sand Fill - fine to coarse sand and gravel, some bricks; no odor; dry; no staining Reddish-brown silty clay, some subrounded gravel (fine to medium); residual product within the gravelly submatrix; stains gloves; dark brown/black (MGP product) The pit remained open down to 8 feet bls with no water entering the hole. Material at 8 feet appeared slightly moist/damp; very tight material	
TP-64	0-1: 1-3.5: 3.5-5: 5-5.5: 5.5-6.5:	Gravel; brick fragments at 0.5 foot Fill - reddish-brown fine sand and gravel transitioning into black-stained sand and gravel; moist Black fine to coarse sand/silts and clay with sheen; wet water entering pit; has moderate sheen; strong odor (burnt MGP odor); PID: 10-50 ppm Brown silty sand; some staining; slight odor Reddish-brown silts, some clay; slightly moist; no odor; no staining; PID: 0 ppm	

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-65	0-2: 3-5: 5-6.5: 6.5-7:	Red/brown sand and gravel (fill); three electrical conduits running parallel to trench; PID: 0-5 ppm Gray/brown sand and gravel (fill); some bricks, soda/beer cans circa 1970s "flip top"; sweet naphthalene odor; moist; PID: 10-50 ppm Brown, fine sand and silt; some wet; strong "sweet" odor (naphthalene); <u>no</u> staining; moist not wet at 6.5 feet; PID: 200-300 ppm Reddish/brown clayey silt; slightly moist; no staining; slight odor; PID: 3-5 ppm	
TP-66	0-4: 4-8:	Fill - grayish/brown sand and gravel; dry; slight naphthalene odor; PID: 0-10 ppm Brown fine sand and silt, some clay; wet; no staining; strong naphthalene odor Refusal at 8 feet bls rock or concrete slab-flat; numerous underground utilities prevent moving out to locate extent of slab/naphthalene odor; PID: 200-300 ppm	
TP-68	0-1: 1:	Gravel, some medium-to-coarse sand Concrete slab	Concrete slab 1 foot bls. Moved three times and encountered slab at 1-foot bls each time.
TP-69	0-0.5: 0.5-1: 1-3: 3-5:	Gravel Fill - sand and gravel, some brick; slight staining; slight odor Fill; stained black; moist; moderate MGP/fuel odor; PID: 10-15 ppm Fill - fine to coarse gravel; stained black; wet-strong tar odor; heavy sheen; gravel coated with liquid tar; pit fills with water up to 3.5 feet bls; heavy sheen on water; PID: 100-800 ppm	Analytical Sample TP-68(3-4) collected on 1/12/00
TP-70	0-0.5: 0.5-1: 1-2.5: 2.5-3: 3-4:	Gravel Reddish-brown sand and gravel, some brick fragments and ash; PID: 0-1 ppm Fill - purifier waste, fine to coarse sand and gravel; stained black; moist; strong purifier odor when trench first opened - moderate during logging; PID: 50-100 ppm Black fine sand and silts; slight odor/staining; PID: 5-10 ppm Reddish brown silts, some clay, trace very fine sand; no odor; slightly moist; water entering hole at approximately 2.0 feet bls; PID: 0 ppm	
TP-71A	0-0.5: 0.5-2.5: 2.5-3: 3-7:	Gravel; plastic sheeting at 0.5 foot Fill - ash, clinker, sand and gravel, some bricks; stained black; moist at 2 feet bls; PID: 0-5 ppm Black stained sandy silt; moist; PID: 0-2 ppm; very slight burnt odor Reddish brown silt, some clays, some very fine sand; slightly moist; no staining, no odor; PID: 0 ppm Water coming in from approximately 2 feet; dry from 3 to 7 feet	

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-71B	0-0.5: 0.5-2.5: 2.5-3: 3-4:	Gravel Fill - sand and gravel, ash, clinker, some bricks; stained black; no odor; wet at 2 feet bls; PID: 0-5 ppm Dark brown fine sand and silt; moist; no odor; slight staining Reddish brown silt, some clay, trace very fine sand; moist not wet; no staining; no odors; PID: 0 ppm	
TP-72	0-4: ~1: 4-6:	Fill - fine to coarse sand and gravel; numerous bricks and purifier waste (from <1 foot bls) Concrete pad with slight dip in toward center Fill - black clinker and gravel, some wood chips and pieces of wood; free product noted on bucket of hoe and wood pieces; strong sheen and trace product noted; strong MGP odor noted	
TP-73	0-0.5: 0.5-4.5: 4.5: 4.5-8:	Black large gravel Reddish-brown fine sand and gravel, some bricks and pieces of metal piping (1") Concrete; bucket refusal at northwest end of test pit Black-dark brown sand and gravel - fill, some bricks and tarpaulin; PID: 100 ppm Moderate sheen on water entering excavation at approximately 5-6 feet bls; no NAPL present; water entering hole prevented digging below 8 feet bls	
TP-75	0-0.5: 0.5-4: 4-4.5: 4-7.5:	Black large gravel Reddish-brown with fine sand and gravel, some bricks; no odor; slight staining First Location (closest to SB-TP-75 in base map) - bucket refusal at 4.5 feet bls; black silty sand; wet; slight sheen in water entering pit; PID: 10 ppm Second Location - Black sand and gravel, some bricks and clinker; 6-7.5 feet bls - wet; moderate MGP odor; moderate sheen on water entering at approximately 5-6 feet bls; no NAPL present; PID: 10-30 ppm Water entering the hole prevented digging below 7.5 feet bls	
TP-B5	0-0.5: 0.5-4: 4-6:	Coarse black gravel and sand Fill - bricks, pieces of wood, residual product on wood, sand and gravel, large pieces of brick wall (4 to 5 bricks wide) (former holder wall?); concrete slab at 4 feet bls in vicinity of holder with wood framing; PID: 75-120 ppm (outside holder) Brownish-gray silty clay and fine sand; wet; moderate MGP odor; water entering from approximately 4 feet bls; moderate sheen with residual LNAPL (blebs); moderate MGP odor; cannot dig below 6 feet due to water entering hole; PID: 40-50 ppm	

Table 3 (continued)
Test Pit Descriptions
Erie Street Former MGP Site

Test Pit	Depth (feet bls)	Description	Comments
TP-B6	0-0.5: 0.5-1: 1-5:	Black large gravel and sand Fill - sand and gravel, some bricks; slight staining; no odor Brown silty sand, some gravel, some bricks; moderate MGP odor; moderate staining; slight residual product; 8-inch cast iron pipe at 5 feet bls broken by backhoe teeth; approximately ½ gallon of moderate to highly viscous tar "slopped" out of pipe followed by a ½ gallon of water; sweet naphthalene odor; water stops and pit is backfilled; PID: 20 ppm at 1 foot bls; PID: 75-200 ppm at 5 feet bls	
TP-TS-2	0-0.5: 0.5-6.5:	Black large gravel and sand Fill - reddish-brown silts and clays; some sand and gravel - partially stained black; slight to moderate MGP/fuel oil odor. Water enters hole at approximately 1 foot bls; slight LNAPL on water; tar separator test pit did not fill with water over 1-hour period No tar was present inside tar separator - only some soil was partly saturated with oily residue; PID: 20-30 ppm Standing water at approximately 2 feet bls outside the tar separator	

Notes:
PID = photoionization detector
H.S. = head space
bls = below land surface

Table 4
Monitoring Well Information and Groundwater Levels
Erie Street Former MGP Site

Monitoring Well Information						May 23, 2000		August 22, 2000		January 8, 2001		February 21, 2001	
WELL ID	TOC	Screen Length (feet)	Screen Depth Below Ground Surface (feet)	Screen Elevation (feet)	Geologic Unit Within the Screen Interval	Depth to Groundwater (feet bls)	Groundwater Elevation (feet NGVD)	Depth to Groundwater (feet bls)	Groundwater Elevation (feet NGVD)	Depth to Groundwater (feet bls)	Groundwater Elevation (feet NGVD)	Depth to Groundwater (feet bls)	Groundwater Elevation (feet NGVD)
MW-1	12.9	14	2 to 16	7.9 to -6.1	Glacial Till	3.38	9.52	4.82	8.08	6.57	6.33	5.8	7.1
MW-1D	13.57	NA	NA	NA	Bedrock	7.35	6.22	8.04	5.53	9.05	4.52	8.86	4.71
MW-2	10.67	16	4 to 20	4.7 to -11.3	Fill	2.6	8.07	3.46	7.21	NM	NC	3.5	7.17
MW-2D	10.92	NA	NA	NA	Bedrock	6.7	4.22	44.12	-33.2	NM	NC	54.95	-44.03
MW-3	10.06	12	2 to 14	4.7 to -7.3	Glacial Till	4.05	6.03	4.74	5.34	5.7	4.38	4.86	5.22
MW-4	13.95	19	1 to 20	10.1 to -8.9	Fill, Peat, Glacial Till (sandy)	5.33	8.62	6	7.95	NM	NC	6.75	7.2
MW-5	9.32	18	2 to 20	4.8 to -13.4	Fill, Peat, Glacial Till	2.65	6.67	3.1	6.22	NM	NC	3.49	5.83
MW-5D	10.16	NA	NA	NA	Bedrock	4.11	6.05	4.91	5.25	NM	NC	5.62	4.54
MW-6	8.92	17	2 to 19	4.3 to -12.7	Fill, Peat, Glacial Till	2.38	6.54	2.85	6.07	4.12	4.8	3.49	5.43
MW-6D	9.3	NA	NA	NA	Bedrock	4.96	4.34	5.78	3.52	6.75	2.55	6.34	2.96
MW-7	10.63	16	2 to 18	6.7 to -7.3	Fill, Peat, Glacial Till	7.21	3.42	6.71	3.92	NM	NC	6.79	3.84
MW-7D	10.16	NA	NA	NA	Bedrock	6	4.16	7.05	3.11	NM	NC	7.51	2.65
MW-8	13.1	12	1 to 13	8.8 to -3.2	Fill, Peat, Glacial Till	5.41	7.69	6.11	6.99	NM	NC	6.43	6.67
MW-8D	11.4				Bedrock	5.7	5.7	6.4	5	NM	NC	6.8	4.6
MW-9	12.96	16	3 to 13	6.5 to -9.5	Fill, Peat, Glacial Till (sandy)	6.75	6.21	6.91	6.05	7.33	5.63	NM	NC
MW-9D	10.47				Bedrock	4	6.47	4.1	6.37	NM	NC	NM	NC
MW-10	12	17	3 to 20	6.1 to -10.9	Fill, Peat, Glacial Till	NM	NC	4.56	7.44	NM	NC	5.35	6.65
MW-11	12.96	7.5	4.5 to 12	5.5 to -2.0	Fill	4.51	8.45	5.15	7.81	6.51	6.45	5.95	7.01
MW-12	11.7	13	4 to 17	6.4 to -7.6	Fill, Peat, Glacial Till (sandy)	3.98	7.72	4.44	7.26	5.46	6.22	4.76	6.94
MW-13	11.82	10	4 to 14	5.6 to -4.4	Fill, Glacial Till (sandy)	5.18	6.64	5.43	6.39	6.13	5.69	NM	NC
MW-14A/BP-2	7.79	5	3 to 8	3.0 to -2.0	Fill, Peat	1.8	5.99	2.3	5.49	3.34	4.45	2.8	4.99
MW-14B	8.97	9	16 to 25	[-11 to -20]	Till, Weathered Bedrock	3.59	5.38	4.35	4.62	5.17	3.6	5	3,97
MW-15A/BP-1	8.69	4	3 to 7	3.0 to -1.0	Fill, Peat	2.7	5.99	3.08	5.61	4.13	4.56	3.75	4.94
MW-15B	9.71	8	16 to 24	[-9.5 to -17.5]	Till, Weathered Bedrock	5.03	4.68	5.99	3.72	6.77	2.94	6.5	3.21
MW-16A	10.23	6	2.5 to 8.5	5.1to -0.9	Fill	5.81	4.42	6.3	3.93	6.79	3.44	6.47	3.76
MW-16B	10.35	8	16 to 22	[-8.4 to -14.4]	Till, Weathered Bedrock	6.76	3.59	7.11	3.24	8.09	2.26	7.87	2.48
MW-17A/BP-8	15.22	10	4 to 14	6.5 to -1.5	Fill, Peat	6.7	8.52	7.35	7.87	8.71	6.51	8.7	6.52
MW-17B	13.84	7	19 to 26	[-6 to -15]	Peat/Clay, Till, Weathered Bedrock	7 85	5.99	8.53	5.31	9.52	4.32	9.28	4.56

Table 4 (continued)
Monitoring Well Information and Groundwater Levels
Erie Street Former MGP Site

Monitoring Well Information						May 23, 2000		August 22, 2000		January 8, 2001		February 21, 2001	
WELL ID	TOC	Screen Length (feet)	Screen Depth Below Ground Surface (feet)	Screen Elevation (feet)	Geologic Unit Within the Screen Interval	Depth to Groundwater (feet bls)	Groundwater Elevation (feet NGVD)	Depth to Groundwater (feet bls)	Groundwater Elevation (feet NGVD)	Depth to Groundwater (feet bls)	Groundwater Elevation (feet NGVD)	Depth to Groundwater (feet bls)	Groundwater Elevation (feet NGVD)
MW-18A/ BP-4	24.26	10	4 to 14	12 to 2	Fill	15.82	8.44	16	8.26	21.23	8.46	16.57	7.69
MW-18B	25.65	10	32 to 42	[-6.35 to -16.35]	Till, Weathered Bedrock	19.56	6.09	20.35	5.3	17.19	3.03	NM	NC
MW-19A	13.47	4	4 to 8	6.0 to 2.0	Fill, Peat	5.75	7.72	6.4	7.07	8.02	5.45	7.02	6.45
MW-19B	13.54	7	18 to 25	[-8 to -15]	Till, Weathered Bedrock	7.1	6.44	7.73	5.81	8.89	4.65	8.31	5.23
MW-20A	11.66	4	2.5 to 6.5	7 to 3	Fill, Peat	4.39	7.29	5.41	6.27	6.61	5.07	5.89	5.79
MW-20B/ BP-8	8.94	4	8 to 12	[1 to -3]	Glacial Till (sandy)	2.62	6.32	3.15	5.79	4.19	4.75	3.66	5.28
MW-21A	9.48	10	3 to 13	6.7 to -3.3	Fill, Glacial Till	0.45	9.03	0.95	8.53	1.05	8.43	1.31	8.17
MW-21B	9.68	10	20 to 30	[-10.32 to -20.32]	Glacial Till	3.32	6.36	3.92	5.76	4.87	4.81	4.55	5.13
MW-22A	12.52	10	2.5 to 12.5'	7.5 to -0.5'	Fill, Glacial Till	5.09	7.43	6.02	6.5	6.82	5.7	6.1	6.42
MW-22B	12.5	3.5	24.5 to 28.0	[-15 to -18.5]	Glacial Till	6.38	6.12	7.03	5.47	8	4.5	7.83	4.67
MW-23A	6.87	5	2 to 7	4.87 to -0.13	Fill, Glacial Till (sandy)	Not Installed	Not Installed	Not Installed	Not Installed	3.76	3.11	2.86	4.01
MW-23B	7.04	10	16 to 26	-8.96 to -18.96	Glacial Till	Not Installed	Not Installed	Not Installed	Not Installed	3.06	3.98	1.92	5.12
MW-24A	7.53	7	2 to 9	5.53 to -1.47	Fill, Peat/Clay	Not Installed	Not Installed	Not Installed	Not Installed	NM	NC	3.57	3.96
MW-24B	7.6	7	12 to 19	-4.4 to -11.4	Glacial Till/ Weathered Bedrock	Not Installed	Not Installed	Not Installed	Not Installed	NM	NC	2.85	4.75
MW-25A	5.96	6	2 to 8	3.96 to -2.04	Fill, Glacial Till	Not Installed	Not Installed	Not Installed	Not Installed	2.8	3.16	2.54	3.42
MW-26A	8.22	8	2 to 10	6.22 to -1.78	Fill, Glacial Till,Weathered Bedrock	Not Installed	Not Installed	Not Installed	Not Installed	1.13	7.09	1.92	6.3
BP-3	12.45	10	4 to 14	4.5 to -4.5	Fill, Peat, Glacial Till (sandy)	3.75	8.7	4.4	8.05	NM	NC	5.12	7.33
BP-6	11.48	10	2 to 12	7.0 to -3.0	Fill, Glacial Till (sandy)	3.31	8.17	NM	NC	NM	NC	NM	NC
BP-7	10.79	5	3 to 8	5.9 to 0.9	Fill, Peat	3.96	6.83	4.45	6.34	NM	NC	3.86	6.93

Notes:
NM: Indicates not measured
NC: Indicates groundwater elevation was not able to be calculated because groundwater level was not collected.

Table 5
Monitoring Well NAPL Summary Information
Erie Street Former MGP Site

WELL ID	February 4,1997 and February 13,1997 LNAPL/Thickness in feet	DNAPL/Thickness in feet	Other Observations	Odor	May 23, 2000 LNAPL/ Thickness in feet	DNAPL/ Thickness in feet	Other Observations	Odor	February 21, 2001 LNAPL/ Thickness in feet	DNAPL/ Thickness in feet	Other Observations	Odor
MW-1	NP	NP	None	None	NP	NP	None	None	NP	NP	None	None
MW-1D	NP	NP	None	MGP odor in water from the bottom	NP	NP	None	None	NP	NP	None	None
MW-2	NP	NP/NM	Slight sheen on silt from the bottom of the well	Slight MGP (Naphtha odor at bottom)	NP	NP	None	None	Not Measured	Not Measured	---	---
MW-2D	NP	P/0.04	None	MGP odor in deep GW	NP	NP	None	None	NP	NM	DNAPL blebs on tape	None
MW-3	NP	NP	None	Strong solvent smell in deep GW	NP	NP	None	None	NP	NP	None	None
MW-4	NP	NP/NM	Droplets of DNAPL and sheen on water at bottom of the well	MGP and possible solvent odor	NP/NM	NP	Tar staining on well casing	Slight Tar Odor	NP	NP	None	Slight MGP odor
MW-5	NP/ NM	P/0.33	Globules of LNAPL	Tar/ Naphthalene Odor	NP	NP	None	Tar Odor	NP	NM	DNAPL blebs on tape	MGP odors
MW-5D	NP	NP	None	None	NP	NP	None	None	NP	NP	None	None
MW-6	NP	NP	Slight sheen on sediment from well	Tar Odor	NP	NP	None	None	NP	NP	None	Slight Hydrocarbon
MW-6D	NP	NP	None	None	NP	NP	None	None	NP	NP	None	None
MW-7	NP	NP	None	Swampy odor	NP	NP	None	None	NP	NP	None	None
MW-7D	NP	NP	None	None	NP	NP	None	None	NP	NP	None	None
MW-8	NP	NP	None	None	NP	NP	None	None	NP	NP	None	None
MW-8D	NP	NP	None	MGP odor in water from the bottom	NP	NP	None	None	NP	NP	None	None
MW-9	NP	NP	None	Slight MGP odor on shallow water/ Moderate MGP odor in deep GW	NP	NP	None	None	Not Measured	Not Measured	---	---
MW-9D	Not Installed	Not Installed	---	---	NP	NP	None	None	Not Measured	Not Measured	---	---
MW-10	P/0.17	P/2.0	None	Moderate MGP odor in Shallow GW/ strong MGP odor in deep GW	Not Measured	Not Measured	---	---	>1.0'	NP	None	None
MW-11	P/0.04	P/0.5	None	Naphthalene Odor on top/ MGP (Naphthalene on bottom)	0.2'	None	Tar staining on well casing	None	NP	0.1 to 0.4'	None	None
MW-12	NP	NP	None	Solvent odor in groundwater from the top	NP	NP	None	None	NP	NP	None	None

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Table 5 (continued)
Monitoring Well NAPL Summary Information
Erie Street Former MGP Site

	February 4,1997 and February13,1997				May 23, 2000				February 21, 2001			
MW-13	NP	NP	None	Slight MGP odor in deep GW	NP	NP	None	None	---	---	---	---
MW-14A/BP-2	NP	NP	None	Slight MGP odor in Deep GW	NP	<.1'	Oil/Tar noted on the probe	None	NP	<0.1'	None	MGP odors
MW-14B	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	None
MW-15A/BP-1	NP	NP	None	Slight MGP odor in deep GW	NP	<.1'	Oil/Tar noted on the probe	None	NP	NP	None	Slight hydrocarbon and MGP odors
MW-15B	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	None
MW-16A	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	None
MW-16B	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	Swampy odor
MW-17A/BP-6	NP	NP	None	Very slight MGP odor in deeper GW	0.2'	NP	Tar staining on well casing	None	NP	1 to 2'	None	None
MW-17B	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	None
MW-18A/ BP 4	NP	NP/NM	Sheen in deep GW	Slight MGP odor shallow GW	NP	0.2'	Tar on probe	None	NP	<0.1'	None	None
MW-18B	Not Installed	Not Installed	---	---	NP	NP	None	None	Not Measured	Not Measured	---	---
MW-19A	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	None
MW-19B	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	None
MW-20A	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	Slight Hydrocarbon
MW-20B/ BP 8	NP	NP	None	Slight Solvent Odor	NP	NP	None	None	NP	NP	None	Slight Hydrocarbon
MW-21A	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	None
MW-21B	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	None
MW-22A	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	None
MW-22B	Not Installed	Not Installed	---	---	NP	NP	None	None	NP	NP	None	Slight Hydrocarbon
MW-23A	Not Installed	Not Installed	---	---	Not Installed	Not Installed	---	---	NP	NP	None	None
MW-23B	Not Installed	Not Installed	---	---	Not Installed	Not Installed	---	---	NP	NP	None	None
MW-24A	Not Installed	Not Installed	---	---	Not Installed	Not Installed	---	---	NP	NP	None	None
MW-24B	Not Installed	Not Installed	---	---	Not Installed	Not Installed	---	---	NP	NP	None	None
MW-25A	Not Installed	Not Installed	---	---	Not Installed	Not Installed	---	---	NP	NP	None	None
MW-26A	Not Installed	Not Installed	---	---	Not Installed	Not Installed	---	---	NP	NP	None	None
BP-3	NP	NP	None	Moderate MGP odor in shallow and deep GW	NP	NP	None	None	NP	NP	None	None
BP-5	NP	NP	None	None	NP	NP	None	None	Not Measured	Not Measured	---	---
BP-7	NP	NP	None	Slight MGP Odor in deep GW	NP	NP	None	None	NP	NP	None	None

NOTES:

NAPL	Stands for Non-Aqueous Phase Liquid
LNAPL	Stands for Light Non-Aqueous Phase Liquid
DNAPL	Stands for Dense Non-Aqueous Phase Liquid
NP	Indicates that LNAPL or DNAPL was not present in monitoring well.
NP/NM	Indicates that LNAPL or DNAPL was not present (or not present in measurable quantities) in the monitoring well, but other impacts/sheens were noted.
P/0.33'	Indicates that LNAPL or DNAPL was present and the measured thickness within the monitoring well.
Not Installed	Indicates that the monitoring well was not installed.
---	Indicates that no observations were able to be made because the well was not installed or was not measured on the sampling event.
None	Indicates that no physical observations or olfactory observations were noted for the monitoring well.

Table 6
Surface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	B-16 (1-2)	B-17 (1.5-2)	B-19 (0-2)	B-20 (0-2)	B-21 (0-2)	SS-1 (0-1.5)	SS-2 (0-1.6)	SS-3 (0-1.2)	SS-4 (0-1.2)	SS-5 (0-1.3)
				Sample ID/Sample Depth (feet below land surface)									
Volatile Organic Compounds (VOCs) (mg/Kg)													
Benzene	1	3	13	*3.3 U*	*2.5 U*	*2.9 U*	*2.9 U*	*2.9 U*	[illegible]	*3.3 U*	0.31 J	0.07 J	*3.2 U*
Toluene	500	1000	1000	3.3 U	2.5 U	2.9 U	2.9 U	0.054 J	1.2 J	3.3 U	4.9	0.11 J	3.2 U
Ethylbenzene	100	1000	1000	3.3 U	2.5 U	2.9 U	2.9 U	0.27 J	0.071 J	3.3 U	1.3 J	2.8 U	3.2 U
Xylene (total)	67	410	1000	3.3 U	2.5 U	2.9 U	2.9 U	0.036 J	0.24 J	3.3 U	5.7	2.8 U	3.2 U
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/Kg)													
Naphthalene	100	230	4200	0.086 J	0.13 J	0.39	0.47	0.18 J	0.038 J	0.026 J	0.15 J	0.18 J	0.092 J
2-Methylnaphthalene	NLS	NLS	NLS	0.069 J	0.17 J	0.29 J	0.15 J	0.091 J	0.021 J	0.025 J	0.11 J	0.12 J	0.052 J
Acenaphthylene	NLS	NLS	NLS	0.12 J	0.28 J	1.7	1	0.18 J	0.15 J	0.12 J	0.73	1.3	0.14 J
Acenaphthene	100	3400	10000	0.24 J	0.062 J	0.1 J	0.077 J	0.089 J	0.013 J	0.022 J	0.043 J	0.2 J	0.05 J
Fluorene	100	2300	10000	0.28 J	1.7 U	0.052 J	0.088 J	0.069 J	0.01 J	0.02 J	0.041 J	0.17 J	0.077 J
Phenanthrene	NLS	NLS	NLS	2.4	0.67 J	0.72	0.73	0.63	0.29 J	0.43	0.77	2.7	0.9 J
Anthracene	100	3400	10000	0.6	0.36 J	0.57	0.38	0.26 J	0.11 J	0.098 J	0.39	1.1	0.21 J
Fluoranthene	100	2300	10000	2.5	1.5 J	1.1	0.96	0.96	0.53	0.49	0.68	2.9	0.86 J
Pyrene	100	1700	10000	2.6	1.6 J	1.2	1.2	0.94	0.68	0.45	1.2	3.5	0.81 J
Benz(a)anthracene	500	0.9	4	[illegible]	0.98 J	0.88	0.85	0.47	0.49	0.25 J	0.76	2.6?	0.5
Chrysene	500	9	40	1.2	1.1 J	1.1	1.2	0.82	0.56	0.29 J	1.2	3	0.52
Benzo(b)fluoranthene	50	0.9	4	0.78	1.3 J	2 J	1	0.88	0.59	0.2 J	[illegible]	2.1?	0.34 J
Benzo(k)fluoranthene	500	0.9	4	0.87	1.5 J	2 J	0.86	0.76	0.56	0.28 J	0.89	2.2	0.48
Benzo(a)pyrene	100	0.66	0.66	[illegible]	1.1 U	0.83 J	0.79	0.58	[illegible]	0.21 J	[illegible]	[illegible]	0.42
Indeno(1,2,3-cd)pyrene	500	0.9	4	0.75	0.41 J	0.34 J	0.06 J	0.06 J	0.68	0.18 J	0.56	[illegible]	0.31 J
Dibenz(a,h)anthracene	100	0.66	0.66	0.27 J	0.1 J	0.14 J	0.022 J	0.36 U	0.22 J	0.059 J	0.26 J	[illegible]	0.11 J
Benzo(g,h,i)perylene	NLS	NLS	NLS	0.89	0.37 J	0.39 J	0.047 J	0.067 J	0.83	0.2 J	0.43	1.4	0.37 J
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)													
1,2-Dichlorobenzene	50	5100	10000	0.38 U	1.7 U	0.019 J	0.35 U	0.028 J	0.39 U	0.42 U	0.36 U	0.77 U	0.38 U
Isophorone	50	1100	10000	0.38 U	1.7 U	0.36 U	0.35 U	0.36 U	0.39 U	0.42 U	0.028 J	0.77 U	0.38 U
Dibenzofuran	NLS	NLS	NLS	0.14 J	0.056 J	0.36 U	0.099 J	0.036 J	0.014 J	0.024 J	0.36 U	0.11 J	0.068 J
Diethylphthalate	50	10000	10000	0.38 U	1.7 U	0.36 U	0.024 J	0.36 U	0.39 U	0.42 U	0.36 U	0.77 U	0.38 U
Di-n-butylphthalate	100	5700	10000	0.38 U	1.7 U	0.011 J	0.011 J	0.36 U	0.39 U	0.008 J	0.047 J	0.77 U	0.007 J
Butylbenzylphthalate	100	1100	10000	0.38 U	1.7 U	0.13 J	0.35 U	0.36 U	0.39 U	0.42 U	0.25 J	0.19 J	0.042 J
bis(2-Ethylhexyl)phthalate	100	49	210	0.38 U	1.7 U	0.42 B	0.54 B	0.36 U	0.39 U	0.39 U	0.36 U	0.77 U	0.38 U
Di-n-octylphthalate	100	1100	10000	0.38 U	0.11 J	0.36 U	0.35 U	0.36 UJ	0.39 U	0.42 U	0.36 U	0.77 U	0.38 U
Inorganic Compounds (mg/Kg)													
Aluminum	NLS	NLS	NLS	13400	3520 J	5370	4820	8080	12100	13000	7940	4590	7370
Antimony	NLS	14	340	1.4 U	0.87 U	2.1 J	2.8 J	0.85 UJ	1.2 U	1.1 U	1.0 U	1.1 U	1.0 U
Arsenic	NLS	20	20	4.6	5.1	6.1 J	5.0 J	3.1 J	3.4	3.7	1.9 J	9.9	4.2

Table 7A
Test Pit Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth TP-14 (15-16)▼	TP-17A (3)▼	TP-22 (2-2.5)	TP-24 (6)▼	TP-25 (13-15)▼	TP-30 (20-21)▼	TP-33 (5.5)▼	TP-34 (10)	TP-36A (8)	TP-37 (3-3.5)	TP-37 (PIPE)
Volatile Organic Compounds (VOCs) (mg/kg)														
Benzene	1	3	13	1.4 J	3.3 J	0.02 UJ	18 J	3 U	0.26 J	24 J	360	14 J	6.6	16
Toluene	500	1000	1000	0.095 J	0.34 J	1.6 UJ	35 U	3 U	1.4 U	3.2 J	580	1.8 J	2.3 J	1.8 J
Ethylbenzene	100	1000	1000	0.1 J	5.3 J	0.21 J	280	3 U	1.4 U	190 J	200	100	6.2	16
Xylene (total)	67	410	1000	1.1 J	2.9 J	0.12 J	110	3 U	1.4 U	150 J	580	84	6.3	5.3
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)														
Naphthalene	100	230	4200	0.21 J	61 B	1.2 J	3700 B	0.003 J	0.003 J	840	8000	30000	13 B	150 B
2-Methylnaphthalene	NLS	NLS	NLS	0.036 J	39	0.81 J	3100	0.003 J	0.002 J	1100	9200	36000 J	8.8 J	67
Acenaphthylene	NLS	NLS	NLS	0.006 J	9.3	2.5 J	110 J	0.38 U	0.002 J	130 J	3400	3400 J	40	2.7 J
Acenaphthene	100	3400	10000	0.39 U	41	2 J	1100	0.38 U	0.002 J	430	580 J	12000	16	56
Fluorene	100	2300	10000	0.39 U	17	2.1 J	520	0.38 U	0.38 U	330	2700	7700 J	10 J	20 J
Phenanthrene	NLS	NLS	NLS	0.007 J	78 DJ	11 J	1700	0.005 J	0.016 J	910	8300	22000	15	14 J
Anthracene	100	3400	10000	0.002 J	22	3 J	510	0.001 J	0.38 U	240	2000	7300 J	20	3.1 J
Fluoranthene	100	2300	10000	0.006 J	14	5.2 J	410 J	0.002 J	0.38 U	170 J	2100	6000 J	36	3.4 J
Pyrene	100	1700	10000	0.011 J	31 J	17 J	660	0.003 J	0.002 J	220	4000	8000 J	68	3.2 J
Benz(a)anthracene	500	0.9	4	0.004 J	9.5 J	3.8 J	180 J	0.38 U	0.38 U	86 J	1300 J	2700 J	34	1.3 J
Chrysene	500	9	40	0.005 J	11 J	4.3 J	150 J	0.38 U	0.38 U	100 J	1100 J	2600 J	40	2 J
Benzo(b)fluoranthene	50	0.9	4	0.003 J	4 J	2.6 J	76 J	0.38 U	0.38 U	20 J	480 J	680 J	18	1.7 J
Benzo(k)fluoranthene	500	0.9	4	0.004 J	5.9 J	3.1 J	110 J	0.38 U	0.38 U	41 J	750 J	1400 J	20	1.1 J
Benzo(a)pyrene	100	0.66	0.66	0.003 J	8.8 J	4.4 J	210 J	0.38 U	0.38 U	44 J	1000 J	1700 J	32	1.2 J
Indeno(1,2,3-cd)pyrene	500	0.9	4	0.002 J	4.6 J	2.2 J	66 J	0.38 U	0.38 U	16 J	280 J	820 J	14	0.79 J
Dibenz(a,h)anthracene	100	0.66	0.66	0.39 U	1.8 J	3.9 U	500 U	0.38 U	0.38 U	6.6 J	100 J	10000 U	6 J	26 U
Benzo(g,h,i)perylene	NLS	NLS	NLS	0.003 J	5.9 J	3 J	68 J	0.38 U	0.38 U	15 J	290 J	880 J	17	0.77 J
Other Semivolatile Organic Compounds (SVOCs) (mg/kg)														
Dibenzofuran	NLS	NLS	NLS	0.39 U	2.9 J	0.21 J	150 J	0.38 U	0.38 U	80 J	640 J	1900 J	1.7 J	4.8 J
Butylbenzylphthalate	100	1100	10000	0.002 J	8 U	3.9 UJ	500 U	0.002 J	0.003 J	195 U	169 U	10000 U	12 U	26 U
Bis(2-ethylhexyl)phthalate	100	49	210	0.39 U	8 UJ	3.9 UJ	500 U	0.38 U	0.38 U	195 U	169 U	10000 U	12 U	26 U
Metals (mg/kg)														
Aluminum	NLS	NLS	NLS	9290	5500	7380	1510	10900	7380	11400 J	986 J	4730 J	13400	8750
Antimony	NLS	14	340	0.66 U	1.7 U	2.2 J	2.1 J	1.6 J	1.0 J	7.2 J	4.1 U	2.8 U	8.1 J	8.2 J
Arsenic	NLS	20	20	1.8 J	8.4	7.1	22.6	3.2	2.0	19.5	16.6	11.4	46.5 J	32.7 J
Barium	NLS	700	47000	70.9 J	66.6	118	119	143 J	90.3 J	160	64.1	37.3 J	203	114
Beryllium	NLS	1	1	0.47 J	0.28 J	0.17 U	0.19 U	0.71 J	0.34 J	0.29 U	0.28 U	0.43 J	1 J	1.3
Cadmium	NLS	1	100	R	0.19 U	1.1 J	0.19 U	R	R	0.29 U	0.28 U	0.3 U	2.1 J	4.4 J
Calcium	NLS	NLS	NLS	2570	3410 J	24000	1390 J	2080	16200	10300 J	432 J	646 J	1860	1740
Chromium	NLS	NLS	NLS	17.3	12.9 J	39.5 J	8.2 J	20.8	13.5	14.7 U	6.6	8.9	51.7	27.7
Cobalt	NLS	NLS	NLS	8.3 J	4.8 J	8.7	4.4 J	13.0 J	6.2 J	9.8 J	1.6 J	5.6 J	3.8 J	12.4
Copper	NLS	600	600	13.0	47.7 J	63.1 J	55 J	12.8	10.2	100	58.7	67.9	803	820

Table 7A (continued)
Test Pit Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth TP-39 (3-4)	TP-39A (4)	TP-39 (15-16)[v]	TP-39 (23-26)[v]	TP-49 (5-5.5)[v]	TP-51 (3.5)	TP-51 (7.5)[v]	TP-56 (4-5)[v]	TP-57A (3-4)[v]	TP-68 (3-4)[v]	TP-75 (15-16)[v]
Volatile Organic Compounds (VOCs) (mg/kg)														
Benzene	1	3	13	7.8 J	3.6 J	2.8 U	2.7 U	0.26 J	*0.01 UJ*	1.1 UJ	700	NA	60	0.09 J
Toluene	500	1000	1000	37 J	0.53 J	2.8 U	2.7 U	0.15 J	1.4 UJ	1.1 UJ	150	NA	4 J	2.92 U
Ethylbenzene	100	1000	1000	71	4.6 J	2.8 U	2.7 U	0.93 J	1.4 UJ	1.1 UJ	160	NA	260	2.92 U
Xylene (total)	67	410	1000	400	5.8 J	2.8 U	2.7 U	0.085 J	1.4 UJ	1.1 UJ	680	NA	280	2.92 U
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)														
Naphthalene	100	230	4200	10000 B	8.1 B	0.39 U	0.37 U	0.58 J	0.5 U	0.006 J	2400 B	1.1 J	310 DB	0.023 J
2-Methylnaphthalene	NLS	NLS	NLS	5600	18	0.39 U	0.37 U	0.22 J	0.5 U	0.39 U	1500	0.71 J	130	0.005 J
Acenaphthylene	NLS	NLS	NLS	180 J	16	0.002 J	0.37 U	4	0.5 U	0.39 U	73 J	4	23	0.44
Acenaphthene	100	3400	10000	89 J	9	0.39 U	0.37 U	0.46 J	0.63	0.39 U	66 J	0.24 J	87	0.084 J
Fluorene	100	2300	10000	230 J	12	0.39 U	0.37 U	0.93 J	0.76	0.39 U	170 J	0.31 J	42	0.018 J
Phenanthrene	NLS	NLS	NLS	520 J	36	0.39 U	0.37 U	0.54 J	0.5 U	0.009 J	370	3 J	210 DJ	0.01 J
Anthracene	100	3400	10000	120 J	11	0.39 U	0.002 J	0.64 J	0.5 UJ	0.39 U	120 J	1.7 J	53	0.002 J
Fluoranthene	100	2300	10000	130 J	13	0.38 U	0.37 U	1.5	0.11 J	0.39 U	99 J	5.1	41	0.003 J
Pyrene	100	1700	10000	210 J	25	0.39 U	0.37 U	3.1	0.21 J	0.39 U	160 J	14 J	93 J	0.004 J
Benz(a)anthracene	500	0.9	4	88 J	7.9	0.39 U	0.002 J	1.3	0.071 J	0.39 U	64 J	6.9 J	30 J	0.002 J
Chrysene	500	9	40	83 J	10	0.39 U	0.002 J	1.8	0.12 J	0.39 U	63 J	7.1 J	32 J	0.003 J
Benzo(b)fluoranthene	50	0.9	4	*1900 U*	3.2 J	0.39 U	0.37 U	0.67 J	0.021 J	0.39 U	22 J	12 J	11 J	0.002 J
Benzo(k)fluoranthene	500	0.9	4	*1900 U*	4.8	0.39 U	0.37 U	1 J	0.019 J	0.39 U	30 J	9.4 J	18 J	0.002 J
Benzo(a)pyrene	100	0.66	0.66	49 J	5.1	0.39 U	0.002 J	0.89 J	0.025 J	0.39 U	39 J	6.7 J	25 J	0.002 J
Indeno(1,2,3-cd)pyrene	500	0.9	4	*1900 U*	2.9 J	0.39 U	0.37 U	0.6 J	0.021 J	0.39 U	*360 U*	1.3 J	14 J	0.41 U
Dibenz(a,h)anthracene	100	0.66	0.66	*1900 U*	1.4 J	0.39 U	0.37 U	0.22 J	0.5 U	0.39 U	*360 U*	*3.4 UJ*	4.8 J	0.41 U
Benzo(g,h,i)perylene	NLS	NLS	NLS	*1900 U*	3.6 J	0.39 U	0.37 U	0.67 J	0.022 J	0.39 U	360 U	3.4 UJ	19 J	0.41 U
Other Semivolatile Organic Compounds (SVOCs) (mg/kg)														
Dibenzofuran	NLS	NLS	NLS	39 J	2.6 J	0.39 U	0.37 U	0.3 J	0.5 U	0.39 U	31 J	0.21 J	7.5 J	0.018 J
Butylbenzylphthalate	100	1100	10000	*1900 U*	5 U	0.39 U	0.37 U	1.1 U	0.5 UJ	0.007 J	360 U	3.4 UJ	18 U	0.41 U
Bis(2-ethylhexyl)phthalate	100	49	210	*1900 U*	5 U	0.39 U	0.37 U	1.1 U	0.12 J	0.39 U	*360 U*	3.4 UJ	18 UJ	0.41 U
Metals (mg/kg)														
Aluminum	NLS	NLS	NLS	760	4080	15500	12400	15200	23400 J	13800 J	14000	8360	7120	14200
Antimony	NLS	14	340	16.1 J	2.3 J	1.2 U	1.1 U	6.2 J	2 U	1.4 U	1.9 U	2.6 J	1.8 U	1.4 J
Arsenic	NLS	20	20	42.6 J	8 J	3.2	3.4	22.6 J	3.0	2.4	14.8	7.6	25.2	2.5
Barium	NLS	700	47000	30.7 J	53.2	64.2	72.4	186	147	122	90.6	91.9	120	41.5 J
Beryllium	NLS	1	1	0.29 U	0.25 U	0.54 J	1.1 J	1.1 J	1.9	0.84	0.44 J	0.20 J	0.37 J	0.25 J
Cadmium	NLS	1	100	0.82 J	0.25 U	R	R	0.28 U	0.22 U	0.16 U	0.21 U	0.16 U	0.57 J	R
Calcium	NLS	NLS	NLS	11600	1080 J	661 J	2010 J	2590	3430	2280	1600 J	1030 J	10000	270 J
Chromium	NLS	NLS	NLS	249	13.4	24.2	24.2	31.8	19.5	26.0	28.0 J	20.8 J	22.2 J	15
Cobalt	NLS	NLS	NLS	11.6 J	6.9 J	10.9	14.4	34.6	9.8 J	11.4	9.8 J	6.6 J	9.1 J	4 J
Copper	NLS	600	600	642	139	15.6	14.5	176.	20.7	12.2	147 J	55.5 J	77.2 J	14.5

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Table 7A (continued)
Test Pit Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth TP-39 (3-4)	TP-38A (4)	TP-39 (15-16)▼	TP-39 (23-25)▼	TP-49 (5-5.5)▼	Sample ID/Sample Depth TP-51 (3.5)	TP-51 (7.5)▼	TP-56 (4-5)▼	TP-57A (3-4)▼	TP-68 (3-4)▼	TP-75 (15-16)▼
Metals (continued) (mg/kg)														
Iron	NLS	NLS	NLS	223000	18600	32500	29600	35200	23200	30000	81000	28000	39200	16300
Lead	NLS	400	600	183 J	82.9	11.4	12.8	148 J	18.8 J	12.1 J	118 J	378 J	523 J	6.8
Magnesium	NLS	NLS	NLS	520 J	1000 J	8980	8860	3280	4590	7150	4260	3650	2730	3130 J
Manganese	NLS	NLS	NLS	795	108	248	937	288	2050	538	453 J	273 J	154 J	74.2
Mercury	NLS	14	270	0.094	0.34	0.0025 U	0.0031 J	0.30	0.054 J	0.0032 J	0.39	0.12	0.46	0.007
Nickel	NLS	250	2400	177	28	23.7	32.5	95.2	23.5	28.1	35.9	18.9	35.1	9.8 J
Potassium	NLS	NLS	NLS	143 U	395 U	3200 J	3320 J	850 J	1310 J	2900 J	1590	969	756 J	1610 J
Selenium	NLS	63	3100	12.9 J	1.5 J	0.58 UJ	0.57 UJ	3.7 J	1.1 UJ	0.79 UJ	4.5	2	4.5	0.83 UJ
Silver	NLS	110	4100	0.58 UJ	0.5 UJ	0.20 UJ	0.19 UJ	0.96 UJ	0.44 U	0.32 U	0.43 UJ	0.33 UJ	0.41 UJ	0.2 U
Sodium	NLS	NLS	NLS	449 U	412 U	1980 J	1170 J	411 U	155 U	202 U	274 J	284. J	542 J	935 J
Thallium	NLS	2	2	22.8 J	2.7 J	0.87 U	0.78 U	3.6 J	*2.2 UJ*	2.2 J	7.0 J	1.6 UJ	3.7 J	1.6 UJ
Vanadium	NLS	370	7100	54.0	17.6	32.6	25.8	34.1	28.3	32.2	37.6	27.5	26.0	23.5
Zinc	NLS	1500	1500	347 J	104 J	59.8	71.1	243 J	141	72	108 J	63.3 J	318 J	26.1
Cyanide (mg/Kg)														
Cyanide, Total	NLS	1100	21000	778	2.21	0.580 U	0.570 U	0.850 U	0.850 U	0.590 U	52.4	88.3	0.760 U	0.62 U
Cyanide, Amenable	NLS	NLS	NLS	0.850 U	0.730 U	NA	NA	NA	NA	NA	0.690 U	19.3	NA	NA
Diesel Range Organics (mg/Kg)														
Diesel Range Organics	NLS	NLS	NLS	NA	NA	NA	NA	NA	1700	NA	NA	NA	NA	NA

Notes:

This table is a summary for hit compounds only; compounds that were not detected in any samples are not included in this table.
IGW - Impact to Groundwater Soil Screening Criteria
RDC - Residential Direct Contact Soil Cleanup Screening Criteria
NRDC - Non-Residential Direct Contact Soil Cleanup Screening Criteria
NLS - no listed standard (NJDEP has not established criteria for this analyte)
Shading indicates compound detected above NJDEP RDC and/or NRDC, and/or IGW Cleanup Screening Criteria.
Italics indicate that the Practical Quantitation Limit (PQL) is greater than NJDEP RDC and/or NRDC and/or IGW Cleanup Screening Criteria. The PQL has been replaced with the corrected Method Detection Limit (MDL).
Yellow shading denotes sample was visibly impacted.
J - estimated value
U - undetected, value shown is detection limit
R - rejected result
D - result is from diluted sample analysis
B - (organic compounds) analyte was detected in blank samples
NA - not analyzed
ND - no detections of compounds included in total

▼ Symbol indicates that sample was collected below the water table (i.e., saturated).
Saturated samples are not compared to IGW criteria.

Table 7B
Soil Boring Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	B-11 (13-15)▼	B-11 (19-20)▼	B-12 (5-6)	B-12 (7.5-8)	B-12 (13-14)▼	B-14 (3-4)	B-15 (2-3)	B-15 (12-14)▼	B-16 (20-22)▼	B-15 (25-26)▼	B-16 (26-28)▼
				Sample ID/Depth (feet below land surface)										
Volatile Organic Compounds (VOCs) (mg/Kg)														
Benzene	1	3	13	*0.03 U*	2.9 U	0.27 J	*0.03 UJ*	2.7 UJ	0.27 J	*0.03 U*	2.8 U	6.8	8.3 J	1 J
Toluene	500	1000	1000	3.2 U	2.9 U	0.26 J	2.8 UJ	2.7 UJ	0.23 J	3.1 U	2.9 U	3.6 U	18 U	2.8 U
Ethylbenzene	100	1000	1000	3.2 U	2.9 U	14 J	2.8 UJ	2.7 UJ	1.9 J	3.1 U	2.8 U	0.46 J	11 J	1.3 J
Xylene (total)	67	410	1000	3.2 U	2.9 U	2 J	2.8 UJ	2.7 UJ	0.22 J	3.1 U	2.9 U	0.66 J	25	2 J
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/Kg)														
Naphthalene	100	230	4200	0.38 U	0.2 J	4.8	0.027 J	0.38 U	2.8 B	0.4 U	0.38 U	0.29 J	270	0.89
2-Methylnaphthalene	NLS	NLS	NLS	0.026 J	0.26 J	0.38 J	0.009 J	0.38 U	1.6 B	0.4 U	0.38 U	0.036 J	210	0.91
Acenaphthylene	NLS	NLS	NLS	0.009 J	0.059 J	0.3 J	0.38 U	0.38 U	2.6	0.4 U	0.38 U	0.01 J	15 J	0.092 J
Acenaphthene	100	3400	10000	0.38 U	0.012 J	0.34 J	0.38 U	0.38 U	1.2 J	0.4 U	0.38 U	0.006 J	52	0.31 J
Fluorene	100	2300	10000	0.004 J	0.028 J	0.72 J	0.38 U	0.38 U	1.8	0.4 U	0.38 U	0.007 J	45	0.22 J
Phenanthrene	NLS	NLS	NLS	0.38 U	0.087 J	1.8	0.026 J	0.018 J	4.6 B	0.4 U	0.38 U	0.019 J	140	0.8
Anthracene	100	3400	10000	0.006 J	0.028 J	0.35 J	0.006 J	0.38 U	2.1	0.4 U	0.003 J	0.003 J	40 J	0.22 J
Fluoranthene	100	2300	10000	0.005 J	0.026 J	0.43 J	0.027 J	0.011 J	2.4	0.4 U	0.38 U	0.4 U	42	0.24 J
Pyrene	100	1700	10000	0.006 J	0.043 J	0.66 J	0.022 J	0.011 J	4.4 B	0.4 U	0.38 U	0.4 U	61	0.37
Benz(a)anthracene	500	0.9	4	0.003 J	0.017 J	0.22 J	0.012 J	0.38 U	1.6	0.001 J	0.002 J	0.4 U	24 J	0.13 J
Chrysene	600	9	40	0.003 J	0.02 J	0.28 J	0.011 J	0.38 U	1.8	0.002 J	0.002 J	0.4 U	28 J	0.14 J
Benzo(b)fluoranthene	50	0.9	4	0.001 J	0.005 J	0.085 J	0.38 U	0.38 U	0.75 J	0.4 U	0.38 U	0.4 U	6.6 J	0.035 J
Benzo(k)fluoranthene	500	0.9	4	0.002 J	0.009 J	0.11 J	0.38 U	0.38 U	0.84 J	0.4 U	0.38 U	0.4 U	12 J	0.063 J
Benzo(a)pyrene	100	0.66	0.66	0.38 U	0.011 J	0.1 J	0.38 U	0.38 U	1.2 J	0.001 J	0.002 J	0.4 U	18 J	0.068 J
Indeno(1,2,3-cd)pyrene	500	0.9	4	0.38 U	0.004 J	0.075 J	0.38 U	0.38 U	0.47 J	0.4 U	0.38 U	0.4 U	3.8 J	0.023 J
Dibenz(a,h)anthracene	100	0.66	0.66	0.38 U	0.003 J	*0.76 U*	0.38 U	0.38 U	0.18 J	0.4 U	0.38 U	0.4 U	1.3 J	0.008 J
Benzo(g,h,i)perylene	NLS	NLS	NLS	0.38 U	0.005 J	0.082 J	0.38 U	0.38 U	0.55 J	0.4 U	0.38 U	0.4 U	4.2 J	0.027 J
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)														
Dibenzofuran	NLS	NLS	NLS	0.002 J	0.008 J	0.11 J	0.38 U	0.38 U	0.35 J	0.4 U	0.38 U	0.4 U	5.3 J	0.028 J
Diethylphthalate	50	10000	10000	0.38 U	0.39 U	0.76 U	0.38 U	0.38 U	1.5 U	0.4 U	0.38 U	0.4 U	41.25 U	0.37 U
Di-n-butylphthalate	100	5700	10000	0.38 U	0.39 U	0.76 U	0.38 U	0.38 U	1.5 U	0.4 U	0.38 U	0.4 U	41.25 U	0.37 U
bis(2-Ethylhexyl)phthalate	100	49	210	0.38 U	0.56 J	0.76 U	0.38 U	0.38 U	1.5 U	0.4 U	0.38 U	0.4 U	41.25 U	0.37 U
Inorganic Compounds (mg/Kg)														
Aluminum	NLS	NLS	NLS	15400	12700	7620	4310	2310	7680	12700	9280	8620	14400	10600
Antimony	NLS	14	340	0.68 U	0.86 U	1.3 U	1.8 U	2 U	1.1 U	1.4 U	1.0 U	0.86 U	1.4 U	0.65 U
Arsenic	NLS	20	20	3.3	4.6	1.6	1.8 J	2.3	5.6	3.1	1.8	2.3	4.4	6.8
Barium	NLS	700	47000	96.6	105	54.2	68.5	81.7	44.2	107	43.6	64.1	141	80.2
Beryllium	NLS	1	1	0.88 J	0.74 J	0.64 J	0.52 J	0.42 J	0.18 U	0.53 J	0.31 J	0.30 J	0.65 J	0.68 J

Table 7B (continued)
Soil Boring Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth (feet below land surface) B-11 (13-16)▼	B-11 (19-20)▼	B-12 (5-6)	B-12 (7.5-8)	B-12 (13-14)▼	B-14 (3-4)	B-15 (2-3)	B-16 (12-14)▼	B-16 (20-22)▼	B-16 (26-28)▼	B-16 (26-28)▼
Inorganic Compounds (continued) (mg/Kg)														
Cadmium	NLS	1	100	R	R	0.15 U	0.2 U	0.22 U	R	R	R	R	R	R
Calcium	NLS	NLS	NLS	1060 J	1630 J	1510	2600	18400	9560 J	5710 J	1310 J	21700	6830 J	29800
Chromium	NLS	NLS	NLS	26.2	24.9	8.4	6	2.8	21.9	20.0	17.5	13.7	24.3	20.2
Cobalt	NLS	NLS	NLS	13.8	12.6	4 J	5.1 J	3.6 J	5.9 J	9.6	8.2 J	6.5 J	12.0	9.9
Copper	NLS	600	600	16.4	15.4	16	7	4.7 J	32.4	15.4	11.0	14.0	14.2	12.5
Iron	NLS	NLS	NLS	33200	31500	12100	6480	2280	20400	25600	22800	17500	29800	25900
Lead	NLS	400	600	13.4	13.8	20.8	10.1	4.5	48.9	10.2	8.8	7.5	11.9	12.4
Magnesium	NLS	NLS	NLS	8910	8090	1500	1960	1980	5280	6250	4600	5340	8550	7600
Manganese	NLS	NLS	NLS	388	750	158	444	638	185	568	264	422	546	553
Mercury	NLS	14	270	0.0058 U	0.0032 U	0.14	0.0086 U	0.038 J	0.031	0.0033 J	0.0033 U	0.0020 U	0.0036 U	0.0033 U
Nickel	NLS	250	2400	32.7	28.5	8.9	6.7 J	6.5 J	16.2	21.6	18.6	14.0	27.5	23.2
Potassium	NLS	NLS	NLS	3530 J	3210 J	268 J	270 J	526 J	827 J	3030 J	1610 J	2240 J	3780 J	3340 J
Selenium	NLS	63	3100	0.55 UJ	0.62 UJ	0.82 J	0.98 UJ	1.1 UJ	0.71 J	0.53 UJ	0.50 UJ	0.48 UJ	0.62 UJ	0.56 UJ
Silver	NLS	110	4100	0.18 UJ	0.23 UJ	0.29 U	0.39 U	0.44 U	0.18 UJ	0.18 UJ	0.17 UJ	0.16 UJ	0.21 UJ	0.19 UJ
Sodium	NLS	NLS	NLS	1120 J	1530 J	178 J	209 J	285 J	155 J	280 J	124 J	232 J	286 J	302 J
Thallium	NLS	2	2	0.73 U	0.83 U	1.9 J	2 U	*2.2 U*	0.73 U	0.71 U	0.67 U	0.65 U	0.83 U	0.74 U
Vanadium	NLS	370	7100	28.7	27.1	10.5	9.1 J	6.4 J	24.1	26.0	21.4	19.6	30.6	23.5
Zinc	NLS	1500	1500	73.4	65.3	32.4	23.5	18.6	150	52.4	42.3 J	44.3 J	81.4	60.3
Cyanide (mg/Kg)														
Cyanide, Total	NLS	1100	21000	0.600 U	6.40	9.77	0.69 U	0.66 U	13.2	0.570 U	0.570 U	0.670 U	0.650 U	0.580 U
Cyanide, Amenable	NLS	NLS	NLS	NA	6.40	0.68 U	NA	NA	0.550 U	NA	NA	NA	NA	NA

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Table 7B (continued)
Soil Boring Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth (feet below land surface) B-16 (8-9)▼	B-17 (3.5-4)▼	B-17 (7-8)▼	B-18 (5-5.5)▼	B-18 (9-10)▼	B-19 (2-4)	B-19 (8-10)▼	B-20 (5-6)	B-20 (8-10)▼
Volatile Organic Compounds (VOCs) (mg/Kg)												
Benzene	1	3	13	2.9 U	NA	2.6 U	*0.04 U*	2.7 U	NA	*0.03 U*	NA	2.8 U
Toluene	500	1000	1000	2.9 U	NA	2.6 U	0.44 J	2.7 U	NA	3.2 U	NA	2.8 U
Ethylbenzene	100	1000	1000	2.9 U	NA	2.6 U	3.7 J	2.7 U	NA	3.2 U	NA	2.8 U
Xylene (total)	67	410	1000	2.9 U	NA	2.6 U	0.82 J	2.7 U	NA	3.2 U	NA	2.8 U
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/Kg)												
Naphthalene	100	230	4200	0.36 U	0.39 U	0.39 U	19	0.38 U	**940**	0.033 J	**560**	0.026 J
2-Methylnaphthalene	NLS	NLS	NLS	0.003 J	0.39 U	0.39 U	11	0.38 U	1200	0.02 J	39 J	0.37 U
Acenaphthylene	NLS	NLS	NLS	0.003 J	0.39 U	0.39 U	16	0.38 U	140 J	0.38 U	86 U	0.37 U
Acenaphthene	100	3400	10000	0.38 U	0.39 U	0.39 U	8.8 J	0.38 U	**140 J**	0.38 U	**330**	0.37 U
Fluorene	100	2300	10000	0.002 J	0.39 U	0.39 U	7.3 J	0.38 U	**350**	0.38 U	**160**	0.37 U
Phenanthrene	NLS	NLS	NLS	0.013 J	0.39 U	0.39 U	43 J	0.38 U	1000	0.014 J	490 J	0.01 J
Anthracene	100	3400	10000	0.004 J	0.39 U	0.39 U	6.1 J	0.38 U	**190 J**	0.38 U	**150 J**	0.37 U
Fluoranthene	100	2300	10000	0.008 J	0.39 U	0.39 U	33 J	0.006 J	**210 J**	0.008 J	93	0.006 J
Pyrene	100	1700	10000	0.011 J	0.006 J	0.39 U	64 J	0.009 J	**350**	0.007 J	**230 J**	0.005 J
Benz(a)anthracene	500	0.9	4	0.005 J	0.39 U	0.39 U	**27 J**	0.38 U	**130 J**	0.38 U	**82 J**	0.37 U
Chrysene	500	9	40	0.004 J	0.39 U	0.39 U	**40 J**	0.38 U	**140 J**	0.38 U	**87 J**	0.37 U
Benzo(b)fluoranthene	50	0.9	4	0.001 J	0.38 U	0.39 U	**14**	0.38 U	**32 J**	0.38 U	**19 J**	0.37 U
Benzo(k)fluoranthene	500	0.9	4	0.002 J	0.38 U	0.39 U	**18**	0.38 U	**51 J**	0.38 U	**25 J**	0.37 U
Benzo(a)pyrene	100	0.66	0.66	0.002 J	0.38 U	0.39 U	**7.1 J**	0.38 U	**59 J**	0.38 U	**34 J**	0.37 U
Indeno(1,2,3-cd)pyrene	500	0.9	4	0.36 U	0.39 U	0.39 U	**11**	0.38 U	**27 J**	0.38 U	**11 J**	0.37 U
Dibenz(a,h)anthracene	100	0.66	0.66	0.36 U	0.39 U	0.39 U	**6.4 J**	0.38 U	**12 J**	0.38 U	**6.1 J**	0.37 U
Benzo(g,h,i)perylene	NLS	NLS	NLS	0.36 U	0.38 U	0.39 U	11 J	0.38 U	37 J	0.38 U	10 J	0.37 U
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)												
Dibenzofuran	NLS	NLS	NLS	0.36 U	0.39 U	0.39 U	NA	0.38 U	58 J	0.38 U	45 J	0.37 U
Diethylphthalate	50	10000	10000	0.36 U	0.39 U	0.39 U	NA	0.38 U	320 U	0.38 U	86 U	0.37 U
Di-n-butylphthalate	100	5700	10000	0.36 U	0.39 U	0.39 U	NA	0.38 U	320 U	0.38 U	86 U	0.37 U
bis(2-Ethylhexyl)phthalate	100	49	210	0.36 U	0.39 U	0.39 U	NA	0.38 U	*320 U*	0.38 U	*86 U*	0.37 U
Inorganic Compounds (mg/Kg)												
Aluminum	NLS	NLS	NLS	8290	NA	7840 J	7270 J	11100 J	NA	9630	NA	10100
Antimony	NLS	14	340	0.73 U	NA	1.0 U	**28.1**	0.80 U	NA	0.92 UJ	NA	1.1 UJ
Arsenic	NLS	20	20	3.1	NA	2.2	**42.8**	2.1	55.3 J	2.2 J	NA	3.0 J
Barium	NLS	700	47000	69.3	NA	35.0 J	**832**	91.3	NA	26.9 J	NA	39.2 J
Beryllium	NLS	1	1	0.37 J	NA	0.61 J	0.48 J	0.60 J	NA	0.54 J	NA	0.59 J

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Table 7B (continued)
Soil Boring Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth (feet below land surface) B-16 (8-9)▼	B-17 (3.5-4)▼	B-17 (7-8)▼	B-18 (5-5.5)▼	B-18 (9-10)▼	B-19 (2-4)	B-19 (8-10)▼	B-20 (5-6)	B-20 (8-10)▼
Inorganic Compounds (continued) (mg/Kg)												
Cadmium	NLS	1	100	R	NA	0.10 U	1.1 J	0.080 U	NA	R	NA	R
Calcium	NLS	NLS	NLS	22200	NA	806 J	1640	1010	NA	698 J	NA	400 U
Chromium	NLS	NLS	NLS	17.4	NA	10.1	197	15.2	NA	16.3	NA	12.8
Cobalt	NLS	NLS	NLS	7.9 B	NA	4.8 J	11.6 J	8.3	NA	9.4	NA	5.5 J
Copper	NLS	600	600	8.0	NA	11.9	543	17.2	NA	10.9	NA	13.0
Iron	NLS	NLS	NLS	20800	NA	13000	14300	19300	NA	19000	NA	12500
Lead	NLS	400	600	9.0	NA	6.6 J	948 J	9.4 J	256 J	9.6 J	NA	8.2 J
Magnesium	NLS	NLS	NLS	5360	NA	2290	2190	4530	NA	5030	NA	3100
Manganese	NLS	NLS	NLS	631	NA	289	139 U	347	NA	374	NA	102 U
Mercury	NLS	14	270	0.0038 U	NA	0.0086 J	3.6 J	0.0044 U	NA	0.0030 U	NA	0.0074 J
Nickel	NLS	250	2400	18.2	NA	9.0	47.2	19.9	NA	18.1	NA	13.7
Potassium	NLS	NLS	NLS	2010 J	NA	770 J	1180 J	1800	NA	1710	NA	1210
Selenium	NLS	63	3100	0.56 UJ	NA	1.0 U	4.4	0.80 U	NA	0.92 U	NA	1.1 U
Silver	NLS	110	4100	0.18 UJ	NA	0.21 U	2.3 J	0.16 U	NA	0.18 UJ	NA	0.22 UJ
Sodium	NLS	NLS	NLS	197 J	NA	105 J	239 J	136 J	NA	243 J	NA	648 J
Thallium	NLS	2	2	0.73 U	NA	1.3 U	1.8 U	0.96 U	NA	1.1 U	NA	1.6 U
Vanadium	NLS	370	7100	22.2	NA	17.1	116	20.6	NA	20.4 J	NA	19.0 J
Zinc	NLS	1500	1500	42.8 J	NA	22.9	333	43.3	NA	44.6	NA	32.1
Cyanide (mg/Kg)												
Cyanide, Total	NLS	1100	21000	0.540 U	NA	0.584 UJ	717 J	0.511 UJ	NA	0.571 U	NA	0.575 U
Cyanide, Amenable	NLS	NLS	NLS	NA	NA	NA	0.831 U	NA	NA	NA	NA	NA

Table 7B (continued)
Soil Boring Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth (feet below land surface) B-21 (6-7)	B-21 (8-9)	B-21 (13-14)▼	B-22 (21-22)▼	B-23 (17-18)▼	B-29 (16-17)▼	B-30 (24-25)▼	B-33 (13-14)▼	B-33 (20-21)▼	B-36 (16-18)▼
Volatile Organic Compounds (VOCs) (mg/Kg)													
Benzene	1	3	13	0.15 J	NA	*0.03 U*	0.43 J	*0.03 U*	1.2 J	0.23 J	2.6 UJ	*0.03 UJ*	2.9 UJ
Toluene	500	1000	1000	0.78 J	NA	3.1 U	3 U	3.5 U	2.8 UJ	3 U	2.6 UJ	3.1 UJ	2.9 UJ
Ethylbenzene	100	1000	1000	4.9 J	NA	3.1 U	3 U	3.5 U	0.43 J	3 U	2.6 UJ	3.1 UJ	2.9 UJ
Xylene (total)	67	410	1000	3.7 J	NA	3.1 U	3 U	3.5 U	0.88 J	3 UJ	2.6 UJ	3.1 UJ	2.9 UJ
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/Kg)													
Naphthalene	100	230	4200	28	0.03 J	0.4 U	0.088 J	0.062 J	0.78	0.39 U	0.37 U	0.015 J	0.39 U
2-Methylnaphthalene	NLS	NLS	NLS	8.4 J	0.88 U	0.4 U	0.03 J	0.39 U	0.13 J	0.39 U	0.37 U	0.036 J	0.39 U
Acenaphthylene	NLS	NLS	NLS	14 J	0.012 J	0.4 U	0.38 U	0.39 U	0.38 U	0.39 U	0.016 J	0.024 J	0.003 J
Acenaphthene	100	3400	10000	120	0.032 J	0.4 U	0.004 J	0.39 U	0.38 U	0.39 U	0.011 J	0.025 J	0.39 U
Fluorene	100	2300	10000	56	0.021 J	0.4 U	0.005 J	0.003 J	0.38 U	0.39 U	0.016 J	0.028 J	0.39 U
Phenanthrene	NLS	NLS	NLS	180	0.065 J	0.009 J	0.034 J	0.39 U	0.38 U	0.39 U	0.11 J	0.11 J	0.39 U
Anthracene	100	3400	10000	58	0.02 J	0.4 U	0.002 J	0.39 U	0.38 U	0.009 J	0.026 J	0.029 J	0.39 U
Fluoranthene	100	2300	10000	52	0.02 J	0.4 U	0.38 U	0.39 U	0.38 U	0.011 J	0.048 J	0.033 J	0.39 U
Pyrene	100	1700	10000	78	0.025 J	0.005 J	0.38 U	0.39 U	0.38 U	0.018 J	0.072 J	0.045 J	0.39 U
Benz(a)anthracene	500	0.9	4	28	0.88 U	0.4 U	0.002 J	0.39 U	0.38 U	0.008 J	0.021 J	0.018 J	0.39 U
Chrysene	500	9	40	32	0.88 U	0.4 U	0.002 J	0.39 U	0.38 U	0.39 U	0.031 J	0.018 J	0.39 U
Benzo(b)fluoranthene	50	0.9	4	12 J	0.88 U	0.4 U	0.001 J	0.39 U	0.38 U	0.39 U	0.37 U	0.38 U	0.39 U
Benzo(k)fluoranthene	500	0.9	4	12 J	0.88 U	0.4 U	0.001 J	0.39 U	0.38 U	0.39 U	0.37 U	0.38 U	0.39 U
Benzo(a)pyrene	100	0.66	0.66	18 J	*0.88 U*	0.4 U	0.001 J	0.39 U	0.38 U	0.39 U	0.014 J	0.012 J	0.39 U
Indeno(1,2,3-cd)pyrene	500	0.9	4	8.9 J	0.88 U	0.4 U	0.38 U	0.39 U	0.38 U	0.39 U	0.37 U	0.38 U	0.39 U
Dibenz(a,h)anthracene	100	0.66	0.66	4 J	*0.88 U*	0.4 U	0.38 U	0.39 U	0.38 U	0.39 U	0.37 U	0.38 U	0.39 U
Benzo(g,h,i)perylene	NLS	NLS	NLS	11 J	0.88 U	0.4 U	0.38 U	0.39 U	0.38 U	0.39 U	0.37 U	0.38 U	0.39 U
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)													
Dibenzofuran	NLS	NLS	NLS	13 J	NA	0.4 U	0.002 J	0.39 U	0.38 U	0.39 U	0.37 U	0.38 U	0.39 U
Diethylphthalate	50	10000	10000	26 U	NA	0.4 U	0.38 U	0.39 U	0.38 U	0.39 U	0.37 U	0.38 U	0.39 U
Di-n-butylphthalate	100	5700	10000	26 U	NA	0.4 U	0.38 U	0.39 U	0.38 U	0.39 U	0.37 U	0.38 U	0.39 U
bis(2-Ethylhexyl)phthalate	100	49	210	26 U	NA	0.4 U	0.38 U	0.39 U	0.38 U	0.39 U	0.37 U	0.38 U	0.39 U
Inorganic Compounds (mg/Kg)													
Aluminum	NLS	NLS	NLS	6550	NA	7700	13000	13300	6400	8480	4900	2820	16900
Antimony	NLS	14	340	5.5 J	NA	0.99 UJ	1.2 J	1.6 U	1.2 U	1.30 U	1.40 U	1.10 U	1.2 U
Arsenic	NLS	20	20	16.2 J	NA	2.8 J	3.4	2.3	2 J	2.4 J	1.3 J	0.84 J	3.7
Barium	NLS	700	47000	278 J	NA	22.9 J	142	70.1	94.5	176	20.2 J	44.9	93.3
Beryllium	NLS	1	1	0.40 J	NA	0.38 J	0.44 J	0.42 J	0.42 J	0.64 J	0.26 J	0.31 J	0.71 J

Table 7B (continued)
Soil Boring Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth (feet below land surface) B-21 (6-7)	B-21 (8-9)	B-21 (13-14)▼	B-22 (21-22)▼	B-23 (17-18)▼	B-29 (16-17)▼	B-30 (24-26)▼	B-33 (13-14)▼	B-33 (20-21)▼	B-35 (16-18)▼
Inorganic Compounds (continued) (mg/Kg)													
Cadmium	NLS	1	100	0.72 J	NA	R	0.24 U	R	0.18 U	0.19 U	0.16 U	0.13 U	R
Calcium	NLS	NLS	NLS	3500	NA	384 U	24000	1690 J	21200 U	2180 U	439 J	20700	736. J
Chromium	NLS	NLS	NLS	43.8	NA	11.8	21.4	22.6	12.1	17.9	6.1	3.5	27.4
Cobalt	NLS	NLS	NLS	6.0 J	NA	4.8 J	10.4 J	11.9	7.6 J	10.4	2.5 J	3.2 J	28.9
Copper	NLS	600	600	175	NA	8.3	18.8	16.5	23.2	16.7	15.2	9.4	89.3
Iron	NLS	NLS	NLS	22500	NA	13100	26400	29400	15300	23000	6000	3920	28400
Lead	NLS	400	600	678 J	NA	7.7 J	11.2	12.2	8.5 J	11.4 J	5	3.9	12.4
Magnesium	NLS	NLS	NLS	3130	NA	3080	7810	6960	4540	5350	1730	2670	7310
Manganese	NLS	NLS	NLS	149 U	NA	203	590 J	641	561 J	682 J	66.7	417	275
Mercury	NLS	14	270	2.4 J	NA	0.0091 J	0.0037 U	0.0027 U	0.0097 U	0.0077 U	0.013 U	0.0074 U	0.0098
Nickel	NLS	250	2400	29.2	NA	12.3	23.0	26.0	16.6	23	6.8	8.8	55.1
Potassium	NLS	NLS	NLS	1340 J	NA	1270	3020	2460 J	1170	1460	488 J	693	3610 J
Selenium	NLS	63	3100	1.8 J	NA	0.99 U	0.73 UJ	0.60 UJ	0.89 UJ	0.93 UJ	0.81 UJ	0.63 UJ	0.66 UJ
Silver	NLS	110	4100	1.0 J	NA	0.20 UJ	0.24 UJ	0.20 UJ	0.18 UJ	0.19 UJ	0.32 U	0.25 U	0.22 UJ
Sodium	NLS	NLS	NLS	1570	NA	1740	386 J	282. J	214 U	189 U	132 J	419 J	2460 J
Thallium	NLS	2	2	1.7 U	NA	2.0 U	0.97 UJ	0.79 U	1.8 UJ	1.9 UJ	1.6 U	1.3 U	0.88 U
Vanadium	NLS	370	7100	20.4 J	NA	17.4 J	27.8	27.0	18.6	23.6	8.7	4.8 J	37.2
Zinc	NLS	1500	1500	536	NA	30.2	60.2 J	88.7	42 U	56.4 U	21.9	20.4	81.9
Cyanide (mg/Kg)													
Cyanide, Total	NLS	1100	21000	1.3 J	NA	0.598 U	0.620 U	0.620 U	1.06	0.58 U	0.56 U	0.61 U	0.620 U
Cyanide, Amenable	NLS	NLS	NLS	0.774 U	NA	NA	NA	NA	1.06	NA	NA	NA	NA

Table 7B (continued)
Soil Boring Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth (feet below land surface) HB-1 (11.6-13.6)▼	HB-1 (22.4-23.2)▼	HB-3 (6-8)▼	HB-3 (14-16)▼	VB-1 (17-18)▼	VB-1 (24-25)▼	VB-2 (16-17)▼	VB-2 (22-24)▼	VB-3 (15-16)▼	VB-4 (6.5-7.5)▼	VB-4 (14-15)▼
Volatile Organic Compounds (VOCs) (mg/Kg)														
Benzene	1	3	13	21 J	0.28 J	0.92 J	320	*0.03 U*	*0.03 U*	*0.03 U*	2.6 U	*0.03 U*	2.7 U	2.9 U
Toluene	500	1000	1000	6.7 J	0.018 J	0.44 J	490	3.2 U	3.1 U	0.018 J	0.017 J	3.1 U	2.7 U	2.9 U
Ethylbenzene	100	1000	1000	940	0.49 J	0.23 J	58 J	0.071 J	3.1 U	3.1 U	2.6 U	3.1 U	2.7 U	2.9 U
Xylene (total)	67	410	1000	1200	0.12 J	0.43 J	660	0.11 J	3.1 U	3.1 U	2.6 U	3.1 U	2.7 U	2.9 U
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/Kg)														
Naphthalene	100	230	4200	2800	0.056 J	0.82	4600	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
2-Methylnaphthalene	NLS	NLS	NLS	1900	0.026 J	0.3 J	4500	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Acenaphthylene	NLS	NLS	NLS	61 J	0.41 U	0.039 J	1100	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Acenaphthene	100	3400	10000	840	0.021 J	0.039 J	220 J	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Fluorene	100	2300	10000	460	0.41 U	0.063 J	670 J	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Phenanthrene	NLS	NLS	NLS	1100	0.075 J	0.26 J	1600	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Anthracene	100	3400	10000	360 J	0.016 J	0.059 J	400 J	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Fluoranthene	100	2300	10000	420	0.021 J	0.22 J	450 J	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.021 J
Pyrene	100	1700	10000	520	0.025 J	0.22 J	590 J	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.016 J
Benz(a)anthracene	500	0.9	4	**300 J**	0.41 U	0.099 J	**220 J**	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.014 J
Chrysene	500	9	40	**210 J**	0.41 U	0.12 J	**210 J**	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.009 J
Benzo(b)fluoranthene	50	0.9	4	**50 J**	0.41 U	0.068 J	**52 J**	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.008 J
Benzo(k)fluoranthene	500	0.9	4	**84 J**	0.41 U	0.062 J	**88 J**	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.014 J
Benzo(a)pyrene	100	0.66	0.66	**140 J**	0.41 U	0.085 J	**140 J**	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.01 J
Indeno(1,2,3-cd)pyrene	500	0.9	4	**31 J**	0.41 U	0.08 J	***800 U***	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Dibenz(a,h)anthracene	100	0.66	0.66	***380 U***	0.41 U	0.39 U	***800 U***	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Benzo(g,h,i)perylene	NLS	NLS	NLS	39 J	0.41 U	0.098 J	800 U	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)														
Dibenzofuran	NLS	NLS	NLS	51 J	0.41 U	0.026 J	78 J	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Diethylphthalate	50	10000	10000	380 U	0.41 U	0.019 J	800 U	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Di-n-butylphthalate	100	5700	10000	380 U	0.41 U	0.021 J	800 U	0.4 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
bis(2-Ethylhexyl)phthalate	100	49	210	***380 U***	0.41 U	0.39 U	***800 U***	0.39 U	0.39 U	NA	NA	0.39 U	0.39 U	0.37 U
Inorganic Compounds (mg/Kg)														
Aluminum	NLS	NLS	NLS	5550	7720	7740	5250	6610	7120	NA	NA	7040	9170	6740
Antimony	NLS	14	340	1.0 U	1.0 U	1.0 U	1.1 U	1.2 U	0.96 U	NA	NA	0.90 U	0.85 U	1.0 U
Arsenic	NLS	20	20	1.4 J	2.3	2.4	1.8 J	1.3 J	4.0	NA	NA	2.0	4.3	2.5
Barium	NLS	700	47000	82.8	138	76.6	29.7 J	35.4 J	76.5 J	NA	NA	46.4	66.4	70.5
Beryllium	NLS	1	1	0.22 J	0.6 J	0.49 J	0.31 J	0.39 J	0.68 J	NA	NA	0.58 J	0.78 J	0.62 J

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Table 7B (continued)
Soil Boring Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	HB-1 (11.6-13.5)▼	HB-1 (22.4-23.2)▼	HB-3 (6-8)▼	HB-3 (14-16)▼	VB-1 (17-18)▼	VB-1 (24-25)▼	VB-2 (16-17)▼	VB-2 (22-24)▼	VB-3 (15-16)▼	VB-4 (6.5-7.5)▼	VB-4 (14-15)▼
				Sample ID/Depth (feet below land surface)										
Inorganic Compounds (continued) (mg/Kg)														
Cadmium	NLS	1	100	R	R	R	R	R	R	NA	NA	R	R	R
Calcium	NLS	NLS	NLS	522 U	2270	12000	1630	210 U	1090 U	NA	NA	969	1330	21600
Chromium	NLS	NLS	NLS	4.7	13.4	12.8	7.6	9.8	16.5	NA	NA	12.3	18.2	12.5
Cobalt	NLS	NLS	NLS	4.4 J	8.5 J	8.3 J	4.4 J	2.9 J	9.9	NA	NA	7.3 J	8.4 J	8.2 J
Copper	NLS	600	600	18.7	14.3	32.2	9.6	15.6	13.0	NA	NA	11.5 J	14.1 J	9.0 J
Iron	NLS	NLS	NLS	5840	16400	14000	8490	9970	20100	NA	NA	14400	20000	12700
Lead	NLS	400	600	5.2	8.7	34.8	8.0	5.4	11.9	NA	NA	8.6	9.8	7.6
Magnesium	NLS	NLS	NLS	2140	4720	4920	2560	1890	4110	NA	NA	4240	4820	5730
Manganese	NLS	NLS	NLS	275	481	377	294	55.9	1440	NA	NA	613	364	512
Mercury	NLS	14	270	0.003 U	0.0029 U	0.060	0.0033 U	0.018	0.0032 U	NA	NA	0.0037 U	0.0047 U	0.0042 U
Nickel	NLS	250	2400	10.3	18.1	16.4	10.2	6.8 J	21.1	NA	NA	17.9	19.3	19.8
Potassium	NLS	NLS	NLS	842 J	1820 J	1610 J	1040 J	1080 J	2190 J	NA	NA	1740	1340	2160
Selenium	NLS	63	3100	1.0 U	1.0 U	1.0 U	1.1 U	1.2 U	0.96 U	NA	NA	0.90 U	0.85 U	1.0 U
Silver	NLS	110	4100	0.21 UJ	0.20 UJ	0.21 UJ	0.22 UJ	0.36 J	0.19 UJ	NA	NA	0.18 UJ	0.17 UJ	0.20 UJ
Sodium	NLS	NLS	NLS	97.4 J	164 J	230 J	118. J	739 J	1020	NA	NA	1980 J	137 J	190 J
Thallium	NLS	2	2	1.2 U	1.4 U	1.3 U	1.3 U	1.4 U	1.8 U	NA	NA	1.1 U	1.3 U	1.4 U
Vanadium	NLS	370	7100	8.9 J	20.0	18.4	11.1	13.7	23.3	NA	NA	18.4	24.2	17.8
Zinc	NLS	1500	1500	19.8	45.8	87.1	25.4	20.8	44.5	NA	NA	40.4	44.6	46.1
Cyanide (mg/Kg)														
Cyanide, Total	NLS	1100	21000	0.581 U	0.581 U	0.567 U	0.722	0.574 U	0.599 U	NA	NA	0.58 U	0.68 U	0.55 U
Cyanide, Amenable	NLS	NLS	NLS	0.6 U	0.5 U	0.5 U	0.574 U	0.5 U	0.6 U	NA	NA	0.6 U	0.5 U	0.6 U

Notes:

This table is a summary for hit compounds only; compounds that were not detected in any sample are not included in this table.

IGW - Impact to Groundwater Soil Screening Criteria

RDC - Residential Direct Contact Soil Cleanup Screening Criteria

NRDC - Non-Residential Direct Contact Soil Cleanup Screening Criteria

NLS - no listed standard (NJDEP has not established criteria for this analyte)

Shading indicates compound detected above NJDEP RDC and/or NRDC, and/or IGW Cleanup Screening Criteria

Italics indicate that the Practical Quantitation Limit (PQL) is greater than NJDEP RDC and/or NRDC and/or IGW Cleanup Screening Criteria. The PQL has been replaced with the corrected Method Detection Limit (MDL).

Yellow outline denots sample was visibly impacted.

J - estimated value

U - undetected, value shown is detection limit

R - rejected result

D - result is from diluted sample analysis

B - (organic compounds) analyte was detected in blank samples

B - (inorganic compounds) result between instrument detection limit (IDL) and contract required detection limit (CRDL)

NA - not analyzed

ND - no detections of compounds included in total

▼ Symbol indicates that sample was collected below the water table (i.e., saturated).

Saturated samples are not compared to IGW criteria.

Table 7C
Monitoring Well Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth MW-14B (12-13)▼	MW-14B (22-24)▼	MW-15B (6-8)▼	MW-15B (10-11)▼	MW-15B (14-15)▼	MW-15B (23-24)▼	MW-16A (8-8.5)▼	MW-16B (16-17)▼	MW-17B (18-20)▼
Volatile Organic Compounds (VOCs) (mg/Kg)												
Benzene	1	3	13	3.4 UJ	1.2 U	0.59 J	11.5 UJ	1.1 U	1.3 U	0.38 J	0.04 J	2.8 U
Toluene	500	1000	1000	3.4 UJ	1.2 U	0.36 J	11.5 UJ	1.1 U	1.3 U	1.4 J	1.05 U	2.8 U
Ethylbenzene	100	1000	1000	3.4 UJ	1.2 U	8.3 J	11.5 UJ	1.1 U	1.3 U	7.9 J	1.05 U	2.8 U
Xylene (total)	67	410	1000	3.4 UJ	1.2 U	4.1 J	11.5 UJ	1.1 U	1.3 U	7.3 J	1.05 U	2.8 U
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/Kg)												
Naphthalene	100	230	4200	0.087 J	0.38 U	160	1.6 UJ	0.39 U	0.027 J	160 B	0.39 U	0.34 J
2-Methylnaphthalene	NLS	NLS	NLS	0.062 J	0.38 U	140	0.088 J	0.39 U	0.39 U	7.6 J	0.39 U	0.26 J
Acenaphthylene	NLS	NLS	NLS	0.009 J	0.38 U	24 J	0.043 J	0.39 U	0.39 U	12 J	0.39 U	0.12 J
Acenaphthene	100	3400	10000	0.045 J	0.38 U	42 J	1.6 UJ	0.39 U	0.39 U	99	0.39 U	0.032 J
Fluorene	100	2300	10000	0.022 J	0.38 U	84	1.6 UJ	0.39 U	0.39 U	43	0.39 U	0.079 J
Phenanthrene	NLS	NLS	NLS	0.071 J	0.008 J	76	1.6 UJ	0.008 J	0.39 U	140	0.005 J	0.24 J
Anthracene	100	3400	10000	0.019 J	0.38 U	47 J	1.6 UJ	0.39 U	0.39 U	46	0.39 U	0.067 J
Fluoranthene	100	2300	10000	0.02 J	0.38 U	51 J	1.6 UJ	0.39 U	0.39 U	38	0.002 J	0.039 J
Pyrene	100	1700	10000	0.037 J	0.005 J	87	0.048 UJ	0.39 U	0.39 U	64	0.003 J	0.088 J
Benz(a)anthracene	500	0.9	4	0.013 J	0.38 U	28 J	*1.6 UJ*	0.39 U	0.39 U	20 J	0.39 U	0.023 J
Chrysene	500	9	40	0.44 U	0.38 U	33 J	1.6 UJ	0.39 U	0.39 U	23	0.39 U	0.023 J
Benzo(b)fluoranthene	50	0.9	4	0.44 U	0.38 U	12 J	*1.6 UJ*	0.39 U	0.39 U	8 J	0.39 U	0.006 J
Benzo(k)fluoranthene	500	0.9	4	0.44 U	0.38 U	17 J	*1.6 UJ*	0.39 U	0.39 U	10 J	0.39 U	0.009 J
Benzo(a)pyrene	100	0.66	0.66	0.44 U	0.38 U	15 J	*1.6 UJ*	0.39 U	0.39 U	12 J	0.39 U	0.012 J
Indeno(1,2,3-cd)pyrene	500	0.9	4	0.44 U	0.38 UJ	4.6 J	*1.6 UJ*	0.39 UJ	0.39 UJ	8 J	0.39 U	0.38 U
Dibenz(a,h)anthracene	100	0.66	0.66	0.44 U	0.38 UJ	1.8 J	*1.6 UJ*	0.39 UJ	0.39 UJ	1.7 J	0.39 U	0.38 U
Benzo(g,h,i)perylene	NLS	NLS	NLS	0.44 U	0.38 UJ	4.8 J	1.6 UJ	0.39 UJ	0.39 UJ	5.3 J	0.39 U	0.38 U
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)												
Dibenzofuran	NLS	NLS	NLS	0.44 U	0.38 U	13 J	1.6 UJ	0.39 U	0.39 U	13 J	0.39 U	0.017 J
Diethylphthalate	50	10000	10000	0.44 U	0.38 U	*52 U*	1.6 UJ	0.39 U	0.39 U	22 U	0.003 J	0.008 J
Di-n-butylphthalate	100	5700	10000	0.44 U	0.38 U	52 U	1.6 UJ	0.39 U	0.39 U	22 U	0.39 U	0.38 U
Butylbenzylphthalate	100	1100	10000	0.44 U	0.38 U	52 U	1.6 UJ	0.39 U	0.39 U	22 U	0.003 J	0.38 U
Di-n-octylphthalate	100	1100	10000	0.44 U	0.38 U	52 U	1.6 UJ	0.39 U	0.39 U	22 U	0.39 U	0.01 J
Inorganic Compounds (mg/Kg)												
Aluminum	NLS	NLS	NLS	15300	6630	9750 J	6930 J	10600	8170	18100 J	11200 J	20200
Antimony	NLS	14	340	1.6 U	2.5 UJ	11.7 UJ	5.2 UJ	2.3 UJ	2.5 UJ	3.2 J	0.66 J	2.8 J
Arsenic	NLS	20	20	4.4 J	5.1	29.9 J	4.9 J	2.1	2.5	16.7	1.2 J	1.9 J
Barium	NLS	700	47000	38.1 J	90.3	51.5 J	10.7 J	68.8	86.1	109	151	119
Beryllium	NLS	1	1	0.45 J	0.92 J	0.39 UJ	0.74 UJ	0.37 J	0.59 J	0.54 J	0.24 J	0.75 J

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Table 7C (continued)
Monitoring Well Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth MW-14B (12-13)▼	MW-14B (22-24)▼	MW-15B (6-8)▼	MW-15B (10-11)▼	MW-15B (14-15)▼	MW-15B (23-24)▼	MW-16A (8-8.5)▼	MW-16B (16-17)▼	MW-17B (18-20)▼
Inorganic Compounds (continued) (mg/Kg)												
Cadmium	NLS	1	100	0.22 U	0.23 U	0.39 UJ	0.74 UJ	0.2 U	0.21 U	0.24 UJ	0.19 UJ	0.28 U
Calcium	NLS	NLS	NLS	380 U	15400 J	1260 UJ	4470 UJ	470 J	22700 J	2960	959	532. J
Chromium	NLS	NLS	NLS	22.9	15.0	394 J	12.4 J	17.5	17	40.3	23.6	30.8
Cobalt	NLS	NLS	NLS	10.5 J	13.4	87.5 J	3.3 J	8.6 J	10.2 J	14.8	8.4 J	12.5 J
Copper	NLS	600	600	12.8	8.6 J	305 J	4.9 J	14.2 J	11.9 J	87.1 J	13.9 J	17.5 J
Iron	NLS	NLS	NLS	24800	16200	58400 J	18200 J	23900	18900	29800	16700	29200 J
Lead	NLS	400	600	13 J	11.9 J	88.6 J	5.6 J	11.9 J	10.7 J	134 J	8 J	15.2 J
Magnesium	NLS	NLS	NLS	5930	9020 J	204 UJ	5060 J	5540 J	6360 J	5700	5140	8300
Manganese	NLS	NLS	NLS	168 J	1160 J	60.7 J	83.4 J	231 J	666 J	268	139	306 *
Mercury	NLS	14	270	0.011	0.0065 UJ	0.12 J	0.052 UJ	0.0081 UJ	0.0071 UJ	2.1	0.0046 J	0.64 J
Nickel	NLS	250	2400	22.9	28.0	674 J	9.8 J	21.2	25.3	39.4	17.4	29.6
Potassium	NLS	NLS	NLS	2210	2050 J	31.2 UJ	969 J	1650 J	1950 J	3010 J	3040 J	4070 J
Selenium	NLS	63	3100	1.1 UJ	1.2 UJ	4.3 J	3.7 J	1.2 J	R	0.89 J	0.67 UJ	2.2 J
Silver	NLS	110	4100	0.22 UJ	0.46 U	0.39 UJ	0.74 UJ	0.4 U	0.42 U	0.29 J	0.19 UJ	0.28 UJ
Sodium	NLS	NLS	NLS	1620	1470 J	148 UJ	13400 J	2120 J	1730 J	2070 J	2200 J	1890
Thallium	NLS	2	2	*2.2 UJ*	*2.3 UJ*	*3.9 UJ*	*7.4 UJ*	2.0 UJ	*2.1 UJ*	0.97 UJ	0.76 UJ	*2.8 UJ*
Vanadium	NLS	370	7100	31.3	21.2	50.7 J	20.9 J	26.1	20.4	33.6	16.2	35.1
Zinc	NLS	1500	1500	58.8 U	57.6	983 J	35.7 UJ	49.1	57.6	302 J	48.8 J	83.9 J
Cyanide (mg/Kg)												
Cyanide, Total	NLS	1100	21000	0.66 U	0.570 UJ	1420 J	2.56 UJ	0.530 UJ	0.570 UJ	0.720 U	0.590 U	0.560 U
Cyanide, Amenable	NLS	NLS	NLS	NA	NA	1.22 UJ	2.56 UJ	NA	NA	NA	NA	NA

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Table 7C (continued)
Monitoring Well Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth MW-17B (30-32)▼	MW-18B (26-28)▼	MW-19A (4-6)▼	MW-19B (18-20)▼	MW-21 (2-4)	MW-21 (10-12)▼	MW-22 (2-4)	MW-22 (10-12)▼	MW-22 (22-23)▼
Volatile Organic Compounds (VOCs) (mg/Kg)												
Benzene	1	3	13	*0.03 U*	*1.2 U*	0.18 J	1.2 U	0.12 J	3.1 U	**6.4 J**	**88**	*0.03 U*
Toluene	500	1000	1000	3.1 U	1.2 U	0.11 J	1.2 U	0.039 J	3.1 U	1.5 J	340	3.4 U
Ethylbenzene	100	1000	1000	3.1 U	1.2 U	0.44 J	1.2 U	0.087 J	3.1 U	54	180	3.4 U
Xylene (total)	67	410	1000	3.1 U	1.2 U	0.22 J	1.2 U	3.3 U	3.1 U	22	650	3.4 U
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/Kg)												
Naphthalene	100	230	4200	0.05 J	0.33 U	0.66	0.33 U	0.4 U	0.39 U	**270**	**2500**	0.047 J
2-Methylnaphthalene	NLS	NLS	NLS	0.058 J	0.33 U	0.72	0.33 U	0.4 U	0.39 U	65	950	0.012 J
Acenaphthylene	NLS	NLS	NLS	0.02 J	0.33 U	0.37	0.33 U	0.008 J	0.39 U	13 J	88 J	0.42 U
Acenaphthene	100	3400	10000	0.014 J	0.33 U	0.27 J	0.33 U	0.4 U	0.39 U	7.2 J	25 J	0.42 U
Fluorene	100	2300	10000	0.023 J	0.33 U	0.35 J	0.33 U	0.4 U	0.39 U	8.8 J	71 J	0.42 U
Phenanthrene	NLS	NLS	NLS	0.12 J	0.013 J	1.7 J	0.33 U	0.089 J	0.39 U	45	200 J	0.022 J
Anthracene	100	3400	10000	0.026 J	0.003 J	0.37 J	0.33 U	0.014 J	0.39 U	13 J	44 J	0.003 J
Fluoranthene	100	2300	10000	0.024 J	0.008 J	0.66 J	0.33 U	0.17 J	0.39 U	42	58 J	0.004 J
Pyrene	100	1700	10000	0.037 J	0.006 J	1.3	0.33 U	0.24 J	0.39 U	42	96 J	0.009 J
Benz(a)anthracene	500	0.9	4	0.012 J	0.33 U	0.35 J	0.33 U	0.068 J	0.39 U	**19 J**	**31 J**	0.42 U
Chrysene	500	9	40	0.013 J	0.33 U	0.48	0.33 U	0.092 J	0.39 U	**18 J**	**28 J**	0.42 U
Benzo(b)fluoranthene	50	0.9	4	0.39 U	0.33 U	0.12 J	0.33 U	0.06 J	0.39 U	**12 J**	**11 J**	0.42 U
Benzo(k)fluoranthene	500	0.9	4	0.39 U	0.33 U	0.18 J	0.33 U	0.067 J	0.39 U	**17 J**	**14 J**	0.42 U
Benzo(a)pyrene	100	0.66	0.66	0.39 U	0.33 U	0.24 J	0.33 U	0.068 J	0.39 U	**19 J**	**23 J**	0.42 U
Indeno(1,2,3-cd)pyrene	500	0.9	4	0.39 U	0.33 U	0.11 J	0.33 U	0.044 J	0.39 UJ	**8.7 J**	**6 J**	0.42 U
Dibenz(a,h)anthracene	100	0.66	0.66	0.39 U	0.33 U	0.37 UJ	0.33 U	0.4 U	0.39 UJ	**3.2 J**	***390 U***	0.42 U
Benzo(g,h,i)perylene	NLS	NLS	NLS	0.39 U	0.33 U	0.13 J	0.33 U	0.059 J	0.39 UJ	11 J	8 J	0.42 U
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)												
Dibenzofuran	NLS	NLS	NLS	0.39 U	0.33 U	0.09 J	0.33 U	0.4 U	0.39 U	4 J	11 J	0.42 U
Diethylphthalate	50	10000	10000	0.39 U	0.33 U	0.37 U	0.33 U	0.4 U	0.39 U	39 U	393 U	0.01 J
Di-n-butylphthalate	100	5700	10000	0.39 U	0.33 U	0.37 UJ	0.33 U	0.4 U	0.39 U	39 U	393 U	0.42 U
Butylbenzylphthalate	100	1100	10000	0.39 U	0.33 U	0.37 U	0.33 U	0.4 U	0.39 U	39 U	393 U	0.42 U
Di-n-octylphthalate	100	1100	10000	0.01 J	0.33 U	0.37 U	0.33 U	0.4 U	0.39 U	39 U	393 U	0.012 J
Inorganic Compounds (mg/Kg)												
Aluminum	NLS	NLS	NLS	15100	8920 J	8460	12200 J	16000	16900	16400	10600	16400
Antimony	NLS	14	340	1.8 J	1.8 U	2.8 UJ	1.6 U	**28.4 J**	1.8 U	1.8 U	1.0 U	2.4 J
Arsenic	NLS	20	20	9.1	1.6 J	0.73 U	2.3	**888**	1.9 J	**20.3**	2.5	4.7
Barium	NLS	700	47000	230	42.8	11.9 J	59.2	**2580**	79.6	127	52.1	107
Beryllium	NLS	1	1	0.87 J	0.69 J	0.81 J	0.76 J	0.78 J	0.82 J	0.56 J	0.37 J	0.66 J

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Table 7C (continued)
Monitoring Well Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth MW-17B (30-32)▼	MW-18B (26-28)▼	MW-19A (4-6)▼	MW-19B (18-20)▼	MW-21 (2-4)	MW-21 (10-12)▼	MW-22 (2-4)	MW-22 (10-12)▼	MW-22 (22-23)▼
Inorganic Compounds (continued) (mg/Kg)												
Cadmium	NLS	1	100	0.26 U	0.21 U	0.18 U	0.2 UJ	90.9	0.23 U	0.26 U	0.14 U	0.25 U
Calcium	NLS	NLS	NLS	3280 J	872 J	2010 J	6610	1580 J	1850 J	10100 J	738 J	3400 J
Chromium	NLS	NLS	NLS	42.7	16.1 J	13.1	22.6 J	24.2	27.0	24.1	14.8	33.8
Cobalt	NLS	NLS	NLS	26.2	6.5 J	3.2 J	11.8	10.9	11.7	8.9 J	7.9	16.4
Copper	NLS	600	600	12.6 J	7.4 J	4.3 J	24.3 J	3120 J	18.6 J	34.6 J	15.7 J	21.6 J
Iron	NLS	NLS	NLS	32700 J	16700	9720	26600	69200 J	29800 J	28300 J	17400 J	32700 J
Lead	NLS	400	600	17.6 J	7.2 J	30.4 J	11.6 J	48600 J	19.7 J	259 J	9.0 J	25.3 J
Magnesium	NLS	NLS	NLS	9040	4240	1900 J	7520	3260	7540	5080	3870	8140
Manganese	NLS	NLS	NLS	555 *	256	30.9 J	661	460 *	382 *	370 *	526 *	630 *
Mercury	NLS	14	270	0.29 U	0.0070 U	0.086 J	0.0055 U	0.36	0.014	41.6	0.81 J	1.4
Nickel	NLS	250	2400	41.3	17.2 J	11	27.0 J	14.8	26.5	22.8	16.5	43.2
Potassium	NLS	NLS	NLS	3760 J	2010 J	474 J	2910 J	1310	3620	2370 J	1630 J	3480 J
Selenium	NLS	63	3100	1.8 J	1.0 U	R	1.0 U	14.1 J	1.7 J	R	0.84 J	2.1 J
Silver	NLS	110	4100	0.26 UJ	0.41 U	0.36 U	0.4 U	82.4 J	0.23 UJ	0.26 UJ	0.14 UJ	0.25 UJ
Sodium	NLS	NLS	NLS	546. J	628 J	669 UJ	1060 J	259 J	324 J	315 J	206 J	361 J
Thallium	NLS	2	2	*2.6 UJ*	*3.7 U*	1.9 UJ	2.0 U	8.8 J	*2.3 UJ*	*2.6 UJ*	1.4 UJ	*2.5 UJ*
Vanadium	NLS	370	7100	90.9	17.2	13.4	26.8	28.9	34.3	32.8	21.0	36.8
Zinc	NLS	1600	1500	98.8 J	84.7	27.2	66.1	4390 J	204 J	179 J	61 J	87.2 J
Cyanide (mg/Kg)												
Cyanide, Total	NLS	1100	21000	0.580 U	0.580 U	42.7 J	0.580 U	0.600 U	0.580 U	0.610	0.600 U	0.630 U
Cyanide, Amenable	NLS	NLS	NLS	NA	NA	0.530 UJ	NA	NA	NA	0.570 U	NA	NA

Table 7C (continued)
Monitoring Well Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth MW-23B (3-4)	MW-23B (8-10)▼	MW-23B (24-25)▼	MW-24B (4-5)	MW-24B (7-8)▼	MW-24B (16-17)▼	MW-25A (4-5)	MW-26A (6-7)▼	MW-28A (3-4)	MW-28A (9-10)▼
Volatile Organic Compounds (VOCs) (mg/Kg)													
Benzene	1	3	13	*0.03 U*	*0.03 U*	2.8 U	*0.04 U*	*0.04 U*	*0.04 U*	*0.03 U*	*0.03 U*	*0.03 U*	*0.04 U*
Toluene	500	1000	1000	3.0 U	3.1 U	2.8 U	3.7 U	3.6 U	3.9 U	2.8 U	3.4 U	3.1 U	3.6 U
Ethylbenzene	100	1000	1000	3.0 U	3.1 U	2.8 U	3.7 U	3.6 U	3.9 U	2.8 U	3.4 U	3.1 U	3.6 U
Xylene (total)	67	410	1000	3.0 U	3.1 U	2.8 U	3.7 U	3.6 U	3.9 U	2.8 U	3.4 U	3.1 U	3.6 U
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/Kg)													
Naphthalene	100	230	4200	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
2-Methylnaphthalene	NLS	NLS	NLS	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Acenaphthylene	NLS	NLS	NLS	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Acenaphthene	100	3400	10000	0.39 U	0.38 U	0.36 U	0.41 U	0.092 J	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Fluorene	100	2300	10000	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Phenanthrene	NLS	NLS	NLS	0.39 U	0.38 U	0.36 U	0.41 U	0.009 J	0.38 U	0.006 J	0.42 U	0.38 U	0.39 U
Anthracene	100	3400	10000	0.39 U	0.38 U	0.36 U	0.41 U	0.006 J	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Fluoranthene	100	2300	10000	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Pyrene	100	1700	10000	0.39 U	0.38 U	0.36 U	0.41 U	0.006 J	0.005 J	0.37 U	0.42 U	0.38 U	0.39 U
Benz(a)anthracene	500	0.9	4	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Chrysene	500	9	40	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Benzo(b)fluoranthene	50	0.9	4	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Benzo(k)fluoranthene	500	0.9	4	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Benzo(a)pyrene	100	0.66	0.66	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Indeno(1,2,3-cd)pyren	500	0.9	4	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Dibenz(a,h)anthracene	100	0.66	0.66	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Benzo(g,h,i)perylene	NLS	NLS	NLS	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)													
Dibenzofuran	NLS	NLS	NLS	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Diethylphthalate	50	10000	10000	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Di-n-butylphthalate	100	5700	10000	0.01 J	0.38 U	0.36 U	0.016 J	0.4 U	0.38 U	0.37 U	0.42 U	0.014 J	0.39 U
Butylbenzylphthalate	100	1100	10000	0.014 J	0.38 U	0.36 U	0.41 U	0.4 U	0.38 U	0.37 U	0.42 U	0.38 U	0.39 U
Di-n-octylphthalate	100	1100	10000	0.39 U	0.38 U	0.36 U	0.41 U	0.4 U	0.018 J	0.37 U	0.42 U	0.38 U	0.39 U
Inorganic Compounds (mg/Kg)													
Aluminum	NLS	NLS	NLS	10100	6800	6810	11200	8400	4890	10300	4980	8490	8020
Antimony	NLS	14	340	0.85 UJ	1.0 UJ	1.1 UJ	1.2 UJ	0.94 UJ	1.0 UJ	1.0 UJ	1.1 UJ	1.1 UJ	1.1 UJ
Arsenic	NLS	20	20	3.2 J	1.9 J	2.7 J	3.5 J	1.9 J	9.8 J	2.5 J	1.8 J	2.0 J	2.3 J
Barium	NLS	700	47000	33.9 J	59.5 J	70.5 J	55.1 J	81.4 J	75.8 J	40.9 J	32.5 J	32.0 J	85.1 J
Beryllium	NLS	1	1	0.30 J	0.40 J	0.63 J	0.28 J	0.39 J	0.98 J	0.48 J	0.37 J	0.39 J	0.74 J

Table 7C (continued)
Monitoring Well Subsurface-Soil Analytical Data
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth MW-23B (3-4)	MW-23B (8-10)▼	MW-23B (24-25)▼	MW-24B (4-5)	MW-24B (7-8)▼	MW-24B (16-17)▼	Sample ID/Sample Depth MW-25A (4-5)	MW-25A (6-7)▼	MW-26A (3-4)	MW-26A (9-10)▼
Inorganic Compounds (continued) (mg/Kg)													
Cadmium	NLS	1	100	R	R	R	R	R	R	R	R	R	R
Calcium	NLS	NLS	NLS	600 U	794 J	22300	585 U	549 U	6480	905 J	637 J	895 J	2390
Chromium	NLS	NLS	NLS	15.1	11.4	15.7	15.1	15.7	11.3	13.1	10.2	11.2	18.6
Cobalt	NLS	NLS	NLS	4.5 J	5.8 J	8.6 J	3.4 J	6.7 J	8.2 J	8.6 J	3.5 J	7.0 J	10.4 J
Copper	NLS	600	600	9.0	15.4	8.7	8.8	8.9	6.2	12.1	9.0	12.2	10.2
Iron	NLS	NLS	NLS	16900	14100	17100	16900	12300	15200	15800	10800	13300	20500
Lead	NLS	400	600	9.6 J	7.3 J	9.7 J	10.5 J	9.2 J	8.5 J	8.7 J	5.4 J	7.2 J	11.1 J
Magnesium	NLS	NLS	NLS	2640	3420	5720	2460	2740	4420	3620	1960	3360	5640
Manganese	NLS	NLS	NLS	244	371	544	82.2 U	132	788	830	136 U	400	889
Mercury	NLS	14	270	0.029 J	0.0027 U	0.0037 U	0.014 J	0.0043 J	0.0026 U	0.0059 J	0.0034 U	0.0026 U	0.0038 U
Nickel	NLS	250	2400	10.3	14.6	20.4	8.8 J	13.2	19.3	16.0	7.4 J	14.0	24.2
Potassium	NLS	NLS	NLS	588 J	1020 J	2230	1090 J	877 J	2020	1410	512 J	1210	1710
Selenium	NLS	63	3100	0.85 U	1.0 U	1.1 U	1.2 U	0.94 U	1.0 U	1.0 U	1.1 U	1.1 U	1.1 U
Silver	NLS	110	4100	0.17 UJ	0.21 UJ	0.22 UJ	0.23 UJ	0.19 UJ	0.20 UJ	0.20 UJ	0.22 UJ	0.22 UJ	0.22 UJ
Sodium	NLS	NLS	NLS	166 U	112 U	193 U	267 U	146 U	176 U	216 J	84.7 J	248 U	176 U
Thallium	NLS	2	2	1.0 U	*2.3 U*	1.7 U	1.4 U	1.9 U	*2.6 U*	1.2 U	1.7 U	2.0 U	*2.9 U*
Vanadium	NLS	370	7100	26.2 J	18.3 J	20.1 J	20.0 J	15.4 J	16.6 J	18.2 J	13.8 J	16.1 J	22.8 J
Zinc	NLS	1500	1500	27.5	33.6	45.9	24.9	27.6	46.4	39.6	21.2	34.9	53.4
Cyanide (mg/Kg)													
Cyanide, Total	NLS	1100	21000	0.584 U	0.646 U	0.55 U	0.633 U	0.578 U	0.57 U	0.553 U	0.643 U	0.572 U	0.578 U
Cyanide, Amenable	NLS	NLS	NLS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

This table is a summary for hit compounds only; compounds that were not detected in any samples are not included in this table.
IGW - Impact to Groundwater Soil Screening Criteria
RDC - Residential Direct Contact Soil Cleanup Screening Criteria
NRDC - Non-Residential Direct Contact Soil Cleanup Screening Criteria
NLS - no listed standard (NJDEP has not established criteria for this analyte)
Shading indicates compound detected above NJDEP RDC and/or NRDC, and/or IGW Cleanup Screening Criteria
Italics indicate that the Practical Quantitation Limit (PQL) is greater than NJDEP RDC and/or NRDC and/or IGW Cleanup Screening Criteria.
The PQL has been replaced with the corrected Method Detection Limit (MDL).
Yellow shading denotes sample was visibly impacted.
* - laboratory duplicate analysis not within control limit
J - estimated value
U - undetected, value shown is detection limit
R - rejected result
D - result is from diluted sample analysis
B - (organic compounds) analyte was detected in blank samples
NA - not analyzed
ND - no detections of compounds included in total

▼ Symbol indicates that sample was collected below the water table (i.e., saturated).
Saturated samples are not compared to IGW criteria.

Table 7D
Analytical Results for Product and Groundwater Collected from MW-2D, January 2001
Erie Street Former MGP Site

	Date Sampled
	01/17/01
BTEX (µg/L)	
Benzene	6600
Toluene	4000
Ethylbenzene	1900
Xylene (total)	3600
Total BTEX	
Semivolatile Organic Compounds (SVOCs) (µg/L)	
Polycyclic Aromatic Hydrocarbons (PAHs)	
Naphthalene	1400000
2-Methylnaphthalene	1100000
Acenaphthylene	140000
Acenaphthene	260000
Fluorene	190000
Phenanthrene	610000
Anthracene	180000
Fluoranthene	120000
Pyrene	160000
Benz(a)anthracene	64000
Chrysene	78000
Benzo(b)fluoranthene	22000
Benzo(k)fluoranthene	35000
Benzo(a)pyrene	57000
Indeno(1,2,3-cd)pyrene	17000
Dibenz(a,h)anthracene	15000
Benzo(g,h,i)perylene	21000
Total PAHs	
Other SVOCs	
Isophorone	*17000 U*
Dibenzofuran	37000
Di-n-butylphthalate	*14000 U*
bis(2-Ethylhexyl)phthalate	*53000 U*
Inorganic Compounds (µg/L)	
Aluminum	63.2 B
Antimony	5 U
Arsenic	3.5 U
Barium	109 B
Beryllium	1 U
Cadmium	1 U
Calcium	7290
Chromium	2 U
Cobalt	2 U
Copper	4 B
Iron	45200
Lead	16.3
Magnesium	2060 B
Manganese	373
Mercury	0.1 U
Nickel	2.9 B
Potassium	231 B
Selenium	4 U
Silver	2 U
Sodium	2140 B
Thallium	10 U
Vanadium	2.7 B
Zinc	92.9
Cyanide, Amenable	NA
Cyanide, Total	NA

Notes:
U - Not detected at reporting limit shown

TIERRA-B-017728

Table 8
Analytical Results to Characterize Visibly Impacted Soil
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth — Test Pit Samples: TP-17A (3)*	TP-22 (2-2.5)	TP-24 (6)*	TP-33 (5.5)*	TP-34 (10)	TP-38A (8)	TP-37 (3-3.5)	TP-37 (PIPE)	TP-39A (3-4)	TP-39A (4)	TP-45 (5-5.5)	TP-56 (4-5)*	TP-68 (3-4)*
Volatile Organic Compounds (VOCs)																
Benzene	1	3	13	[illegible]	0.02 UJ	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.26 J	[illegible]	[illegible]
Toluene	500	1000	1000	0.34 J	1.6 UJ	35 U	3.2 J	[illegible]	1.8 J	2.3 J	1.8 J	37 J	0.53 J	0.15 J	150	4 J
Ethylbenzene	100	1000	1000	5.3 J	0.21 J	280	190 J	[illegible]	100	8.2	15	71	4.6 J	0.93 J	200	280
Xylene (total)	67	410	1000	2.9 J	0.12 J	110	150 J	[illegible]	84	6.3	5.3	[illegible]	5.8 J	0.085 J	[illegible]	280
Polycyclic Aromatic Hydrocarbons (PAHs)																
Naphthalene	100	230	4200	81 B	1.2 J	2700 B	840 B	9800 J	[illegible]	13 B	180 B	[illegible]	9.1 B	0.68 J	[illegible]	310
2-Methylnaphthalene	NLS	NLS	NLS	39	0.61 J	3100	1100	8200	36000 J	8.8 J	87	5800	18	0.22 J	1500	130
Acenaphthylene	NLS	NLS	NLS	9.3	2.5 J	110 J	130 J	3400	3400 J	40	2.7 J	160 J	16	4	73 J	23
Acenaphthene	100	3400	10000	41	2 J	1100	430	[illegible]	12000	18	58	89 J	8	0.46 J	66 J	87
Fluorene	100	2300	10000	17	2.1 J	620	330	2700	7700 J	10 J	20 J	[illegible]	12	0.93 J	170 J	42
Phenanthrene	NLS	NLS	NLS	78 DJ	11 J	1700	910	8300	22000	15	14 J	520 J	35	0.54 J	370	210 DJ
Anthracene	100	3400	10000	22	3 J	510	240	[illegible]	7300 J	20	3.1 J	[illegible]	11	0.84 J	120 J	53
Fluoranthene	100	2300	10000	14	5.2 J	410 J	170 J	2100	6400 J	38	3.4 J	[illegible]	13	1.5	39 J	41
Pyrene	100	1700	10000	31 J	17 J	860	220	4200	[illegible]	66	3.2 J	[illegible]	25	3.1	180 J	93 J
Benz(a)anthracene	500	0.9	4	[illegible]	3.8 J	190 J	88 J	1300 J	3700 J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	94 J	[illegible]
Chrysene	500	9	40	[illegible]	4.3 J	180 J	190 J	3100 J	[illegible]	[illegible]	2 J	[illegible]	[illegible]	1.8	[illegible]	[illegible]
Benzo(b)fluoranthene	50	0.9	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1900 U	[illegible]	0.67 J	[illegible]	[illegible]
Benzo(k)fluoranthene	500	0.9	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1900 U	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(a)pyrene	100	0.66	0.66	[illegible]	[illegible]	[illegible]	64 J	1000 J	1700 J	[illegible]	[illegible]	49 J	[illegible]	[illegible]	[illegible]	[illegible]
Indeno(1,2,3-cd)pyrene	500	0.9	4	[illegible]	[illegible]	56 J	15 J	280 J	630 J	[illegible]	0.79 J	1900 U	[illegible]	0.6 J	380 U	[illegible]
Dibenz(a,h)anthracene	100	0.66	0.66	[illegible]	3.9 U	500 U	[illegible]	[illegible]	10000 U	[illegible]	26 U	1900 U	[illegible]	0.22 J	360 U	[illegible]
Benzo(g,h,i)perylene	NLS	NLS	NLS	5.9 J	3 J	68 J	15 J	280 J	880 J	17	0.77 J	1900 U	3.6 J	0.67 J	360 U	18 J
Other Semivolatile Organic Compounds (SVOCs)																
Dibenzofuran	NLS	NLS	NLS	2.9 J	0.21 J	150 J	80 J	640 J	1900 J	1.7 J	4.8 J	39 J	2.6 J	0.3 J	31 J	7.5 J
Diethylphthalate	50	10000	10000	8 U	3.9 U	500 U	195 U	1858 U	10000 U	12 U	26 U	5 U	5 U	1.1 U	380 U	18 U
Butylbenzylphthalate	100	1100	10000	8 U	3.9 UJ	500 U	195 U	1858 U	10000 U	12 U	26 U	1900 U	5 U	1.1 U	360 U	18 U
Di-n-butylphthalate	100	5700	10000	8 U	3.9 U	500 U	195 U	1858 U	10000 U	12 U	26 U	5 U	5 U	1.1 U	380 U	18 U
Bis(2-ethylhexyl)phthalate	100	49	210	8 UJ	3.9 UJ	500 U	195 U	1858 U	10000 U	12 U	26 U	1900 U	5 U	1.1 U	360 U	18 UJ
Di-n-octylphthalate	100	1100	10000	8 UJ	3.9 U	500 U	195 U	1858 U	10000 U	12 U	26 U	5 U	5 U	1.1 U	360 U	18 UJ
Metals																
Aluminum	NLS	NLS	NLS	5500	7380	1510	11400 J	986 J	4730 J	13400	8750	780	4080	15200	14000	7120
Antimony	NLS	14	340	1.7 U	2.2 J	2.1 J	7.2 J	4.1 U	2.8 U	8.1 J	8.2 J	[illegible]	2.3 J	6.2 J	1.9 U	1.8 U
Arsenic	NLS	20	20	8.4	7.1	[illegible]	19.5	16.8	11.4	46.4 J	32.7 J	[illegible]	8 J	23.5 J	14.8	28.2
Barium	NLS	700	47000	88.6	118	119	150	84.1	37.3 J	203	114	30.7 J	53.2	186	90.8	120
Beryllium	NLS	1	1	0.28 J	0.17 U	0.19 U	0.29 U	0.28 U	0.43 J	1 J	[illegible]	0.29 U	0.26 U	[illegible]	0.44 J	0.37 J
Cadmium	NLS	1	100	0.19 U	1.1 J	0.19 U	0.29 U	0.28 U	0.3 U	[illegible]	[illegible]	0.82 J	0.26 U	0.28 U	0.21 U	0.57 J
Calcium	NLS	NLS	NLS	3410 J	24000	1380 J	10300 J	432 J	646 J	1650	1740	11800	1080 J	2690	1800 J	10000
Chromium	NLS	NLS	NLS	12.9 J	39.5 J	8.2 J	14.7 U	6.6	8.9	61.7	27.7	249	13.4	31.8	26.0 J	22.2 J
Cobalt	NLS	NLS	NLS	4.8 J	8.7	4.4 J	8.8 J	1.8 J	5.6 J	3.6 J	12.4	11.8 J	6.9 J	34.8	9.8 J	9.1 J
Copper	NLS	600	600	47.7 J	63.1 J	55 J	100	58.7	67.9	883	890	[illegible]	139	176	147 J	77.2 J

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Table 8 (continued)
Analytical Results to Characterize Visibly Impacted Soil
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth — Test Pit Samples: TP-17A (3)*	TP-22 (2-2.5)	TP-24 (6)*	TP-33 (6.5)*	TP-34 (10)	TP-38A (8)	TP-37 (3-3.5)	TP-37 (PIPE)	TP-39A (3-4)	TP-39A (4)	TP-49 (5-5.5)	TP-56 (4-5)*	TP-88 (3-4)*
Metals (continued) (mg/Kg)																
Iron	NLS	NLS	NLS	13700	29400	18900	50200	7770	18800	25100	25500	223000	19800	35200	81000	39200
Lead	NLS	400	800	134 J	[illegible]	79.8 J	427 J	438	32.0	[illegible]	[illegible]	183 J	82.8	148 J	116 J	[illegible] J
Magnesium	NLS	NLS	NLS	2000	6760	389 J	4360	190 J	1340 J	1750	708 J	820 J	1000 J	3280	4290	2730
Manganese	NLS	NLS	NLS	131 J	279 J	41.4 J	288	38.2 J	117	39.5	78.2	785	109	288	453 J	154 J
Mercury	NLS	14	270	0.31	1.8	0.12	0.60 J	0.44	0.038 J	4.8	3.3	0.094	0.34	0.30	0.39	0.46
Nickel	NLS	250	2400	14.0	40.8	15.7	29.8	7.7 J	18.1	32.6	88.3	177	28	96.2	35.9	35.1
Potassium	NLS	NLS	NLS	868 J	732 J	144 J	1450 J	166 U	572 J	402 U	374 U	143 U	385 U	880 J	1590	756 J
Selenium	NLS	63	3100	2.4	1.7	4.9	3.2 J	4 UJ	2.7 J	5.5 J	4.7 J	12.9 J	1.9 J	3.7 J	4.6	4.5
Silver	NLS	110	4100	0.38 UJ	0.34 UJ	0.38 UJ	0.68 U	0.28 U	0.61 U	0.59 UJ	0.48 UJ	0.68 UJ	0.5 UJ	0.58 UJ	0.43 UJ	0.41 UJ
Sodium	NLS	NLS	NLS	491 J	810 J	292 J	410 U	70 J	150 U	480 U	540 U	449 U	412 U	411 U	274 J	542 J
Thallium	NLS	2	2	1.8 UJ	4.7 J	2.8 J	4.7 UJ	1.1 UJ	2.0 UJ	2.8 UJ	[illegible]	22.8 J	2.7 J	3.5 J	7.0 J	2.7 J
Vanadium	NLS	370	7100	15.3	21.0	13.0	40.8	28	18.1	65.0	27.8	54.0	17.8	34.1	37.8	26.0
Zinc	NLS	1500	1500	123	148 J	50.8 J	252	107	54.5	560 J	2370 J	347 J	104 J	243 J	108 J	318 J
Cyanide (mg/Kg)																
Cyanide, Total	NLS	1100	21000	0.800 U	0.810 U	2.30	0.910 U	0.500 U	0.880 U	3.83	0.820 U	776	2.21	0.850 U	52.4	0.780 U
Cyanide, Amenable	NLS	NLS	NLS	NA	NA	0.710 U	NA	14.5 J	NA	0.880 U	NA	0.860 U	0.730 U	NA	0.690 U	NA
Diesel Range Organics (mg/Kg)																
Diesel Range Organics	NLS	NLS	NLS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 8 (continued)
Analytical Results to Characterize Visibly Impacted Soil
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Sample ID/Depth — Soil Boring Samples: B-18 (28-28)▼	B-19 (2-4)	B-20 (6-8)	B-21 (6-7)	HB-1 (11.5-13.5)▼	HB-3 (14-16)▼	Monitoring Well Samples: MW-15S (6-8)▼	MW-18A (8-8.5)▼	MW-22 (2-4)	MW-22 (10-12)▼
Volatile Organic Compounds (VOCs) (mg/kg)													
Benzene	1	3	13	[illegible] J	NA	NA	0.15 J	21 [illegible]	220	0.59 J	0.38 J	8.4 [illegible]	38
Toluene	500	1000	1000	19 U	NA	NA	0.78 J	8.7 J	490	0.36 J	1.4 J	1.5 J	340
Ethylbenzene	100	1000	1000	11 J	NA	NA	4.9 J	940	58 J	8.3 J	7.9 J	54	180
Xylene (total)	67	410	1000	25	NA	NA	3.7 J	1200	680	4.1 J	7.3 J	22	650
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)													
Naphthalene	100	230	4200	270	940	880	26	2800	4800	160	150 B	270	2600
2-Methylnaphthalene	NLS	NLS	NLS	210	1200	38 J	8.4 J	1900	4500	140	7.6 J	55	950
Acenaphthylene	NLS	NLS	NLS	16 J	140 J	88 U	14 J	81 J	1100	24 J	12 J	13 J	88 J
Acenaphthene	100	3400	10000	52	440 J	330	130	840	220 J	42 J	99	7.2 J	25 J
Fluorene	100	2300	10000	46	390	180	56	450	670 J	84	43	8.8 J	71 J
Phenanthrene	NLS	NLS	NLS	140	1000	490 J	180	1100	1600	76	140	45	200 J
Anthracene	100	3400	10000	40 J	180 J	180 J	58	360 J	400 J	47 J	46	13 J	44 J
Fluoranthene	100	2300	10000	42	210 J	93	52	420	450 J	51 J	38	42	58 J
Pyrene	100	1700	10000	61	300	230 J	79	520	690 J	87	84	42	95 J
Benz(a)anthracene	500	0.9	4	34 J	[illegible]	82 J	38	200 J	220 J	24 J	20 J	18 J	31 J
Chrysene	500	9	40	[illegible]	160 J	87 J	32	210 J	210 J	[illegible]	21	[illegible]	38 J
Benzo(b)fluoranthene	50	0.9	4	8.5 J	33 J	18 J	13 J	80 J	82 J	[illegible]	[illegible]	[illegible]	17 J
Benzo(k)fluoranthene	500	0.9	4	13 J	[illegible]	28 J	13 J	64 J	[illegible]	[illegible]	[illegible]	17 J	14 J
Benzo(a)pyrene	100	0.66	0.66	[illegible]	[illegible]	34 J	16 J	[illegible]	[illegible]	[illegible]	[illegible]	18 J	33 J
Indeno(1,2,3-cd)pyrene	500	0.9	4	[illegible]	27 J	[illegible]	[illegible]	[illegible]	800 U	[illegible]	[illegible]	[illegible]	[illegible]
Dibenz(a,h)anthracene	100	0.66	0.66	1.3 J	[illegible]	5.1 J	4 J	380 U	800 U	[illegible]	[illegible]	[illegible]	390 U
Benzo(g,h,i)perylene	NLS	NLS	NLS	4.2 J	37 J	10 J	11 J	39 J	800 U	4.8 J	5.3 J	11 J	8 J
Other Semivolatile Organic Compounds (SVOCs) (mg/kg)													
Dibenzofuran	NLS	NLS	NLS	5.35 J	58 J	45 J	13 J	51 J	78 J	13 J	13 J	4 J	11 J
Diethylphthalate	50	10000	10000	41 U	320 U	86 U	26 U	380 U	805 U	52 U	22 U	39 U	393 U
Butylbenzylphthalate	100	1100	10000	41 U	320 U	86 U	26 U	380 U	805 U	52 U	22 U	39 U	393 U
Di-n-butylphthalate	100	5700	10000	41 U	320 U	86 U	26 U	380 U	805 U	52 U	22 U	39 U	393 U
Bis(2-ethylhexyl)phthalate	100	49	210	41 U	320 U	89 U	26 U	380 U	805 U	52 U	22 U	39 U	393 U
Di-n-octylphthalate	100	1100	10000	41 U	320 U	86 U	26 U	380 U	805 U	52 U	22 U	39 U	393 U
Metals (mg/kg)													
Aluminum	NLS	NLS	NLS	14400	NA	NA	8550	8560	5250	9750 J	18100 J	18400	10800
Antimony	NLS	14	340	1.4 U	NA	NA	5.5 J	1.0 U	1.1 U	11.7 UJ	3.2 J	1.8 U	1.0 U
Arsenic	NLS	20	20	4.4	58.3 J	NA	18.2 J	1.4 J	1.8 J	[illegible] J	18.7	[illegible]	2.5
Barium	NLS	700	47000	141	NA	NA	278 J	82.8	29.7 J	51.5 J	109	127	52.1
Beryllium	NLS	1	1	0.65 J	NA	NA	0.40 J	0.22 J	0.31 J	0.39 UJ	0.64 J	0.58 J	0.37 J
Cadmium	NLS	1	100	R	NA	NA	0.72 J	R	R	0.39 UJ	0.24 UJ	0.28 U	0.14 U
Calcium	NLS	NLS	NLS	6830 J	NA	NA	3500	522 U	1630	1260 UJ	2960	10100 J	738 J
Chromium	NLS	NLS	NLS	24.3	NA	NA	43.8	4.7	7.6	394 J	40.3	24.1	14.8
Cobalt	NLS	NLS	NLS	12.0	NA	NA	8.0 J	4.4 J	4.4 J	87.5 J	14.8	8.9 J	7.9
Copper	NLS	600	600	14.2	NA	NA	175	18.7	9.8	305 J	87.1 J	34.6 J	15.7 J

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Table 8 (continued)
Analytical Results to Characterize Visibly Impacted Soil
Erie Street Former MGP Site

Parameter	IGW Criteria (mg/Kg)	RDC Criteria (mg/Kg)	NRDC Criteria (mg/Kg)	Soil Boring Samples: B-18 (25-26)▼	B-19 (2-4)	B-20 (5-6)	B-21 (8-7)	HB-1 (11.5-13.5)▼	HB-3 (14-16)▼	Monitoring Well Samples: MW-15B (8-9)▼	MW-18A (8-8.5)▼	MW-22 (2-4)	MW-22 (10-12)▼
Metals (continued) (mg/kg)													
Iron	NLS	NLS	NLS	25500	NA	NA	22500	5840	8490	56400 J	25800	26300 J	17400 J
Lead	NLS	400	600	11.9	NA	NA	[illegible]	5.2	8.0	88.6 J	134 J	259 J	8.0 J
Magnesium	NLS	NLS	NLS	8550	NA	NA	3130	2140	2560	204 UJ	5700	5050	3870
Manganese	NLS	NLS	NLS	546	NA	NA	149 U	275	294	60.7 J	288	370 *	525 *
Mercury	NLS	14	270	0.0038 U	NA	NA	2.4 J	0.003 U	0.0033 U	0.12 J	2.1	[illegible]	0.61 J
Nickel	NLS	250	2400	27.5	NA	NA	29.2	10.3	10.2	[illegible]	39.4	22.8	16.5
Potassium	NLS	NLS	NLS	3780 J	NA	NA	1340 J	842 J	1040 J	31.2 UJ	3010 J	2370 J	1830 J
Selenium	NLS	63	3100	0.62 UJ	NA	NA	1.5 J	1.0 U	1.1 U	4.3 J	0.69 J	R	0.84 J
Silver	NLS	110	4100	0.21 UJ	NA	NA	1.0 J	0.21 UJ	0.22 UJ	0.39 UJ	0.29 J	0.26 UJ	0.14 UJ
Sodium	NLS	NLS	NLS	288 J	NA	NA	1570	97.4 J	118. J	148 UJ	2070 J	315 J	206 J
Thallium	NLS	2	2	0.83 U	NA	NA	1.7 U	1.2 U	1.3 U	3.9 UJ	0.97 UJ	2.6 UJ	1.4 UJ
Vanadium	NLS	370	7100	30.8	NA	NA	20.4 J	8.5 J	11.1	60.7 J	33.8	32.8	21.0
Zinc	NLS	1500	1500	81.4	NA	NA	536	19.8	25.4	983 J	302 J	179 J	61 J
Cyanide (mg/kg)													
Cyanide, Total	NLS	1100	21000	0.650 U	NA	NA	1.3 J	0.551 U	0.722	[illegible]	0.720 U	0.810	0.600 U
Cyanide, Amenable	NLS	NLS	NLS	NA	NA	NA	0.774 U	0.5 U	0.574 U	1.22 UJ	NA	0.570 U	NA
Diesel Range Organics (mg/kg)													
Diesel Range Organics	NLS	NLS	NLS	NA	NA		NA	NA	NA	NA	NA	NA	NA

Table 9
Monitoring Well Purge Data
Erie Street Former MGP Site

Purged Gallons (Cumulative Totals)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (C°)	ORP (mv/s)	Salinity (%)
Monitoring Well MW-1D							
2	6.30	1.06	40.6	0.28	14.7	-10	0.0
5	6.37	1.13	34.2	0.00	14.9	-14	0.1
10	6.62	1.57	21	0.00	15.0	-40	0.1
15	6.78	1.9	15.1	0.00	15.0	-52	0.1
20	6.86	2.06	11.2	0.00	14.9	-58	0.1
25	6.92	2.13	10.4	0.00	14.9	-58	0.1
30	7.06	2.3	8.3	1.50	14.9	-58	0.1
35	7.04	2.26	5.8	0.00	15.0	-65	0.1
40	7.01	2.32	5.1	0.00	15.0	-68	0.1
45	7.02	2.33	4.5	0.00	15.0	-70	0.1
50	7.04	2.35	4.6	0.00	15.0	-70	0.1
55	7.05	2.37	4.8	0.00	15.0	-71	0.1
60	7.09	2.37	5.8	0.00	15.0	-71	0.1
Monitoring Well MW-2D							
0	8.37	0.459	96.8	7.3	13.9	-238	0.0
20	8.46	0.420	19.1	NM	14.9	-278	NM
40	8.63	0.410	20.9	NM	15.2	-245	NM
Monitoring Well MW-3							
0	7.26	0.486	7.6	2.47	11.7	116	0.0
2	7.12	0.483	7.3	1.52	11.6	111	0.0
5	6.94	0.485	3.8	0.96	11.6	11	0.0
10	6.82	0.513	0.0	0.0	11.9	-50	0.0
15	6.76	0.631	0.0	0.0	12.9	-56	0.0
20	6.83	0.782	0.0	0.0	13.7	-55	0.0
22	6.84	0.792	0.0	0.0	13.8	-53	0.0
Monitoring Well MW-6D							
0	8.61	2.58	0.0	0.98	13.2	-228	0.1
5	8.47	2.57	0.0	0.0	13.4	-241	0.1
10	8.48	2.56	0.0	0.0	13.5	-249	0.1
15	8.53	2.54	0.0	0.0	13.6	-259	0.1
20	9.06	2.19	1.3	0.0	13.7	-310	0.1
25	9.21	2.07	0.6	0.0	13.8	-311	0.1
30	9.23	2.05	0.9	0.0	13.9	-298	0.1
35	9.23	2.04	1.1	0.0	13.9	-291	0.1
40	9.23	2.04	1.8	0.0	13.9	-281	0.1
45	9.24	2.04	3.4	0.0	13.9	-271	0.1
50	9.26	2.03	20.8	0.0	13.4	-235	0.1
55	9.19	2.06	20.9	0.0	13.6	-237	0.1
60	9.22	2.05	9.5	0.0	13.9	-252	0.1
65	9.21	2.05	13.5	0.0	13.9	-240	0.1
70	9.2	2.07	19.0	0.0	13.8	-236	0.1
75	9.25	2.04	26.7	0.0	13.9	-224	0.1
80	9.36	1.99	26.0	0.0	14.0	-199	0.1
85	9.24	2.09	17.7	0.0	14.1	-115	0.1
90	8.77	2.37	4.9	7.25	14.2	0.1	22.0

Table 9 (continued)
Monitoring Well Purge Data
Erie Street Former MGP Site

Purged Gallons (Cumulative Totals)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (C°)	ORP (mv/s)	Salinity (%)
			Monitoring Well MW-7D				
0	7.14	35.8	54.5	0.43	14.2	-69	2.3
5	7.16	35.9	50.3	0.0	14.2	-72	2.3
10	7.15	33.5	23.8	0.0	14.3	-89	2.1
15	7.14	29.8	5.6	0.0	14.4	-95	1.8
20	7.14	28.1	1.0	0.0	14.3	-98	1.3
25	8.67	24.7	11.0	0.0	14.3	-331	1.6
30	7.15	26.4	0.0	0.0	14.3	-96	1.6
35	7.12	26.2	0.0	0.0	14.2	-94	1.6
40	7.13	25.6	0.0	0.0	14.3	-78	1.6
45	7.13	25.5	0.0	0.0	14.3	-82	1.5
50	7.13	25.5	0.0	0.0	14.3	-87	1.5
55	7.13	25.6	0.0	0.0	14.3	-90	1.5
60	7.14	25.4	0.0	0.0	14.3	-89	1.5
65	7.14	25.2	0.0	0.0	14.4	-91	1.5
			Monitoring Well MW-8D				
0	8.8	2.01	12.5	8.9	12.8	-188	0.1
20	7.44	2.01	9.7	NM	13.3	-170	0.1
40	7.46	0.169	14.4	NM	13.6	-186	0.1
60	7.41	0.162	7.3	NM	13.8	-183	0.1
80	7.34	1.72	6.1	NM	13.8	-190	0.1
100	7.3	1.79	5.8	NM	13.8	-201	0.1
120	7.28	1.82	5.3	NM	13.8	-213	0.1
140	7.28	1.83	5.3	NM	13.8	-221	0.1
			Monitoring Well MW-14A				
3.5	NM	NM	NM	NM	NM	NM	NM
			Monitoring Well MW-14B				
0	7.41	22.7	0.4	0.39	13.9	-163	1.4
5	7.42	22.6	5.4	0.0	14.1	-170	1.4
10	7.53	20.9	3.5	NM	13.2	-175	1.2
15	7.52	20.5	0.4	NM	13.4	-154	1.2
20	7.48	21.1	0.0	NM	13.6	-157	1.3
25	7.49	21.5	0.0	NM	13.6	-157	1.3
30	7.98	21.5	0.7	NM	13.8	-160	1.3
35	7.44	21.4	0.8	NM	14.0	-163	1.3
			Monitoring Well MW-15A				
3.0	NM	NM	NM	NM	NM	NM	NM
			Monitoring Well MW-15B				
0	7.26	16.0	29	8.0	10.0	-96	0.9
5	8.75	14.4	53.9	5.1	13.2	-299	0.8
10	8.99	14.3	52.9	NM	13.3	-258	0.8
15	8.63	14.1	52.7	NM	13.4	-229	0.8
20	8.15	13.9	57.0	NM	13.0	-171	-0.8
25	9.18	13.5	42.9	NM	13.2	-245	8
30	9.05	13.5	47.8	NM	13.3	-217	-8.0
35	8.81	13.3	39.3	NM	13.4	-179	-8.0
40	8.24	12.2	34.1	NM	13.4	-15.7	-7.0

Table 9 (continued)
Monitoring Well Purge Data
Erie Street Former MGP Site

Purged Gallons (Cumulative Totals)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (C°)	ORP (mv/s)	Salinity (%)
Monitoring Well MW-16A							
0	7.08	3.27	15.1	1.0	7.5	-164	0.2
1	7.02	3.04	13.9	0.0	5.5	-153	0.1
3	6.98	2.98	18.6	1.46	7.6	-160	0.1
7	6.98	3.13	NM	NM	8.4	-123	0.2
Monitoring Well MW-16B							
0	7.35	35.7	7.2	0.1	9.0	-47	2.2
1	7.38	35.5	7.8	0.6	10.6	-66	2.2
5	7.41	35.1	16.2	2.60	11.5	-81	2.2
Monitoring Well MW-17B							
0	13.41	13.4	9.4	1.5	9.8	-192	0.8
5	13.45	13.2	9.1	0.2	14.9	-199	0.8
10	13.45	9.4	27.9	7.16	14.9	-124	0.4
15	13.3	6.18	34.6	6.3	14.7	-116	0.3
20	10.76	2.93	40.8	0.8	15.1	-50	0.1
25	9.78	2.83	62.3	0.7	15.6	-31	0.1
Monitoring Well MW-18B							
0	7.29	1.81	29.7	9.3	15.0	89.0	0.1
10	6.83	2.17	0.0	NM	15.0	0.1	22.0
20	6.94	2.34	0.0	NM	15.0	0.1	21.0
30	7.0	2.43	0.0	NM	15.0	0.1	20.0
40	7.0	2.47	0.0	NM	14.9	0.1	19.0
50	7.04	2.50	0.0	NM	14.7	18.0	0.1
Monitoring Well MW-19B							
0	7.83	1.21	9.7	10.88	13.9	-95.0	0.1
5	6.65	1.13	58.8	NM	13.9	0.1	-87.0
10	6.66	1.16	52.3	NM	13.9	0.1	-84.0
15	6.68	1.18	39.7	NM	14.3	0.1	-89.0
20	6.73	1.39	1.8	NM	14.9	0.1	-97.0
25	6.80	1.51	51.4	0.28	15.3	0.1	-77.0
30	6.79	1.49	23.4	1.40	15.8	0.1	-64.0
35	6.80	1.52	15.0	1.91	15.6	0.1	-57.0
40	6.83	1.52	11.2	1.82	15.7	0.1	-61.0
Monitoring Well MW-20B							
0	6.86	0.594	6.6	0.71	9.6	0.0	-67
0.5	6.95	0.638	1.0	0.00	9.7	0.0	-91
1	6.95	0.646	0.1	0.00	9.7	0.0	-96
2	6.93	0.684	0.0	0.00	10.0	0.0	-109
3	6.94	0.697	0.0	0.00	10.1	0.0	-116
4	6.94	0.714	0.0	0.00	10.1	0.0	-120
Monitoring Well MW-21A							
0	7.44	0.457	28	9.52	9.2	66	0.0
2	7.30	0.469	12.4	10.22	9.3	69	0.0
5	7.25	0.506	8.4	10.11	8.7	64	0.0
10	7.13	0.491	17.4	7.69	8.3	40	0.0
15	7.00	0.606	17.5	5.25	8.6	7	0.0
20	6.90	0.563	16.0	3.50	8.6	7	0.0

Table 9 (continued)
Monitoring Well Purge Data
Erie Street Former MGP Site

Purged Gallons (Cumulative Totals)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (C°)	ORP (mv/s)	Salinity (%)
Monitoring Well MW-21B							
0	10.16	0.98	3.3	4.11	12.3	-53	0.0
2	10.15	1.07	9	1.02	12.8	-62	0.0
5	10.15	1.07	10.7	0.92	13.0	-59	0.0
10	10.03	1.06	10	0.57	13.9	-48	0.0
15	9.55	1.05	45.1	0.11	13.9	-36	0.0
20	7.51	1.25	71.0	0.00	14.5	-103	0.0
30	Meter inoperable - bailed remaining volume						0.0
Monitoring Well MW-22A							
0	9.64	0.264	2.6	19.99	9.4	-156	0.0
5	9.64	0.224	0.0	19.99	8.7	-13.0	NM
10	9.94	0.257	0.0	14.28	10.0	-20.0	NM
15	9.05	0.27	0.0	5.57	10.8	-12.0	NM
Monitoring Well MW-22B							
0	0.53	1.27	0.2	8.1	15.7	-100	0.1
5	7.22	1.30	10.3	NM	15.2	-164	0.1
10	7.26	1.28	20.7	NM	15.2	-180	0.1
15	7.26	1.31	19.4	NM	15.2	-193	0.1
20	7.3	1.34	14.9	NM	15.2	-201	0.1
25	7.31	1.35	40.1	NM	15.2	-209	0.1
30	7.32	1.37	37.0	NM	15.2	-222	0.1
35	7.33	1.38	30.1	NM	15.2	-228	0.1
40	7.36	1.38	33.1	NM	15.3	-240	0.1
Monitoring Well MW-23A							
0	7.17	2.39	0.0	4.14	6.7	78	0.1
0.5	7.18	2.37	4.6	3.96	6.6	88	0.1
1	7.11	2.44	12.9	3.25	7.8	103	0.1
1.5	7.17	2.45	16.6	0.00	8.3	106	0.1
4	7.32	2.25	9.2	NM	7.0	107	0.1
Monitoring Well MW-23B							
5	6.89	0.836	33.9	3.00	15.38	199	0.0
6	7.28	0.812	0.4	0.0	15.8	168	0.0
7	7.32	0.81	0.9	0.0	15.49	160	0.0
8	7.34	0.807	0.0	0.0	15.86	143	0.0
9	7.35	0.798	3.8	0.0	15.88	135	0.0
10	7.35	0.795	12.3	0.0	15.86	133	0.0
11	7.35	0.788	25.1	0.0	15.83	129	0.0
12	7.35	0.791	0.0	0.0	15.86	127	0.0
Monitoring Well MW-24A							
0	9.02	4.44	12.3	6.5	6.5	-92	0.2
0.5	9.40	4.69	7.4	4.8	4.6	-84	0.2
1	7.62	4.64	5.9	1.9	6.4	-52	0.2
2	7.14	4.63	16.4	0.7	7.9	-1	0.2
3	6.95	4.45	10.3	0.5	8.5	0.0	0.2

Table 9 (continued)
Monitoring Well Purge Data
Erie Street Former MGP Site

Purged Gallons (Cumulative Totals)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (C°)	ORP (mv/s)	Salinity (%)
			Monitoring Well MW-24B				
3	7.31	1.19	234	0.7	14.2	-38	0.1
4	7.33	1.10	103	0.4	14.3	-49	0.0
5	7.32	1.08	54.5	0.3	14.2	-55	0.0
6	7.32	1.07	41.4	0.1	14.0	-56	0.0
7	7.31	1.07	33.2	0.1	14.2	-68	0.0
8	7.31	1.06	43.1	0.01	14.2	-59	0.0
			Monitoring Well MW-25A				
0	7.32	1.41	20.0	0.94	8.6	136	0.1
0.5	7.23	1.36	22.8	0.01	8.8	157	0.1
1	7.17	1.33	18.8	0.0	9.5	134	0.1
2	7.15	1.32	14.8	0.0	10.2	150	0.1
3	7.15	1.28	15.8	0.0	10.6	129	0.1
			Monitoring Well MW-26				
0	6.78	8.51	5.7	7.4	9.5	130	0.5
1	10.48	8.58	30.4	2.3	3.6	22	0.5
2	9.20	7.78	35.3	1.5	5.0	55	0.5
3	8.98	9.25	16.5	5.7	6.8	56	0.5
4	7.90	8.40	11.7	4.2	7.9	65	0.5
5	7.70	8.47	5.2	0.10	9.4	75	0.5

Note
NM - not measured
1 unable to measure parameters due to groundwater impact.

Table 10A
Groundwater Analytical Results From the Overburden A and B Zones
Erie Street Former MGP Site

	NJDEP Class IIA		Sample ID/Date						
			MW-3	MW-14A		MW-14B		MW-15A	
	GWQC	PQL	01/12/01	05/23/00	01/11/01	05/25/00	01/16/01	05/23/00	01/11/01
BTEX (µg/L)									
Benzene	0.2	1	5.3	[illegible]	1200	0.4 UJ	33	44 J	27
Toluene	1000	5	0.5 U	22	18	0.5 U	1.2	4.6	4.4
Ethylbenzene	700	5	0.4 U	1400	[illegible]	0.4 U	28	120	110
Xylene (total)	1000	2	1.4 U	490	390	1.4 U	36	15	13
Semivolatile Organic Compounds (SVOCs) (µg/L)									
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	300	NLS	1.1 U	[illegible]	[illegible]	1.1 U	25	9.8	10
2-Methylnaphthalene	NLS	NLS	1.3 U	630	730	1.3 U	1.5	1.3 U	1.3 U
Acenaphthylene	NLS	10	1 U	50 U	40 U	1 U	[illegible]	4.2	3.2
Acenaphthene	400	10	0.9 U	190	200	0.9 U	18	12	12
Fluorene	300	10	0.8 U	55	70	0.8 U	2.3	6.2	6.4
Phenanthrene	NLS	10	1 U	[illegible]	[illegible]	1 U	1.8	6.3	3.3
Anthracene	2000	10	1.3 U	65 U	52 U	1.3 U	1.3 U	2.7	1.8
Fluoranthene	300	10	0.8 U	40 U	32 U	0.8 U	0.8 U	1.5	0.8 U
Pyrene	200	20	1.7 U	85 U	68 U	1.7 U	1.7 U	3.8	1.7 U
Benz(a)anthracene	0.05	10	1.6 U	80 U	64 U	1.6 U	1.6 U	1.6 U	1.6 U
Chrysene	6	20	1.3 U	65 U	52 U	1.3 U	1.3 U	1.3	1.3 U
Benzo(b)fluoranthene	0.05	10	1 U	50 U	40 U	1 U	1 U	1 U	1 U
Benzo(k)fluoranthene	0.5	2	1.1 U	55 U	44 U	1.1 U	1.1 U	1.1 U	1.1 U
Benzo(a)pyrene	0.005	20	0.8 U	40 U	32 U	0.8 U	0.8 U	0.8 U	0.8 U
Indeno(1,2,3-cd)pyrene	NLS	20	0.7 U	35 U	28 U	0.7 U	0.7 U	0.7 U	0.7 U
Dibenz(a,h)anthracene	NLS	20	0.9 U	NA	36 U	NA	0.9 U	NA	0.9 U
Benzo(g,h,i)perylene	NLS	20	0.8 U	40 U	32 U	0.8 U	0.8 U	0.8 U	0.8 U
Other SVOCs (µg/L)									
Isophorone	100	10	1 U	50 U	40 U	1 U	1 U	1 U	1 U
Dibenzofuran	NLS	NLS	1 U	50 U	40 U	1 U	1 U	1.5	1.5
Di-n-butylphthalate	300	20	.8 U	40 U	32 U	0.8 U	0.8 U	0.8 U	0.8 U
bis(2-Ethylhexyl)phthalate	3	30	3.1 U	160 U	120 U	3.1 U	3.1 U	3.1 U	3.1 U
Inorganic Compounds (µg/L)									
Aluminum	200	200	50 U	11.3 UJ	50 U	189 J	57	6020	50 U
Antimony	2	20	5 U	4.7 U	5 U	2.1 U	5	4.5 U	5 U
Arsenic	0.02	8	3.5 U	3.8 J	3.5 U	3.1 U	10.4	3.8 J	3.5 U
Barium	2000	200	205	291	244	156 J	324	306	234
Beryllium	0.008	20	1 U	0.2 U	1 U	0.2 U	1	0.2 U	1 U
Cadmium	4	2	1 U	0.2 U	1 U	0.36 U	1	0.2 U	1 U
Calcium	NLS	NLS	95800	87000 J	73800	85900 J	102000	58200 J	47800
Chromium	100	10	2 U	1 U	2 U	0.52 U	2	31.6	7 B
Cobalt	NLS	NLS	2.2 B	0.38 U	2 U	1.6 U	2.8	5.5 J	2 U
Copper	1000	1000	2 U	0.38 U	2 U	2.8 U	3.2	86.4	2.3 B
Iron	300	100	1840	20800 J	20600	406 J	53700	81800 J	38200
Lead	5	10	2 U	1.8 UJ	2 U	1.3 UJ	3	23.7	2 U
Magnesium	NLS	NLS	26600	16100 J	13800	198000 J	274000	14700 J	10300
Manganese	50	6	6860	2160 J	1810	1160 J	3230	1010 J	894
Mercury	2	0.5	0.1 U	NA	0.1 U	0.20 U	0.1	0.22	0.1 U
Nickel	100	10	6.1 B	0.4 U	2 U	5.1 J	3.1	16.7 J	2 U
Potassium	NLS	NLS	1210 B	7270 J	8650	168000 J	174000	8540 J	9180
Selenium	50	10	4 U	1.7 U	5.3	1.5 U	5	2.4 U	4 U
Silver	NLS	2	2 U	0.3 U	2 U	0.3 U	2	0.3 U	2 U
Sodium	50000	400	25200	42000 J	39000	208000 J	2650000	34800 J	29000
Thallium	0.5	10	10 U	5.3 UJ	10 U	5.3 UJ	10	5.3 UJ	10 U
Vanadium	NLS	NLS	2 U	0.3 U	2 U	3.8 J	2.9	15.8 J	2 U
Zinc	5000	30	8 B	13.2 U	5 U	21.9 U	6	51.2	5 U
Cyanide, Amenable	NLS	NLS	10 U	114	10 U	13	33	411	55
Cyanide, Total	200	40	2484	522	441	369	803	2380	2100

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Table 10A (continued)
Groundwater Analytical Results From the Overburden A and B Zones
Erie Street Former MGP Site

	NJDEP Class IIA		Sample ID/Date							
			MW-15B		MW-16A		MW-16B		MW-17A	
	GWQC	PQL	05/24/00	01/18/01	05/23/00	01/09/01	05/23/00	01/10/01	05/25/00	01/18/01
BTEX (µg/L)										
Benzene	0.2	1	0.4 UJ	0.4 U	[illegible]	0.5 U	0.4 UJ	0.4 U	570	400
Toluene	1000	5	0.5 U	0.5 U	3.8	3.8	1	0.5 U	30	17
Ethylbenzene	700	5	0.4 U	0.4 U	23	20	0.4 U	0.4 U	210	400
Xylene (total)	1000	2	1.4 U	1.4 U	24	18	1.4 U	1.4 U	790	500
Semivolatile Organic Compounds (SVOCs) (µg/L)										
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	300	NLS	1.2 U	1.1 U	27 J	230	1.1 U	1.1 U	8300	13000
2-Methylnaphthalene	NLS	NLS	1.4 U	1.3 U	2.7 J	15	1.3 U	1.3 U	6400	14000
Acenaphthylene	NLS	10	1.1 U	1 U	1 U	4 U	1 U	1 U	[illegible]	1100
Acenaphthene	400	10	1 U	0.9 U	3.1 J	43	0.9 U	0.9 U	[illegible]	2400
Fluorene	300	10	0.8 U	0.7 U	1 J	2.8 U	0.8 U	0.7 U	[illegible]	1100
Phenanthrene	NLS	10	1.1 U	0.8 U	1 J	16	1 U	0.8 U	[illegible]	[illegible]
Anthracene	2000	10	1.4 U	1 U	R	17	1.3 U	1 U	960	[illegible]
Fluoranthene	300	10	0.8 U	1.3 U	R	5.2 U	0.8 U	1.3 U	[illegible]	2400
Pyrene	200	20	1.8 U	0.8 U	R	3.2 U	1.7 U	0.8 U	1600	2800
Benz(a)anthracene	0.05	10	1.7 U	1.7 U	R	6.8 U	1.6 U	1.7 U	440	820
Chrysene	5	20	1.4 U	1.8 U	R	6.4 U	1.3 U	1.8 U	430	1500
Benzo(b)fluoranthene	0.05	10	1.1 U	1.3 U	R	5.2 U	1 U	1.3 U	720	820
Benzo(k)fluoranthene	0.6	2	1.2 U	1 U	R	4 U	1.1 U	1 U	180	470
Benzo(a)pyrene	0.005	20	0.8 U	1.1 U	R	4.4 U	0.8 U	1.1 U	230	600
Indeno(1,2,3-cd)pyrene	NLS	20	0.7 U	0.8 U	R	3.2 U	0.7 U	0.8 U	87 J	240
Dibenz(a,h)anthracene	NLS	20	NA	0.7 U	NA	2.8 U	NA	0.7 U	NA	215 U
Benzo(g,h,i)perylene	NLS	20	0.8 U	0.9 U	R	3.6 U	0.8 U	0.9 U	110	300
Other SVOCs (µg/L)										
Isophorone	100	10	1.1 U	1 U	R	4 U	2.2	1 U	110 U	240 U
Dibenzofuran	NLS	NLS	1.1 U	1 U	R	4.4	1 U	1 U	240	650
Di-n-butylphthalate	300	20	0.8 U	0.8 U	R	3.2 U	0.8 U	0.8 U	91 U	190 U
bis(2-Ethylhexyl)phthalate	3	30	3.3 U	3.1 U	R	12 U	3.1 U	6.6	340 U	740 U
Inorganic Compounds (µg/L)										
Aluminum	200	200	64.7 UJ	60.1 B	2302	1400	7.3 UJ	270 B	153 J	464
Antimony	2	20	2.1 U	5.0 U	3.9 U	5.0 U	272	5.0 U	4.6 U	5 U
Arsenic	0.02	8	3.1 U	6.6 B	3.1 U	8.5 B	64.9	3.6 U	8.8 J	8.6 B
Barium	2000	200	35.8 J	31.9 B	322	826	365	303	130 J	57.6 B
Beryllium	0.008	20	0.2 U	1.0 U	0.2 U	1.0 U	0.2 UJ	1.0 U	0.2 U	1 U
Cadmium	4	2	0.28 U	1.0 U	0.2 U	1.0 U	0.38 U	1.0 U	0.2 U	1 U
Calcium	NLS	NLS	69100 J	72800	177000 J	209000	137000 J	136000	61600 J	39300
Chromium	100	10	0.48 U	2.0 U	2.6 U	13.5	3.5 U	2.0 U	1.1 U	2 U
Cobalt	NLS	NLS	2.8 U	2.5 B	2.4 U	3.3 B	3.2 UJ	4.1 B	0.63 U	2 U
Copper	1000	1000	3.4 U	6.6 B	6.9 U	25.8	2.1 U	3.2 B	1.4 U	2.8 B
Iron	300	100	587 J	1670	48000 J	37400	1820 J	7870	36400 J	17800
Lead	5	10	1.3 UJ	3.0 U	6.8 J	89.2	1.3 UJ	2.0 U	1.4 UJ	2 U
Magnesium	NLS	NLS	119000 J	132000	65000 J	74000	516000 J	510000	13100 J	23900
Manganese	50	8	986 J	1130	1400 J	1590	4680 J	5150	2120 J	5280
Mercury	2	0.5	0.53	0.10 U	0.50	0.17 B	0.20 U	0.10 U	0.20 U	0.1 U
Nickel	100	10	3.1 J	6.3 B	8.3 J	55.3	9.4 J	7.8 B	0.86 J	2 U
Potassium	NLS	NLS	66300 J	117000	30300 J	57300	349000 J	591000	3920 J	9260
Selenium	50	10	1.5 U	5.0 U	1.6 U	5.5	4.8 UJ	4.0 U	1.5 U	6.9
Silver	NLS	2	0.3 U	2.0 U	0.3 U	2.0 U	4.8 J	2.0 U	0.3 U	2 U
Sodium	50000	400	158000 J	416000	250000 J	205000	391000 J	90700	28400 J	230000
Thallium	0.5	10	5.3 UJ	10.0 U	5.3 UJ	10.0 U	5.3 UJ	10.0 U	5.3 UJ	10.2
Vanadium	NLS	NLS	5.5 J	10.2 B	0.7 U	6.6 B	0.86 UJ	8.2 B	0.45 U	2 U
Zinc	5000	30	13 U	5.0 U	28.4 U	60.1	10.3 U	21.5	14.5 U	7.9 B
Cyanide, Amenable	NLS	NLS	521	320	263	125	10 U	NA	51.6	10 U
Cyanide, Total	200	40	2020	2090	1290	1680	10.2	10 U	163	204

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Table 10A (continued)
Groundwater Analytical Results From the Overburden A and B Zones
Erie Street Former MGP Site

	NJDEP Class IIA		Sample ID/Date							
			MW-17B		MW-18A		MW-18B		MW-19A	
	GWQC	PQL	05/25/00	01/17/01	05/25/00	01/18/01	05/25/00	01/16/01	05/24/00	01/16/01
BTEX (µg/L)										
Benzene	0.2	1	24 J	31	[illegible]	48	0.4 UJ	0.4 U	22 J	0.4 U
Toluene	1000	5	25	26	32	59	0.5 U	0.5 U	2.3	0.5 U
Ethylbenzene	700	5	11	15	440	680	0.4 U	0.4 U	48	0.4 U
Xylene (total)	1000	2	48	57	680	1000	1.4 U	1.4 U	6.7	1.4 U
Semivolatile Organic Compounds (SVOCs) (µg/L)										
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	300	NLS	310	110	3000	20000	1.1 U	1.1 U	140	1.4 U
2-Methylnaphthalene	NLS	NLS	140	62	2400	26000	1.3 U	1.3 U	22	1.6 U
Acenaphthylene	NLS	10	4 U	2 U	[illegible]	1400	0.1 U	1 U	2.1 U	1.2 U
Acenaphthene	400	10	6.1	2.7	[illegible]	[illegible]	0.9 U	0.9 U	1.9	1.1 U
Fluorene	300	10	4.8	1.4 U	230	[illegible]	0.8 U	0.7 U	1.8	0.9 U
Phenanthrene	NLS	10	[illegible]	2.3	[illegible]	[illegible]	1 U	0.8 U	2.1 U	1 U
Anthracene	2000	10	6.2 U	7.1	160	[illegible]	1.3 U	1 U	2.6 U	1.2 U
Fluoranthene	300	10	3.2 U	2.6 U	78	1400	0.8 U	1.3 U	1.7 U	1.6 U
Pyrene	200	20	6.8 U	1.6 U	140	1500	1.7 U	0.8 U	3.6 U	1 U
Benz(a)anthracene	0.05	10	5.4 U	3.4 U	*80 U*	*880 U*	1.6 U	1.7 U	3.4 U	2.1 U
Chrysene	5	20	5.2 U	3.2 U	*65 U*	*710 U*	1.3 U	1.6 U	2.8 U	2 U
Benzo(b)fluoranthene	0.05	10	4 U	2.6 U	*50 U*	*580 U*	1 U	1.3 U	2.1 U	1.6 U
Benzo(k)fluoranthene	0.5	2	*4.4 U*	2 U	*56 U*	*600 U*	1.1 U	1 U	*2.3 U*	1.2 U
Benzo(a)pyrene	0.005	20	3.2 U	2.2 U	*40 U*	*440 U*	0.8 U	1.1 U	1.7 U	1.4 U
Indeno(1,2,3-cd)pyrene	NLS	20	2.8 U	1.6 U	*35 U*	*380 U*	0.7 U	0.8 U	1.5 U	1 U
Dibenz(a,h)anthracene	NLS	20	NA	1.4 U	NA	NA	NA	0.7 U	NA	0.8 U
Benzo(g,h,i)perylene	NLS	20	3.2 U	1.8 U	*40 U*	*440 U*	0.8 U	0.9 U	1.7 U	1.1 U
Other SVOCs (µg/L)										
Isophorone	100	10	4 U	2 U	50 U	*550 U*	1 U	1 U	2.1 U	1.2 U
Dibenzofuran	NLS	NLS	4 U	2 U	54	750	1 U	1 U	2.1 U	1.2 U
Di-n-butylphthalate	300	20	3.2 U	1.6 U	40 U	NA	0.8 U	0.8 U	1.7 U	1 U
bis(2-Ethylhexyl)phthalate	3	30	12 U	6.2 U	*160 U*	*1700 U*	3.1 U	3.1 U	6.6 U	3.9 U
Inorganic Compounds (µg/L)										
Aluminum	200	200	186 J	1410	280	71.8 B	152 J	50.0 U	788	286
Antimony	2	20	3.6 U	5.0 U	8.1 U	5 U	4.2 U	5.0 U	2.1 U	5.0 U
Arsenic	0.02	8	3.1 U	5.0 U	9.1 J	12 B	3.1 U	6.2 B	9.7 J	5.0 U
Barium	2000	200	241	174. B	677	796	21.4 J	31.0 B	99.2 J	32.1 B
Beryllium	0.008	20	0.2 U	1.0 U	0.2 U	1 U	0.2 U	1.0 U	0.2 UJ	1.0 U
Cadmium	4	2	0.24 U	1.0 U	0.2 U	1 U	0.22 U	1.0 U	0.2 U	1.0 U
Calcium	NLS	NLS	127000 J	158000	84000 J	65200	47400 J	192000	148000 J	24100
Chromium	100	10	84.4	49.9	0.97 U	2 U	6 J	2.0 U	10.6	2.7 B
Cobalt	NLS	NLS	0.43 U	2.0 U	7.7 J	2 U	0.95 U	2.0 U	6.4 J	2.0 U
Copper	1000	1000	9.3 U	7.5 B	10.8 U	2 U	1.8 U	2.0 U	8.9 U	6.8 B
Iron	300	100	193 U	1260	28000 J	31000	279 J	69.6 B	151000 J	3360
Lead	5	10	1.7 UJ	3.0 U	1.4 UJ	2 U	1.3 UJ	3.0 U	4.2 UJ	6.3
Magnesium	NLS	NLS	31700 J	86200	23700 J	18300	8670 J	42100	30000 J	2190 B
Manganese	50	6	82.6 J	821	1100 J	871	483 J	311	6230 J	248
Mercury	2	0.5	0.20 U	0.1 U	0.20 U	0.1 U	0.20 U	0.10 U	0.20 U	0.10 U
Nickel	100	10	2 J	16.1 B	8.8 J	2 B	2.3 J	2.0 U	11.1 J	2.0 U
Potassium	NLS	NLS	138000 J	114000	17900 J	22200	16400 J	10800	94600 J	16900
Selenium	50	10	1.5 U	5.0 U	1.5 U	4 U	1.6 U	5.0 U	3.6 UJ	5.0 U
Silver	NLS	2	0.3 U	2.0 U	0.3 U	2 U	0.3 U	2.0 U	0.3 U	2.0 U
Sodium	50000	400	301000 J	222000	63100 J	66000	232000 J	186000	96900 J	20200
Thallium	0.5	10	5.3 UJ	*50.0 U*	5.3 UJ	10 U	5.3 UJ	10.0 U	5.3 UJ	10.0 U
Vanadium	NLS	NLS	6.9 J	11.9 B	0.38 U	2 U	0.99 U	2.8 B	2.9 J	2.0 U
Zinc	5000	30	5.1 U	21.2	147	8.6 B	21.0 U	5.0 U	25.1 U	6.4 B
Cyanide, Amenable	NLS	NLS	43.4	54.2	115	10 U	NA	15.3	371	115
Cyanide, Total	200	40	43.4	31.2	115	129	10 U	15.3	1530	10 U

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Table 10A (continued)
Groundwater Analytical Results From the Overburden A and B Zones
Erie Street Former MGP Site

	NJDEP Class IIA		Sample ID/Date					
			MW-19B		MW-20A		MW-20B	
	GWQC	PQL	05/31/00	01/16/01	05/24/00	01/10/01	05/24/00	01/10/01
BTEX (µg/L)								
Benzene	0.2	1	97	8.8	280	380	0.4 UJ	170
Toluene	1000	5	0.5 U	0.5 U	13	13	0.5 U	1.1
Ethylbenzene	700	5	0.4 U	0.4 U	110	130	0.4 U	16
Xylene (total)	1000	2	1.4 U	1.4 U	83	42	1.4 U	5.4
Semivolatile Organic Compounds (SVOCs) (µg/L)								
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	300	NLS	1.1 U	1.1 U	180	240	1.1 U	1.9
2-Methylnaphthalene	NLS	NLS	1.3 U	1.3 U	36	5.5 U	1.3 U	1.3 U
Acenaphthylene	NLS	10	1 U	1 U	4 U	4.2 U	1 U	1 U
Acenaphthene	400	10	0.9 U	0.9 U	18	37	0.9 U	5.8
Fluorene	300	10	1	0.7 U	9.1	2.9 U	0.8 U	0.7 U
Phenanthrene	NLS	10	1 U	0.9 U	4.2	37	1 U	5
Anthracene	2000	10	1.3 U	1 U	5.2 U	9.1	1.3 U	2.1
Fluoranthene	300	10	0.8 U	1.3 U	3.2 U	5.5 U	0.8 U	1.3 U
Pyrene	200	20	1.7 U	0.8 U	6.8 U	3.4 U	1.7 U	0.8 U
Benz(a)anthracene	0.05	10	1.8 U	1.7 U	6.4 U	7.2 U	1.6 U	1.7 U
Chrysene	5	20	1.3 U	1.6 U	5.2 U	6.7 U	1.3 U	1.6 U
Benzo(b)fluoranthene	0.05	10	1 U	1.3 U	4 U	5.5 U	1 U	1.3 U
Benzo(k)fluoranthene	0.5	2	1.1 U	1 U	4.4 U	4.2 U	1.1 U	1 U
Benzo(a)pyrene	0.005	20	0.8 U	1.1 U	3.2 U	4.6 U	0.8 U	1.1 U
Indeno(1,2,3-cd)pyrene	NLS	20	0.7 U	0.8 U	2.8 U	3.4 U	0.7 U	0.8 U
Dibenz(a,h)anthracene	NLS	20	NA	0.7 U	NA	2.9 U	NA	0.7 U
Benzo(g,h,i)perylene	NLS	20	0.8 U	0.9 U	3.2 U	3.8 U	0.8 U	0.9 U
Other SVOCs (µg/L)								
Isophorone	100	10	1 U	1 U	4 U	4.2 U	1 U	1 U
Dibenzofuran	NLS	NLS	1 U	1 U	4 U	4.4	1 U	1.4
Di-n-butylphthalate	300	20	0.8 U	0.8 U	3.2 U	3.4 U	0.8 U	0.8 U
bis(2-Ethylhexyl)phthalate	3	30	3.1 U	3.1 U	12 U	13 U	3.1 U	3.1 U
Inorganic Compounds (µg/L)								
Aluminum	200	200	7.3 U	858	45.1 UJ	50.0 U	63 UJ	50.0 U
Antimony	2	20	2.1 U	5.0 U	6.2 U	5.0 U	4.1 U	5.0 U
Arsenic	0.02	8	11.8	7.8 B	3.1 U	29.2	5.4 J	4.5 B
Barium	2000	200	57.3 J	51.4 B	62.8 J	50.7 B	90.4 J	78.8 B
Beryllium	0.008	20	0.2 U	1.0 U	0.2 U	1.0 U	0.2 U	1.0 U
Cadmium	4	2	0.45 U	1.0 U	0.2 U	1.0 U	0.2 U	1.0 U
Calcium	NLS	NLS	40800	35700	125000 J	168000	27500 J	21300
Chromium	100	10	0.87 J	6.1 B	8.4 J	4.2 B	0.58 U	2.0 U
Cobalt	NLS	NLS	2.3 U	3.2 B	4 J	3.1 B	1.4 U	2.0 U
Copper	1000	1000	1.8 UJ	4.5 B	0.5 U	6.1 B	0.3 U	2.0 U
Iron	300	100	33.5 J	10700	30200 J	45800	8810 J	6720 J
Lead	5	10	1.3 J	3.0 U	1.3 UJ	2.0 U	1.3 UJ	2.0 U
Magnesium	NLS	NLS	30000	24200	18100 J	29200	18000 J	16300
Manganese	50	6	5080	4430	1180 J	2350	848 J	807
Mercury	2	0.5	0.20 U	0.10 U	0.20 U	0.10 U	0.20 U	0.10 U
Nickel	100	10	1.9 U	13.2 B	5.7 J	4.0 B	1 J	2.0 U
Potassium	NLS	NLS	30700 J	33800	12400 J	67400	14400 J	23100
Selenium	50	10	1.5 U	5.0 U	1.5 U	4.0 U	1.5 U	4.0 U
Silver	NLS	2	0.82 UJ	2.0 U	0.3 U	2.0 U	0.3 U	2.0 U
Sodium	50000	400	84400	203000	83800 J	69700	33800 J	32600
Thallium	0.5	10	5.3 U	10.0 U	5.3 U	10.0 U	5.3 UJ	10.0 U
Vanadium	NLS	NLS	1.4 U	2.8 B	3.9 J	4.2 B	1.7 U	2.0 U
Zinc	5000	30	14.1 U	23.5	5.2 U	8.3 B	6.1 U	8.6 B
Cyanide, Amenable	NLS	NLS	10 U	80	1580	1180	482	250
Cyanide, Total	200	40	1800	1490	8840	9570	2380	3840

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Table 10A (continued)
Groundwater Analytical Results From the Overburden A and B Zones
Erie Street Former MGP Site

	NJDEP Class IIA		Sample ID/Date					
			MW-21A		MW-21B		MW-22A	
	GWQC	PQL	05/24/00	01/10/01	05/24/00	01/10/01	05/24/00	01/17/01
BTEX (µg/L)								
Benzene	0.2	1	2.9 J	4 J	8.8 J	0.4 U	120	[illegible]
Toluene	1000	5	0.5 U	0.5 U	1.2	0.5 U	6.9	8.5
Ethylbenzene	700	5	0.4 U	2	15	0.4 U	140	98
Xylene (total)	1000	2	1.4 U	1.4	12	1.4 U	220	110
Semivolatile Organic Compounds (SVOCs) (µg/L)								
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	300	NLS	1.1 UJ	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U
2-Methylnaphthalene	NLS	NLS	1.3 UJ	1.3 U	1.3 U	1.4 U	1.3 U	1.6
Acenaphthylene	NLS	10	1 UJ	1 U	1 U	1 U	1 U	1.1
Acenaphthene	400	10	0.9 UJ	0.9 U	0.9 U	1 U	0.9 U	1.8
Fluorene	300	10	0.8 UJ	0.7 U	0.8 U	0.7 U	0.8 U	0.7 U
Phenanthrene	NLS	10	1 UJ	0.8 U	1 U	0.8 U	1 U	1.7
Anthracene	2000	10	1.3 UJ	1 U	1.3 U	1 U	1.3 U	1 U
Fluoranthene	300	10	0.8 UJ	1.3 U	0.8 U	1.4 U	0.8 U	1.3 U
Pyrene	200	20	1.7 UJ	0.8 U	1.7 U	0.8 U	1.7 U	1.9
Benz(a)anthracene	0.05	10	1.6 UJ	1.7 U	1.6 U	1.8 U	1.6 U	3.3
Chrysene	5	20	1.3 UJ	1.6 U	1.3 U	1.7 U	1.3 U	1.6 U
Benzo(b)fluoranthene	0.05	10	1 UJ	1.3 U	1 U	1.4 U	1 U	1.3 U
Benzo(k)fluoranthene	0.5	2	1.1 UJ	1 U	1.1 U	1 U	1.1 U	1 U
Benzo(a)pyrene	0.005	20	0.8 UJ	1.1 U	0.8 U	1.2 U	0.8 U	1.1 U
Indeno(1,2,3-cd)pyrene	NLS	20	0.7 UJ	0.8 U	0.7 U	0.8 U	0.7 U	0.8
Dibenz(a,h)anthracene	NLS	20	NA	0.7 U	NA	0.7 U	NA	0.7 U
Benzo(g,h,i)perylene	NLS	20	0.8 UJ	0.9 U	0.8 U	1 U	0.8 U	0.9 U
Other SVOCs (µg/L)								
Isophorone	100	10	1 U	1 U	1 U	1 U	1 U	1 U
Dibenzofuran	NLS	NLS	1 U	1 U	1 U	1 U	1 U	1 U
Di-n-butylphthalate	300	20	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
bis(2-Ethylhexyl)phthalate	3	30	3.1 U	3.1 U	3.1 U	3.3 U	3.1 U	3.1 U
Inorganic Compounds (µg/L)								
Aluminum	200	200	7.3 U	1130	186 J	400	228	160 B
Antimony	2	20	3 U	6.0 U	2.1 U	6.0 U	7.5 U	5.0 U
Arsenic	0.02	8	18.0	3.5 U	3.1 U	3.5 U	9.8 J	12.8
Barium	2000	200	121 J	68.2 B	17.1 J	66.6 B	16.4 J	24.2 B
Beryllium	0.008	20	0.2 U	1.0 U	0.2 U	1.0 U	0.2 U	1.0 U
Cadmium	4	2	0.2 U	1.0 U	0.29 U	1.0 U	0.2 U	1.0 U
Calcium	NLS	NLS	55400	36000	6530 J	119000	43100 J	38400
Chromium	100	10	10.4	2.4 B	2 U	2.0 U	2.9 U	3.3 B
Cobalt	NLS	NLS	0.39 U	2.0 U	0.3 U	2.0 U	0.3 U	2.0 U
Copper	1000	1000	3.9 J	13.6 B	2.5 U	2.8 B	5 U	4.4 B
Iron	300	100	7.3 J	4230	289 J	813	448 J	307
Lead	5	10	2.1 J	20.0	2.9 UJ	2.0 U	1.3 UJ	3.0 U
Magnesium	NLS	NLS	4950 J	4610 B	16700 J	30000	1860 J	2210 B
Manganese	50	8	[illegible]	1740	9 J	438	15.4 J	74.0
Mercury	2	0.5	0.20 U	0.10 U	NA	0.10 U	0.20 U	0.10 U
Nickel	100	10	2.9 U	3.6 B	2.2 J	2.2 B	1.4 J	3.0 B
Potassium	NLS	NLS	4740 U	4030 B	98800 J	23300	7970 J	7530
Selenium	50	10	2.4 U	4.0 U	1.5 U	4.0 U	1.9 U	5.0 U
Silver	NLS	2	R	2.0 U	0.3 U	2.0 U	0.3 U	2.0 U
Sodium	50000	400	22300	53800	121000 J	116000	10800 J	7360
Thallium	0.5	10	5.3 U	10.0 U	5.3 UJ	10.0 U	5.3 UJ	10.0 U
Vanadium	NLS	NLS	0.38 U	2.5 B	0.3 U	2.0 U	22.2 J	16.1 B
Zinc	5000	30	15.3 U	46.6	40.0 U	10.2 B	57.5	5.0 U
Cyanide, Amenable	NLS	NLS	10 U	NA	105	10 U	50.8	36.1
Cyanide, Total	200	40	10 U	10 U	109	82.7	50.8	79.3

Table 10A (continued)
Groundwater Analytical Results From the Overburden A and B Zones
Erie Street Former MGP Site

	NJDEP Class IIA		Sample ID/Date							
			MW-22B		MW-23A[1]	MW-23B[1]	MW-24A[1]	MW-24B[1]	MW-25A[1]	MW-26A[1]
	GWQC	PQL	06/08/00	01/17/01	01/11/01	01/11/01	01/09/01	01/09/01	01/09/01	01/09/01
BTEX (µg/L)										
Benzene	0.2	1	360	140	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Toluene	1000	5	3	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	700	5	42	2.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Xylene (total)	1000	2	14	2.8 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Semivolatile Organic Compounds (SVOCs) (µg/L)										
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	300	NLS	1.1 UJ	360	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U
2-Methylnaphthalene	NLS	NLS	1.3 U	170	1.3 U	1.3 U	1.4 U	1.3 U	1.3 U	1.4 U
Acenaphthylene	NLS	10	4.2	5 U	1 U	1 U	1 U	1 U	1 U	1.1 U
Acenaphthene	400	10	2.7 J	140	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	1 U
Fluorene	300	10	0.6 UJ	3.5 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.8 U
Phenanthrene	NLS	10	1 UJ	[illegible]	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.9 U
Anthracene	2000	10	1.3 J	65	1 U	1 U	1 U	1 U	1 U	1.1 U
Fluoranthene	300	10	3.4	16	1.3 U	1.3 U	1.4 U	1.3 U	1.3 U	1.4 U
Pyrene	200	20	9.9	4.8	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.9 U
Benz(a)anthracene	0.05	10	2.8	8.5 U	1.7 U	1.7 U	1.8 U	1.7 U	1.7 U	1.9 U
Chrysene	5	20	2.4	8 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.8 U
Benzo(b)fluoranthene	0.05	10	1.4	6.5 U	1.3 U	1.3 U	1.4 U	1.3 U	1.3 U	1.4 U
Benzo(k)fluoranthene	0.5	2	2.5	5 U	1 U	1 U	1 U	1 U	1 U	1.1 U
Benzo(a)pyrene	0.005	20	3.5	5.5 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U
Indeno(1,2,3-cd)pyrene	NLS	20	1.4	4 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.9 U
Dibenz(a,h)anthracene	NLS	20	NA	3.5 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.8 U
Benzo(g,h,i)perylene	NLS	20	1.9	4.5 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	1 U
Other SVOCs (µg/L)										
Isophorone	100	10	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1.1 U
Dibenzofuran	NLS	NLS	1 U	8.3	1 U	1 U	1 U	1 U	1 U	1.1 U
Di-n-butylphthalate	300	20	0.8	4 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.9 U
bis(2-Ethylhexyl)phthalate	3	30	5.3	16 U	3.1 U	3.1 U	3.2 U	3.1 U	3.1 U	3.4 U
Inorganic Compounds (µg/L)										
Aluminum	200	200	46.6 U	50.0 U	292	50.0 U	826	1440	103 B	50.0 U
Antimony	2	20	2.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Arsenic	0.02	8	3.1 U	5.2 B	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
Barium	2000	200	1220	2070	130 B	55.3 B	150 B	93.4 B	95.5 B	257
Beryllium	0.008	20	0.20 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	4	2	0.20 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Calcium	NLS	NLS	104000	127000	99400	86300	130000	81600	48200	265000
Chromium	100	10	0.30 UJ	2.0 U	2.0 U	2.0 U	22.0	2.0 U	2.0 U	2.7 B
Cobalt	NLS	NLS	1.5 U	2.4 B	2.8 B	2.0 U	4.2 B	3.2 B	2.0 U	2.0 U
Copper	1000	1000	4.4 J	2.0 U	3.8 B	2.0 U	8.3 B	4.8 B	2.2 B	7.8 B
Iron	300	100	3080	1550	681	50.0 U	12000	1420	111	50.0 U
Lead	5	10	2.4 J	3.0 U	2.0 U	2.0 U	5.3	2.2 B	2.0 U	2.0 U
Magnesium	NLS	NLS	34600	43700	13100	25300	24200	30600	35400	34000
Manganese	50	6	4230	2540	849	893	3070	2040	1490	82.4
Mercury	2	0.5	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	100	10	0.40 UJ	2.0 U	2.0 U	2.0 U	6.7 B	4.2 B	2.0 U	6.5 B
Potassium	NLS	NLS	6300 J	5980	25600	3490 B	58100	3380 B	3440 B	142000
Selenium	50	10	1.6 UJ	5.0 U	4.0 U	4.0 U	4.0 U	4.2 B	4.0 U	4.0 U
Silver	NLS	2	0.41 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Sodium	50000	400	54600	54400	176000	35000	224000	32200	80900	384000
Thallium	0.5	10	10.4	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Vanadium	NLS	NLS	0.30 U	2.0 U	2.0 U	3.1 B	2.0 U	2.5 B	2.0 U	2.0 U
Zinc	5000	30	9.8 U	5.0 U	10.8 B	9.5 B	25.0	37.5	20.8	9.2 B
Cyanide, Amenable	NLS	NLS	513	200	50.1	NA	10 U	40	NA	NA
Cyanide, Total	200	40	2030	1970	50.1	10 U	30.5	157	10 U	10 U

Notes:
[1] - Wells were not installed until January 2001
U - Not detected at reporting limit shown
J - Estimated value
R - Rejected result
B - Results shown is below the contract required detection limit (CRDL), but above the instrument detection limit (IDL).
NJDEP - New Jersey Department of Environmental Protection
GWQC - Groundwater Quality Criteria
PQL - Practical Quantitation Limit
NLS - No Listed Standard
Shaded values - Result exceeds the higher of NJDEP Class IIA GWQC or PQL.
Reporting limits in italics are greater than the higher of NJDEP Class IIA GWQC or PQL.

Table 10B
Groundwater Analytical Results From the Shallow Bedrock
Erie Street Former MGP Site

	NJDEP Class IIA		MW-1D		MW-2D	MW-5D	MW-6D	
	GWQC	PQL	05/25/00	01/11/01	06/08/00	06/09/00	06/01/00	01/12/01
BTEX (µg/L)								
Benzene	0.2	1	0.4 UJ	0.4 U	[illegible]	24	0.4 U	0.4 U
Toluene	1000	5	0.5 U	0.5 U	300	0.5 U	0.5 U	0.5 U
Ethylbenzene	700	5	0.4 U	0.4 U	70	34	0.4 U	0.4 U
Xylene (total)	1000	2	1.4 U	1.4 U	230	8.1	1.4 U	1.4 U
Semivolatile Organic Compounds (SVOCs) (µg/L)								
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	300	NLS	1.1 U	1.1 U	180	76	1.1 U	1.1 U
2-Methylnaphthalene	NLS	NLS	1.3 U	1.3 U	99	13	1.3 U	1.3 U
Acenaphthylene	NLS	10	1 U	1 U	37	1 U	1 U	1 U
Acenaphthene	400	10	0.9 U	0.9 U	41	6.9	0.9 U	0.9 U
Fluorene	300	10	0.8 U	0.8 U	26	2.5	0.8 U	0.8 U
Phenanthrene	NLS	10	1 U	1 U	[illegible]	2	1 U	1 U
Anthracene	2000	10	1.3 U	1.3 U	15	1.3 U	1.3 U	1.3 U
Fluoranthene	300	10	0.8 U	0.8 U	7.4	0.8 U	0.8 U	0.8 U
Pyrene	200	20	1.7 U	1.7 U	12	1.7 U	1.7 U	1.7 U
Benz(a)anthracene	0.05	10	1.6 U	1.6 U	6.4 U	1.6 U	1.6 U	1.6 U
Chrysene	5	20	1.3 U	1.3 U	5.2 U	1.3 U	1.3 U	1.3 U
Benzo(b)fluoranthene	0.05	10	1 U	1 U	4 U	1 U	1 U	1 U
Benzo(k)fluoranthene	0.5	2	1.1 U	1.1 U	***4.4 U***	1.1 U	1.1 U	1.1 U
Benzo(a)pyrene	0.005	20	0.8 U	0.8 U	3.2 U	0.8 U	0.8 U	0.8 U
Indeno(1,2,3-cd)pyrene	NLS	20	0.7 U	0.7 U	2.8 U	0.7 U	0.7 U	0.7 U
Dibenz(a,h)anthracene	NLS	20	NA	0.9	NA	NA	NA	0.9 U
Benzo(g,h,i)perylene	NLS	20	0.8 U	0.8 U	3.2 U	0.8 U	0.8 U	0.8 U
Other SVOCs (µg/L)								
Isophorone	100	10	1 U	1 U	4 U	1 U	1 U	1 U
Dibenzofuran	NLS	NLS	1 U	1 U	4 U	1 U	1 U	1 U
Di-n-butylphthalate	300	20	0.8 U	0.8 U	3.2 U	0.8 U	0.8 U	0.8 U
bis(2-Ethylhexyl)phthalate	3	30	3.1 U	3.1 U	12 U	3.1 U	3.1 U	3.1 U
Inorganic Compounds (µg/L)								
Aluminum	200	200	6080	1000	62.4 U	27.2 U	7.3 U	214
Antimony	2	20	2.1 U	5.0 U	2.1 U	2.1 U	2.1 U	5 U
Arsenic	0.02	8	3.1 U	3.5 U	3.1 U	4.6 J	3.1 U	3.5 U
Barium	2000	200	29.5 J	52.2 B	126 J	28.6 J	16.8 J	66.9 B
Beryllium	0.008	20	8.5	1.0 U	0.38 U	0.34 U	0.2 U	1 U
Cadmium	4	2	22.2	1.9 B	0.20 U	0.20 U	0.2 U	1 U
Calcium	NLS	NLS	154000 J	204000	14000	44800	5720	26900
Chromium	100	10	0.3 U	2.0 U	0.30 UJ	0.30 UJ	0.3 U	12.4
Cobalt	NLS	NLS	27.5 J	8.6 B	0.30 U	0.37 U	1.6 U	4.2 B
Copper	1000	1000	0.86 U	2.0 U	0.30 UJ	0.30 UJ	2.4 J	4.3 B
Iron	300	100	70100 J	17200	6840	10700	7.2 U	4360
Lead	5	10	4.9 UJ	***2.0 U***	5.1	1.3 U	1.9 J	2 U
Magnesium	NLS	NLS	28100 J	51300	6310	33100	9630	18900
Manganese	50	6	6240 J	5440	627	367	90.2	161
Mercury	2	0.5	0.20 U	0.10 U	0.10 U	0.10 U	0.20 U	0.1 U
Nickel	100	10	19.7 J	5.5 B	0.40 UJ	0.40 UJ	2 U	12.4 B
Potassium	NLS	NLS	4500 J	6980	1820 J	15200 J	23800 J	33700
Selenium	50	10	2.8 U	4 U	4.6 UJ	1.5 UJ	2.4 U	4 U
Silver	NLS	2	0.3 U	2 U	0.30 U	0.30 U	R	2 U
Sodium	50000	400	44100 J	55900	15600	160000	230000	264000
Thallium	0.5	10	7.6 J	10 U	5.3 U	5.3 U	5.3 U	10 U
Vanadium	NLS	NLS	0.3 U	2 U	0.32 U	0.30 U	1.7 U	6.2 B
Zinc	5000	30	9880	1770	11.7 U	10.5 U	13 U	15.4 B
Cyanide, Amenable	NLS	NLS	259	20	10 U	10 U	18.2	10 U
Cyanide, Total	200	40	876	166	10 U	10 U	938	880

Notes:
U - Not detected at reporting limit shown
J - Estimated value
R - Rejected result
NJDEP - New Jersey Department of Environmental Protection
GWQC - Groundwater Quality Criteria
PQL - Practical Quantitation Limit
NLS - No Listed Standard
Shaded values - Result exceeds the higher of NJDEP Class IIA GWQC or PQL
Reporting limits in bold and italics are greater than the higher of NJDEP Class IIA GWQC or PQL

Table 10B
Groundwater Analytical Results From the Shallow Bedrock
Erie Street Former MGP Site

	NJDEP Class IIA GWQC	NJDEP Class IIA PQL	MW-7D 05/31/00	MW-7D 01/11/01	MW-8D 05/31/00	MW-8D 01/17/01	MW-9D 06/06/00	MW-9D 01/17/01
BTEX (µg/L)								
Benzene	0.2	1	0.4 U	0.4 U	430	460 E	17000	140000
Toluene	1000	5	0.5 U	0.5 U	5 U	2.5 U	210	170
Ethylbenzene	700	5	0.4 U	0.4 U	9.7	10	1900	2300
Xylene (total)	1000	2	1.4 U	1.4 U	14 U	7 U	2800	9400
Semivolatile Organic Compounds (SVOCs) (µg/L)								
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	300	NLS	1.2 U	1.1 U	2	5.6	8700	14000
2-Methylnaphthalene	NLS	NLS	1.5 U	1.3 U	1.4 U	1.3 U	2800	14000
Acenaphthylene	NLS	10	1.1 U	1 U	1.1 U	1.4	*200 U*	230
Acenaphthene	400	10	1 U	0.9 U	6.3	8.2	1100	2900
Fluorene	300	10	0.9 U	0.8 U	2.1	3.1	240	1900
Phenanthrene	NLS	10	1.1 U	1 U	1.1 U	1 U	890	1900
Anthracene	2000	10	1.5 U	1.3 U	1.4 U	1.3 U	280 U	1600
Fluoranthene	300	10	0.9 U	0.8 U	0.9 U	0.8 U	160 U	1200
Pyrene	200	20	1.9 U	1.7 U	1.9 U	1.7 U	*340 U*	1600
Benz(a)anthracene	0.05	10	1.8 U	1.6 U	1.8 U	1.6 U	*320 U*	*640 U*
Chrysene	5	20	1.5 U	1.3 U	1.4 U	1.3 U	*280 U*	620
Benzo(b)fluoranthene	0.05	10	1.1 U	1 U	1.1 U	1 U	*200 U*	*400 U*
Benzo(k)fluoranthene	0.5	2	1.2 U	1.1 U	1.2 U	1.1 U	*220 U*	*440 U*
Benzo(a)pyrene	0.005	20	0.9 U	0.8 U	0.9 U	0.8 U	*160 U*	400
Indeno(1,2,3-cd)pyrene	NLS	20	0.8 U	0.7 U	0.8 U	0.7 U	*140 U*	280 U
Dibenz(a,h)anthracene	NLS	20	NA	0.9 U	NA	0.9 U	NA	360 U
Benzo(g,h,i)perylene	NLS	20	0.9 U	0.8 U	0.9 U	0.8 U	*160 U*	320 U
Other SVOCs (µg/L)								
Isophorone	100	10	1.1 U	1 U	1.1 U	1 U	*200 U*	*400 U*
Dibenzofuran	NLS	NLS	1.1 U	1 U	1.1 U	1 U	200 U	400 U
Di-n-butylphthalate	300	20	0.9 U	0.8 U	0.9 U	0.8 U	160 U	*320 U*
bis(2-Ethylhexyl)phthalate	3	30	3.5 U	3.1 U	3.4 U	3.1 U	*620 U*	*1200 U*
Inorganic Compounds (µg/L)								
Aluminum	200	200	7.3 U	50 U	7.3 U	50 U	31.6 U	96.3 B
Antimony	2	20	2.1 U	5 U	3.8 U	5 U	2.5 U	5 U
Arsenic	0.02	8	3.1 U	3.5 U	3.1 U	3.5 U	5.4 J	8.4 B
Barium	2000	200	22.9 J	31.4 B	16.5 J	20.7 B	571	437
Beryllium	0.008	20	0.2 U	1 U	0.2 U	1 U	0.20 U	1 U
Cadmium	4	2	0.35 U	1 U	0.2 U	1 U	0.20 U	1 U
Calcium	NLS	NLS	74700	315000	164000	191000	40800	34800
Chromium	100	10	0.7 J	2 U	0.96 J	2 U	0.30 UJ	2 U
Cobalt	NLS	NLS	0.3 UJ	5.6 B	1.6 U	2 U	5.0 J	5.7 B
Copper	1000	1000	16.4 J	2 U	1.3 UJ	2 U	0.30 UJ	2.5 B
Iron	300	100	23.7 J	3060	13.5 J	2390	4920	21100
Lead	5	10	1.3 U	2 U	1.3 U	2 U	1.3 U	2 U
Magnesium	NLS	NLS	339000	355000	81800	75800	19200	25300
Manganese	50	8	242	2460	1420	1750	240	232
Mercury	2	0.5	0.20 U	0.12 B	0.20 U	0.1 U	0.10 U	0.1 U
Nickel	100	10	1.5 U	8.4 B	1.2 U	2 U	0.40 UJ	3.4 B
Potassium	NLS	NLS	111000 J	136000	4920 U	4860 B	8020 J	13000
Selenium	50	10	1.5 U	4 U	1.5 U	4 U	2.6 UJ	4.2 B
Silver	NLS	2	0.39 UJ	2 U	0.84 UJ	2 U	0.30 U	2 U
Sodium	50000	400	413000	26300	58600	60600	34600	39400
Thallium	0.5	10	5.3 UJ	10 U	5.3 U	10 U	5.3 U	10 U
Vanadium	NLS	NLS	0.3 UJ	2.1 B	0.41 U	2 U	0.36 U	2 U
Zinc	5000	30	13.6 U	13.2 B	5.4 U	5 U	12.3 U	5.2 B
Cyanide, Amenable	NLS	NLS	14.2	10 U	10 U	120	170	200
Cyanide, Total	200	40	214	1350	1230	1690	1550	1730

Notes:
U - Not detected at reporting limit shown
J - Estimated value
R - Rejected result
NJDEP - New Jersey Department of Environmental Protection
GWQC - Groundwater Quality Criteria
PQL - Practical Quantitation Limit
NLS - No Listed Standard
Shaded values - Result exceeds the higher of NJDEP Class IIA GWQC or PQL
Reporting limits in bold and italics are greater than the higher of NJDEP Class IIA GWQC or PQL

Table 11
Sediment Sample Summary Table
Erie Street Former MGP

Transect	Transect Location	Sediment Vibracore Number	Sample Description	Analytical Sample (feet)[1]
Transect 1	Downstream of the 1st Avenue Bridge Approximately 560 feet downstream of the eastern boundary of the Erie Street former MGP site.	#1	0.0-1.0: SEDIMENT 1.0-2.0: SEDIMENT & LEAVES, some silt and fine sand. 2.0-3.0: SEDIMENT & LEAVES, some silt and fine sand then transitions into Brown, SILTs, no staining, petroleum odor noted. 3.0-3.5: Brown, fine, silty-SAND, some roots and leaves. Slight hydrocarbon and organic odor.	TR1#1A (0.0-0.5) TR1#1B (4.5-5.0)
		#2	0.0-0.4: SEDIMENT, no odors, no visual contamination noted. 0.4-4.4: Black, silty-SEDIMENT and ORGANIC MATTER (LEAVES). 4.4-4.5: Black, SAND, GRAVEL, and SILT, moderate swampy odor, no visual impacts noted.	TR1#2A (0.0-0.5) TR1#2B (3.0-4.0)
		#3	0.0-0.3: Black, very fine silty-SAND [SEDIMENT], some leaves. No odors or visual contamination noted. 0.3-0.5: Gray, silty-CLAY. No odors or visual contamination noted. 0.5-2.5: TILL, No odor or visual contamination noted.	TR1#3A (0.0-0.5) TR1#3B (2.0-2.5)
		#4	0.0-0.8: SEDIMENT, no odors or visual contamination noted. 0.8-1.0: Gray, silty-CLAY. No odors or visual contamination noted. 1.0-2.0: TILL, no odor or visual contamination noted.	TR1#4A (0.0-0.5) TR1#4B (1.5-1.9)
Transect 2	Approximately 275 feet downstream of the eastern boundary of the Erie Street former MGP site.	#1	0.0-1.0: SEDIMENT, no odor or visual contamination noted. 1.0-1.4: ORGANIC MATTER (leaves), no odor or visual contamination noted. 1.4-4.8: TILL, no odor or visual contamination noted.	TR2#1A (0.0-0.5) TR2#1B (2.8-3.2)
		#2	0.0-0.3: SAND and SILT, no odor or visual contamination noted. 0.3-0.5: Coarse SAND, no odor or visual contamination noted. 0.5-1.3: Fine to medium SAND and GRAVEL, no odor or visual contamination noted. 1.3-2.3: Silty, very fine SAND, no odor or visual contamination noted. 2.3-4.6: Dark black, SILT and CLAY, some organic matter (roots and leaves)	TR2#2A (0.0-0.5) TR2#2B (1.3-1.8)
		#3	0.0-0.5: Black very fine silty SEDIMENT, no odors, no visual contamination. 0.5-2.5: TILL, No odor or visual contamination noted.	TR2#3A (0.0-0.5) TR2#3B
		#4	0.0-0.8: SEDIMENT, no odors, no staining. (PID 0.0 ppm). 0.8-3.8: Grayish-black, silty clay with organic matter (roots), no odor, no staining. (PID 0.0 ppm). 3.8-4.1: TILL, no odor, no staining.	TR2#4A (0.0-0.5) TR2#4B
Transect 3	Adjacent to the eastern boundary of the Erie Street former MGP site and the City of Elizabeth Sewage Treatment Plant.	#1	0.0-0.5: Light brown, fine silty-SAND with fine yellow gravel. No odors or visual contamination noted. 0.5-0.6: GRAVEL, No odor or visual contamination noted. 0.6-1.5: TILL, No odor or visual contamination noted.	TR3#1A (0.0-0.5) TR3#2B(1.0-1.5)
		#2	0.0-1.2: SEDIMENT, no odor or visual contamination noted. 1.2-2.8: Dark brown, very fine silty-SAND, some organic material (leaves, roots, clay), slight swampy and hydrocarbon odor, visual contamination. 2.8-5.2: Fine silty-SAND, some fine gravel, pieces of plywood and glass at 4.9. Slight swampy and hydrocarbon odor.	TR3#2B(4.3-4.8)
		#3	0.0-0.8: Silty-Sandy SEDIMENT transitioning into silty decomposed organic matter (leaves) (PID 10-15) 0.8-1.0: ORGANIC MATTER (LEAVES) some black silt. (PID1-5 ppm) 1.0-3.0: Black, very fine silty-SAND, moderate swampy odor and possible hydrocarbon odor, no visual contamination 3.0-3.2: PEAT, no odors or visual contamination. (PID 0.0 ppm) 3.2-5.6: Grayish-black, fine SAND, some medium sand, trace gravel, slight swampy odor. No visual contamination.	TR3#3A(0.0-0.5) TR3#3B(3.5-4.0)

Table 11 Sediment Sample Summary Table Erie Street Former MGP				
Transect	**Transect Location**	**Sediment Vibracore Number**	**Sample Description**	
Transect 3 (continued)		#4	0.0-1.0: Black, SEDIMENT, organic, very liquidy > 50% liquid), swampy odor, no visual contamination noted. (PID 5.0-20.0 ppm) 1.0-4.0: Black, silty-SEDIMENT and ORGANIC MATTER (leaves and roots) transitioning into light brown, fine silty-SAND, traces of organic matter (leaves and roots), swampy odor, no visual contamination noted. (PID 0.0- 8.0 ppm) 4.0-5.5: Tan-gray, fine SAND, some medium sand and gravel, swampy odor, no visual contamination noted. (PID 0.0-3.0)	TR3#4A (0.0-0.5) TR3#4B (4.0-4.5)
Transect 4	Adjacent to the central portion of the Erie Street former MGP site and the City of Elizabeth Sewage Treatment Plant.	#1	0.0-2.5: Black, SEDIMENT, "liquidy", strong decompositional odor/ sewer odor, no visual contamination noted (PID 60 ppm) 2.5-3.5: Black, silty-SEDIMENT and fine to medium SAND, strong decompositional/sewer, no visual contamination noted. (PID 12 ppm) 3.5-5.5: Tan-gray, medium SAND, some dark silt and fine sand, swamp odor, no visual contamination noted. (PID 3.5 ppm)	TR4#1A (0.0-0.5) TR4#1B (4.5-5.0)
		#2	0.0-0.8: Black, SEDIMENT, "liquidy", strong swamp/ sewer odor, no visual contamination noted. (PID 30-70 ppm) 0.8-3.5: Gray, medium SAND, some fine sand, swampy odor, no visual contamination noted. 3.5-4.8: Black, silty-MATERIAL and ORGANIC MATTER (decomposing), swampy odor, no visual contamination noted. 4.8-5.3: Reddish-brown, very fine silty SAND, some clay and fine to medium gravel, swampy odor and no visual contamination.	TR4#2A (0.0-0.5) TR4#2B (4.0-4.5)
		#3	0.0-1.0: Black, SEDIMENT, "liquidy", some organic matter (40% leaves), some very fine sand, strong decomposing/sewer odor, slight MGP odor, no visual contamination noted. (PID 15-75 ppm) 1.0-2.0: Black, silty-SEDIMENT, some fine to coarse sand, trace gravel, no odors or visual contamination noted. (PID 15 ppm) 2.0-3.0: Black, SILT and ORGANIC MATTER (leaves), strong decomposing odor, no visual contamination noted. (PID 3-12 ppm) Note: Thin layer of Peat and fill (plastic) noted at 3.0. 3.0-3.8: Reddish brown, SILT, some fine sand and gravel, trace clay [TILL], swampy odor noted and slight hydrocarbon odor noted, no visual contamination noted. (PID 0.0-3.5 ppm)	TR4#3A (0.0-0.5) TR4#3B (2.5-3.0)
		#4	0.0-1.0: Black, SEDIMENT, "liquidy", strong sewer odor, possible asphalt type odor. (PID 20-25 ppm) 1.0-2.0: Black, SILT and SAND, some fine to medium gravel, swampy odor, no visual contamination noted. (PID 10-15 ppm) 2.0-3.5: Black, SILT and CLAY, some fine sand and gravel, strong swampy odor and slight hydrocarbon odor, no visual contamination noted. (PID 0.0-4.0)	TR4#4A (0.0-0.5) TR4#4B(2.0-2.5)
Transect 5	Adjacent to the western boundary of the Erie Street former MGP site and the City of Elizabeth Sewage Treatment Plant.	#1	0.0-0.5: ORGANIC MATTER (decomposing vegetation, leaves). No odor or visual contamination noted. (PID 7 ppm) 0.5-1.0: Medium SAND, some fine to coarse sand, swampy odor, no visual contamination noted. (PID 4 ppm) 1.0-1.3: Black, SEDIMENT, organic, muddy, no odor or visual contamination noted. (PID 5 ppm) 1.3-2.3: ORGANIC MATTER (decomposing vegetation, leaves, roots). No odor or visual contamination noted. (PID 5 ppm) 2.3-5.5: Black, SEDIMENT, organic root, muddy, no odor or visual contamination noted. (PID 15 ppm)	TR5#1A (0.3-0.8) TR5#1B (4.5-5.0)

Table 11 (continued)
Sediment Sample Summary Table
Erie Street Former MGP

Transect	Transect Location	Sediment Vibracore Number	Sample Description	
Transect 5 (continued)			0.0-0.3: Black, ORGANIC MATTER (decomposing leaves), no odor or visual contamination noted. (PID 12 ppm)	
		#2	0.3-2.5: Black, SEDIMENT (mud), some organic matter (leaves and roots), slight sheen on the leaves (0.0-0.8) and strong decomposition odor. (PID 10-40 ppm) 2.5-5.0: Dark brown to black, medium SAND, some fine to coarse sand, slight hydrocarbon odor, no visual contamination noted. (PID 10-12 ppm) 5.0-5.5: Dark brown, organic CLAY, slight to moderate hydrocarbon (possibly MGP type odor. (PID 4 ppm)	TR5#1A (0.0-0.5) TR5#2B (2.3-2.8)
		#3	0.0-0.4: Black, silty-SEDIMENT, strong organic decomposition odor, no visual contamination noted. (PID 7 ppm) 0.4-0.6: PEAT(dense root mat), no odors and nor visual contamination noted. (PID 0.0 ppm) 0.6-1.2: Black, SILT and coarse GRAVEL, moderate organic decomposition odor, no visual impacts noted. (PID 0.0 ppm) 1.2-2.4: Dark brown to black, coarse GRAVEL and medium SAND, moderate organic decomposition odor, no visual impacts noted. (PID 0 ppm)	TR5#3A (0.0-0.5) TR5#3B (1.0-1.5)
		#4	0.0-0.5: Black, silty-SEDIMENT, some organic matter (leaves), organic decompositional odor and slight sheen on leaves. (PID 15-20 ppm) 0.5-1.3: Black, GRAVEL and silty-SEDIMENT, moderate decompositional odor, no visual contamination noted. 1.3-2.1: Coarse GRAVEL and medium SAND, some fine and coarse sand, moderate organic decomposition and petroleum hydrocarbon odor, no visual contamination noted.	TR5#4A (0.0-0.5) TR5#4B (1.0-1.5)
Transect 6	Approximately 300 feet upstream of the western boundary of the Erie Street former MGP site.	#1	0.0-0.4: Black, silty-SEDIMENT and pieced of wood, slight sheen and slight hydrocarbon odor. (PID 0-5 ppm) 0.4-5.9: Dark gray to dark brown, silty-CLAY, mottled with veins of organic matter (roots/leaves), slight decomposed odor, no staining. (PID 0 ppm)	TR6#1A (0.0-0.5) TR6#1B (4.0-4.5)
		#2	0.0-0.5: Black, silty-SEDIMENT, very soft. No odor or visual contamination noted. (PID 0 ppm) 0.5-6.0: Dark gray to black dark brown, silty-CLAY, with veins of organic matter (roots/leaves), slight swampy odor, no staining noted. (PID 0 ppm)	TR6#2A (0.0-0.5) TR6#2B (4.0-4.5)
		#3	0.0-0.6: Black, silty-SEDIMENT, some gravel, slight hydrocarbon odor and swampy odor, nor visual contamination noted. (PID 0-15) 0.6-1.0: Black to gray, silty-CLAY and PEAT, swamp odor, no staining noted. (PID 0 ppm) 1.0-5.8: Gray to black, silty-CLAY, mottled with organic matter (roots), no odors, no staining. (PID 0 ppm)	TR6#3A (0.0-0.5) TR5#3B (3.5-4.0)
		#4	0.0-0.5: Black, SEDIMENT, very loose, swampy odor, no sheens or staining. (PID 0-5 ppm) 0.5-3.5: Grayish black, silty-CLAY with organic matter (roots), no odor, no staining noted. (PID 0 ppm) 3.5-4.5: Dark gray to black, clayey-SILT, no odors or staining noted. (PID 0 ppm) 4.5-5.0: Brown, fine, silty-SAND, some clay and fine gravel, no staining or odor. (PID 0 ppm)	TR6#4A (0.0-0.5) TR6#4B (3.5-4.0)

Table 11 (continued)
Sediment Sample Summary Table
Erie Street Former MGP

Transect	Transect Location	Sediment Vibracore Number	Sample Description	
Transect 7	Approximately 540 feet upstream of the western boundary of the Erie Street former MGP site, between the NJTP and Atlantic Avenue overpasses.	#1	0.1-0.8: Dark brown, organic silty-CLAY and ROOTS, slightly swampy odor. No visual contamination noted (PID 0-7) 0.8-1.5: Grey, CLAY, some silts large gravel noted, no staining and no odor. (PID 0-3 ppm) 1.5-4.5: Brown, SILT/CLAY and fine to coarse GRAVEL [TILL] (PID 0 ppm)	TR7#1A (0.0- 0.5) TR7#1B (3.0- 3.5)
		#2	0.0-0.1: Black, SILT and SAND, slight hydrocarbon odor and swampy odor. No visual contamination noted. (0-10 ppm) 0.1-1.5: Black, fine silty-SAND, some organic matter, some fine to medium gravel, heavy sheen [grey metallic], no residual product. Asphalt-like odor (PID 40->200) Refusal at 1.5.	TR7#2A (0.0- 1.5)
		#3	0.0-0.5: Fine to coarse SAND and fine GRAVEL, no sheen, slight swampy odor. No visual contamination. (PID 0-4 ppm) 0.5-0.7: Grey, silty-CLAY, transitioning into PEAT, swampy odor, no sheen, no staining. (PID 0-5 ppm) 0.7-1.0: PEAT (PID 0) 1.0-3.0: Silty, clayey ORGANIC MATTER (leaves and roots), moderate sheen and staining, asphalt odor. (PID 40-200) 3.0-3.3: PEAT, no staining or sheen, moderate asphalt-like odor. (PID 0 ppm) 3.3-3.8: Black silty-SAND and ROOTS, some fine gravel, heavy staining, sheen, asphalt-like odor. (PID 70- >200). Rock in the tip of the sampler.	TR7#3A (0.0- 0.5) TR7#3AB (3.3-3.8)
		#4	0.0-0.5: Fine to coarse SAND and fine GRAVEL, no sheen, slight swampy odor. No visual contamination. (PID 0-4 ppm) 0.5-0.7: Grey, silty-CLAY, transitioning into PEAT, swampy odor, no sheen, no staining. (PID 0-5 ppm) 0.7-1.0: PEAT (PID 0) 1.0-3.0: Silty, clayey ORGANIC MATTER (leaves and roots), moderate sheen and staining, asphalt odor. (PID 40-200) 3.0-3.3: PEAT, no staining or sheen, moderate asphalt-like odor. (PID 0 ppm) 3.3-4.1: Black silty-SAND and ROOTS, some fine gravel, heavy staining, sheen, asphalt-like odor. (PID 70- >200). Rock in the tip of the sampler.	TR7#4A (0.0- 0.5) TR7#4A (3.6- 4.1)

Note
[1] Depth interval is in feet below the bottom of the riverbed.

Table 12
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR1#1A (0-0.5) 7/1/00	TR1#1B (4.5-5.0) 7/1/00	TR1#2A (0-0.5) 7/1/00	TR1#2B (3.0-4.0) 7/1/00	TR1#3A (0-0.5) 7/1/00	TR1#3B (2.0-2.5) 7/1/00	TR1#4A (0-0.5) 7/1/00	TR1#4B (1.5-1.9) 7/1/00
			Sample ID/Depth (ft)/Date							
Volatile Organic Compounds (VOCs) (mg/kg)										
Benzene	NLS	NLS	0.2 J	4.2 UJ	4.9 UJ	4.2 UJ	3.8 UJ	0.023 J	4.5 UJ	3.3 UJ
Toluene	NLS	NLS	0.53 J	4.2 UJ	4.9 UJ	0.2 J	0.19 J	0.037 J	4.5 UJ	3.3 UJ
Ethylbenzene	NLS	NLS	4.2 UJ	4.2 UJ	4.9 UJ	1.2 J	3.8 UJ	0.017 J	4.5 UJ	3.3 UJ
Xylene (total)	NLS	NLS	0.75 J	4.2 UJ	4.9 UJ	0.78 J	3.8 UJ	3.6 UJ	4.5 UJ	3.3 UJ
Styrene	NLS	NLS	4.2 UJ	4.2 UJ	4.9 UJ	4.2 UJ	3.8 UJ	0.033 J	4.5 UJ	3.3 UJ
Carbon Disulfide	NLS	NLS	0.74 J	0.49 J	0.29 J	0.86 J	3.8 UJ	3.6 UJ	1.8 J	3.3 UJ
Chloroform	NLS	NLS	4.2 UJ	4.2 UJ	4.9 UJ	4.2 UJ	3.8 UJ	3.6 UJ	4.5 UJ	3.3 UJ
Trichloroethene	NLS	NLS	4.2 UJ	4.2 UJ	4.9 UJ	4.2 UJ	3.8 UJ	3.6 UJ	4.5 UJ	3.3 UJ
2-Hexanone	NLS	NLS	4.2 UJ	4.2 UJ	4.9 UJ	4.2 UJ	3.8 UJ	3.6 UJ	4.5 UJ	0.43 J
Tetrachloroethene	NLS	NLS	4.2 UJ	4.2 UJ	4.9 UJ	4.2 UJ	3.8 UJ	0.028 J	4.5 UJ	3.3 UJ
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)										
Naphthalene	0.16	2.1	0.88 J	2.1 J	0.2 J	35	0.83 J	0.39 U	2.2 J	0.4 U
2-Methylnaphthalene	0.07	0.67	0.38 J	1.9 J	0.15 J	26	0.3 J	0.39 U	0.15 J	0.4 U
Acenaphthylene	0.044	0.64	0.68 J	0.92 J	0.57 J	7.7 J	1.4 J	0.39 U	0.35 J	0.006 J
Acenaphthene	0.016	0.5	1.2 U	2.8 J	0.87 J	57	0.33 J	0.39 U	0.15 J	0.4 U
Fluorene	0.019	0.54	1.1 J	1.7 J	0.42 J	30	1.26 J	0.39 U	0.19 J	0.4 U
Phenanthrene	0.24	1.5	8 J	6.1 J	3.8	110	1.9	0.004 J	1.8	0.005 J
Anthracene	0.0853	1.1	2.1 J	2.4 J	1.2 J	33	1.1 J	0.39 U	0.57 J	0.003 J
Fluoranthene	0.6	5.1	9.8	7.2 J	8.2	139	4.2	0.009 J	3	0.006 J
Pyrene	0.665	2.6	14 J	6.8 J	8.4	96	12	0.015 J	4.1	0.008 J
Benz(a)anthracene	0.261	1.6	6.2 J	3.6 J	3.4	17 J	3.4 J	0.006 J	1.8	0.4 U
Chrysene	0.384	2.8	5 J	4.1 J	4.1	16 J	3.8 J	0.005 J	1.8	0.004 J
Benzo(b)fluoranthene	NLS	NLS	4.6	2.8 J	2.9	8.5 J	2.4	0.004 J	1.3	0.007 J
Benzo(k)fluoranthene	NLS	NLS	3.9 J	2.6 J	2.6	8.2 J	2.8	0.39 U	1.5	0.007 J
Benzo(a)pyrene	0.43	1.6	4.9	3.9 J	3.3	14 J	3.5	0.005 J	1.7	0.009 J
Indeno(1,2,3-cd)pyrene	NLS	NLS	4.4 J	2.9 J	3	4.6 J	2.5	0.39 U	1.4	0.006 J
Dibenz(a,h)anthracene	0.0634	0.26	1.5 J	0.86 J	1.2 J	1.6 J	0.82 J	0.39 U	0.51 J	0.4 U
Benzo(g,h,i)perylene	NLS	NLS	5.4	3.6 J	3.6	6.1 J	3.1	0.39 U	1.7	0.007 J
Total PAHs	4.022	44.79	72.8	56.2	45.71	622.6	48.14	0.047	22.04	0.085
Other Semivolatile Organic Compounds (SVOCs) (mg/kg)										
Phenol	NLS	NLS	4.6 U	2.4 UJ	2.7 U	24 U	0.018 J	0.39 U	1.2 U	0.4 U
1,4-Dichlorobenzene	NLS	NLS	4.6 U	0.056 J	2.7 U	24 U	0.052 J	0.39 U	1.2 U	0.4 U
Benzyl alcohol	NLS	NLS	4.6 U	2.4 UJ	2.7 U	24 U	1.7 U	0.39 U	1.2 U	0.4 U
4-Methylphenol	NLS	NLS	0.083 J	2.4 UJ	0.18 J	24 U	0.042 J	0.39 U	0.04 J	0.4 U
Isophorone	NLS	NLS	4.6 U	2.4 UJ	2.7 U	24 U	1.7 U	0.39 U	1.2 U	0.4 U
Benzoic acid	NLS	NLS	22 U	2.4 UJ	13 U	120 U	8.1 U	1.9 U	5.8 U	1.9 U
4-Chloroaniline	NLS	NLS	4.6 U	0.34 J	0.084 J	0.47 J	1.7 U	0.39 U	1.2 U	0.4 U
4-Chloro-3-methylphenol	NLS	NLS	4.6 U	2.4 UJ	2.7 U	24 U	1.7 U	0.39 U	1.2 U	0.4 U
2-Chloronaphthalene	NLS	NLS	4.6 U	2.4 UJ	2.7 U	24 U	1.7 U	0.39 U	1.2 U	0.4 U
Dimethylphthalate	NLS	NLS	4.6 U	2.4 UJ	2.7 U	24 U	1.7 U	0.39 U	1.2 U	0.4 U

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Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	Sample ID/Depth (ft)/Date TR1#1A (0-0.5) 7/1/00	TR1#1B (4.5-5.0) 7/1/00	TR1#2A (0-0.5) 7/1/00	TR1#2B (3.0-4.0) 7/1/00	TR1#3A (0-0.5) 7/1/00	TR1#3B (2.0-2.5) 7/1/00	TR1#4A (0-0.5) 7/1/00	TR1#4B (1.5-1.9) 7/1/00
4-Nitrophenol	NLS	NLS	22 U	2.4 UJ	13 U	120 U	8.1 U	1.9 U	5.8 U	1.9 U
Dibenzofuran	NLS	NLS	0.48 J	0.78 J	0.19 J	6.9 J	0.2 J	0.39 U	0.12 J	0.4 U
Diethylphthalate	NLS	NLS	4.6 U	2.4 UJ	2.7 U	24 U	1.7 U	0.39 U	1.2 U	0.4 U
Carbazole	NLS	NLS	0.52 J	0.35 J	0.4 J	0.68 J	0.22 J	0.39 U	0.18 J	0.4 U
Di-n-butylphthalate	NLS	NLS	4.6 U	2.4 UJ	2.7 U	24 U	1.7 U	0.39 U	1.2 U	0.4 U
Butylbenzylphthalate	NLS	NLS	0.82 J	2.4 UJ	0.58 J	24 U	1.7 U	0.39 U	0.13 J	0.4 U
bis(2-Ethylhexyl)phthalate	NLS	NLS	18 J	19 J	13 B	17 J	5.6 B	0.39 U	4.4 B	0.4 U
Di-n-octylphthalate	NLS	NLS	0.84 J	0.35 J	0.78 J	24 U	1.7 U	0.39 U	0.2 J	0.4 U
Dioxin/Furans (mg/kg)										
Tetrachlorodibenzo-p-dioxin	NLS	NLS	1 U	0.89 U	1.3 U	0.68 U	0.71 U	0.58 U	1 U	0.57 U
Tetrachlorodibenzofuran	NLS	NLS	1 U	0.89 U	1.3 U	0.68 U	0.71 U	0.58 U	1 U	0.57 U
Hexachlorodibenzofuran	NLS	NLS	1 U	0.89 U	1.3 U	0.68 U	0.71 U	0.58 U	1 U	0.57 U
Pesticides (mg/kg)										
alpha-BHC	NLS	NLS	0.016 UJ	0.015 UJ	0.0062 UJ	0.016 UJ	0.004 UJ	0.002 UJ	0.003 UJ	0.0022 UJ
delta-BHC	NLS	NLS	0.016 UJ	0.015 UJ	0.0011 J	0.016 UJ	0.004 UJ	0.002 UJ	0.003 UJ	0.0022 UJ
Heptachlor	NLS	NLS	0.016 UJ	0.015 UJ	0.0062 UJ	0.016 UJ	0.004 UJ	0.002 UJ	0.003 UJ	0.0022 UJ
Aldrin	NLS	NLS	0.011 J	0.015 U	0.0064	0.016 J	0.0058	0.002 U	0.0038 J	0.0022 U
Heptachlor Epoxide	NLS	NLS	0.016 U	0.015 U	0.0062 U	0.016 U	0.004 U	0.002 U	0.003 U	0.0022 U
Endosulfan I	NLS	NLS	0.016 U	0.015 U	0.0062 U	0.016 U	0.003 J	0.002 U	0.003 U	0.0022 U
Dieldrin	0.00002	0.008	*0.032 UJ*	*0.029 UJ*	*0.012 UJ*	*0.031 UJ*	*0.0077 UJ*	*0.0038 UJ*	0.0027 J	*0.0042 UJ*
4,4'-DDE	0.0022	0.027	0.042 NJ	0.046 NJ	0.025 NJ	0.068 NJ	0.014 NJ	*0.0038 U*	0.018 NJ	*0.0042 U*
Endrin	NLS	NLS	0.0068 J	0.024 J	0.0027 J	0.028 J	0.0072 J	0.0038 U	0.0019 J	0.0042 U
Endosulfan II	NLS	NLS	0.032 U	0.029 U	0.012 U	0.031 U	0.0077 U	0.0038 U	0.0057 U	0.0042 U
4,4'-DDD	0.002	0.02	0.046 NJ	*0.029 UJ*	0.052 NJ	*0.031 UJ*	0.043 NJ	*0.0038 UJ*	0.028 NJ	*0.0042 UJ*
Endosulfan Sulfate	NLS	NLS	0.032 UJ	0.029 UJ	0.012 UJ	0.032 J	0.0077 UJ	0.0038 UJ	0.0057 UJ	0.0042 UJ
4,4'-DDT	0.001	0.007	0.014 J	R27	0.0052 J	0.036 J	R27	*0.0038 UJ*	R27	*0.0042 UJ*
alpha-Chlordane (a)	0.0005	0.006	0.062 J	0.067	0.023 J	0.046 J	0.0078 J	*0.002 U*	0.0068 J	*0.0022 U*
gamma-Chlordane (a)	0.0005	0.006	0.05	0.038	0.014 J	0.045	0.005	*0.002 U*	0.0062 J	*0.0022 U*
Polychlorinated Biphenyls (PCBs) (mg/kg)										
Aroclor-1242	NLS	NLS	0.063 UJ	0.22 J	0.045 J	0.23 J	0.038 J	0.038 UJ	0.029 J	0.042 UJ
Aroclor-1248	NLS	NLS	0.1 J	0.12 U	0.061 U	0.062 U	0.038 U	0.038 U	0.057 U	0.042 U
Aroclor-1254	NLS	NLS	0.21	0.12 U	0.061 U	0.25	0.086	0.038 U	0.057 U	0.042 U
Aroclor-1260	NLS	NLS	0.36 J	0.68 J	0.11 J	0.27 J	0.048 J	0.038 U	0.029 J	0.042 U
Total PCBs	0.0227	0.18	0.67	0.9	0.155	0.75	0.172	ND	0.058	ND
Inorganic Compounds (mg/kg)										
Aluminum	NLS	NLS	8160	13200	8900	12600	8170	18000	22200	14800
Antimony	NLS	NLS	1.3 UJ	1.2 UJ	1.1 UJ	0.94 UJ	6.6 UJ	0.42 UJ	21 J	0.48 UJ
Arsenic	8.2	70	7.2 J	12.3 J	7 J	11.8 J	85.4	41.6	329	8.4 J
Barium	NLS	NLS	126	188	125	165	119	80.4	176	40.5 J
Beryllium	NLS	NLS	0.51 J	0.77 J	0.52 J	0.87 J	0.49 J	1.2 J	1.3 J	0.74 J
Cadmium	1.2	9.6	4.8 J	14.2 J	4.3 J	6.8 J	3.2 J	0.4 J	2.1 J	0.23 UJ

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Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	Sample ID/Depth (ft)/Date							
			TR1#1A (0-0.5) 7/1/00	TR1#1B (4.5-5.0) 7/1/00	TR1#2A (0-0.5) 7/1/00	TR1#2B (3.5-4.0) 7/1/00	TR1#3A (0-0.5) 7/1/00	TR1#3B (2.0-2.5) 7/1/00	TR1#4A (0-0.5) 7/1/00	TR1#4B (1.5-1.9) 7/1/00
Calcium	NLS	NLS	4480	6370	3550	4800	3150	873 J	2470	884 J
Chromium	81	370	87.8 J	179 J	77.5 J	146 J	46.4 J	31.2 J	48.2 J	24.5 J
Cobalt	NLS	NLS	8.8 J	9.4 J	7.1 J	8.8 J	6.9 J	13.2 J	11.8 J	8.5 J
Copper	34	270	218 J	285 J	225 J	292 J	159 J	15.5 J	232 J	11.1 J
Iron	NLS	NLS	20700	26600	21300	25800	25400	38400	43600	26700
Lead	46.7	218	436	473	380	444	427	16.8	588	12.2
Magnesium	NLS	NLS	4560	5960	5140	6170	3410	8700	7810	6310
Manganese	NLS	NLS	171	289	179	216	157	252	295	278
Mercury	0.15	0.71	1.8 J	0.95 J	1.1 J	2.6 J	1.7 J	0.017 J	[illegible]	0.0087 J
Nickel	20.9	51.8	43.4 J	72.7	40.4 J	48.7 J	[illegible]	[illegible]	54.2 J	22.9 J
Potassium	NLS	NLS	1370 J	2190	1560 J	2320	1250	3140	3840	2510
Selenium	NLS	NLS	2.1 J	1.1 UJ	1.8 J	2 J	4.8 J	0.89 UJ	3.7 J	0.75 UJ
Silver	1	3.7	6.2 J	13.7 J	3.4 J	7.8 J	2.2 J	0.2 UJ	[illegible]	0.22 UJ
Sodium	NLS	NLS	5320	6260	7390	7730	3370	2740	6580	2490
Thallium	NLS	NLS	1.3 J	1.2 UJ	1.4 UJ	1.3 UJ	1.4 J	0.77 UJ	7.4 J	0.83 UJ
Vanadium	NLS	NLS	33.8 J	43 J	33.4 J	45 J	29.4 J	37.7 J	50.5 J	31.3 J
Zinc	150	410	494 J	599 J	498 J	604 J	515 J	78.2 J	310 J	60.2 U
Cyanide, Total	NLS	NLS	R8	R8	R8	R8	R8	R8	0.84 J	R8
			Total Organic Carbon (mg/kg)							
TOC	NLS	NLS	55800	47800	50800	76600	30400	2420	37400	1660

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Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR2#1A (0-0.5) 07/03/00	TR2#1B (2.8-3.2) 07/03/00	TR2#2A (0-0.5) 07/03/00	TR2#2B (1.3-1.8) 07/03/00	TR2#3A (0-0.5) 07/03/00	TR2#3B (3.5-4.0) 07/03/00	TR2#4A (0-0.5) 07/03/00	TR2#4B (0-0.5) 07/03/00
			Sample ID/Depth (ft)/Date							
Volatile Organic Compounds (VOCs) (mg/kg)										
Benzene	NLS	NLS	R7	R7	R7	R7	R7	R7	R7	R7
Toluene	NLS	NLS	0.21 J	0.069 J	0.1 J	0.093 J	0.12 J	0.55 J	R7	R7
Ethylbenzene	NLS	NLS	R7	0.43 J	R7	R7	R7	0.67 J	R7	R7
Xylene (total)	NLS	NLS	R7	0.1 J	4.7 UJ	R7	R7	0.7 J	R7	R7
Styrene	NLS	NLS	R7	R7	R7	R7	R7	R7	R7	R7
Carbon Disulfide	NLS	NLS	1.1 J	0.1 J	0.92 J	0.12 J	R7	R7	0.79 J	R7
Chloroform	NLS	NLS	R7	R7	R7	R	R7	R7	R7	R7
Trichloroethene	NLS	NLS	R7	R7	R7	R	R7	R7	R7	R7
2-Hexanone	NLS	NLS	R7	R7	R7	R	R7	R7	R7	R7
Tetrachloroethene	NLS	NLS	R7	R7	R7	R	R7	R7	R7	R7
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)										
Naphthalene	0.16	2.1	0.37 J	0.25 J	[illegible]	0.16 J	0.14 J	16	[illegible]	32
2-Methylnaphthalene	0.07	0.67	0.21 J	0.23 J	0.28 J	0.064 J	0.079 J	[illegible]	[illegible]	[illegible]
Acenaphthylene	0.044	0.64	0.39 J	0.94	[illegible]	0.28 J	[illegible]	[illegible]	[illegible]	0.88 J
Acenaphthene	0.016	0.5	0.82 J	0.5 J	0.48 J	0.11 J	[illegible]	[illegible]	[illegible]	3.2 J
Fluorene	0.019	0.54	0.81 J	0.48 J	0.44 J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Phenanthrene	0.24	1.5	3.7 J	2.4	3.9	[illegible]	2.5	[illegible]	[illegible]	[illegible]
Anthracene	0.0853	1.1	[illegible]	1.2	[illegible]	0.47 J	[illegible]	[illegible]	[illegible]	2.8 J
Fluoranthene	0.6	5.1	6.1 J	2.8	[illegible]	[illegible]	[illegible]	10	[illegible]	10
Pyrene	0.665	2.6	10 J	[illegible]	8.8 J	2.8	[illegible]	[illegible]	[illegible]	10
Benz(a)anthracene	0.261	1.6	3.2 J	[illegible]	2.7 J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chrysene	0.384	2.8	[illegible]	2.5	4.5 J	[illegible]	[illegible]	[illegible]	[illegible]	4.4
Benzo(b)fluoranthene	NLS	NLS	3.6 J	1.1 J	2.7 J	0.44 J	2.3 J	3.9 J	4.1 J	2.6 J
Benzo(k)fluoranthene	NLS	NLS	4.2 J	1.5 J	3 J	0.85 J	3.4 J	5.3 J	6.2 J	2.9 J
Benzo(a)pyrene	0.43	1.6	3.7 J	1.4 J	2.9 J	0.63 J	[illegible]	[illegible]	[illegible]	3.8 J
Indeno(1,2,3-cd)pyrene	NLS	NLS	2.7 J	1.2 J	2.2 J	0.47 J	2.8 J	4.5 J	3.9 J	3.2 J
Dibenz(a,h)anthracene	0.0634	0.26	1.2 J	0.52 J	0.8 J	0.14 U	1.2 J	[illegible]	1.8 J	1.1 J
Benzo(g,h,i)perylene	NLS	NLS	3.2 J	1.4 J	2.2 J	0.58 J	2.9 J	5.1 J	4.6 J	3.8 J
Total PAHs	4.022	44.79	49.7	25	40.96	10.664	[illegible]	[illegible]	[illegible]	100.43
Other Semivolatile Organic Compounds (SVOCs) (mg/kg)										
Phenol	NLS	NLS	7.1 U	0.79 U	4.3 U	0.76 U	1.7 U	4.5 U	6.3 U	4.4 U
1,4-Dichlorobenzene	NLS	NLS	7.1 U	0.79 U	4.3 U	0.76 U	1.7 U	4.6 U	6.3 U	4.4 U
Benzyl alcohol	NLS	NLS	7.1 U	0.79 U	4.3 U	0.76 U	1.7 U	4.5 U	6.3 U	4.4 U
4-Methylphenol	NLS	NLS	7.1 U	0.79 U	0.32 J	0.76 U	1.7 U	4.5 U	6.3 U	4.4 U
Isophorone	NLS	NLS	7.1 U	0.79 U	4.3 U	0.76 U	1.7 U	0.15 J	6.3 U	4.4 U
Benzoic acid	NLS	NLS	34 UJ	0.077 J	21 UJ	3.7 U	8.3 UJ	22 UJ	30 UJ	21 UJ
4-Chloroaniline	NLS	NLS	0.3 J	0.79 U	4.3 U	0.76 U	1.7 U	0.46 J	6.3 U	4.4 U
4-Chloro-3-methylphenol	NLS	NLS	7.1 U	0.79 U	4.3 U	0.76 U	1.7 U	4.5 U	6.3 U	4.4 U
2-Chloronaphthalene	NLS	NLS	7.1 U	0.79 U	4.3 U	0.76 U	1.7 U	4.5 U	6.3 U	4.4 U
Dimethylphthalate	NLS	NLS	7.1 U	0.79 U	4.3 U	0.76 U	1.7 U	4.5 U	6.3 U	4.4 U

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR2#1A (0-0.5) 07/03/00	TR2#1B (2.8-3.2) 07/03/00	TR2#2A (0-0.5) 07/03/00	TR2#2B (1.3-1.8) 07/03/00	TR2#3A (0-0.5) 07/03/00	TR2#3B (3.5-4.0) 07/03/00	TR2#4A (0-0.5) 07/03/00	TR2#4B (0-0.5) 07/03/00
			Sample ID/Depth (ft)/Date							
4-Nitrophenol	NLS	NLS	34 U	3.8 U	21 U	3.7 U	8.3 U	22 U	1.4 J	21 U
Dibenzofuran	NLS	NLS	0.2 J	0.29 J	0.23 J	0.083 J	0.13 J	1.7 J	0.21 J	1.8 J
Diethylphthalate	NLS	NLS	7.1 U	0.79 U	4.3 U	0.76 U	1.7 U	4.5 U	6.3 U	4.4 U
Carbazole	NLS	NLS	0.56 J	0.27 J	0.46 J	0.067 J	0.3 J	0.91 J	0.55 J	0.64 J
Di-n-butylphthalate	NLS	NLS	7.1 UJ	0.79 U	0.12 J	0.76 U	1.7 U	4.5 U	0.19 J	4.4 U
Butylbenzylphthalate	NLS	NLS	0.88 J	0.79 UJ	0.47 J	0.76 U	0.54 J	0.41 J	0.79 J	4.4 U
bis(2-Ethylhexyl)phthalate	NLS	NLS	37 J	0.64 J	18 J	2.2	8.5 J	30 J	27	12
Di-n-octylphthalate	NLS	NLS	1.7 J	0.79 UJ	18 J	0.76 UJ	0.65 J	0.49 J	1.3 J	0.17 J
Dioxin/Furans (mg/kg)										
Tetrachlorodibenzo-p-dioxin	NLS	NLS	1.5 U	0.59 U	0.76 U	0.00051 J	0.62 U	0.83 U	1.1 U	0.76 U
Tetrachlorodibenzofuran	NLS	NLS	1.5 U	0.59 U	0.76 U	0.00043 J	0.62 U	0.83 U	1.1 U	0.76 U
Hexachlorodibenzofuran	NLS	NLS	1.5 U	0.59 U	0.76 U	0.55 U	0.62 U	0.83 U	1.1 U	0.76 U
Pesticides (mg/kg)										
alpha-BHC	NLS	NLS	0.024 UJ	0.00044 J	0.005 UJ	0.002 UJ	0.0047 UJ	0.015 UJ	0.008 UJ	0.014 UJ
delta-BHC	NLS	NLS	0.024 UJ	0.0042 UJ	0.005 UJ	0.002 UJ	0.0047 UJ	0.015 UJ	0.008 UJ	0.014 UJ
Heptachlor	NLS	NLS	0.024 UJ	0.0042 UJ	0.005 UJ	0.002 UJ	0.0047 UJ	0.015 UJ	0.008 UJ	0.014 UJ
Aldrin	NLS	NLS	0.011 J	0.0028 J	0.0059 J	0.002 UJ	0.0027 J	0.0093 J	0.0064 J	0.013 J
Heptachlor Epoxide	NLS	NLS	0.024 UJ	0.0042 UJ	0.005 UJ	0.002 UJ	0.0047 UJ	0.015 UJ	0.008 UJ	0.014 UJ
Endosulfan I	NLS	NLS	0.024 UJ	0.004 J	0.005 UJ	0.002 UJ	0.0047 UJ	0.015 UJ	0.008 UJ	0.015 J
Dieldrin	0.00002	0.008	0.018 J	*0.0082 UJ*	0.0065 J	0.0016 J	0.0034 J	*0.029 UJ*	0.0079 J	*0.027 UJ*
4,4'-DDE	0.0022	0.027	0.074 NJ	0.0058 NJ	0.014 NJ	*0.0038 UJ*	*0.009 UJ*	0.034 NJ	0.045 NJ	0.059 NJ
Endrin	NLS	NLS	0.015 J	0.0082 UJ	0.0045 J	0.0034 J	0.0019 J	0.0071 J	0.0059 J	0.013 J
Endosulfan II	NLS	NLS	0.047 UJ	0.0082 UJ	0.0097 UJ	0.0038 UJ	0.009 UJ	0.029 UJ	0.016 UJ	0.027 UJ
4,4'-DDD	0.002	0.02	0.1 NJ	0.021 NJ	0.058 NJ	0.02 NJ	0.027 NJ	0.064 NJ	[illegible]	0.048 NJ
Endosulfan Sulfate	NLS	NLS	0.047 UJ	0.0082 UJ	0.0097 UJ	0.0018 J	0.009 UJ	0.029 UJ	0.016 UJ	0.027 UJ
4,4'-DDT	0.001	0.007	0.012 J	0.0086 J	0.017 J	0.0045 J	0.0032 J	0.0064 J	0.0065 J	0.022 J
alpha-Chlordane (a)	0.0005	0.006	0.053 J	0.034 J	0.028 J	0.0071 J	0.018 J	0.057 J	0.037 J	0.045 J
gamma-Chlordane (a)	0.0005	0.006	0.09 J	0.019 J	0.017 U	0.0043 J	0.0093 J	0.034 J	0.023 J	0.03 J
Polychlorinated Biphenyls (PCBs) (mg/kg)										
Aroclor-1242	NLS	NLS	0.47 UJ	0.082 UJ	0.097 UJ	0.038 UJ	0.045 UJ	0.29 UJ	0.18 UJ	0.27 UJ
Aroclor-1248	NLS	NLS	0.3 J	0.082 J	0.13 J	0.035 J	0.055 J	0.3	0.18 J	0.35 J
Aroclor-1254	NLS	NLS	0.47 U	0.05 J	0.097 U	0.038 U	0.045 U	0.29 U	0.18 U	0.27 U
Aroclor-1260	NLS	NLS	0.65 J	0.05 J	0.11 J	0.03 J	0.09 J	0.29 J	0.29 J	0.48 J
Total PCBs	0.0227	0.18	0.95	0.182	0.24	0.065	0.145	0.59	0.47	0.83
Inorganic Compounds (mg/kg)										
Aluminum	NLS	NLS	13800	7940	3320	9100	2310	8820	12200	6830
Antimony	NLS	NLS	2.4 UJ	0.47 UJ	0.69 UJ	0.34 UJ	1.4 UJ	0.53 UJ	0.78 UJ	0.66 UJ
Arsenic	8.2	70	11.7 J	5.0 J	2.5 J	2.0 J	2.8 J	9.6 J	11.6 J	8.1 J
Barium	NLS	NLS	199	80.1	64.5 J	26.5 J	59.9	153	141	107
Beryllium	NLS	NLS	0.76 J	0.49 J	0.16 J	0.51 J	0.10 J	0.52 J	0.71 J	0.37 J
Cadmium	1.2	9.6	6.3 J	4.2 J	1.6 J	0.78 J	1.7 J	9.2	5.0 J	6.2 J

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Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR2#1A (0-0.5) 07/03/00	TR2#1B (2.8-3.2) 07/03/00	TR2#2A (0-0.5) 07/03/00	TR2#2B (1.3-1.8) 07/03/00	TR2#3A (0-0.5) 07/03/00	TR2#3B (3.5-4.0) 07/03/00	TR2#4A (0-0.5) 07/03/00	TR2#4B (0-0.5) 07/03/00
			Sample ID/Depth (ft)/Date							
Calcium	NLS	NLS	6200	2340	1790	1400	1240 J	3010	5900	2720
Chromium	81	370	117 J	25.7	37.2	17.1	31.5	[illegible]	129	72.4
Cobalt	NLS	NLS	11.4 J	7.0 J	4.7 J	8.1 J	3.8 J	7.8 J	9.5 J	6.4 J
Copper	34	270	389	83.0	198	43.2	134	[illegible]	232	148
Iron	NLS	NLS	31000	18900	9460	14800	7880	19000	24300	14500
Lead	46.7	218	545	88.1	279	28.1	154	[illegible]	282	282
Magnesium	NLS	NLS	8150	3700	2320	4900	1700	3920	6740	3190
Manganese	NLS	NLS	274	216	103	173	74.1	198	295	161
Mercury	0.15	0.71	1.3	0.33	24.7	0.018	0.19	[illegible]	[illegible]	0.42
Nickel	20.9	51.6	57.4 J	22.6 J	28.7 J	27.8 J	22.8 J	74.3 J	[illegible] J	44.0 J
Potassium	NLS	NLS	2340 J	957 J	528 J	1530 J	330 J	1300 J	2380 J	901 J
Selenium	NLS	NLS	0.73 UJ	0.34 UJ	1.1 J	0.24 UJ	0.38 UJ	0.38 UJ	1.1 J	0.48 UJ
Silver	1	3.7	5.1 J	0.53 J	0.55 UJ	0.16 UJ	0.40 UJ	6.5 J	4.2 J	7.8 J
Sodium	NLS	NLS	14800	1930	2670	2020	1790	7450	8100	6070
Thallium	NLS	NLS	2.8 UJ	2.1 UJ	1.7 UJ	0.87 UJ	1.3 UJ	1.3 UJ	2.4 UJ	1.7 UJ
Vanadium	NLS	NLS	57.1 J	22.7 J	11.1 J	16.3 J	9.4 J	33.6 J	40.8 J	27.9 J
Zinc	150	410	733 J	101 J	198 J	68.4 J	185 J	171 J	293 J	292 J
Cyanide, Total	NLS	NLS	R8	R8	R8	R8	R8	R8	R8	R8
			Total Organic Carbon (mg/kg)							
TOC	NLS	NLS	90700	36100	17300	3310	8970	51400	52200	41200

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Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR3#1A (0-0.5) 7/3/00	TR3#1B (1.0-1.5) 7/3/00	TR3#2A (0-0.5) 7/3/00	TR3#2B (4.3-4.8) 07/03/00	TR3#3A (0-0.5) 06/30/00	TR3#3B (3.5-4.0) 06/30/00	TR3#4A (0-0.5) 06/30/00	TR3#4B (4.0-4.5) 06/30/00
			Sample ID/Depth (ft)/Date							
Volatile Organic Compounds (VOCs) (mg/kg)										
Benzene	NLS	NLS	R7	R7	R7	R7	3.4 UJ	4.6 UJ	6.3 UJ	4.5 UJ
Toluene	NLS	NLS	R7	R7	R7	0.066 J	0.21 J	4.6 UJ	6.3 UJ	0.24 J
Ethylbenzene	NLS	NLS	4.3 UJ	2.9 UJ	8.7 UJ	0.079 J	0.27 J	4.6 UJ	6.3 UJ	4.5 UJ
Xylene (total)	NLS	NLS	4.3 UJ	2.9 UJ	8.7 UJ	0.083 J	0.23 J	4.8 UJ	6.3 UJ	4.5 UJ
Styrene	NLS	NLS	4.3 UJ	2.9 UJ	8.7 UJ	R7	3.4 UJ	4.6 UJ	6.3 UJ	4.5 UJ
Carbon Disulfide	NLS	NLS	R7	R7	0.38 J	0.065 J	3.4 UJ	0.53 J	0.73 J	4.5 UJ
Chloroform	NLS	NLS	R7	R7	R7	R7	3.4 UJ	4.6 UJ	6.3 UJ	4.5 UJ
Trichloroethene	NLS	NLS	R7	R7	R1	R7	3.4 UJ	4.6 UJ	6.3 UJ	4.5 UJ
2-Hexanone	NLS	NLS	4.3 UJ	2.9 UJ	8.7 UJ	R7	3.4 UJ	4.8 UJ	6.3 UJ	4.5 UJ
Tetrachloroethene	NLS	NLS	4.3 UJ	2.9 UJ	8.7 UJ	R7	3.4 UJ	4.6 UJ	6.3 UJ	4.6 UJ
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)										
Naphthalene	0.16	2.1	0.12 J	0.008 J	0.43 J	0.86 J	14	16	6.3 J	0.86 J
2-Methylnaphthalene	0.07	0.67	0.074 J	0.005 J	0.4 J	0.46 J	18	4.8	0.63 J	0.57 J
Acenaphthylene	0.044	0.64	0.29 J	0.041 J	0.42 J	0.54 J	4.9 J	2.5	4.6 J	0.33 J
Acenaphthene	0.016	0.5	0.08 J	0.005 J	1.7 J	5.4	3.6 J	4.5	6.7	1.6 J
Fluorene	0.019	0.54	0.049 J	0.38 U	0.42 J	1.5	5.5	[illegible]	7.2	1.8 J
Phenanthrene	0.24	1.5	0.51 J	0.013 J	2.6 J	8.4	36	10	3.8	4.9
Anthracene	0.0853	1.1	0.27 J	0.019 J	1.5 J	[illegible]	4.4	3.3	12 J	1.6 J
Fluoranthene	0.6	5.1	1.8	0.032 J	7.1	14	32	26	13	4.9
Pyrene	0.665	2.6	2.6	0.17 J	7.8	7 J	23	24	16 J	9.2
Benz(a)anthracene	0.261	1.6	0.88	0.056 J	3 J	2.2 J	4.1 J	3.2	11 J	1.6 J
Chrysene	0.384	2.8	0.9	0.049 J	2.6 J	2.8 J	5.3 J	4.3	8.9 J	2.2
Benzo(b)fluoranthene	NLS	NLS	0.58 J	0.035 J	2.5 J	1.2 J	3.3 J	2.3 J	5.7 J	1.4 J
Benzo(k)fluoranthene	NLS	NLS	0.75 J	0.041 J	3 J	1.7 J	3.2 J	2.8	7.2 J	2.1 J
Benzo(a)pyrene	0.43	1.6	0.8 J	0.062 J	2.2 J	1.7 J	3.4 J	2.6	6.6 J	1.5 J
Indeno(1,2,3-cd)pyrene	NLS	NLS	0.66 J	0.03 J	1.8 J	1.2 J	2.5 J	1.8 J	4.7 J	0.95 J
Dibenz(a,h)anthracene	0.0634	0.26	0.23 J	0.011 J	0.52 J	0.43 J	0.93 J	0.55 J	1.2 J	0.3 J
Benzo(g,h,i)perylene	NLS	NLS	0.78 J	0.033 J	2.1 J	1.4 J	2.9 J	1.6 J	5 J	0.88 J
Total PAHs	4.022	44.79	11.563	0.81	41.88	42.34	168.53	75.85	109.43	30.71
Other Semivolatile Organic Compounds (SVOCs) (mg/kg)										
Phenol	NLS	NLS	0.84 U	0.003 J	6.9 U	1.6 U	3.8 U	2.6 U	6.7 U	2.5 U
1,4-Dichlorobenzene	NLS	NLS	0.84 U	0.38 U	6.9 U	1.6 U	3.8 U	2.6 U	6.7 U	2.5 U
Benzyl alcohol	NLS	NLS	0.84 U	0.38 U	6.9 U	1.6 U	3.8 U	2.6 U	6.7 U	2.5 U
4-Methylphenol	NLS	NLS	0.026 J	0.38 U	0.36 J	1.6 U	3.8 U	2.6 U	6.7 U	0.1 J
Isophorone	NLS	NLS	0.84 U	0.38 U	6.9 U	1.6 U	3.8 U	2.6 U	6.7 U	2.5 U
Benzoic acid	NLS	NLS	4.1 U	1.8 UJ	34 U	7.6 UJ	18 U	13 U	33 U	12 U
4-Chloroaniline	NLS	NLS	0.84 U	0.38 U	0.73 J	1.6 U	0.66 J	0.75 J	0.56 J	0.54 J
4-Chloro-3-methylphenol	NLS	NLS	0.84 U	0.38 U	6.9 U	1.6 U	3.8 U	2.6 U	6.7 U	2.5 U
2-Chloronaphthalene	NLS	NLS	0.84 U	0.38 U	6.9 U	1.6 U	3.8 U	0.094 J	6.7 U	2.5 U
Dimethylphthalate	NLS	NLS	0.84 U	0.38 U	6.9 U	1.6 U	3.8 U	2.6 U	6.7 U	2.5 U

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR3#1A (0-0.5) 7/3/00	TR3#1B (1.0-1.5) 7/3/00	TR3#2A (0-0.5) 7/3/00	TR3#2B (4.3-4.8) 07/03/00	TR3#3A (0-0.5) 06/30/00	TR3#3B (3.5-4.0) 06/30/00	TR3#4A (0-0.5) 06/30/00	TR3#4B (4.0-4.5) 06/30/00
			Sample ID/Depth (ft)/Date							
4-Nitrophenol	NLS	NLS	4.1 U	1.8 U	34 U	7.6 U	18 U	13 U	33 U	12 U
Dibenzofuran	NLS	NLS	0.046 J	0.38 U	0.8 J	0.48 J	3.2 J	1.8 J	1.7 J	0.74 J
Diethylphthalate	NLS	NLS	0.84 U	0.38 U	6.9 U	1.6 U	3.8 U	2.6 U	6.7 U	2.5 U
Carbazole	NLS	NLS	0.059 J	0.38 U	0.35 J	0.17 J	0.91 J	0.63 J	0.68 J	0.23 J
Di-n-butylphthalate	NLS	NLS	0.84 U	0.38 U	6.9 U	1.6 U	3.8 U	2.6 U	6.7 U	2.5 U
Butylbenzylphthalate	NLS	NLS	0.068 J	0.38 U	0.68 J	1.6 UJ	3.8 UJ	0.11 J	1.1 J	0.31 J
bis(2-Ethylhexyl)phthalate	NLS	NLS	2.5 B	0.38 U	40 B	3.7 J	15 J	7.3 B	40 J	10 B
Di-n-octylphthalate	NLS	NLS	0.06 J	0.38 U	1.6 J	1.6 UJ	0.4 J	0.23 J	1.5 J	0.6 J
Dioxin/Furans (mg/kg)										
Tetrachlorodibenzo-p-dioxin	NLS	NLS	0.6 U	0.57 U	1.1 U	0.71 U	0.00071 U	0.00096 U	0.0013 U	0.00088 U
Tetrachlorodibenzofuran	NLS	NLS	0.6 U	0.57 U	1.1 U	0.71 U	0.00071 U	0.00096 U	0.0013 U	0.00088 U
Hexachlorodibenzofuran	NLS	NLS	0.6 U	0.57 U	1.1 U	0.71 U	0.00071 U	0.0043	0.0013 U	0.00088 U
Pesticides (mg/kg)										
alpha-BHC	NLS	NLS	0.0021 UJ	0.0019 UJ	0.0081 UJ	0.002 UJ	0.0051 UJ	0.0068 UJ	0.0081 UJ	0.0062 UJ
delta-BHC	NLS	NLS	0.00044 J	0.0019 UJ	0.014 J	0.002 UJ	0.0051 UJ	0.0068 UJ	0.0081 UJ	0.0062 UJ
Heptachlor	NLS	NLS	0.0021 UJ	0.0019 UJ	0.01 J	0.002 UJ	0.0051 UJ	0.0068 UJ	0.0081 UJ	0.0062 UJ
Aldrin	NLS	NLS	0.0016 J	0.0019 U	0.01 J	0.002 UJ	0.0051 U	0.0068 U	0.0081 U	0.0062 U
Heptachlor Epoxide	NLS	NLS	0.0021 U	0.0019 U	0.0081 U	0.002 UJ	0.0051 U	0.0068 U	0.0081 U	0.0062 U
Endosulfan I	NLS	NLS	0.0021 U	0.0019 U	0.0081 U	0.002 UJ	0.0051 UJ	0.0068 UJ	0.0081 UJ	0.0066 J
Dieldrin	0.00002	0.008	*0.0041 UJ*	*0.0038 UJ*	*0.016 UJ*	*0.0039 UJ*	*0.0098 UJ*	*0.013 UJ*	*0.016 UJ*	*0.012 UJ*
4,4'-DDE	0.0022	0.027	0.0041 NJ	*0.0038 U*	0.057 NJ	*0.0039 UJ*	*0.0098 UJ*	0.037	0.016 UJ	0.08 NJ
Endrin	NLS	NLS	0.00051 J	0.0038 U	0.016 U	0.0039 UJ	0.0084 J	0.0083 J	0.01 J	0.012 J
Endosulfan II	NLS	NLS	0.0041 U	0.0038 U	0.016 U	0.0039 UJ	0.0098 U	0.013 U	0.016 U	0.012 U
4,4'-DDD	0.002	0.02	0.0041 NJ	*0.0038 UJ*	*0.016 UJ*	*0.0039 UJ*	0.038 NJ	0.049 NJ	0.08 NJ	0.062 NJ
Endosulfan Sulfate	NLS	NLS	0.0041 UJ	0.0038 UJ	0.016 UJ	0.0039 UJ	0.0098 U	0.013 U	0.016 U	0.012 U
4,4'-DDT	0.001	0.007	R	*0.0038 UJ*	R	*0.0039 UJ*	R	R	R	R
alpha-Chlordane (a)	0.0005	0.006	0.0045 J	*0.0019 U*	0.052 J	*0.002 UJ*	0.033 J	0.034 J	0.037 J	0.055 J
gamma-Chlordane (a)	0.0005	0.006	0.0026 J	*0.0019 U*	0.035 J	*0.002 UJ*	0.023 J	0.024 J	0.024 J	0.037 J
Polychlorinated Biphenyls (PCBs) (mg/kg)										
Aroclor-1242	NLS	NLS	0.019 J	0.038 UJ	0.29 J	0.039 UJ	0.098 U	0.13 U	0.16 U	0.41 J
Aroclor-1248	NLS	NLS	0.041 U	0.038 U	0.078 U	0.039 U	0.18 J	0.31 J	0.29	0.12 U
Aroclor-1254	NLS	NLS	0.024 J	0.038 U	0.33 J	0.039 U	0.098 U	0.13 U	0.16 U	0.12 U
Aroclor-1260	NLS	NLS	0.016 J	0.038 U	0.44 J	0.039 UJ	0.43 J	0.46 J	0.96 J	0.7 J
Total PCBs	0.0227	0.18	0.057	ND	1.06	ND	0.61	0.77	1.25	1.11
Inorganic Compounds (mg/kg)										
Aluminum	NLS	NLS	4930	2960	17900	5130	7570	9140	9750	13700
Antimony	NLS	NLS	0.51 UJ	0.42 UJ	2 UJ	0.48 UJ	1.5 UJ	0.81 UJ	0.91 UJ	2.3 UJ
Arsenic	8.2	70	5.4 J	0.85 J	18 J	5.1 J	6.6	10.3	8.4	10.2
Barium	NLS	NLS	85.9	5.2 B	251	56.4	106	168	131	240
Beryllium	NLS	NLS	0.3 J	0.18 J	0.97 J	0.45 J	0.82 U	0.87 U	1.1 U	1.2 J
Cadmium	1.2	9.6	3.8 J	0.12 UJ	8.8 J	1.4 J	7.4	8.0	4.7	8.8

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Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR3#1A (0-0.5) 7/3/00	TR3#1B (1.0-1.5) 7/3/00	TR3#2A (0-0.5) 7/3/00	TR3#2B (4.3-4.8) 07/03/00	TR3#3A (0-0.5) 06/30/00	TR3#3B (3.5-4.0) 06/30/00	TR3#4A (0-0.5) 06/30/00	TR3#4B (4.0-4.5) 06/30/00
			Sample ID/Depth (ft)/Date							
Calcium	NLS	NLS	1220	146 J	6720	4140	2190	3740	4710	5000
Chromium	81	370	40 J	4.7 J	218 J	29.2	67.1	[illegible]	79.5	130
Cobalt	NLS	NLS	3.3 J	1.2 J	12.4 J	5.9 J	5.7 J	6.9 J	7.2 J	9.8 J
Copper	34	270	230 J	2.8 J	420 J	92.8	149	[illegible]	272	394
Iron	NLS	NLS	11800	5140	37000	13100	16700	22900	28200	28600
Lead	46.7	218	278	3.7	888	111	384	[illegible]	414	870
Magnesium	NLS	NLS	1750	266 J	8800	3840	2720	4370	5830	8300
Manganese	NLS	NLS	83.3	16.7	397	148	123	177	201	276
Mercury	0.15	0.71	0.2 J	0.0083 J	3.2 J	0.79	[illegible]	[illegible]	[illegible]	3.0 J
Nickel	20.9	51.6	27.8 J	3 J	68.5 J	23.2 J	60.6	[illegible]	40.9	85.8
Potassium	NLS	NLS	484 J	135 U	2970	601 J	1020 J	1560 J	1610 J	1960 J
Selenium	NLS	NLS	0.76 UJ	0.68 UJ	2.6 J	0.74 J	1.6 U	2.3 U	0.75 U	1.6 U
Silver	1	3.7	8.3 J	0.2 UJ	11.7 J	0.84 J	8.3 J	[illegible]	5.5 J	5.7 J
Sodium	NLS	NLS	2160	1010	7460	1180	2710 J	6300 J	6260 J	1880 J
Thallium	NLS	NLS	0.85 UJ	0.76 UJ	1.7 J	1.2 UJ	1.6 U	1.5 U	4.6 U	2.8 U
Vanadium	NLS	NLS	19.4 J	7.8 J	59.5 J	19.3 J	32.9	35.4	39.0	47.4
Zinc	150	410	220 J	13.1 UJ	834 J	158 J	[illegible]	[illegible]	579	599
Cyanide, Total	NLS	NLS	R	R	R	R	R	R	R	R
Total Organic Carbon (mg/kg)										
TOC	NLS	NLS	1380	1130	51600	28500	38000	63000	57800	61400

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Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR4#1A (0-0.5) 06/29/00	TR4#1B (4.5-5.0) 06/29/00	TR4#2A (0-0.5) 06/29/00	TR4#2B (4.0-4.5) 06/29/00	TR4#3A (0-0.5) 06/30/00	TR4#3B (2.5-3.0) 06/30/00	TR4#4A (0-0.5) 6/30/00	TR4#4B (2.0-2.5) 06/30/00
			Sample ID/Depth (ft)/Date							
Volatile Organic Compounds (VOCs) (mg/kg)										
Benzene	NLS	NLS	5.4 UJ	5 UJ	4.1 UJ	3 U	4.7 UJ	3.4 UJ	5.3 UJ	2.8 U
Toluene	NLS	NLS	0.25 J	0.72 J	0.4 J	0.28 J	4.7 UJ	0.51 J	5.3 UJ	0.13 J
Ethylbenzene	NLS	NLS	5.4 UJ	5 UJ	4.1 UJ	3 U	4.7 UJ	3.4 UJ	5.3 UJ	2.8 U
Xylene (total)	NLS	NLS	5.4 UJ	5 UJ	4.1 UJ	3 U	4.7 UJ	3.4 UJ	5.3 UJ	2.8 U
Styrene	NLS	NLS	5.4 UJ	5 UJ	4.1 UJ	3 U	4.7 UJ	3.4 UJ	5.3 UJ	2.8 U
Carbon Disulfide	NLS	NLS	1.2 J	5 UJ	4.1 UJ	3 U	4.7 UJ	0.27 J	0.81 J	2.8 U
Chloroform	NLS	NLS	0.059 J	5 UJ	4.1 UJ	3 U	4.7 UJ	3.4 UJ	5.3 UJ	2.8 U
Trichloroethene	NLS	NLS	5.4 UJ	5 UJ	4.1 UJ	3 U	0.28 J	3.4 UJ	5.3 UJ	2.8 U
2-Hexanone	NLS	NLS	5.4 U	5 UJ	4.1 UJ	3 UJ	4.7 UJ	3.4 UJ	5.3 UJ	2.8 U
Tetrachloroethene	NLS	NLS	5.4 U	5 UJ	4.1 UJ	3 U	0.13 J	3.4 UJ	5.3 UJ	2.8 U
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)										
Naphthalene	0.16	2.1	0.18 J	0.25 J	1.1 J	2.7 J	64	[illegible]	0.37 J	0.54 J
2-Methylnaphthalene	0.07	0.67	0.13 J	0.21 J	1.1 J	4.4	[illegible]	[illegible]	[illegible]	0.26 J
Acenaphthylene	0.044	0.64	[illegible]	0.83 J	1.2 J	0.8 J	[illegible]	[illegible]	[illegible]	0.65 J
Acenaphthene	0.016	0.5	[illegible]	1.8 J	2.1 J	3.5	16	[illegible]	6.9 J	0.38 J
Fluorene	0.019	0.54	0.32 J	1.1 J	1.8 J	4.1	13	3.4	0.99 J	0.92 J
Phenanthrene	0.24	1.5	3.4	8.5	14	18	[illegible]	[illegible]	8.4	2.4
Anthracene	0.0853	1.1	[illegible]	2.1 J	3.3 J	4.4	[illegible]	[illegible]	1.6 J	[illegible]
Fluoranthene	0.6	5.1	5	8.9	14	11	[illegible]	[illegible]	[illegible]	3
Pyrene	0.665	2.6	3.6 J	11	10 J	17 J	[illegible]	[illegible]	[illegible]	2.6 J
Benz(a)anthracene	0.261	1.6	2.6 J	4.6 J	6.1 J	[illegible]	[illegible]	[illegible]	[illegible]	1.2 J
Chrysene	0.384	2.8	4	5.5	16	[illegible]	8.8 J	4.7	[illegible]	2.4 J
Benzo(b)fluoranthene	NLS	NLS	2.5 J	3.4 J	8.3	3.7 J	4.9 J	3.5	3.8 J	1.4 J
Benzo(k)fluoranthene	NLS	NLS	2.6 J	4.6 J	6.3	6 J	6.2 J	4.8	4.4 J	1.8 J
Benzo(a)pyrene	0.43	1.6	2.7 J	3.9 J	7	6.2 J	8.3 J	4.4	4.3 J	1.8 J
Indeno(1,2,3-cd)pyrene	NLS	NLS	2.8 J	4.2 J	7	4.4 J	5.1 J	3.8	3.5 J	1.5 J
Dibenz(a,h)anthracene	0.0634	0.26	0.96 J	1.6 J	2.5 J	1.6 J	[illegible]	[illegible]	[illegible]	0.32 J
Benzo(g,h,i)perylene	NLS	NLS	3 J	5.1 J	7.5	5.2 J	5.7 J	4.3	3.8 J	1.7 J
Total PAHs	4.022	44.79	38.37	66.03	112.8	104.2	234.8	[illegible]	[illegible]	27.24
Other Semivolatile Organic Compounds (SVOCs) (mg/kg)										
Phenol	NLS	NLS	3.2 U	5.2 U	0.18 J	3.3 U	10 U	3.3 U	0.078 J	0.81 U
1,4-Dichlorobenzene	NLS	NLS	3.2 U	5.2 U	0.46 J	3.3 U	10 U	0.24 J	4.6 UJ	0.81 U
Benzyl alcohol	NLS	NLS	3.2 U	5.2 U	4.7 U	3.3 U	10 U	3.3 U	4.6 UJ	0.81 U
4-Methylphenol	NLS	NLS	0.21 J	5.2 U	0.36 J	0.17 J	10 U	3.3 U	0.23 J	0.036 J
Isophorone	NLS	NLS	3.2 U	5.2 U	4.7 U	3.3 U	10 U	3.3 U	4.6 UJ	0.81 U
Benzoic acid	NLS	NLS	16 U	25 U	23 U	16 U	48 U	16 U	22 UJ	0.12 J
4-Chloroaniline	NLS	NLS	3.2 U	5.2 U	4.7 U	0.34 J	0.99 J	3.3 U	4.6 UJ	0.81 U
4-Chloro-3-methylphenol	NLS	NLS	3.2 U	5.2 U	4.7 U	3.3 U	10 U	3.3 U	4.6 UJ	0.81 U
2-Chloronaphthalene	NLS	NLS	3.2 U	5.2 U	4.7 U	3.3 U	10 U	3.3 U	4.6 UJ	0.81 U
Dimethylphthalate	NLS	NLS	3.2 U	5.2 U	4.7 U	3.3 U	10 U	3.3 U	4.6 UJ	0.81 U

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR4#1A (0-0.5) 06/29/00	TR4#1B (4.5-5.0) 06/29/00	TR4#2A (0-0.5) 06/29/00	TR4#2B (4.0-4.5) 06/29/00	TR4#3A (0-0.5) 06/30/00	TR4#3B (2.5-3.0) 06/30/00	TR4#4A (0-0.5) 6/30/00	TR4#4B (2.0-2.5) 06/30/00
			Sample ID/Depth (ft)/Date							
4-Nitrophenol	NLS	NLS	16 U	25 U	23 U	16 U	48 U	16 U	22 U	3.9 U
Dibenzofuran	NLS	NLS	0.16 J	0.42 J	1.1 J	1.7 J	7.9 J	0.8 J	0.22 J	0.16 J
Diethylphthalate	NLS	NLS	3.2 U	5.2 U	4.7 U	3.3 U	10 U	3.3 U	4.6 U	0.81 U
Carbazole	NLS	NLS	0.42 J	0.72 J	1.6 J	1.5 J	1.9 J	0.72 J	0.47 J	0.12 J
Di-n-butylphthalate	NLS	NLS	3.2 U	5.2 U	4.7 U	3.3 U	10 U	3.3 U	4.6 U	0.81 U
Butylbenzylphthalate	NLS	NLS	0.46 J	0.71 J	0.65 J	3.3 UJ	10 U	3.3 U	0.82 J	0.81 UJ
bis(2-Ethylhexyl)phthalate	NLS	NLS	18 J	21 B	17 J	12 J	16 B	3.3 U	23 B	0.74 J
Di-n-octylphthalate	NLS	NLS	0.91 J	0.78 J	1.5 J	0.21 J	0.41 J	3.3 U	1.1 J	0.81 UJ
Dioxin/Furans (mg/kg)										
Tetrachlorodibenzo-p-dioxin	NLS	NLS	0.0013 U	0.00094 U	0.00082 U	0.00088 U	0.00077 U	0.00088 U	0.0012 U	0.00062 U
Tetrachlorodibenzofuran	NLS	NLS	0.0013 U	0.00094 U	0.00082 U	0.00088 U	0.00077 U	0.00088 U	0.0012 U	0.00062 U
Hexachlorodibenzofuran	NLS	NLS	0.0013 U	0.00059 J	0.00082 U	0.0024 J	0.00077 U	0.0011	0.0012 U	0.00062 U
Pesticides (mg/kg)										
alpha-BHC	NLS	NLS	0.0012 J	0.0064 UJ	0.014 UJ	0.0045 UJ	0.0054 UJ	0.022 UJ	0.018 UJ	0.021 UJ
delta-BHC	NLS	NLS	0.0074 UJ	0.0064 UJ	0.014 UJ	0.0045 UJ	0.0054 UJ	0.022 UJ	0.018 UJ	0.021 UJ
Heptachlor	NLS	NLS	0.0074 U	0.0064 UJ	0.014 UJ	0.0045 UJ	0.0054 UJ	0.022 UJ	0.018 UJ	0.021 UJ
Aldrin	NLS	NLS	0.0074 U	0.0064 U	0.014 U	0.012 J	0.0054 U	0.0084 J	0.018	0.021 U
Heptachlor Epoxide	NLS	NLS	0.0074 U	0.0064 U	0.014 U	0.0045 U	0.0054 U	0.022 U	0.018 U	0.021 U
Endosulfan I	NLS	NLS	0.0074 UJ	0.0064 UJ	0.014 UJ	0.0045 UJ	0.004 J	0.022 UJ	0.018 U	0.021 UJ
Dieldrin	0.00002	0.008	0.0093 J	0.0088 J	0.01 J	0.0064 J	0.012 J	*0.042 UJ*	*0.034 UJ*	*0.041 UJ*
4,4'-DDE	0.0022	0.027	*0.014 UJ*	*0.012 UJ*	*0.027 UJ*	*0.0087 UJ*	*0.01 UJ*	*0.042 UJ*	0.069 NJ	*0.041 UJ*
Endrin	NLS	NLS	0.0054 J	0.0062 J	0.0066 J	0.0048 J	0.019 J	0.042 UJ	0.0057 J	0.007 J
Endosulfan II	NLS	NLS	0.014 U	0.012 U	0.027 U	0.0087 U	0.01 U	0.042 U	0.034 U	0.041 U
4,4'-DDD	0.002	0.02	0.066 NJ	0.075 NJ	0.05 NJ	0.092 NJ	0.11 NJ	0.056 NJ	0.086 NJ	0.096 NJ
Endosulfan Sulfate	NLS	NLS	0.014 U	0.012 U	0.027 U	0.0087 U	0.01 U	0.042 U	0.034 UJ	0.041 U
4,4'-DDT	0.001	0.007	R	R	R	R	R	R	0.019 J	R
alpha-Chlordane (a)	0.0005	0.006	0.045 J	0.046 J	0.046 J	0.026 J	0.032 J	0.01 J	0.071 J	0.0066 J
gamma-Chlordane (a)	0.0005	0.006	0.028 J	0.029 J	0.033 J	0.016 J	0.022 J	0.0076 J	0.04 J	0.0025 J
Polychlorinated Biphenyls (PCBs) (mg/kg)										
Aroclor-1242	NLS	NLS	0.14 U	0.12 U	0.11 U	0.23 J	0.31 J	0.32 J	0.088 UJ	0.081 U
Aroclor-1248	NLS	NLS	0.25 J	0.33 J	0.3 J	0.087 U	0.26 U	0.21 U	0.15	0.092
Aroclor-1254	NLS	NLS	0.14 U	0.12 U	0.11 U	0.087 U	0.26 U	0.21 U	0.26	0.081 U
Aroclor-1260	NLS	NLS	0.39 J	0.54 J	0.37 J	0.19 J	0.56 J	0.071 J	0.35 J	0.098 J
Total PCBs	0.0227	0.18	0.64	0.87	0.67	0.42	0.82	[illegible]	0.76	0.19
Inorganic Compounds (mg/kg)										
Aluminum	NLS	NLS	10000	10800	9730	2900	4590	2140	15400	6350
Antimony	NLS	NLS	0.74 UJ	1.3 UJ	1.5 UJ	0.46 UJ	0.64 UJ	0.63 UJ	1.4 UJ	9.7 J
Arsenic	8.2	70	8.6	20 J	7.5	3.3	7.9	2.7	12.6 J	5.2
Barium	NLS	NLS	120	196	160	62.2	171	56.8	209	94.6
Beryllium	NLS	NLS	1.1 U	1.2 J	1.0 U	0.46 U	0.67 U	0.38 U	0.85 J	0.59 U
Cadmium	1.2	9.6	3.4	5.6	18.0	6.6	5.4	3.5	7.2 J	0.70 J

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	Sample ID/Depth (ft)/Date							
			TR4#1A (0-0.5) 08/29/00	TR4#1B (4.5-5.0) 08/29/00	TR4#2A (0-0.5) 08/29/00	TR4#2B (4.0-4.5) 08/29/00	TR4#3A (0-0.5) 08/30/00	TR4#3B (2.5-3.0) 08/30/00	TR4#4A (0-0.5) 8/30/00	TR4#4B (2.0-2.5) 08/30/00
Calcium	NLS	NLS	3280	5300	4930	1890	2200	1120	5120	1250
Chromium	81	370	74.4	114	118	48.8	[illegible]	42.2	[illegible]	30.9
Cobalt	NLS	NLS	6.6 J	8.2 J	7.1 J	3.4 J	4.5 J	2.8 J	10.6 J	3.9 J
Copper	34	270	232	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	77.1
Iron	NLS	NLS	22500	33000	22100	8770	14200	5590	30100	12800
Lead	46.7	218	[illegible]	520	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Magnesium	NLS	NLS	5570	4500	4640	1480	2840	1030	7560	2180
Manganese	NLS	NLS	172	230	242	75.5	140	64.2	286	129
Mercury	0.15	0.71	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nickel	20.9	51.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15.6
Potassium	NLS	NLS	1690 J	1360 J	1580 J	405 J	842 J	287 J	2740	851 J
Selenium	NLS	NLS	1.7 U	2.9 U	2.4 U	0.91 U	1.9 U	0.73 U	1.9 J	1.0 U
Silver	1	3.7	[illegible]	6.9 J	[illegible]	[illegible]	[illegible]	0.86 J	[illegible]	[illegible]
Sodium	NLS	NLS	6970 J	345 J	5780 J	978 J	3820 J	1260 J	8480	1870 J
Thallium	NLS	NLS	5.0 U	2.0 U	1.5 U	1.2 U	1.6 U	1.8 U	1.6 UJ	2.5 U
Vanadium	NLS	NLS	35.7	40.4	39.1	16.5	21.0	8.0 J	52.3 J	16.7
Zinc	150	410	462	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	128
Cyanide, Total	NLS	NLS	R8	1.34 J	R8	R8	R8	R8	R8	R8
Total Organic Carbon (mg/kg)										
TOC	NLS	NLS	68800	32400	92400	31200	128000	29600	58200	27600

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR5#1A (0.3-0.8) 06/29/00	TR5#1B (4.5-6.0) 06/29/00	TR5#2A (0-0.5) 06/29/00	TR5#2B (2.3-2.8) 06/29/00	TR5#3A (0-0.5) 06/29/00	TR5#3B (1.0-1.5) 06/29/00	TR5#4A (0-0.5) 06/29/00	TR5#4B (1.0-1.5) 06/29/00
			Sample ID/Depth (ft)/Date							
Volatile Organic Compounds (VOCs) (mg/kg)										
Benzene	NLS	NLS	0.36 J	4.6 UJ	5.2 UJ	0.62 J	3.9 UJ	3.7 UJ	4 UJ	3 UJ
Toluene	NLS	NLS	3.5 UJ	4.6 UJ	5.2 UJ	1 J	3.9 UJ	0.31 J	4 UJ	3 UJ
Ethylbenzene	NLS	NLS	3.5 UJ	1.5 J	0.67 J	25 J	3.9 UJ	3.7 UJ	4 UJ	3 UJ
Xylene (total)	NLS	NLS	3.5 UJ	2.3 J	0.4 J	14 J	3.9 UJ	3.7 UJ	4 UJ	3 UJ
Styrene	NLS	NLS	3.5 UJ	4.6 UJ	5.2 UJ	9.4 UJ	3.9 UJ	3.7 UJ	4 UJ	3 UJ
Carbon Disulfide	NLS	NLS	3.5 UJ	0.24 J	5.2 UJ	9.4 UJ	0.4 J	3.7 UJ	0.55 J	3 UJ
Chloroform	NLS	NLS	0.053 J	4.6 UJ	5.2 UJ	9.4 UJ	3.9 UJ	3.7 UJ	4 UJ	3 UJ
Trichloroethene	NLS	NLS	3.5 UJ	4.6 UJ	5.2 UJ	9.4 UJ	3.9 UJ	3.7 UJ	4 UJ	3 UJ
2-Hexanone	NLS	NLS	3.5 UJ	4.6 UJ	5.2 UJ	9.4 UJ	3.9 UJ	3.7 UJ	4 UJ	3 UJ
Tetrachloroethene	NLS	NLS	3.5 UJ	4.6 UJ	5.2 UJ	9.4 UJ	3.9 UJ	3.7 UJ	4 UJ	3 UJ
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)										
Naphthalene	0.16	2.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2-Methylnaphthalene	0.07	0.67	[illegible]	14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Acenaphthylene	0.044	0.64	[illegible]	[illegible]	7.7 J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Acenaphthene	0.016	0.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fluorene	0.019	0.54	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Phenanthrene	0.24	1.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Anthracene	0.0853	1.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fluoranthene	0.6	5.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pyrene	0.665	2.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benz(a)anthracene	0.261	1.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chrysene	0.384	2.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(b)fluoranthene	NLS	NLS	2.1 J	4.1 J	5.3 J	12 J	0.92 J	2.7 J	2 J	0.38 J
Benzo(k)fluoranthene	NLS	NLS	2.8 J	6.7 J	7 J	14 J	1.5 J	4.3 J	2.1 J	0.49
Benzo(a)pyrene	0.43	1.6	[illegible]	[illegible]	[illegible]	16 J	[illegible]	[illegible]	[illegible]	[illegible]
Indeno(1,2,3-cd)pyrene	NLS	NLS	2.4 J	4.7 J	4.3 J	9.1 J	1.3 J	3 J	1.8 J	0.42
Dibenz(a,h)anthracene	0.0634	0.26	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(g,h,i)perylene	NLS	NLS	2.8 J	5.8 J	5.3 J	12 J	1.6 J	3.8 J	1.7 J	0.51
Total PAHs	4.022	44.79	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Other Semivolatile Organic Compounds (SVOCs) (mg/kg)										
Phenol	NLS	NLS	2.3 U	6.3 U	16 U	29 U	1.7 U	3.7 U	2.2 U	0.4 U
1,4-Dichlorobenzene	NLS	NLS	2.3 U	6.3 U	16 U	29 U	1.7 U	3.7 U	2.2 U	0.4 U
Benzyl alcohol	NLS	NLS	2.3 U	6.3 U	16 U	29 U	1.7 U	3.7 U	2.2 U	0.4 U
4-Methylphenol	NLS	NLS	2.3 U	6.3 U	16 U	29 U	1.7 U	3.7 U	0.32 J	0.4 U
Isophorone	NLS	NLS	2.3 U	6.3 U	16 U	29 U	1.7 U	3.7 U	2.2 U	0.4 U
Benzoic acid	NLS	NLS	11 U	31 U	78 U	140 U	8.3 U	18 U	11 UJ	1.9 U
4-Chloroaniline	NLS	NLS	2.3 U	1.2 J	0.51 J	1.5 J	1.7 U	0.2 J	0.08 J	0.4 U
4-Chloro-3-methylphenol	NLS	NLS	2.3 U	6.3 U	16 U	29 U	1.7 U	3.7 U	2.2 U	0.4 U
2-Chloronaphthalene	NLS	NLS	2.3 U	6.3 U	16 U	29 U	1.7 U	3.7 U	2.2 U	0.4 U
Dimethylphthalate	NLS	NLS	2.3 U	6.3 U	16 U	29 U	1.7 U	3.7 U	2.2 U	0.4 U

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR5#1A (0.3-0.8) 08/29/00	TR5#1B (4.5-5.0) 08/29/00	TR5#2A (0-0.5) 08/29/00	TR5#2B (2.3-2.8) 08/29/00	TR5#3A (0-0.5) 08/29/00	TR5#3B (1.0-1.5) 08/29/00	TR5#4A (0-0.5) 08/29/00	TR5#4B (1.0-1.5) 08/29/00
			Sample ID/Depth (ft)/Date							
4-Nitrophenol	NLS	NLS	11 U	31 U	78 U	140 U	8.3 U	18 U	11 U	1.9 U
Dibenzofuran	NLS	NLS	0.83 J	1.4 J	3.9 J	9 J	0.11 J	0.25 J	2.3	0.1 J
Diethylphthalate	NLS	NLS	2.3 U	6.3 U	16 U	29 U	1.7 U	3.7 U	2.2 U	0.4 U
Carbazole	NLS	NLS	0.61 J	1.2 J	0.64 J	1.9 J	0.082 J	0.27 J	0.42 J	0.085 J
Di-n-butylphthalate	NLS	NLS	2.3 U	6.3 U	16 U	29 U	1.7 U	3.7 U	2.2 U	0.4 U
Butylbenzylphthalate	NLS	NLS	0.21 J	0.37 J	16 U	29 U	1.7 U	3.7 U	0.23 J	0.4 U
bis(2-Ethylhexyl)phthalate	NLS	NLS	5.5	21	15 J	29 U	3.2	7.5 B	8.5 J	0.4 U
Di-n-octylphthalate	NLS	NLS	0.26 J	0.65 J	1.4 J	0.87 J	1.7 U	3.7 UJ	0.52 J	0.012 J
Dioxin/Furans (mg/kg)										
Tetrachlorodibenzo-p-dioxin	NLS	NLS	0.00078 U	0.00085 U	0.00098 U	0.00086 U	0.00074 U	0.00065 U	0.00098 U	0.00056 U
Tetrachlorodibenzofuran	NLS	NLS	0.00076 U	0.00085 U	0.00098 U	0.00086 U	0.00074 U	0.00065 U	0.00098 U	0.00056 U
Hexachlorodibenzofuran	NLS	NLS	0.00078 U	0.00085 U	0.00047 J	0.00086 U	0.00074 U	0.00065 U	0.00098 U	0.00056 U
Pesticides (mg/kg)										
alpha-BHC	NLS	NLS	0.004 J	0.0069 J	0.0027 J	0.006 J	0.0034 J	0.002 J	0.0018 J	0.00067 J
delta-BHC	NLS	NLS	0.0048 UJ	0.032 UJ	0.0066 UJ	0.015 UJ	0.0043 UJ	0.0057 UJ	0.0052 UJ	0.0021 UJ
Heptachlor	NLS	NLS	0.0048 U	0.032 U	0.0066 U	0.015 U	0.0016 J	0.0057 U	0.0052 U	0.0021 U
Aldrin	NLS	NLS	0.0093 J	0.032 U	0.0066 U	0.015 U	0.0043 U	0.0057 U	0.0052 U	0.001 J
Heptachlor Epoxide	NLS	NLS	0.0048 U	0.032 U	0.0066 U	0.015 U	0.0043 U	0.0057 U	0.0052 U	0.0021 U
Endosulfan I	NLS	NLS	0.0048 UJ	0.032 UJ	0.011 J	0.0088 J	0.0043 UJ	0.0057 UJ	0.0052 UJ	0.0021 UJ
Dieldrin	0.00002	0.008	*0.0093 UJ*	0.025 J	0.0082 J	*0.029 UJ*	0.011 J	*0.011 UJ*	*0.01 UJ*	0.0017 J
4,4'-DDE	0.0022	0.027	*0.0093 UJ*	*0.063 UJ*	0.056 NJ	*0.029 UJ*	*0.0084 UJ*	*0.011 UJ*	*0.01 UJ*	*0.004 UJ*
Endrin	NLS	NLS	0.0084 J	0.026 J	0.02 J	0.045 J	0.0084 UJ	0.0056 J	0.0033 J	0.004 UJ
Endosulfan II	NLS	NLS	0.0093 U	0.063 U	0.013 U	0.029 U	0.0084 U	0.011 U	0.01 U	0.004 U
4,4'-DDD	0.002	0.02	0.025 NJ	0.16 NJ	0.08 NJ	0.091 NJ	*0.0084 U*	0.026 NJ	0.021 NJ	0.01 NJ
Endosulfan Sulfate	NLS	NLS	0.0093 U	0.063 U	0.02 J	0.03 J	0.0098 J	0.0046 J	0.01 U	0.004 U
4,4'-DDT	0.001	0.007	R	R	R	R	0.011 J	R	R	R
alpha-Chlordane (a)	0.0005	0.006	0.028 J	0.2 J	0.039 J	0.074 J	0.0072 J	0.014	0.0031 J	0.0044 J
gamma-Chlordane (a)	0.0005	0.006	0.018 J	0.19	0.037	0.065	0.007	0.012	0.0022 J	0.0011 J
Polychlorinated Biphenyls (PCBs) (mg/kg)										
Aroclor-1242	NLS	NLS	0.44 J	3.1 J	0.34 J	0.41 J	0.084 U	0.11 U	0.1 U	0.081 U
Aroclor-1248	NLS	NLS	0.093 U	0.63 U	0.13 U	0.12 U	0.098	0.26 J	0.11 J	0.031 J
Aroclor-1254	NLS	NLS	0.093 U	0.63 U	0.13 U	0.12 U	0.084 U	0.11 U	0.1 U	0.081 U
Aroclor-1260	NLS	NLS	0.41 J	1.5 J	0.32 J	0.46 J	0.12 J	0.26 J	0.11 J	0.027 J
Total PCBs	0.0227	0.18	0.85	4.6	0.66	0.87	0.218	0.52	0.22	0.058
Inorganic Compounds (mg/kg)										
Aluminum	NLS	NLS	2960	9630	12600	7910	6340	5730	9990	5760
Antimony	NLS	NLS	1.5 UJ	2.0 UJ	2.1 UJ	2.7 UJ	0.78 UJ	0.68 UJ	0.73 UJ	0.50 UJ
Arsenic	8.2	70	4.7	9.8	12.9	10.2	7.6	4.7	5.5	2.9 J
Barium	NLS	NLS	69.3	234	203	155	83.1	82.4	43.3 J	11.5 J
Beryllium	NLS	NLS	0.48 U	1.1 U	1.2 J	0.91 U	0.68 U	0.71 U	1.0 U	0.70 J
Cadmium	1.2	9.6	3.4	34.5	9.3	14.7	2.0	4.2	1.4	0.42 J

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	Sample ID/Depth (ft)/Date							
			TR5#1A (0.3-0.8) 08/29/00	TR5#1B (4.5-5.0) 08/29/00	TR5#2A (0-0.5) 08/29/00	TR5#2B (2.3-2.8) 08/29/00	TR5#3A (0-0.5) 08/29/00	TR5#3B (1.0-1.5) 08/29/00	TR5#4A (0-0.5) 08/29/00	TR5#4B (1.0-1.5) 08/29/00
Calcium	NLS	NLS	1220	5360	5310	3120	2050	2590	5880	6090
Chromium	81	370	36.1	206	[illegible]	106	37.7	50.1	28.5	8.0
Cobalt	NLS	NLS	3.1 J	8.3 J	9.5 J	7.8 J	5.9 J	5.5 J	8.4 J	9.2 J
Copper	34	270	78.8	445	297	221	101	[illegible]	[illegible]	40.7
Iron	NLS	NLS	15800	24700	30000	22100	18800	15800	25300	26900
Lead	46.7	218	175	1590	634	[illegible]	165	[illegible]	[illegible]	17.2 J
Magnesium	NLS	NLS	1280	4490	6090	4040	3500	3010	4720	4190
Manganese	NLS	NLS	71.4	238	277	200	153	158	260	188
Mercury	0.15	0.71	10.6 J	0.66 J	2.0 J	1.2 J	0.45 J	[illegible]	[illegible]	0.048 J
Nickel	20.9	51.6	22.2	166	56.7	97.4	[illegible]	[illegible]	22.1	12.2
Potassium	NLS	NLS	347 J	1100 J	1860 J	1200 J	992 J	814 J	836 J	374 J
Selenium	NLS	NLS	0.79 U	3.9 U	2.2 U	1.4 U	0.79 U	1.4 U	1.3 U	1.1 U
Silver	1	3.7	4.3 J	9.6 J	7.8 J	9.3 J	1.6 J	[illegible] J	0.85 J	0.24 U
Sodium	NLS	NLS	361 J	2060 J	7690 J	3640 J	3150 J	2340 J	4420 J	3040 J
Thallium	NLS	NLS	2.1 U	3.4 U	3.9 U	1.8 U	1.7 U	2.8 U	2.5 U	2.6 UJ
Vanadium	NLS	NLS	13.9	51.9	50.6	36.2	30.5	25.2	62.9	78.4
Zinc	150	410	172	1160	629	587	206	275	267	49.3
Cyanide, Total	NLS	NLS	0.66 U	R8	R8	R8	R8	R8	R8	R8
Total Organic Carbon (mg/kg)										
TOC	NLS	NLS	10600	85000	50300	53100	30600	33700	42500	19200

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Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR6#1A (0-0.5) 07/02/00	TR6#1B (4.0-4.5) 07/02/00	TR6#2A (0-0.5) 7/2/00	TR6#2B (4.0-4.5) 7/2/00	TR6#3A (0-0.5) 7/2/00	TR6#3B (3.5-4.0) 7/2/00	TR5#4A (0-0.5) 7/2/00	TR5#4B (3.5-4.0) 7/2/00
			Sample ID/Depth (ft)/Date							
Volatile Organic Compounds (VOCs) (mg/kg)										
Benzene	NLS	NLS	R	R	0.036 J	R	R	R	R	R
Toluene	NLS	NLS	R	R	0.12 J	0.034 J	0.13 J	R	R	R
Ethylbenzene	NLS	NLS	R	0.044 J	0.022 J	6.8 UJ	0.033 J	4.8 UJ	3.9 UJ	4 UJ
Xylene (total)	NLS	NLS	R	0.42 J	4.6 UJ	6.8 UJ	5.5 UJ	4.8 UJ	3.9 UJ	4 UJ
Styrene	NLS	NLS	R	R	4.6 UJ	6.8 UJ	5.5 UJ	4.8 UJ	3.9 UJ	4 UJ
Carbon Disulfide	NLS	NLS	0.32 J	R	0.31 J	0.29 J	0.36 J	R	R	R
Chloroform	NLS	NLS	R	R	R	R	R	R	R	R
Trichloroethene	NLS	NLS	R	R	R	R	R	R	R	R
2-Hexanone	NLS	NLS	R	R	4.6 UJ	6.8 UJ	5.5 UJ	4.8 UJ	3.9 UJ	4 UJ
Tetrachloroethene	NLS	NLS	R	R	4.6 UJ	6.8 UJ	5.5 UJ	4.8 UJ	3.9 UJ	4 UJ
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)										
Naphthalene	0.16	2.1	1.4 J	0.021 J	0.25 J	0.011 J	0.16 J	0.6 UJ	0.47 J	0.5 U
2-Methylnaphthalene	0.07	0.67	0.67 J	*1 U*	0.1 J	*1.4 U*	0.081 J	0.6 UJ	0.15 J	*0.5 U*
Acenaphthylene	0.044	0.64	0.78 J	*1 U*	0.15 J	0.007 J	0.3 J	0.006 J	0.28 J	*0.5 U*
Acenaphthene	0.016	0.5	12	*1 U*	0.91	*1.4 U*	0.37 J	*0.6 UJ*	0.3 J	*0.5 U*
Fluorene	0.019	0.54	0.85 J	*1 U*	0.31 J	0.015 J	0.22 J	0.005 J	0.55 J	*0.5 U*
Phenanthrene	0.24	1.5	[illegible]	0.025 J	1.1	0.058 J	2.6	0.008 J	2.4	0.005 J
Anthracene	0.0853	1.1	6.3	0.014 J	0.71	0.028 J	0.74 J	*0.6 UJ*	0.82 J	*0.5 U*
Fluoranthene	0.6	5.1	[illegible]	0.019 J	3.3	0.072 J	4.2	0.008 J	6.3	0.005 J
Pyrene	0.665	2.6	12	0.024 J	3.5	0.15 J	3.8	0.012 J	5.8	0.009 J
Benz(a)anthracene	0.261	1.6	5.5	*1 U*	1.5	0.06 J	2.3	*0.6 UJ*	3.3	*0.5 U*
Chrysene	0.384	2.8	5.1	*1 U*	1.5	0.057 J	2.7	*0.6 UJ*	3.6	*0.5 U*
Benzo(b)fluoranthene	NLS	NLS	2.2 J	1 U	0.96	0.04 J	1.8 J	0.6 UJ	3	0.5 U
Benzo(k)fluoranthene	NLS	NLS	3	1 U	1.1	0.04 J	2	0.6 UJ	2.4	0.5 U
Benzo(a)pyrene	0.43	1.6	4.2	0.41 J	1.4	0.04 J	2.2	*0.6 UJ*	3.3	*0.5 U*
Indeno(1,2,3-cd)pyrene	NLS	NLS	2.7	1 U	0.76	0.035 J	1.6 J	0.6 UJ	2.9	0.5 U
Dibenz(a,h)anthracene	0.0634	0.26	0.86 J	*1 U*	0.26 J	*1.4 U*	0.68 J	*0.6 UJ*	0.88 J	*0.5 U*
Benzo(g,h,i)perylene	NLS	NLS	2.9	1 U	0.73	0.039 J	1.7 J	0.6 UJ	3.6	0.5 U
Total PAHs	4.022	44.79	73.86	0.513	18.84	0.852	28.831	0.039	44.49	0.019
Other Semivolatile Organic Compounds (SVOCs) (mg/kg)										
Phenol	NLS	NLS	2.4 U	1 U	0.012 J	1.4 U	0.032 J	0.8 UJ	2.1 U	0.5 U
1,4-Dichlorobenzene	NLS	NLS	2.4 U	1 U	0.53 U	1.4 U	0.03 J	0.8 UJ	2.1 U	0.5 U
Benzyl alcohol	NLS	NLS	2.4 U	1 U	0.53 U	0.026 J	2 U	0.6 UJ	2.1 U	0.5 U
4-Methylphenol	NLS	NLS	2.4 U	1 U	0.029 J	1.4 U	0.071 J	0.6 UJ	0.079 J	0.5 U
Isophorone	NLS	NLS	2.4 U	1 U	0.53 U	1.4 U	2 U	0.6 UJ	2.1 U	0.5 U
Benzoic acid	NLS	NLS	11 UJ	5 UJ	2.6 UJ	0.048 J	10 U	2.9 UJ	10 U	0.022 J
4-Chloroaniline	NLS	NLS	2.4 U	1 U	0.53 U	1.4 U	2 U	0.6 UJ	0.1 J	0.5 U
4-Chloro-3-methylphenol	NLS	NLS	2.4 U	1 U	0.53 U	1.4 U	2 U	0.6 UJ	2.1 U	0.5 U
2-Chloronaphthalene	NLS	NLS	2.4 U	1 U	0.53 U	1.4 U	2 U	0.6 UJ	2.1 U	0.5 U
Dimethylphthalate	NLS	NLS	2.4 U	1 U	0.53 U	1.4 U	2 U	0.6 UJ	2.1 U	0.5 U

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	Sample ID/Depth (ft)/Date: TR6#1A (0-0.5) 07/02/00	TR6#1B (4.0-4.5) 07/02/00	TR6#2A (0-0.5) 7/2/00	TR6#2B (4.0-4.5) 7/2/00	TR6#3A (0-0.5) 7/2/00	TR6#3B (3.5-4.0) 7/2/00	TR6#4A (0-0.5) 7/2/00	TR6#4B (3.5-4.0) 7/2/00
4-Nitrophenol	NLS	NLS	11 U	5 U	2.6 U	6.8 U	10 U	2.9 UJ	10 U	2.4 U
Dibenzofuran	NLS	NLS	0.91 J	1 U	0.17 J	1.4 U	0.11 J	0.6 UJ	0.2 J	0.5 U
Diethylphthalate	NLS	NLS	2.4 U	1 U	0.53 U	1.4 U	2 U	0.6 UJ	2.1 U	0.004 J
Carbazole	NLS	NLS	0.14 J	1 U	0.073 J	1.4 U	0.27 J	0.6 UJ	0.29 J	0.5 U
Di-n-butylphthalate	NLS	NLS	2.4 U	1 U	0.53 U	1.4 U	2 U	0.6 UJ	2.1 U	0.5 U
Butylbenzylphthalate	NLS	NLS	2.4 U	1 U	0.53 U	1.4 U	0.27 J	0.6 UJ	0.25 J	0.5 U
bis(2-Ethylhexyl)phthalate	NLS	NLS	0.075 J	0.034 J	0.53 U	1.4 U	4.4 B	0.6 UJ	7.7 B	0.5 U
Di-n-octylphthalate	NLS	NLS	2.4 U	1 U	0.53 U	1.4 U	0.24 J	0.6 UJ	2.1 U	0.5 U
Dioxin/Furans (mg/kg)										
Tetrachlorodibenzo-p-dioxin	NLS	NLS	0.00076 U	0.00072	0.00068 U	0.0011 U	0.00066 U	0.00085 U	0.00075 U	0.00077 U
Tetrachlorodibenzofuran	NLS	NLS	0.00076 U	0.00072 U	0.00068 U	0.0011 U	0.00066 U	0.00085 U	0.00022 J	0.00028 J
Hexachlorodibenzofuran	NLS	NLS	0.00076 U	0.00072 U	0.00068 U	0.0011 U	0.00066 U	0.00085 U	0.00075 U	0.00077 U
Pesticides (mg/kg)										
alpha-BHC	NLS	NLS	0.0028 UJ	0.0025 UJ	0.0056 UJ	0.0033 UJ	0.0024 UJ	0.003 UJ	0.0018 J	0.0024 UJ
delta-BHC	NLS	NLS	0.0028 UJ	0.0025 UJ	0.0056 UJ	0.0033 UJ	0.0024 UJ	0.003 UJ	0.0052 UJ	0.0024 UJ
Heptachlor	NLS	NLS	0.0 J	0.0025 UJ	0.0056 UJ	0.0033 UJ	0.0024 UJ	0.003 UJ	0.0031 J	0.0024 UJ
Aldrin	NLS	NLS	0.00099 J	0.0025 UJ	0.0038 J	0.0033 U	0.0034	0.003 U	0.0086 J	0.0024 U
Heptachlor Epoxide	NLS	NLS	0.0018 J	0.0025 UJ	0.0056 U	0.0033 U	0.0024 U	0.003 U	0.0052 U	0.0024 U
Endosulfan I	NLS	NLS	0.0028 UJ	0.0025 UJ	0.0056 U	0.0033 U	0.0024 U	0.003 U	0.0052 U	0.0024 U
Dieldrin	0.00002	0.008	*0.0054 UJ*	*0.0049 UJ*	*0.011 UJ*	*0.0064 UJ*	*0.0047 UJ*	*0.0058 UJ*	*0.01 UJ*	*0.0048 UJ*
4,4'-DDE	0.0022	0.027	*0.0054 UJ*	*0.0049 UJ*	*0.011 U*	*0.0064 U*	0.012 NJ	*0.0058 U*	[illegible] NJ	*0.0048 U*
Endrin	NLS	NLS	0.0054 UJ	0.0049 UJ	0.0037 J	0.0064 U	0.0021 J	0.0058 U	0.0061 J	0.0048 U
Endosulfan II	NLS	NLS	0.0054 UJ	0.0049 UJ	0.0034 J	0.0064 U	0.0047 U	0.0058 U	0.01 U	0.0048 U
4,4'-DDD	0.002	0.02	0.0070 NJ	*0.0049 UJ*	0.013 NJ	*0.0064 UJ*	0.012 NJ	*0.0058 UJ*	[illegible] NJ	*0.0048 UJ*
Endosulfan Sulfate	NLS	NLS	0.0054 UJ	0.0049 UJ	0.0038 J	0.0064 UJ	0.0047 UJ	0.0058 UJ	0.01 UJ	0.0048 UJ
4,4'-DDT	0.001	0.007	R27	*0.0049 UJ*	0.004 J	*0.0064 UJ*	[illegible]	*0.0058 UJ*	[illegible]	*0.0048 UJ*
alpha-Chlordane (a)	0.0005	0.006	*0.0028 UJ*	*0.0025 UJ*	0.01 J	*0.0033 U*	[illegible]	*0.003 U*	[illegible]	*0.0024 U*
gamma-Chlordane (a)	0.0005	0.006	*0.0028 UJ*	*0.0025 UJ*	0.0056	*0.0033 U*	0.0077	*0.003 U*	[illegible]	*0.0024 U*
Polychlorinated Biphenyls (PCBs) (mg/kg)										
Aroclor-1242	NLS	NLS	0.054 UJ	0.049 UJ	0.027 J	0.064 UJ	0.033 J	0.058 UJ	0.13 J	0.048 UJ
Aroclor-1248	NLS	NLS	0.054 U	0.049 U	0.055 U	0.064 U	0.047 U	0.058 U	0.05 U	0.048 U
Aroclor-1254	NLS	NLS	0.054 U	0.049 U	0.063 J	0.064 U	0.051 J	0.058 U	0.22 J	0.048 U
Aroclor-1260	NLS	NLS	0.054 UJ	0.049 UJ	0.042 J	0.064 UJ	0.053 J	0.058 U	0.14 J	0.048 U
Total PCBs	0.0227	0.18	ND	ND	0.182	ND	[illegible]	ND	0.49	ND
Inorganic Constituents (mg/kg)										
Aluminum	NLS	NLS	11600	8000	6840	24600	7740	18900	11400	8580
Antimony	NLS	NLS	0.70 UJ	0.59 UJ	0.62 UJ	0.88 UJ	0.66 UJ	0.65 UJ	0.68 UJ	0.61 UJ
Arsenic	8.2	70	12.8 J	4.8 J	7.4 J	14.3 J	4.9 J	[illegible]	6.9 J	4 J
Barium	NLS	NLS	240	222	111	223	82.6	230	115	347
Beryllium	NLS	NLS	0.70 J	0.48 J	0.42 J	1.3 J	0.42 J	0.87 J	0.62 J	0.6 J
Cadmium	1.2	9.6	1.2 J	0.75 J	2.5 J	0.59 J	2.0 J	0.64 J	2.3 J	0.27 UJ

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	TR6#1A (0-0.5) 07/02/00	TR6#1B (4.0-4.5) 07/02/00	TR6#2A (0-0.5) 7/2/00	TR6#2B (4.0-4.5) 7/2/00	TR6#3A (0-0.5) 7/2/00	TR6#3B (3.5-4.0) 7/2/00	TR6#4A (0-0.5) 7/2/00	TR6#4B (3.5-4.0) 7/2/00
			Sample ID/Depth (ft)/Date							
Calcium	NLS	NLS	3540	2720	2240	5180	3240	3880	3660	2560
Chromium	81	370	54.7	17.8	92.7 J	44.1 J	48.6 J	35.3 J	54.8 J	45.3 J
Cobalt	NLS	NLS	9.4 J	6.8 J	5.4 J	13.8 J	6.7 J	10.3 J	7.8 J	5.9 J
Copper	34	270	67.2	11.1 J	121 J	32.1 J	[illegible]	15.6 J	[illegible]	7.9 J
Iron	NLS	NLS	24900	18700	18700	40700	18700	34800	24900	16700
Lead	46.7	218	117	9.2	148	77.5	[illegible]	14.9	281	7.5
Magnesium	NLS	NLS	4940	3670	3120	8500	3710	6880	5230	3920
Manganese	NLS	NLS	215	164	153	433	144	280	198	103
Mercury	0.15	0.71	2.9	0.84	0.81 J	0.29 J	0.42 J	0.038 J	[illegible]	0.015 J
Nickel	20.9	51.6	[illegible]	18.2 J	54.4	34.8 J	30.4 J	27.7 J	56.2 J	14.2 J
Potassium	NLS	NLS	1570 J	913 J	1100 J	3580	1210 J	2730	1780	1090 J
Selenium	NLS	NLS	0.60 UJ	0.42 UJ	1.6 J	1.4 UJ	0.97 UJ	1.8 J	1.3 J	1.8 J
Silver	1	3.7	0.33 UJ	0.084 UJ	1 J	0.42 UJ	1.3 J	0.33 J	4.8 J	0.29 UJ
Sodium	NLS	NLS	10000	293 U	1900	3220	1190 J	1730	2030	300 U
Thallium	NLS	NLS	1.8 UJ	1.5 UJ	1.1 UJ	1.6 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.1 UJ
Vanadium	NLS	NLS	35.7 J	25.4 J	20 J	59.8 J	25.1 J	75.4	32.4 J	43 J
Zinc	150	410	144 J	47.0 J	282 J	114 J	[illegible]	88.2 U	[illegible]	48.8 U
Cyanide, Total	NLS	NLS	R8	R8	R8	R8	R8	R8	R8	R8
			Total Organic Carbon (mg/kg)							
TOC	NLS	NLS	66800	24000	28200	39000	19500	34800	24000	51200

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	Sample ID/Depth (ft)/Date: TR7#1A (0-0.5) 07/02/00	TR7#1B (3.0-3.5) 07/02/00	TR7#2A (0-1.5) 07/02/00	TR7#3A (0-0.5) 07/02/00	TR7#3B (3.3-3.8) 07/02/00	TR7#4A (0-0.5) 07/02/00	TR7#4B (3.6-4.1) 07/02/00
Volatile Organic Compounds (VOCs) (mg/kg)									
Benzene	NLS	NLS	6.2 UJ	3.2 UJ	2.9 J	4.2 UJ	4 J	2.6 UJ	0.13 J
Toluene	NLS	NLS	0.12 J	0.016 J	6.9 J	4.2 UJ	4.2 J	0.28 J	0.25 J
Ethylbenzene	NLS	NLS	6.2 UJ	3.2 UJ	80	4.2 UJ	140 J	0.043 J	1.1 J
Xylene (total)	NLS	NLS	6.2 UJ	3.2 UJ	79	4.2 UJ	84 J	0.059 J	0.53 J
Styrene	NLS	NLS	6.2 UJ	3.2 UJ	20 UJ	4.2 UJ	2 J	2.6 UJ	4.2 UJ
Carbon Disulfide	NLS	NLS	0.55 J	3.2 UJ	0.59 J	4.2 UJ	5 J	0.067 J	0.35 J
Chloroform	NLS	NLS	6.2 UJ	3.2 UJ	20 UJ	4.2 UJ	R	2.6 UJ	4.2 UJ
Trichloroethene	NLS	NLS	0.14 J	3.2 UJ	20 UJ	4.2 UJ	R	2.6 UJ	0.09 J
2-Hexanone	NLS	NLS	6.2 UJ	3.2 UJ	20 UJ	4.2 UJ	R	2.6 UJ	4.2 UJ
Tetrachloroethene	NLS	NLS	0.13 J	3.2 UJ	20 UJ	4.2 UJ	R	2.6 UJ	0.54 J
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)									
Naphthalene	0.16	2.1	0.16 J	0.4 UJ	[illegible]	[illegible]	[illegible]	[illegible]	53
2-Methylnaphthalene	0.07	0.87	5.6 U	0.4 UJ	720 J	0.48 J	[illegible]	[illegible]	[illegible]
Acenaphthylene	0.044	0.64	0.18 J	0.4 UJ	[illegible]	0.79	[illegible]	[illegible]	3.6 J
Acenaphthene	0.016	0.5	0.37 J	0.4 UJ	340 J	[illegible]	[illegible]	[illegible]	[illegible]
Fluorene	0.019	0.54	0.43 J	0.4 UJ	150 J	0.78	[illegible]	[illegible]	[illegible]
Phenanthrene	0.24	1.5	2.6 J	0.4 UJ	440	[illegible]	[illegible]	[illegible]	110
Anthracene	0.0853	1.1	0.7 J	0.4 UJ	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fluoranthene	0.6	5.1	6.2 J	0.4 UJ	140 J	[illegible]	[illegible]	[illegible]	[illegible]
Pyrene	0.665	2.6	4.8 J	0.4 UJ	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benz(a)anthracene	0.261	1.6	2.2 J	0.4 UJ	74	[illegible]	[illegible]	[illegible]	[illegible]
Chrysene	0.384	2.8	2.5 J	0.4 UJ	65 J	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(b)fluoranthene	NLS	NLS	2.1 J	0.4 UJ	21 J	0.82 J	65 J	1.8	7 J
Benzo(k)fluoranthene	NLS	NLS	2 J	0.4 UJ	32 J	0.95 J	93 J	1.7	10 J
Benzo(a)pyrene	0.43	1.6	2.1 J	0.4 UJ	[illegible]	[illegible]	[illegible]	[illegible]	14 J
Indeno(1,2,3-cd)pyrene	NLS	NLS	2.3 J	0.4 UJ	16 J	0.88 J	47 J	1.7	6.7 J
Dibenz(a,h)anthracene	0.0634	0.26	[illegible]	0.4 UJ	5.7 J	[illegible]	[illegible]	[illegible]	2.5 J
Benzo(g,h,i)perylene	NLS	NLS	2.5 J	0.4 UJ	17 J	0.89 J	53 J	1.5	7.5 J
Total PAHs	4.022	44.79	31.41	ND	3177.7	[illegible]	[illegible]	[illegible]	[illegible]
Other Semivolatile Organic Compounds (SVOCs) (mg/kg)									
Phenol	NLS	NLS	5.5 U	0.4 UJ	110 U	1.1 U	440 U	0.76 U	20 U
1,4-Dichlorobenzene	NLS	NLS	5.5 U	0.4 UJ	110 U	1.1 U	440 U	0.76 U	20 U
Benzyl alcohol	NLS	NLS	5.5 U	0.4 UJ	110 U	1.1 U	440 U	0.76 U	20 U
4-Methylphenol	NLS	NLS	5.5 U	0.4 UJ	110 U	1.1 U	440 U	0.76 U	20 U
Isophorone	NLS	NLS	5.5 U	0.4 UJ	110 U	1.1 U	440 U	0.76 U	20 U
Benzoic acid	NLS	NLS	27 UJ	1.9 UJ	530 UJ	5.2 UJ	2100 UJ	3.7 UJ	97 UJ
4-Chloroaniline	NLS	NLS	5.5 U	0.4 UJ	110 U	1.1 U	440 U	0.76 U	20 U
4-Chloro-3-methylphenol	NLS	NLS	5.5 U	0.4 UJ	110 U	0.082 J	440 U	0.76 U	20 U
2-Chloronaphthalene	NLS	NLS	5.5 U	0.4 UJ	110 U	1.1 U	440 U	0.76 U	20 U
Dimethylphthalate	NLS	NLS	5.5 U	0.4 UJ	110 U	1.1 U	440 U	0.027 J	20 U

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	Sample ID/Depth (ft)/Date TR7#1A (0-0.5) 07/02/00	TR7#1B (3.0-3.5) 07/02/00	TR7#2A (0-1.5) 07/02/00	TR7#3A (0-0.5) 07/02/00	TR7#3B (3.3-3.8) 07/02/00	TR7#4A (0-0.5) 07/02/00	TR7#4B (3.8-4.1) 07/02/00
4-Nitrophenol	NLS	NLS	27 U	1.9 UJ	530 U	5.2 U	2100 U	3.7 U	87 U
Dibenzofuran	NLS	NLS	0.15 J	0.4 UJ	35 J	0.55 J	99 J	0.092 J	10 J
Diethylphthalate	NLS	NLS	6.6 U	0.4 UJ	110 U	1.1 U	440 U	0.76 U	20 U
Carbazole	NLS	NLS	0.34 J	0.4 UJ	4.2 J	0.077 J	21 J	0.18 J	1.6 J
Di-n-butylphthalate	NLS	NLS	0.83 J	0.4 UJ	110 U	1.1 U	440 U	0.13 J	20 U
Butylbenzylphthalate	NLS	NLS	0.28 J	0.4 UJ	110 U	1.1 U	440 U	0.76 U	20 U
bis(2-Ethylhexyl)phthalate	NLS	NLS	25	0.4 UJ	110 U	0.36 J	440 U	0.64 J	20 U
Di-n-octylphthalate	NLS	NLS	0.55 J	0.4 UJ	110 U	0.021 J	440 U	0.76 U	20 U
Dioxin/Furans (mg/kg)									
Tetrachlorodibenzo-p-dioxin	NLS	NLS	0.0014 U	0.00055 U	0.00076 U	0.00085 U	0.00091 U	0.00057 U	0.00074 U
Tetrachlorodibenzofuran	NLS	NLS	0.0034	0.00055 U	0.00076 U	0.00085 U	0.00091 U	0.00057 U	0.0032
Hexachlorodibenzofuran	NLS	NLS	0.0014 U	0.00055 U	0.00076 U	0.00085 U	0.00091 U	0.00057 U	0.00074 U
Pesticides (mg/kg)									
alpha-BHC	NLS	NLS	0.0067 UJ	0.002 U	0.0042 J	0.0034 UJ	0.029 UJ	0.002 UJ	0.0042 UJ
delta-BHC	NLS	NLS	0.0067 UJ	0.002 U	0.0044 J	0.0034 UJ	0.009 J	0.002 UJ	0.0042 UJ
Heptachlor	NLS	NLS	0.0067 UJ	0.002 U	0.012 J	0.00084 J	0.024 J	0.002 UJ	0.0017 J
Aldrin	NLS	NLS	0.0067 UJ	0.002 U	0.0053 J	0.0034 UJ	0.0064 J	0.002 UJ	0.0018 J
Heptachlor Epoxide	NLS	NLS	0.0067 UJ	0.002 U	0.011 J	0.0027 J	0.054 J	0.002 UJ	0.0058 J
Endosulfan I	NLS	NLS	0.0037 J	0.002 U	0.0067 UJ	0.0034 UJ	0.029 UJ	0.002 UJ	0.0042 UJ
Dieldrin	0.00002	0.008	*0.013 UJ*	*0.0039 U*	*0.013 UJ*	*0.0065 UJ*	*0.056 UJ*	*0.004 UJ*	*0.0082 UJ*
4,4'-DDE	0.0022	0.027	0.0055 NJ	*0.0039 U*	*0.013 UJ*	*0.0065 UJ*	*0.056 UJ*	*0.004 UJ*	*0.0082 UJ*
Endrin	NLS	NLS	0.013 UJ	0.0039 U	0.013 UJ	0.0065 UJ	0.056 UJ	0.004 UJ	0.0082 UJ
Endosulfan II	NLS	NLS	0.013 UJ	0.0039 U	0.013 UJ	0.0065 UJ	0.056 UJ	0.004 UJ	0.0082 UJ
4,4'-DDD	0.002	0.02	0.015 NJ	*0.0039 U*	0.044 NJ	0.0031 NJ	*0.056 UJ*	[illegible]	0.0028 NJ
Endosulfan Sulfate	NLS	NLS	0.013 UJ	0.0039 U	0.013 UJ	0.0065 UJ	0.056 UJ	0.004 UJ	0.0082 UJ
4,4'-DDT	0.001	0.007	0.012 J	*0.0039 U*	R27	R27	*0.056 UJ*	R27	R27
alpha-Chlordane (a)	0.0005	0.006	0.015 J	*0.002 U*	*0.0067 UJ*	*0.0034 UJ*	*0.029 UJ*	[illegible]	*0.0042 UJ*
gamma-Chlordane (a)	0.0005	0.006	0.0062 J	*0.002 U*	*0.0067 UJ*	0.0018 J	[illegible]	[illegible]	*0.0042 UJ*
Polychlorinated Biphenyls (PCBs) (mg/kg)									
Aroclor-1242	NLS	NLS	0.13 UJ	0.039 U	0.13 UJ	0.085 UJ	0.28 UJ	0.04 UJ	0.082 UJ
Aroclor-1248	NLS	NLS	0.059 J	0.039 U	0.13 U	0.085 U	0.28 U	0.042 J	0.082 U
Aroclor-1254	NLS	NLS	0.13 U	0.039 U	0.13 U	0.085 U	0.28 U	0.04 U	0.082 U
Aroclor-1260	NLS	NLS	0.054 J	0.039 U	0.074 J	0.021 J	0.28 UJ	0.053 J	0.082 UJ
Total PCBs	0.0227	0.18	0.415	ND	0.074	0.021	ND	[illegible]	ND
Inorganic Compounds (mg/kg)									
Aluminum	NLS	NLS	2470	5720	7780	8710	7820	2540	8970
Antimony	NLS	NLS	0.88 UJ	0.47 U	6.2 J	0.59 UJ	6.6 J	0.38 UJ	3.5 UJ
Arsenic	8.2	70	1.5 J	1.7 J	16.7	3.8 J	[illegible]	2.6 J	11.4 J
Barium	NLS	NLS	27.2 J	45.5	231	43.7 J	388	19.8 J	169
Beryllium	NLS	NLS	0.083 UJ	0.42 J	0.52 J	0.40 J	0.48 J	0.16 J	0.52 J
Cadmium	1.2	9.6	0.87 J	0.62 J	2.2 J	0.96 J	[illegible]	[illegible]	1.4 J

Table 12 (continued)
Sediment Analytical Data
Erie Street Former MGP Site

Parameter	Marine Sediment ERL	Marine Sediment ERM	Sample ID/Depth (ft)/Date						
			TR7#1A (0-0.5) 07/02/00	TR7#1B (3.0-3.5) 07/02/00	TR7#2A (0-1.5) 07/02/00	TR7#3A (0-0.5) 07/02/00	TR7#3B (3.3-3.8) 07/02/00	TR7#4A (0-0.5) 07/02/00	TR7#4B (3.6-4.1) 07/02/00
Calcium	NLS	NLS	3580	525 J	5600	24100	4270	2300	4490
Chromium	81	370	17.6	12.3	68.0	21.8	[illegible]	78.2	40.7
Cobalt	NLS	NLS	2.1 J	8.1 J	7.8 J	4.8 J	7.4 J	3.2 J	8.0 J
Copper	34	270	67.5	7.7 J	150	[illegible]	[illegible]	[illegible]	115
Iron	NLS	NLS	6560	17500	26300	15500	23300	9300	23200
Lead	46.7	218	85.2	7.5	362	75.9	[illegible]	80.4	[illegible]
Magnesium	NLS	NLS	3420	3100	4870	15900	4840	1870	5360
Manganese	NLS	NLS	59.5	270	209	182	164	152	192
Mercury	0.15	0.71	0.10	0.0026 J	2.9 J	0.080	[illegible]	[illegible]	[illegible]
Nickel	20.9	51.6	9.5 J	11.9	33.0 J	15.8 J	[illegible]	[illegible]	[illegible]
Potassium	NLS	NLS	681 J	853 J	1300 J	2010 J	1070 J	418 J	1350 J
Selenium	NLS	NLS	0.62 UJ	0.38 J	2.0 J	0.91 J	3.1 J	0.47 J	1.0 J
Silver	1	3.7	0.19 UJ	0.067 U	1.0 J	0.092 UJ	2.8 J	0.16 UJ	0.49 UJ
Sodium	NLS	NLS	8520	729 J	2470	6410	1950	1150	2390
Thallium	NLS	NLS	2.2 UJ	1.2 UJ	1.6 UJ	1.5 UJ	1.7 UJ	0.96 UJ	1.5 UJ
Vanadium	NLS	NLS	18.3 J	24.4	26.3 J	21.9 J	31.7 J	6.8 J	26.6 J
Zinc	150	410	127 J	28.8 J	442 J	87.8 J	[illegible]	117 J	271 J
Cyanide, Total	NLS	NLS	R8	R8	R8	R8	R8	R8	R8
Total Organic Carbon (mg/kg)									
TOC	NLS	NLS	104000	1100	56300	43900	178000	2060	61400

Notes:

ERL - Effects Range Low
ERM - Effects Range Median
ERL and ERM from "Sediments Classification Methods Compendium." Long and MacDonald 1992. EPA 823-R-92-006
(a) ERL and ERM values shown are for chlordane
NLS - No Listed Standard (ERL and ERM values have not been developed for this analyte)
U - Not detected at reporting limit shown
J - Estimated value
B - (organic analyted) - Analyte was detected in blank
B (inorganic analytes) - Result is between instrument detection limit (IDL) and contract required detection limit (CRDL)
N - Estimated value (% breakdown exceeded quality control limits)
R7 - One or more of the surrogate standard percent recoveries was found outside of established control limits for surrogate recoveries less than 10%, estimate positive results and reject non-detects.
R8 - The matrix spike and matrix spike duplicate (MS/MSD) percent recoveries were not within the control limits for this compound. MS/MSD results were less than 30%. All non-detect results for this analyte were rejected.
R27 - Percent breakdown of DDT was greater than 20% since no DDT was present in these samples, but DDE was detected, the CRDL for DDT is rejected.
Shaded values exceed ERL and/or ERM
Italics indicate that the detection limit is greater than the ERL and/or ERM

Table 13
Surface Water Analytical Data
Erie Street Former MGP Site

Parameter	NJDEP SE-3 SWQC	SW1 06/28/00	SW2 06/28/00	SW3 06/28/00	SW4 06/30/00	SW5 06/30/00	SW6 07/01/00	SW7 07/01/00
Methylene Chloride	1600 (hc)	12	2 J	8	11	12	10	11
Acetone	NLS	10 UJ	10 UJ	10 UJ	10 UJ	4 J	4 J	4 J
Carbon Disulfide	NLS	5 UJ	2 J	5 UJ	5 UJ	5 UJ	2 J	3 J
Tetrachloroethene	4.29 (hc)	*5 U*	*5 U*	*5 U*	*5 U*	*5 U*	2 J	*5 U*
Toluene	200,000 (h)	5 U	0.5 J	5 U	5 U	5 U	0.6 J	5 U
Chlorobenzene	21,000 (h)	5 U	4 J	5 U	5 U	5 U	5 U	5 U
Fluoranthene	393 (h)	0.08 J	0.06 J	0.09 J	0.1 J	11 U	10 U	10 U
Pyrene	8,970 (h)	0.1 J	0.08 J	0.1 J	0.1 J	11 U	0.08 J	10 U
Diethylphthalate	111,000 (h)	0.1 J	0.2 J	0.1 J	0.1 J	11 U	10 U	10 U
Butylbenzylphthalate	416 (h)	10 U	10 U	11 U	0.2 J	11 U	10 U	10 U
Silvex	NLS	0.1 U	0.1 U	0.066 J	0.1 U	0.1 U	0.1 U	0.1 U
2,4,5-T	NLS	0.13	0.11	0.13	0.1 U	0.1 U	0.1 U	0.1 U
Aluminum	Reserved	19.0 U	23.6 U	28.9 U	25.5 U	94.4 J	84.5 J	21.8 U
Arsenic	0.136 (hc)	[illegible]	*3.1 UJ*	*3.1 UJ*	*3.1 UJ*	*3.1 UJ*	*3.1 UJ*	*3.1 UJ*
Barium	NLS	51.9 J	49.6 J	52.4 J	42.9 J	45.9 J	47.2 J	48.1 J
Calcium	NLS	115000 J	119000 J	104000 J	138000 J	143000 J	143000 J	137000 J
Iron	Reserved	203 U	268	208 U	252	322	374	294
Lead	NLS	1.3 UJ	2.3 J	1.3 UJ	1.3 UJ	1.3 UJ	1.5 J	1.3 UJ
Magnesium	NLS	280000 J	301000 J	252000 J	393000 J	396000 J	410000 J	388000 J
Manganese	100 (h)	79.3	77.3	76.7	81.8	86.4	88.3	86.5
Nickel	3,900 (h)	2.4 J	2.5 J	2.3 J	1.8 J	2.2 J	1.9 J	2.0 J
Potassium	NLS	173000	188000	161000	245000	240000	257000	242000
Silver	NLS	0.30 UJ	0.30 J	0.30 UJ	0.30 UJ	0.30 UJ	0.30 UJ	0.30 UJ
Sodium	NLS	528000 J	536000 J	495000 J	573000 J	579000 J	574000 J	564000 J
Thallium	6.22 (h)	[illegible]	5.3 UJ	5.3 UJ	5.3 UJ	5.3 UJ	5.3 UJ	5.3 UJ
Vanadium	NLS	0.55 J	1.0 J	0.74 J	0.63 J	1.0 J	1.0 J	1.2 J
Zinc	Reserved	26.6 J	25.8 J	32.4 J	14.2 UJ	16.2 J	23.7 J	16.0 J
TOC	NLS	6.38	6.14	6.53	4.17 U	4.14 U	3.22 U	4.34 U

Notes:

U - Not detected at reporting limit shown

J - Estimated value

NJDEP SE-3 SWQC - New Jersey Department of Environmental Protection saline estuary Class 3 Surface Water Quality Criteria from New Jersey Administrative Code (NJAC) 7:9B-1.14(c), April 1988.

Dioxin congenor octachlorodibenzodioxin was detected at a concentration of 0.019 mg/L in the duplicate sample for which SW6 is a primary.

NLS - No listed standard (NJDEP has not developed SE-3 SWQC for this analyte)

(h) - Noncarcinogenic effect-based human health criteria as a 30-day average with no frequency of exceedance at or above the design flows specified in Section NJAC 7:9B-1.5(c)2.

(hc) - Carcinogenic effect-based human health criteria as a 70-year average with no frequency of exceedance at or above the design flows specified in Section NJAC 7:9B-1.5(c)2, based on a risk level of one-in-one million.

Shaded Values - Result exceeds NJDEP SE-3 SWQC. Reporting limits in italics are greater than NJDEP SE-3 SWQC.

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FIGURES

Figures

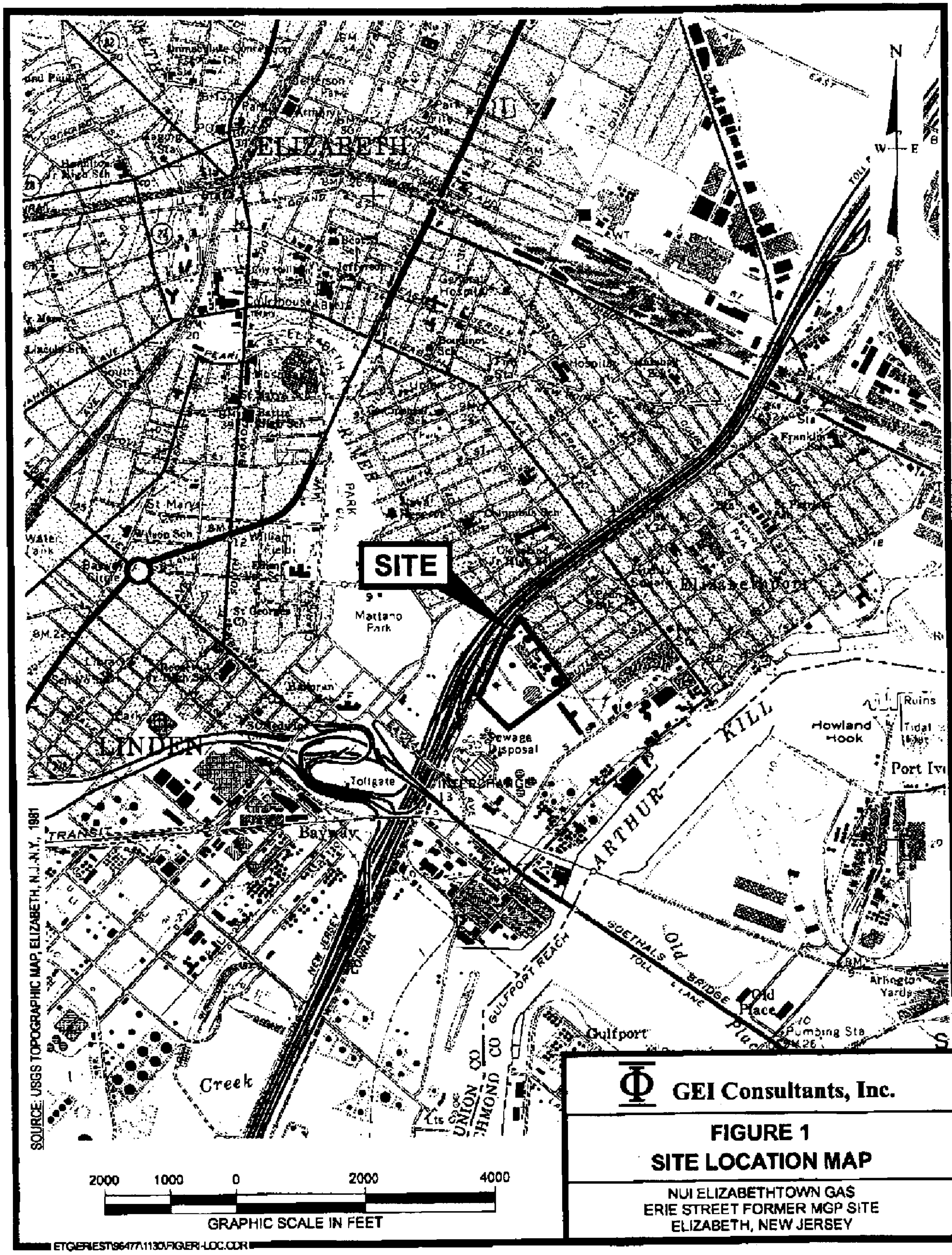

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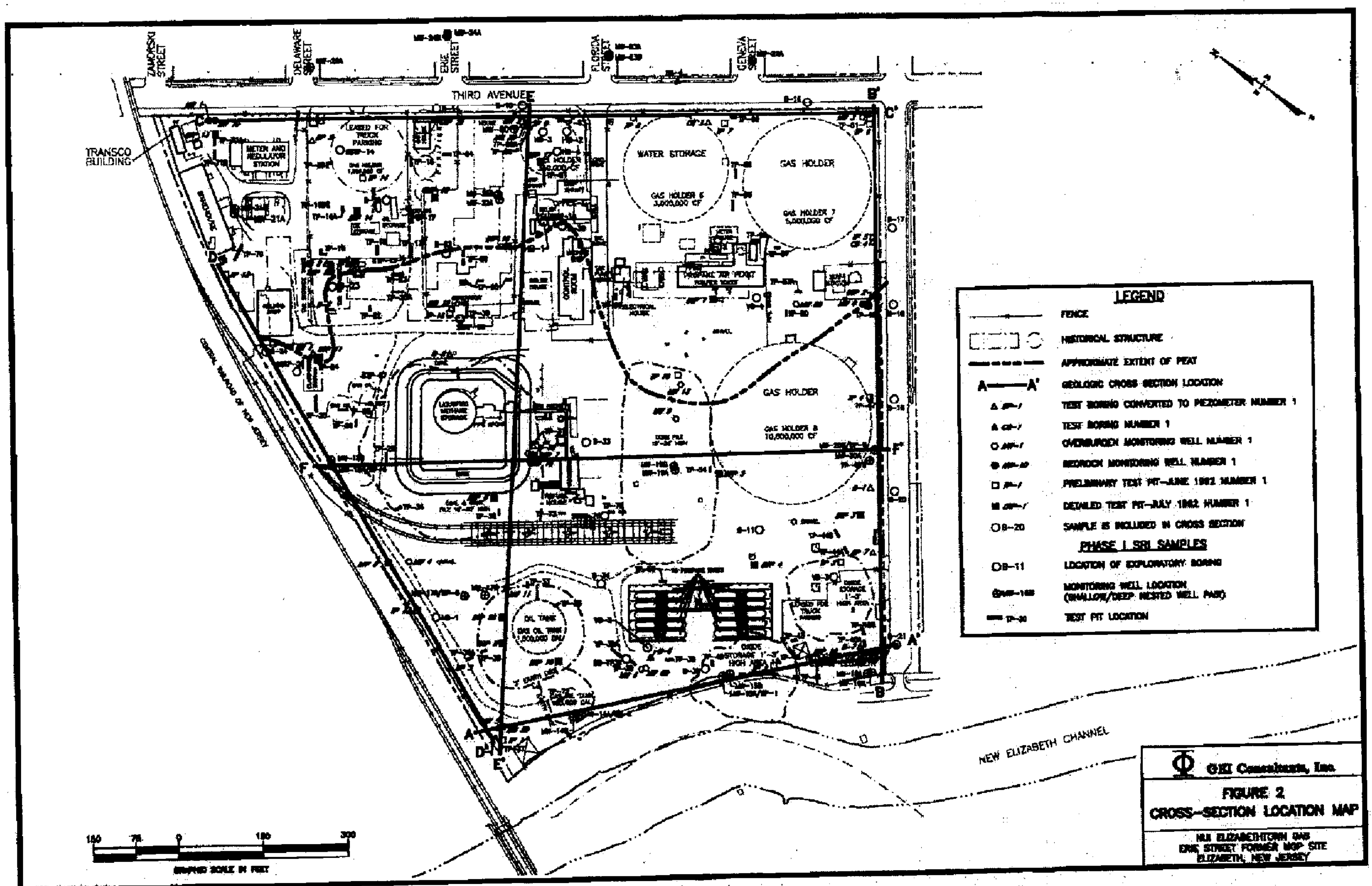
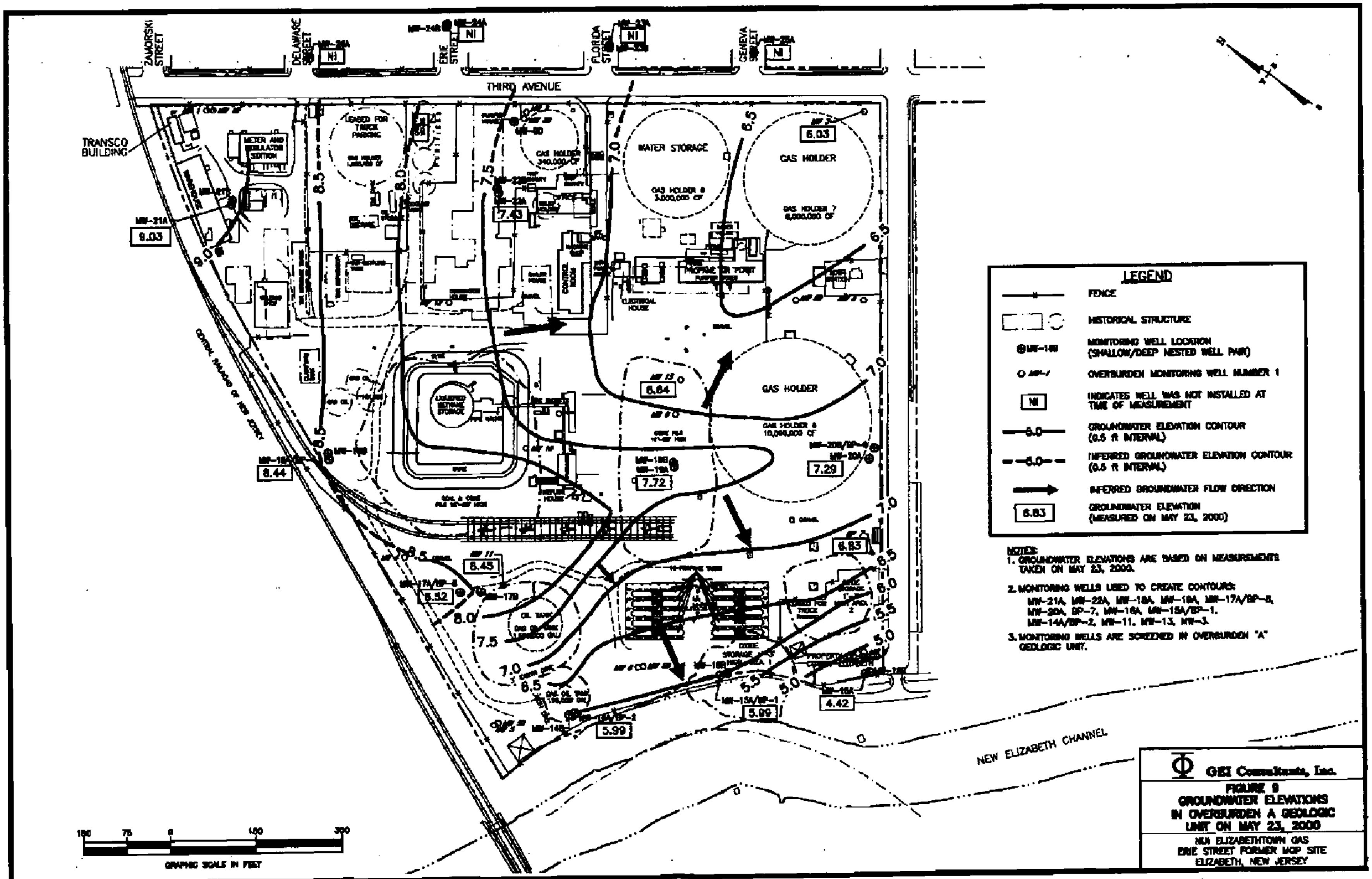
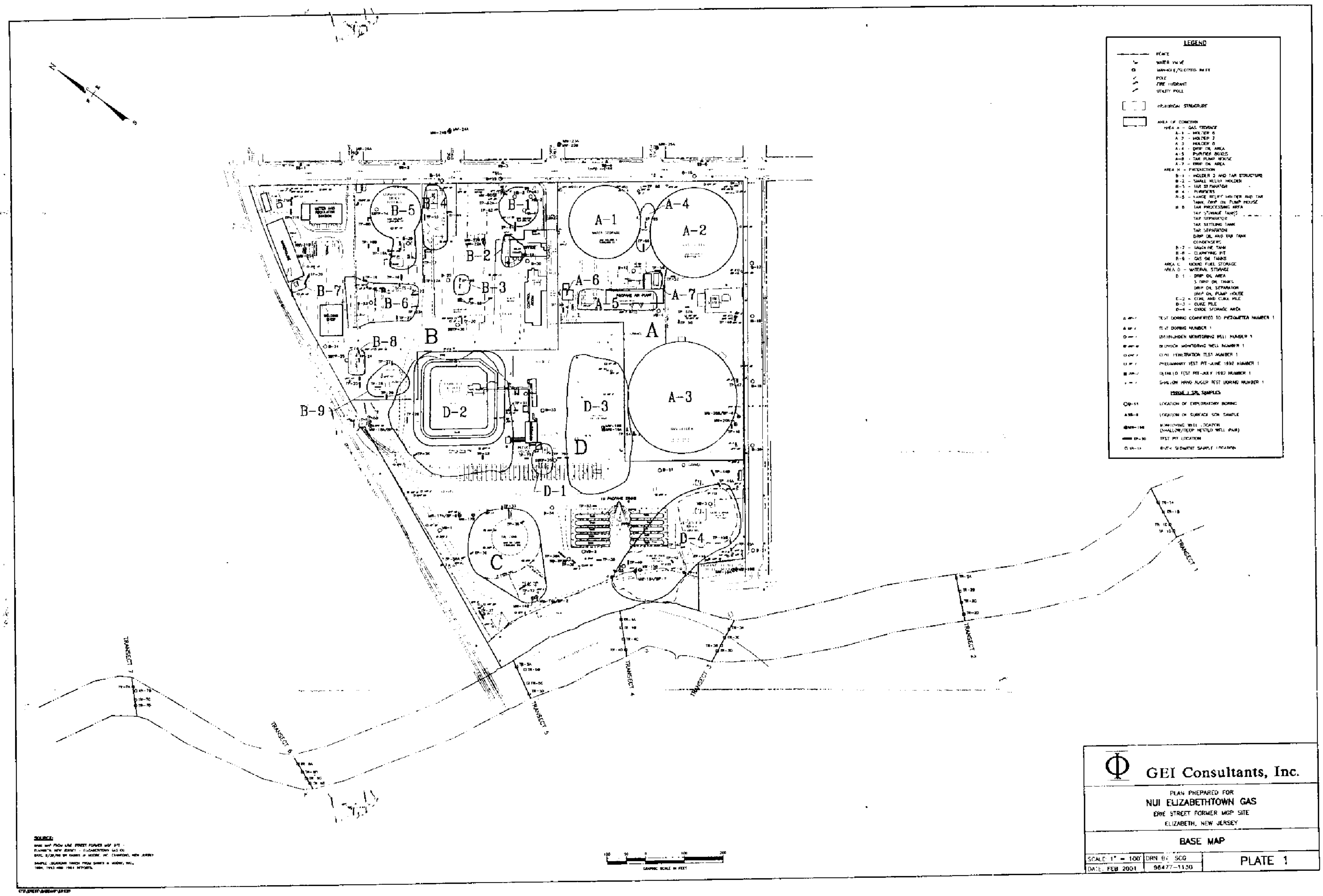
FIGURE 1
SITE LOCATION MAP

NUI ELIZABETHTOWN GAS
ERIE STREET FORMER MGP SITE
ELIZABETH, NEW JERSEY


ZAMORSKI STREET
DELAWARE STREET
ERIE STREET
FLORIDA STREET
GENEVA STREET
THIRD AVENUE
TRANSCO BUILDING
METER AND REGULATOR STATION
LEASED FOR TRUCK PARKING
WATER STORAGE
GAS HOLDER 6 3,000,000 CF
GAS HOLDER
GAS HOLDER 7 5,000,000 CF
GAS HOLDER
GAS HOLDER 8 10,000,000 CF
CONTROL ROOM
OIL TANK
NEW ELIZABETH CHANNEL
LEGEND
FENCE
HISTORICAL STRUCTURE
APPROXIMATE EXTENT OF PEAT
A——A'
GEOLOGIC CROSS SECTION LOCATION
TEST BORING CONVERTED TO PIEZOMETER NUMBER 1
TEST BORING NUMBER 1
OVERBURDEN MONITORING WELL NUMBER 1
BEDROCK MONITORING WELL NUMBER 1
PRELIMINARY TEST PIT—JUNE 1982 NUMBER 1
DETAILED TEST PIT—JULY 1982 NUMBER 1
B-20
SAMPLE IS INCLUDED IN CROSS SECTION
PHASE I SRI SAMPLES
B-11
LOCATION OF EXPLORATORY BORING
MONITORING WELL LOCATION (SHALLOW/DEEP NESTED WELL PAIR)
TEST PIT LOCATION
150 75 0 150 300
GRAPHIC SCALE IN FEET
GHI Consultants, Inc.
FIGURE 2
CROSS-SECTION LOCATION MAP
NUI ELIZABETHTOWN GAS
ERIE STREET FORMER MGP SITE
ELIZABETH, NEW JERSEY



TIERRA-B-017776



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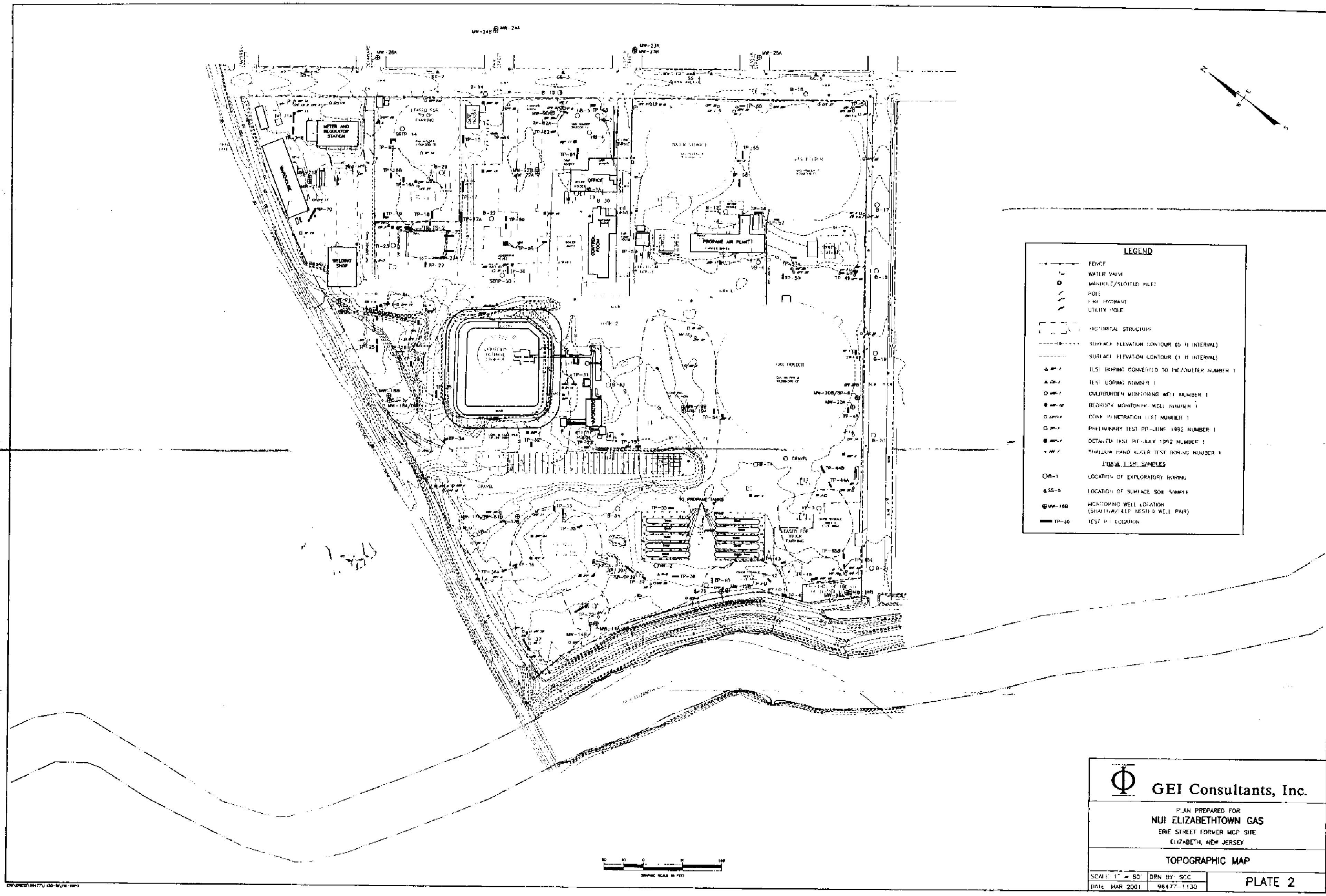
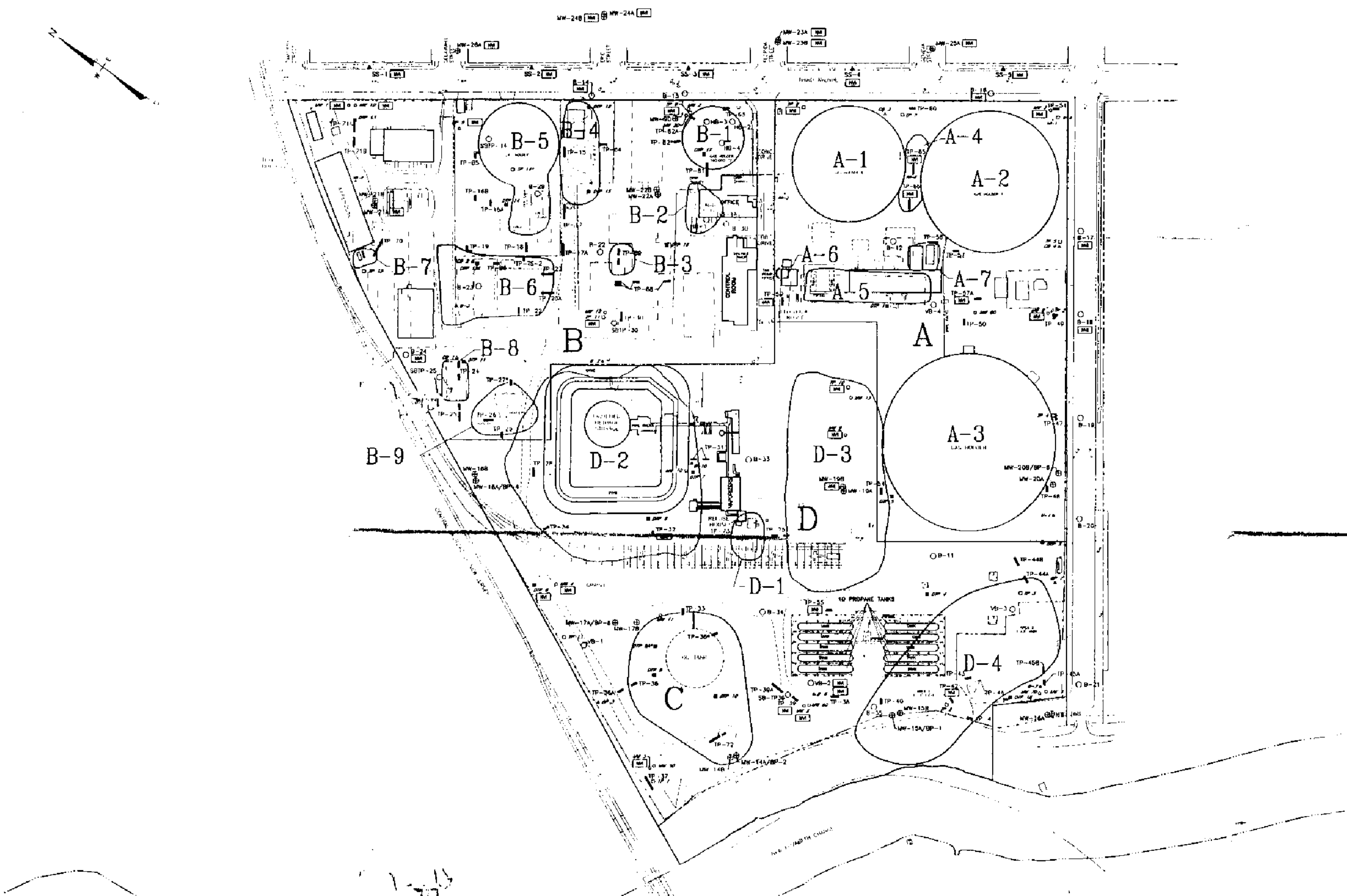


TIERRA-B-017778



LEGEND

FENCE
WATER VALVE
MANHOLE/SLOTTED INLET
POLE
FIRE HYDRANT
UTILITY POLE
HISTORICAL STRUCTURE
AREA OF CONCERN
AREA A - GAS STORAGE
A-1 - HOLDER 6
A-2 - HOLDER 7
A-3 - HOLDER 8
A-4 - DRIP OIL AREA
A-5 - PURIFIER BOXES
A-6 - TAR PUMP HOUSE
A-7 - DRIP OIL AREA
AREA B - PRODUCTION
B-1 - HOLDER 3 AND TAR STRUCTURE
B-2 - SMALL RELIEF HOLDER
B-3 - TAR SEPARATOR
B-4 - PURIFIERS
B-5 - LARGE RELIEF HOLDER AND TAR TANK, DRIP OIL PUMP HOUSE
B-6 - TAR PROCESSING AREA
TAR STORAGE TANKS
TAR SEPARATOR
TAR SETTLING TANK
TAR SEPARATOR
DRIP OIL AND TAR TANK
CONDENSERS
B-7 - GASOLINE TANK
B-8 - CLARIFYING PIT
B-9 - GAS OIL TANKS
AREA C - LIQUID FUEL STORAGE
AREA D - MATERIAL STORAGE
D-1 - DRIP OIL AREA
3 DRIP OIL TANKS
DRIP OIL SEPARATOR
DRIP OIL PUMP HOUSE
D-2 - COAL AND COKE PILE
D-3 - COKE PILE
D-4 - OXIDE STORAGE AREA

TEST BORING CONVERTED TO PIEZOMETER NUMBER 1
TEST BORING NUMBER 1
OVERBURDEN MONITORING WELL NUMBER 1
BEDROCK MONITORING WELL NUMBER 1
PRELIMINARY TEST PIT - JUNE 1992 NUMBER 1
DETAILED TEST PIT - JULY 1992 NUMBER 1
SHALLOW HAND AUGER TEST BORING NUMBER 1

PHASE I SRI SAMPLES

B-1 LOCATION OF EXPLORATORY BORING
SS-5 LOCATION OF SURFACE SOIL SAMPLE
MW-16B MONITORING WELL LOCATION (SHALLOW/DEEP NESTED WELL PAIR)
TP-30 TEST PIT LOCATION

VISIBLE IMPACT INFORMATION

B-1 VISIBLE IMPACTS OBSERVED BUT NO ANALYTICAL SAMPLE WAS COLLECTED OF THE IMPACTED MATERIAL
B-12 VISIBLE IMPACTS OBSERVED AND ANALYTICAL SAMPLE COLLECTED OF THE IMPACTED MATERIAL WITH NO CONCENTRATIONS THAT EXCEED NJDEP CRITERIA
B-20 VISIBLE IMPACTS OBSERVED AND ANALYTICAL SAMPLE COLLECTED OF THE IMPACTED MATERIAL WITH ONE OR MORE CONCENTRATIONS THAT EXCEED NJDEP CRITERIA
NO VISIBLE IMPACTS NOTED
NO LOG AVAILABLE FOR SAMPLE LOCATIONS

NOTES:
VISIBLE IMPACTS INCLUDE FREE PRODUCT, RESIDUAL PRODUCT, SHEEN AND STAIN

NO LITHOGRAPHIC INFORMATION IS AVAILABLE FOR SHALLOW HAND AUGER TEST BORINGS HA-1 THROUGH HA-4.

SOURCE:
BASE MAP FROM ERIE STREET FORMER MGP SITE - ELIZABETH, NEW JERSEY - ELIZABETHTOWN GAS CO.
DATE: 5/28/98 BY DAMES & MOORE, INC., CRANFORD, NEW JERSEY

SAMPLE LOCATIONS TAKEN FROM DAMES & MOORE, INC., 1984, 1993 AND 1994 REPORTS

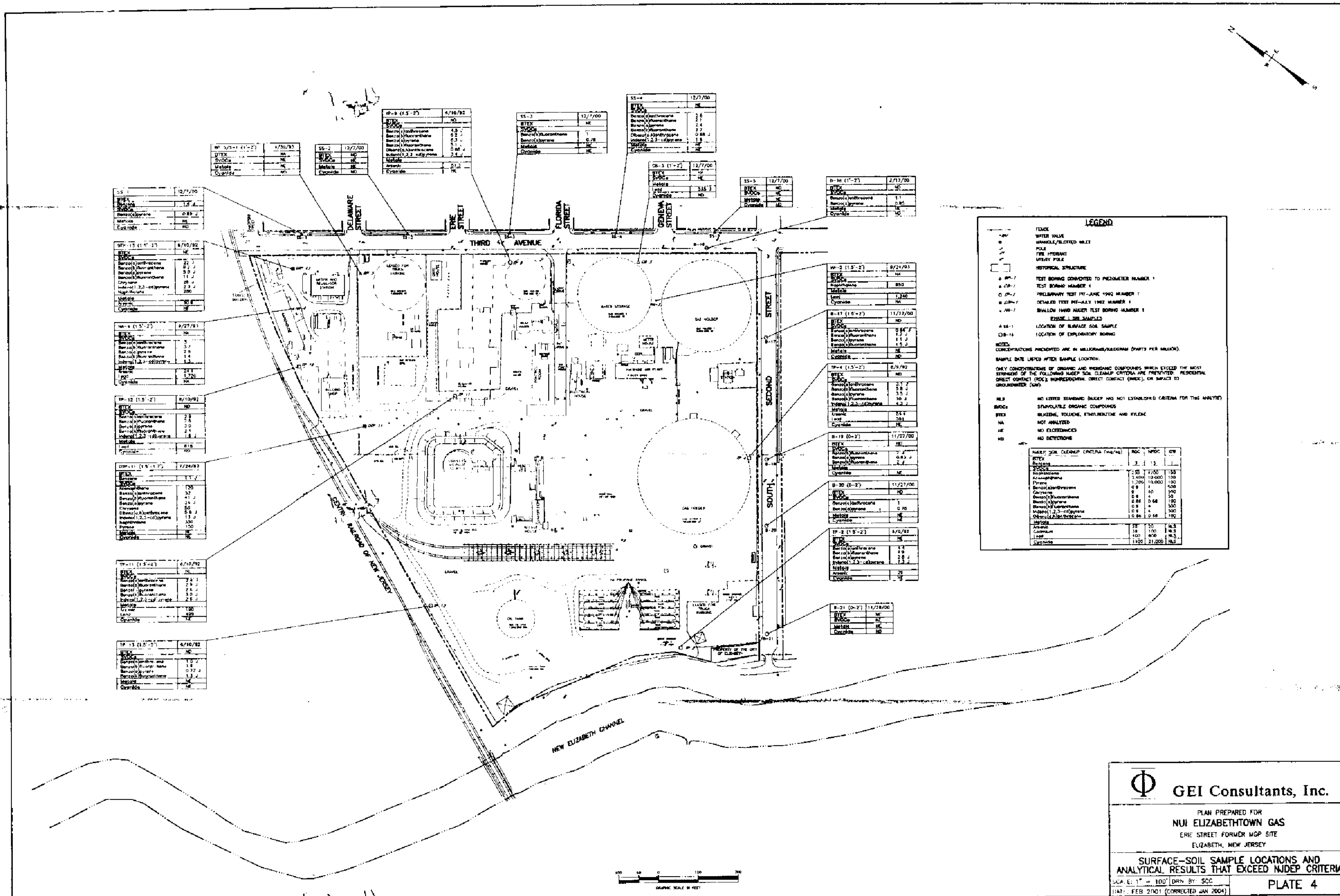
GRAPHIC SCALE IN FEET

GEI Consultants, Inc.

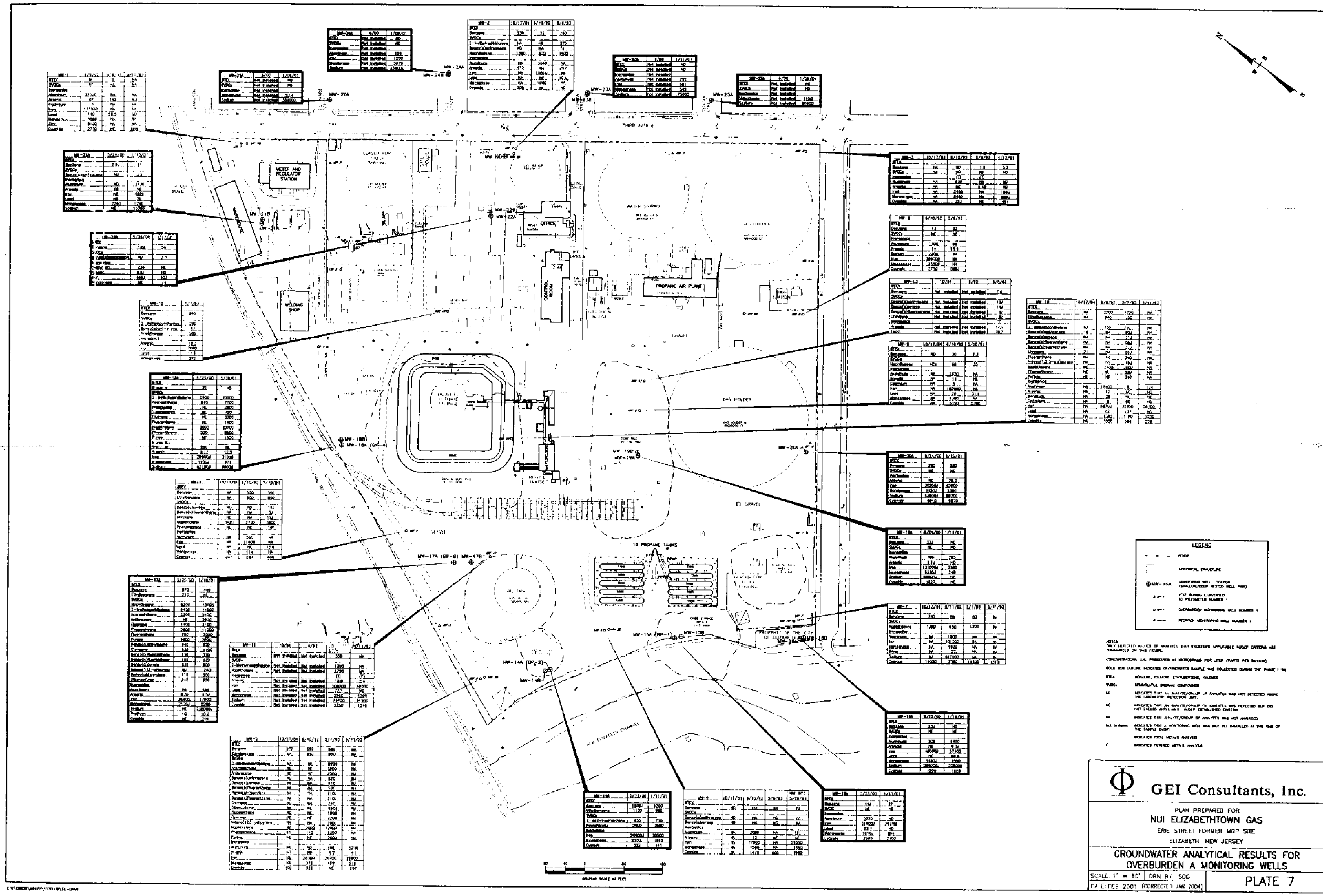
PLAN PREPARED FOR
NUI ELIZABETHTOWN GAS
ERIE STREET FORMER MGP SITE
ELIZABETH, NEW JERSEY

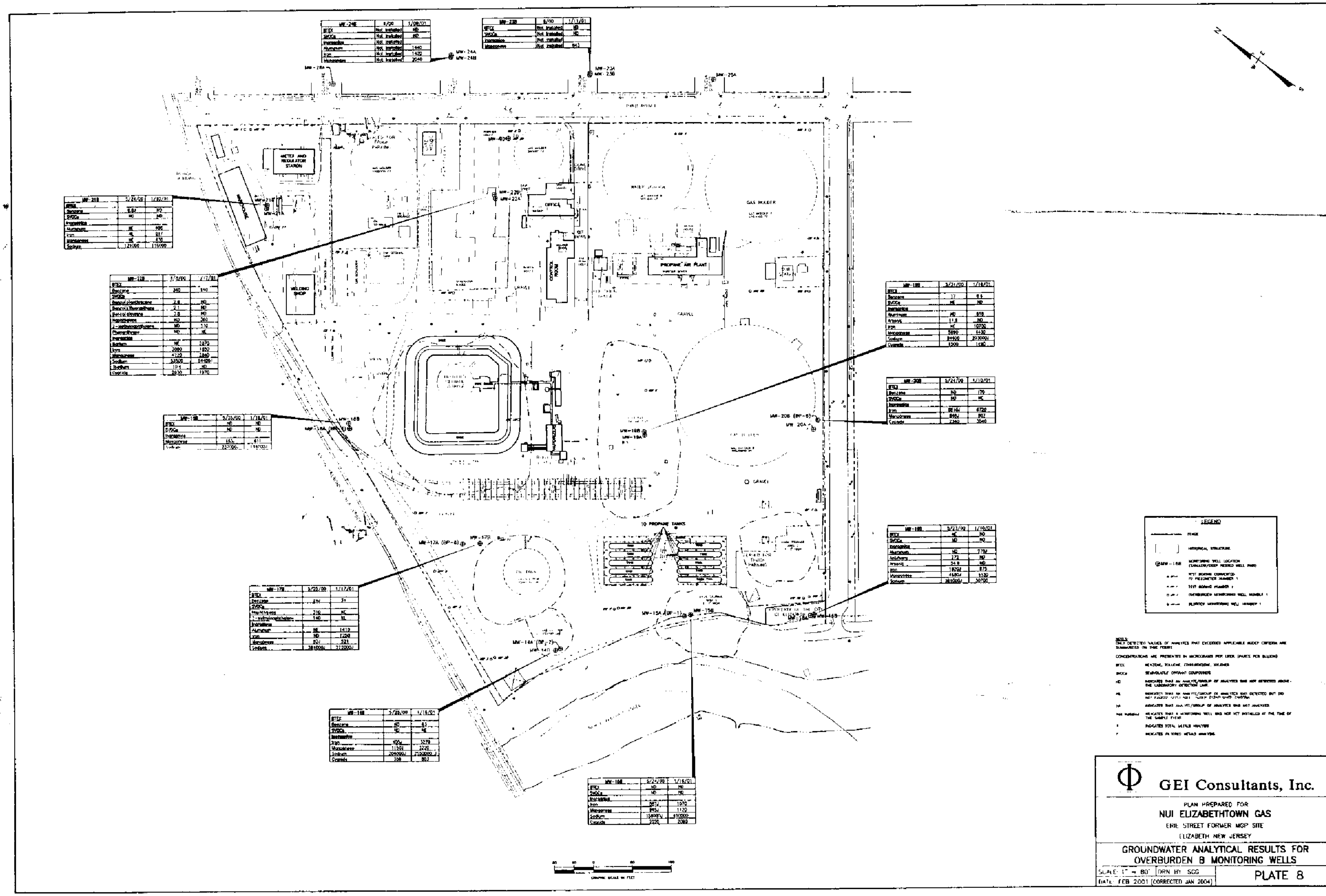
ILLUSTRATION OF ANALYTICAL SAMPLES COLLECTED IN VISIBLY IMPACTED SOIL

SCALE 1" = 80'	DRN BY SCG	PLATE 3
DATE FEB 2001	96477-1130	



TIERRA-B-017780


GAS HOLDER
10 PROPANE TANKS
PROPANE AIR PLANT
METER AND REGULATOR STATION
GEI Consultants, Inc.
PLAN PREPARED FOR
NUI ELIZABETHTOWN GAS
ERIE STREET FORMER MGP SITE
ELIZABETH, NEW JERSEY
GROUNDWATER ANALYTICAL RESULTS FOR
OVERBURDEN A MONITORING WELLS
SCALE: 1" = 80'
DRN BY: SCG
DATE: FEB 2001 (CORRECTED JAN 2004)
PLATE 7



MW-24B	8/00	1/09/01
BTEX	Not Installed	ND
SVOCs	Not Installed	ND
Inorganics	Not Installed	
Aluminum	Not Installed	1440
Iron	Not Installed	1420
Manganese	Not Installed	2040

MW-23B	8/00	1/11/01
BTEX	Not Installed	ND
SVOCs	Not Installed	ND
Inorganics	Not Installed	
Manganese	Not Installed	843

MW-21B	5/24/00	1/10/01
BTEX		
Benzene	0.8J	ND
SVOCs	ND	ND
Inorganics		
Aluminum	NE	406
Iron	NE	317
Manganese	NE	438
Sodium	121000	115000

MW-22B	5/5/00	1/17/01
BTEX		
Benzene	340	140
SVOCs		
Benzo(a)anthracene	2.8	ND
Benzo(b)fluoranthene	2.1	ND
Benzo(a)pyrene	2.8	ND
Naphthalene	ND	360
2-Methylnaphthalene	ND	170
Phenanthrene	ND	NE
Inorganics		
Barium	NE	2070
Iron	3080	1850
Manganese	4720	2840
Sodium	53500	54400J
Thallium	19.4	ND
Cyanide	2030	1970

MW-19B	5/25/00	1/18/01
BTEX	ND	ND
SVOCs	ND	ND
Inorganics		
Manganese	163	611
Sodium	227000	194000J

MW-17B	5/25/00	1/17/01
BTEX		
Benzene	24J	5J
SVOCs		
Naphthalene	230	NE
2-Methylnaphthalene	140	NE
Inorganics		
Aluminum	NE	1410
Iron	ND	1250
Manganese	82J	521
Sodium	381000J	272000J

MW-18B	5/31/00	1/18/01
BTEX		
Benzene	17	6.6
SVOCs	NE	ND
Inorganics		
Aluminum	ND	659
Arsenic	11.8	ND
Iron	NE	10700
Manganese	5890	4430
Sodium	84400	203000J
Cyanide	1500	1480

MW-20B	5/24/00	1/10/01
BTEX		
Benzene	ND	179
SVOCs	ND	NE
Inorganics		
Iron	8810J	6720
Manganese	848J	807
Cyanide	2340	3840

MW-16B	5/23/00	1/16/01
BTEX	NE	ND
SVOCs	ND	ND
Inorganics		
Aluminum	ND	7790
Antimony	272	ND
Arsenic	54.8	ND
Iron	18700	875
Manganese	4680J	1130
Sodium	381000J	30700

MW-14B	5/25/00	1/16/01
BTEX		
Benzene	ND	63
SVOCs	ND	NE
Inorganics		
Iron	400J	3270
Manganese	11550	2220
Sodium	2040000J	2550000 J
Cyanide	350	803

MW-15B	5/24/00	1/16/01
BTEX	ND	ND
SVOCs	ND	ND
Inorganics		
Iron	887J	1070
Manganese	995J	1120
Sodium	158000J	410000
Cyanide	2020	2080

GEI Consultants, Inc.

PLAN PREPARED FOR

NUI ELIZABETHTOWN GAS

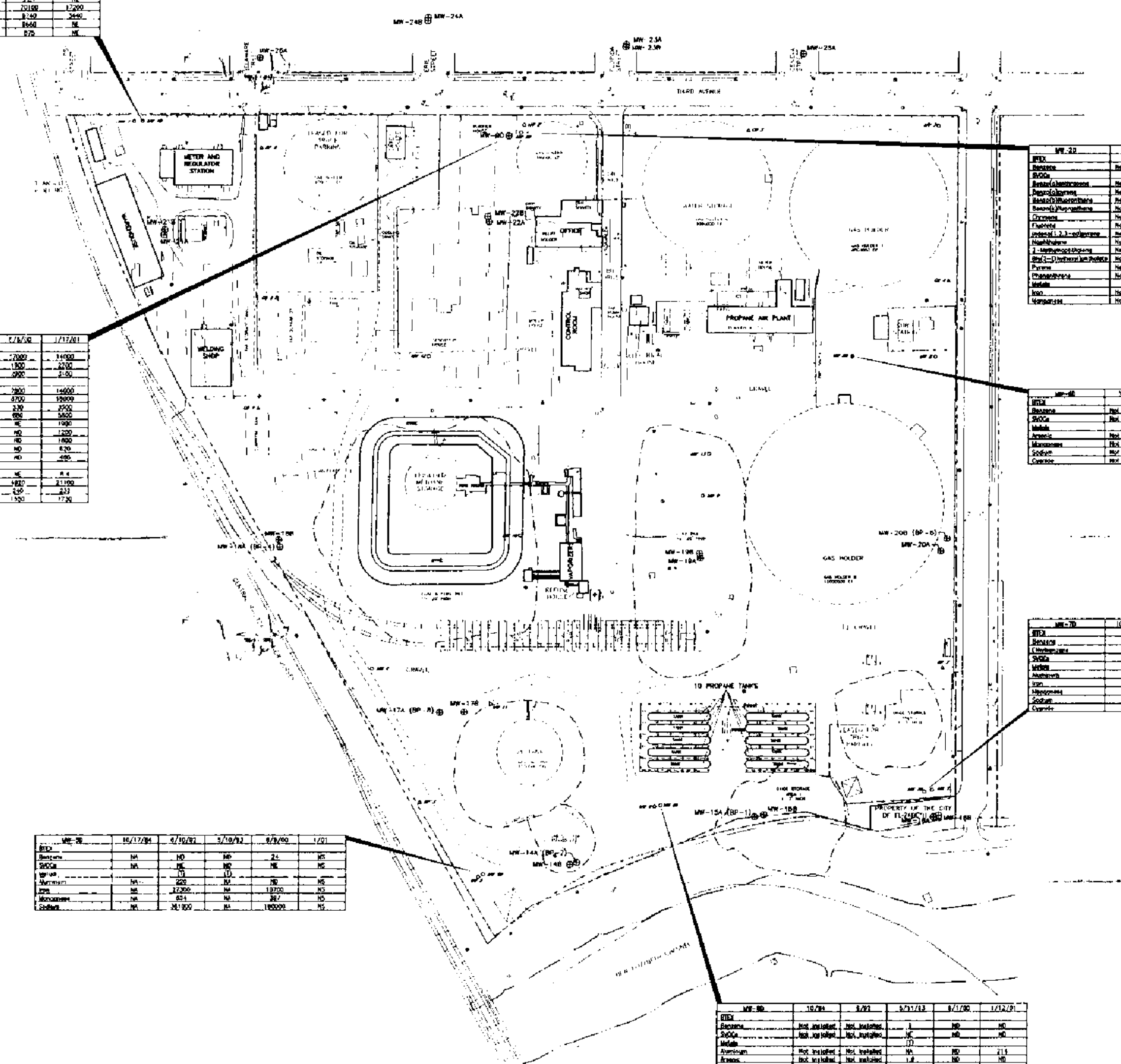
ERIE STREET FORMER MGP SITE

ELIZABETH NEW JERSEY

GROUNDWATER ANALYTICAL RESULTS FOR OVERBURDEN B MONITORING WELLS

SCALE: 1" = 80'	DRN BY: SCG	PLATE 8
DATE: FEB 2001 (CORRECTED JAN 2004)		

TIERRA-B-017782



MW-1D	10/17/84	6/9/92	5/6/93	5/25/00	1/11/01
BTEX	NA	ND	NE	ND	ND
SVOCs	NA	ND	ND	ND	ND
Metals		(T)	(T)		
Aluminum	NA	1600	NA	8080	1060
Arsenic	NA	ND	11.1	ND	ND
Beryllium	NA	?	NA	NE	ND
Cadmium	NA	19	NA	22.1	NE
Iron	NA	98700	NA	70100	17200
Manganese	NA	11800	NA	8140	3440
Zinc	NA	14500	NA	8660	NE
Cyanide (Total)	NA	810	NE	875	NE

MW-2D	10/84	6/92	5/11/93	6/8/00	1/11/01
BTEX					
Benzene	Not Installed	Not Installed	1950	660	PRODUCT IN WELL NO ANALYTICAL DATA
SVOCs					
Benzo(a)anthracene	Not Installed	Not Installed	95	NE	
Benzo(a)pyrene	Not Installed	Not Installed	90	NE	
Benzo(b)fluoranthene	Not Installed	Not Installed	53	NE	
Benzo(k)fluoranthene	Not Installed	Not Installed	20 J	NE	
Chrysene	Not Installed	Not Installed	97	NE	
Fluorene	Not Installed	Not Installed	350	NE	
Indeno(1,2,3-cd)pyrene	Not Installed	Not Installed	29 J	NE	
Naphthalene	Not Installed	Not Installed	840	NE	
2-Methylnaphthalene	Not Installed	Not Installed	1300	NE	
Bis(2-Ethylhexyl)phthalate	Not Installed	Not Installed	46 J	NE	
Pyrene	Not Installed	Not Installed	260	NE	
Phenanthrene	Not Installed	Not Installed	790	NE	
Metals			(T)		
Iron	Not Installed	Not Installed	NA	5240	
Manganese	Not Installed	Not Installed	NA	62.7	

MW-9D	7/6/00	1/17/01
BTEX		
Benzene	17000	14000
Ethylbenzene	1500	2200
Xylenes	2600	2100
SVOCs		
2-Methylnaphthalene	7800	14000
Naphthalene	8700	15000
Acenaphthene	230	2500
Phenanthrene	650	5600
Fluorene	NE	1900
Fluoranthene	ND	1200
Pyrene	ND	1600
Chrysene	ND	620
Benz(a)pyrene	ND	460
Metals		
Arsenic	NE	8.4
Iron	4820	21100
Manganese	250	233
Cyanide	1100	1730

MW-4D	10/84	6/92	5/10/93	5/31/00	1/11/01
Benzene	Not Installed	Not Installed	1300	820	390
SVOCs	Not Installed	Not Installed	NE	NE	NE
Metals			(T)		
Arsenic	Not Installed	Not Installed	2.5	ND	ND
Manganese	Not Installed	Not Installed	NA	1128	1110
Sodium	Not Installed	Not Installed	NA	58600	50800
Cyanide	Not Installed	Not Installed	1150	1230	1590

MW-7D	10/17/84	6/11/92	5/7/93	5/31/00	1/11/01
BTEX					
Benzene	778	ND	ND	ND	ND
Ethylbenzene	778	ND	ND	ND	ND
SVOCs	NE	ND	ND	ND	ND
Metals		(T)	(T)		
Aluminum	NA	616	NA	ND	ND
Iron	NA	133000	NA	3050	3050
Manganese	NA	2650	NA	742	2480
Sodium	NA	2700000	NA	453000	NE
Cyanide	3990	845	826	214	1350

MW-3D	10/17/84	6/10/92	5/10/93	6/8/00	1/01
BTEX					
Benzene	NA	ND	ND	24	NS
SVOCs	NA	NE	ND	NE	NS
Metals		(T)	(T)		
Aluminum	NA	220	NA	ND	NS
Iron	NA	17300	NA	10700	NS
Manganese	NA	634	NA	387	NS
Sodium	NA	361000	NA	180000	NS

MW-8D	10/84	6/92	5/11/93	6/1/00	1/12/01
BTEX					
Benzene	Not Installed	Not Installed	1	ND	ND
SVOCs	Not Installed	Not Installed	NE	ND	ND
Metals			(T)		
Aluminum	Not Installed	Not Installed	NA	ND	214
Arsenic	Not Installed	Not Installed	1.8	ND	ND
Iron	Not Installed	Not Installed	NA	ND	4760
Manganese	Not Installed	Not Installed	NA	98.2	158
Sodium	Not Installed	Not Installed	NA	230000	264000
Cyanide	Not Installed	Not Installed	994	936	880

LEGEND

TEST BORING CONVERTED TO PIEZOMETER NUMBER 1

TEST BORING NUMBER 1

OVERBURDEN MONITORING WELL NUMBER 1

BEDROCK MONITORING WELL NUMBER 1

NOTES

ONLY DETECTED VALUES OF ANALYTES THAT EXCEEDED APPLICABLE NJDEP CRITERIA ARE SUMMARIZED ON THIS FIGURE

CONCENTRATIONS ARE PRESENTED IN MICROGRAMS PER LITER (PARTS PER BILLION)

BTEX — BENZENE, TOLUENE, ETHYLBENZENE, XYLENES

SVOCs — SEMIVOLATILE ORGANIC COMPOUNDS

ND — INDICATES THAT AN ANALYTE/GROUP OF ANALYTES WAS NOT DETECTED ABOVE THE LABORATORY DETECTION LIMIT

NE — INDICATES THAT AN ANALYTE/GROUP OF ANALYTES WAS DETECTED BUT DID NOT EXCEED APPLICABLE NJDEP ESTABLISHED CRITERIA

NA — INDICATES THAT ANALYTE/GROUP OF ANALYTES WAS NOT ANALYZED

NS — INDICATES WELL WAS NOT SAMPLED DURING SPECIFIED SAMPLE EVENT

Not Installed — INDICATES THAT A MONITORING WELL WAS NOT YET INSTALLED AT THE TIME OF THE SAMPLE EVENT

T — INDICATES TOTAL METALS ANALYSIS

F — INDICATES FILTERED METALS ANALYSIS

Φ GEI Consultants, Inc.

PLAN PREPARED FOR

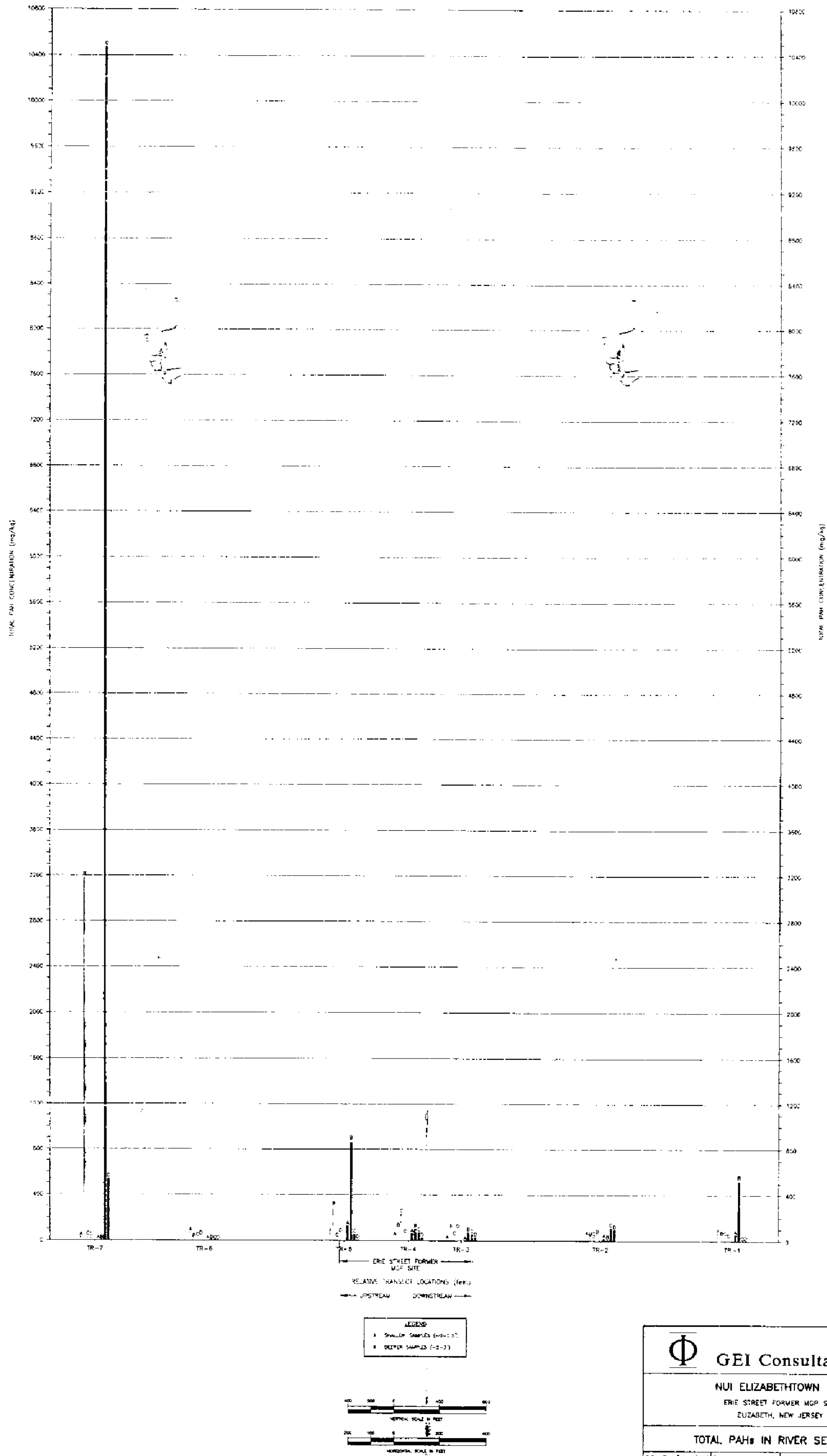
NUI ELIZABETHTOWN GAS

ERIE STREET FORMER MGP SITE

ELIZABETH NEW JERSEY

GROUNDWATER ANALYTICAL RESULTS FOR BEDROCK MONITORING WELLS

SCALE 1" = 80'	DRN BY: SCG	PLATE 9
DATE FEB 2001 (CORRECTED JAN 2004)		



Φ GEI Consultants, Inc.

NUI ELIZABETHTOWN GAS

ERIE STREET FORMER MGP SITE

ELIZABETH, NEW JERSEY

TOTAL PAHs IN RIVER SEDIMENTS

SCALE: 1" = 200'	DRN BY: PHH	PLATE 10
DATE: MAR 2001	98477-1130	

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT
LANCE R. MILLER, DIRECTOR
CN 028
Trenton, N.J. 08625-0028
(609) 633-1408
Fax # (609) 633-1454

RECEIVED
APR 11 1991
LEGAL DEPARTMENT

APR 9 1991

Mary Patricia Keefe, Vice President
Elizabethtown Gas Company
One Elizabethtown Plaza
Union, New Jersey 07083

Dear Ms. Keefe:

Re: Elizabethtown Gas Company, South Street Site
Administrative Consent Order (ACO)
406-426 South Street
Elizabeth, Union County, New Jersey

Enclosed find one executed original ACO for the referenced site for your records. Please note that the effective date of the ACO is April 9, 1991.

If you have any questions contact David Sweeney at (609) 633-0719.

Sincerely,

Colleen Kokas

Colleen Kokas, Acting Section Chief
Bureau of State Case Management

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT
LANCE R. MILLER, DIRECTOR
CN 028
Trenton, N.J. 08625-0028
(609) 633-1408
Fax # (609) 633-1454

Date: MAR 26 1991

IN THE MATTER OF THE :
SOUTH STREET COAL GAS SITE :
AND :
ELIZABETHTOWN GAS COMPANY :

ADMINISTRATIVE CONSENT ORDER

This Administrative Consent Order is issued pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection (hereinafter "NJDEP" or the "Department") by N.J.S.A. 13:1D-1 et seq. and the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. and duly delegated to the Assistant Director for the Responsible Party Cleanup Element of the Division of Hazardous Waste Management pursuant to N.J.S.A. 13:1B-4.

FINDINGS

1. Elizabethtown Gas Company (hereinafter "EGC") is a New Jersey Corporation with its principal offices located at 1 Elizabethtown Plaza, Morris Avenue, Union County, Union, New Jersey. EGC owns the property located at 400-426 South Street, Elizabeth, New Jersey, designated as Block 9, Lot 1151 on the municipal tax maps of the City of Elizabeth (hereinafter "the Site"). The Elizabeth River runs through the southwest corner of the Site in a concrete channel. The Site is bordered by residential properties to the northeast, east and southeast, light industry to the north, a storm water retention basin and the concrete bulkheads that contain the Elizabeth River to the southwest and Route 1 and 9 to the west. The Site consists of approximately 2.7 acres enclosed by a fence. There are four buildings on the Site, including one office building and three other buildings that contain debris and construction machinery.

2. EGC leased the property to Vignola Haulage of N.J., Inc., a haulage company.

3. In 1855 Elizabethtown Gas Light Company, a predecessor to EGC, began gas manufacturing operations on the Site for distribution and sale to its customers within the City of Elizabeth. The manufacture of gas was accomplished through several processes which resulted in gas. Coal gas was manufactured through the thermo-decomposition of volatile matter in coal in equipment called retorts, benches and coke ovens. This process produced the

following by-products and/or wastes which may have included, but not be limited to: ash, coke, clinker, tars, spent oxide, spent lime and ammonia liquor. Because of the nature of the by-products and/or wastes generated, handled and/or stored at coal gasification facilities there exists the possibility that these by-products and/or wastes and/or constituents thereof, which are hazardous substances as defined in the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. and pollutants as defined in the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., are present at the Site.

4. EGC alleges that: (a) the coal gasification process necessarily included the manufacture of certain materials (some or all of which are the subject of this Administrative Consent Order) which, at the time of the coal gasification activities, were neither believed to be hazardous, nor were regulated as hazardous; (b) as a result of subsequent changes in laws and regulations governing environmental matters and based upon a more advanced understanding of the characteristics of the aforementioned materials, it is now recognized that these materials are or may be hazardous; (c) nevertheless, EGC acted in an appropriate manner consistent with their understanding and in accordance with the law at the time the operations took place. The Department neither admits nor denies the above allegations.

5. In 1901 Elizabethtown Gas Light Company ceased gas manufacturing operations at the Site and soon thereafter reorganized and became known as EGC.

6. By letter dated August 22, 1983, the Department notified EGC of the potential presence of hazardous substances as defined in the Spill Compensation and Control Act, and pollutants as defined in the Water Pollution Control Act, at former coal gasification facilities, including the Site resulting from by-products and/or wastes, and/or constituents thereof, from gas manufacturing processes. In this letter the Department also notified EGC that it would be assessing gas manufacturing facilities for contamination.

7. By letter dated September 19, 1983, EGC notified the United States Environmental Protection Agency (hereinafter "USEPA") that pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, EGC was giving notice of the potential existence of hazardous substances and pollutants at the Site.

8. By letter dated September 19, 1983, EGC notified the Department of its intention to fully comply with the New Jersey Spill Compensation and Control Act.

9. Between January 27, 1987 and February 5, 1987, the New Jersey Department of Transportation (NJDOT) performed an environmental Site screening investigation on the portion of the Site which NJDOT plans to purchase for the building of a right-of-way. Data generated from the investigation has revealed the presence of cadmium, lead and cyanide. Polynuclear Aromatic Hydrocarbons (PAH) were the most significant organic contaminants detected in concentrations ranging from 40 parts per million (ppm) to 3090 ppm in eight of twelve samples.

10. The substances referenced in paragraph(s) 3 and 8 above are hazardous substances pursuant to the Spill Compensation and Control Act, N.J.S.A., 58:10-23.11b(k).

11. The hazardous substances referenced above were discharged into the waters and onto the lands of the State of New Jersey in violation of the Spill Compensation and Control Act, specifically N.J.S.A. 58:10-23.11c.

12. The substances referenced in paragraph(s) 3 and 8 above are pollutants pursuant to the Water Pollution Control Act, N.J.S.A. 58:10A-3n.

13. The pollutants referenced above were discharged onto the lands and into the waters of the State of New Jersey (without a permit) in violation of the Water Pollution Control Act, specifically N.J.S.A. 58:10A-6.

14. Based on these FINDINGS, the Department has determined (i) that as a result of operations at the site, hazardous substances as defined in the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. and pollutants as defined in the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq. have been and may continue to discharge onto the land and into the waters of the State of New Jersey in violation of the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. and the Water Pollution Control Act, N.J.S.A. 58:10A-6 et seq. at or about the Site; and, (ii) that EGC is a responsible party, as defined in N.J.S.A. 58:10-23.11g.

15. Historical records reveal the likelihood that other possible sources of pollution exist proximate to the site.

16. To determine the nature and extent of the problem presented by the discharge of pollutants and hazardous substances at the site and to develop environmentally sound remedial actions, it is necessary to conduct a remedial investigation and feasibility study of remedial action alternatives (hereinafter "RI/FS") for the site. To correct the problems presented by the discharge, it may be necessary to implement a remedial action plan, the scope of which will be based on the results of the RI/FS.

17. To resolve this matter without the necessity for litigation, EGC has agreed to conduct an RI/FS and to design and implement a remedial action alternative for the site.

18. Notwithstanding the provisions of paragraph 14, EGC enters into this Administrative Consent Order without trial or adjudication of any of the facts or issues contained herein. The execution of this Administrative Consent Order by EGC and EGC's subsequent compliance with its terms, does not constitute, and shall not be construed as; an admission of liability of any kind or an admission of any fact or conclusion of law or the applicability of any law.

ORDER

NOW, THEREFORE, IT IS HEREBY ORDERED AND AGREED THAT:

I. Reimbursement of Prior Costs

A. Reimbursement of Prior Costs

19. Within thirty (30) calendar days after receipt from the Department of a written summary of all costs incurred by the Department to date, in connection with the investigation of, and response to, the matters described in the FINDINGS hereinabove, including the costs associated with the preparation of this Administrative Consent Order, EGC shall submit to the Department a cashier's or certified check payable to the "Treasurer, State of New Jersey" for the full amount of the Department's oversight costs. Payment shall be submitted to the contact listed in paragraph 44 below.

II. Remedial Investigation and Cleanup

A. Remedial Investigation

20. Within sixty (60) calendar days after the effective date of this Administrative Consent Order, EGC shall submit to the Department a detailed draft Remedial Investigation Work Plan (hereinafter the "RI Work Plan") in accordance with the scope of work set forth in Appendices B, C and D, which are attached hereto and made a part hereof.

21. Within one hundred (100) calendar days after receipt of the Department's written comments on the draft RI Work Plan, EGC shall modify the draft RI Work Plan to conform to the Department's comments and shall submit the modified RI Work Plan to the Department. The determination as to whether or not the modified RI Work Plan, as resubmitted, conforms to the Department's comments and is otherwise acceptable to the Department shall be made solely by the Department in writing.

22. Upon receipt of the Department's written final approval of the RI Work Plan, EGC shall conduct the remedial investigation in accordance with the approved RI Work Plan and the schedule therein.

23. EGC shall submit to the Department a draft Remedial Investigation Report (hereinafter "RI Report") in accordance with Appendix B and the RI Work Plan and the schedule therein.

24. If upon review of the draft RI Report the Department determines that additional remedial investigation is required, EGC shall conduct additional remedial investigation as directed by the Department and submit a second draft RI Report.

25. Within one hundred (100) calendar days after receipt of the Department's written comments on the draft or second draft (if applicable pursuant to the preceding paragraph) RI Report, EGC shall modify the draft or second draft RI Report to conform to the Department's comments and shall submit the modified RI Report to the Department. The determination as to whether or not the modified RI Report, as resubmitted, conforms with the Department's comments and is otherwise acceptable by the Department shall be made solely by the Department in writing.

B. Feasibility Study

26. Within sixty (60) calendar days after receipt of the Department's written final approval of the RI Report, or as otherwise directed by the Department, EGC shall submit to the Department a detailed draft Feasibility Study Work Plan (hereinafter, "FS Work Plan") in accordance with the scope of work set forth in Appendix E, which is attached hereto and made a part hereof.

27. Within one hundred (100) calendar days after receipt of the Department's written comments on the draft FS Work Plan, EGC shall modify the draft FS Work Plan to conform to the Department's comments and shall submit the modified FS Work Plan to the Department. The determination as to whether or not the modified FS Work Plan, as resubmitted, conforms to the Department's comments and is otherwise acceptable to the Department shall be made solely by the Department in writing.

28. Upon receipt of the Department's written final approval of the FS Work Plan, EGC shall conduct the feasibility study in accordance with the approved FS Work Plan and the schedule therein.

29. EGC shall submit to the Department a draft Feasibility Study Report (hereinafter "FS Report") in accordance with Appendix E and the approved FS Work Plan and the schedule therein.

30. Within one hundred (100) calendar days after receipt of the Department's written comments on the draft FS Report, EGC shall modify the draft FS Report to conform to the Department's comments and shall submit the modified FS Report to the Department. The determination as to whether or not the modified FS Report, as resubmitted, conforms to the Department's comments and is otherwise acceptable to the Department shall be made solely by the Department in writing.

C. <u>Remedial Action</u>

31. The Department will designate the remedial action alternatives that meet the criteria set forth in Appendix E, Section I.D. Within forty-five (45) calendar days after receipt of the Department's designation, EGC shall notify the Department which of these remedial action alternatives it will implement

32. Within ninety (90) calendar days after EGC's written notification of selection of the remedial action alternative it will implement, EGC shall submit to the Department a detailed draft Remedial Action Plan in accordance with the scope of work set forth in Appendix F, which is attached hereto and made a part hereof.

33. Within one hundred (100) calendar days after receipt of the Department's written comments on the draft Remedial Action Plan, EGC shall modify the draft Remedial Action Plan to conform to the Department's comments and shall submit the modified Remedial Action Plan to the Department. The determination as to whether or not the modified Remedial Action Plan, as resubmitted, conforms to the Department's comments and is otherwise acceptable to the Department shall be made solely by the Department in writing.

34. Upon receipt of the Department's written final approval of the Remedial Action Plan, EGC shall implement the approved Remedial Action Plan in accordance with the schedule therein.

35. The Department and EGC hereby acknowledge and, where relevant, will take into account that certain activities, e.g. field sampling and analysis, could take more than 30 calendar days to complete.

D. Additional Remedial Investigation and Remedial Action

36. If at any time prior to EGC receipt of written notice from the Department pursuant to paragraph 88, the Department determines that the criteria set forth in Appendix E (Section I.D.) are not being achieved or that additional remedial investigation and/or remedial action is required to protect human health or the environment, EGC shall conduct such additional activities as directed by the Department and in accordance with this Administrative Consent Order.

E. Progress Reports

37. EGC shall submit to the Department quarterly progress reports; the first progress report shall be submitted on or before the 30th calendar day of the month following the first full quarter after the effective date of this Administrative Consent Order. Each progress report thereafter shall be submitted on or before the 30th calendar day of the month following the quarter being reported. Each progress report shall detail the activities taken to comply with this Administrative Consent Order and shall include the following:

a. Identification of site and reference to this Administrative Consent Order;

b. Identify specific requirements of this Administrative Consent Order (including the corresponding paragraph number or schedule) which were initiated during the reporting period;

c. Identify specific requirements of this Administrative Consent Order (including the corresponding paragraph number or schedule) which were initiated in a previous reporting period, which are still in progress and which will continue to be carried out during the next reporting period;

d. Identify specific requirements of this Administrative Consent Order (including the corresponding paragraph number or schedule) which were completed during this reporting period;

e. Identify specific requirements of this Administrative Consent Order (including the corresponding paragraph numbers or schedule) which should have been completed during the reporting period and were not;

f. An explanation of any non-compliance with any approved work plan(s), schedule(s) or Remedial Action Plan, and actions taken or to be taken to rectify non-compliance;

g. Identify the specific requirements of this Administrative Consent Order (including the corresponding paragraph number or schedule) that will be initiated during the upcoming reporting period.

III. Permits

38. This Administrative Consent Order shall not be construed to be a permit or in lieu of a permit for existing or former activities which require permits and it shall not relieve EGC from obtaining and complying with all applicable Federal, State and local permits necessary for any future activities which EGC must perform in order to carry out the obligations of this Administrative Consent Order.

39. EGC shall submit complete applications for all Federal, State and local permits required to carry out the obligations of this Administrative Consent Order in accordance with the approved time schedules.

40. Within sixty (60) calendar days of receipt of written comments concerning any permit application to a Federal, State or local agency, or as otherwise required by the permitting agency, EGC shall modify the permit application to conform to the agency's comments and resubmit the permit application to the agency. The determination as to whether or not the permit application, as resubmitted, conforms with the agency's comments or is otherwise acceptable to the agency shall be made solely by the agency in writing.

41. This Administrative Consent Order shall not preclude the Department from requiring that EGC apply for any permit or permit modification issued by the Department under the authority of the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and/or any other statute for the matters covered herein. The terms and conditions of any such permit or permit modification shall not be preempted by the terms and conditions of this Administrative Consent Order even if the terms and conditions of any such permit or permit modification are more stringent than the terms and conditions of this Administrative Consent Order. To the extent that the terms and conditions of any such permit or permit modifications are substantially equivalent with the terms and conditions of this Administrative Consent Order, EGC waives any rights it may have to a hearing on such terms and conditions during any such permit process.

IV. Project Coordination

42. EGC shall submit to the Department all documents required by this Administrative Consent Order, including correspondence relating to force majeure issues, by certified mail, return receipt requested or by hand delivery with an acknowledgement of receipt form for the Department's signature. The date that the Department executes the receipt or acknowledgement will be the date the Department uses to determine EGC compliance with the requirements of this Administrative Consent Order and the applicability of stipulated penalties and any other remedies available to the Department.

43. Within seven (7) calendar days after the effective date of this Administrative Consent Order, EGC shall submit to the Department the name, title, address and telephone number of the individual who shall be the EGC contact for the Department for all matters concerning this Administrative Consent Order. The individual identified in the following paragraph shall be the Department's contact for the EGC for all matters concerning this Administrative Consent Order.

44. EGC shall submit four (4) copies of all documents required by this Administrative Consent Order, unless otherwise directed by the Department, to:

New Jersey Department of Environmental Protection
Bureau of State Case Management
Division of Hazardous Waste Management
401 East State Street - Fifth Floor
CN-028
Trenton, NJ 08625
Attention: David Sweeney, Section Chief

45. EGC shall notify, both verbally and in writing, the contact person listed above at least two weeks prior to the initiation of any component identified in any submittals relating to field activities required under this Administrative Consent Order and as soon as practicable following any schedule change.

V. Financial Requirements

A. Financial Assurance

46. Within thirty (30) calendar days after the effective date of this Administrative Consent Order, EGC shall obtain and provide to the Department financial assurance in the form of either an irrevocable letter of credit or a performance bond in the amount of $700,000.00. EGC shall also establish an irrevocable standby trust fund, with an initial deposit of One Thousand dollars ($1,000.00) or as otherwise required by the financial institution. The irrevocable letter of credit, the performance bond and the irrevocable trust fund agreement shall meet the following requirements:

i. Letter of credit

a. Is identical to the wording specified in Appendix G for letters of credit, which is attached hereto and made a part hereof;

b. Is issued by a New Jersey State or Federally chartered bank, savings bank, or savings and loan association, which has its principal office in New Jersey, unless otherwise approved by the Department; and

c. Is accompanied by a letter from EGC referring to the Letter of Credit by number, issuing institution and date and providing the following information: the name and address of the facility and/or site which is the subject of the Administrative Consent Order and the amount of funds securing the EGC performance of all its obligations under the Administrative Consent Order.

ii. Performance Bond

a. Is identical to the wording specified in Appendix I for performance bonds, which is attached hereto and made a part hereof;

b. The surety company issuing the performance bond shall, at a minimum, be among those listed as acceptable sureties on Federal bonds in the most recent version of Circular 570 issued by the U.S. Department of the Treasury, which is published annually on July 1 in the Federal Register; and

c. Is accompanied by a letter from EGC referring to the Performance Bond by number, issuing institution and date and providing the following information: the name and address of the facility and/or site which is the subject of the Administrative Conset Order and the amount of funds securing the company's performance of all its obligations under the Administrative Consent Order.

iii. Standby Trust

a. Is identical to the wording specified in Appendix H, which is attached hereto and made a part hereof;

b. The irrevocable standby trust fund may, at the discretion of the Department, be the depository for all funds paid pursuant to a draft by the Department against the letter of credit or payments made under the performance bond as directed by the Department;

c. The trustee shall be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or New Jersey agency;

d. Is accompanied by an executed certification of acknowledgement that is identical to the wording specified in Appendix H.

47. EGC shall establish and maintain the standby trust fund until terminated by the written agreement of the Department, the trustee and EGC, or of the trustee and the Department if EGC ceases to exist. EGC shall maintain the letter of credit or performance bond until the Department provides written notification to EGC that the financial assurance is no longer required for compliance with this Administrative Consent Order. In the event that the Department determines that EGC has failed to perform any of its obligations under this Administrative Consent Order, the Department may proceed to have the financial assurance deposited into the standby trust; provided, however, that before the Department draws on the letter of credit or makes a claim against the performance bond, the Department shall notify EGC in writing of the obligation(s) which it has not performed, and EGC shall have a reasonable time, not to exceed thirty (30) calendar days, unless approved in writing by the Department, to perform such obligation(s).

48. At any time, EGC may apply to the Department to substitute other financial assurances in a form, manner and amount acceptable to the Department.

B. <u>Project Cost Review</u>

49. Beginning three hundred sixty-five (365) calendar days after the effective date of this Administrative Consent Order and annually thereafter on that same calendar day, EGC shall submit to the Department a detailed review of all costs incurred by EGC in conjunction with the investigations and remediation of the Site. This cost review shall also include a detailed summary of all monies spent to date pursuant to this Administrative Consent Order, the estimated cost of all future expenditures required to comply with

this Administrative Consent Order (including any operation and maintenance costs), and the reason for any changes from the previous cost review submitted by EGC.

50. At any time after EGC submits the first cost review pursuant to the preceding paragraph, EGC may request the Department's approval to reduce the amount of the financial assurance to reflect the remaining costs of performing its obligations under this Administrative Consent Order. If the Department grants written approval of the request, EGC may amend the amount of the then existing letter of credit or performance bond.

51. If the estimated cost of meeting EGC obligations in this Administrative Consent Order at any time increases to an amount greater than the financial assurance, EGC shall, within fourteen (14) calendar days after receipt of written notice of the Department's determination, increase the amount of the then existing letter of credit or performance bond so that it is equal to the estimated cost as determined by the Department. The Department shall consider EGC's comments concerning costs of future actions into its determination. EGC shall provide the amended financial assurance to the Department within seven (7) calendar days after it has been obtained.

C. Oversight Cost Reimbursement

52. Within thirty (30) calendar days after receipt from the Department of a written summary of all costs incurred in connection with its oversight functions of this Administrative Consent Order for a fiscal year, or any part thereof, EGC shall submit to the Department a cashier's or certified check payable to the "Treasurer, State of New Jersey" for the full amount of the Department's oversight costs.

D. Stipulated Penalties

53. Upon a demand made by the Department, EGC shall pay stipulated penalties to the Department for its failure to comply with any of the deadlines or schedules required by this Administrative Consent Order including those established and approved by the Department in writing pursuant to this Administrative Consent Order. Each deadline or schedule not complied with shall be considered a separate violation. Payment of stipulated penalties shall be made according to the following schedule, unless the Department has modified the compliance date pursuant to the force majeureprovisions hereinbelow and other provisions which may have been established:

Calendar Days After Due Date	Stipulated Penalties
1 - 7	$ 1,000 per calendar day
8 - 14	$ 2,000 per calendar day
15 - 21	$ 3,000 per calendar day
22 - 28	$ 5,000 per calendar day
29 - over	$10,000 per calendar day

54. Any such penalty shall be due and payable thirty (30) calendar days following receipt of a written demand by the Department. Payment of stipulated penalties shall be made by a cashier's or certified check payable to the "Treasurer, State of New Jersey".

55. All penalties paid pursuant to this Administrative Consent Order shall be considered civil and/or civil administrative penalties.

56. Payment of stipulated penalties does not alter EGC responsibility to complete any requirement of this Administrative Consent Order.

VI. Force Majeure

57. If any event as specified in the following paragraph occurs which EGC believes or should believe may cause delay in the compliance or non-compliance with any provision of this Administrative Consent Order, EGC shall notify the Department in writing no later than seven (7) calendar days after the delay or the date the anticipated delay became known to EGC. The notification referenced in this paragraph shall describe the anticipated length of the delay, the precise cause or causes of the delay, any measures taken or to be taken to minimize the delay, and the anticipated time required to take any such measures to minimize the delay. EGC shall take all necessary action to prevent or minimize any such delay.

58. If the Department finds that: (a) EGC has complied with the notice requirements of the preceding paragraph (b) that any delay or anticipated delay has been or will be caused by fire, flood, riot, strike or other circumstances beyond the control of EGC; and (c) EGC has taken all necessary action to prevent or minimize any such delay the Department shall extend the time for performance hereunder for a period no longer than the delay resulting from such circumstances. If the Department determines that, (i) EGC has not complied with the notice requirements of the preceding paragraph, (ii) the event causing the delay is not beyond the control of EGC, or (iii) EGC has not taken all necessary actions to prevent or minimize the delay, this paragraph shall not be applicable and failure to comply with breach of the requirements of this Administrative Consent Order. The burden of proving that any delay is caused by circumstances beyond the control of EGC and the length of any such delay attributable to those circumstances shall rest with EGC. Increases in the cost or expenses incurred by EGC in fulfilling the requirements of this Administrative Consent Order shall not constitute a <u>force majeure</u>. Delay in an interim requirement shall not automatically justify or excuse delay in the attainment of subsequent requirements. <u>Force majeure</u> shall not include nonattainment of the goals, standards, guidelines and requirements set forth in the appendicies attached hereto. <u>Force majeure</u> shall not include contractor's breach unless such breach falls under (a), (b) and (c) of this paragraph.

VII. Reservation of Rights

59. The Department reserves the right to unilaterally terminate this Administrative Consent Order in the event EGC violates the terms or fails to meet the obligations of this Administrative Consent Order.

60. Nothing in this Administrative Consent Order shall preclude the Department from seeking civil or civil administrative penalties or any other legal or equitable relief against EGC.

61. This Administrative Consent Order shall not be construed to affect or waive the claims of federal or State natural resources trustees against EGC for damages for injury to, destruction of, or loss of natural resources.

62. The Department reserves the right to require EGC to take or arrange for the taking of any and all additional measures if the Department determines that such actions are necessary to protect human health or the environment. Nothing in this Administrative Consent Order shall constitute a waiver of any statutory right of the Department to require EGC to undertake such additional measures should the Department determine that such measures are necessary.

63. Nothing in this Administrative Consent Order, including the Department's assessment of stipulated penalties, shall preclude the Department from seeking civil or civil administrative penalties or any other legal or equitable relief against EGC for violations of this Administrative Consent Order. In any such action brought by the Department under this Administrative Consent Order for injunctive relief, or civil, civil administrative or stipulated penalties, EGC may raise among other defenses, a defense that EGC failed to comply with a decision of the Department, made pursuant to this Administrative Consent Order, on the basis that the Department's decision was arbitrary, capricious or unreasonable. If EGC is successful in establishing such a defense, EGC shall not be liable for stipulated penalties for failure to comply with that particular requirement of the Administrative Consent Order. Although EGC may raise such defenses in any action initiated by the Department for injunctive relief or stipulated penalties, EGC shall not otherwise seek review of any decision made or to be made by the Department pursuant to this Administrative Consent Order and under no circumstances shall EGC initiate any action or proceeding challenging any decision made or to be made by the Department pursuant to this Administrative Consent Order.

64. Paragraphs 59, 60, 61, 62 and 63 notwithstanding, EGC reserves whatever rights it may have, if any, to contest, after implementation of the remediation for which the financial assurance was used by the Department, that the Department's use of the financial assurance provided pursuant to this Administrative Consent Order was arbitrary, capricious or unreasonable. The Department reserves its rights to contest any such action.

VIII. General Provisions

65. This Administrative Consent Order shall be binding on EGC, its agents, successors, assignees and any trustee in bankruptcy or receiver appointed pursuant to a proceeding in law or equity.

66. EGC shall perform all work conducted pursuant to this Administrative Consent Order in accordance with prevailing professional standards.

67. EGC shall conduct all site operations in accordance with the Health and Safety plan developed for this site (as set forth in Appendix B). All site activities shall be conducted in accordance with all general industry (29 CFR 1910) and construction (29 CFR 1926) standards of the federal Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, as well as any other State or municipal codes or ordinances that may apply.

68. In accordance with N.J.S.A. 45:8-45, all plans or specifications involving professional engineering, submitted pursuant to this Administrative Consent Order, shall be submitted affixed with the seal of a professional engineer licensed pursuant to the provisions of N.J.S.A. 45:8-1 et seq.

69. EGC shall conform all actions pursuant to this Administrative Consent Order with all applicable Federal, State, and local laws and regulations.

70. All appendices referenced in this Administrative Consent Order, as well as all reports, work plans and documents required under the terms of this Administrative Consent Order are, upon approval by the Department, incorporated into this Administrative Consent Order by reference and made a part hereof.

71. Each field activity to be conducted pursuant to this Administrative Consent Order shall be coordinated by an onsite professional(s) with experience relative to the particular activity being conducted at the site each day, such as experience in the area of hydrogeology, geology, environmental controls, risk analysis, health and safety or soils.

72. Upon the receipt of a written request from the Department, EGC shall submit to the Department all data and information, including technical records and contractual documents, concerning pollution at and/or emanating from the site, or which has emanated from the site, including raw sampling and monitor data, whether or not such data and information, including technical records and contractual documents, was developed pursuant to this Administrative Consent Order.

73. EGC shall preserve, during the pendency of this Administrative Consent Order and for a minimum of six (6) years after its termination, all data, records and documents in their possession or in the possession of their divisions, employees, agents, accountants, contractors, or attorneys which relate in any way to the implementation of work under this Administrative Consent Order, despite any document retention policy to the contrary. After this six year period, EGC shall notify the Department within thirty (30) calendar days prior to the destruction of any such documents. If the Department requests in writing that some or all of the documents be preserved for a longer time period, EGC shall comply with that request. Upon receipt of a written request by the Department, the EGC shall submit to the Department all non-privileged records or copies of any such records.

74. Obligations and penalties of the Order are imposed pursuant to the police powers of the State of New Jersey for the enforcement of the law and the protection of the public health, safety and welfare and are not intended to constitute debt or debts which may be limited or discharged in a bankruptcy proceeding.

75. In addition to the Department's statutory and regulatory rights to enter and inspect, EGC shall allow the Department and its authorized representatives access to the site at all times for the purpose of monitoring EGC compliance with this Administrative Consent Order and/or to perform any remedial activities EGC fails to perform as required by this Administrative Consent Order.

76. EGC shall not construe any informal advice, guidance, suggestions, or comments by the Department, or by persons acting on behalf of the Department, as relieving EGC of its obligation to obtain written approvals as required herein, unless the Department specifically relieves EGC of such obligations, in writing in accordance with the following paragraph.

77. No modification or waiver of this Administrative Consent Order shall be valid except by written amendment to this Administrative Consent Order duly executed by EGC and the Department.

78. EGC hereby consents to and agrees to comply with this Administrative Consent Order which shall be fully enforceable as an Order in the New Jersey Superior Court upon the filing of a summary action for compliance pursuant to N.J.S.A. 13:1D-1 et seq., the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq. and/or the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq.

79. In the event that the Department determines that a public meeting concerning the cleanup of the site is necessary at any time, EGC shall ensure that the EGC appropriate representative is prepared, available, and participates in such a meeting upon notification from the Department of the date, time and place of such meeting.

80. EGC waives its rights to an administrative hearing concerning the entry of this Administrative Consent Order pursuant to N.J.S.A. 52:14B-1 et seq. and N.J.S.A. 58:10A-1 et seq.

81. EGC agrees not to contest the authority or jurisdiction of the Department to issue this Administrative Consent Order; EGC further agrees not to contest the terms or conditions of this Administrative Consent Order, except as to interpretation or application of such terms and conditions in any action brought by the Department to enforce the provisions of this Administrative Consent Order.

82. EGC shall provide a copy of this Administrative Consent Order to each contractor and subcontractor retained to perform the work required by this Administrative Consent Order and shall condition all contracts and subcontracts entered for the performance of such work upon compliance with the terms and conditions of this Administrative Consent Order. EGC shall be responsible to the Department for ensuring that their contractors and subcontractors perform the work herein in accordance with this Administrative Consent Order.

83. EGC shall give written notice of this Administrative Consent Order to any successor in interest within 90 calendar days prior to transfer of ownership of EGC facilities which are the subject of this Administrative Consent Order, and shall simultaneously verify to the Department that such notice has been given. This requirement shall be in addition to any other statutory or regulatory requirements arising from the transfer of owership of EGC facilities.

84. Within sixty (60) calendar days after the effective date of this Administrative Consent Order, EGC shall record a copy of this Administrative Consent Order with the Register of Deeds, Union County, State of New Jersey and submit a letter to the Department which shall include the deed book and page number on which the Administrative Consent Order was recorded.

85. The Site that is the subject of this Administrative Consent Order may be freely alienated provided that:

a. At least ninety (90) calendar days prior to the date of such alienation, EGC shall notify the Department in writing of the proposed alienation, the name of the grantee, and a description of the grantor's obligations, if any, proposed to be performed by such grantee.

b. Any contract to alienate the Site shall require the grantee to allow and provide access for the implementation, continuation and oversight of all activities and obligations pursuant to this Administrative Consent Order. EGC obligations under this Administrative Consent Order shall continue unless the grantee agrees to assume EGC obligations and unless the Department in its sole discretion agrees to permit the grantee to assume the obligations of EGC.

c. Any deed, title or other instrument of conveyance regarding the Site shall contain a notice that the Site is the subject of this Administrative Consent Order. Any such deed, title or other instrument of conveyance shall be subject to the requirements set forth in paragraph 86 below regarding the use of the Site and deed restrictions.

d. Nothing herein shall relieve EGC of the obligation to comply with all applicable statutes and rules relating to the alienation of the Site.

86. EGC agrees not to make any use of the Site or take any actions inconsistent within this Administrative Consent Order. EGC agrees to impose such use and/or access restrictions regarding the Site as may be reasonably deemed necessary by the Department. The use and access restrictions shall run with the land, shall be for the benefit of and enforceable by the Department and the citizens of the State of New Jersey and shall provide actual and constructive notice of such restrictions to any subsequent grantee. EGC shall record the restrictions with the Union County Register of Deeds immediately upon request of the Department that EGC do so.

87. It is the mutual intention of EGC and the Department that the investigatory and cleanup requirements of this Administrative Consent Order shall be in conformity with and shall satisfy the applicable requirements of the statutes and regulations which form the basis for this Administrative Consent Order, i.e., the Water Pollution Control Act, N.J.S.A. 58:10a-1 et seq.; the Solid Waste Management Act, N.J.S.A. 13:1e-1 et seq.; and the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. Where the requirements conflict, the more stringent requirement shall apply.

88. The requirements of this Administrative Consent Order shall be deemed satisfied upon the receipt by EGC of written notice from the Department that EGC has demonstrated, to the satisfaction of the Department, that the obligations imposed by this Administrative Consent Order have been completed by EGC.

89. EGC shall submit to the Department, along with the executed original Administrative Consent Order, the appropriate documentary evidence (such as a

corporate resolution) that the signitory for EGC has the authority to bind EGC to the terms of this Administrative Consent Order.

90. This Administrative Consent Order shall become effective upon execution by the Department.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Date: April 9, 1991

By: ____________________
Dennis Hart, Acting Assistant Director
Responsible Party Cleanup Element
Division of Hazardous Waste Management

ELIZABETHTOWN GAS COMPANY

Date: April 8, 1991

By: Frederick W. Sullivan

Name: Frederick W. Sullivan

Title: President & CEO

ATTEST:

____
Kenneth G. Ward, Secretary

LIST OF APPENDICES

APPENDIX A

INTERIM REMEDIAL MEASURES
SCOPE OF WORK

INTERIM REMEDIAL MEASURES

I. Requirements of Interim Remedial Measures

A. [List, with as much detail as possible, all interim remedial measures that the company is to take immediately, such as:

providing a fence or other security

securing spilled or damaged drums/containers that have or threaten to discharge hazardous substances

covering or removing waste piles

providing water treatment, bottled water, or extension of water lines

initiate non-aqueous phase liquid recovery

begin pumping and proper disposal of contaminated ground water

upgrade existing treatment facility

increase above-ground storage

retrofit leaking lagoon

cap or cover solid waste management unit]

II. Contents of Interim Remedial Measures Plan

A. A statement of requirements for the interim remedial measures plan pursuant to Section I. above

B. A report on all activities undertaken pursuant to all Directives and Administrative Orders issued by the Department concerning this site.

C. A detailed schedule for all interim remedial measures required by this Administrative Consent Order and in this Scope of Work, including:

1. dates for submission of all permit applications

2. dates for start and ending of all field activities

D. A detailed engineering design for each interim remedial measure including:

1. a description of appropriate new or additional containment, treatment and/or disposal technologies

2. a description of special engineering considerations required to upgrade existing facilities

3. a description of operation, maintenance and monitoring requirements of each interim remedial measures

4. offsite disposal needs and transportation plans

5. additional temporary or permanent storage requirements

6. safety requirements for interim remedial measures

7. a description of ability of each measure to be phased into individual operable units

8. a review of each measure to ensure compliance with applicable statutes and regulations

9. a list of all Federal, State and local permits required for each measure

10. a discussion of any limits or constraints each measure may place on final remedial alternatives

E. Curriculum vitae of all key personnel who will participate in the implimentation of the approved Interim Remedial Measures Plan.

F. A detailed performance evaluation program

APPENDIX B

REMEDIAL INVESTIGATION
SCOPE OF WORK

REMEDIAL INVESTIGATION SCOPE OF WORK

I. Requirements of Remedial Investigation

A. Fully characterize all waste and other materials which are, or may be the source(s) of air, soil, surface water and ground water pollution at the site

B. Fully determine the nature, type and physical states of air, soil, surface water and ground-water pollution at the site, emanating from the site or which has emanated from the site

C. Fully determine the horizontal and vertical extent of pollution at the site, emanating from the site or which has emanated from the site

D. Fully determine migration paths of pollutants through air, soil, ground water, surface water and sediment

E. Fully determine impact of the air, soil, surface water and ground water pollution on human health and the environment

F. Collect, present and discuss all data necessary to adequately support the development of a feasibility study and the selection of a remedial action alternative that will remedy the adverse impacts of the pollution on human health and the environment

G. Fully analyze present production methodologies for manufacturing, waste generation and environmental control at the site in order to ascertain if any change to such methodologies will decrease the threat to health or environment posed by operations at the site.

II. Contents of Remedial Investigation Work Plan

IMPORTANT NOTE: All of the following items shall be included in the RI Work Plan. If any of the items have previously been submitted or completed, it shall be so stated in the RI Work Plan. For these items, the following shall be included in the RI Work Plan:

- description of items submitted and/or summary of investigation completed

- date(s) of submission or completion

- any known changes or new information developed since submission or completion

The Department will determine the extent to which prior submissions or completions may satisfy specific items required by this Scope of Work.

A. A statement of requirements for the remedial investigation pursuant to Section I., above

B. A complete site history including:

1. an operational and ownership history of the site since 1940, including for each owner/operator:

   a. type of operation conducted,
   b. start and end dates of ownership/operation, and
   c. current address for owner/operator

2. a list of all raw materials used and products made, past and present, including all pertinent dates

3. a description, including dates, of all past and present disposal practices as well as the location of all known and suspected pollution sources

4. all historical site plans and facility as-built construction drawings available to or in EGC possession

5. all aerial photographs of the site in possession of or available to EGC

6. a site water budget: input, use, distribution and discharge

7. a background of site and surroundings, including but not limited to the following:

   a. ground water use in area, including well logs and records, and

   b. boring logs for onsite and nearby construction

8. the identification of any previous ECRA submission for any part of the site, including:

   a. ECRA Case No.,
   b. Date of submission, and
   c. Current Status

9. a list of all federal and state environmental permits, registrations, licenses, or other approvals applied for, or received or both, at the site, since 1960 including:

   a. issuing agency,
   b. permit number,
   c. certificate number,
   d. date of submission,
   e. date of approval or denial,
   f. reason for denial (if applicable), and
   g. expiration date

10. summary of all civil and criminal enforcement actions for violation of environmental laws, including:

a. name and address of agency that initiated action,
b. date of action,
c. section of statute, rule or permit violated,
d. type of enforcement action,
e. description of violations, and
f. resolution or status of violation

11. a description of all containers, tanks, surface impoundments, landfills, septic systems and any other structure, vessel, contrivance or unit that contain or previously contained hazardous substances or wastes, including:

    a. type,
    b. age,
    c. dimension,
    d. location, and
    e. chemical content

12. a complete and current inventory, description and location of hazardous substances and wastes generated, manufactured, refined, transported, treated, stored, handled or disposed at the site, above or below ground

13. a detailed description of any known discharge of hazardous substances or wastes that occurred during current or past operations of the site and a detailed description of any remedial actions undertaken to handle any such discharge

14. a list of all current or previously developed data and information concerning pollution at and/or emanating from the site, or which has emanated from the site, including raw sampling and monitor data

15. a summary, review and evaluation of all existing environmental data concerning pollution at the site, emanating from the site or which has emanated from the site

16. a list of all events which have occurred at the site, including but not limited to fires, spills, and discharges which have had or potentially may have had an adverse impact on human health or the environment

C. A detailed schedule for all remedial investigation activities set forth in this Administrative Consent Order and in this Scope of Work including:

    1. dates for submission of all required permit applications

    2. dates for start and ending of all field investigations

    3. dates for submission of all reports

D. Curriculum vitae of all key personnel who will participate in the remedial investigation

E. A field sampling plan including:

1. Waste characterization

a. specify number, type and frequency of samples required to accurately characterize all solid waste in tanks, drums, lagoons/impoundments, piles or otherwise at the site

b. explain the type of data which will be collected, justification for collection, and intentions for use of the data

c. specify location (on site map) and depths of proposed soil borings, test pits and other sampling points

d. specify EPA analytical procedures, including test parameters for waste analyses

e. specify chain-of-custody procedures

f. specify the name of the State certified laboratory EGC will use for analysis of all samples

g. specify which quality assurance deliverable requirements will be submitted in accordance with Appendix C, which is attached hereto and made a part hereof

h. specify all Federal, State and local permits required

i. specify investigation procedures in accordance with the following:

i. obtain drilling permits for all soil borings pursuant to N.J.A.C. 58:4A-14

ii. install soil borings under direct supervision of a New Jersey licensed well driller and a qualified geologist

iii. decontaminate soil boring and sampling equipment between individual samples and borings according to the approved decontamination plan

iv. classify waste according to N.J.A.C. 7:26-1 et seq.

v. use field instrumentation (PID, FID) to analyze soil samples in the field

vi. analyze waste samples to quantify and determine type of pollutants

vii. permanently seal all soil borings using a certified well sealer, within 12 hours of completion of each boring

viii. provide for proper disposal of all materials (eg., cuttings) generated during the soil boring program.

2. Soil investigation

a. specify number, type and frequency of samples required to accurately define the horizontal and vertical extent of soil pollution at the site, emanating from the site or which has emanated from the site

b. explain the type of data which will be collected, justification for collection and intentions for use of the data

c. specify location (on site map) and depths of proposed soil borings, test pits and other sampling points

d. specify EPA analytical procedures, including test parameters for soil analyses

e. specify chain-of-custody procedures

f. specify the name of the State certified laboratory EGC will use for analysis of all samples

g. specify which quality assurance deliverable requirements will be submitted pursuant to Appendix C

h. specify all Federal, State and local permits required

i. specify investigation procedures in accordance with the following:

i. obtain drilling permits for all soil borings pursuant to N.J.A.C. 58:4A-14

ii. install soil borings under direct supervision of a New Jersey licensed well driller and a qualified geologist

iii. decontaminate soil boring and sampling equipment between individual samples and borings according to the approved decontamination plan

iv. classify soil according to a standard approved system, e.g. Burmeister, Unified, USDA

v. analyze particle size in laboratory on representative samples to confirm field identification

vi. use field instrumentation (PID, FID) to analyze soil samples in the field

vii. analyze soil samples to quantify and determine type of pollutants

viii. permanently seal all soil borings using a certified well sealer, within 12 hours of completion of each boring

ix. provide for proper disposal of all materials (eg., cuttings) generated during soil boring program

3. ground-water and potable well investigation

a. specify number, locations (on site map) and designs of existing and proposed piezometers, monitor wells, industrial wells, potable wells, and other sampling points required to accurately define the horizontal and vertical extent of ground-water pollution at the site, emanating from the site or which has emanated from the site

b. explain the type of data which will be collected, justification for collection, and intentions for use of the data

c. specify number, type and frequency of ground-water and potable well samples required to accurately define the horizontal and vertical extent of ground-water pollution at the site, emanating from the site, or which has emanated from the site

d. specify EPA analytical procedures, including test parameters for ground-water analyses

e. specify chain-of-custody procedures

f. specify the name of the State certified laboratory EGC will use for analysis of all samples

g. specify which quality assurance deliverable requirements will be submitted in accordance with Appendix C

h. specify frequency of synoptic static water level measurements

i. specify all Federal, State and local permits required

j. specify investigation procedures in accordance with the following

i. have a qualified hydrogeologist with substantial experience in ground-water pollution investigations oversee all site activities

ii. obtain well drilling permits pursuant to N.J.S.A. 58:4A-14

iii. drill all wells under the direct supervision of a New Jersey licensed well driller and a qualified hydrogeologist

iv. install wells in accordance with the monitor well specifications in Appendix D, which is attached hereto and made a part hereof

IMPORTANT NOTE: Improperly constructed monitor wells can compound a pollution problem. Therefore, particular attention shall be given to the details of these specifications. The Department has the authority to shut down a drilling operation which is not adhering to the approved procedures. Data derived from improperly constructed wells shall not be accepted by the Department.

v. collect split-spoon samples during drilling through the overburden according to ASTM Standard Penetration Methods, ASTM D1586-67, at five-foot intervals, at changes in soil strata, and at all zones which show obvious signs of pollution; with a specific number of drilling locations including continuous split spoon samples to fully define subsurface stratigraphy

vi. collect sufficient rock core, according to ASTM Diamond Core Drilling Methods, ASTM 2113-70, during the drilling of bedrock monitor wells to obtain a thorough understanding of fracture patterns beneath the site

vii. rock core run lengths shall be five feet, the core size shall be of "NX" diameter and the following items, at a minimum, shall be included in the log of the core:

a. lithology
b. fracture frequency
c. degree of weathering of rock and fractures
d. fracture fit
e. fracture spacing
f. orientation of fractures
g. odors and stains present in rock core
h. % recovery
i. % RQD

viii. retain all soil and rock samples for future reference and/or analysis

ix. decontaminate drilling and sampling equipment after each drilling and sampling event according to the approved decontamination plan

x. survey all well casings, to the nearest hundredth (0.01) foot above mean sea level and horizontally to an accuracy of one-tenth of a second latitude and longitude by a New Jersey licensed land surveyor

xi. a permanent water-level measurement mark shall be etched onto the well casing to allow for accurate, reproduceable water-level measurements over time

xii. obtain synoptic static water levels to the nearest hundredth (0.01) foot in each monitor well on a regular basis

xiii. collect all ground-water samples pursuant to N.J.A.C. 7:14A-6.12 and NJDEP field procedures manual for water data acquisition

xiv. ground-water samples shall not be collected within 14 calendar days of installation and development of the wells

xv. complete sufficient pumping and packer tests to adequately define aquifer characteristics and develop recovery well design for aquifer restoration

xvi. complete borehole and surface geophysical surveys and/or ground-water modeling as appropriate for the site

4. surface water and sediment investigation

a. specify number and type of samples required to accurately determine the horizontal and vertical extent of surface water and sediment pollution at the site, emanating from the site or which has emanated from the site

b. explain the type of data which will be collected, justification for collection, and intentions for use of the data

c. specify location (on site map) of surface water and sediment sampling points

d. specify EPA analytical procedures, including test parameters, for surface water and sediment analyses

e. specify chain-of-custody procedures

f. specify the name of the State certified laboratory EGC will use for anlaysis of all samples

g. specify which quality assurance deliverable requirements will be submitted in accordance with Appendix C

h. specify all Federal, State and local permits required

i. specify investigation procedures in accordance with the following

   i. analyze surface water and sediment samples to determine the presence of pollutants in the surface water and sediment according to the approved sampling plan

   ii. decontaminate sampling equipment between sampling events according to the approved decontamination plan

   iii. collect surface water and sediment samples in accordance with Field Procedures Manual for Water Data Acquisition, Division of Water Resources, New Jersey Department of Environmental Protection, 1983

5. ambient air monitoring investigation

   a. characterize baseline air quality conditions on and in the vicinity of the site, and identify present air quality hazards related to the site

   b. develop a field screening protocol including:

      i. wellhead monitoring and soil sample emissions analyses

      ii. any specific air quality concerns in the ultimate selection of a remedial alternative

      iii. any adverse air quality impacts that may be associated with the selected remedial action

      iv. enable the implementation of measures to control any adverse air quality impacts that may occur during the course of remedial activities (for example, to design and implement a construction related air program to monitor ambient levels)

      v. specify all Federal, State and local permits required

      vi. specify investigation procedures

G. A site-specific health and safety plan (HASP) based on EPA protocols and in compliance with the requirements of 29 CFR 1910.120 for on-site personnel to minimize the risk of personal injury, illness and potential environmental impairment associated with the site investigation. The HASP shall address those aspects specified in paragraph(i) of 29 CFR 1910.120 entitled "Informational Programs" and shall include:

   1. listing of personal protective equipment (including respiratory protection) to be used and guidelines for their use, including manufacturer, model, duration of safety period, and any required certification documentation

2. listing of safety equipment (including manufacturer, expiration date and model) to be used, such as fire extinguishers, portable eye wash stations, air monitoring equipment, gamma survey instrument, etc. (equipment shall meet OSHA standards or other acceptable industrial standards)

3. contingency plans for emergency procedures, spill prevention/response, and evacuation plans

4. onsite monitoring for personnel safety (e.g. PID, FID)

5. criteria for selecting proper level of personal protection

6. medical surveillance program for all onsite personnel involved in remedial investigation

7. personal hygiene requirements

8. training program including training protocol

9. special medical procedures to be available at site

10. telephone numbers of emergency medical facility and personnel

H. An equipment decontamination plan including:

1. list the items to be decontaminated

   a. drilling equipment, paying particular attention to down hole tools, back of drilling rig and drilling rod racks

   b. sampling equipment including split spoons, shelby tubes, trowels, spatulas, etc.

   c. bailers, pumps, hoses, etc.

   d. personnel clothing

2. procedures for decontamination

   a. all field sampling equipment shall be laboratory cleaned, wrapped and dedicated to a particular sampling point, unless written permission for field cleaning is obtained from the Department prior to the collection of any samples

   b. field cleaning of well casing, well screening and drilling equipment shall consist of a manual scrubbing to remove foreign material and steam cleaning inside and out until all traces of oil and grease are removed; these materials shall then be stored in such a manner to preserve it in this pristine condition

   c. split spoons, bailers, pumps, etc.

- non-phosphate detergent

- tap water rinse

- distilled/deionized water rinse

- 10% nitric acid rinse*

- distilled/deionized water rinse*

- acetone (pesticide grade) rinse

- total air dry or nitrogen blow out

- distilled/deionized water rinse

*only if sample is to be analyzed for metals

d. hoses

- steam cleaning

- alconox scrub

- alconox flushing

e. the chain of custody for sampling events shall begin with the cleaning of the sampler; wherever possible samplers should be numbered in a manner that will not affect their integrity, wrapped in a material (i.e. aluminum foil) that has either been autoclaved or cleaned in the same manner as the sampler

f. the use of distilled water commercially available in 5 - gallon polyethylene carboys is acceptable for sampler decontamination provided that it is also deionized; use of this water is unacceptable for field and trip blanks unless it has been demonstrated to be analyte free by laboratory analysis

IMPORANT NOTE: Use of dedicated sampling equipment is recommended

III. Contents and Format of Remedial Investigation Report

A. Presentation of data

1. results of all analyses on data sheets supplied by the Department, laboratory data sheets and the required quality assurance documentation

2. summary table(s) of all analyses

3. stratigraphic logs including grain size and field instrument readings detected during drilling for each soil boring and monitor well

4. stratigraphic cross section

5. as-built construction diagrams for each soil boring and monitor well

6. well casing elevations to the nearest hundredth (0.01) foot above mean sea level, taken at the top of casing with locking cap removed

7. depth to ground water to the nearest hundredth (0.01) foot above mean sea level, taken at the top of well casing prior to sampling with cap removed

8. all support data including graphs, equations, references, raw data, etc.

B. Maps

1. site map

   a. property boundaries
   b. structures and improvements
   c. surface water bodies
   d. site and adjacent land use
   e. topography indicating two-foot contours
   f. all underground piping and utilities
   g. all underground tanks, associated piping, lagoons, seepage pits, dry wells, etc.
   h. scale and orientation

2. sample location map(s)

   a. monitor well locations and casing elevations
   b. sample collection locations
   c. soil boring locations

3. soil quality contour map and cross section(s)

4. ground-water elevation contour maps for each aquifer on multiple dates

5. ground-water quality contour map(s) and cross section(s)

6. bedrock contour map

C. Discussion of data

1. waste characterization, including degree of hazard and probable quantities of waste, by type

2. description of site/regional hydrogeology and its relation to migration of pollutants

3. direction and rate of ground-water flow in the aquifer(s), both horizontally and vertically

4. levels of soil, surface water and ground-water pollution as compared to applicable standards pursuant to N.J.A.C. 7:14A, 7:9-4, 7:9-6, and guidelines, or background levels where pertinent

5. extent of soil, surface water and ground-water pollution both on and offsite

6. pollutant behavior, stability, biological and chemical degradation, mobility and any other relevant factors pertinent to the investigation

7. projected rate(s) of pollution movement

8. identification of all pollution sources

9. identification of critical pollutants

D. Assessment of impact of pollution on human health and the environment

1. identification of human receptors in the paths of pollution migration; mobility of pollutants and specific routes to target organs (e.g., liver)

2. identification of the receiving media and/or ecological groups and migration pathways of critical pollutants

3. toxicology of each critical pollutant (acute and chronic toxicity for short- and long-term exposure, carcinogenicity, mutagenicity, teratogenicity, synergistic and/or antagonistic associations, aquatic toxicity, ecological impacts on flora and fauna, etc.)

4. migration potential and environmental fate of each critical pollutant in site-specific terms (e.g., attenuation, dispersion and biodegradation are factors in the ground-water pathway)

5. evaluation of potential for biomagnification and/or bioaccumulation of critical pollutants in the food chain

E. Recommendations for additional investigations

1. waste
2. soil
3. ground water
4. surface water and sediment
5. air

APPENDIX C

QUALITY ASSURANCE REQUIREMENTS

QUALITY ASSURANCE DELIVERABLE REQUIREMENTS

There are three parts to this Appendix. The first part outlines, according to sample/data type, frequency and use, the approximate percentage of samples for which the Tier I and Tier II quality assurance deliverables are required. The second part is a copy of the Tier I Quality Assurance Deliverable Requirements. The third part is a copy of the Tier II Quality Assurance Deliverable Requirements.

CRITERIA FOR QUALITY ASSURANCE DELIVERABLE REQUIREMENTS

	TIER I	TIER II
A. Remedial Investigation:		
1. initial RI phase	100%	
2. subsequent RI phases	10%, or minimum of one monitor well, or one sample per sampling event	90%
B. Remedial Action:		
1. monitoring of decontamination effectiveness		
a. initial sampling	100%	
b. subsequent sampling	25%	75%
2. sampling to support proposal to terminate decontamination system	100%	
3. post cleanup/removal soil sampling to determine if any additional cleanup/removal is required	100%	
C. Other Site Specific Considerations:		
1. potable water		
a. initial sampling	100%	
b. subsequent sampling	25%	75%

Dave

Let's protect our earth

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT
LANCE R. MILLER, DIRECTOR
CN 028
Trenton, N.J. 08625-0028
(609) 633-1408
Fax # (609) 633-1454

OCT 3

MEMORANDUM

TO: Linda Grayson, Chief
Bureau of State Case Management

FROM: Nate Byrd, Case Transfer Coordinator NB
Bureau of Site Assessment

DATE: October 29, 1991

SUBJECT: PRELIMINARY ASSESSMENTS/SITE INSPECTIONS

Attached please find copies of the narrative portion of Preliminary Assessments (PA) and/or Site Inspections (SI) which have recently been completed by the Bureau of Planning and Assessment or the U.S. EPA. Available information indicates that these sites are being handled by your program; thus, reports are attached for your information. The complete files are available at BSA.

Should you have any questions or comments, please call me at (609) 584-4291.

NB:ap
Attachments (2):

SI: Elizabeth Coal Gas Site #2 - 911032
Bayonne Gas Works - 911031

SITE INSPECTION REPORT: LEVEL III

PART I: SITE INFORMATION

1. Site Name/Alias Elizabeth Coal Gas Site #2

   Street 406 South Street

   City Elizabeth State New Jersey Zip 07202

2. County Union County Code 039 Cong. Dist. 07

3 EPA ID No. NJD981082902

4. Block No. 9 Lot No. 1151

5. Latitude 40° 39' 29" N Longitude 74° 12' 32" W

   USGS Quad. Elizabeth, New Jersey

6a. Owner Elizabethtown Gas Light Company Tel. No. (201) 289-5000

   Street 1 Elizabeth Plaza

   City Elizabeth State New Jersey Zip 07207

   Northern portion of the site.

6b. Owner Union County Dept. of Parks and Rec. Tel. No. (201) 527-4814

   Street Administrative Building, County of Union

   City Elizabeth State New Jersey Zip 07207

   Southern portion of site.

7. Operator No current operator. Tel. No. ________

   Street ________

   City ________ State ________ Zip ________

8. Type of Ownership

   ☒ Private ☐ Federal ☐ State
   ☐ County ☐ Municipal ☐ Unknown ☐ Other ________

9. Owner/Operator Notification on File

   ☐ RCRA 3001 Date ________ ☒ CERCLA 103c* Date Sept. 19, 1983
   ☐ None ☐ Unknown

*NOTE: A copy of an official CERCLA 103c form is not available. This information is based on the letter enclosed in Ref No 14.

10. **Permit Information**

Permit	Permit No.	Date Issued	Expiration Date	Comments
N/A				

11. **Site Status**

☐ Active ☒ Inactive ☐ Unknown

12. **Years of Operation** 1855 to 1901

13. **Identify the types of waste sources (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.**

(a) Waste Sources

Waste Unit No.	Waste Unit Type	Facility Name for Unit
1	Unlined Pits	Waste Pits

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.

TAMS Consultants, Inc. (TAMS) reported after an initial site visit on December 16, 1986 that there was surface water present in the catch basin located adjacent to the South Street Pumping Station and that this water had a strong odor of raw sewage and spots of oil sheen in places. These substances were assumed to have origins other than coal gasification wastes. TAMS also reported that quantities of retort slag were scattered about open areas of the site both under the viaduct and in areas disturbed by construction of flood control facilities. This initial site visit also revealed a number of locations near the viaduct where waste oil appeared to have been dumped in small quantities (Ref. No. 3).

14. **Information available from**

Contact Amy Brochu **Agency** U.S. EPA **Tel. No.** (201) 906-6802

Preparer Richard M. Settino **Agency** NUS Corp. Region 2 FIT **Date** September 14, 1990

PART II: WASTE SOURCE INFORMATION

The site was used for the production of coal gas from 1855 to approximately 1901. The uses of the site from 1901 until its present uses by a salvage company and for flood control are unknown. Wastes produced on site were the result of the gasification processes. These wastes typically include ammonia, amonium sulfate, sulfur, coke, coal tar, coal tar pitch, clinker, and light oils. The coal tar may contain significant concentrations of pyrene, anthracene, and other polynuclear aromatic hydrocarbons (PAHs), including known or suspected carcinogens (Ref. No. 1, p.4 and Attachment 8). Actual waste handling practices that occurred at the plant are largely unknown. Wastes were reported to be disposed of in unlined pits primarily on the northern portion of the site and most likely extended into the southern portion also. Low grade tar and tar-water mixtures along with spent oil were most likely dumped on site. During an NUS Corp. Region 2 FIT site inspection a substance assumed to be coal was discovered in on- site soils, and a substance assumed to be solidified coal tar was encountered while collecting a subsurface soil sample (Ref. No. 2). It is reported that some remedial action was taken by the Elizabethtown Gas Light Company; however, the time and extent of remediation are unknown (Ref. No. 26).

The structures that existed on site in 1903 are as follows: two gas storage tanks of unknown size, two sheds, a blacksmith shop, a purifying house, a retort building, two coal sheds, an engine house, and an office building (Ref. No. 1, p. 9). Aerial photographs show that most of the structures were removed from the site between 1959 and 1966 (Ref. No. 10). The retort house and office building still exist on site (Ref. No. 1). Figures 1 and 2 provide a Site Location Map and a present day Site Map, respectively. Figure 3 shows a Site Map of the former facility as it existed in 1903. There is no known containment associated with the waste pits. Potential for direct contact is high since there is a public-access baseball field located on the southern portion of the site (Ref. No. 2). The exact quantity of wastes deposited, as well as the size or exact location of any pits that currently exist or formerly existed on site, is unknown.

PART III: PRE-EXISTENT ANALYTICAL DATA

From January 27 to February 5, 1987, eight soil borings were drilled and nine test pits were excavated on site by TAMS Consultants, Inc. (TAMS). Soil samples were collected from the borings and pits at this time for chemical analysis. All samples were analyzed for U.S. EPA Priority Pollutants plus 40 peaks (or selected fractions) and provided with NJDEP Tier III deliverables by Weston Analytics of Lionville, Pennsylvania Analytical parameters included heavy metals, cyanide, phenolics, polynuclear aromatic hydrocarbons (PAHs), and volatile organic compounds. The area investigated was only in the northern portion of the site immediately under the viaduct. This area was to be used by the New

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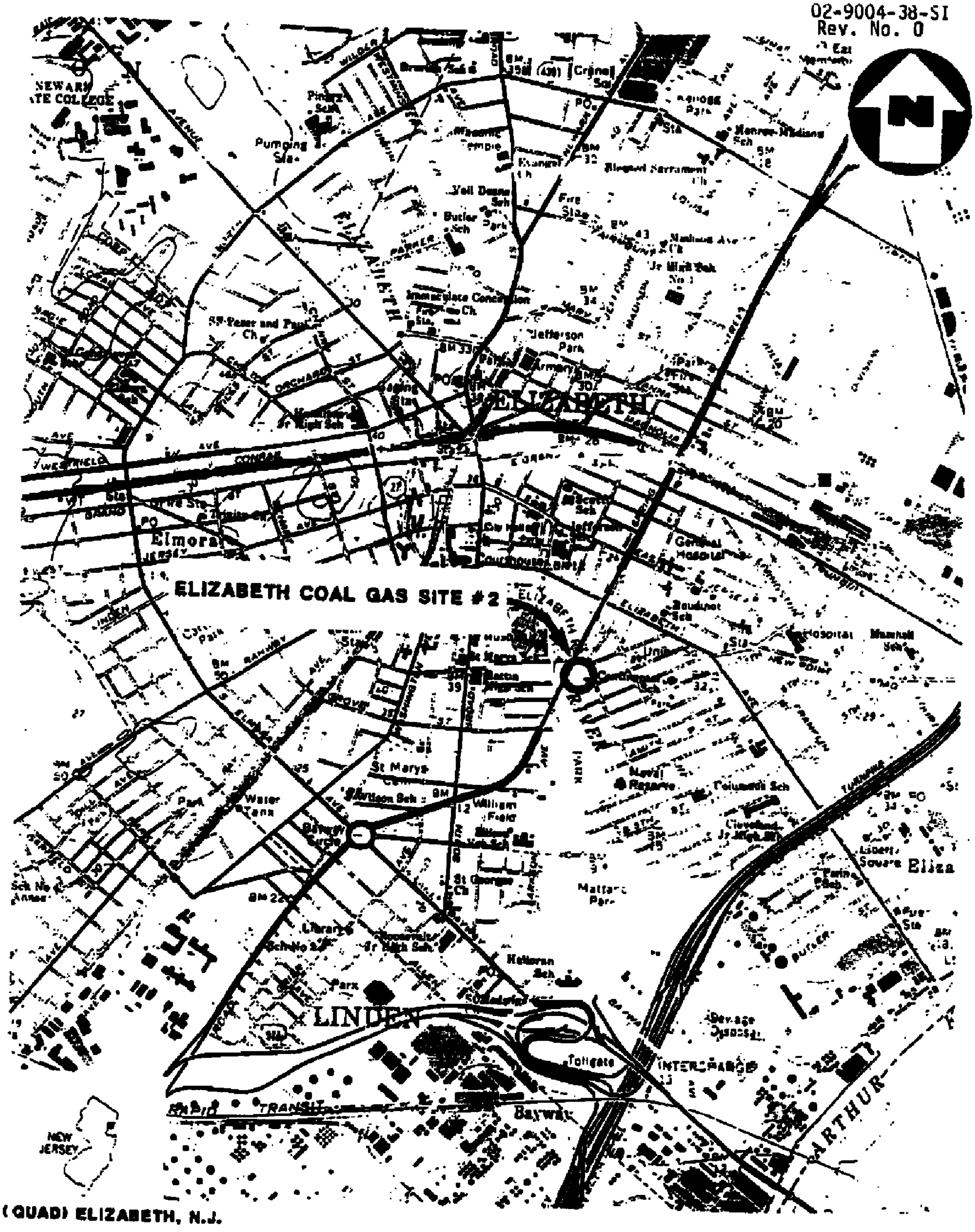


(QUAD) ELIZABETH, N.J.

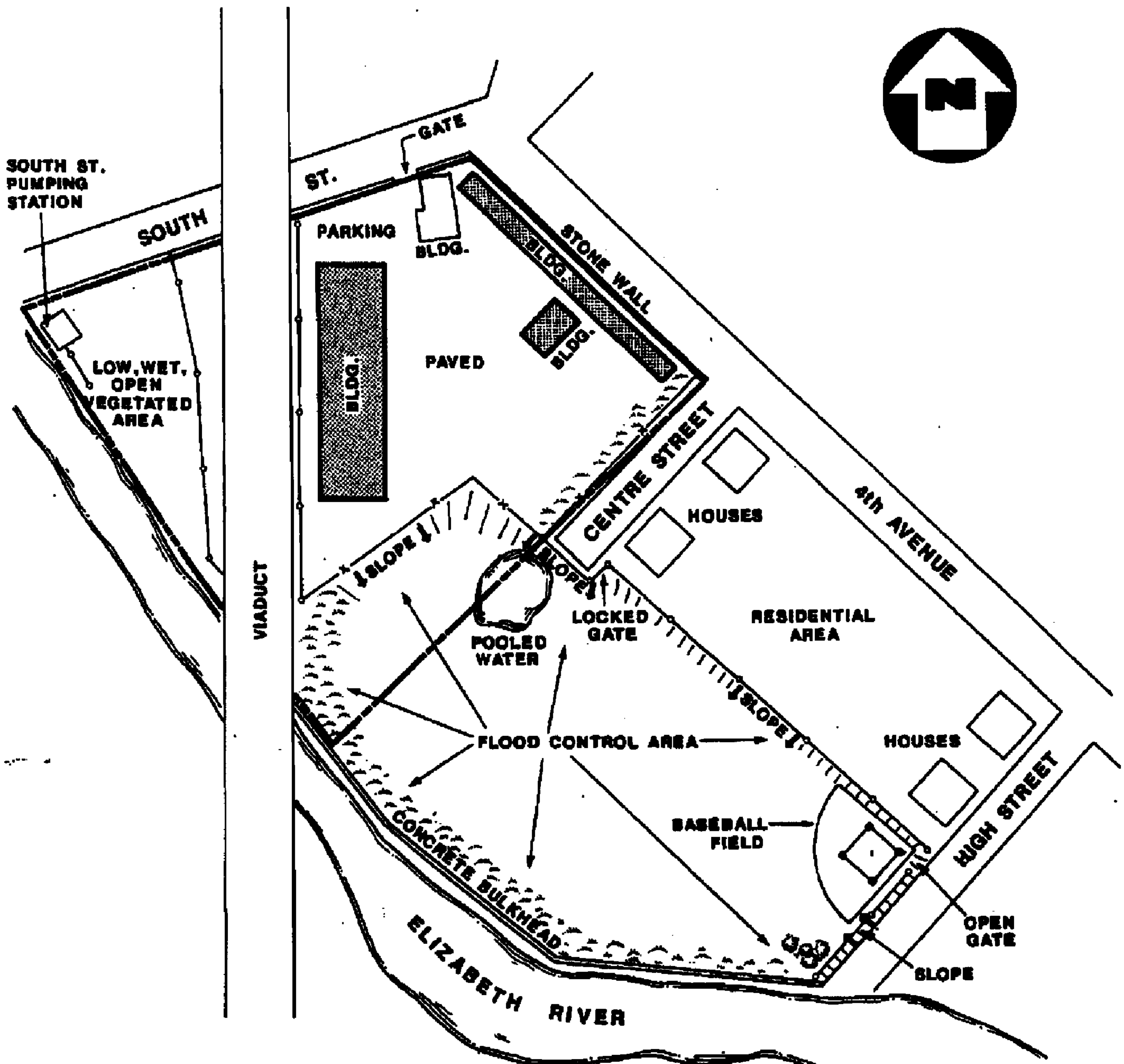
SITE LOCATION MAP

ELIZABETH COAL GAS SITE #2, ELIZABETH, N.J.

SCALE: 1" = 2000'

FIGURE 1

NUS CORPORATION



LEGEND

- CATTAILS AND HIGH VEGETATION
- FENCE
- BARBED WIRE FENCE
- APPROX. ORIGINAL SITE BOUNDARY

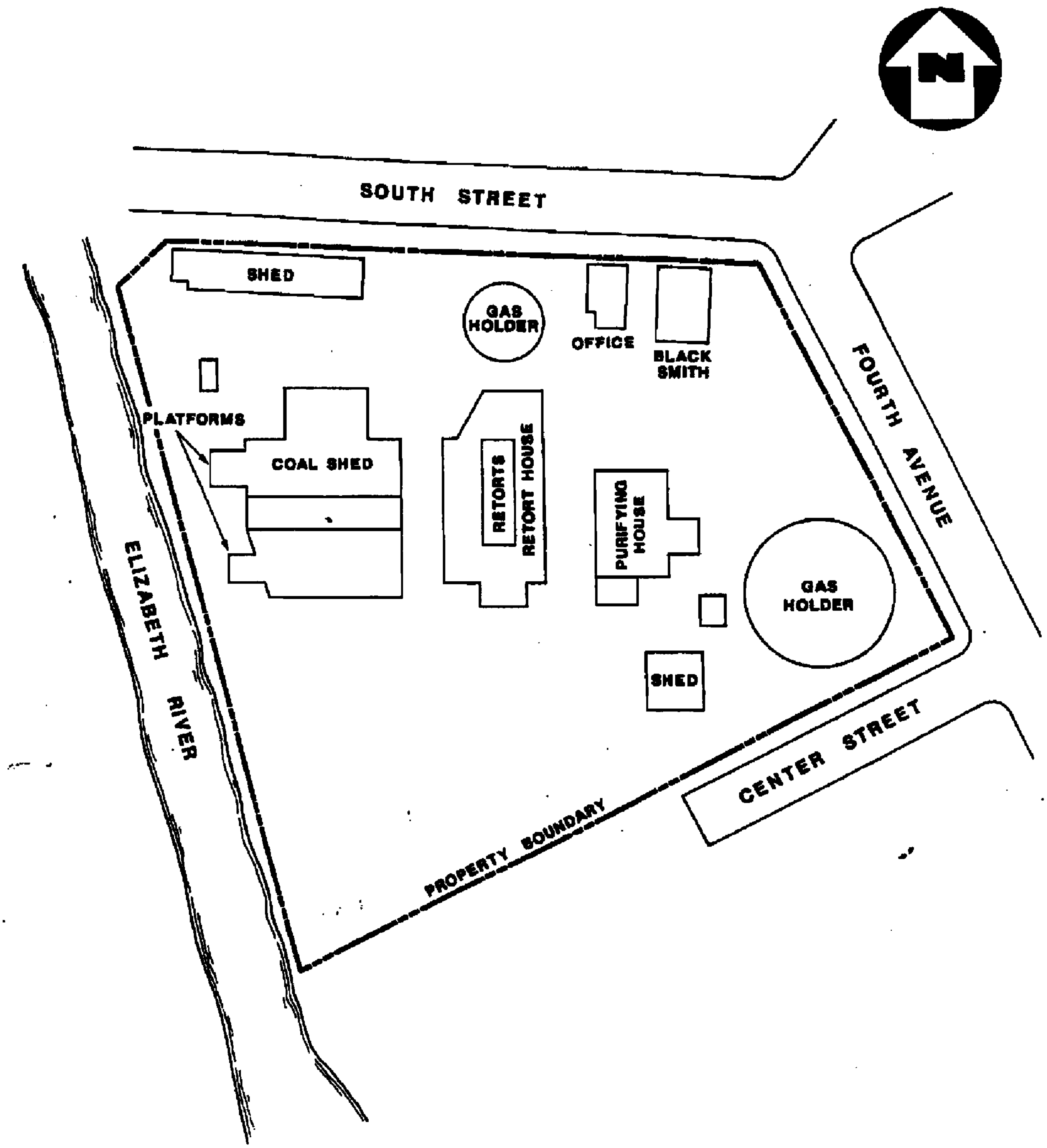
SITE MAP

FIGURE 2

ELIZABETH COAL GAS SITE #2, ELIZABETH, N.J.

NOT TO SCALE

NUS CORPORATION



SITE MAP FROM 1903

ELIZABETH COAL GAS #2, ELIZABETH, N.J.

NOT TO SCALE

FIGURE 3

NUS CORPORATION

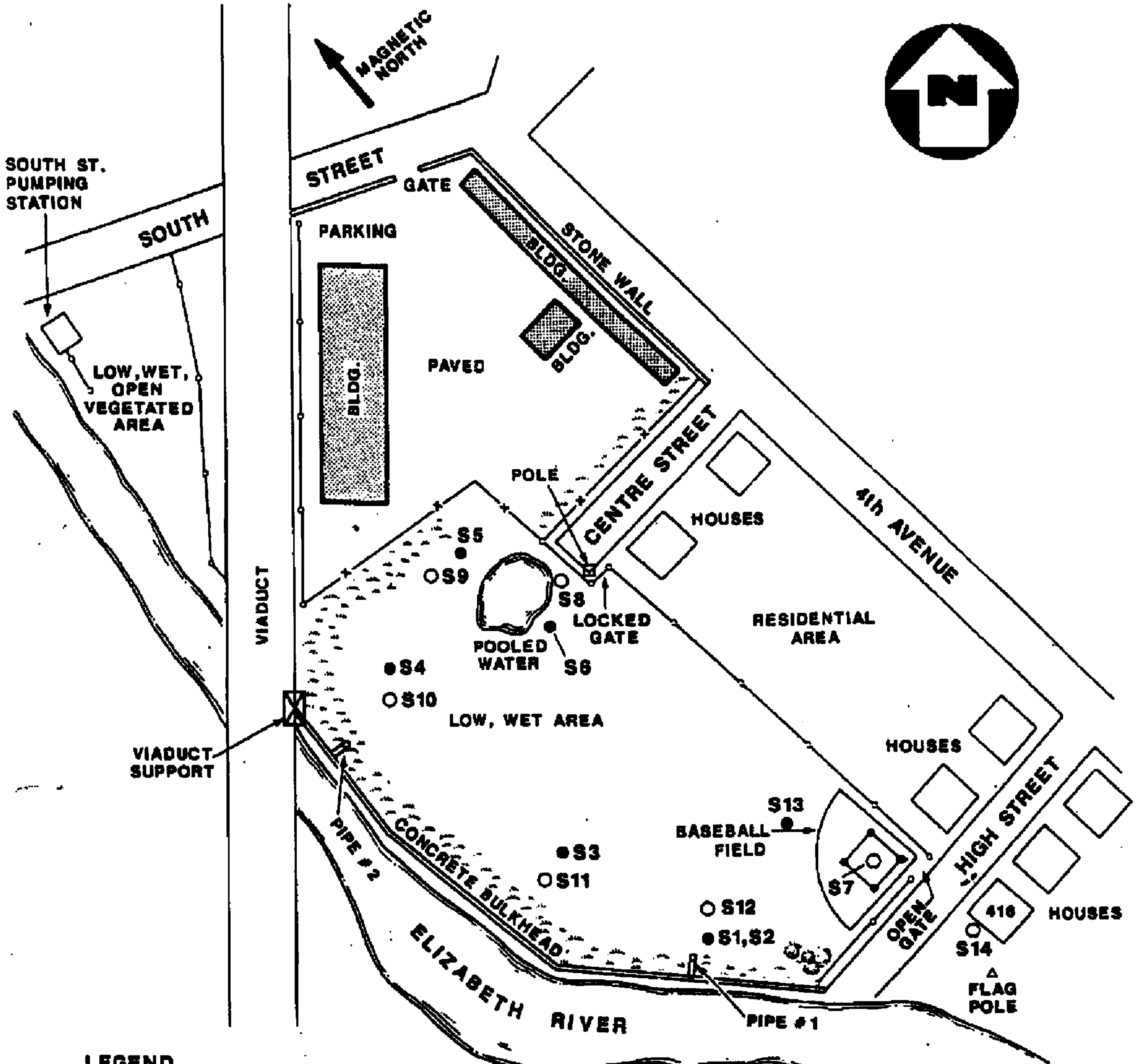
Jersey Department of Transportation (NJDOT) to widen the viaduct. The TAMS investigation did not include screening of the entire site. Refer to Reference No. 3, Figure 2 for the locations of the borings and test pits.

TAMS reported little visual evidence of coal gasification wastes to be present in these borings and test pits, with the exception of some subsurface retort slag. However, every soil sample tested exceeded the New Jersey Department of Environmental Protection informal action levels for at least one parameter. The inorganics exceeding action levels included cadmium, lead, and cyanide. Inorganic analyses are presented in Reference No. 3, Table 1. The most significant concentrations of organic contaminants detected were for PAHs, ranging from over 40 parts per million (ppm) to 3,090 ppm in eight of the twelve samples taken. High concentrations of other semivolatile organic (dibenzofuran and naphthalenes) and inorganic (lead) compounds were detected in association with the high PAH concentrations. Reference No. 3, Table 2 presents organic analysis results (Ref. No. 3).

PART IV: SITE INSPECTION SAMPLE RESULTS

The NUS Corporation Region 2 FIT (FIT) conducted a sampling site inspection at the Elizabeth Coal Gas Site #2 on June 12, 1990, during which seven surface and seven subsurface soil samples were collected (Ref. No. 2). The soil samples were collected to determine if any soil contamination or waste exists that can be attributed to previous coal gasification operations and to assess the potential for direct contact with contaminants present. The samples were analyzed under the Contract Laboratory Program(CLP) for Target Compound List (TCL) organic and inorganic constituents, including cyanide. All NUS Corporation Region 2 FIT analytical data sheets are provided in Ref. No. 27 of this report. Refer to Figure 4 for all sample locations and to Table 1 for a summary of the organic compounds detected in the soil samples. In the following discussion, all soil sample numbers are preceded by NJGA.

The site can be divided into two sections: the northern portion of the site occupied by Vignola Salvage Corp. and the southern portion owned by Union County. The northern portion of the site was previously sampled by TAMS Consultants, Inc and the data are summarized above. The FIT collected 13 surface and subsurface soil samples (S1 to S13), including a duplicate, from the southern portion of the site, and one surface soil sample (S14) from a residential property, located on the south side of High Street, to serve as a background sample. Sample locations were determined by using a thin-walled tube sampler at random subsurface locations around the site and marking the areas where waste was encountered and/or where readings significantly above background were registered on the HNU or OVA air monitoring instruments. No visual waste was encountered while using the tube sampler to determine the actual sample locations; however elevated readings



LEGEND
- CATTAILS AND HIGH VEGETATION
- FENCE
- BARBED WIRE FENCE
- ○ SURFACE SOIL SAMPLE LOCATION
- ● SUBSURFACE SOIL SAMPLE LOCATION

SAMPLE LOCATION MAP

FIGURE 4

ELIZABETH COAL GAS SITE #2, ELIZABETH, N.J.

NOT TO SCALE

NUS CORPORATION

TABLE 1: SUMMARY OF ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES COLLECTED AT THE ELIZABETH COAL GAS SITE #2 BY THE NUS CORP. REGION 2 FIT ON JUNE 12, 1990

COMPOUND	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14
VOLATILES														
Carbon Disulfide	J	J	ND	ND	10,000E	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	J	82,000E	ND	7	J	J	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	59,000E	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	14,000E	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	25	68,000E	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEMIVOLATILES														
Naphthalene	J	J	J	2,200	270,000E	ND	J	950	1,300	J	J	J	ND	J
2-Methylnaphthalene	J	J	J	J	3,300,000E	ND	ND	J	J	J	J	J	ND	J
Acenaphthylene	J	J	J	3,600	2,600,000E	ND	J	2,300	3,700	2,100	990	J	ND	J
Acenaphthene	J	850	J	1,100	460,000E	ND	J	J	J	J	J	J	ND	J
Dibenzofuran	J	J	J	ND	2,300,000E	ND	ND	J	860	J	J	J	ND	J
Phenanthrene	2,900	5,300	3,600	44,000	220,000E	ND	740	11,000	20,000	7,900	5,200	3,700E	ND	10,000
Anthracene	1,300	2,800	1,300	7,600	2,900,000E	ND	J	3,800	5,200	1,700	1,300	1,200E	ND	J
Flouranthene	7,700	11,000	8,400	140,000	140,000E	ND	2,300	27,000	34,000	12,000	12,000E	7,900E	J	9,600
Pyrene	7,800	10,000	8,600	140,000	140,000E	ND	2,900	26,000	32,000	9,200	8,400	5,700E	ND	8,800
Fluorene	J	J	J	2,200	2,500,000E	ND	ND	1,400	1,700	J	J	J	ND	J

Notes:

All results reported in ug/kg.
E = Estimated Value
ND = Not Detected
J = Estimated value, compound present below CRQL but above IDL

Ref. No. 27

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TABLE 1: SUMMARY OF ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES COLLECTED AT THE ELIZABETH COAL GAS SITE #2 BY THE NUS CORP. REGION 2 FIT ON JUNE 12, 1990 (CONT'D)

COMPOUND														
SEMIVOLATILES (CONT'D)	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14
Benzo(a)anthracene	5,900	7,200	5,600	74,000	2,500,000E	ND	1,600	14,000	16,000	12,000	7,100	3,600E	ND	3,600
Chrysene	5,400	7,800	5,800	140,000	2,800,000E	ND	1,500	22,000	27,000	12,000	9,200	4,400E	ND	5,400
Benzo(b)fluoranthene	4,900	5,300	4,600	82,000	1,500,000E	ND	1,700	14,000	16,000	16,000E	8,400	5,100E	ND	5,000
Benzo(k)fluoranthene	2,900	3,800	3,200	ND	1,400,000E	ND	ND	7,600	ND	ND	3,800	2,500E	ND	ND
Benzo(a)pyrene	3,700	3,700	3,100	94,000	1,900,000E	ND	1,200	9,600	4,100	9,000	6,100	3,600E	ND	3,300
Indeno(1,2,3-cd)pyrene	3,200	3,200	2,800	73,000	1,000,000E	ND	1,000	8,700	8,900	8,200	5,200	2,700E	ND	2,500
Dibez(a,h)anthracene	1,900	1,700	1,700	11,000	570,000E	ND	J	6,000	5,100	3,500	2,200	1,100E	ND	940
Benzo(g,h,i)perylene	2,800	2,800	2,500	57,000	870,000E	ND	830	8,400	8,000	8,400	3,900	2,100E	ND	3,000
PESTICIDES														
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	230	220E	J	J	ND	ND	J

Notes:

All results reported in ug/kg.
E = Estimated Value
ND = Not Detected
J = Estimated value, compound present below CRQL but above IDL

Ref No 27

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registered on the OVA in every hole made with the tube sampler at depths ranging from 0 to 48 inches. Samples were collected in pairs at each location: one surface soil sample and one subsurface vertical composite soil sample (Ref. No. 2).

A substance assumed to be solidified coal tar was encountered in soil sample S5 at a depth of approximately 18 to 36 inches. Analytical results from a sample of this material show elevated concentrations of volatile organic compounds associated with coal gasification. Estimated concentrations of carbon disulfide (10,000 micrograms per kilogram [ug/kg]), benzene (82,000 ug/kg) , toluene (59,000 ug/kg), styrene (14,000 ug/kg), and total xylenes (68,000 ug/kg) were detected in this sample. Acetone was detected in sample S2 at an estimated concentration of 150 ug/kg. Benzene was detected in sample S7 at a concentration of 7 ug/kg and total xylenes were detected at 25 ug/kg in sample S4 (Ref. Nos. 2, 27).

Semivolatile organic analyses indicate that on-site soils contain notable concentrations of anthracene (12,000 ug/kg [estimated] to 2,900,000 ug/kg) in comparison to the background level (which was below the Contract Required Quantitation Limit [CRQL] of 388 ug/kg). Several soil samples contained notable concentrations of chrysene, which ranged from 22,000 ug/kg to an estimated 2,800,000 ug/kg, (compared to a background concentration of 5,400 ug/kg), and of numerous other semivolatile organic compounds, including several PAHs. The highest concentrations of these compounds, which include fluoranthenes, pyrenes, naphthalenes, and dibenzofuran, were detected in soil sample S5, ranging from an estimated 140,000 ug/kg to an estimated 3,300,000 ug/kg. PAHs were found in the intended background sample S14 at concentrations ranging from 940 ug/kg to 10,000 ug/kg (Ref No. 27).

The only pesticide detected was 4,4'-DDT, which was found in soil samples S8 and S9 at concentrations of 230 ug/kg and an estimated 220 ug/kg, respectively. No other pesticides and no polychlorinated biphenyls (PCBs) were detected in any soil samples. Cyanide was detected only in soil sample S8, at a concentration of 2.2 milligrams per kilogram (mg /kg).

Various inorganic constituents were detected in all soil samples, including notable concentrations of arsenic in soil samples S1 (29.2 mg/kg) and S2 (22.5mg/kg), chromium in soil sample S14 (estimated 489 mg/kg), and copper in soil sample S11 (estimated 269 mg/kg). Lead was also detected at concentrations ranging from an estimated 9.3 mg/kg to 362 mg/kg. These inorganic constituents cannot be directly attributed to coal gasification processes (Ref. Nos. 1, 2, 27), although the levels of arsenic and copper in on-site soils are over 3 and 4 times higher, respectively, than those found in the background sample. All other inorganic constituents were present in on-site soils at levels comparable to each other and/or to the background level.

PART V: HAZARD ASSESSMENT

GROUNDWATER ROUTE

1. **Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

There is a very high potential for a release of contaminants to groundwater to occur at the facility. Soil samples from the facility show that elevated concentrations of volatile and semivolatile organic compounds exist on site. These compounds include benzene, toluene, styrene, xylenes, and a number of PAHs including known and suspected carcinogens, all of which are related to the coal gasification process. In soil sample S5, a substance assumed to be solidified coal tar was encountered at a depth of approximately 18 to 36 inches. This and other wastes associated with coal gasification are reported to be buried in unlined pits on site. Contaminants contained in these pits could leach through the soil and enter groundwater below the site.

Ref Nos. 1, 2, 3, 27

2. **Describe the aquifer of concern; include information such as depth, thickness, geologic composition, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

The aquifer of concern is the Passaic Formation, which was formerly known as the Brunswick Formation. The Passaic Formation is the most extensive and important aquifer in Union County. The formation is composed of thin-bedded shales, mudstones, and sandstones which range in thickness from 6,000 to 8,000 feet. Groundwater in this formation occurs along joints and fracture zones which decrease in volume with depth. Groundwater in the area exists under confined and unconfined conditions resulting in both artesian and water table aquifers, respectively. The confining layers generally consist of silt and clay beds. On-site borings show that the red-brown Brunswick Shale of the Passaic Formation exists at a depth ranging from 8 to 18 feet below the ground surface. The upper 1 to 3 feet of the shale is reported to be decomposed. The permeability of the shale is approximately 10^{-7} cm/sec. Overlying a majority of the Passaic Formation is a stratum of unconsolidated glacial sediments consisting of clay, silt, sand, gravel, and boulders. The overburden beneath the site ranges in thickness from approximately 11 to 19 feet. Borings completed in a limited area near the viaduct indicate that locally bedrock is immediately overlain by medium dense to dense silt 2 to 5 feet thick. Above that lies a 4- to 10-foot-thick layer of silty clay, clayey silt, and organic silt. This deposit, however, is not continuous in the northernmost portion of the site, where overburden consists of silty clay, sand and gravel, and clayey sand and gravel, in ascending order. The uppermost deposit throughout the site consists of fill materials including earth fill and debris. The permeability of these unconsolidated deposits beneath the site is 10^{-5} to 10^{-7} cm/sec. There is direct hydraulic connection between the glacial deposits and the bedrock and also with adjacent surface waters. Groundwater levels at the site range from 7 to 10 feet below the ground surface. A perched water zone exists in the northern portion of the site. Depth to groundwater in this perched zone ranges from 1 foot to 5.5 feet. Near the site groundwater is assumed to flow southwest toward the Elizabeth River.

Ref. Nos. 2, 3, 8, 9, 12

3. **Is a designated sole source aquifer within 3 miles of the site?**

A sole source aquifer has not been designated within 3 miles of the site.

Ref. No. 25

4. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

During the NUS Corp. Region 2 FIT site inspection, readings above background were observed on the OVA and HNu air monitoring instruments when a substance assumed to be solidified coal tar was encountered from a depth of approximately 18 to 36 inches. Analytical data indicates that soil contamination exists across the site at depths ranging from 0 to 48 inches. Groundwater exists under water table conditions 7 to 10 feet below the ground surface. Therefore, the depth to the aquifer of concern ranges from 3 to 6 feet.

Ref. Nos. 2, 3, 8, 9

5. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?**

The permeability value for the silts and clays overlying the Brunswick Shale is 10^{-5} to 10^{-7} cm/sec.

Ref. No. 12

6. **What is the net precipitation for the area?**

The net precipitation for the area is 12 inches.

Ref. No. 12

7. **Identify uses of groundwater within 3 miles of the site (i.e., private drinking source, municipal source, commercial, industrial, irrigation, unusable).**

Groundwater within 3 miles of the site is used only for commercial and industrial purposes. There are no known wells used for drinking or irrigation purposes within 3 miles of the site. All wells used for potable water supply that exist within 3 miles of the site are reported to be closed.

Ref. Nos. 7, 16-24

8. **What is the distance to and depth of the nearest well that is currently used for drinking or irrigation purposes?**

There are no known wells currently used for drinking or irrigation purposes within 3 miles of the site. All wells used for potable water supply that exist within 3 miles of the site are reported to be closed.

Ref. Nos. 7, 16-24

9. **Identify the population served by the aquifer of concern within a 3-mile radius of the site.**

There are no people known to be served by the aquifer of concern within 3 miles of the site. All public supply water is supplied by the Elizabethtown Water Company and the City of Newark Water Department. These utilities receive water from reservoirs not located within 3 miles of the site.

Ref. Nos. 7, 16-24

SURFACE WATER ROUTE

10. **Describe the likelihood of a release of contaminant(s) to surface water as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminants to the facility.**

There is a high potential for a release of contaminants to surface water to occur at the site. Groundwater is in direct hydraulic connection with adjacent surface waters. Since there is a high potential for groundwater contamination to occur, surface water, in turn may be impacted. Analytical data from soil samples collected at the site indicate that wastes associated with coal gasification exist in surface and subsurface soils in the southern portion of the site. This portion of the site is a closed basin used for flood control. It is lower than surrounding topography and is separated from the river by a manmade concrete bulkhead which is approximately 8 to 10 feet higher than the site. This bulkhead has a floodgate that bisects its base at each end of the site. This creates a high potential for surface water contamination because in the event of a flood, water would contact contaminants in on-site soils. This contaminated water from the site would be mixed with river water once the flood water was allowed to return to the river through the flood gates.

Ref Nos. 1, 2, 3, 27

11. **Identify and locate the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.**

The nearest downslope surface water is the Elizabeth River. The river is bulkheaded at this point and the bulkhead extends approximately 8 to 10 feet above the site where it borders the river. However, there are potential drainage paths through two flood gates which penetrate the bulkhead at each end of the site. In the event of a flood, the gates could be opened and contaminated floodwater from the site and water in the river could be mixed, allowing for contaminant migration. The Elizabeth River empties into the Arthur Kill approximately 2.3 miles downstream from the site.

Ref. Nos. 2, 4

12. **What is the facility slope in percent? (Facility slope is measured from the highest point of deposited hazardous waste to the most downhill point of the waste area or to where contamination is detected.)**

The facility slope is less than 3 percent.

Ref. Nos. 2, 4

13. **What is the slope of the intervening terrain in percent? (Intervening terrain slope is measured from the most downhill point of the waste area to the probable point of entry to surface water.)**

The slope of the intervening terrain is less than 3 percent.

Ref. Nos. 2, 4

14. **What is the 1-year 24-hour rainfall?**

The 1-year 24-hour rainfall for the region is approximately 2.75 inches.

Ref. No. 12

15. **What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.**

The Elizabeth River borders the site to the west and southwest. However, the river is bulkheaded along the site. The bulkhead extends approximately 8 to 10 feet above the site, which would prevent runoff from entering the river, except in the case of a flood.

Ref. Nos. 1, 2, 3

16. **Identify uses of surface waters within 3 miles downstream of the site (i.e., drinking, irrigation, recreation, commercial, industrial, not used).**

The designated uses of the Elizabeth River and the Arthur Kill within 3 miles downstream of the site include secondary contact recreation, maintenance and migration of food populations, migration of diadromous fish, maintenance of wildlife, and any other reasonable uses. There are no surface water intakes within 3 miles downstream of the site.

Ref. Nos. 5, 7, 19, 20, 23, 24

17. **Describe any wetlands, greater than 5 acres in area, within 2 miles downstream of the site. Include whether it is a freshwater or coastal wetland.**

A 5-acre, tidally influenced coastal wetland is located approximately 1.4 miles downstream of the site. This wetland is classified as an emergent, intertidal, estuarine wetland.

Ref. No. 6

18. **Describe any critical habitats of federally listed endangered species within 2 miles of the site along the migration path.**

There are no critical habitats of federally listed endangered species located within 2 miles of the site. However, the federally endangered peregine falcon (Falco peregrinus) may use the area for feeding and nesting and the federally endangered bald eagle (Haliaeetus leucocephalus) makes transient appearances there.

Ref. No. 11

19. **What is the distance to the nearest sensitive environment along or contiguous to the migration path (if any exist within 2 miles)?**

A tidally influenced coastal wetland is located approximately 1.4 miles downstream of the site. This wetland is classified as an emergent, intertidal, estuarine wetland.

Ref. No. 6

20. **Identify the population served or acres of food crops irrigated by surface water intakes within 3 miles downstream of the site and the distance to the intake(s).**

There are no known surface water intakes used for drinking or irrigation within 3 miles of the site. All public supply water is supplied by the Elizabethtown Water Company and the City of Newark Water Department. These utilities use reservoirs located outside of a 3-mile radius around the site.

Ref. Nos. 7, 19, 20, 23, 24

21. **What is the state water quality classification of the water body of concern?**

The Elizabeth River and the Arthur Kill are both classified as SE3 waterways in the vicinity of the site.

Ref. No. 5

22. **Describe any apparent biota contamination that is attributable to the site.**

During an NUS Corp. Region 2 FIT site inspection, no apparent biota contamination attributable to the site was observed.

Ref. No. 2

AIR ROUTE

23. **Describe the likelihood of a release of contaminant(s) to the air as follows: observed, alleged, potential, none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

During the NUS Corp. Region 2 FIT site inspection no wastes were noted to be present on the site surface. No readings above background were detected in the ambient air by the Organic Vapor Analyzer (OVA) or the HNu photoionization detector (HNu) prior to the disturbance of soil. However, readings above background were detected on at least one of the air monitoring instruments in all subsurface soil sample auger holes and above the disturbed soil at sample location NJGA-S12. Subsurface soil samples were collected at depths ranging from 6 inches to 48 inches. These readings ranged from 0.4 ppm to greater than 1,000 ppm. Therefore, there is a potential for volatile contaminants to migrate through cover soils and release to air. There have been no reported releases to air associated with the facility. There were no readings above background on either of the air monitoring instruments within the breathing zone at any time during the sample collection event.

Ref. Nos. 1, 2

24. **What is the population within a 4-mile radius of the site?**

The population within a 4-mile radius of the site is approximately 296,200.

Ref. No. 13

FIRE AND EXPLOSION

25. **Describe the potential for a fire or explosion to occur with respect to the hazardous substance(s) known or suspected to be present on site. Identify the hazardous substance(s) and the method of storage or containment associated with each.**

The potential for a fire or explosion to occur with respect to hazardous substances present on site is low. Coal and coal tar have a moderate potential for fire and explosion. However, during the NUS Corp. Region 2 FIT site inspection all wastes on site were noted to be buried. Part of the site is used for storage and part is used for public recreation and flood control. There have been no reported fires or explosions associated with the facility.

Ref. Nos. 1, 2, 3

26. What is the population within a 2-mile radius of the hazardous substance(s) at the facility?

The population within a 2-mile radius of the site is approximately 109,200.

Ref. No. 13

DIRECT CONTACT/ON-SITE EXPOSURE

27. Describe the potential for direct contact with hazardous substance(s) stored in any of the waste units on site or deposited in on-site soils. Identify the hazardous substance(s) and the accessibility of the waste unit.

There is a very high potential for direct contact with hazardous substances which occur in on-site soils. A substance assumed to be coal tar was encountered in on- site soils in the southern portion of the site at a depth of 18 inches. The site is easily accessible and part of it is used as a public baseball field. Numerous volatile and semivolatile organic compounds were detected in both surface and subsurface soil samples collected by the NUS Corporation Region 2 FIT in the southern portion of the site, including the baseball field. The site is located in a heavily populated urban area and is bordered by residences to the east. Children were observed on the site during the site inspection.

Ref. Nos. 2, 3, 27

28. How many residents live on a property whose boundaries encompass any part of an area contaminated by the site?

There is no known documentation that states that any nearby residential property boundaries encompass any part of an area contaminated by the site.

Ref. Nos. 1, 3, 10

29. What is the population within a 1-mile radius of the site?

The population within a 1-mile radius of the site is approximately 49,600.

Ref. No. 13

PART VI: ACTUAL HAZARDOUS CONDITIONS

Analysis of samples collected during the NUS Corporation Region 2 FIT site inspection revealed the presence of numerous volatile and semivolatile organic compounds in on-site surface and subsurface soil samples. These compounds included various polynuclear aromatic hydrocarbons (PAHs), many of which are known or suspected carcinogens. These contaminants were found at depths ranging from 0 to 48 inches at various locations across the site. The area is easily accessible to the public and is used as a baseball field. Children were observed to be present during the NUS Corporation Region 2 FIT site inspection. No other actual hazardous conditions pertaining to human or enviromental contamination have been documented. Specifically:

- Contamination has not been documented either in organisms in a food chain leading to humans or in organisms directly consumed by humans.
- There have been no documented observed incidents of direct physical contact with hazardous substances at the facility involving a human being (not including occupational exposure) or a domestic animal.
- There have been no documented incidents of damage to flora (e.g., stressed vegetation) or to fauna (e.g., fish kill) that can be attributed to the hazardous material at the facility.
- A fire marshall has not certified that the facility presents a significant threat of fire or explosion and there is no demonstrated threat based on field observation.
- There is no documented contamination of a sewer or storm drain.
- There is no direct evidence of release of a substance of concern from the facility to the groundwater.

Ref. Nos. 1, 2, 3

PART VII: SITE SUMMARY AND RECOMMENDATIONS

The Elizabeth Coal Gas Site #2 is an inactive former coal gasification site located in a mixed urban residential and industrial area between South Street, High Street, Fourth Avenue, and the Elizabeth River under the U. S. Routes 1 and 9 Viaduct in Elizabeth, New Jersey. The site is comprised of approximately 2 acres and can be divided into two sections. The northern section of the site is an active salvage area while the southern portion is inactive and is used for flood control and as a public-access baseball field

The site has been owned by Elizabethtown Gas Light Company since 1855 and was used to manufacture coal gas until approximately 1901. Coal gas operations took place primarily in the northern portion of the site but most likely extended into the southern portion also. Presently, the northern section of the property is still owned by Elizabethtown Gas Light Company but is operated by Vignola Salvage Corp. as a storage and light industrial facility. The sourthern half of the property was donated to the Union County Department of Parks and Recreation by the City of Elizabeth in 1953. This part of the property is part of a flood control project. A small rectangular parcel of property, which encompasses the baseball diamond itself, is owned by the Church of Saint Anthony (Ref. No. 28).

Actual waste handling practices used at the plant during the time of coal gas production are largely unknown. It is very likely that coal and coke were stored on site in large piles. Waste materials which were not marketable, such as poor quality tars and oils, were probably deposited in unlined pits on site. Analytical results of surface and subsurface soil samples taken during the NUS Region 2 FIT site inspection indicate the presence of elevated concentrations of compounds associated with coal gas manufacturing wastes. A substance assumed to be solidified coal tar was encountered at sample location S5, and elevated levels of various organic compounds including high levels of polynuclear aromatic hydrocarbons (PAHs) were detected in a sample of the material. Although levels of PAHs were generally higher than those found in the sample that was intended to represent the background conditions, in many instances "background" levels for other compounds detected were comparable to or higher than those found in some on-site soil samples. This indicates that either those on-site samples are unaffected by facility wastes or that the residential area where the "background" sample was collected has been impacted by the site. Some remedial action has been reported to have occurred at the site along with the removal and/or addition of unknown amounts of soil during the flood control basin construction (Ref Nos. 1, p. A-1; 26).

The site is completely fenced with a locked gate along Centre Street. However, there is an open gate along High Street which permits access to the site. There is a high potential for a release of contaminants to both groundwater and surface water from the facility; however, groundwater and

PART VII: SITE SUMMARY AND RECOMMENDATIONS (Cont'd)

surface water in the area are used for industrial and commercial purposes only. A portion of the site is used as a baseball field and children were observed on site. Because of the high potential for direct contact with on-site wastes and contaminated surface soils to occur, a **LISTING SITE INSPECTION** is recommended for the Elizabeth Coal Gas Site #2. Recommendations for further work should include a soil boring program to determine the quantity and extent of the waste deposited, and soil sampling of nearby residential properties to determine whether or not contaminants have migrated off site. Due to the elevated concentrations of PAH compounds and other compounds generally associated with coal gas wastes that were detected in surface soils, it is also recommended that emergency action be taken to prevent access to the site by unauthorized personnel (i.e., children who pass through or use the ballfield on site).