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BUILDING 1600A LUST INVESTIGATION/REMEDIATION REPORT NS GREAT LAKES IL
12/8/1997
HERITAGE ENVIRONMENTAL SERVICES, INC

219

BUILDING 1600 A
LUST INVESTIGATION/REMEDIATION
REPORT

Prepared for:

Department of Navy
PWC Great Lakes, Illinois
Environmental Department, Bldg. 1-A
2703 Sheridan Road, Suite 120
Great Lakes, Illinois 60088-5600

Prepared by:

Heritage Environmental Services, Inc.
Chicago Division
15330 Canal Bank Road
Lemont, Illinois 60439

December 8, 1997

Heritage Environmental Services, Inc.

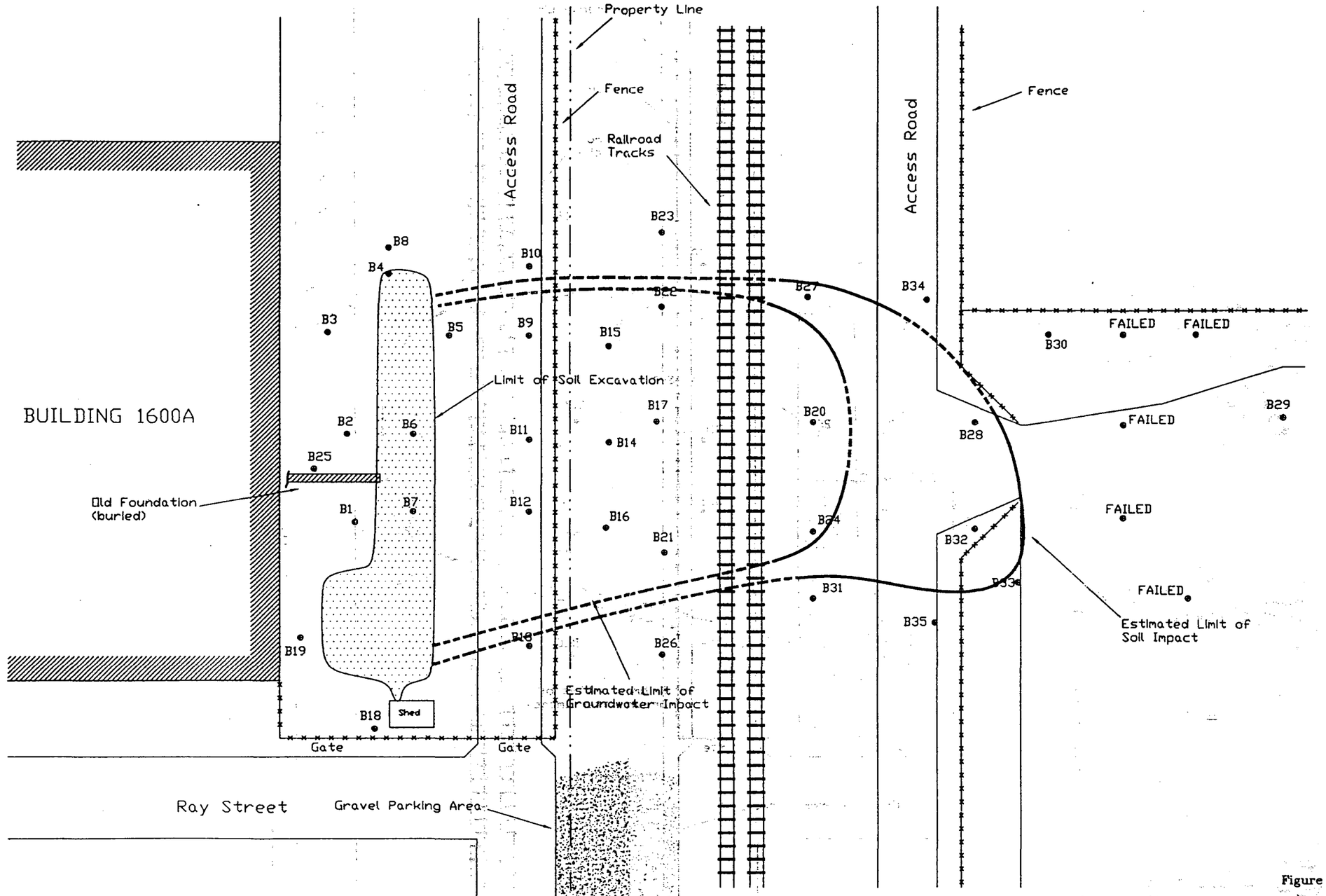

Figure 8

NORTH

SCALE: 1" = 30'

0 15' 30'

PWC GREAT LAKES

Estimated Extent of Contamination

DRAWN BY: KJC		DATE:	10/20/97
APP. BY: KJR	HERITAGE	SCALE:	1" = 30'
JOB NO. 10319		DWG.	NAVY1.DWG

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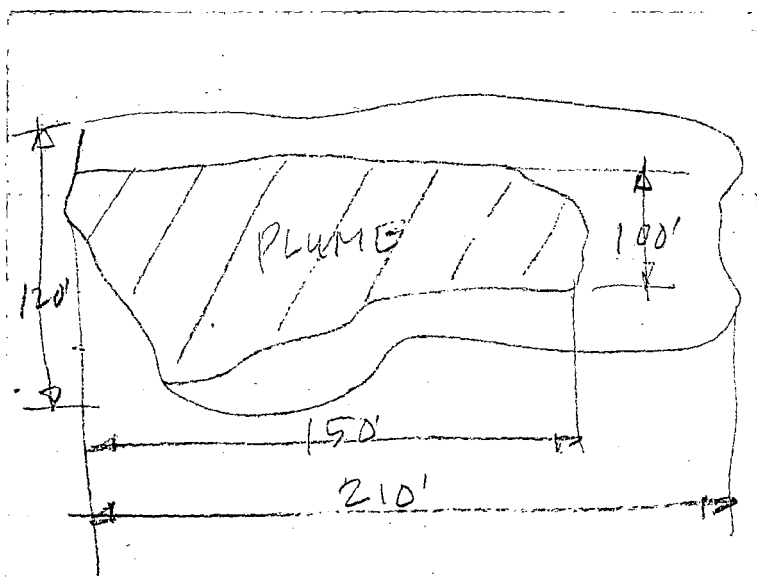

OF EXTRACTION WELLS $= \frac{210 \times 120}{(3.14)(150 \times 100)}$

$\approx 0.5 \approx 1$

OF VEP $= \frac{210 \times 120}{(3.14)(20')(10')} = 40$

210

TABLE OF CONTENTS

1.0 INTRODUCTION 1
- 1.1 Site Location 1
- 1.2 Site Description 2
- 1.3 UST Information 2

2.0 SITE INVESTIGATION 5
- 2.1 Subsurface Soil Investigation Activities 5
  - *2.1.1 Soil Boring and Sample Collection Procedures* 5
  - *2.1.2 Soil Sampling Procedures* 7
- 2.2 Groundwater Investigation Activities 7
  - *2.2.1 Piezometer Installation Procedures* 7
  - *2.2.2 Groundwater Sampling Procedures* 9

3.0 FIELD AND LABORATORY ANALYTICAL RESULTS 11

4.0 LIMITED REMEDIAL ACTION ACTIVITIES 12

5.0 SITE CHARACTERISTICS 15
- 5.1 Site Geology 15
- 5.2 Site Hydrogeology 17
- 5.3 Hydrology 17
- 5.4 Site Climatology 18

6.0 LOCAL GROUNDWATER WELLS 20

7.0 DISCUSSION OF RESULTS 21
- 7.1 Site Soil Conditions 21
- 7.2 Site Groundwater Conditions 23

8.0 CONCLUSIONS 25

9.0 RECOMMENDATIONS 27

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LIST OF APPENDICES

Appendix 1 Site Figures
- Figure 1, Site Location Map
- Figure 2, Former UST System
- Figure 3, Soil Boring Locations
- Figure 4, Piezometer Location and Groundwater Contours
- Figure 5, Site Cross Section Lines
- Figure 6, Site Cross Sections
- Figure 7, Water Well Locations
- Figure 8, Estimated Extent of Contamination

Appendix 2 Soil Boring Logs

Appendix 3 Piezometer Logs

Appendix 4 Tables
- Table 1, Summary of Soil Sample Results (PID Readings)
- Table 2, Summary of Soil Sample Results (IPS Field Screening)
- Table 3, Summary of Soil Sample Results (Heritage)
- Table 4, Summary of Groundwater Results (Heritage)
- Table 5, Survey Data and Well Measurements
- Table 6, Climatological Data

Appendix 5 Field Analytical Results

Appendix 6 Laboratory Certificates - Soil Samples

Appendix 7 Laboratory Certificates - Groundwater Samples

Appendix 8 Photographs

Appendix 9 Geotechnical Laboratory Results

Appendix 10 Water Well Records

Appendix 11 Site Classification Completion Report

1.0 INTRODUCTION

Heritage Environmental Services, Inc. (Heritage) was retained by the Public Works Command of the Great Lakes Naval Training Center (PWC-NTC) to perform a limited remedial action in respect to a leaking underground storage tank (LUST) located at Building 1600A at the United States Navy, Great Lakes Training Center. These activities also included the performance of an investigation of the subsurface conditions in the area of the LUST for the purposes of defining the extent and magnitude of petroleum contamination.

SEE ATTACHED

In early September 17 1997, R.W. Collins, Inc. obtained the necessary permits and removed two (2) 10,000 gallon gasoline underground storage tanks (USTs), one (1) 6,000 6,500 gallon diesel UST, and the associated fuel dispensers. ~~Following the removal of the USTs, residual petroleum impacted soils were observed.~~ On September 25, 1997, Heritage mobilized to the site to remove the distribution piping and to excavate the petroleum contaminated soils within the immediate area of the former USTs. These excavated soils were incorporated with other petroleum impacted soils which were being bio-remediated at the former Naval Fire-Fighter Training Facility (Building 3304). During the performance of these limited remedial actions, Heritage also conducted a subsurface soil and groundwater investigation in the area of the former LUSTs to define the extent and magnitude of the petroleum contamination associated with these LUSTs.

This report has been prepared to document and summarize the activities conducted at the site and the findings of the investigative activities. The basis of the classification of this site and recommendations for further actions are also provided in this report.

1.1 Site Location

The site is identified as the US Navy Public Works Center, Building 1600A, Ray Street, Naval Training Center, Great Lakes, Lake County, Illinois. The site is located in Lake County, Illinois. The site is geographically located in the SE quarter, of the NW quarter, of the SE quarter, of Section 5, Township 44 North, Range 12 East, East of the Third

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Principal Meridian, Longitude 87° 51.115' West, Latitude 42° 18.907' North. The location of the site is shown in Appendix 1, Figure 1. Figure 1, is reproduced from the USGS 7.5 minute Waukegan Quadrangle Topographic Map, Photorevised 1980.

1.2 Site Description

The site is located within the confines of the United States Navy, Great Lakes Training Facility. The site was utilized as a fueling station for US Navy motor pool vehicles from 1972 to September 1997. The UST's were registered with the Illinois Office of the State Fire Marshal (OSFM). The site was assigned OSFM Facility Registration No. 2023810.

During 1997, the Navy relocated the fueling operations to a different area of the Great Lakes Naval Facility. In September 1997, the USTs at the site were removed by R.W. Collins, Inc. The UST removal activities included the excavation and removal of the three USTs, vent lines, and the fuel dispensers. The distribution lines remained in place until removed by Heritage in September 1997. The location of the former UST system is shown in Figure 2, Appendix 1.

1.3 UST Information

Three USTs were formerly located at the site, as shown in Appendix 1, Figure 2. The USTs were reportedly installed in 1972 (OSFM Registration Records) and consisted of two 10,000-gallon capacity gasoline tanks (OSFM record Tank's 1 and 2) and one 6,000-gallon capacity diesel tank (OSFM record Tank 3). The UST's were reported as single-wall fiberglass construction. Distribution piping was reported as single-wall steel construction and were encased in concrete. The fuel dispensers were located approximately 70 feet north of the USTs.

In late 1990, a tank tightness test was performed on the UST System. The results of the tank tightness test indicated a leak in the dispenser lines. The Illinois Emergency Services

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and Disaster Agency (IESDA) was notified, and the site was assigned the incident number 90-3584. As a result of the UST system's failure of the tightness test in February 1991, Versar, Inc., Oak Brook, Illinois (Versar), performed an investigation of the subsurface soils in the area of the product dispenser piping to evaluate the potential impact to subsurface soils. The results of this investigation indicated that the subsurface soils in the area of the dispensers had been impacted by petroleum constituents. Subsequent to this determination, the two unleaded gasoline tanks were taken out of service until replacement of the UST dispenser piping was completed. In April 1991, the UST dispenser piping was replaced. Prior to the placement of the new dispenser piping, and back-filling of the excavated piping trench, two soil samples were collected from the floor of the excavated trench and submitted to a laboratory for analysis of petroleum constituents. One sample (TB1) was reported to exhibit BETX constituents above IEPA Cleanup Criteria. The sample TB1 was collected from the floor of the excavation trench for the replacement dispenser pipeline and near the fuel dispenser island.

After completion of the new dispenser piping installation, the piping was again tested for its tightness to confirm a leak-free installation. The system passed the tightness test. The piping trench was then back-filled, and the UST system was returned to service.

Approximately 55 cubic yards of petroleum impacted soils were excavated from the piping trench and transported for disposal. The quantity of petroleum product released as a result of this incident was unknown.

In September 1997, the UST System at the site was taken out of service, and the USTs were excavated and removed. The removal of the UST system was the result of a planned UST decommissioning and not the result of a new release incident. During the performance of the UST removal activities, petroleum impacted soils were encountered

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(A section on the UST Removal activities as performed by RW Collins could be added here, including OSFM Permits, photographs, and management of waste materials). This will require the PWC-NTC to request this information from R.W. Collins, Inc.

Please provide the recent IEMA Incident number.

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2.0 SITE INVESTIGATION

2.1 Subsurface Soil Investigation Activities

On September 25, 1997, Heritage mobilized the necessary personnel and equipment to perform a subsurface soil investigation at the site. The purpose of the investigation was to collect data for evaluation of the magnitude and extent of contamination of the subsurface soils and groundwater as a result of past operations of the former USTs at the site. At the time of the site investigation, the UST tanks and product dispensers had been excavated and removed from the site, although the product dispenser piping remained in place. Photographs reporting the various site activities are provided in Appendix 8.

2.1.1 Soil Boring and Sample Collection Procedures

Subsurface investigation activities at the site were performed utilizing a Geoprobe® drilling and soil sample collection technique. Drilling and soil sample collection was performed by Innovative Probing Solutions, Inc. (IPC), Mount Vernon, Illinois. Heritage provided engineering oversight for the investigative activities. Heritage oversight activities included determination of the location for constructed soil borings, sample collection intervals, sample logging, laboratory sample submittal, and other activities as necessary to coordinate and direct the site investigation.

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IPS utilized a van-mounted Geoprobe® unit to advance all soil borings performed at the site and to collect soil samples. A total of 35 soil borings were advanced at the site. Soil borings were identified as B-1 through B-35. Soil boring logs for the borings completed at the site are provided in Appendix 2. Location for the soil borings at the site are shown in Appendix 1, Figure 3.

The Geoprobe® technique utilized at the site involves the use of hydraulic or manually driven probing equipment that allows the collection of soil and groundwater samples at discrete depths in the subsurface. A rotary impact hammer drill and masonry drill bit was utilized to drill through hard surface cover materials encountered at the site (concrete and asphalt) and allow insertion of the sample collection tube and probe rods to the underlying soils. Soil samples were collected into polypropylene sample-tube liners, which were inserted into the sample tubes. Appropriate drive rods are attached to the sample tube as the sample tube is driven into the subsurface until the sample collection depth is reached. The sample tube is then driven through the sample collection interval (4-foot length). The drive rods and sample tube, containing the collected sample, were removed from the boring, and the sample tube liner was removed from the sample tube.

The retrieved sample tube liner was cut open to expose the soil sample. A portion of the soil sample was collected into a laboratory supplied sample container for possible laboratory analysis (BETX and PNAs), labeled and placed in the sample cooler. A separate portion of the collected sample was placed into a container for PID/head-space testing and an additional sample collected for on-site analysis by IPS. The PID/head-space sample was set aside while the remaining sample was logged for soil types. After completion of the soil log, a PID/head-space reading was performed on the head-space sample and was recorded in the boring log. PID meter results are also summarized in Table 1, Appendix 4. Selected soil samples were analyzed on-site utilizing a field gas chromatograph for BETX compounds. Field analytical results are included in Appendix 5.

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The sample tube and retractable drive point were decontaminated between each use by a detergent wash and water rinse. The sample tube components were dried, a new sample liner was installed, and the sample tube was reassembled for reuse.

At completion of each soil boring, the soil boring was abandoned by back-filling the bore hole with bentonite clay to surface grade.

2.1.2 Soil Sampling Procedures

Soil samples collected for laboratory analysis were collected into one 2-ounce (BETX) and one 4-ounce (PNA) glass jars. Laboratory soil samples were packed for zero-headspace and labeled at the time of collection indicating sample collection location, sample ID, collection date and time, and requested laboratory analysis. To prevent sample cross-contamination, single-use latex sample gloves were utilized by the sample collector during all sample collection and handling activities. The soil samples were placed in an ice packed sample cooler, to maintain sample temperature at approximately 4°C, until shipment to the receiving laboratory was completed. Laboratory samples were logged on laboratory sample Chain of Custody Forms and transported to the receiving laboratory under Chain of Custody Documentation procedures. Laboratory Certificate of Analysis, Sample Certification Forms and Chain of Custody Documents are provided in Appendix 6.

2.2 Groundwater Investigation Activities

2.2.1 Piezometer Installation Procedures

Four piezometers were installed at the site utilizing Geoprobe® techniques. The piezometer construction and installation was performed by Innovative Probing Solutions, Inc. (IPS). The piezometers are identified as P-1, P-2, P-3, and P-4. The

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piezometers were installed at the site to provide a means to evaluate local groundwater gradient and flow direction. In addition, groundwater samples were collected from the piezometers to evaluate the potential for petroleum impact upon groundwater at the site.

Soil boring procedures for the installation of the piezometers were similar to the procedures for advancing the soil borings of with the exception of soil sample collection activities. Soil samples were not collected from piezometer locations P-2, P-3, and P-4, as these locations were adjacent to soil boring locations B-13, B-11, and B-9, respectively. Soil samples were collected and logged during the installation of piezometer P-1. Where soil samples were not collected, an oversize drive shoe was attached to the drive rods to provide for a slightly larger bore hole; facilitating the installation of the piezometer materials.

Piezometers installed at the site were constructed from PVC material. To prevent cross contamination during storage and transportation, all construction material arrived on-site in factory packaging material (plastic wrapping). In addition, single use nitrile sample gloves were utilized during handling, assembly, and installation of the piezometers. Piezometer-screen sections utilized at the site were five feet in length, utilized 0.010-inch mill slots, and were sheathed in a silt-sock to inhibit silt size particles from entering the piezometer through the screened section. The piezometer riser and riser-cap were also constructed of PVC materials. All well sections utilized threaded, PVC wire-tie, or press-on attachment; no glue or adhesives were utilized in piezometer construction or installation. A sand filter pack was poured in place around the screened section. A granular Bentonite clay was poured in place above the screened section to surface grade to provide a seal for the annulus space of the riser piping. Piezometer well construction logs are provided in Appendix 3. The location of the piezometers installed at the site are shown in Appendix 1, Figure 4.

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2.2.2 *Groundwater Sampling Procedures*

On October 10, 1997, a reference survey was performed at the site to establish a vertical elevation reference datum. Locations of the soil borings, piezometers, as well as other surface grade features, were surveyed. Water level measurements were then recorded from the piezometers. A summary of the survey data and groundwater elevation measurements are provided in Appendix 4, Table 5.

Subsequent to recording groundwater level measurements at each piezometer, the groundwater within the piezometers was purged by removal of 5 times the calculated standing volume of water within each piezometer. Piezometer purging and subsequent groundwater sample collection were facilitated utilizing a MasterFlex® Peristaltic Pump and single-use polypropylene tubing. A length of polypropylene tubing was inserted into, and extended to the base of the piezometer; the other end of the tubing was attached to the MasterFlex® pump. The pump was operated until 5 volumes of standing water was removed from the piezometer or the piezometer was purged dry. Subsequent to purging each piezometer, a groundwater sample was then collected directly into laboratory sample containers for BETX (2-40 ml. Glass vials with septum caps) and PNA analysis (1 Liter Amber-Glass container).

The collected groundwater samples were labeled at the time of collection indicating sample collection location, sample ID, collection date and time, and requested laboratory analysis. To prevent sample cross-contamination, single-use latex sample gloves were utilized by the sample collector during all sample collection and handling activities. The collected laboratory samples were placed in an ice packed sample cooler, to maintain sample temperature at approximately 4C, until shipment to the receiving laboratory was completed. Laboratory samples were logged on laboratory sample chain of custody forms and transported to the receiving laboratory under chain of custody documentation procedures. Laboratory

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certificates of analysis, sample certification forms and sample chain of custody documents are provided in Appendix 7.

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3.0 FIELD AND LABORATORY ANALYTICAL RESULTS

A summary of the IPS field analytical results, provided by IPS, are provided in Appendix 4, Table 2. Soil and groundwater samples collected during the site investigation activities were submitted to Heritage Laboratories, 7901 West Morris Street, Indianapolis, Indiana for analysis. Samples were analyzed for Benzene, Ethylbenzene, Toluene, and Total Xylenes (BETX) constituents utilizing SW846-8240B methodology, and Polynuclear Aromatics (PNA's) utilizing SW846-8310 methodology. In addition, one sample was submitted for Total and TCLP Lead analysis utilizing SW846-6010A methodology. A Summary of Laboratory Results for the soil samples are provided in Appendix 4, Table 3. A Summary of the Laboratory Results of the groundwater samples analyzed at the site are provided in Appendix 3, Table 4.

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4.0 LIMITED REMEDIAL ACTION ACTIVITIES

In addition to performing an investigation to define the extent of petroleum impacted soils and groundwater at the site, Heritage provided the necessary personnel and equipment to complete the removal of the UST system (product piping) and excavate petroleum impacted soils in the immediate area of the former UST System.

Based on the preliminary findings of the subsurface soil investigation performed at the site, the extent of petroleum impacted soils were determined to be limited to the immediate area south, west and north of the former UST system. In these areas, the impacted soils were excavated. The excavation of the petroleum impacted soils to the east of the former UST excavation were limited by the presence of a buried water line traversing in a north-south direction, an access road, and railroad tracks. It was also determined, that based upon the extent of the lateral migration of the petroleum constituents in the eastward direction (Appendix 1, Figure 8), the continued excavation of these soils was not appropriate without further evaluation of alternative remedial actions. As a result, extensive excavation of petroleum impacted soils was not performed to the east of the former UST location.

Groundwater was encountered at a depth of 7 to 8 feet below surface grade at the excavation, and as a result, excavation of impacted soils was not advanced to a depth greater than 8 feet below surface grade.

On September 27, 1997, Heritage commenced the excavation and removal of petroleum impacted soils from the former UST excavation and dispenser pipeline area. Soils were excavated to the south of the UST excavation to the extent practical. The removal of soils to the south were limited by the presence of a buried electrical power utility line and a buried stormwater drainage line. The wood shoring for the stormwater utility pipeline was partially exposed along the south face of the excavation; refer to Appendix 8, Photograph 11.

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Soils were excavated to the west of the former UST excavation to within 9 feet of Building 1600A and to within 15 feet of the building along the former distribution piping trench, see Appendix 1, Figure 8.

Soils were excavated to the east of the former UST excavation to within 4 feet of a buried water line utility which ran in a north-south direction along the west side of the access roadway. The wood shoring for this utility pipeline was partially exposed along the west face of the excavation; refer to Appendix 8, Photograph 13.

Soils were excavated to the north of the former UST excavation along the former product dispenser distribution pipeline. Soil excavation proceeded northward along the pipelines, from surface grade to a depth of 7 feet below surface grade, until encountering the former product dispenser area.

Free product was not encountered during the excavation activities. Groundwater was encountered during the excavation activities at a depth of 7 to 8 feet below surface grade. Groundwater was in contact with petroleum impacted soils at the floor of the excavation. Groundwater encountered at the floor of the excavation did not exhibit a petroleum sheen in the area of the former USTs but did exhibit a petroleum sheen along the former dispenser pipeline trench. As a result of the large number of soil borings advanced at the site, and the soil samples collected from these soil borings which were submitted to a laboratory for BETX and/or PNA constituent analysis, additional soil samples were not collected from the limits of the completed UST excavation.

Excavated petroleum impacted soils were temporarily stockpiled at the north end of the site until off-site transportation arrangements were in place. An estimated 800 cubic yards of petroleum impacted soils were excavated and stockpiled at the site. The stockpiled soils were transported, and incorporated into, a bio-remediation project that was occurring at the former Naval Fire-Fighter Training Facility (Building 3304).

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The UST excavation was back-filled to 1 foot of surface grade utilizing imported 3–inch crushed limestone and brought to final grade with imported grade-8 crushed limestone. Surface restoration was completed by applying a new asphalt surface cover over the excavation area.

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5.0 SITE CHARACTERISTICS

5.1 Site Geology

Results of the field observations made during the subsurface soil investigation indicated the geology of the site, to a depth of 16 feet below surface grade, consisted primary of three soil units. The upper soil unit, extending from surface grade to 6 feet below surface grade, was Silty-clay to Clayey-silt, brown to red-brown, moist, and contained cobbles, pebbles, and sand. A thin, sandy, deposit was encountered in this upper soil unit at boring B-14. The middle soil unit, extending from 6 feet to 12 feet below surface grade, was a Sandy-silt to Silty-sand, medium to fine grained, brown to light-brown, water saturated, and containing cobbles, pebbles, and thin clay lenses. The lower soil unit, extending from 12 feet below surface grade to the maximum depth of the investigation, was a Clayey-silt to Silty-clay, gray, massive to interbedded silt and clay, moist, with included pebbles, shells, and sand. The two lower units appeared to be lacustrine in origin, the upper unit was consistent with glacial till material.

One notable exception to the natural soils encountered during the site investigation, was the concrete, slag, and coal encountered in the area of boring B-29. These materials were apparently remnants from a reported former coal storage area that had been located in the area of B-29 and B-30 sometime in the past. The presence of the concrete at 2 to 3 feet in this area inhibited the completion of some of the soil borings attempted in the area. The failed borings are noted in Appendix 1, Figure 3.

Free product was encountered at soil boring location B-17. This was observed by the accumulation of approximately 0.2-inch of free product at the top of the second soil sample tube (4-8' BSG) after removal of the soil sample tube from the boring. This soil boring was immediately back-filled to surface grade utilizing granular bentonite clay following collection of a soil sample for submittal to the laboratory for analysis of lead. Free product was not observed in the soils collected from the surrounding soil borings B-

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14, B-15, B-20, and B-22, indicating the occurrence of free product, or petroleum saturated soils, may be limited in extent. As a result of the small area indicated to be impacted by petroleum-saturated soils and the depth below surface grade this saturated soils was encountered, additional activities associated with the removal of this observed free product was not initiated.

A soil core sample was collected from the Silty-sand soil unit for submittal to a geotechnical laboratory for analysis of moisture content, moist density, dry density, specific gravity, porosity, soil pH, and coefficient of permeability. The laboratory analysis was performed to provide information on the hydraulic characteristics of the groundwater-saturated zone. Laboratory results for the sample are provided in Appendix 9.

Reference to the Stack Unit Map of Northern Illinois identifies the surface geology at the site as part of the Lake Border Moraines of the Wadsworth Till Member of the Wedron Formation. The Wedron Formation generally consists of silty and clayey diamictons and occurs in thickness exceeding 20 feet. The Wedron Formation is predominately till with interbedded deposits of waterlaid gravel, sand and silt.

Immediately east of the site are occurrences of the Dolton member of the Equity Formation. The Dolton member is predominantly shore and shallow-water lake deposits of sand, pebbly-sand, gravelly-sand, and silt beds. These lacustrine deposits are generally less than 20 feet in thickness and overlie older Wedron Formation deposits.

Soils encountered at the site are consistent with the characteristics of the Wadsworth Till. In addition, some surface deposits, or soils, in the investigation area may have been the result of past surface-fill activities.

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5.2 Site Hydrogeology

Groundwater was encountered at the site, and within the area covered by the investigation, at a depth of approximately 7 feet below surface grade. Groundwater was primarily contained within the silty-sand soil unit. Groundwater elevation measurements utilizing the piezometers installed at the site, indicated the groundwater elevation was consistent with observed saturated soils as noted in the soil boring logs. This similarity in groundwater elevations between the soil borings and piezometer measurements indicate the groundwater aquifer encountered is unconfined.

Groundwater flow direction across the site was determined using groundwater elevation measurements recorded on October 10, 1997. The groundwater elevation measurements indicated groundwater flow at the site was in a east to southeast direction. The groundwater gradient at the site was calculated as 0.0037 foot/foot.

Reference to the Potential for Contamination of shallow Aquifers from Land Burial of Municipal Wastes Map (Berg & Kempton) indicates the site is located in an area characterized as E; Uniform, relatively impermeable silty or clayey till at least 50 feet thick and little evidence of interbedded sand or gravel. The site also borders an area to the west of the site that is characterized as A2; thick, permeable sand and gravel within 20 feet of surface. The A2 characterization is consistent with the field observation of the silty-sand encountered at depth at the site and as a result, is the characterization considered applicable to the site. Releases occurring in areas characterized as A2 are considered to pose a potential for groundwater contamination.

5.3 Hydrology

There are no surface water bodies within 100 feet of the former UST area. The terrain surrounding the former UST area is typified by buildings and an asphaltic covering. Stormwater runoff from these areas are collected in catch basins located along the edge

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of the area and discharge into the stormwater sewer system of the Great Lakes Center. The storm sewer, which flows west to east and is located south of the UST excavation, discharges to a shallow ditch along the railroad tracks.

5.4 Site Climatology

The following site climatological conditions were referenced from the Soil Survey of DuPage and Part of Cook Counties, Illinois (USDA), and Climate of Illinois (Climatography of the United States No. 60). In addition, temperature records for the Waukegan Area, which were available on-line through the Midwest Climate Center, were accessed and are summarized in Appendix 4, Table 6.

Generally, the climatological conditions of the site are typically continental, with cold and snowy winters and warm summers. As a result of the site's location, near Lake Michigan, local temperatures are cooler than surrounding inland-regions.

As a result of the generally flat terrain of the surrounding region and proximity to Lake Michigan (within one-mile), the site experiences a full sweep of winds. Generally, the southeast and easterly winds bring mild and wet weather, southwesterly winds bring rain showers and warm temperatures, westerly winds bring dry and moderate temperatures, and winds from the north are cool and dry.

In winter, the average temperature is 25°F and the average minimum temperature is 17°F. The average seasonal snowfall is 39 inches. The driest month of the year is usually February. The average frost-line reaches 3 feet in depth in mid-winter.

In summer, the average temperature is 71°F and the average daily maximum temperature is 81°F. The average summer precipitation, April through September, is 22 inches. The wettest month of the year is usually May or June. The average relative humidity in mid-

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afternoon (spring and summer months) is 61 percent and can reach as high as 80 percent at dawn.

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6.0 LOCAL GROUNDWATER WELLS

The Illinois Water Well Survey records for Public-Industrial-Commercial and Private Well Database records were searched for groundwater wells within a 2,500 feet radius of the site, which might potentially be impacted by the release. This search was conducted by utilizing the on-line Database Query available through the Illinois Water Well Survey. A records query was performed for both the Public-Industrial-Commercial and Private Well Database records for Sections 4, 5, 6, 7, 8, and 9, of Township 44 North, Range 12 East, and Sections 34, 35, and 36 of Township 45 North, Range 12 East. The results of the above records search for Public-Industrial-Commercial and Private Well Database records are provided in Appendix 10.

Review of the results of the Public-Industrial-Commercial Well Database Query indicated eight water well records were on file for the search area. Of these eight records, five records indicated the well status as inactive, two records indicated the well status as emergency use only, and one record indicated the well status as active. None of the Public-Industrial-Commercial Water Well's identified by the database query was located within a 2,500 ft. radius of the site.

Review of the results of the Private Well Database Query indicated 44 water well records were on file for the search area. Of these 44 records, none were located within a 2,500 ft. radius of the site. Refer to Appendix 1, Figure 7, for a site map identifying a 200 ft. and 2,500 ft. radius from the site.

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7.0 DISCUSSION OF RESULTS

7.1 Site Soil Conditions

The soil sample laboratory results indicate that the petroleum constituents detected in the soil samples were below the IEPA Tier 1 Cleanup Criteria for Industrial-Commercial Properties. In general, the submitted soil samples were collected from the soil borings at depths and distances that were anticipated to identify the limits of petroleum impact at the site. All soil samples analyzed exhibited concentrations below the Tier I Cleanup Criteria with the exception of B-20.

As a result of the number of soil borings and soil samples collected from these soil borings at the site, specific soil samples were not collected from the actual limits of the UST and UST distribution piping excavation. Laboratory results from soil samples submitted from soil borings B-18 (8-9ft.), B-19 (6-7ft.), B-1 (7-8ft.), B-25 (3-4ft.), B-2 (10-11ft.), B-3 (5-6ft.), and B-8 (6-7ft.), which were located in close proximity to the limits of the UST excavation, indicated that suspected petroleum impacted soils to the south, west and north of the UST excavation were remediated, by excavation and removal, to the extent necessary to meet the IEPA Tier 1 Cleanup Criteria for Industrial-Commercial Properties. The soil samples collected from the soils underlying the product distribution piping, to a depth of 7 feet below surface grade (groundwater surface contact) in the area of soil borings B-5, B-6 (11-12ft.), and B-7 verify that the soils were remediated, by excavation and removal, to the extent necessary to meet IEPA Tier 1 Cleanup Objectives for Industrial-Commercial Properties. Based on the field analytical results (BETX and TVH) provided by IPS, soils at 1 to 2 feet below the groundwater surface (i.e. soils 7 to 9 feet below surface grade) that remained in place at the site in the area of soil borings B-5, B-6, and B-7, are considered to satisfy the IEPA Tier 1 Cleanup Criteria for Industrial-Commercial Properties.

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Subsurface soils, east of the excavation limits of the UST dispenser piping trench, are considered to be impacted by residual petroleum constituents at concentrations above IEPA Tier 1 Cleanup Criteria for Industrial-Commercial Properties. The estimated limits of these residual contaminated soils, east of the excavated area, are based on visual observations during the soil boring activities, analytical results provided by IPS on-site analysis, and laboratory results from samples submitted to Heritage Laboratories.

The vertical thickness of the impacted soil decreases at increasing distances from the former dispenser pipeline. Near the former dispenser pipeline, the vertical thickness is estimated at 8 feet (2 to 10 ft. interval), of which approximately 4 feet extends below the groundwater table surface. Further east of the excavated area, the vertical thickness decreases from 6 feet (6 to12 ft. interval) to 4 feet (9 to 13 ft. interval), and to nearly 2 feet (10 to 13 ft. interval) near the estimated eastern limit of impacted soils. The lower 4 to 5 feet of these impacted soils are below the groundwater table surface. Impacted soils, which occur below the groundwater surface, are attributed to fluctuations in the elevation of the groundwater table surface over time (seasonal variations in elevation). Based on the site investigation activity, the estimated horizontal extent of impacted soils is shown in Appendix 1, Figure 8, and the vertical extent is shown in Appendix 1, Figure 6.

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7.2 Site Groundwater Conditions

Groundwater was encountered at the site approximately 7 feet below surface grade. Based upon the site conditions and geology, groundwater at the site is considered as a Class II Groundwater Resource.

Groundwater at the site occurs within a Silty-sand soil unit that has an estimated average vertical thickness of 6 feet. This water-saturated zone is considered an unconfined aquifer with limited vertical extent (5 to 6 feet of water saturation).

The Clayey-silts underlying the Silty-sand aquifer is anticipated to behave as a lower confining unit, or aquitard, for the above aquifer.

Groundwater samples were collected from the four piezometers installed at the site. As a result of poor groundwater recovery at piezometers P-1 and P-4, only sufficient sample volume for BETX analysis was collected. Sufficient sample volume was collected from piezometers P-2 and P-3 for both BETX and PNA analysis. The groundwater sample laboratory results indicate that BETX and PNA petroleum constituents are below the IEPA Tier 1 Cleanup Criteria for Class II groundwater resources with the exception of the sample collected from piezometer P-3. Specifically, the laboratory results from this groundwater sample reveal Benzene at concentrations of 0.3 mg/L, which is above the Class II Groundwater Cleanup Criteria of 0.025 mg/L. All other analytical constituents reported for this sample were below the Class II Groundwater Cleanup Criteria.

Water level measurements performed at the site, utilizing the installed piezometers, indicate that the groundwater flow direction across the site is generally to the east towards Lake Michigan. Based on the groundwater surface contours, derived from the water level measurements, a groundwater surface gradient of 3.57×10^{-3} ft/ft was calculated. Utilizing the hydraulic conductivity results from the submitted soil core sample collected at soil

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boring B-20 of 1.09 x 10^{-4} cm/sec (3.58 x 10^{-6} ft/sec) groundwater flow velocity was estimated at 3.32 x 10^{-3} ft/day.

Recycled Paper

8.0 CONCLUSIONS

Based upon the site investigative activities, the estimated extent of petroleum contaminated soils and groundwater at the site are shown in Appendix 1, Figure 8. Within these areas of contamination, the shallow groundwater has been the apparent mechanism for the migration of contaminants from the UST area. The vertical extent of soil contamination decreases in thickness as distance increases from the UST excavation area. At the eastern limit of the UST excavation, the estimated thickness of contaminated soil is 6 feet. The thickness of contaminated soil decreases to less than 2 feet in thickness at the eastern most extent of contamination.

As part of this report, the Site Classification Completion Report Form is included in Appendix 11. The site is classified as high priority primarily because contamination was detected off-site (railroad property) and the presence of free product in the subsurface soils at soil boring B-17.

Within the area of the former USTs, several potential migration pathways were identified including a waterline and storm sewer. However, the water table elevation is beneath the invert elevations of the waterline and storm sewer. Therefore, based upon the site hydrogeology, these utility lines are not considered to be a migration pathway.

After completing early corrective action measures, there is no apparent evidence that through natural or man-made pathways, migration of petroleum vapors threaten human health and safety or could cause explosions in basements, crawl spaces, utility conduits, storm or sanitary sewers, vaults or other confined spaces.

Class III special resource groundwater is not located within 200 feet of the excavation. Surface bodies of water have not been adversely affected by the release. Groundwater quality standards have been exceeded at the site's eastern property boundary (bordering railroad property).

Based upon the well survey, see Appendix 10, there are no potable water wells within the 200 or 2,500 foot radii of the site. The site is not located within the minimum, maximum, or

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regulated recharge area of a potable water supply well. The site geology is consistent with the A2 characterization in the Illinois State Geological Survey Circular 532. Physical soil classification results are included in Appendix 9.

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9.0 RECOMMENDATIONS

Heritage recommends that five monitoring wells be installed at the site to verify the extent and magnitude of the petroleum contamination. Possible locations are shown in Appendix 1, Figure 8. In addition, a recovery well should be installed in the vicinity of B-17 to facilitate recovery of the free product observed in this area. The wells should be constructed of stainless steel materials with the screened intervals varying from 5 to 10 feet, dependent upon the specific location (refer to cross sections in Appendix 1, Figure 6. The wells can be used to perform slug and/or pump tests to further evaluate the hydraulic conductivity of the aquifer materials.

Free product recovery should be started as soon as the recovery well is installed. Initial product recovery methods utilized may be passive or active, depending on the quantity of product exhibited in the recovery well.

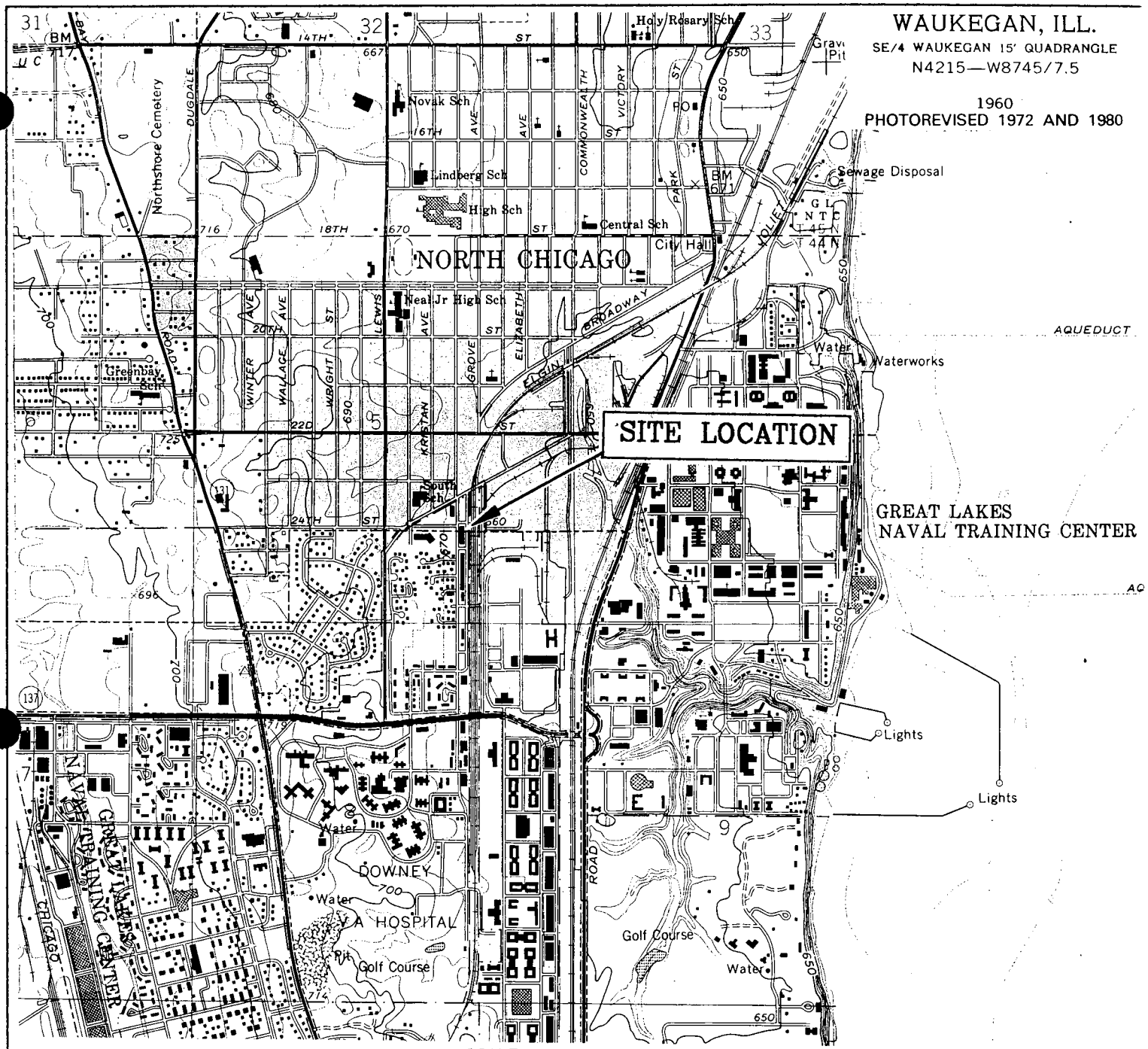
With the additional information collected through the installation of a recovery well and monitoring wells, a remediation action plan can be developed to address the remaining soil and groundwater contamination at the site. Remedial technologies which would be evaluated include conventional groundwater recovery and treatment, and in-situ technologies including air sparging, soil vapor extraction, bioremediation or a combination of one or more of these technologies.

Recycled Paper

APPENDIX 1

Site Figures

Recycled Paper



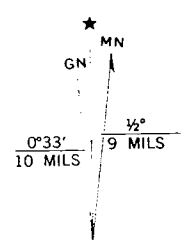
SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



UTM GRID AND 1980 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

QUADRANGLE LOCATION

US Navy
North Chicago, Illinois

TOPOGRAPHIC SITE LOCATION MAP
USN Base, North Chicago, IL, Building 1600A

REVISIONS
10329F1.DWG

HERITAGE

HERITAGE ENVIRONMENTAL SERVICES, INC.

DRAWN BY	DATE Nov. 11, 1997	FIGURE 1	
APPROVED BY	SCALE 1:24,000	JOB NO.	10319

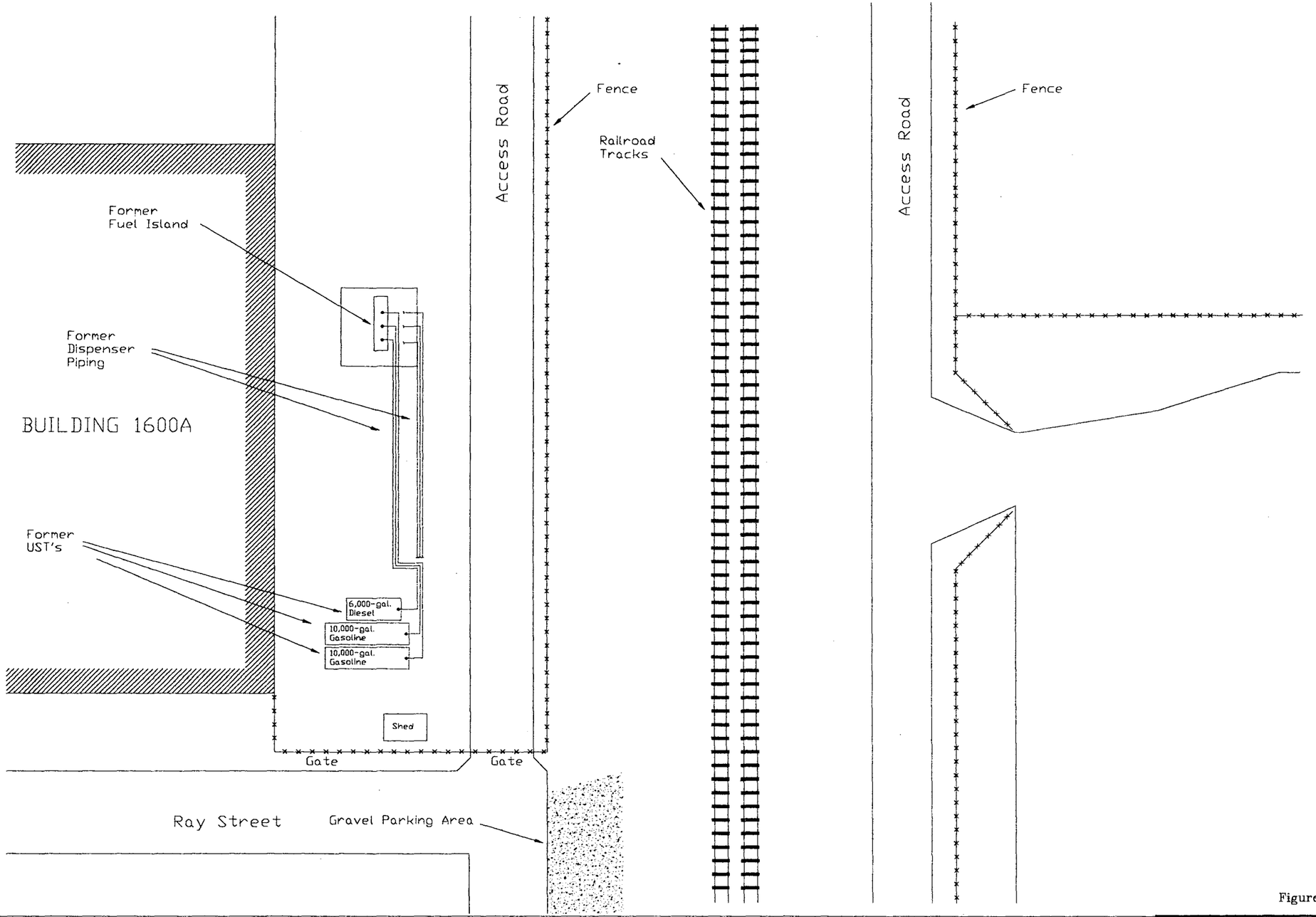


Figure 2

NORTH

SCALE: 1" = 30'

0 15' 30'

PWC GREAT LAKES

Former UST System Location

DRAWN BY: KJC		DATE:	10/20/97
APP. BY: KJR	HERITAGE	SCALE:	1" = 30'
JOB NO. 10319		DWG.	NAVY1.DWG

HERITAGE ENVIRONMENTAL SERVICES, INC.
LEMONT, ILLINOIS

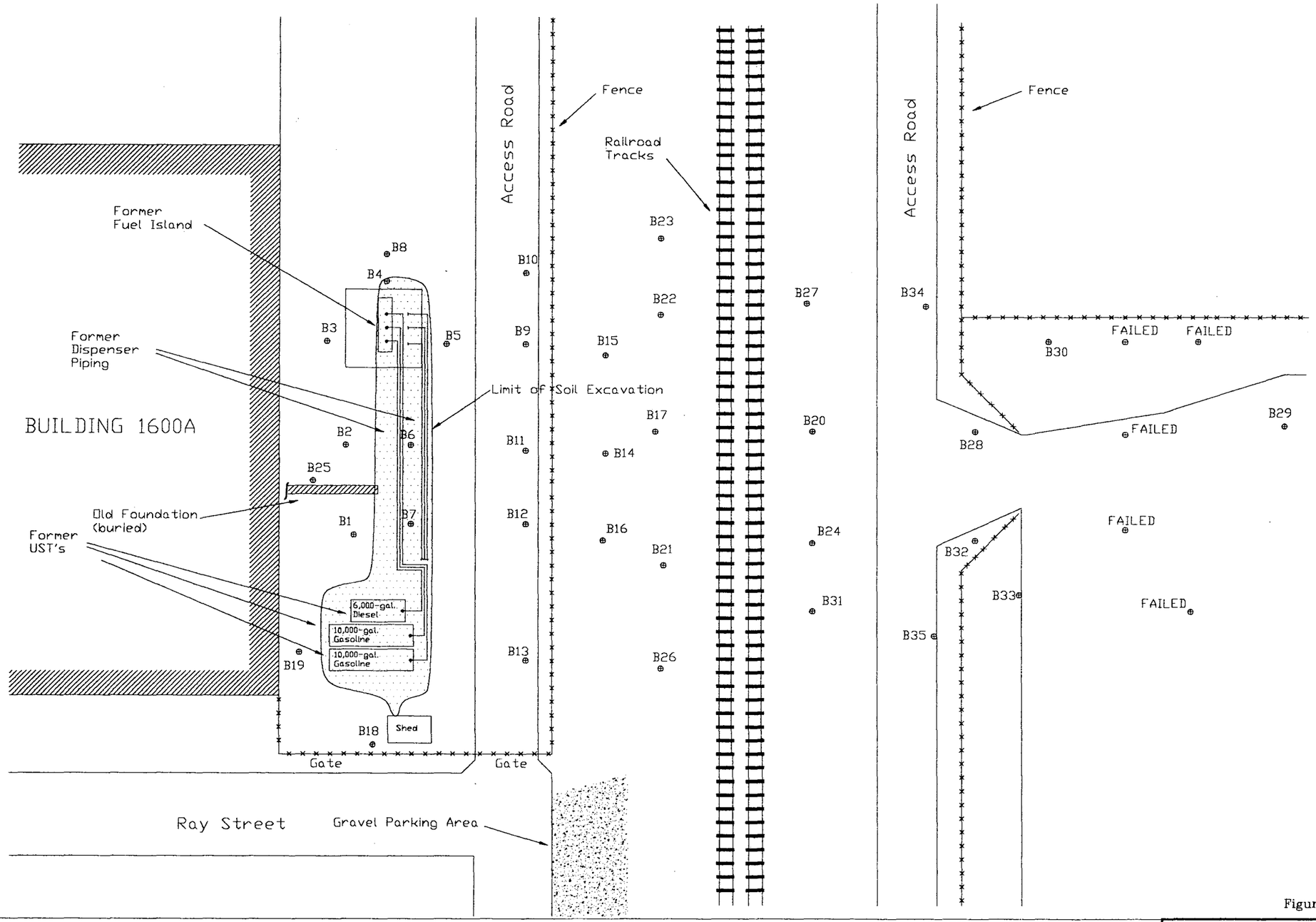


Figure 3

NORTH

SCALE: 1" = 30'

0 15' 30'

PWC GREAT LAKES

Soil Boring Location

DRAWN BY: KJC		DATE:	10/20/97
APP. BY: KJR	HERITAGE	SCALE:	1" = 30'
JOB NO. 10319		DWG.	NAVY1.DWG

HERITAGE ENVIRONMENTAL SERVICES, INC.
LEMONT, ILLINOIS

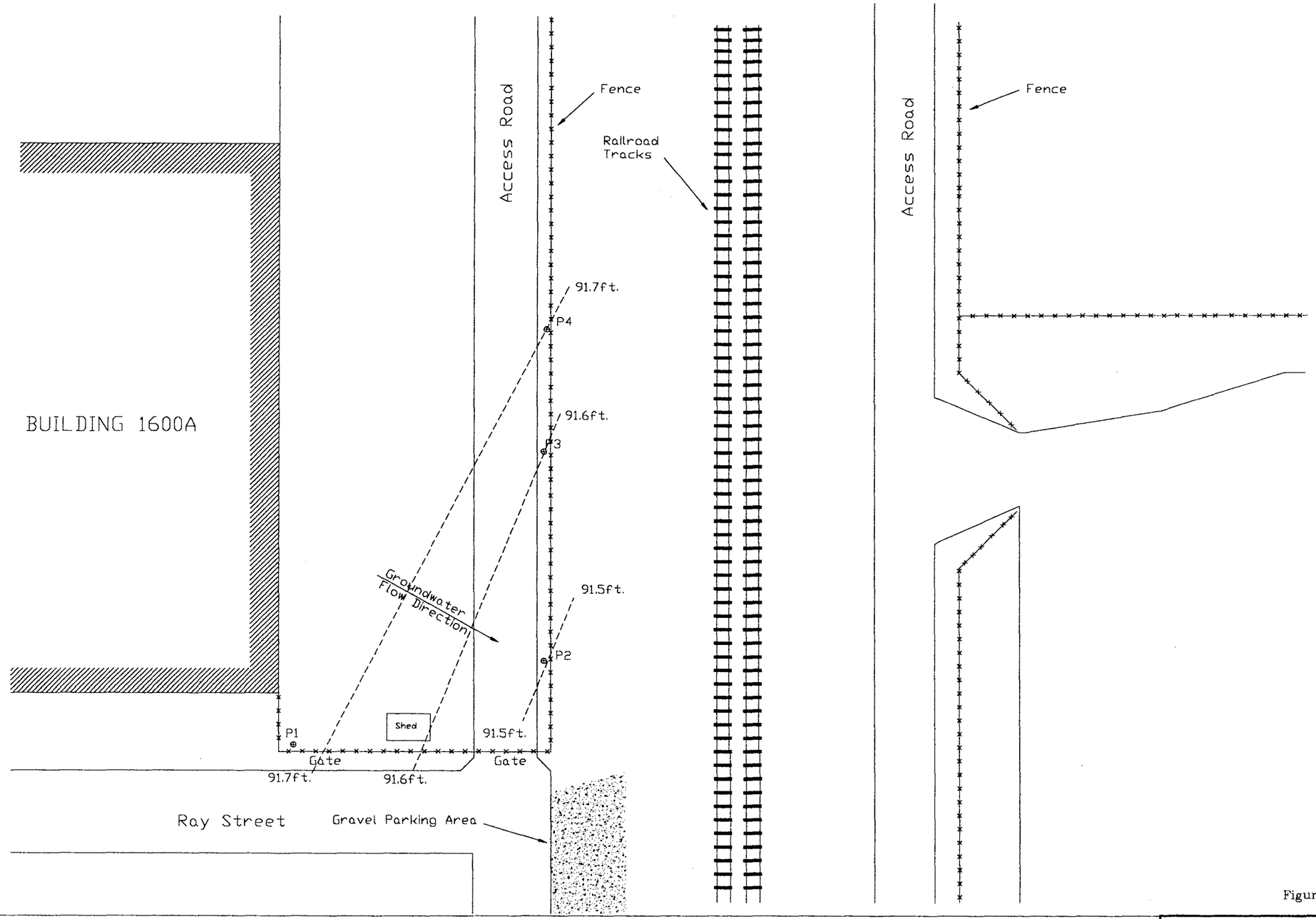


Figure 4

NORTH

SCALE: 1" = 30'

0 15' 30'

PWC GREAT LAKES

Piezometer Location & Groundwater Contours

DRAWN BY:	KJC	DATE:	10/20/97
APP. BY:	KJR	SCALE:	1" = 30'
JOB NO.	10319	DWG.	NAVY1.DWG

HERITAGE

HERITAGE ENVIRONMENTAL SERVICES, INC.
LEMONT, ILLINOIS

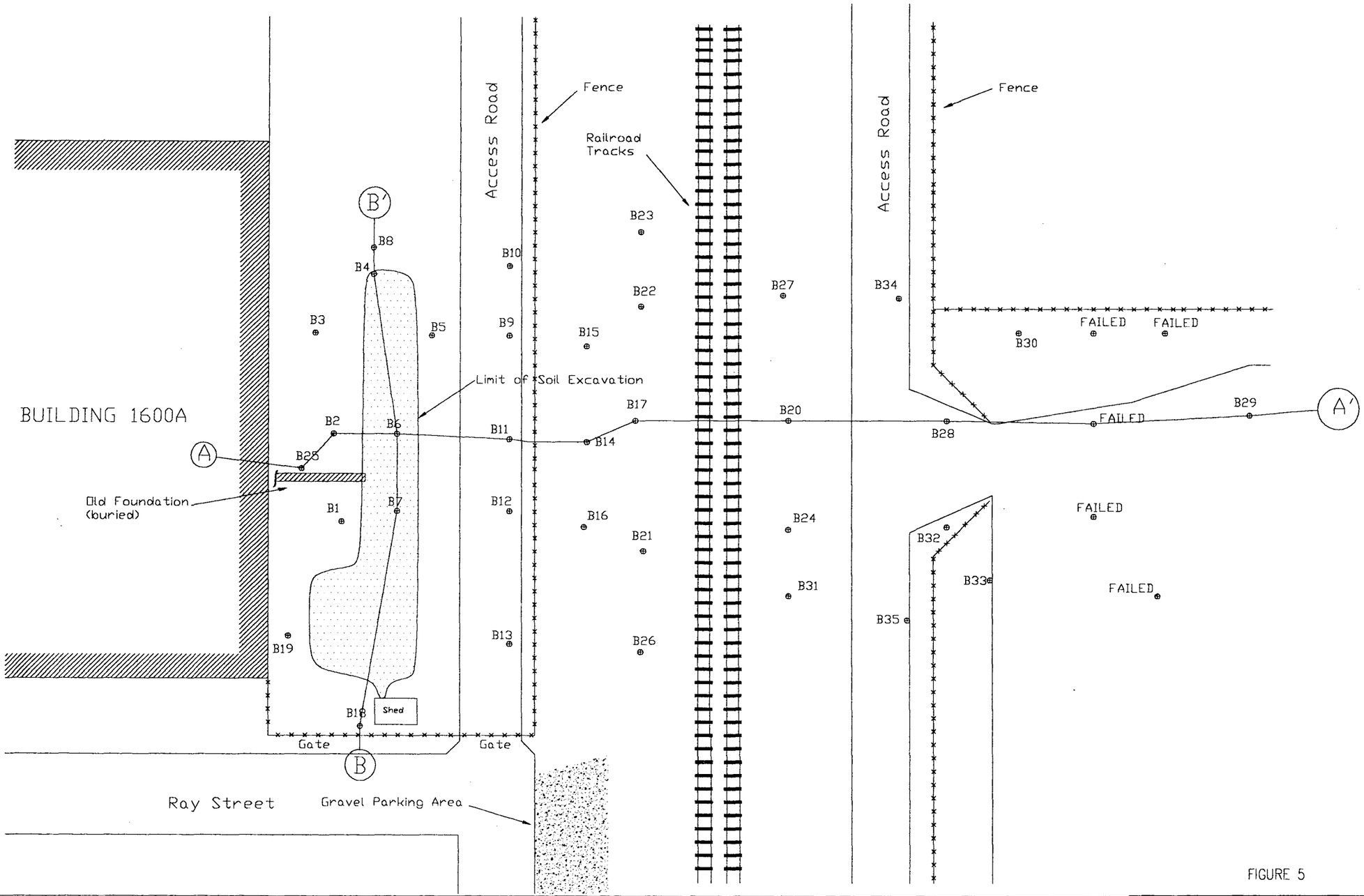


FIGURE 5

NORTH

SCALE: 1" = 30'

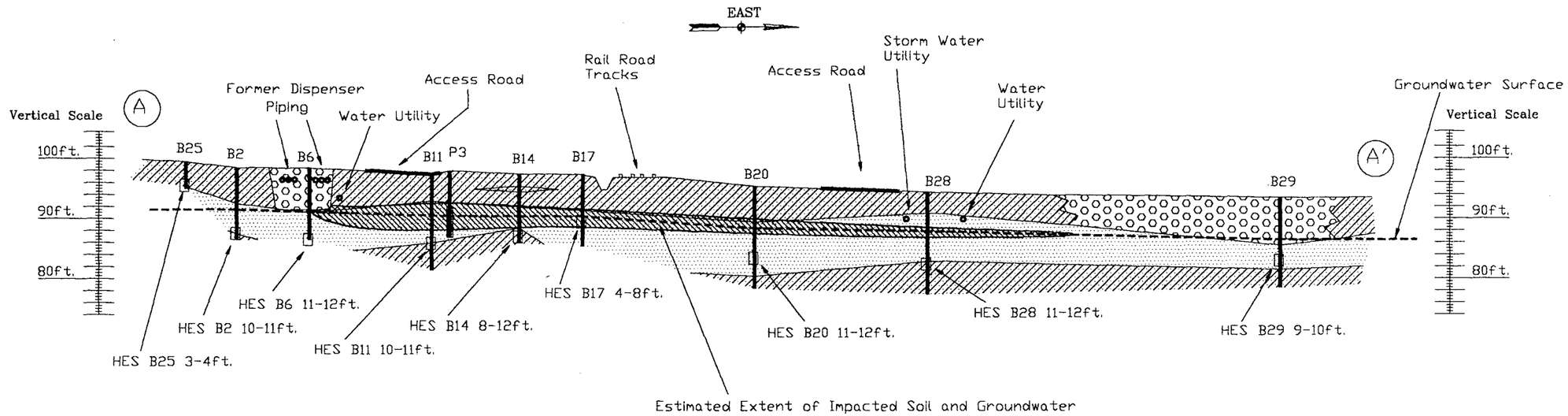
0 15' 30'

PWC GREAT LAKES

SITE CROSS-SECTIONS

DRAWN BY: KJC		DATE:	10/20/97
APP. BY: KJR	HERITAGE	SCALE:	1" = 30'
JOB NO. 10319		DWG.	NAVY1.DWG

HERITAGE ENVIRONMENTAL SERVICES, INC.
LEMONT, ILLINOIS



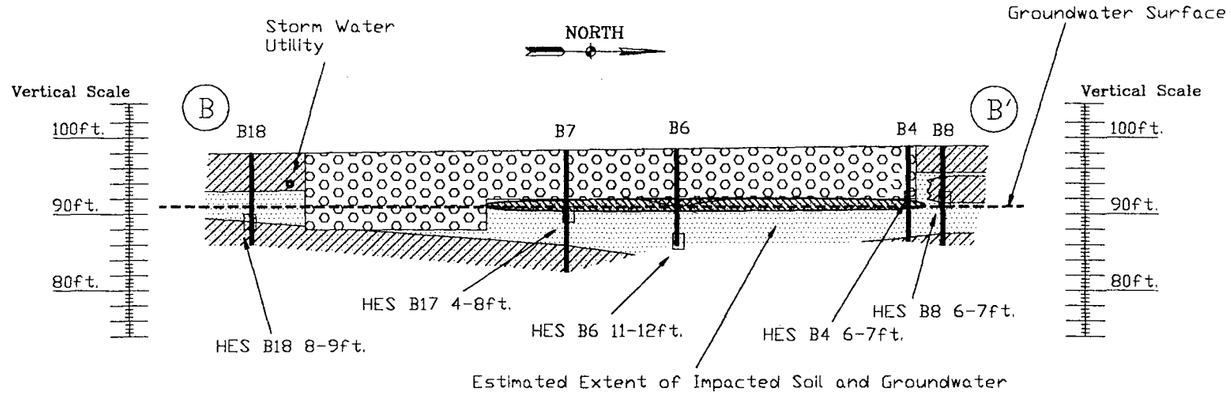


Figure 6

Clayey Silts & Silty Clays

Sand & Silty Sands

Placed Fill or Slag

Horizontal Scale

0 15' 30'

PWC GREAT LAKES

Site Cross-Sections

DRAWN BY: KJC		DATE:	10/20/97
APP. BY: KJR	HERITAGE	SCALE:	1" = 30'
JOB NO. 10319		DWG.	NAVY1.DWG

HERITAGE ENVIRONMENTAL SERVICES, INC.
LEMONT, ILLINOIS

Illinois Water Well Data

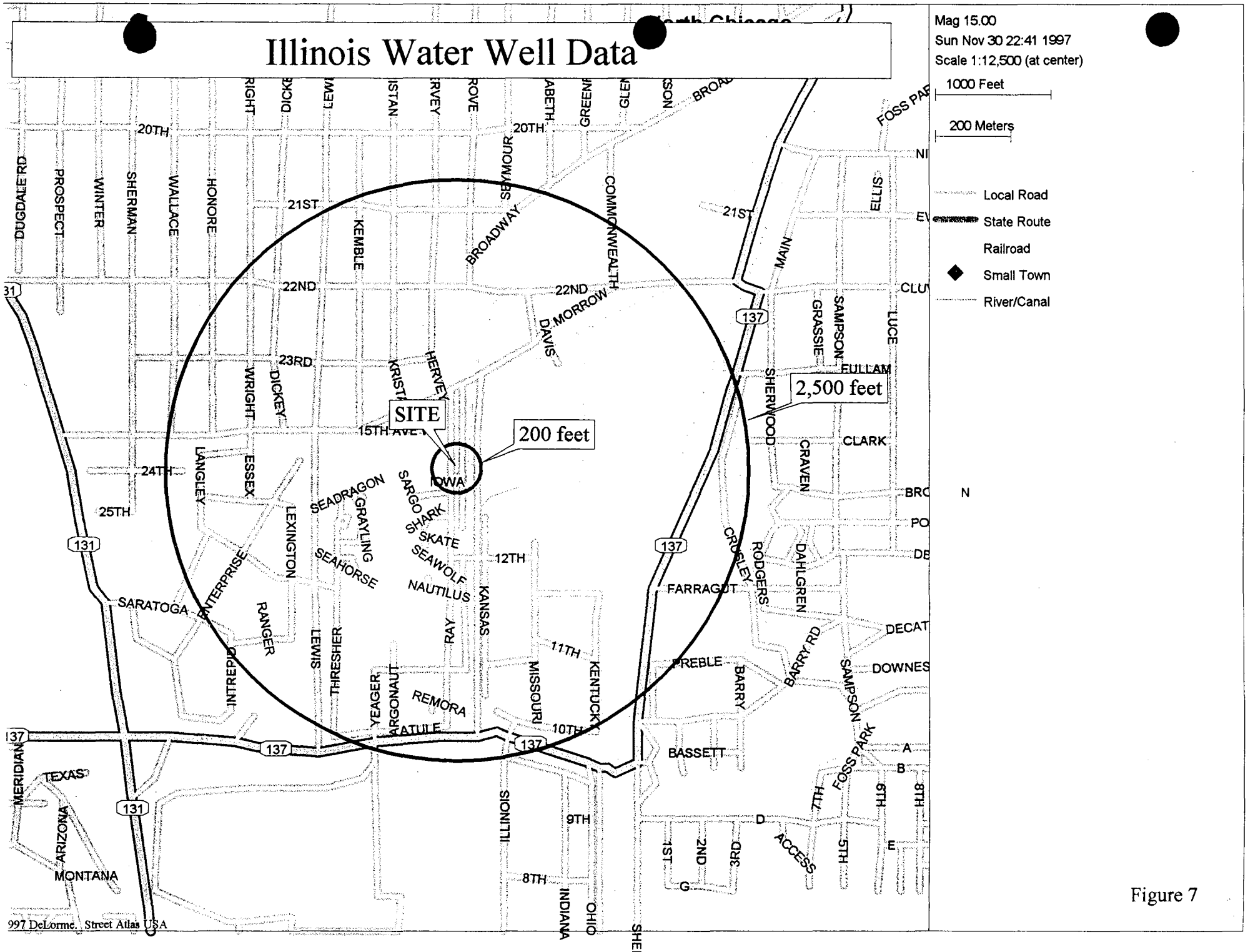


Figure 7

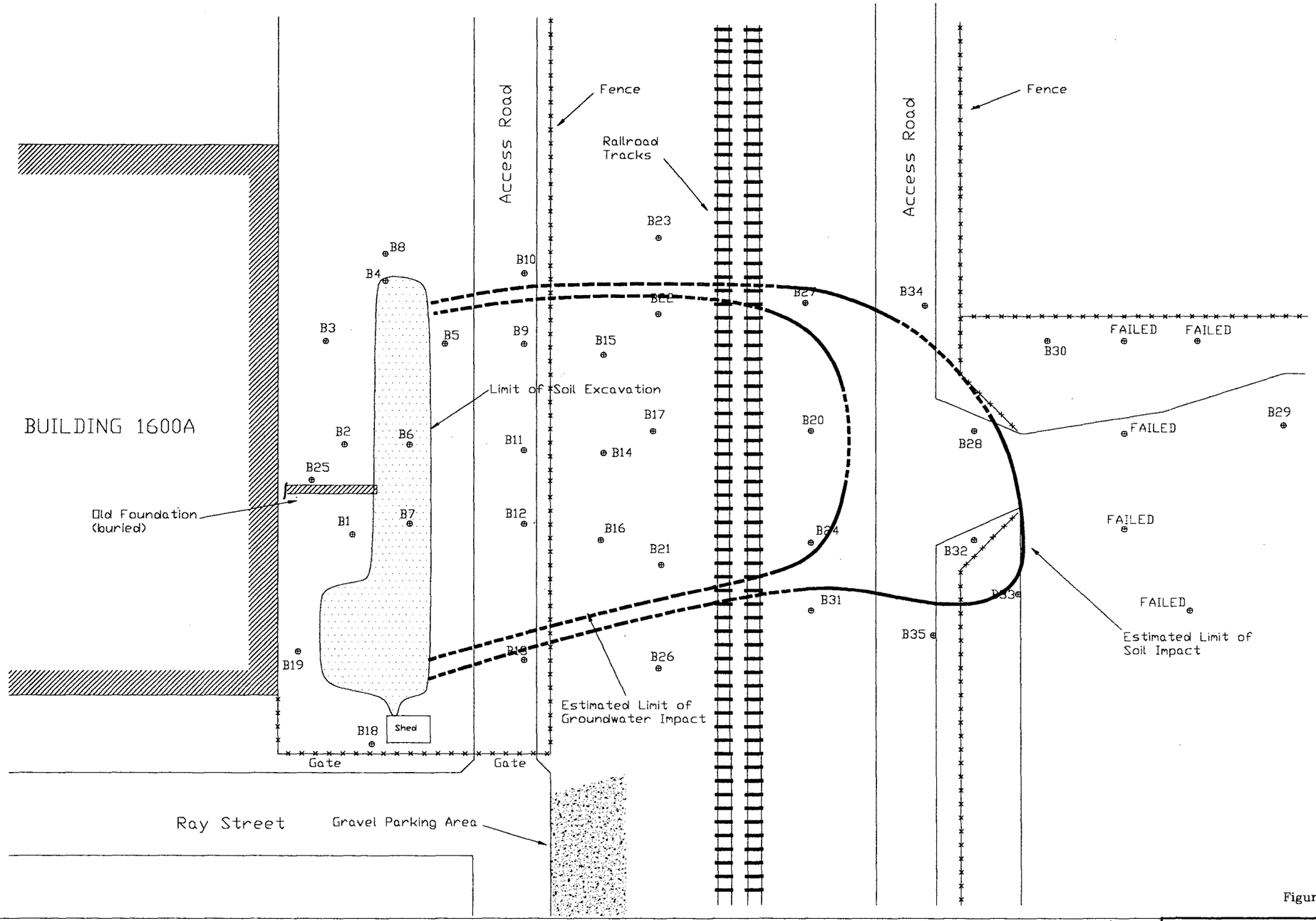


Figure 8

NORTH

SCALE: 1" = 30'

0 15' 30'

PWC GREAT LAKES

Estimated Extent of Contamination

DRAWN BY: KJC		DATE:	10/20/97
APP. BY: KJR	HERITAGE	SCALE:	1" = 30'
JOB NO. 10319		DWG.	NAVY1.DWG

HERITAGE ENVIRONMENTAL SERVICES, INC.
LEMONT, ILLINOIS

APPENDIX 2

Soil Boring Logs

Recycled Paper

SOIL BORING LOG

LOG No. B-1

HERITAGE ENVIRONMENTAL SERVICES, INC.
5330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

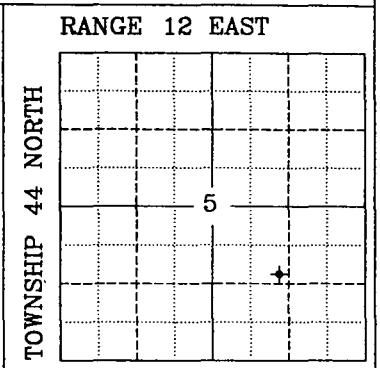
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.:	Inovative Probing Co.
DRILL RIG:	IPC Van / Hydraulic
DRILLING METHOD:	Direct Push / Geoprobe
SAMPLING METHOD:	4 ft. sample tube
DRILLER:	IPC
GEOLOGIST:	K. CRANDELL
ENGINEER:	R. MILLMAN
START:	9/25/97
END:	9/25/97
DEPTH:	16 ft.
WATER LEVEL:	7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Asphalt
							Silt, Sandy, moist.
		157	1	80%	0-4ft.	2	Clay, Silty, Dark-Brown with red streaks, some sand and gravel.
ISP-1	●					3	
						4	
						5	Perroleum staining and odors between 3 and 6 ft. interval.
		65	2	50%	4-8ft.	6	
HES-B1	■					▽ 7	Sand, Gravelly, water saturated.
						8	
ISP-2	●					9	Clay, Silty, Dark-Brown with red streaks, some sand and gravel. Water Saturated
		0	3	100%	8-12ft.	10	
						11	Clay, Brown, 2-inches.
						12	
						13	Clay, Silty, Dark-Brown with red streaks, some sand and gravel. Moist
		0	4	100%	12-16ft	14	
						15	
						16	Sand, Clayey, Grey, moist, some gravel.
						17	Soil Boring B-1 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-2

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

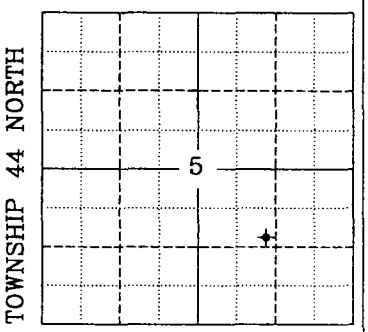
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 12 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Asphalt
		84	1	80%	0-4ft.	2	Clay, Silty, Dark-Brown with red streaks, some sand and gravel.
						3	
						4	Clay, Silty, Dark Brown, pebbly, friable, moist. Petroleum odors and staining between 3 to 4 ft.
						5	
		207	2	50%	4-8ft.	6	
ISP-3	●					▽ 7	Sand, medium, Brown, some gravel, water saturated at 7 ft., Black hydrocarbon staining at base, banded.
						8	Silt, brown, moist, massive, no hydrocarbon stain.
						9	Sand, medium, brown, very gravelly, water saturated, hydrocarbon staining and odor.
ISP-4	●	12	3	100%	8-12ft.	10	Silt, brown, moist.
HES-B2	■					11	Sand, medium, brown, gravelly, water saturated.
						12	Clay, silty, moist, some peagravel, stiff.
						13	Soil Boring B-2 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						14	
						15	
						16	
						17	
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-3

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

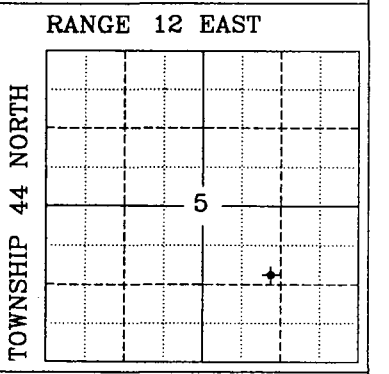
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.:	Inovative Probing Co.
DRILL RIG:	IPC Van / Hydraulic
DRILLING METHOD:	Direct Push / Geoprobe
SAMPLING METHOD:	4 ft. sample tube
DRILLER:	IPC
GEOLOGIST:	K. CRANDELL
ENGINEER:	R. MILLMAN
START:	9/25/97
END:	9/25/97
DEPTH:	12 ft.
WATER LEVEL:	7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
							Asphalt
		1	1	80%	0-4ft.	1 2 3 4	Clay, Silty, Dark-Brown with red streaks, some sand and gravel.
ISP-5 HES-B3		1	2	50%	4-8ft.	5 6 7 8	Sand, medium, Brown, some gravel, water saturated at 7.2 ft.
		0	3	100%	8-12ft.	9 10 11 12	Clay, Silty, brown, moist. Clay, silty, moist, some peagravel, stiff.
						13 14 15 16 17 18 19 20 21 22 23 24 25 26	Soil Boring B-3 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-4

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

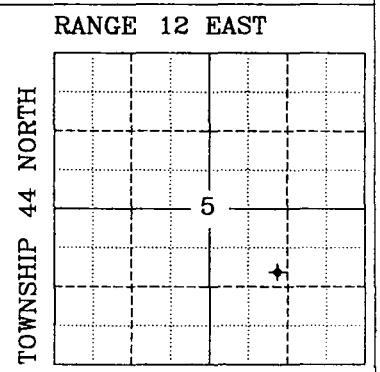
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 12 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
							Asphalt
		62	1	60%	0-4ft.		Clay, Silty, Dark-Brown with red streaks, some sand and gravel.
ISP-6 HES-B4		75	2	60%	4-8ft.		Sand, medium, Brown, some gravel, water saturated at 7.2 ft. Petroleum staining and odors between 5 to 6 ft. interval.
		7	3	60%	8-12ft.		Sand, silty, brown, water saturated.
							Sand, medium, brown, some gravel, water saturated.
							Clay, silty, grey, moist, some peagravel, stiff.
							Soil Boring B-4 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

SOIL BORING LOG

LOG No. B-5

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

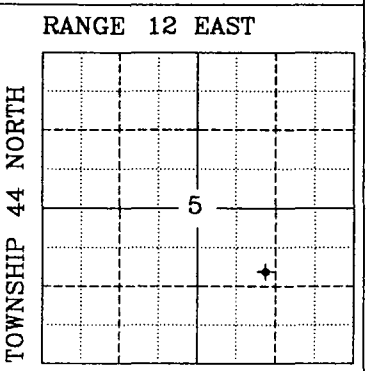
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 16 ft.
WATER LEVEL: 7.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
							Asphalt
		2000+	1	80%	0-4ft.	1, 2, 3, 4	Clay, Silty, Dark-Brown with red streaks, some sand and gravel.
							Sand, silty, black, petroleum odor (gasoline), some slag, moist.
ISP-7 HES-B5		2000+	2	50%	4-8ft.	5, 6, 7, 8	Clay, silty, brown, some cobbles, moist, Petroleum odors not exhibited. Sand, silty, brown, moist, petroleum odors exhibited. Water saturated at 7 ft., petroleum staining exhibited at and below water line.
		121	3	100%	8-12ft.	9, 10, 11, 12	Clay, grey, moist, plastic, some pebbles.
		22	3	100%	12-16ft.	13, 14, 15, 16	
						17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-5 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-6

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

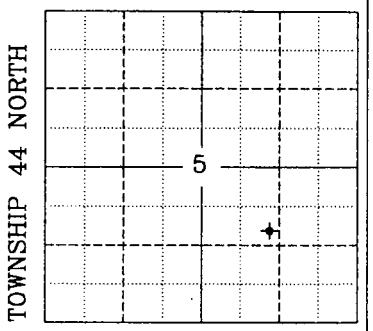
PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 12 ft.
WATER LEVEL: 6.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate

RANGE 12 EAST



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Asphalt
		2000+	1	80%	0-4ft.	2	Clay, Silty, Dark-Brown with red streaks, some sand and gravel.
						3	
						4	Petroleum staing and odors exhibited at 3 ft. to 11 ft. interval
						5	
		2000+	2	80%	4-8ft.	6	
						7	Water saturated at 6.5 ft.
ISP-8	●					8	
						9	Sand, silty, cobbley, grey-brown, water saturated, petroleum odors and staining exhibited to 11 ft. depth.
		17	3	80%	8-12ft.	10	
						11	
HES-B6	■					12	Sand, silty, brown, some gravel, water saturated.
						13	Soil Boring B-6 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						14	
						15	
						16	
						17	
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-7

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

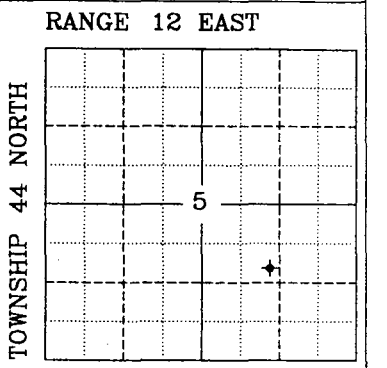
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 16 ft.
WATER LEVEL: 6.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Asphalt
						1	Silt, Sandy, Lt. grey, moist.
		853	1	60%	0-4ft.	2	Silt, clayey, red-brown, moist, petroleum odor.
						3	
						4	Silt, clayey, red-grey, moist, petroleum stained and odor.
						5	
		2000+	2	50%	4-8ft.	6	Sand, silty, Lt. grey-brown, some cobbles, petroleum odor, black streaks near base.
						7	
						8	
						9	Sand, medium grain, grey-drk. grey, silty, some cobbles, petroleum staining and odor, water saturated.
		128	3	80%	8-12ft.	10	
						11	
ISP-9						12	
HES-B7						13	Clay, grey, stiff, pebbley, moist.
		0	4	80%	12-16ft.	14	
						15	
						16	
						17	Soil Boring B-7 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-8

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

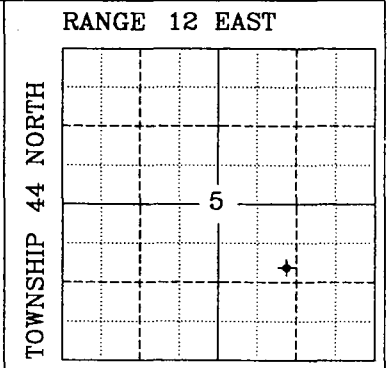
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 12 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
							Asphalt
						1	Silt, clayey, Black-brown, pebbley, moist.
		6	1	100%	0-4ft.	2	
						3	Silt, Clayey, red-brown, gravelly, moist.
						4	Sand, silty, red-brown, cobbley, moist.
						5	Silt, Clayey, red-brown, gravelly, moist.
		0	2	50%	4-8ft.	6	
HES-B8						▽ 7	
						8	Sand, silty, grey-brown, pebbley, water sarurated.
						9	
						10	
						11	Clay, grey, moist, stiff.
						12	
						13	Soil Boring B-8 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						14	
						15	
						16	
						17	
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-9

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

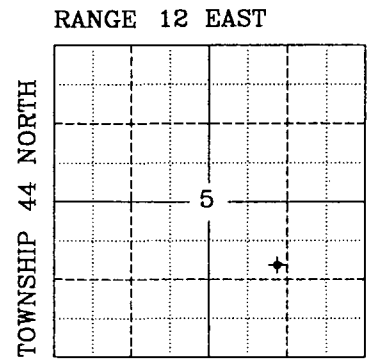
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 12 ft.
WATER LEVEL: 6.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Asphalt
		370	1	60%	0-4ft.	2	Silt, clayey, black-brown, moist, trace petroleum odor.
						3	Sand, silty, Drk. brown, gravelly, moist, petroleum odor.
						4	
						5	
		59	2	60%	4-8ft.	▽ 6	Thin gravel lense, water saturated.
ISP-10	●					7	
						8	Clay, grey, pebbley, moist, stiff.
HES-B9	■					9	
		0	3	50%	8-12ft.	10	
						11	
						12	
						13	Soil Boring B-9 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						14	
						15	
						16	
						17	
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-10

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

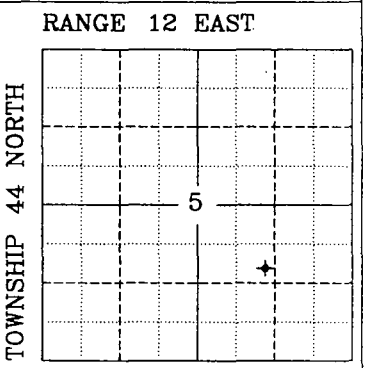
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 12 ft.
WATER LEVEL: Not encountered

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Asphalt Silt, clayey, brown, moist, pebbley.
		5	1	80%	0-4ft.	2	Thin (1") charcoal layer.
						3	Sand, fine, silty, Drk. brown, gravelly, moist.
						4	
						5	Silt, sandy, brown, massive, moist.
HES-B10		3	2	60%	4-8ft.	6	
ISP-10						7	Clay, grey, pebbley, moist, stiff.
						8	
						9	
		0	3	60%	8-12ft.	10	
						11	
						12	
						13	Soil Boring B-10 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						14	
						15	
						16	
						17	
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-11

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

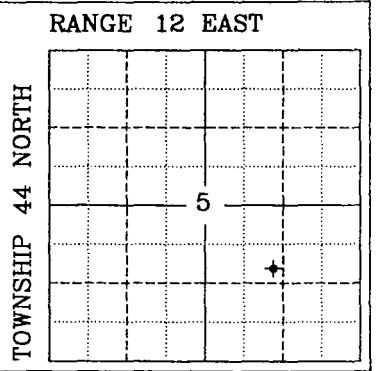
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 16 ft.
WATER LEVEL: 6.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
							Asphalt
		467	1	80%	0-4ft.	1, 2, 3, 4	Silt, organic, black, massive, trace pebbles, moist.
							Silt, sandy, brown, pebbley, moist, petroleum odor.
		2000+	2	30%	4-8ft.	5, 6, 7, 8	Sand, fine, silty, red-brown, petroleum odor, water saturated.
HES-B11 at 10-11ft.	[redacted]	140	3	60%	8-12ft.	9, 10, 11, 12	heavy petroleum staining at 9-10 ft. interval, petroleum odor. petroleum staining absent at base of unit.
HES-B11 at 13-14ft.	[redacted]	4	4	50%	12-16ft.	13, 14, 15, 16	Silt, sandy, massive, abundant small shells, grey, moist.
						17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-11 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-12

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

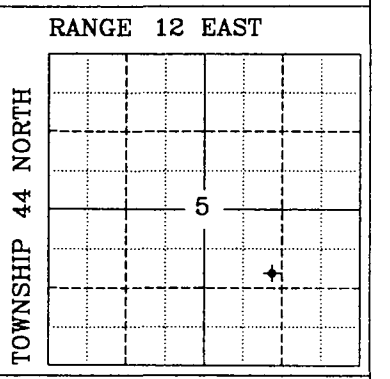
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 20 ft.
WATER LEVEL: 7.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
							Asphalt
		2000+	1	50%	0-4ft.	1 2 3 4	Silt, clayey, black-brown, pebbley, sandy, root structures (grasses), trace petroleum odor, moist.
							Sand, fine, brown-grey, laminated, petroleum odor, moist.
		1800	2	50%	4-8ft.	5 6 7 8	Sand, silty, red-brown, cobbley, petroleum odor, water saturated at 7.5 ft.
		51	3	50%	8-12ft.	9 10 11 12 13	petroleum odor not exhibited at base of unit.
HES-B12 ISP-12		20	4	50%	12-16ft.	14 15 16	Sand, coarse, gravelly, brown, silt varves, water saturated.
		0	5	50%	16-20ft.	17 18 19 20	
						21 22 23 24 25 26	Soil Boring B-12 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-13

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

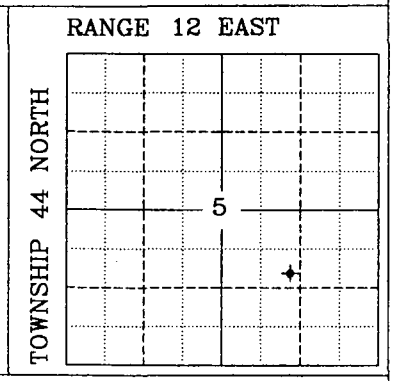
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 16 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Asphalt
		35	1	80%	0-4ft.	2	Silt, clayey, brown, gravelly, moist.
						3	
						4	Clay, silty, brown, gravelly, trace petroleum odor, moist.
						5	
HES-B13		7	2	50%	4-8ft.	6	Silt, sandy, brown, trace petroleum odor, water saturated at 7.5 ft., some gravel.
ISP-13						▽ 7	
						8	
		0	3	60%	8-12ft.	9	Sand, medium, silty, gravelly, water saturated.
						10	
						11	
						12	Sand, silty, red-brown, gravelly, water saturated.
		0	4	50%	12-16ft.	13	
						14	
						15	
						16	Silt, grey, pebbly, moist.
						17	Soil Boring B-13 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-14

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

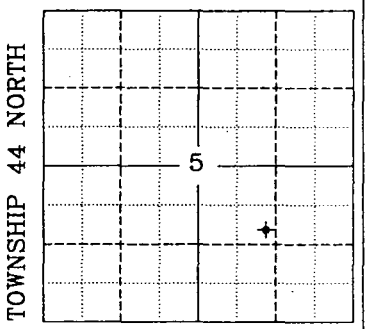
PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 12 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate

RANGE 12 EAST



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		240	1	100%	0-4ft.	1, 2, 3, 4	Silt, sandy, drk. brown, root structures, moist. Silt, gravelly, brown, slightly moist. Sand, silty, red-brown, cobbles and pebbles, moist.
ISP-14		2000+	2	50%	4-8ft.	5, 6, 7, 8	Clay, silty, red-brown, mottled, pebbley, moist. Sand, silty, red-brown, cobbles and gravel, moist, petroleum staining (blackened) and odor, water saturated.
HES-B14		110	3	60%	8-12ft.	9, 10, 11, 12	Gravel, sandy, water saturated, petroleum stained and odor. Silt, massive, brown with grey laminae, water saturated. Silt, clayey, grey, massive, pebbley, moist, stiff.
						13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-14 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-15

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

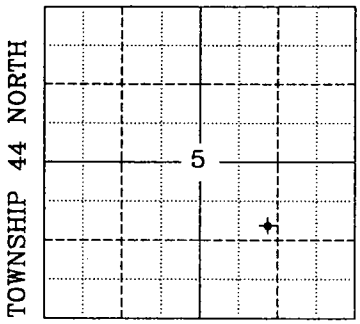
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.:	Inovative Probing Co.
DRILL RIG:	IPC Van / Hydraulic
DRILLING METHOD:	Direct Push / Geoprobe
SAMPLING METHOD:	4 ft. sample tube
DRILLER:	IPC
GEOLOGIST:	K. CRANDELL
ENGINEER:	R. MILLMAN
START:	9/25/97
END:	9/25/97
DEPTH:	12 ft.
WATER LEVEL:	7.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		0	1	100%	0-4ft.	1, 2, 3, 4	Silt, sandy, drk. brown, root structures, moist. Silt, gravelly, brown, slightly moist. Silt, sandy, red-brown, moist.
HES-B15		501	2	50%	4-8ft.	5, 6, 7, 8	Sand, silty, gravelly, red-brown, water saturated at 7.5 ft., Dark grey color at base of unit, petroleum odor.
		0	3	60%	8-12ft.	9, 10, 11, 12	Clay, silty, brown, pebbley, moist. Silt, massive, brown, moist. Clay, grey, pebbley, moist.
						13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-15 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-16

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

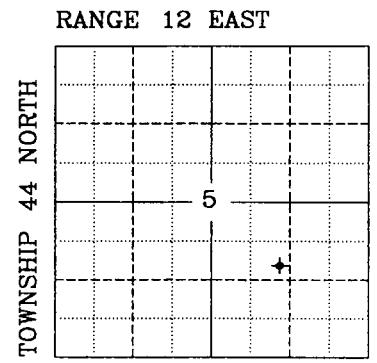
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 12 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		0	1	100%	0-4ft.	1, 2, 3	Silt, black, slightly moist, root structures (grasses). Silt, brown, slightly moist, root structures. Silt, clayey, brown, root structures, moist.
		2000+	2	20%	4-8ft.	4, 5, 6, 7, 8	Silt, clayey, grey-brown, mottled, moist. Sand, gravelly and silty, brown, water saturated, petroleum odor.
ISP-15 HES-B16		0	3	60%	8-12ft.	9, 10, 11, 12	Silt, sandy, brown, moist. Clay, grey, pebbley, moist.
						13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-16 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-17

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

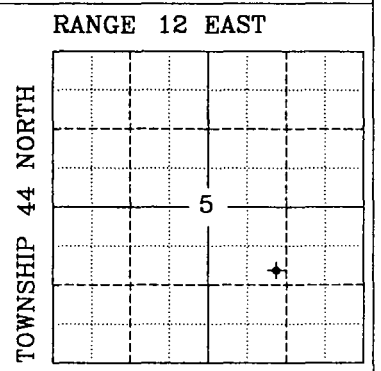
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/25/97
END: 9/25/97
DEPTH: 12 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		30	1	100%	0-4ft.	1, 2, 3, 4	Silt, black, slightly moist, root structures (grasses). Silt, sandy, gravel and cobble, brown, moist. Silt, clayey, mottled, grey-brown, moist.
		2000+	2	50%	4-8ft.	5, 6, ▽7, 8	Grey color at base of unit. Sand, silty, grey-brown, water saturated, petroleum odor and staining.
		991	3	50%	8-12ft.	9, 10, 11, 12	Small accumulation of free product noted at top of sanple tube #3. Unit appears less water saturated at base of sample tube #3.
						13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-17 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-18

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

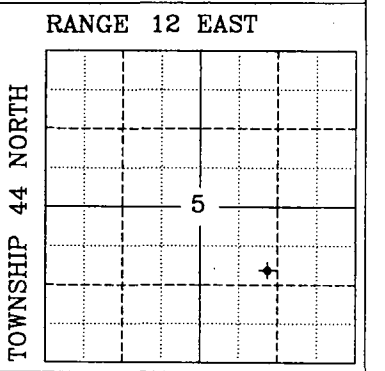
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/26/97
END: 9/26/97
DEPTH: 12 ft.
WATER LEVEL: 6 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
							Asphalt.
		3	1	100%	0-4ft.	1, 2, 3	Clay, silty, drk. brown, pebbley, moist.
						4	Clay, silty, Lt. brown, pebbley, moist.
		4	2	70%	4-8ft.	5, ▽ 6, 7, 8	Sand, medium-fine, silty, some gravel and cobble, brown, water saturated.
HES-B18	[redacted]	86	3	70%	8-12ft.	9, 10, 11, 12	Clay, grey, stiff, pebbley, moist.
						13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-18 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-19

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

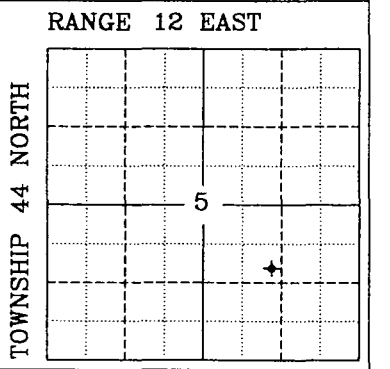
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/26/97
END: 9/26/97
DEPTH: 12 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
							Asphalt.
		0	1	90%	0-4ft.	1, 2, 3, 4	Clay, sandy, brown, moist.
							Clay, humus, black, moist.
HES-B19		0	2	50%	4-8ft.	5, 6, 7, 8	Silt, sandy, red-brown, moist.
ISP-16		0	3	90%	8-12ft.	9, 10, 11, 12	Sand, gravelly, brown, silty, water saturated.
							Clay, grey, stiff, pebbely, moist.
						13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-19 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-20

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

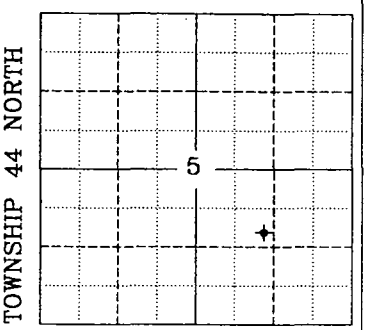
PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/26/97
END: 9/26/97
DEPTH: 16 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate

RANGE 12 EAST



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Slag, black, glassy, moist.
							Clay, speckled, Lt. brown, moist.
		2	1	90%	0-4ft.	2	Clay, no speckling, Lt. brown, moist.
						3	
						4	Silt, clayey, brown, some peagravel, moist.
						5	
		1200	2	90%	4-8ft.	6	Clay, grey, silty, sandy, moist.
ISP-17	●					7	Sand, gravelly and silty, water saturated, trace petroleum odor and some staining (near top of unit).
						8	
						9	
		772	3	90%	8-12ft.	10	
ISP-18	●					11	
HES-B20	■					12	
						13	
ISP-19	●	119	4	90%	12-16ft.	14	Moist at base of unit.
						15	
						16	Silt, grey, sand laminea, moist.
						17	Soil Boring B-20 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-21

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

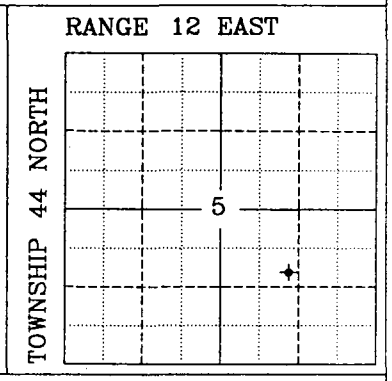
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/26/97
END: 9/26/97
DEPTH: 12 ft.
WATER LEVEL: 7.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		0	1	90%	0-4ft.	1, 2, 3, 4	Silt, clayey, black, root structures (grasses), moist. Silt, clayey, brown, moist.
HES-B21		60	2	60%	4-8ft.	5, 6, 7, 8	Mottled at base of unit. Sand, gravelly and silty, brown, water saturated.
ISP-20							
ISP-21		3	3	90%	8-12ft.	9, 10, 11, 12	grades to grey color at 8.5ft. Black streaks, petroleum odor and stains at 10.5 ft. Silt, gravelly, brown, moist. Silt, grey, massive, moist.
						13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-21 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-22

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

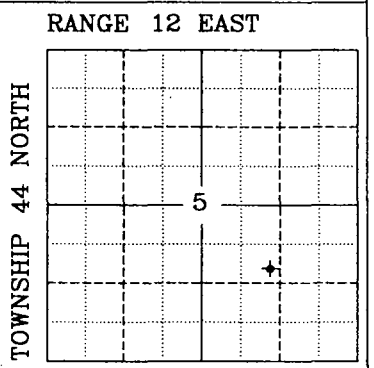
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/26/97
END: 9/26/97
DEPTH: 12 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		0	1	90%	0-4ft.	1, 2, 3, 4	Silt, sandy, brown, root structures (grasses), moist.
							Silt, mottled, red-brown, moist.
		2000+	2	60%	4-8ft.	5, 6, 7, 8	Sand, silty, gravelly, red-brown, moist.
ISP-22	●					▽ 7	water saturated at 7.ft., grey-black petroleum staining and petroleum odor.
							Sand, silt laminea, brown, water saturated.
ISP-23	●	127	3	90%	8-12ft.	9, 10, 11, 12	
							Clay, brown, pebbley, moist, trace grey sand.
						13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-22 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-23

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

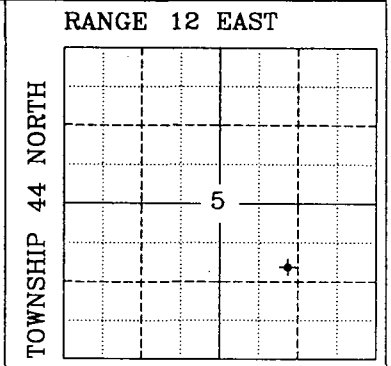
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/26/97
END: 9/26/97
DEPTH: 12 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		0	1	80%	0-4ft.	1, 2, 3, 4	Silt, sandy, brown, slightly moist. Silt, clayey, brown, moist. Silt, sandy, red-brown, very moist.
ISP-24 HES-B23		0	2	50%	4-8ft.	5, 6, 7, 8	Sand, silty, gravelly, red-brown, very moist at top of unit, water saturated at 7 ft.
		0	3	90%	8-12ft.	9, 10, 11, 12	Sand, silty, brown, water saturated. Silt, massive, brown, moist. Sand, gravelly, brown, water saturated, grey silt at base.
						13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-23 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-24

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

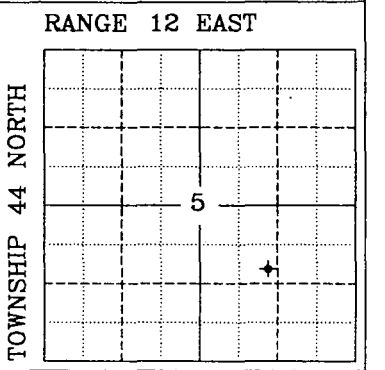
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/26/97
END: 9/26/97
DEPTH: 12 ft.
WATER LEVEL: 7.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Silt, black, root structures (grasses), moist.
		0	1	80%	0-4ft.	2	Clay, silty, drk. brown, pebbley, moist.
						3	Clay, silty, mottled, brown and grey, massive, moist.
						4	
						5	
		370	2	50%	4-8ft.	6	
ISP-25 HES-B24						7	Sand, silty, brown, water saturated.
						8	
						9	
		1	3	60%	8-12ft.	10	
						11	
						12	
						13	Soil Boring B-24 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						14	
						15	
						16	
						17	
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-25

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

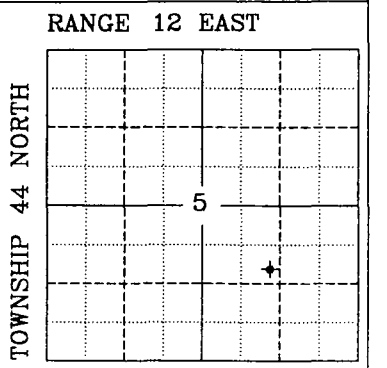
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/27/97
END: 9/27/97
DEPTH: 4 ft.
WATER LEVEL: Not encountered

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Asphalt
						2	Silt, gravelly, brown, moist.
		89	1	80%	0-4ft.		
ISP-26						3	Silt, sandy, red-brown, moist, trace petroleum odor.
HES-B25						4	
						5	Soil Boring B-25 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						6	
						7	
						8	
						9	
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-26

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

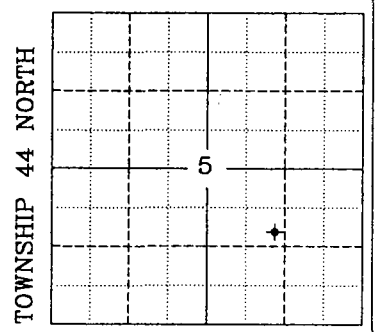
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/27/97
END: 9/27/97
DEPTH: 12 ft.
WATER LEVEL: 5.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Silt, sandy, drk. brown, root structures (grasses), dry.
		3	1	90%	0-4ft.	2	Silt, clayey, black, moist.
						3	
						4	
						5 ▽	Sand, silty, brown, water saturated, some gravel.
		6	2	70%	4-8ft.	6	
ISP-27	[redacted]					7	
HES-B26						8	
						9	
		6	3	60%	8-12ft.	10	
						11	Sand, coarse, silty, grey, water saturated.
						12	Clay, stiff, grey, moist.
						13	Soil Boring B-26 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						14	
						15	
						16	
						17	
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-27

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

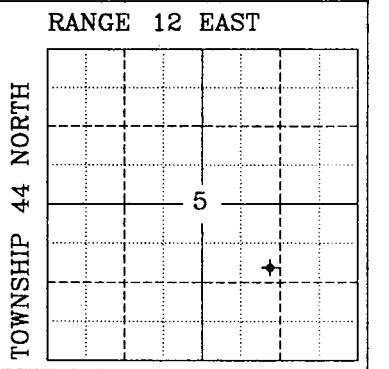
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/27/97
END: 9/27/97
DEPTH: 12 ft.
WATER LEVEL: 6 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		6	1	90%	0-4ft.	1	Silt, black, slag, wood, dry.
						2	Silt, sandy, red-brown, some gravel, moist.
						3	
						4	Silt, Lt. brown, moist.
		7	2	90%	4-8ft.	5	Sand, silty, red-brown, moist, some gravel.
						6 ▽	Water saturated at 6 ft.
ISP-29	●					7	
						8	Old soil horizon, black humus, root structures (grasses).
		2000+	3	70%	8-12ft.	9	
HES-B27	■					10	
						11	Silt, grey, massive, moist.
ISP-28	●					12	
						13	Soil Boring B-27 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						14	
						15	
						16	
						17	
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-28

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

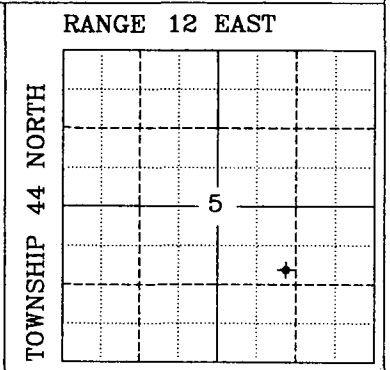
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/29/97
END: 9/29/97
DEPTH: 16 ft.
WATER LEVEL: 6.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Concrete.
							Subgrade gravel.
							Silt, sandy, slightly moist, brown.
		9	1	50%	0-4ft.	2	Clay, mottled, brown, moist.
						3	
						4	Sand, gravelly, brown, moist, silty.
						5	
ISP-30		380	2	60%	4-8ft.	6	
HES-B28 7-8ft.						7	Water saturated at 6.5 ft.
						8	
						9	
		20	3	60%	8-12ft.	10	
ISP-31						11	Sand, very fine, grey, silty.
HES-B28 11-12ft.						12	Clay, pebbley, grey, sandy. Interbeded silts at base of unit.
						13	
		8	4	50%	12-16ft.	14	Clay, plastic, pebbley, grey, moist.
						15	
ISP-32						16	
						17	Soil Boring B-28 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-29

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

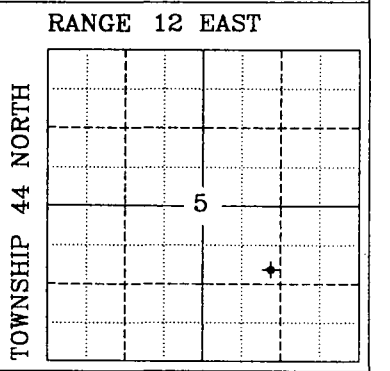
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/29/97
END: 9/29/97
DEPTH: 14 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Asphalt. Subgrade rock, limestone.
						2	No sample collected or retained in sample tube.
		1	1	70%	2-6ft.	3 4 5 6	Slage, Black, silt and sand matrix (brown), moist.
IPS-33 HES-B29 9-10ft.		1	2	40%	6-10ft.	▽ 7 8	Silt, brown, moist, massive.
ISP-34 HES-B29 11-12ft.		0	3	60%	10-14ft.	9 10 11 12	Sand, gravelly, brown, water saturated.
						13 14	Clay, grey, pebbley, moist.
						15 16 17 18 19 20 21 22 23 24 25 26	Soil Boring B-29 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-30

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

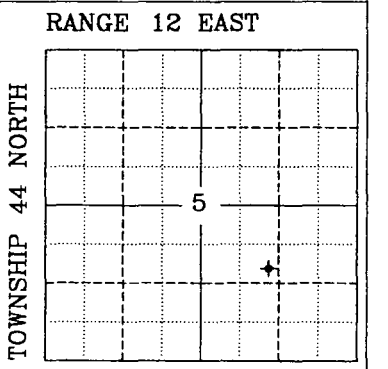
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/29/97
END: 9/29/97
DEPTH: 16 ft.
WATER LEVEL: 12.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		0	1	90%	0-4ft.	1, 2, 3, 4	Silt, sandy, brown, root structures (grasses), slightly moist, trace slag or coal. Clay, brown, stiff, slightly moist.
ISP-35 HES-B30		0	2	70%	4-8ft.	5, 6, 7, 8	Clay, silty, plastic, very moist, Lt. brown-tan. Sand, red-brown, gravelly, moist.
ISP-36		1	3	80%	8-12ft.	9, 10, 11, 12	
		0	4	50%	12-16ft	13, 14, 15, 16	Sand, brown, water saturated. Sand, red-brown, gravelly, water saturated. Sand, silt laminea, clayey at base, moist, grey.
						17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-30 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-31

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

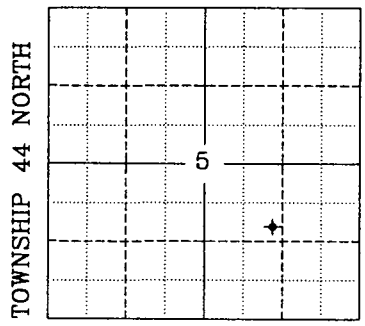
PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/30/97
END: 9/30/97
DEPTH: 16 ft.
WATER LEVEL: 6 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate

RANGE 12 EAST



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		4	1	80%	0-4ft.	1, 2, 3, 4	Silt, sandy, black-brown, root structures, moist. Silt, drk. brown, moist. Clay, drk. brown, pebbley, mottled, mooist.
ISP-37 HES-B31		3	2	70%	4-8ft.	5, 6, 7, 8	Sand, gravelly, brown, silty, water saturated, cobbley.
ISP-38		4	3	80%	8-12ft.	9, 10, 11, 12	
		0	4	50%	12-16ft.	13, 14, 15, 16	Sand, medium, brown, water saturated. Silt, gray, sandy laminea, water saturated.
						17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-31 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-32

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

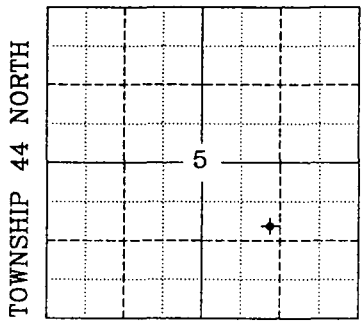
PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/30/97
END: 9/30/97
DEPTH: 16 ft.
WATER LEVEL: 5.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate

RANGE 12 EAST



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
		3	1	90%	0-4ft.	1, 2, 3, 4	Silt, drk. brown, root structures, moist. Sand, gravelly, brown, moist, silty. Clay, brown, mottled, stiff, moist.
ISP-39	●	4	2	90%	4-8ft.	5, 6, 7, 8	Sand, gravelly, silty, red-brown, water saturated, trace petroleum odor.
ISP-40 HES-B32	● ■	95	3	90%	8-12ft.	9, 10, 11, 12	
ISP-41	●	76	4	90%	12-16ft.	13, 14, 15, 16	Silt, Sandy, grey, moist.
						17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-32 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-33

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

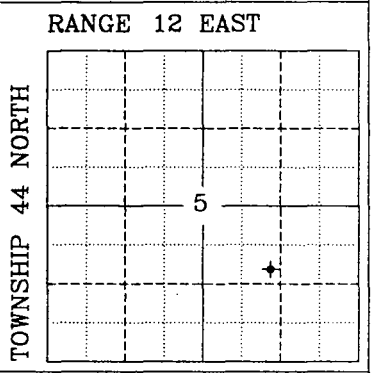
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/30/97
END: 9/30/97
DEPTH: 12 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Silt, sandy, gravelly, drk. brown, root structures, moist.
		2	1	80%	0-4ft.	2	Silt, gravelly, red-brown, moist.
						3	
						4	Silt, clayey, drk. brown, moist, stiff.
						5	Clay, silty, brown, root structures, moist.
ISP-42		2	2	60%	4-8ft.	6	
HES-B33						7 ▽	Water saturated at 7 ft.
						8	
						9	
		65	3	80%	8-12ft.	10	Sand, grey, very silty, water saturated.
ISP-43						11	
						12	
						13	Soil Boring B-33 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						14	
						15	
						16	
						17	
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

SOIL BORING LOG

LOG No. B-34

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

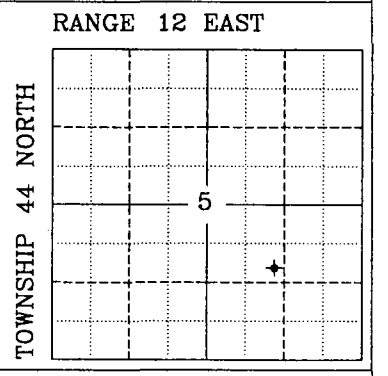
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/30/97
END: 9/30/97
DEPTH: 18 ft.
WATER LEVEL: 7 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1, 2	Not sampled; asphalt and subgrade rock.
		0	1	70%	2-6ft.	3, 4, 5, 6	Silt, mottled, drk. brown to brown, moist.
ISP-44 HES-B34		0	2	60%	6-10ft.	7, 8, 9, 10	Water saturated at 7 ft. Sand, gravelly, red-brown, silty, water saturated.
ISP-45		0	3	80%	10-14ft	11, 12, 13, 14	
ISP-46		0	4	80%	14-18ft	15, 16, 17, 18	Sand, silt laminea, grey, water saturated.
						19, 20, 21, 22, 23, 24, 25, 26	Soil Boring B-34 was abandoned by backfilling the bore hole with bentonite clay to surface grade.

SOIL BORING LOG

LOG No. B-35

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

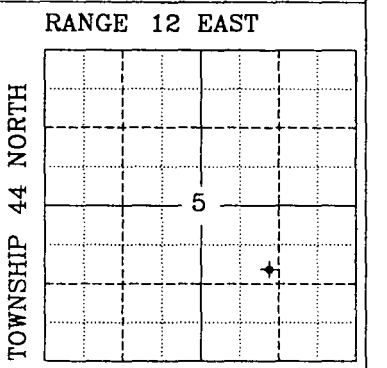
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

DRILLING CO.: Inovative Probing Co.
DRILL RIG: IPC Van / Hydraulic
DRILLING METHOD: Direct Push / Geoprobe
SAMPLING METHOD: 4 ft. sample tube
DRILLER: IPC
GEOLOGIST: K. CRANDELL
ENGINEER: R. MILLMAN
START: 9/30/97
END: 9/30/97
DEPTH: 16 ft.
WATER LEVEL: 6.5 ft.

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



COMMENTS	LAB SAMPLE INTERVAL	PID READING (ppm)	SAMPLE NUMBER	PERCENT RECOVERY	SAMPLE INTERVAL	DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
						1	Asphalt. Subgrade rock (limestone)
						2	Silt, black, moist.
		0	1	70%	0-4ft.	3	Clay, drk. brown, mooist.
						4	Clay, brown, moist.
						5	
		0	2	70%	4-8ft.	6	Sand, gravelly, silty, red-brown, water saturated at 6.5 ft.
ISP-47	●					7	
						8	
						9	Silt laminea at base of unit.
ISP-48	●	1	3	60%	8-12ft.	10	
HES-B35	■					11	Sand, grey, silt laminea, water saturated.
						12	
						13	
		0	4	80%	12-16ft.	14	
						15	Silt, sandy, grey, water saturated.
						16	
						17	Soil Boring B-35 was abandoned by backfilling the bore hole with bentonite clay to surface grade.
						18	
						19	
						20	
						21	
						22	
						23	
						24	
						25	
						26	

APPENDIX 3

Piezometer Logs

Recycled Paper

WELL CONSTRUCTION LOG

LOG No. P-1

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

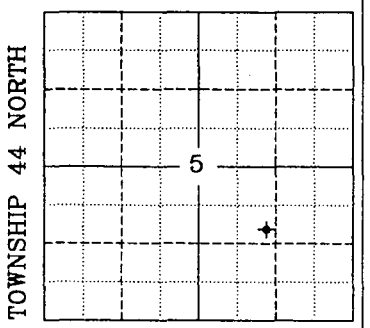
PROJECT No. 10319

DRILLING CO.:	Inovative Probing Co.
DRILL RIG:	IPC Van / Hydraulic
DRILLING METHOD:	Direct Push / Geoprobe
SAMPLING METHOD:	4 ft. sample tube
DRILLER:	IPC
GEOLOGIST:	K. CRANDELL
ENGINEER:	R. MILLMAN
START:	9/26/97
END:	9/26/97
DEPTH:	12 ft.
WATER LEVEL:	6.51FT. FROM TOP OF CASING

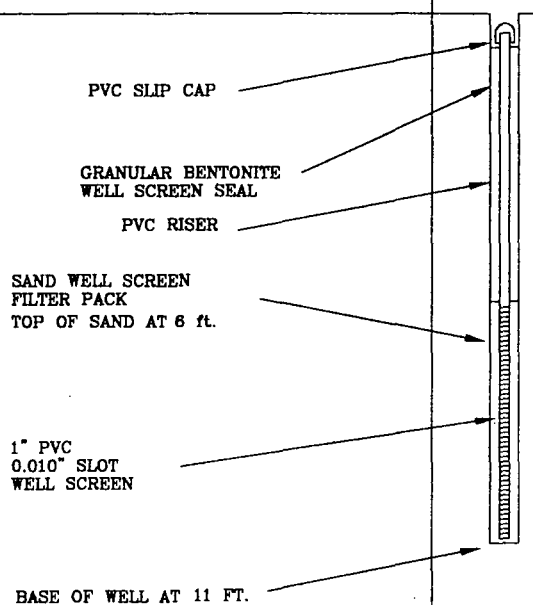
COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate

RANGE 12 EAST



WELL DESCRIPTION



LITHOLOGY DESCRIPTION

DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
	Asphalt.
1	Clay, silty, lt. brown, pebbley, moist.
2	Clay, silty, sandy, red-brown, pebbley, moist.
3	
4	Clay, black, silty, massive, moist.
5	
6	Clay, silty, sandy, red-brown, moist.
7	
8	Sand, fine, silty, brown, water saturated.
9	Silt, brown, massive, moist.
10	Sand, coarse, brown, moist.
11	Silt, brown, massive, moist.
12	
13	
14	
15	
16	
17	
18	
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24	
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26	

WELL CONSTRUCTION LOG

LOG No. P-2

HERITAGE ENVIRONMENTAL SERVICES, INC.
5330 Canal Bank Road
emont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

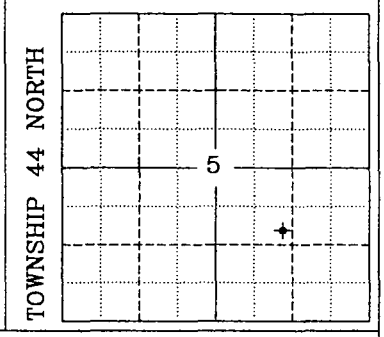
PROJECT No. 10319

DRILLING CO.:	Inovative Probing Co.
DRILL RIG:	IPC Van / Hydraulic
DRILLING METHOD:	Direct Push / Geoprobe
SAMPLING METHOD:	4 ft. sample tube
DRILLER:	IPC
GEOLOGIST:	K. CRANDELL
ENGINEER:	R. MILLMAN
START:	9/26/97
END:	9/26/97
DEPTH:	11 ft.
WATER LEVEL:	6.97 ft. FROM TOP OF CASING

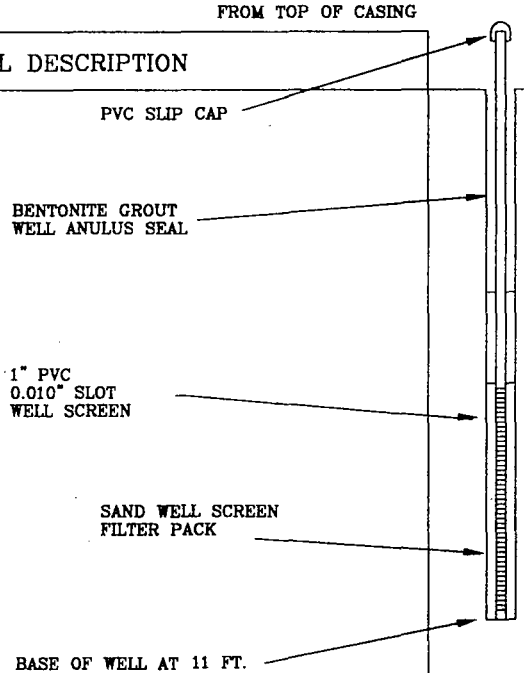
COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate

RANGE 12 EAST



WELL DESCRIPTION



DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
	Asphalt
1	Silt, clayey, brown, gravelly, moist.
2	
3	Clay, silty, brown, gravelly, trace petroleum odor, moist.
4	
5	
6	Silt, sandy, brown, trace petroleum odor, water saturated at 7.5 ft., some gravel.
7	
8	
9	Sand, medium, silty, gravelly, water saturated.
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	

WELL CONSTRUCTION LOG

LOG No. P-3

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

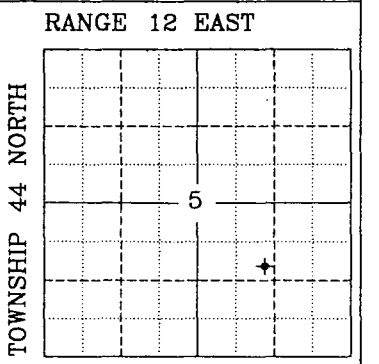
SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

PROJECT No. 10319

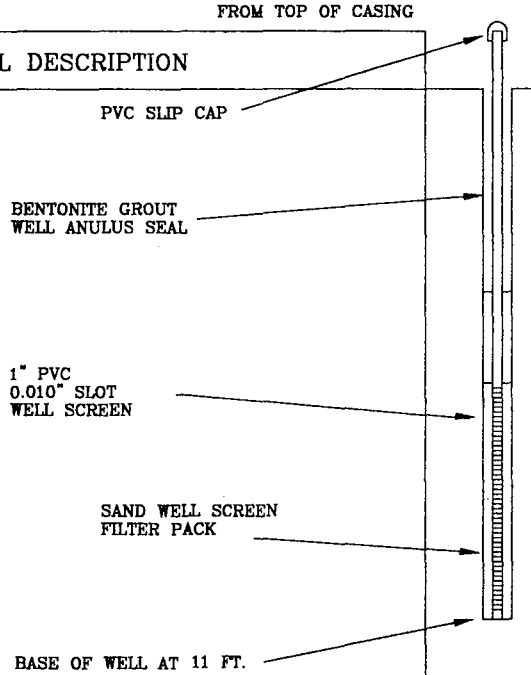
DRILLING CO.:	Inovative Probing Co.
DRILL RIG:	IPC Van / Hydraulic
DRILLING METHOD:	Direct Push / Geoprobe
SAMPLING METHOD:	4 ft. sample tube
DRILLER:	IPC
GEOLOGIST:	K. CRANDELL
ENGINEER:	R. MILLMAN
START:	9/26/97
END:	9/26/97
DEPTH:	11 ft.
WATER LEVEL:	6.48 ft. FROM TOP OF CASING

COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate



WELL DESCRIPTION



LITHOLOGY DESCRIPTION

DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
	Asphalt
1	Silt, organic, black, massive, trace pebbles, moist.
2	
3	Silt, sandy, brown, pebbley, moist, petroleum odor.
4	
5	
6	Sand, fine, silty, red-brown, petroleum odor, water saturated.
7	
8	
9	
10	heavy petroleum staining at 9-10 ft. interval, petroleum odor.
11	petroleum staining absent at base of unit.
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	

WELL CONSTRUCTION LOG

LOG No. P-4

HERITAGE ENVIRONMENTAL SERVICES, INC.
15330 Canal Bank Road
Lemont, Illinois 60439
PHONE: (630) 739-1151
FAX: (630) 739-9491

SITE LOCATION: US Navy
Building 1600A
North Chicago, Illinois

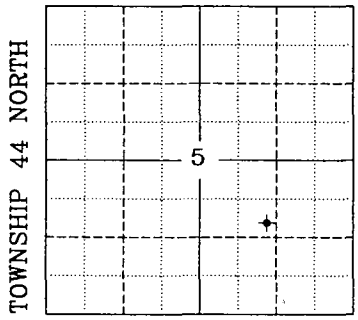
PROJECT No. 10319

DRILLING CO.:	Inovative Probing Co.
DRILL RIG:	IPC Van / Hydraulic
DRILLING METHOD:	Direct Push / Geoprobe
SAMPLING METHOD:	4 ft. sample tube
DRILLER:	IPC
GEOLOGIST:	K. CRANDELL
ENGINEER:	R. MILLMAN
START:	9/26/97
END:	9/26/97
DEPTH:	11 ft.
WATER LEVEL:	6.31 ft. FROM TOP OF CASING

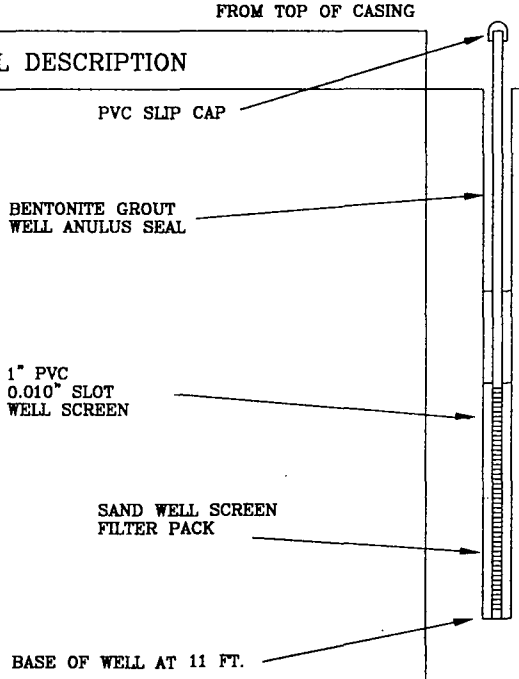
COORDINATES:
X: See Site Map
Y: See Site Map
Z: See Site Map (at top of casing)

WEATHER:
TEMP: 70F
WIND: <5mph
HUMID: Moderate

RANGE 12 EAST



WELL DESCRIPTION



DEPTH BELOW SURFACE GRADE (FEET)	LITHOLOGY DESCRIPTION
	Asphalt
1	Silt, clayey, black-brown, moist, trace petroleum Odor.
2	
3	Sand, silty, Drk. brown, gravelly, moist, petroleum odor.
4	
5	
6	Thin gravel lense, water saturated.
7	Clay, grey, pebbley, moist, stiff.
8	
9	
10	
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26	

APPENDIX 4

Tables

Recycled Paper

Table 1
Summary of Soil Sample Results (ppm)
Field PID Readings

Boring Location	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20	B21	B22	B23	B24	B25	B26	B27	B28	B29	B30	B31	B32	B33	B34	B35
Sample Depth	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.	0-4 ft.
PID	157	84	1	1	2000	2000	853	6	370	5	467	2000	35	240	0	0	30	3	0	2	0	0	0	0	89	3	6	9	1	0	4	3	2	0	0
Sample Depth	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.		4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.	4-8 ft.
PID	65	207	1	2	2000	2000	2000	0	59	3	2000	1800	7	2000	501	2000	2000	4	0	1200	60	2000	0	370		6	7	380	1	0	3	4	2	0	0
Sample Depth	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.		8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.		8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.	8-12 ft.
PID	0	12	0	3	121	17	128		0	0	140	51	0	110	0	0	991	86	0	772	3	127	0	1		6	2000	20	0	1	4	95	65	0	1
Sample Depth	12-16 ft.				12-16 ft.		12-16 ft.				12-16 ft.	12-16 ft.	12-16 ft.							12-16 ft.								12-16 ft.		12-16 ft.	12-16 ft.	12-16 ft.		12-16 ft.	12-16 ft.
PID	0				22		0				4	20	0							119								8		0	0	76		0	0
												16-20 ft.																							
												0																							

Comments:
ppm = parts per million.
(blank) = No sample collected.

Table 2
Summary of Soil Sample Results (ppm)
IPS Field Screening

Boring Location	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20	B21	B22	B23	B24	B25	B26	B27	B28	B29	B30	B31	B32	B33	B34	B35
Sample Depth	3-4 ft.	7-8 ft.	5-6 ft.	6-7 ft.	6-7 ft.	7-8 ft.	11-12 ft.		7-8 ft.	6-7 ft.		15-16 ft.	6-7 ft.	7-8 ft.		9-10 ft.			9-10 ft.	7-8 ft.	7-8 ft.	7-8 ft.	7-8 ft.	7-8 ft.	3-4 ft.	7-8 ft.	7-8 ft.	7-8 ft.	9-10 ft.	7-8 ft.	7-8 ft.	7-8 ft.	7-8 ft.	7-8 ft.	7-8 ft.
Benzene	--	--	--	--	--	--	--		--	--		--	--	10.348		0.348			--	0.324	--	--	--	0.51	--	--	--	0.221	--	--	--	--	--	--	--
Ethylbenzene	--	--	--	--	3.62	1.45	0.132		--	--		--	--	--		--			--	0.072	--	--	--	0.034	--	--	--	0.12	--	--	--	--	--	--	--
Toluene	--	--	--	--	13.872	0.471	0.034		--	--		--	--	17.462		0.054			--	0.39	--	--	--	0.272	--	--	--	0.311	--	--	--	--	--	--	--
Xylenes	--	--	--	--	63.594	0.766	0.186		--	--		--	--	72.083		0.038			--	1.68	--	--	--	0.26	--	--	--	0.661	--	--	--	--	--	--	--
TVH	1.425	1.46	0.064	2.001	796.051	62.129	7.042		0.711	0.209		0.017	0.853	994.302		1.355			--	8.199	0.016	--	--	1.406	0.43	0.026	--	3.395	--	--	--	--	--	--	--
Sample Depth	8-9 ft.	10-11 ft.																		11-12 ft.	9-10 ft.	10-11 ft.					10-11 ft.	11-12 ft.	11-12 ft.	11-12 ft.	11-12 ft.	11-12 ft.	11-12 ft.	11-12 ft.	11-12 ft.
Benzene	--	--																		0.538	0.122	--					--	0.287	--	--	--	1.782	0.202	--	--
Ethylbenzene	--	--																		0.718	--	--					--	0.46	--	--	--	--	--	--	--
Toluene	--	--																		0.476	0.046	--					--	0.194	--	--	--	--	--	--	--
Xylenes	--	--																		2.062	--	--					--	0.11	--	--	--	--	--	--	--
TVH	0.349	0.129																		7.728	0.623	8.169					--	4.658	--	--	--	1.852	0.401	--	--
Sample Depth																				13-14 ft.								15-16 ft.				15-16 ft.		16-17 ft.	
Benzene																				1.22								--				0.855		--	
Ethylbenzene																				0.34								--				--		--	
Toluene																				0.208								--				--		--	
Xylenes																				0.072								--				--		--	
TVH																				3.553								--				0.903		--	

Comments:
(--) = Below Method Detection Limit
ppm = parts per million (mg/kg or mg/L)
(blank) = Sample not collected or not analyzed

Table 3
Summary of Soil Sample Results (ppm)
Heritage Laboratory

		Boring Location	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20	B21	B22	B23	B24	B25	B26	B27	B28	B29	B30	B31	B32	B33	B34	B35
		Sample Depth	7-8 ft.	10-11 ft.	5-6 ft.			11-12 ft.		6-7 ft.	7.5-8.5ft.	5.5-6.5ft.		14-15 ft.	6-7 ft.	9.5-10.5ft.			7-8 ft.	8-9 ft.	6-7 ft.	11-12 ft.			7-8 ft.		3-4 ft.	7-8 ft.	10-11 ft.	11-12 ft.	9-10 ft.	7-8 ft.	6-7 ft.			7-8 ft.	11-12 ft.
	Cleanup Criteria (a)	Inhalation	Migration																																		
BETX Constituents																																					
Benzene	1.5	0.17	--	--	--			0.003		--	--	--		--	--	0.013				--	--	0.15			--		--	--	--	--	--	--	--			--	--
Ethylbenzene	400	19	--	--	--			0.008		--	--	--		--	--	0.046				0.005	--	5.5			--		--	--	--	--	--	--	--			--	--
Toluene	650	29	--	--	--			0.029		--	--	--		--	--	0.058				--	--	3.3			--		--	--	--	--	--	--	--			--	--
Xylenes	410	150	--	--	--			0.04		--	--	--		0.025	--	0.19				0.007	--	23			--		--	--	--	--	--	--	--			--	--
PNA Constituents																																					
Naphthalene	-c-	420	--	--	--			--		--	--	--		0.0074	--	0.058					--				--		--	--	--								
Acenaphthylene	NL	NL	--	--	--			--		--	--	--		--	--	--					--				--		--	--	--								
Acenaphthene	-c-	2,900	--	--	--			--		--	--	--		--	--	--					--				--		--	--	--								
Fluorene	-c-	2,800	--	--	--			--		--	--	--		--	--	--					--				--		--	--	--								
Phenanthrene	NL	NL	--	--	--			0.0087		--	--	--		--	--	--					--				--		--	0.0097	--								
Anthracene	-c-	59,000	--	--	--			--		--	--	--		--	--	--					--				--		--	--	--								
Fluoranthene	-c-	21,000	--	--	--			0.0072		--	0.026	0.033		--	--	--					--				--		--	0.013	--								
Pyrene	-c-	21,000	--	--	--			--		--	0.016	0.03		--	--	--					--				--		--	--	--								
Benzo(a)Anthracene	-c-	8	--	--	--			--		--	0.005	0.0062		--	--	--					--				--		--	0.0038	--								
Chrysene	-c-	800	--	--	--			--		--	0.0084	0.0099		--	--	--					--				--		--	--	--								
Benzo(b)Fluoranthene	-c-	25	--	--	--			--		--	0.016	0.018		--	--	--					--				--		--	0.0058	--								
Benzo(k)Fluoranthene	-c-	250	--	--	--			--		--	0.0054	0.0089		--	0.0035	--					--				--		--	--	--								
Benzo(a)Pyrene	-c-	82	--	--	--			--		--	0.014	0.018		--	--	--					--				--		--	--	--								
Dibenzo(a,h)Anthracene	-c-	7.6	--	--	--			--		--	--	--		--	--	--					--				--		--	--	--								
Benzo(g,h,i)Perylene	NL	NL	--	--	--			0.0094		--	0.014	0.014		0.0075	0.0079	0.0092					--				--		--	--	--								
Indeno(1,2,3-cd)Pyrene	-c-	69	--	--	--			--		--	0.012	0.011		--	0.0044	--					--				--		--	0.005	--								
Metal Constituents																																					
Total Lead	-c-																		15																		
TCLP Lead		0.1																	--																		

Comments:
(--) = Below Method Detection Limit
ppm = parts per million (mg/kg or mg/L)
(blank) = Sample not collected or not analyzed

NL = Not Listed
-c- = No toxicity criteria avalable for this route of exposure.
(a) = Inhalation and Migration values for Tier 1 Industrial-Comercial Properties.

Table 4
Summary of Groundwater Results (ppm)
Heritage Laboratory

	Class II Groundwater Criteria (a)	Piezometer Location			
		P1	P2	P3	P4
BETX Constituents					
Benzene	0.025	--	--	0.3	0.009
Ethylbenzene	1	--	--	0.041	--
Toluene	2.5	--	--	0.43	--
Xylenes	10	--	--	0.19	--
PNA Constituents					
Naphthalene	0.039		--	0.006	
Acenaphthylene	NL		--	--	
Acenaphthene	2.1		--	--	
Fluorene	1.4		--	--	
Phenanthrene	NL		--	--	
Anthracene	10.5		--	--	
Fluoranthene	1.4		--	--	
Pyrene	1.05		--	--	
Benzo(a)Anthracene	0.00065		--	--	
Chrysene	0.0075		--	--	
Benzo(b)Fluoranthene	0.0009		--	--	
Benzo(k)Fluoranthene	0.00085		--	--	
Benzo(a)Pyrene	0.002		--	--	
Dibenzo(a,h)Anthracene	0.0015		--	--	
Benzo(g,h,i)Perylene	NL		--	--	
Indeno(1,2,3-cd)Pyrene	0.00215		--	--	

Comments:

-- = Below Method Detection Limit
ppm = parts per million (mg/L)
(blank) = Sample not collected or not analyzed
(a) = Tier 1 Industrial-Comerical Properties
NL = Not Listed

Table 5
Survey Data and Well Measurements

Location	Instrument Reading	Reference Datum	Closure	Water Level	Water Elevation
Fire Hydrant, top nut	3.61	100.00			
P1, TOC	5.19	98.42		6.51	91.91
P1, Grade	5.03	98.58			
B19	4.69	98.92			
B25	4.10	99.51			
Grade west of trench, along line of B25	4.86	98.75			
Grade west of pump island, near B3	4.59	99.02			
Grade north of pump island, near B4	4.77	98.84			
Grade east of pump island, near B5	5.32	98.29			
B18	5.29	98.32			
B13	6.33	97.28			
B12	6.16	97.45			
B11	6.09	97.52			
B9	6.01	97.60			
B10	6.09	97.52			
P4, TOC	4.67	98.94		7.24	91.70
P4, Grade	5.60	98.01			
P3, TOC	5.06	98.55		6.95	91.60
P3, Grade	5.53	98.08			
P2, TOC	5.13	98.48		6.97	91.51
P2, Grade	5.95	97.66			
CLOSE, Fire Hydrant, top nut	3.61	100.00	0.00		
Fire Hydrant, top nut	3.61	100.00			
B26	6.89	96.72			
B21	6.73	96.88			
B16	5.85	97.76			
B14	5.55	98.06			
B17	6.04	97.57			
B15	4.82	98.79			
B22	5.89	97.72			
B23	5.49	98.12			
Gully west of Track Gage, along B17	8.59	95.02			
West Track Gage, along B17	7.06	96.55			
East Track Gage, along B17	7.82	95.79			
B27	8.41	95.20			
B20	8.33	95.28			
B24	8.26	95.35			
B31	8.08	95.53			
B35	8.84	94.77			
B32	8.90	94.71			
B28	8.81	94.80			
B30	8.47	95.14			
B29	9.96	93.65			
B33	9.33	94.28			
B34	9.28	94.33			
CLOSE, Fire Hydrant, top nut	3.61	100.00	0.00		

Comments:

```
*******************************************************************************
************************ TEMPERATURE SUMMARY ******************************
*******************************************************************************


Station: (119029) WAUKEGAN_2_WNW                Missing Data:   2%  NCDC Averages
Averages: 1961-1990  Extremes: 1923-1996                       #Day-Max  #Day-Min
       Averages          Daily Extremes          Mean Extremes   =>   <=   <=   <=
    Max  Min Mean  High---Date  Low---Date  High-Yr  Low-Yr    90   32   32    0
-------------------------------------------------------------------------------
Ja 27.9 10.8 19.3  64  25/1950 -27  19/1985 35.0 33  8.8 79    0   16   29  6.1
Fe 31.9 14.5 23.2  68  28/1976 -24  09/1933 34.9 54 11.5 36    0   12   27  3.3
Ma 42.5 25.1 33.8  83  27/1945 -12  01/1962 47.7 45 24.8 60    0  4.9   24  0.4
Ap 54.6 35.4 45.0  92  10/1930   8  07/1982 52.1 55 40.0 75    0  0.2  9.9    0
Ma 66.5 45.5 56.0  95  09/1934  24  10/1966 63.6 77 49.5 35  0.5    0  1.2    0
Jn 76.8 55.2 66.1 105  01/1934  32  09/1929 73.8 33 59.7 82  2.9    0    0    0
Jl 81.1 61.3 71.2 108  24/1934  41  03/1924 77.2 55 65.7 24  4.9    0    0    0
Au 79.5 59.9 69.7 102  01/1988  40  29/1935 77.3 47 64.7 86  3.8    0    0    0
Se 72.4 52.6 62.5 103  07/1939  27  25/1942 69.9 31 56.3 24  1.4    0  0.2    0
Oc 61.1 41.1 51.1  90  06/1963  11  29/1925 61.7 63 40.6 25    0    0  4.6    0
No 47.2 30.0 38.6  80  01/1944  -5  24/1950 47.5 31 30.8 76    0  2.5   18  0.2
De 33.0 17.3 25.2  66  08/1946 -23  24/1983 35.6 31 12.9 83    0   12   27  2.7

An 56.2 37.4 46.8 108 07/24/34 -27 01/19/85  51.8 31 42.6 85   14   48  140   13
Wi 30.9 14.2 22.6  68 02/28/76 -27 01/19/85  32.9 32 14.8 79    0   40   82   12
Sp 54.5 35.3 44.9  95 05/09/34 -12 03/01/62  51.1 77 41.0 96  0.6  5.1   35  0.4
Su 79.1 58.8 69.0 108 07/24/34  32 06/09/29  74.1 83 64.2 24   12    0    0    0
Fa 60.2 41.2 50.7 103 09/07/39  -5 11/24/50  57.9 31 46.4 76  1.4  2.5   22  0.2

*******************************************************************************
************************ PRECIPITATION SUMMARY ****************************
*******************************************************************************


Station: (119029) WAUKEGAN_2_WNW                Missing Data:   5%
Averages: 1961-1990  Extremes: 1923-1996
                Total Precipitation                     Snow      #Days Precip
    Mean   High--Yr    Low--Yr     1-Day Max    Mean  High--Yr =>.01 =>.50 =>1.
-------------------------------------------------------------------------------
Ja  1.71    5.27  65   0.00  87   2.37  24/1938   12.2  40.5  79   8.8  0.9  0.2
Fe  1.24    2.85  60   0.18  87   1.46  10/1939    9.9  23.9  67   7.7  0.6  0.1
Ma  2.45    5.90  83   0.30  36   2.23   5/1976    6.9  27.7  65   9.7  1.4  0.4
Ap  3.52    7.11  93   0.57  86   2.50   2/1983    1.8  11.0  70  10.9  2.4  0.7
Ma  3.31    8.13  45   0.34  92   1.97  19/1996    0.0   0.6  66  11.4  2.2  0.7
Jn  3.60    9.86  93   0.98  95   4.00  20/1972    0.0   0.0  49  10.2  2.3  1.0
Jl  3.74    7.50  82   0.26  46   3.40  22/1982    0.0   0.0  49   9.3  2.2  0.9
Au  3.97   10.57  87   0.35  25   3.70   7/1984    0.0   0.0  49   8.9  2.6  0.9
Se  3.71   15.11  86   0.02  79   3.10  26/1986    0.0   0.0  49   8.6  2.5  0.9
Oc  2.34   10.24  41   0.00  52   2.81   5/1991    0.2   3.0  67   8.0  1.6  0.5
No  2.38    5.89  35   0.50  76   2.36  17/1928    1.5   8.8  75   9.1  1.5  0.5
De  2.23    5.60  82   0.27  62   2.44   3/1982    8.6  25.8  73   8.8  1.2  0.2

An 34.20   50.35  72  18.45  89   4.00  6/20/72   40.0  66.9  65 110.5 21.2  6.9
Wi  5.18   11.98  74   1.21  31   2.44 12/ 3/82   31.0  68.4  79  26.2  2.8  0.6
Sp  9.28   14.44  45   2.82  34   2.50  4/ 2/83    8.7  28.0  65  31.7  5.8  1.8
Su 11.31   22.16  72   4.67  46   4.00  6/20/72    0.0   0.0  49  28.5  7.2  2.8
Fa  8.43   21.45  41   2.07  56   3.10  9/26/86    1.6   8.8  75  26.1  5.7  1.9

*******************************************************************************
*************** HEATING AND COOLING DEGREE DAY SUMMARY ********************
*******************************************************************************
```

Station: (119029) WAUKEGAN_2_WNW , IL Missing Data: 1.8%

Degree Days to Selected Base Temperatures (F)

Heating Degree Days

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1356	1164	950	582	297	78	18	24	134	428	773	1202	7006
60	1205	1023	797	442	183	30	3	3	59	293	625	1050	5713
57	1115	938	705	362	125	14	1	1	31	221	538	959	5010
55	1055	882	645	311	93	8	0	0	18	178	481	898	4569
50	904	741	498	196	36	1	0	0	4	90	344	747	3561

Cooling Degree Days

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
55	0	0	5	31	134	345	504	455	250	70	7	0	1801
57	0	0	3	22	105	291	442	395	202	51	4	0	1515
60	0	0	1	13	71	217	352	306	141	30	1	0	1132
65	0	0	0	5	31	115	213	174	66	10	0	0	614
70	0	0	0	1	10	47	103	77	24	2	0	0	264

Derived from the 1961-1990 Data

****
********** GROWING DEGREE DAY SUMMARY **********
****

Station: (119029) WAUKEGAN_2_WNW Missing Data: 1.8%

Growing Degree Days to Selected Base Temperatures (F)

Base		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
40	M	4	5	57	206	504	787	967	912	681	366	99	13	4601
	S	4	9	66	272	776	1563	2530	3442	4123	4489	4588	4601	
45	M	1	1	28	119	359	638	812	759	532	237	48	4	3538
	S	1	2	30	149	508	1146	1958	2717	3249	3486	3534	3538	
50	M	0	0	13	64	231	488	658	607	385	137	21	1	2605
	S	0	0	13	77	308	796	1454	2061	2446	2583	2604	2605	
55	M	0	0	5	31	134	345	504	455	250	70	7	0	1801
	S	0	0	5	36	170	515	1019	1474	1724	1794	1801	1801	
60	M	0	0	1	13	71	217	352	306	141	30	2	0	1133
	S	0	0	1	14	85	302	654	960	1101	1131	1133	1133	

Modified* Growing Degree Days (Base 50F, Ceiling 86F)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
50	M	2	3	36	117	288	492	641	598	410	202	50	7	2846
	S	2	5	41	158	446	938	1579	2177	2587	2789	2839	2846	

Derived from the 1961-1990 Data
M = Monthly Data S = Running Sum of Monthly Data
*Modified == If Low < 50F then Reset to 50F, If High > 86F then Reset to 86F

****
********** GROWING SEASON SUMMARY **********
****

Growing Season Summary
Station: (119029) WAUKEGAN_2_WNW
Years: 1961 To 1990 Missing Data: 1.9%

Base	Date of Last Spring Occurrence						Date of First Fall Occurrence					
Temp	Median	Early	90%	10%	Late	#yrs	Median	Early	10%	90%	Late	#yrs
32	5/01	4/08	4/10	5/09	5/13	30	10/15	9/22	10/02	11/03	11/03	30
30	4/26	3/31	4/08	5/09	5/13	30	10/22	9/23	10/08	11/11	1/01	30
28	4/14	3/31	4/02	5/01	5/10	30	10/28	10/02	10/12	11/18	1/01	30

24	4/07	3/18	3/24	4/17	5/10	30	11/08	10/11	10/23	11/25	1/04	30
20	3/26	2/23	3/14	4/07	4/10	30	11/20	10/24	11/02	12/04	1/09	30
16	3/19	2/19	2/26	3/31	4/08	30	11/30	11/07	11/13	12/10	1/16	30

Base		Length of Season (Days)				
Temp	Median	Shortest	10%	90%	Longest	#yrs
32	172	137	149	190	207	30
30	181	151	159	210	252	30
28	195	165	178	222	252	30
24	218	177	193	236	255	30
20	238	216	219	255	293	30
16	264	218	231	280	300	30

****
********** Midwestern CLimate Center, Champaign IL **********
****

APPENDIX 5

Field Analytical Results

Recycled Paper

INNOVATIVE PROBING SOLUTIONS

environmental service company ™

PROJECT: Great Lakes Naval Training Center
N. Chicago, IL
Purchase Order 79419

CLIENT: Heritage Environmental Services
15330 Canal Bank Road
Lemont, IL 60439

SAMPLE DATE: September 24 - 30, 1997

REPORT DATE: October 1, 1997

REPORT NUMBER: 9709167

This report summarizes soil sampling activities along with on-site analyses at the above-referenced site. Discreet soil samples were obtained by hydraulically pushing and hammering specially designed soil sampler tubes to the desired depth. A plunger assembly, within the soil tubes, was disengaged at sampling depth to facilitate soil collection.

The static headspace method was utilized for all on-site soil analyses. All vapor samples were directly injected into a Shimadzu GC-14A and specific contaminant concentrations were calculated by a Shimadzu CR-4A computer integrator using a flame ionization detector (FID). A total of forty-eight (48) samples were analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX) and Total Volatile Hydrocarbons (TVH). Proven laboratory procedures were employed for quality assurance/quality control, including periodic blanks and calibration standards, resulting in a total of ninety-two (92) analyses.

The static headspace method utilized is a proven method for field screening of volatile organic compounds. Although at times results may prove similar to other laboratory methods, they may also prove to differ. The analytical procedure is one which provides a rapid screening for the targeted compounds with reproducible results.

Mr. Kevin Crandall of Heritage Environmental Services was present to direct sampling activities and acquired samples for additional off-site laboratory analysis.

Upon reviewing the following results, please do not hesitate to call with any questions. Thank you for choosing Innovative Probing Solutions for your project.

P.O. BOX 1243 MT. VERNON, ILLINOIS 62864
618-244-7900 FAX 618-244-7999

HERITAGE ENVIRONMENTAL SERVICES

Great Lakes Naval Training Center
N. Chicago, IL
Purchase Order #79419

Sept. 24- 25- 26- 27- 29- 30, 1997
Report #9709167

LOCATION	IPS 1	IPS 2	IPS 3	IPS 4
TYPE	Soil	Soil	Soil	Soil
DEPTH	4'	4'	7'	10'
BENZENE	BMDL	BMDL	BMDL	BMDL
TOLUENE	BMDL	BMDL	BMDL	BMDL
ETHYLBENZENE	BMDL	BMDL	BMDL	BMDL
XYLENES	BMDL	BMDL	BMDL	BMDL
TVH	1.425	0.349	1.461	0.129

LOCATION	IPS 5	IPS 6	IPS 7	IPS 8
TYPE	Soil	Soil	Soil	Soil
DEPTH	5'	7'	7'	8'
BENZENE	BMDL	BMDL	BMDL	BMDL
TOLUENE	BMDL	BMDL	3.620 E	1.450
ETHYLBENZENE	BMDL	BMDL	13.872 E	0.471
XYLENES	BMDL	BMDL	63.594 E	0.766
TVH	0.064	2.001	796.051 E	62.129

LOCATION	IPS 9	IPS 10	IPS 11	IPS 12
TYPE	Soil	Soil	Soil	Soil
DEPTH	12'	8'	6'	16'
BENZENE	BMDL	BMDL	BMDL	BMDL
TOLUENE	0.132	BMDL	BMDL	BMDL
ETHYLBENZENE	0.034	BMDL	BMDL	BMDL
XYLENES	0.186	BMDL	BMDL	BMDL
TVH	7.042	0.711	0.209	0.017

LOCATION	IPS 13	IPS 14	IPS 15	IPS 16
TYPE	Soil	Soil	Soil	Soil
DEPTH	13'	7'	10'	16'
BENZENE	BMDL	10.348	0.348	BMDL
TOLUENE	BMDL	BMDL	BMDL	BMDL
ETHYLBENZENE	BMDL	17.462	0.054	BMDL
XYLENES	BMDL	72.083	0.038	BMDL
TVH	0.853	994.302	1.355	<0.015

BMDL = BELOW METHOD DETECTION LIMIT
E = SAMPLE EXCEEDED TESTING PARAMETERS ESTIMATED READING GIVEN.
ALL RESULTS REPORTED IN PARTS PER MILLION
DETECTION LIMIT PER ANALYTE 0.015

LOCATION	IPS 17	IPS 18	IPS 19	IPS 20
TYPE	Soil	Soil	Soil	Soil
DEPTH	7'	12'	14'	17'
BENZENE	0.324	0.538	1.220	BMDL
TOLUENE	0.072	0.718	0.340	BMDL
ETHYLBENZENE	0.390	0.476	0.208	BMDL
XYLENES	1.680	2.062	0.072	BMDL
TVH	8.199	7.728	3.553	0.016

LOCATION	IPS 21	IPS 22	IPS 23	IPS 24
TYPE	Soil	Soil	Soil	Soil
DEPTH	9'	7'	10'	8'
BENZENE	0.122	BMDL	BMDL	BMDL
TOLUENE	BMDL	BMDL	BMDL	BMDL
ETHYLBENZENE	0.046	BMDL	BMDL	BMDL
XYLENES	BMDL	BMDL	BMDL	BMDL
TVH	0.623	<0.015	8.169	<0.015

LOCATION	IPS 25	IPS 26	IPS 27	IPS 28
TYPE	Soil	Soil	Soil	Soil
DEPTH	8'	4'	8'	11'
BENZENE	0.510	BMDL	BMDL	BMDL
TOLUENE	0.034	BMDL	BMDL	BMDL
ETHYLBENZENE	0.272	BMDL	BMDL	BMDL
XYLENES	0.260	BMDL	BMDL	BMDL
TVH	1.406	0.430	0.026	<0.015

LOCATION	IPS 29	IPS 30	IPS 31	IPS 32
TYPE	Soil	Soil	Soil	Soil
DEPTH	8'	7'	11'	15'
BENZENE	BMDL	0.221	0.287	BMDL
TOLUENE	BMDL	0.120	0.460	BMDL
ETHYLBENZENE	BMDL	0.311	0.194	BMDL
XYLENES	BMDL	0.661	0.110	BMDL
TVH	<0.015	3.395	4.658	<0.015

BMDL = BELOW METHOD DETECTION LIMIT
E = SAMPLE EXCEEDED TESTING PARAMETERS ESTIMATED READING GIVEN.
ALL RESULTS REPORTED IN PARTS PER MILLION
DETECTION LIMIT PER ANALYTE 0.015

LOCATION	IPS 33	IPS 34	IPS 35	IPS 36
TYPE	Soil	Soil	Soil	Soil
DEPTH	7'	10'	8'	11'
BENZENE	BMDL	BMDL	BMDL	BMDL
TOLUENE	BMDL	BMDL	BMDL	BMDL
ETHYLBENZENE	BMDL	BMDL	BMDL	BMDL
XYLENES	BMDL	BMDL	BMDL	BMDL
TVH	<0.015	<0.015	<0.015	<0.015

LOCATION	IPS 37	IPS 38	IPS 39	IPS 40
TYPE	Soil	Soil	Soil	Soil
DEPTH	7'	11'	7'	11'
BENZENE	BMDL	BMDL	BMDL	1.782
TOLUENE	BMDL	BMDL	BMDL	BMDL
ETHYLBENZENE	BMDL	BMDL	BMDL	BMDL
XYLENES	BMDL	BMDL	BMDL	BMDL
TVH	<0.015	<0.015	<0.015	1.852

LOCATION	IPS 41	IPS 42	IPS 43	IPS 44
TYPE	Soil	Soil	Soil	Soil
DEPTH	15'	7'	10'	7'
BENZENE	0.855	BMDL	0.202	BMDL
TOLUENE	BMDL	BMDL	BMDL	BMDL
ETHYLBENZENE	BMDL	BMDL	BMDL	BMDL
XYLENES	BMDL	BMDL	BMDL	BMDL
TVH	0.903	<0.015	0.401	<0.015

LOCATION	IPS 45	IPS 46	IPS 47	IPS 48
TYPE	Soil	Soil	Soil	Soil
DEPTH	11'	15'	7'	11'
BENZENE	BMDL	BMDL	BMDL	BMDL
TOLUENE	BMDL	BMDL	BMDL	BMDL
ETHYLBENZENE	BMDL	BMDL	BMDL	BMDL
XYLENES	BMDL	BMDL	BMDL	BMDL
TVH	<0.015	<0.015	<0.015	<0.015

BMDL = BELOW METHOD DETECTION LIMIT
E = SAMPLE EXCEEDED TESTING PARAMETERS ESTIMATED READING GIVEN.
ALL RESULTS REPORTED IN PARTS PER MILLION
DETECTION LIMIT PER ANALYTE 0.015

APPENDIX 6

Laboratory Certificates - Soil Samples

The Agency is authorized to require this information under Section 4 and Title XVI of the Environmental Protection Act (415 ILCS 5/4, 5/57 - 57.17). Failure to disclose this information may result in a civil penalty of not to exceed $50,000.00 for the violation and an additional civil penalty of not to exceed $10,000.00 for each day during which the violation continues (415 ILCS 5/42). Any person who knowingly makes a false material statement or representation in any label, manifest, record, report, permit, or license, or other document filed, maintained or used for the purpose of compliance with Title XVI commits a Class 4 felony. Any second or subsequent offense after conviction hereunder is a Class 3 felony (415 ILCS 5/57.17). This form has been approved by the Forms Management Center.

Illinois Environmental Protection Agency
Leaking Underground Storage Tank Program
Laboratory Certification for Chemical Analysis

(soil investigation samples)

A. Site Identification

IEMA Incident # (6 digit): _____ IEPA Generator # (10 digit): _____

Site Name: NAVY PUBLIC WORKS CENTER, Bldg. 1600A, RAY STREET

Site Address (Not a P.O. Box): NAVAL TRAINING CENTER

City: GREAT LAKES, IL 60088 County: LAKE

B. Sample Collector

I certify that:

1. Appropriate sampling equipment/methods were utilized to obtain representative samples. KJC (initial)
2. Chain of custody procedures were followed in the field. KJC (initial)
3. Sample integrity was maintained by proper preservation. KJC (initial)
4. All samples were properly labeled. KJC (initial)

C. Laboratory Representative

I certify that:

1. Proper chain of custody procedures were followed as documented on the chain of custody forms. cls (initial)
2. Sample integrity was maintained by proper preservation. cls (initial)
3. All samples were properly labeled. cls (initial)
4. Quality assurance/quality control procedures were established and carried out. cls (initial)

IL 532 2283
LPC 509 Rev. Dec-96

5. Sample holding times were not exceeded. Cls (initial)

6. SW-846 Analytical Laboratory Procedure (USEPA) methods were used for the analyses. Cls (initial)

D. Signatures

I hereby affirm that all information contained in this form is true and accurate to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sample Collector	**Laboratory Representative**
Name: KEVIN J. CRANDELL	Name: Christine Sarkan
Title: Project GEOLOGIST	Title: Quality Assurance Officer
Company: HERITAGE ENVIRONMENTAL	Company: HERITAGE Environmental - CLO
Address: 15330 CANAL BANK RD.	Address: 15330 CANAL Bank Rd.
LEMONT IL 60439	Lemont IL 60439
Phone: (630)-739-1151	Phone: 630-739-1151
Signature: Kevin Crandell	Signature: Christine Sarkan
Date: 11/20/97	Date: 11/20/97

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421701
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	24-SEP-97 10:30	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B1
PROJECT: US NAVY #10319
DESCRIPTION: 7-8'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 07-OCT-97 17:02 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	4	ug/kg
ETHYL BENZENE	J 5	10	ug/kg
TOLUENE	BDL	10	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	10	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	107		% Rec
TOLUENE-D8	98		% Rec
4-BROMOFLUOROBENZENE	82		% Rec

BETX ONLY
1:2 Dilution
Unable to analyze sample at lower dilution due to high concentration of non-target compounds.

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.94		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 03-OCT-97 18:04 Instrument: HPLC Test: 0630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC.

Sample ID: A421701 B1

Parameter	Result	Det. Limit	Units
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	96		% Rec

Sample Comments

BDL Below Detection Limit
J Estimated

Sample chain of custody number 52101.

This Certificate shall not be reproduced, except in full, without the written approval of the lab.

Approved : P.K Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421702
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	24-SEP-97 11:30	

Report To

KEVIN REINHARD
HERITAGE ENVIRONMENTAL SERVICES
1319 MARQUETTE DRIVE
ROMEOVILLE, IL 60442

Bill To

GLEN BORESI
HERITAGE ENVIRONMENTAL SERVICES
1319 MARQUETTE DRIVE
ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B2
PROJECT: US NAVY #10319
DESCRIPTION: 10-11'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 07-OCT-97 12:59 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	105		% Rec
TOLUENE-D8	99		% Rec
4-BROMOFLUOROBENZENE	87		% Rec

BETX ONLY

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	32.80		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 03-OCT-97 18:45 Instrument: HPLC Test: 0630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC. **Sample ID: A421702 B2**

Parameter	Result	Det. Limit	Units
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	95		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

This Certificate shall not be reproduced, except in full, without the written approval of the lab.

Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421703
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	24-SEP-97 12:45	

Report To

KEVIN REINHARD
HERITAGE ENVIRONMENTAL SERVICES
1319 MARQUETTE DRIVE
ROMEOVILLE, IL 60442

Bill To

GLEN BORESI
HERITAGE ENVIRONMENTAL SERVICES
1319 MARQUETTE DRIVE
ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B3
PROJECT: US NAVY #10319
DESCRIPTION: 5-6'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 06-OCT-97 20:03 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	108		% Rec
TOLUENE-D8	96		% Rec
4-BROMOFLUOROBENZENE	85		% Rec

BETX ONLY

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.13		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 03-OCT-97 20:08 Instrument: HPLC Test: 0630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg

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HERITAGE ENVIRONMENTAL SERVICES, INC.

Sample ID: A421703 B3

Parameter	Result	Det. Limit	Units
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	96		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421704
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	24-SEP-97 15:45	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B6
PROJECT: US NAVY #10319
DESCRIPTION: 11-12'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 06-OCT-97 20:38 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	3	2	ug/kg
ETHYL BENZENE	8	5	ug/kg
TOLUENE	29	5	ug/kg
XYLENES (O/M/P-XYLENE)	40	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	105		% Rec
TOLUENE-D8	96		% Rec
4-BROMOFLUOROBENZENE	90		% Rec

BETX ONLY

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.18		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 03-OCT-97 20:49 Instrument: HPLC Test: 0630.0.0

Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg

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HERITAGE ENVIRONMENTAL SERVICES, INC.

Sample ID: A421704 B6

Parameter	Result	Det. Limit	Units
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	120		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421705
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	24-SEP-97 16:00	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B7
PROJECT: US NAVY #10319
DESCRIPTION: 12.5-13.5'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 07-OCT-97 13:34 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	99		% Rec
TOLUENE-D8	92		% Rec
4-BROMOFLUOROBENZENE	81		% Rec

BETX ONLY
Sample reanalyzed with no improvement in internal standard areas.

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	32.00		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 03-OCT-97 21:30 Instrument: HPLC Test: 0630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	8.7	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	7.2	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg

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HERITAGE ENVIRONMENTAL SERVICES, INC. **Sample ID: A421705 B7**

Parameter	Result	Det. Limit	Units
CHRYSENE	BDL	4	ug/kg
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	9.4	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	110		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421706
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	25-SEP-97 08:30	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B8
PROJECT: US NAVY #10319
DESCRIPTION: 6-7'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 06-OCT-97 21:49 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	104		% Rec
TOLUENE-D8	101		% Rec
4-BROMOFLUOROBENZENE	82		% Rec

BETX ONLY

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	32.71		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 03-OCT-97 22:11 Instrument: HPLC Test: 0630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg

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HERITAGE ENVIRONMENTAL SERVICES, INC. **Sample ID: A421706 B8**

Parameter	Result	Det. Limit	Units
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	100		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421707
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	25-SEP-97 09:15	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B9
PROJECT: US NAVY #10319
DESCRIPTION: 7.5-8.5'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 06-OCT-97 22:24 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	106		% Rec
TOLUENE-D8	97		% Rec
4-BROMOFLUOROBENZENE	76		% Rec

BETX ONLY

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	31.00		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 03-OCT-97 22:52 Instrument: HPLC Test: 0630.0.0

Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	26	3	ug/kg
PYRENE	16	2	ug/kg
BENZ(A)ANTHRACENE	5.0	2	ug/kg
CHRYSENE	8.4	4	ug/kg

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HERITAGE ENVIRONMENTAL SERVICES, INC. Sample ID: A421707 B9

Parameter	Result	Det. Limit	Units
BENZO(B)FLUORANTHENE	16	4	ug/kg
BENZO(K)FLUORANTHENE	5.4	3	ug/kg
BENZO(A)PYRENE	14	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	14	7	ug/kg
INDENO(1,2,3-CD)PYRENE	12	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	97		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421708
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	25-SEP-97 09:45	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B10
PROJECT: US NAVY #10319
DESCRIPTION: 5.5-6.5'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 06-OCT-97 22:59 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	103		% Rec
TOLUENE-D8	85		% Rec
4-BROMOFLUOROBENZENE	80		% Rec

BETX ONLY

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.41		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 03-OCT-97 23:34 Instrument: HPLC Test: 0630.0.0

Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	33	3	ug/kg
PYRENE	30	2	ug/kg
BENZ(A)ANTHRACENE	6.2	2	ug/kg
CHRYSENE	9.9	4	ug/kg

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HERITAGE ENVIRONMENTAL SERVICES, INC.

Sample ID: A421708 B10

Parameter	Result	Det. Limit	Units
BENZO(B)FLUORANTHENE	18	4	ug/kg
BENZO(K)FLUORANTHENE	8.9	3	ug/kg
BENZO(A)PYRENE	18	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	14	7	ug/kg
INDENO(1,2,3-CD)PYRENE	11	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	110		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

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Approved : P.K Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421709
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	25-SEP-97 11:45	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B12
PROJECT: US NAVY #10319
DESCRIPTION: 14-15'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 07-OCT-97 14:09 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	25	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	108		% Rec
TOLUENE-D8	83		% Rec
4-BROMOFLUOROBENZENE	80		% Rec

Matrix Spike is the reanalysis
BETX ONLY
Sample reanalyzed with no improvement in internal standard areas.

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	34.30		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 04-OCT-97 00:15 Instrument: HPLC Test: 0630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	7.4	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC. Sample ID: A421709 B12

Parameter	Result	Det. Limit	Units
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	7.5	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	91		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

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Approved : P.K Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421710
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	25-SEP-97 13:40	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B13
PROJECT: US NAVY #10319
DESCRIPTION: 6-7'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 07-OCT-97 00:10 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	103		% Rec
TOLUENE-D8	84		% Rec
4-BROMOFLUOROBENZENE	91		% Rec

BETX ONLY
Sample reanalyzed with no improvement in internal standard areas.

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 04-OCT-97 00:56 Instrument: HPLC Test: 0630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	3.5	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	7.9	7	ug/kg

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HERITAGE ENVIRONMENTAL SERVICES, INC.

Sample ID: A421710 B13

Parameter	Result	Det. Limit	Units
INDENO(1,2,3-CD)PYRENE	4.4	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	98		% Rec

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	31.86		Grams
FINAL VOLUME	5.0		mL

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421711
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	25-SEP-97 14:45	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B14
PROJECT: US NAVY #10319
DESCRIPTION: 9.5-10.5'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 07-OCT-97 00:45 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	13	2	ug/kg
ETHYL BENZENE	46	5	ug/kg
TOLUENE	58	5	ug/kg
XYLENES (O/M/P-XYLENE)	190	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	105		% Rec
TOLUENE-D8	99		% Rec
4-BROMOFLUOROBENZENE	93		% Rec

BETX ONLY

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 02-OCT-97 05:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.72		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 04-OCT-97 01:37 Instrument: HPLC Test: 0630.0.0

Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	58	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC.

Sample ID: A421711 B14

Parameter	Result	Det. Limit	Units
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	9.2	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	94		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A421998
	Complete	PO Number	
	09-OCT-97	79413	
	Printed	Sampled	
	10-OCT-97	30-SEP-97 10:30	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B17
DESCRIPTION: 4-8'

TOX CHAR LEACHING PROCEDURE (TCLP METALS ONLY) SW846-1311

Analyst: E. MERRILL Analysis Date: 06-OCT-97 Instrument: PREP Test: P106.1.0

Parameter	Result	Det. Limit	Units
TOTAL SAMPLE WEIGHT	100.0		Grams
LIQUID FRACTION (GRAMS)	NA		Grams
EXTRACTED SAMPLE	100.0		Grams
SOLIDS	100.0		Percent
9.5 MM SIEVE TEST	YES		Passed
INITIAL PH	8.8		Std. Units
ADJUSTED PH	2.0		Std. Units
BUFFER SOLUTION PH	4.91		Std. Units
FINAL PH	6.1		Std. Units
VOLUME BUFFERED SOLUTION	2000		mL
VOLUME EXTRACT FILTERED	2000		mL
VOLUME LIQUID (ADD BACK)	NA		mL
TOTAL VOLUME FILTRATE	2000		mL
AMBIENT TEMPERATURE	22.9		Degrees C
INITIAL TIME	5007.8		HRS
FINAL TIME	5025.2		HRS
PHASE 0 VOLUME (REP 0)	2000		mL
PHASE 0 WEIGHT	NA		Grams
PHASE 0 DENSITY	NA		g/mL
PHASE 1 VOLUME (REP 1)	NA		mL
PHASE 1 WEIGHT	NA		Grams
PHASE 1 DENSITY	NA		g/mL

FAA OR ICP ACID DIGESTION (LEACHATE) SW846-3010A

Analyst: P. MASTERS Analysis Date: 07-OCT-97 14:00 Instrument: PREP Test: P130.8.0

Prep: TOX CHAR LEACHING PROCEDURE (TCLP METALS ONLY) SW846-1311 P106.1.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	100		mL
FINAL VOLUME	100		mL

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC.

LEAD ICP (1 POINT MSA) SW846-6010A

Sample ID: A421998 B17

Analyst: A. HILSCHER Analysis Date: 08-OCT-97 12:28 Instrument: ICP Test: M616.7.0

Prep: FAA OR ICP ACID DIGESTION (LEACHATE) SW846-3010A P130.8.0

Prep: TOX CHAR LEACHING PROCEDURE (TCLP METALS ONLY) SW846-1311 P106.1.0

Parameter	Result	Det. Limit	Units
LEAD	BDL	0.25	mg/L
ADDITION 1	5.000		mg/L
SAMPLE	0.0124		Conc
SAMPLE + ADD 1	5.2130		Conc
DILUTION	5		

FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. PUGH Analysis Date: 06-OCT-97 12:00 Instrument: PREP Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL VOLUME	100		mL

LEAD ICP SW846-6010A

Analyst: A. HILSCHER Analysis Date: 07-OCT-97 13:14 Instrument: ICP Test: M116.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
LEAD	15.	5.0	mg/kg

Sample Comments

BDL Below Detection Limit
NA Not Applicable
YES Yes

Sample chain of custody number 52102.

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Approved : _____

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	30-SEP-97		A421712
	Complete	PO Number	
	09-OCT-97	79413	
	Printed	Sampled	
	10-OCT-97	26-SEP-97 08:35	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B18
PROJECT: US NAVY #10319
DESCRIPTION: 8-9'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: B. MAZUR Analysis Date: 07-OCT-97 01:22 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	5	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	7	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	83		% Rec
TOLUENE-D8	88		% Rec
4-BROMOFLUOROBENZENE	107		% Rec

BETX ONLY
Sample reanalyzed with no improvement in internal standard areas.

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52101.

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Approved : _____

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A421999
	Complete	PO Number	
	14-OCT-97	79413	
	Printed	Sampled	
	15-OCT-97	26-SEP-97 09:15	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 15330 CANAL BANK RD. LEMONT, IL 60439	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B19
DESCRIPTION: 6-7'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: R. SHAMP Analysis Date: 09-OCT-97 09:21 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	144		% Rec
TOLUENE-D8	103		% Rec
4-BROMOFLUOROBENZENE	122		% Rec

BETX ONLY
Sample reanalyzed with no improvement in surrogate recovery.

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 07-OCT-97 09:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.95		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 07-OCT-97 17:20 Instrument: HPLC Test: 0630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC.

Sample ID: A421999 B19

Parameter	Result	Det. Limit	Units
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	98		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52102.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422006
	Complete	PO Number	
	15-OCT-97	79413	
	Printed	Sampled	
	16-OCT-97	26-SEP-97 11:30	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 15330 CANAL BANK RD. LEMONT, IL 60439	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B20
DESCRIPTION: 11-12'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: R. SHAMP Analysis Date: 09-OCT-97 10:47 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	150	5	ug/kg
ETHYL BENZENE	*	5	ug/kg
TOLUENE	*	5	ug/kg
XYLENES (O/M/P-XYLENE)	*	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	159		% Rec
TOLUENE-D8	103		% Rec
4-BROMOFLUOROBENZENE	110		% Rec

BETX ONLY
Sample reanalyzed with no improvement in surrogate recovery.
Sample reanalyzed with no improvement in internal standard areas.
Dilution necessary due to high concentration of target compounds.
*Note: * Above linear range -- please see replicate 1.*

MEDIUM LEVEL PREP HLI

Analyst: R. SHAMP Analysis Date: 14-OCT-97 Instrument: PREP Test: P510.3.0

Parameter	Result	Det. Limit	Units
INITIAL SAMPLE WEIGHT	2.07		Grams
FINAL VOLUME	5		mL

VOLATILE ORGANICS SW846-8240B

Analyst: R. SHAMP Analysis Date: 15-OCT-97 07:15 Instrument: GC/MS VOA Test: 0510.3.0
Prep: MEDIUM LEVEL PREP HLI P510.3.0

Parameter	Result	Det. Limit	Units
BENZENE	0.38	0.31	mg/kg
ETHYL BENZENE	5.5	0.31	mg/kg
TOLUENE	3.3	0.31	mg/kg
XYLENES (O/M/P-XYLENE)	23	0.31	mg/kg
...			
SURROGATE RECOVERY			

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC. **Sample ID: A422006 B20**

Parameter	Result	Det. Limit	Units
DICHLOROETHANE-D4	117		% Rec
TOLUENE-D8	121		% Rec
4-BROMOFLUOROBENZENE	78		% Rec

1:63 DILUTION
SURROGATES FAIL QC CRITERIA.

Sample Comments

* *See Note for Parameter*

Sample chain of custody number 52102.

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Approved : P.K Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422001
	Complete	PO Number	
	14-OCT-97	79413	
	Printed	Sampled	
	15-OCT-97	26-SEP-97 15:40	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 15330 CANAL BANK RD. LEMONT, IL 60439	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B23
DESCRIPTION: 7-8'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: R. SHAMP Analysis Date: 09-OCT-97 10:04 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	150		% Rec
TOLUENE-D8	106		% Rec
4-BROMOFLUOROBENZENE	121		% Rec

BETX ONLY
Sample reanalyzed with no improvement in surrogate recovery.

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 07-OCT-97 09:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.02		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 07-OCT-97 18:01 Instrument: HPLC Test: 0630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC. Sample ID: A422001 B23

Parameter	Result	Det. Limit	Units
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	110		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52102.

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Approved : P.K Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422002
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	27-SEP-97 08:30	

Report To

KEVIN REINHARD
HERITAGE ENVIRONMENTAL SERVICES
1319 MARQUETTE DRIVE
ROMEOVILLE, IL 60442

Bill To

GLEN BORESI
HERITAGE ENVIRONMENTAL SERVICES
1319 MARQUETTE DRIVE
ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B25
DESCRIPTION: 3-4'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: H. WILLIAMS Analysis Date: 07-OCT-97 08:23 Instrument: GC/MS VOA Test: O510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	110		% Rec
TOLUENE-D8	101		% Rec
4-BROMOFLUOROBENZENE	108		% Rec

BETX ONLY

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 07-OCT-97 09:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.63		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 07-OCT-97 18:43 Instrument: HPLC Test: O630.0.0

Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg
BENZO(B)FLUORANTHENE	BDL	4	ug/kg

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC. **Sample ID: A422002 B25**

Parameter	Result	Det. Limit	Units
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	100		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52102.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422003
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	27-SEP-97 11:10	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B26
DESCRIPTION: 7-8'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: H. WILLIAMS Analysis Date: 08-OCT-97 05:47 Instrument: GC/MS VOA Test: O510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	115		% Rec
TOLUENE-D8	100		% Rec
4-BROMOFLUOROBENZENE	108		% Rec

BETX ONLY

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 07-OCT-97 09:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.38		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 07-OCT-97 19:24 Instrument: HPLC Test: O630.0.0

Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	9.7	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	13	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	3.8	2	ug/kg
CHRYSENE	BDL	4	ug/kg
BENZO(B)FLUORANTHENE	5.8	4	ug/kg

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC. **Sample ID: A422003 B26**

Parameter	Result	Det. Limit	Units
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	5.0	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	120		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52102.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422004
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	27-SEP-97 13:30	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B27
DESCRIPTION: 10-11'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: H. WILLIAMS Analysis Date: 08-OCT-97 06:30 Instrument: GC/MS VOA Test: O510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	121		% Rec
TOLUENE-D8	96		% Rec
4-BROMOFLUOROBENZENE	102		% Rec

BETX ONLY
Sample reanalyzed with no improvement in internal standard areas.

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 07-OCT-97 09:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.07		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 07-OCT-97 20:05 Instrument: HPLC Test: O630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg
CHRYSENE	BDL	4	ug/kg

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC. Sample ID: A422004 B27

Parameter	Result	Det. Limit	Units
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	120		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52102.

This Certificate shall not be reproduced, except in full, without the written approval of the lab.

Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422007
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	29-SEP-97 10:15	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B28
DESCRIPTION: 11-12'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: H. WILLIAMS Analysis Date: 08-OCT-97 07:13 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	145		% Rec
TOLUENE-D8	94		% Rec
4-BROMOFLUOROBENZENE	103		% Rec

BETX ONLY
Sample reanalyzed with no improvement in internal standard areas.
Sample reanalyzed with no improvement in surrogate recovery.

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52102.

This Certificate shall not be reproduced, except in full, without the written approval of the lab.

Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422008
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	29-SEP-97 13:25	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B29
DESCRIPTION: 9-10'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: H. WILLIAMS Analysis Date: 08-OCT-97 07:56 Instrument: GC/MS VOA Test: D510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	134		% Rec
TOLUENE-D8	102		% Rec
4-BROMOFLUOROBENZENE	109		% Rec

BETX ONLY
Sample reanalyzed with no improvement in surrogate recovery.
Sample reanalyzed with no improvement in internal standard areas.

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52102.

This Certificate shall not be reproduced, except in full, without the written approval of the lab.

Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422009
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	29-SEP-97 15:25	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B30
DESCRIPTION: 7-8'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: H. WILLIAMS Analysis Date: 08-OCT-97 08:40 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	135		% Rec
TOLUENE-D8	101		% Rec
4-BROMOFLUOROBENZENE	117		% Rec

BETX ONLY
Sample reanalyzed with no improvement in surrogate recovery.
Sample reanalyzed with no improvement in internal standard areas.

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52102.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422005
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	30-SEP-97 08:25	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B31
DESCRIPTION: 6-7'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: H. WILLIAMS Analysis Date: 08-OCT-97 09:23 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	140		% Rec
TOLUENE-D8	96		% Rec
4-BROMOFLUOROBENZENE	106		% Rec

BETX ONLY
Sample reanalyzed with no improvement in surrogate recovery.
Sample reanalyzed with no improvement in internal standard areas.

GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A

Analyst: T. DAHN Analysis Date: 07-OCT-97 09:00 Instrument: PREP Test: P236.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	32.30		Grams
FINAL VOLUME	5.0		mL

POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC SW846-8310

Analyst: T. DAHN Analysis Date: 07-OCT-97 20:46 Instrument: HPLC Test: 0630.0.0
Prep: GOG SONICATION EXTRACTION FOR ORGANICS SW846-3550A P236.2.0

Parameter	Result	Det. Limit	Units
NAPHTHALENE	BDL	4	ug/kg
ACENAPHTHYLENE	BDL	13	ug/kg
ACENAPHTHENE	BDL	2	ug/kg
FLUORENE	BDL	4	ug/kg
PHENANTHRENE	BDL	2	ug/kg
ANTHRACENE	BDL	4	ug/kg
FLUORANTHENE	BDL	3	ug/kg
PYRENE	BDL	2	ug/kg
BENZ(A)ANTHRACENE	BDL	2	ug/kg

 (continued on next page)

HERITAGE ENVIRONMENTAL SERVICES, INC. **Sample ID: A422005 B31**

Parameter	Result	Det. Limit	Units
CHRYSENE	BDL	4	ug/kg
BENZO(B)FLUORANTHENE	BDL	4	ug/kg
BENZO(K)FLUORANTHENE	BDL	3	ug/kg
BENZO(A)PYRENE	BDL	8	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	5	ug/kg
BENZO(G,H,I)PERYLENE	BDL	7	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	4	ug/kg
...			
SURROGATE RECOVERY			

2-FLUOROBIPHENYL	100		% Rec

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52102.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422010
	Complete	PO Number	
	10-OCT-97	79413	
	Printed	Sampled	
	14-OCT-97	30-SEP-97 11:50	

Report To	Bill To
KEVIN REINHARD HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60442	GLEN BORESI HERITAGE ENVIRONMENTAL SERVICES 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B34
DESCRIPTION: 7-8'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: H. WILLIAMS Analysis Date: 08-OCT-97 10:06 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	140		% Rec
TOLUENE-D8	92		% Rec
4-BROMOFLUOROBENZENE	117		% Rec

BETX ONLY
Sample reanalyzed with no improvement in surrogate recovery.
Sample reanalyzed with no improvement in internal standard areas.

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52102.

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Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-OCT-97		A422011
	Complete	PO Number	
	14-OCT-97	79413	
	Printed	Sampled	
	15-OCT-97	30-SEP-97 12:55	

Report To

KEVIN REINHARD
HERITAGE ENVIRONMENTAL SERVICES
15330 CANAL BANK RD.
LEMONT, IL 60439

Bill To

GLEN BORESI
HERITAGE ENVIRONMENTAL SERVICES
1319 MARQUETTE DRIVE
ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: B35
DESCRIPTION: 11-12'

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240B

Analyst: R. SHAMP Analysis Date: 09-OCT-97 06:12 Instrument: GC/MS VOA Test: 0510.9.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	2	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
TOLUENE	BDL	5	ug/kg
XYLENES (O/M/P-XYLENE)	BDL	5	ug/kg
...			
SURROGATE RECOVERY			

DICHLOROETHANE-D4	129		% Rec
TOLUENE-D8	96		% Rec
4-BROMOFLUOROBENZENE	102		% Rec

BETX ONLY
Sample reanalyzed with no improvement in surrogate recovery.
Sample reanalyzed with no improvement in internal standard areas.

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 52103.

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Approved : P.K. Spence

TO ENSURE PROPER HANDLING OF SAMPLES PLEASE COMPLETE THIS ENTIRE FORM

HERITAGE ENVIRONMENTAL SERVICES

COMMERCIAL LABORATORY OPERATIONS

7901 West Morris Street
Indianapolis, Indiana 46231 (317) 243-0811 Fax (317) 486-5095

I-60734

Co. Name: HERITAGE Environmental Services
Project Name: USN # 10319
Quote No.:
PO No.: 79413

ENVIRONMENTAL PROGRAM:
CWA NPDES ____ IWP ____ SLUDGE ____
RCRA MW ____ SW ____ DISPOSAL ____
SDWA ____ CERCLA/SUPERFUND ____ OTHER ____

Sampled by: Kevin Crandell

Analyses Requested (Note special detection limits or methods)

Report To:
Co: HERITAGE Environmental
Add: 15330 Canal Bank Rd.
Lemont IL 60439
Attn: Kevin Rienhard
Phone: (630) 739 1151

Accelerated Turnaround Requested ____ (Subject to Additional Charge)

Result Request by: ____ / ____ / ____ (Mo Day Yr) (Date must be Accepted and Approved by Lab)

Client ID:	Date:	Time:	Comp	Grab	Sample Description	Sample Type (Matrix): DW, GW, WW, Soil, Oil, Sludge, Other	No. of Containers	BETX (8240)	PNA (8310)								Remarks:	LAB Sample No.
P1	10/17/97	1700 AM/PM		X	Piezometer 1			X										
P2	10/17/97	1640 AM/PM		X	Piezometer 2			X	X									
P3	10/17/97	1630 AM/PM		X	Piezometer 3			X	X									
P4	10/17/97	1650 AM/PM		X	Piezometer 4			X										
		AM/PM																
		AM/PM																
		AM/PM																
		AM/PM																
		AM/PM																
		AM/PM																
		AM/PM																
		AM/PM																

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Kevin J Crandell	10/20/97 0800			/	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	/			/	
Relinquished by: (Signature)	Date/Time	Received for Lab by: (Signature)	Date/Time	Remarks	
	/		/		

Properly Preserved ____
Broken Bottles ____

Distribution: White original and Yellow copy to accompany sample to laboratory.
Pink copy to be retained by client.

UPS overnight # N2809543259

Rev. 6/95

TO ENSURE PROPER HANDLING OF SAMPLES PLEASE COMPLETE THIS ENTIRE FORM

HERITAGE ENVIRONMENTAL SERVICES

COMMERCIAL LABORATORY OPERATIONS

I- 52102

7901 West Morris Street
Indianapolis, Indiana 46231 (317) 243-0811 Fax (317) 486-5095

Co. Name: Heritage Environmental

Project Name: US Navy #10319

Quote No.: PO No.: 79413

ENVIRONMENTAL PROGRAM:

CWA NPDES _____ IWP _____ SLUDGE _____

RCRA MW _____ SW _____ DISPOSAL _____

SDWA _____ CERCLA/SUPERFUND _____ OTHER _____

Sampled by: Kevin J Crandell

Analyses Requested (Note special detection limits or methods)

Report To:
Co: Heritage Environmental
Add: 15330 Canal Bank Rd
Lemont IL 60439
Attn: Kevin Reinhard
Phone: (630) 739-1151

Accelerated Turnaround Requested _____ (Subject to Additional Charge)

Result Request by: ___/___/___ Mo Day Yr

(Date must be Accepted and Approved by Lab)

Client ID:	Date:	Time:	Comp	Grab	Sample Description	Sample Type (Matrix): DW, GW, WW, Soil, Oil, Sludge, Other	No. of Containers	BETX	PNA	TCLP Pb	TOTAL Pb						Remarks:	LAB Sample No.
B17	9/30/97	1030 AM PM		X	4-8'	Soil	2			X	X							
B19	9/26/97	0915 AM PM		X	6-7'		2	X	X									
B20	9/26/97	1130 AM PM		X	11-12'		1	X										
B23	9/26/97	1540 AM PM		X	7-8'		2	X	X									
B25	9/27/97	0830 AM PM		X	3-4'		2	X	X									
B26	9/27/97	1110 AM PM		X	7-8'		2	X	X									
B27	9/27/97	1330 AM PM		X	10-11'		2	X	X									
B28	9/29/97	1015 AM PM		X	11-12'		1	X										
B29	9/29/97	1325 AM PM		X	9-10'		1	X										
B30	9/29/97	1525 AM PM		X	7-8'		1	X										
B31	9/30/97	0825 AM PM		X	6-7'		2	X	X									
B34	9/30/97	1150 AM PM		X	7-8'		1	X										

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Kevin Crandell	10/1/97 / 1800			/	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	/			/	
Relinquished by: (Signature)	Date/Time	Received for Lab by: (Signature)	Date/Time	Remarks	
	/		/		

Properly Preserved _____

Broken Bottles _____

Distribution: White original and Yellow copy to accompany sample to laboratory. Pink copy to be retained by client.

UPS overnight # N2573486114

Rev. 6/95

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HERITAGE ENVIRONMENTAL SERVICES

COMMERCIAL LABORATORY OPERATIONS

7901 West Morris Street
Indianapolis, Indiana 46231 (317) 243-0811 Fax (317) 486-5095

I - 52103

Co. Name: HERITAGE Environmental

Project Name: US NAVY # 10319

Quote No.:

PO No.: 79413

ENVIRONMENTAL PROGRAM:

CWA NPDES _____ IWP _____ SLUDGE _____

RCRA MW _____ SW _____ DISPOSAL _____

SDWA _____ CERCLA/SUPERFUND _____ OTHER _____

Sampled by: Kevin J. Crandell

Analyses Requested (Note special detection limits or methods)

Report To:

Co: HERITAGE Environmental

Add: 15370 Canal Bank Rd
Lemont IL 60439

Attn: Kevin Reinhard

Phone: (630) 739-1151

Accelerated Turnaround Requested _____ (Subject to Additional Charge)

Result Request by: ____ / ____ / ____ (Mo Day Yr)

(Date must be Accepted and Approved by Lab)

Client ID:	Date:	Time:	Comp	Grab	Sample Description	Sample Type (Matrix): DW, GW, WW, Soil, Oil, Sludge, Other	No. of Containers	BETX	PNA	TCLP Pb	TOTAL Pb						Remarks:	LAB Sample No.
B35	9/30/97	1255 AM PM		X	11-12'	SOIL	1	X										
		AM PM																
		AM PM																
		AM PM																
		AM PM																
		AM PM																
		AM PM																
		AM PM																
		AM PM																
		AM PM																
		AM PM																
		AM PM																

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Kevin Crandell	10/1/97 1800			/	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	/			/	
Relinquished by: (Signature)	Date/Time	Received for Lab by: (Signature)	Date/Time	Remarks	
	/		/		

Properly Preserved _____

Broken Bottles _____

UPS overnight # N2753486114

Distribution: White original and Yellow copy to accompany sample to laboratory.
Pink copy to be retained by client.

Rev. 6/95

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HERITAGE ENVIRONMENTAL SERVICES

COMMERCIAL LABORATORY OPERATIONS

7901 West Morris Street
Indianapolis, Indiana 46231 (317) 243-0811 Fax (317) 486-5095

I - 52101

Co. Name: HERITAGE Environmental

Project Name: US NAVY # 10319

Quote No.: PO No.: 79413

ENVIRONMENTAL PROGRAM:

CWA NPDES _____ IWP _____ SLUDGE _____

RCRA MW _____ SW _____ DISPOSAL _____

SDWA _____ CERCLA/SUPERFUND _____ OTHER _____

Sampled by: Kevin Crandell

Analyses Requested (Note special detection limits or methods)

Report To:
Co: HERITAGE Environmental
Add: 15330 Canal Bank Rd
Lemont IL 60439

Attn: Kevin Reinhard
Phone: 630 379 1151

Accelerated Turnaround Requested _____ (Subject to Additional Charge)

Result Request by: ____ / ____ / ____ (Mo Day Yr)

(Date must be Accepted and Approved by Lab)

Client ID:	Date:	Time:	Comp	Grab	Sample Description	Sample Type (Matrix): DW, GW, WW, Soil, Oil, Sludge, Other	No. of Containers	BETX	PNAs	Remarks:	LAB Sample No.
B1	9/24/97	1030 AM/PM		X	7-8'	SOIL	2	X	X	Extract PNA on Receipt	
B2	9/24/97	1130 AM/PM		X	10-11'	SOIL	2	X	X		
B3	9/24/97	1245 AM/PM		X	5-6'	SOIL	2	X	X		
B6	9/24/97	1545 AM/PM		X	11-12'	SOIL	2	X	X		
B7	9/24/97	1600 AM/PM		X	12.5-13.5'	SOIL	2	X	X		
B8	9/25/97	0830 AM/PM		X	6-7'	SOIL	2	X	X	Extract PNA within 1 day of Receipt	
B9	9/25/97	0915 AM/PM		X	7.5-8.5'	SOIL	2	X	X		
B10	9/25/97	0945 AM/PM		X	5.5-6.5'	SOIL	2	X	X		
B12	9/25/97	1145 AM/PM		X	14-15'	SOIL	2	X	X		
B13	9/25/97	1340 AM/PM		X	6-7'	SOIL	2	X	X		
B14	9/25/97	1445 AM/PM		X	9.5-10.5	SOIL	2	X	X		
B18	9/26/97	0835 AM/PM		X	8-9'	SOIL	1	X		Extract PNA within 2 day of Receipt	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Kevin Crandell	9/29/97 0600			/	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	/			/	
Relinquished by: (Signature)	Date/Time	Received for Lab by: (Signature)	Date/Time	Remarks	
	/		/		

Properly Preserved _____

Broken Bottles _____

Distribution: White original and Yellow copy to accompany sample to laboratory. Pink copy to be retained by client.

Shipped UPS next day AM

Rev. 6/95

APPENDIX 7

Laboratory Certificates - Groundwater Samples

Recycled Paper

The Agency is authorized to require this information under Section 4 and Title XVI of the Environmental Protection Act (415 ILCS 5/4, 5/57 - 57.17). Failure to disclose this information may result in a civil penalty of not to exceed $50,000.00 for the violation and an additional civil penalty of not to exceed $10,000.00 for each day during which the violation continues (415 ILCS 5/42). Any person who knowingly makes a false material statement or representation in any label, manifest, record, report, permit, or license, or other document filed, maintained or used for the purpose of compliance with Title XVI commits a Class 4 felony. Any second or subsequent offense after conviction hereunder is a Class 3 felony (415 ILCS 5/57.17). This form has been approved by the Forms Management Center.

Illinois Environmental Protection Agency
Leaking Underground Storage Tank Program
Laboratory Certification for Chemical Analysis
(groundwater Samples)

A. Site Identification

IEMA Incident # (6 digit): _____ IEPA Generator # (10 digit): _____

Site Name: NAVY Public Works Center, Bldg. 1600A, RAY Street

Site Address (Not a P.O. Box): NAVAL TRAINING Center

City: GREAT LAKES, IL 60088 County: LAKE

B. Sample Collector

I certify that:

1. Appropriate sampling equipment/methods were utilized to obtain representative samples. KJC (initial)
2. Chain of custody procedures were followed in the field. KJC (initial)
3. Sample integrity was maintained by proper preservation. KJC (initial)
4. All samples were properly labeled. KJC (initial)

C. Laboratory Representative

I certify that:

1. Proper chain of custody procedures were followed as documented on the chain of custody forms. Cls (initial)
2. Sample integrity was maintained by proper preservation. Cls (initial)
3. All samples were properly labeled. Cls (initial)
4. Quality assurance/quality control procedures were established and carried out. Cls (initial)

5. Sample holding times were not exceeded. Cls (initial)

6. SW-846 Analytical Laboratory Procedure (USEPA) methods were used for the analyses. Cls (initial)

D. Signatures

I hereby affirm that all information contained in this form is true and accurate to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sample Collector	**Laboratory Representative**
Name: Kevin J. Crandell	Name: Christine Sarkan
Title: Project Geologist	Title: Quality Assurance Officer
Company: Heritage Environmental	Company: Heritage Environmental - CLO
Address: 15330 Canal Bank Rd.	Address: 15330 Canal Bank Rd
Lemont, IL 60439	Lemont IL 60439
Phone: (630) 739-1151	Phone: 630 739-1151
Signature: Kevin Crandell	Signature: Christine Sarkan
Date: 11/20/97	Date: 11/20/97

CERTIFICATE SUMMARY

Service Location	Received	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	21-OCT-97	A423666
	Complete	PO Number
	31-OCT-97	79413
	Printed	Sampled
	03-NOV-97	17-OCT-97 17:00

Report To	Bill To
HERITAGE ENVIRONMENTAL SERVICES KEVIN REINHARD 15330 CANAL BANK RD. LEMONT, IL 60439	HERITAGE ENVIRONMENTAL SERVICES GLEN BORESI 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: P1
DESCRIPTION: PIEZOMETER 1
PROJECT: USN #10319

ORGANICS

Method	Rep	Parameter	Analyzed	Result	Det. Limit	Units
SW846-8240B	0	BENZENE	102797	BDL	2	ug/L
SW846-8240B	0	ETHYL BENZENE	102797	BDL	5	ug/L
SW846-8240B	0	TOLUENE	102797	BDL	5	ug/L
SW846-8240B	0	XYLENES (O/M/P-XYLENE)	102797	BDL	5	ug/L

SURROGATE

Method	Rep	Parameter	Analyzed	Result	Det. Limit	Units
SW846-8240B	0	4-BROMOFLUOROBENZENE	102797	98		% Rec
SW846-8240B	0	DICHLOROETHANE-D4	102797	87		% Rec
SW846-8240B	0	TOLUENE-D8	102797	95		% Rec

Sample Comments

SW846-8240B.0 On this instrument, packed column has been replaced by capillary column SW846-8240B.0 with 8240 criteria.

BDL Below Detection Limit
This is a summary report.
Complete analytical information regarding analysts, methods and dates analyzed can be found in the Certificate of Analysis.

Approved By: _____

1. Agreement – [illegible] sign the Heritage Laboratory Services Quotation form and submit a [illegible] purchase order [illegible] samples constitutes acceptance and acknowledge[illegible] by Client to be [illegible]

2. Fees – Heritage [illegible] provide se[illegible] Quotation. Heritage reserves the right to change prices after providing Client [illegible]

3. Taxes – Prices do not include taxes. It is the Client's responsibility to provide documentation to Heritage if the Client is exempt from tax liability.

4. Payment – Invoices are payable on receipt. All outstanding balances unpaid after 30 days of Client's receipt of invoice [illegible] interest, either [illegible] the amount permissible under applicable law.

5. Samples – Sample [illegible] Heritage [illegible]. Heritage makes no guarantee nor representation as to chain-of-custody prior to acceptance by Heritage. Heritage will not be responsible for exceeded holding times if the samples are not promptly [illegible]. All samples delivered on the weekends or after hours must be [illegible] in advance.

6. Sample [illegible] the report of analysis is made. Sample [illegible]

7. Sample Analysis – Heritage uses analytical methods which conform with U.S. EPA, State agency, American Society for Testing & Materials, Association of Official Analytical Chemists, Standard Methods for the Examination of [illegible] Records of Heritage [illegible] Client.

8. Sample Reports – Heritage [illegible] provide a [illegible] report of the analytical services which will include test results, distinctive [illegible] analytical method references. Additional documentation and special reports are available upon request prior to sample delivery.

9. Confidentiality – Heritage [illegible] information to any third party, except [illegible] to obtain [illegible]

10. Additional or Different Tests – [illegible] necessary due to sample matrix interference, modified or [illegible] samples or any [illegible] of its acceptance of the sample, the Client [illegible] of the additional [illegible] the opportunity to agree to the additional work or return the sample.

11. Cancellation – If the [illegible] prepared and analyzed, the full fee [illegible] samples is delivered and accepted at the laboratory.

12. Indemnification – Client agrees to indemnify and hold harmless Heritage from all loss, damage, cost and expenses, including attorney fees from any suit, claim or action against Heritage or which names Heritage as a party because:

a. Heritage performed analysis or work for the Client;

b. of negligent acts, errors or omissions of the Client; or

c. [illegible]

Heritage's liability [illegible]

CERTIFICATE SUMMARY

Service Location	Received	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	21-OCT-97	A423667
	Complete 04-NOV-97	PO Number 79413
	Printed 05-NOV-97	Sampled 17-OCT-97 16:40

Report To	Bill To
HERITAGE ENVIRONMENTAL SERVICES KEVIN REINHARD 15330 CANAL BANK RD. LEMONT, IL 60439	HERITAGE ENVIRONMENTAL SERVICES GLEN BORESI 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: P2
DESCRIPTION: PIEZOMETER 2
PROJECT: USN #10319

ORGANICS

Method	Rep	Parameter	Analyzed	Result	Det. Limit	Units
SW846-8240B	0	BENZENE	102497	BDL	2	ug/L
SW846-8240B	0	ETHYL BENZENE	102497	BDL	5	ug/L
SW846-8240B	0	TOLUENE	102497	BDL	5	ug/L
SW846-8240B	0	XYLENES (O/M/P-XYLENE)	102497	BDL	5	ug/L
SW846-8310(M	0	ACENAPHTHENE	103097	BDL	0.16	ug/L
SW846-8310(M	0	ACENAPHTHYLENE	103097	BDL	0.40	ug/L
SW846-8310(M	0	ANTHRACENE	103097	BDL	0.08	ug/L
SW846-8310(M	0	BENZ(A)ANTHRACENE	103097	BDL	0.13	ug/L
SW846-8310(M	0	BENZO(A)PYRENE	103097	BDL	0.23	ug/L
SW846-8310(M	0	BENZO(B)FLUORANTHENE	103097	BDL	0.10	ug/L
SW846-8310(M	0	BENZO(G,H,I)PERYLENE	103097	BDL	0.20	ug/L
SW846-8310(M	0	BENZO(K)FLUORANTHENE	103097	BDL	0.06	ug/L
SW846-8310(M	0	CHRYSENE	103097	BDL	0.05	ug/L
SW846-8310(M	0	DIBENZ(A,H)ANTHRACENE	103097	BDL	0.13	ug/L
SW846-8310(M	0	FLUORANTHENE	103097	BDL	0.08	ug/L
SW846-8310(M	0	FLUORENE	103097	BDL	0.13	ug/L
SW846-8310(M	0	INDENO(1,2,3-CD)PYRENE	103097	BDL	0.13	ug/L
SW846-8310(M	0	NAPHTHALENE	103097	BDL	0.16	ug/L
SW846-8310(M	0	PHENANTHRENE	103097	BDL	0.16	ug/L
SW846-8310(M	0	PYRENE	103097	BDL	0.08	ug/L

SURROGATE

Method	Rep	Parameter	Analyzed	Result	Det. Limit	Units
SW846-8240B	0	4-BROMOFLUOROBENZENE	102497	90		% Rec
SW846-8240B	0	DICHLOROETHANE-D4	102497	86		% Rec
SW846-8240B	0	TOLUENE-D8	102497	92		% Rec

[illegible]

1. Agreement – To initiate services, Client must sign the Heritage Laboratory Inc. Quotation form and submit a written purchase order. Submittal of a purchase order to the sample constitutes acceptance and acknowledgement by Client to be bound by the Agreement.

2. Fees – Heritage shall provide services at the rates stated in the quotation. Heritage reserves the right to change prices after providing Client with a 30 day written notice.

3. Taxes – Prices do not include taxes. It is the Client's responsibility to provide documentation to Heritage if the Client is exempt from tax liability.

4. Payment – Invoices are payable on receipt. All outstanding invoices unpaid after 30 days of Client's receipt of invoices are subject to interest, either [illegible] per [illegible] and permissible under applicable law.

5. Samples – Samples delivered to Heritage by others are taken [illegible] Heritage makes no guarantee nor representation as to chain-of-custody prior to acceptance by Heritage. Heritage will not be responsible for exceeded holding times if the samples are not promptly delivered. All samples delivered on the weekends or after hours must be scheduled in advance.

6. [illegible] analysis is made. Samples spoiling beyond 15 days is [illegible]

7. Sample Analysis – Heritage uses analytical methods which conform with U.S. EPA, State agency, American Society for Testing & Materials, Association of Official Analytical Chemists, Standard Methods for the Examination of Water and Wastewater or other [illegible] methodologies [illegible] Heritage [illegible] methods.

8. Sample Reports – Heritage will provide a written report of the results of its services which will include the sample's identification, date of analyses, the analyst, and the official method references. Additional documentation and special reports are available but must be arranged prior to sample delivery.

9. Confidentiality – Heritage shall not disclose results or confidential information to any third party, except as required by law. Heritage shall have no obligation to [illegible] any legal [illegible] to obtain laboratory test results or confidential information.

10. Additional or Different Tasks – If additional analytical testing is necessary due to sample matrix interference, multi-phase samples or any factor not disclosed to Heritage prior to the acceptance of the sample, the Client will be notified of the additional cost and will be given the opportunity to agree to the additional work or return of the sample.

11. Cancellation – If the Client cancels its order after the sample has been prepped and analyzed, the full fee in Heritage's quotation will apply. A $25 cancellation fee will apply if a sample is delivered and accepted at the laboratory.

12. Indemnification – Client agrees to indemnify and hold harmless Heritage from all loss, damage, cost and expenses, including attorney fees from any suit, claim or action against Heritage or which names Heritage as a party because:

a. Heritage performed analysis or work for the Client;

b. of negligent acts, errors or omissions of the Client; or

c. of Client's failure to perform its obligations under this Agreement.

Heritage's liability [illegible] with the performance of the work shall be limited to the [illegible] of the work [illegible] Heritage.

HERITAGE ENVIRONMENTAL SERVICES, INC. Lab Sample ID: A423667

Method	Rep	Parameter	Analyzed	Result	Det. Limit	Units
SW846-8310(M	0	2-FLUOROBIPHENYL	103097	94		% Rec

Sample Comments

SW846-8240B.0 On this instrument, packed column has been replaced by capillary column SW846-8240B.0 with 8240 criteria.

BDL Below Detection Limit
This is a summary report.
Complete analytical information regarding analysts, methods and dates analyzed can be found in the Certificate of Analysis.

Approved By:

LABORATORY SERVICES
TERMS & CONDITIONS

1. Agreement – To initiate services, Client must sign the Heritage Laboratory Services Quotation form and submit a written purchase order. Submittal of a purchase order or order samples constitutes acceptance and acknowledgement by Client to be bound by this Agreement.

2. Fees – Heritage shall provide services at the prices stated in the Quotation. Heritage reserves the right to change prices after providing Client with a 30 day notification.

3. Taxes – Prices do not include taxes. It is the Client's responsibility to provide documentation to Heritage if the Client is exempt from tax liability.

4. Payment – Invoices are payable on receipt. All outstanding balances unpaid after 30 days of Client's receipt of invoices are subject to interest [illegible] or the maximum permissible under applicable law.

5. Samples – Samples delivered to Heritage by other [illegible] guarantee nor representation as to chain-of-custody prior to acceptance by Heritage. Heritage [illegible] responsible for exceeded holding times if the samples are not promptly delivered. All samples delivered on the weekends or after hours must be scheduled in advance.

6. Sample Retention – Samples and sample derivatives [illegible] analysis is made. Sample storage beyond 15 days is available at [illegible]

7. Sample Analysis – Heritage uses analytical methods which conform with U.S. EPA, state agency, American Society for Testing & Materials, Association of Official Analytical Chemists, Standard Methods for the Examination of Water and Wastewater or other [illegible] Heritage [illegible] including the [illegible] Client.

[illegible] Heritage will process a [illegible] limits, dates of [illegible] all reports are a [illegible]

[illegible] shall be [illegible] confidential [illegible]

10. Additional or Difficult Tasks – If additional analytical [illegible] interferences, multi-phase samples or any factor not disclosed to Heritage [illegible] of the sample, the Client will be notified of the additional cost and [illegible] agree to the additional work or return of the sample.

11. Cancellation – If the Client cancels its order after the sample has been prepared [illegible] the full fee in Heritage's quotation will apply. A $25 cancellation fee will apply if a sample [illegible] not accepted at the laboratory.

12. Indemnification – Client agrees to indemnify and hold harmless Heritage from all loss, damage, cost and expenses, including attorney fees from any suit, claim or action against Heritage or which names Heritage as a party because:

a. Heritage performed analysis or work for the Client;

b. of negligent acts, errors or omissions of the Client; or

c. of Client's failure to perform its obligations under this Agreement.

Heritage's liability associated with the performance of the work shall be limited to the [illegible] the work [illegible] the Client.

CERTIFICATE SUMMARY

Service Location	Received	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	21-OCT-97	A423668
	Complete	PO Number
	04-NOV-97	79413
	Printed	Sampled
	05-NOV-97	17-OCT-97 16:30

Report To	Bill To
HERITAGE ENVIRONMENTAL SERVICES KEVIN REINHARD 15330 CANAL BANK RD. LEMONT, IL 60439	HERITAGE ENVIRONMENTAL SERVICES GLEN BORESI 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: P3
DESCRIPTION: PIEZOMETER 3
PROJECT: USN #10319

ORGANICS

Method	Rep	Parameter	Analyzed	Result	Det. Limit	Units
SW846-8240B	0	BENZENE	102497	*	2	ug/L
SW846-8240B	0	ETHYL BENZENE	102497	41	5	ug/L
SW846-8240B	0	TOLUENE	102497	*	5	ug/L
SW846-8240B	0	XYLENES (O/M/P-XYLENE)	102497	190	5	ug/L
SW846-8240B	1	BENZENE	102797	300	20	ug/L
SW846-8240B	1	ETHYL BENZENE	102797	BDL	50	ug/L
SW846-8240B	1	TOLUENE	102797	430	50	ug/L
SW846-8240B	1	XYLENES (O/M/P-XYLENE)	102797	190	50	ug/L
SW846-8310(M	0	ACENAPHTHENE	103097	BDL	0.16	ug/L
SW846-8310(M	0	ACENAPHTHYLENE	103097	BDL	0.40	ug/L
SW846-8310(M	0	ANTHRACENE	103097	BDL	0.08	ug/L
SW846-8310(M	0	BENZ(A)ANTHRACENE	103097	BDL	0.13	ug/L
SW846-8310(M	0	BENZO(A)PYRENE	103097	BDL	0.23	ug/L
SW846-8310(M	0	BENZO(B)FLUORANTHENE	103097	BDL	0.10	ug/L
SW846-8310(M	0	BENZO(G,H,I)PERYLENE	103097	BDL	0.20	ug/L
SW846-8310(M	0	BENZO(K)FLUORANTHENE	103097	BDL	0.06	ug/L
SW846-8310(M	0	CHRYSENE	103097	BDL	0.05	ug/L
SW846-8310(M	0	DIBENZ(A,H)ANTHRACENE	103097	BDL	0.13	ug/L
SW846-8310(M	0	FLUORANTHENE	103097	BDL	0.08	ug/L
SW846-8310(M	0	FLUORENE	103097	BDL	0.13	ug/L
SW846-8310(M	0	INDENO(1,2,3-CD)PYRENE	103097	BDL	0.13	ug/L
SW846-8310(M	0	NAPHTHALENE	103097	6.4	0.16	ug/L
SW846-8310(M	0	PHENANTHRENE	103097	BDL	0.16	ug/L
SW846-8310(M	0	PYRENE	103097	BDL	0.08	ug/L

SURROGATE

Method	Rep	Parameter	Analyzed	Result	Det. Limit	Units
SW846-8240B	0	4-BROMOFLUOROBENZENE	102497	93		% Rec

[illegible]
[illegible]

1. Agreement -- To initiate services, Client must sign the Heritage [illegible] form and submit a [illegible] purchase order. [illegible] acceptance and acknowledgment by Client to [illegible].

2. Fees -- Heritage shall provide services at the price stated at [illegible] reserves the right to change prices after providing Client [illegible].

3. Taxes -- Prices do not include taxes. It is the Client's responsibility [illegible] documentation to Heritage if the Client is exempt from tax liability.

4. Payment -- Invoices are payable on receipt. All [illegible] unpaid after 30 days of Client's [illegible] invoices are subject to interest, either [illegible] permissible under applicable law.

5. Sampling -- Samples delivered to Heritage by others are taken [illegible] guarantee nor representation as to chain-of-custody prior to acceptance by Heritage. Heritage will not be responsible for exceeded holding times if the samples are not promptly delivered. All samples [illegible] the weekends or after hours must be scheduled in advance.

6. Sample Acceptance -- Samples [illegible] analysis is [illegible] sample storage beyond [illegible] available at extra cost.

7. Sample Analysis -- Heritage uses analytical methods which conform with U.S. EPA, State agency, American Society for Testing & Materials, Association of Official Analytical Chemists, Standard Methods for the Examination of Water and [illegible] Heritage [illegible] services.

8. Sample Results -- Heritage shall provide a written report [illegible] will include test results, detection limits, dates of analyses, the analytical and analytical method references. Additional documentation and special reports are available [illegible] prior to sample delivery.

9. Confidentiality -- Heritage shall not disclose results [illegible] to any third party, except when required by law. Heritage shall have no obligation to appear [illegible] proceeding taken to obtain mandatory test results or [illegible].

10. Additional or Different Tests -- If additional analytical testing is necessary due to sample matrix interference, multi-phase samples or any factor not disclosed to Heritage prior to its acceptance of the sample, the Client will be notified of the additional cost and will be given the opportunity to agree to the additional work or return of the sample.

11. Cancellation -- If the Client cancels its order after the sample has been prepped and analyzed, the full fee in Heritage's quotation will apply. A $25 cancellation fee will apply if a sample is delivered and accepted at the laboratory.

12. Indemnification -- Client agrees to indemnify and hold harmless Heritage from all loss, damage, cost and expenses, including attorney fees from any suit, claim or action against Heritage or which names Heritage as a party because:

    a. Heritage performed analysis or work for the Client;

    b. of negligent acts, errors or omissions of the Client; or

    c. of Client's failure to perform its obligations under this Agreement.

Heritage's liability arising from the performance of the work shall be limited to the percentage of the work [illegible]

HERITAGE ENVIRONMENTAL SERVICES, INC. Lab Sample ID: A423668

Method	Rep	Parameter	Analyzed	Result	Det. Limit	Units
SW846-8240B	0	DICHLOROETHANE-D4	102497	87		% Rec
SW846-8240B	0	TOLUENE-D8	102497	94		% Rec
SW846-8240B	1	4-BROMOFLUOROBENZENE	102797	97		% Rec
SW846-8240B	1	DICHLOROETHANE-D4	102797	89		% Rec
SW846-8240B	1	TOLUENE-D8	102797	95		% Rec
SW846-8310(M	0	2-FLUOROBIPHENYL	103097	94		% Rec

Sample Comments

SW846-8240B.0 Dilution necessary due to high concentration of target compounds.
SW846-8240B.0 On this instrument, packed column has been replaced by capillary column
SW846-8240B.0 with 8240 criteria.
*SW846-8240B.0 Note: * Above linear range -- please see replicate 1.*
SW846-8240B.0 pH = 7
SW846-8240B.1 1:10 Dilution necessary due to high concentration of target compounds.
SW846-8240B.1 On this instrument, packed column has been replaced by capillary column
SW846-8240B.1 with 8240 criteria.

** See Note for Parameter*
BDL Below Detection Limit
This is a summary report.
Complete analytical information regarding analysts, methods and dates analyzed can be found in the Certificate of Analysis.

Approved By: _____

LABORATORY SERVICES
TERMS & CONDITIONS

1. Agreement – To initiate services, Client must [illegible] Heritage Laboratory Services Quotation form and submit a written purchase order. Submittal of [illegible] samples constitutes acceptance and [illegible] by Client to be bound by this [illegible]

2. Fees – Heritage shall provide services at the prices stated in its Quotation. Heritage reserves the right to change prices after providing Client with a 30 day notification.

3. Taxes – Prices do not include taxes. It is the Client's responsibility to provide documentation to Heritage if the Client is exempt from tax liability.

4. Payment – Invoices are payable on receipt. All outstanding balances unpaid [illegible] 30 days of Client's receipt of invoices are subject to interest, [illegible] 1.5% per month or [illegible] permissible under applicable law.

5. Samples – Samples delivered to Heritage [illegible] Client. [illegible] no guarantee nor representation as to chain-of-custody prior to acceptance by Heritage. Heritage will not be responsible for exceeded hold time times if the samples are not promptly delivered. All samples received on the weekends or other hours can be scheduled in advance.

6. Sample Retention – Samples and sample [illegible] days after [illegible] of analysis is [illegible] Heritage [illegible]

7. Sample Analysis – Heritage uses analytical methods which conform with U.S. EPA, State agency, American Society for Testing & Materials, Association of Official Analytical Chemists, Standard Methods for the [illegible] Water and Wastewater [illegible]

8. [illegible]

9. Additional or Extraneous Tests – If additional [illegible] samples or any [illegible] the sample, the Client will be notified of the additional cost and [illegible] additional work or return of the sample.

10. Cancellation – If the Client cancels an order [illegible] apply. A $25 [illegible] the laboratory.

12. Indemnification – Client agrees to indemnify and hold harmless Heritage from all loss, damage, cost and expenses, including attorney fees from any suit, claim or action against Heritage or which involves Heritage as a party because:

a. Heritage's performed analysis or work [illegible]

b. [illegible] of negligent acts, errors or omissions on [illegible]

c. Client's failure to perform its obligations [illegible]

Client [illegible] in connection with the performance [illegible] Heritage [illegible]

CERTIFICATE SUMMARY

Service Location	Received	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	21-OCT-97	A423669
	Complete 31-OCT-97	PO Number 79413
	Printed 03-NOV-97	Sampled 17-OCT-97 16:50

Report To	Bill To
HERITAGE ENVIRONMENTAL SERVICES KEVIN REINHARD 15330 CANAL BANK RD. LEMONT, IL 60439	HERITAGE ENVIRONMENTAL SERVICES GLEN BORESI 1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441

Sample Description

CLIENT ID: P4
DESCRIPTION: PIEZOMETER 4
PROJECT: USN #10319

ORGANICS

Method	Rep	Parameter	Analyzed	Result	Det. Limit	Units
SW846-8240B	0	BENZENE	102797	9	2	ug/L
SW846-8240B	0	ETHYL BENZENE	102797	BDL	5	ug/L
SW846-8240B	0	TOLUENE	102797	BDL	5	ug/L
SW846-8240B	0	XYLENES (O/M/P-XYLENE)	102797	BDL	5	ug/L

SURROGATE

Method	Rep	Parameter	Analyzed	Result	Det. Limit	Units
SW846-8240B	0	4-BROMOFLUOROBENZENE	102797	95		% Rec
SW846-8240B	0	DICHLOROETHANE-D4	102797	88		% Rec
SW846-8240B	0	TOLUENE-D8	102797	97		% Rec

Sample Comments

SW846-8240B.0 On this instrument, packed column has been replaced by capillary column SW846-8240B.0 with 8240 criteria.

BDL Below Detection Limit
This is a summary report.
Complete analytical information regarding analysts, methods and dates analyzed can be found in the Certificate of Analysis.

Approved By: _____

1. [illegible] Quotation form and [illegible] acceptance and acknowledgment [illegible]

2. Fees – Heritage [illegible] provide [illegible] Quotation. Heritage reserves the right to change prices [illegible] providing Client [illegible]

3. Terms – Payment [illegible] Client's [illegible] will be to provide documentation to Heritage if the Client [illegible]

4. Interest – Invoices are payable on receipt. All [illegible] invoices unpaid after 30 days of Client's [illegible] interest, [illegible] the amount permissible under applicable law.

5. Samples – [illegible] Heritage [illegible] makes no guarantee nor representation [illegible] Heritage will not be responsible for [illegible] not providing [illegible] the results [illegible]

6. [illegible] the report of analysis is [illegible]

7. Sample Analysis – Heritage uses analytical methods which conform with U.S. EPA, State agency, American Society for Testing & Materials, Association of Official Analytical Chemists, Standard Methods for the [illegible] Heritage [illegible]

8. [illegible]

9. [illegible]

10. [illegible] Heritage prior to its acceptance of the [illegible] agree to the [illegible]

11. [illegible] the full fee [illegible]

12. Indemnification – Client agrees to and hereby indemnifies and holds harmless Heritage from all loss, damage, cost and expenses, including attorney's fees, any suit, claim or action against Heritage or which names Heritage as a [illegible]

[illegible]

Heritage [illegible]

TO ENSURE PROPER HANDLING OF SAMPLES PLEASE COMPLETE THIS ENTIRE FORM

HERITAGE ENVIRONMENTAL SERVICES

COMMERCIAL LABORATORY OPERATIONS

7901 West Morris Street
Indianapolis, Indiana 46231 (317) 243-0811 Fax (317) 486-5095

I-60734

11/20/97 12:23 FAX

Co. Name: Heritage Environmental Services
Project Name: USN # 10319
Quote No.:
PO No.: 794/13

ENVIRONMENTAL PROGRAM:
CWA NPDES ____ IWP ____ SLUDGE ____
RCRA MW ____ SW ____ DISPOSAL ____
SDWA ____ CERCLA/SUPERFUND ____ OTHER ____

Sampled by: Kevin Crandell

Analyses Requested (Note special detection limits or methods)

Report To:
Co: Heritage Environmental
Add: 15330 Canal Bank Rd.
Lemont IL 60439
Attn: Kevin Riemland
Phone: (630) 739 1151
Accelerated Turnaround Requested ____ (Subject to Additional Charge)
Result Request by: ___/___/___ Mo Day Yr
(Date must be Accepted and Approved by Lab)

Client ID:	Date:	Time:	Comp	Grab	Sample Description	Sample Type (Matrix): DW, GW, WW, Soil, Oil, Sludge, Other	No. of Containers	BETX (8240)	PNA (8310)	Remarks:	LAB Sample No.
P1	10/17/97	1700 AM PM		X	Piezometer 1			X			A423666
P2	10/17/97	1640 AM PM		X	Piezometer 2			X	X		667
P3	10/17/97	16:30 AM PM		X	Piezometer 3			X	X		668
P4	10/17/97	1650 AM PM		X	Piezometer 4			X			669
		AM PM									
		AM PM									
		AM PM									
		AM PM									
		AM PM									
		AM PM									
		AM PM									
		AM PM									

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Kevin J Crandell	10/20/97 0800			/	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	/			/	
Relinquished by: (Signature)	Date/Time	Received for Lab by: (Signature)	Date/Time	Remarks	
	/	Victor Hunter	10/21/97 12:35 pm		

Properly Preserved ____
Broken Bottles ____

Distribution: White original and Yellow copy to accompany sample to laboratory.
Pink copy to be retained by client.

UPS overnight # N280 9543259

Rev. 6/95

02

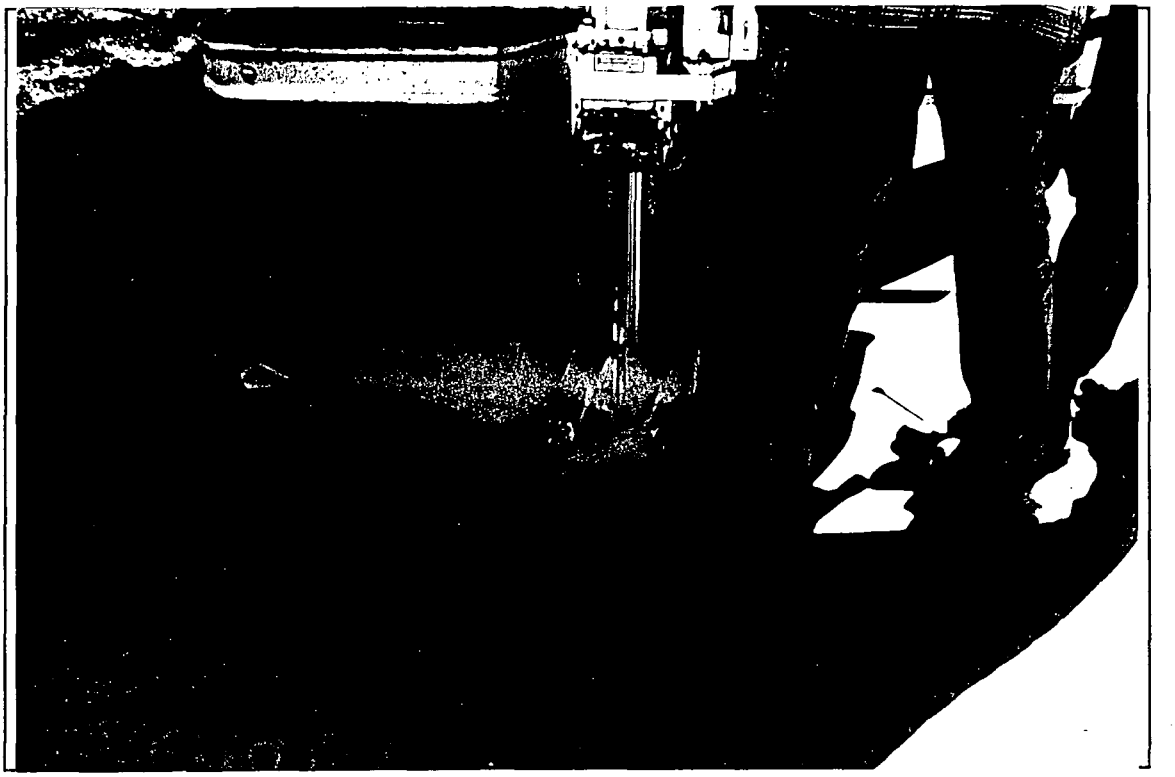
APPENDIX 8

Photographs

Recycled Paper

PHOTOGRAPH 1 (ABOVE): View of soil boring locations along east side of Building 1600A (red flags).

PHOTOGRAPH 2 (BELOW): View of soil boring locations east of fenceline and west of railroad tracks (red flags).

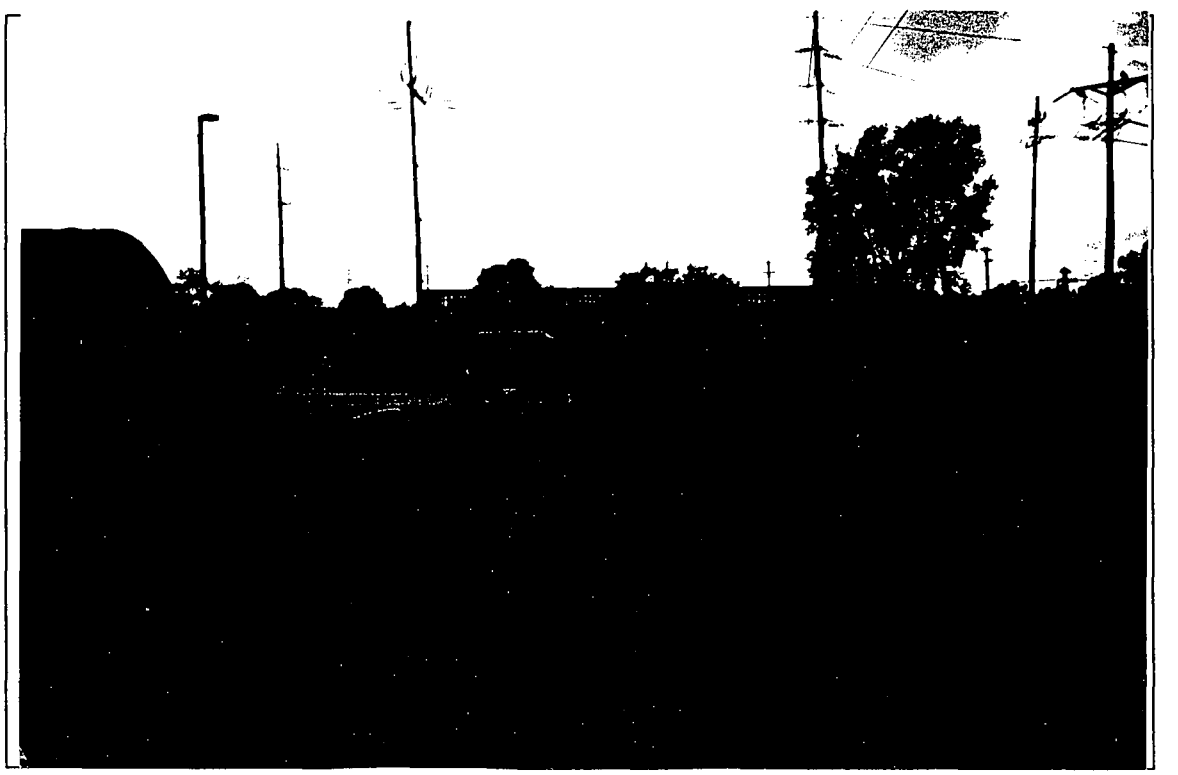


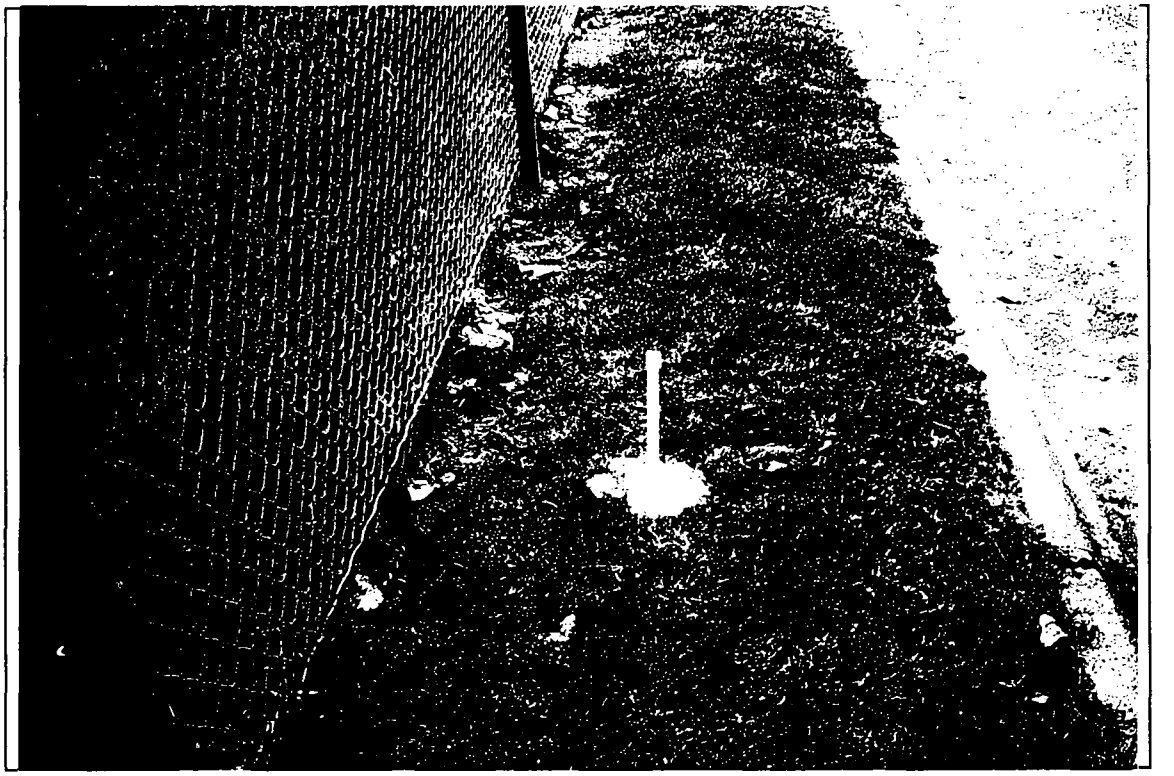
PHOTOGRAPH 3 (ABOVE): View of hydraulic push soil sampling equipment in operation.

PHOTOGRAPH 4 (BELOW): View of soil sample tube during removal from soil boring.

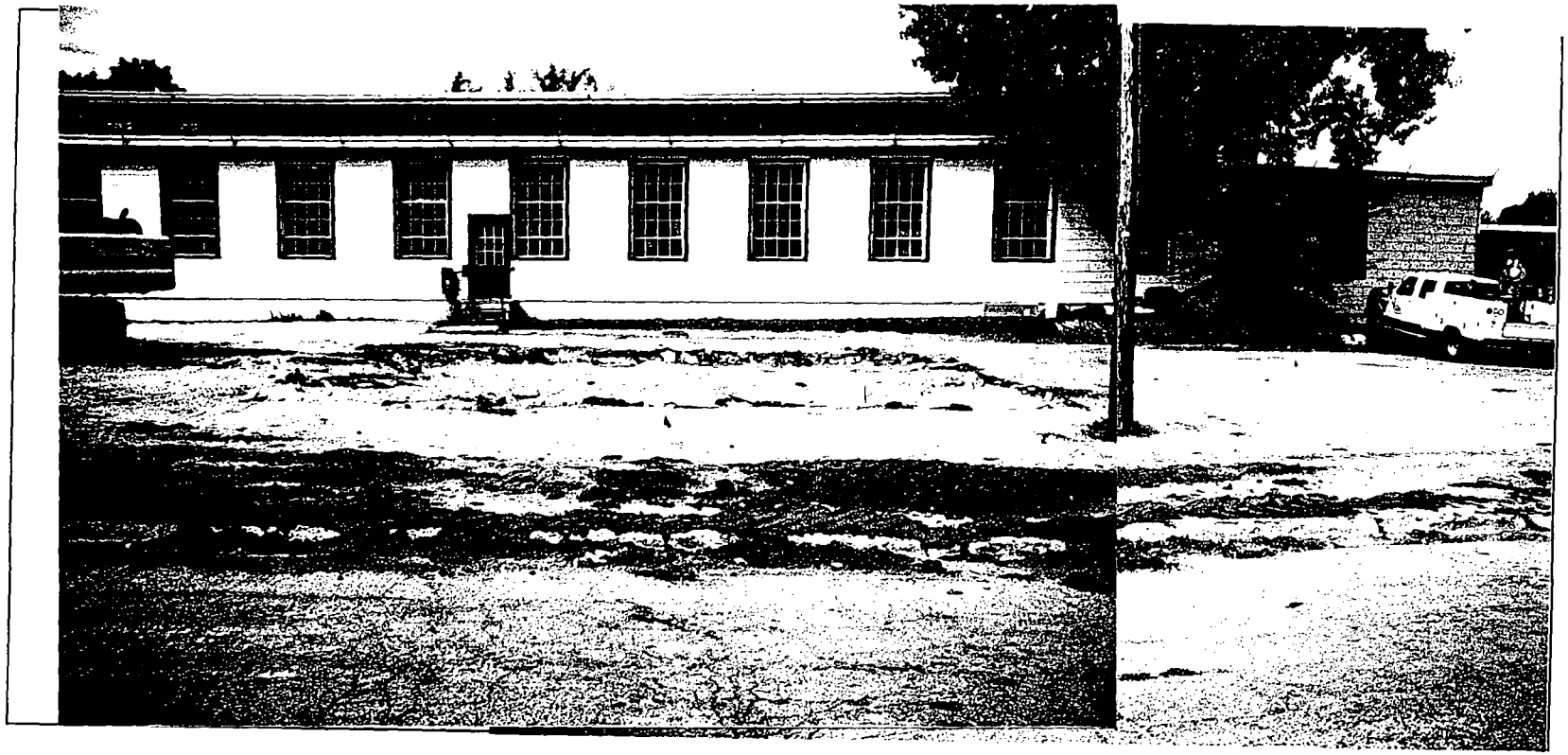
PHOTOGRAPH 5 (ABOVE): View of soil boring locations east of railroad tracks (Building 1600A can be seen in background).

PHOTOGRAPH 6 (BELOW) View from soil boring at far east end of investigation limit. Building 1600A can be seen in background.

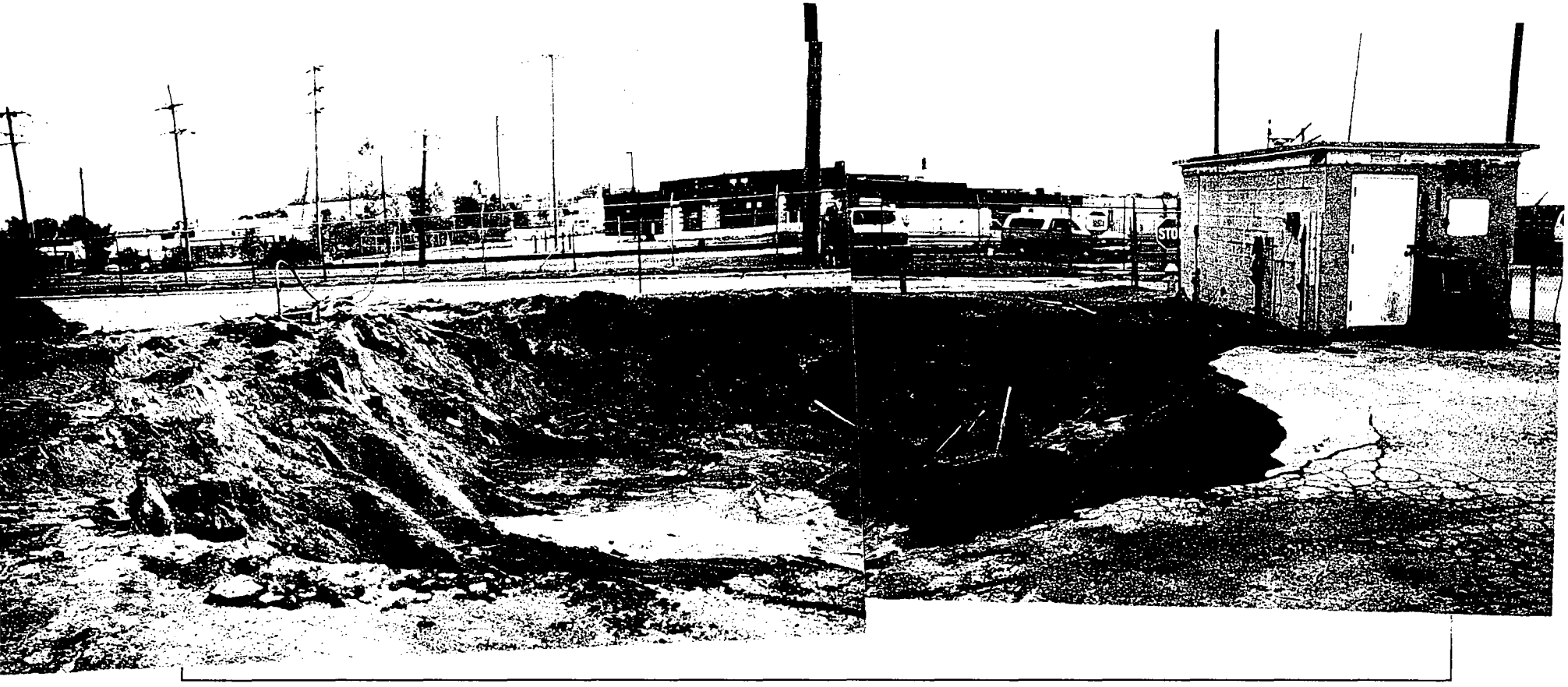




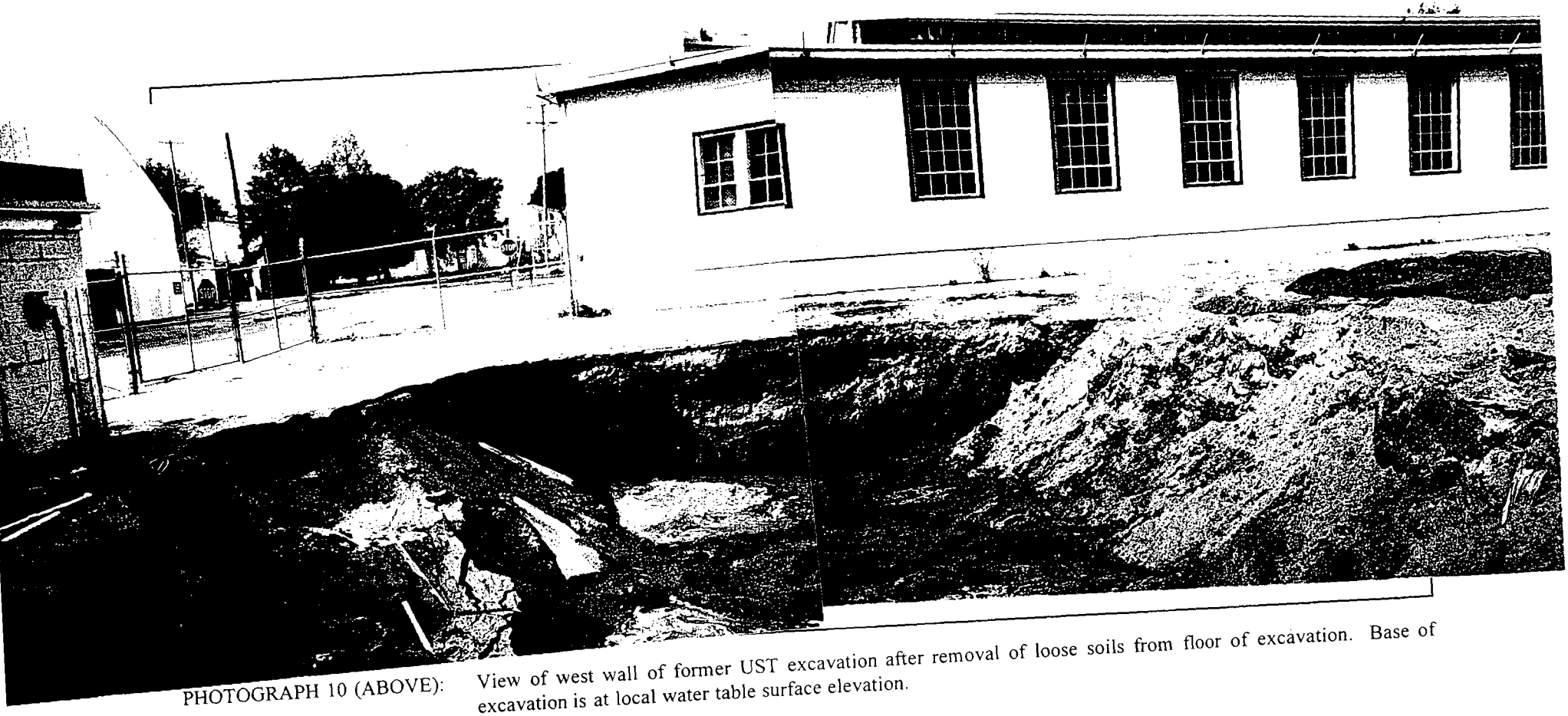
PHOTOGRAPH 7 (ABOVE): Typical view of piezometer installed at site.



PHOTOGRAPH 8 (ABOVE): View looking west at Building 1600A. Former fuel dispenser island area was located in area of surface excavation (center of photo).



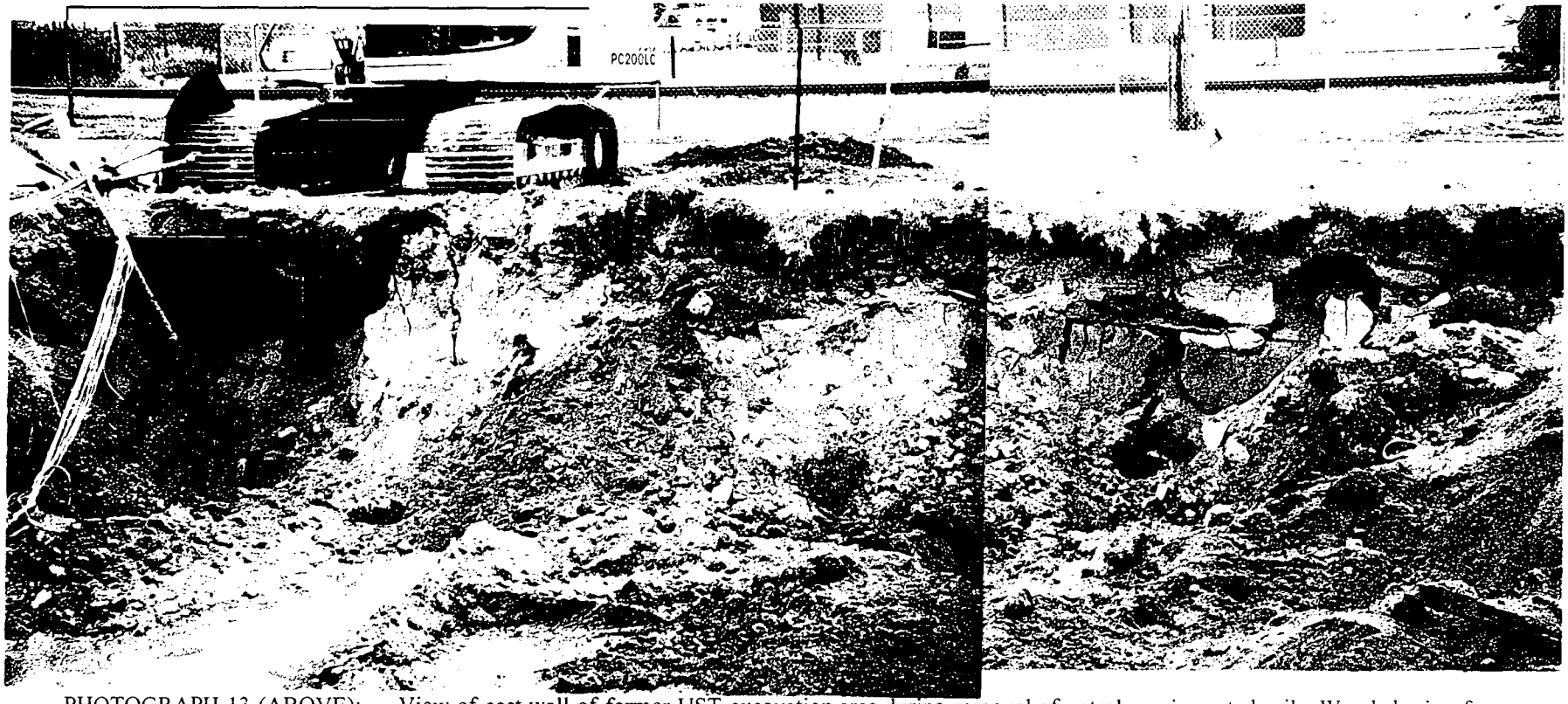
PHOTOGRAPH 9 (ABOVE): View looking east at east wall of former UST location. View after removal of loose soils from floor of UST excavation area. IPC van can be seen in background performing soil borings east of fenceline.



PHOTOGRAPH 10 (ABOVE): View of west wall of former UST excavation after removal of loose soils from floor of excavation. Base of excavation is at local water table surface elevation.

PHOTOGRAPH 11 (ABOVE): View of wooden shoring along south wall of UST excavation area (left of center). Flagging marks stormwater utility location.

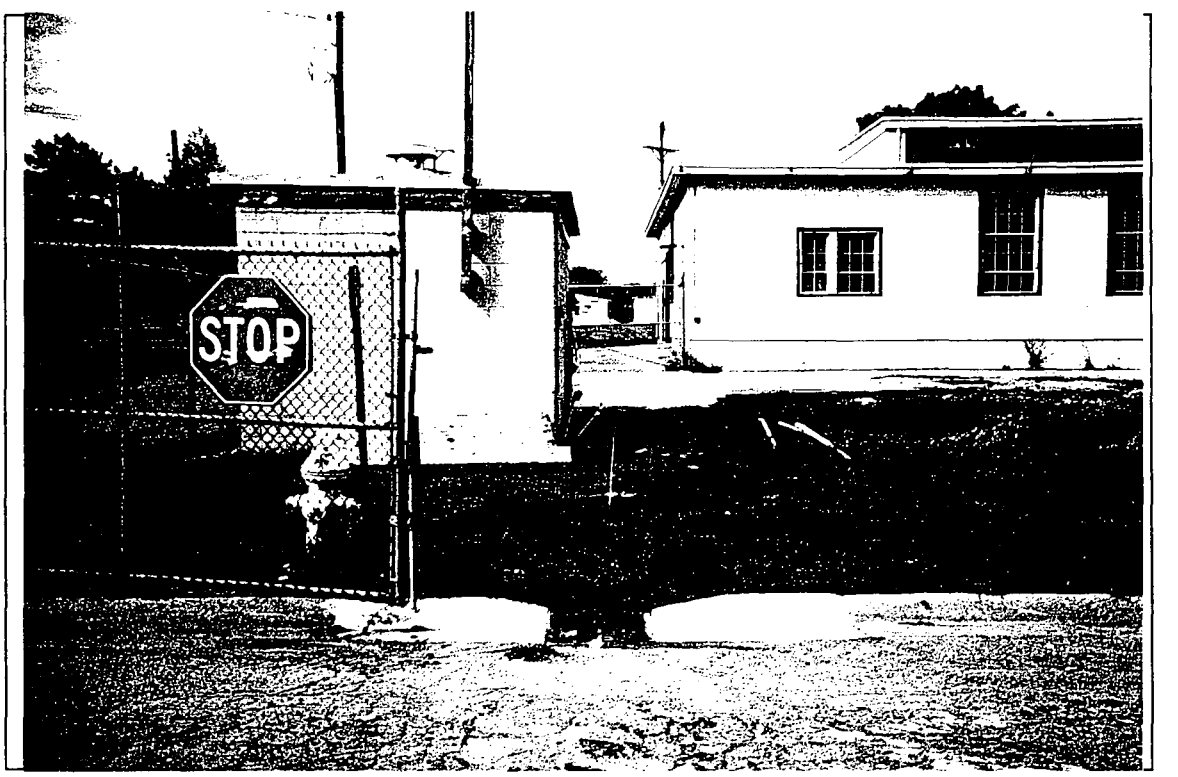
PHOTOGRAPH 12 (BELOW): View looking north along east wall of UST excavation and along buried water utility (blue flagging).



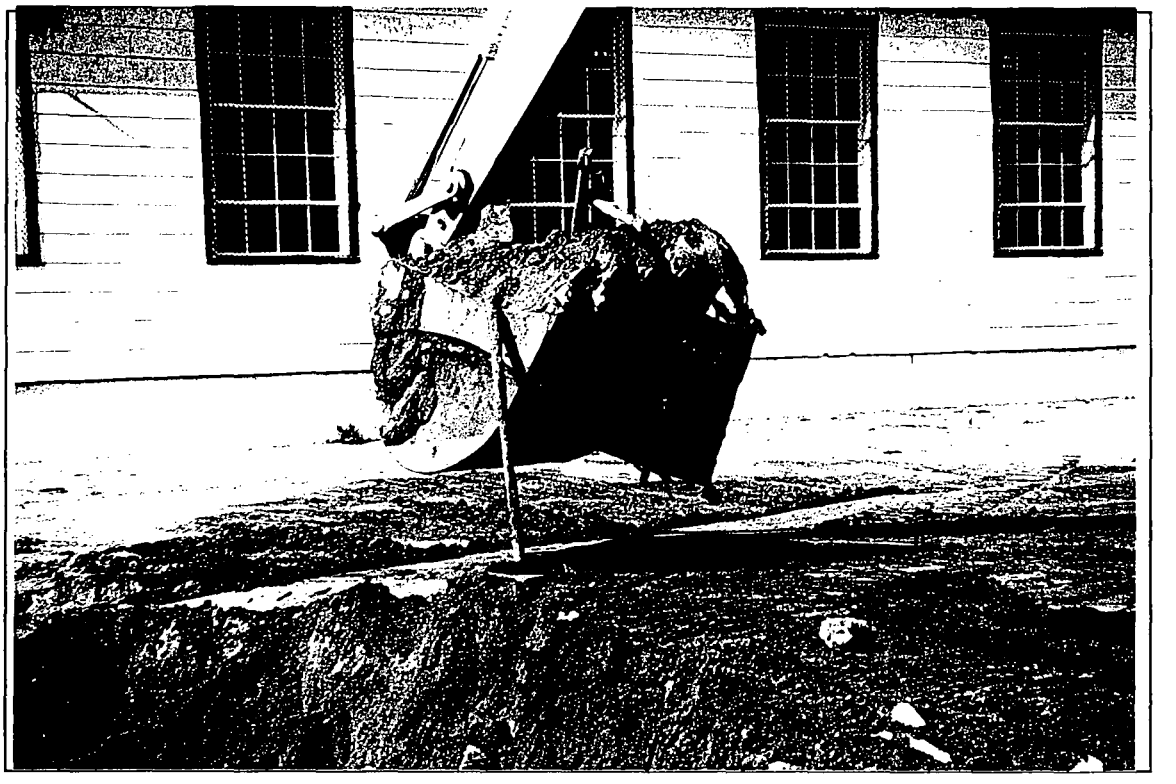
PHOTOGRAPH 13 (ABOVE): View of east wall of former UST excavation area during removal of petroleum impacted soil. Wood shoring for water utility can be seen at left.

PHOTOGRAPH 14 (ABOVE): View looking west at south end of Building 1600A. Stormwater drain (outfall) can be seen in lower foreground.

PHOTOGRAPH 15 (BELOW): Close up view of stormwater utility near excavation area.

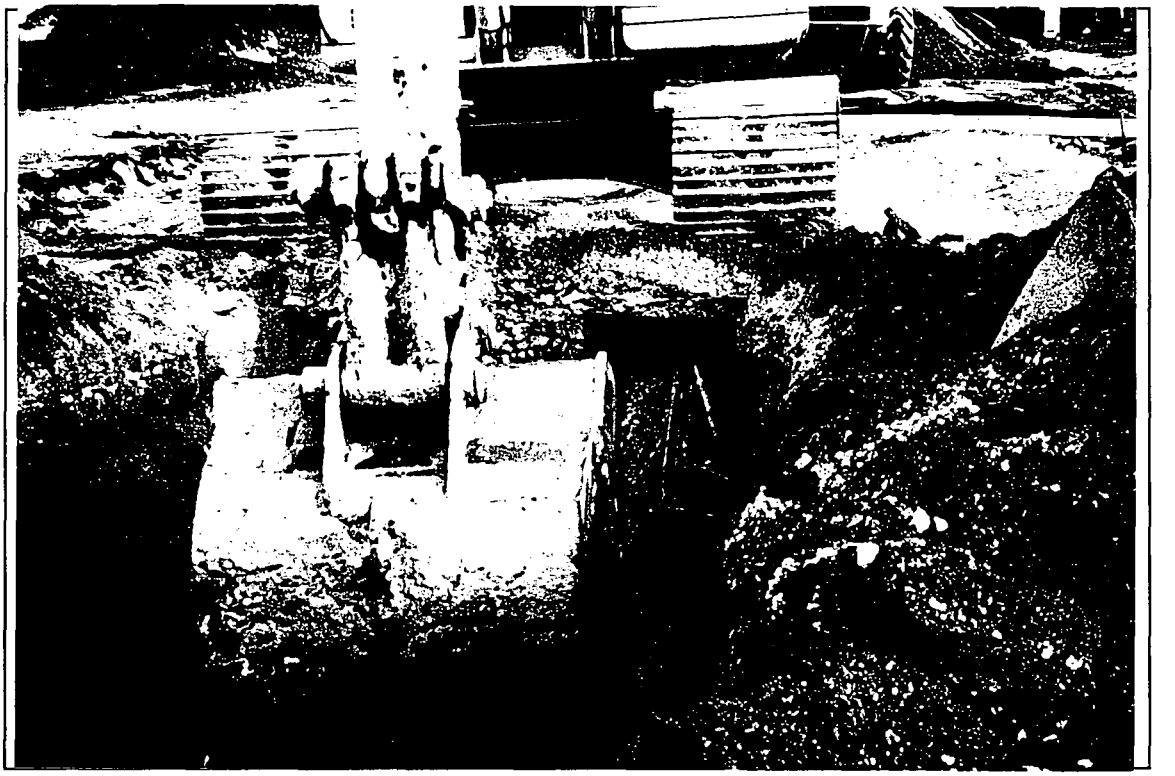


PHOTOGRAPH 16 (ABOVE): View looking north at north wall of UST removal area. Excavation of soils from former dispenser pipeline trench area underway in background.



PHOTOGRAPH 17 (ABOVE): View of oil 55 gallon steel drum removed from former UST excavation area.

PHOTOGRAPH 18 (BELOW): View of oil (foundation?) concrete wall encountered during excavation of west dispenser pipeline run. View is looking west at west wall of excavation trench.



PHOTOGRAPH 19 (ABOVE): View of west pipeline trench excavation near completion at north end of former dispenser location.

PHOTOGRAPH 20 (BELOW): View of pipeline excavation at east dispenser piping trench. Completed west dispenser piping trench can be seen at left.

PHOTOGRAPH 21 (ABOVE): View of dispenser piping concrete pad.

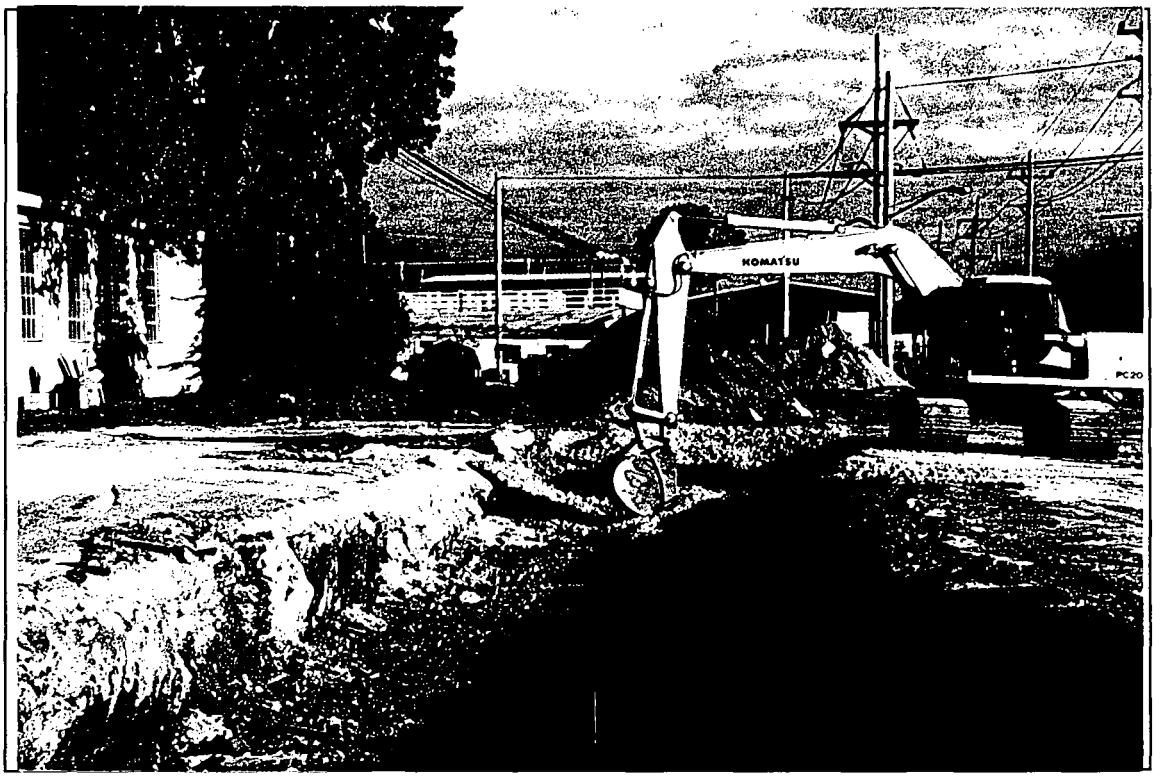
PHOTOGRAPH 22 (BELOW): View of dispenser piping trench after completion of soil and piping removal. Center soil island was collapsed into trench in preparation of placement of stone backfill.

PHOTOGRAPH 23 (ABOVE): View of plastic pad utilized for placement of excavated soils from former UST area.

PHOTOGRAPH 24 (BELOW): View of front end loader moving excavated soils from excavation area to stockpile area. Red flags identify locations of soil borings and piezometers.

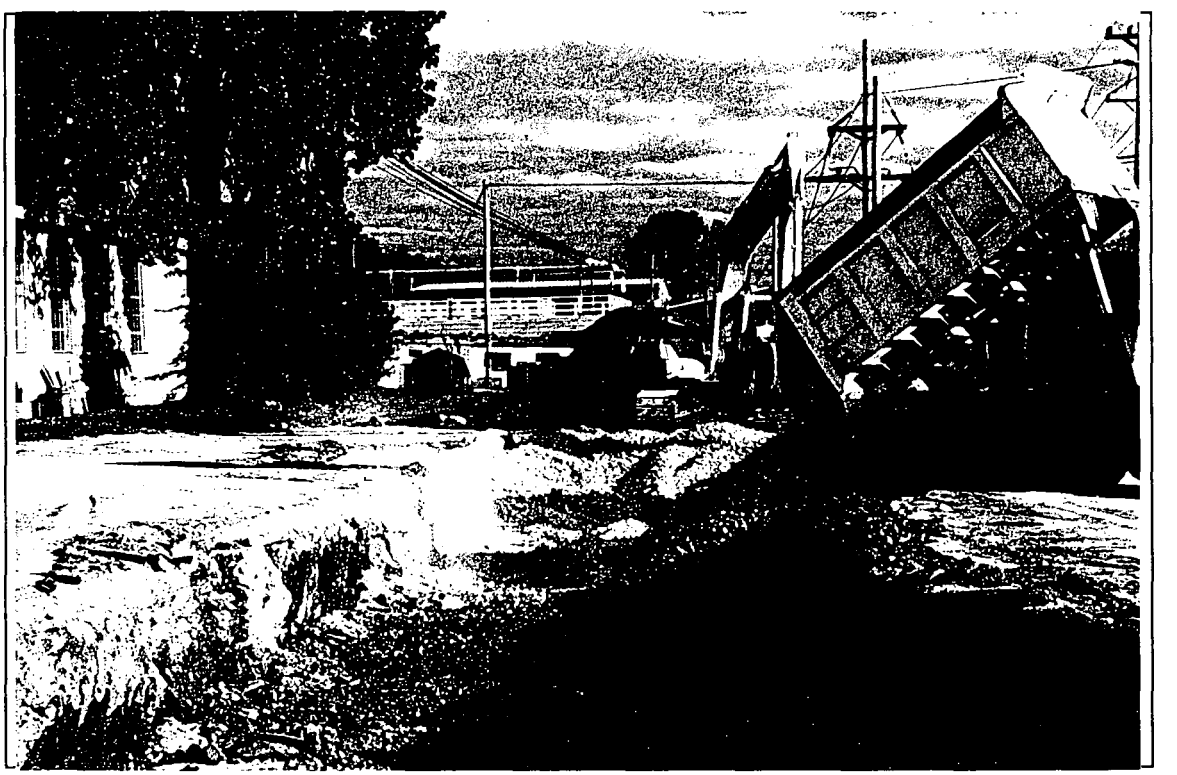
PHOTOGRAPH 25 (ABOVE): View of placement of overnight cover on stockpiled soil.

PHOTOGRAPH 26 (BELOW): Additional view of soil stockpile.



PHOTOGRAPH 27 (ABOVE): View of backfill stone placement.

PHOTOGRAPH 28 (BELOW): Additional view of backfill stone placement. Three inch rock was utilized to within 1 foot of surface. Final grade was established with Grade 8 stone material.



APPENDIX 9

Geotechnical Laboratory Results

Recycled Paper

TELEPHONE
309-673-2131

TESTS * INVESTIGATIONS
ANALYSIS * DESIGN * EVALUATIONS
CONSULTATION * REPORTS * INSPECTIONS
ARBITRATION * EXPERT WITNESS TESTIMONY
* * * * * * * * * *
SOILS * PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE * STEEL
ASPHALT * AGGREGATES * EMULSIONS
POZOLANIC MATERIALS * LIME

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604-3193

TELEFAX
309-673-3050

GEOTECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIRONMENTAL INVESTIGATIONS
* * * * * * * * * *
MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

CLIENT:

W&A FILE NO. 9136001
DATE: 11-18-97

Mr. Kevin J. Crandell
Heritage Environmental Services, Inc.
15330 Canal Bank Road
Lemont, Illinois 60439

PROJECT:

Navy Building 1600A
North Chicago, Illinois
Job #10319 PO #79615

GEOTECHNICAL SOIL TEST RESULTS

SAMPLE DESIGNATION	:	USN #10319
SAMPLE CLASSIFICATION	:	SILTY SAND SM; Fine- To Medium-Grained; Considerable Coarse-Grained Sand And Fine-Grained Gravel
MOISTURE CONTENT - %	:	13.2
MOIST DENSITY - PCF	:	130.1
DRY DENSITY - PCF	:	114.9
SPECIFIC GRAVITY:	:	2.76
POROSITY	:	0.3332
SOIL PH	:	7.4
COEFFICIENT OF PERMEABILITY-CM/SEC.	:	1.09×10^{-4}

GRAIN SIZE ANALYSIS TEST RESULTS

SIEVE DESIGNATION	PERCENTAGE FINER-%
	USN #10319
3/4"	100
3/8"	91
#4	81
#10	66
#20	54
#40	44
#60	31
#140	20
#200	17.5
MAXIMUM DIAMETER-M.M.	
.0400	13
.0260	11
.0150	9
.0100	8
.0074	7
.0050	6
.0036	4
.0010	2
SAND-%	82
SILT -%	12
CLAY-%	6
SOIL CLASSIFICATION	SILTY SAND SM; Fine- To Medium-Grained; Considerable Coarse-Grained Sand And Fine-Grained Gravel

Should you have any questions or comments whatsoever in regard to these test results, or if any additional information is desired, please do not hesitate to contact me personally at your convenience.

Respectfully submitted,

WHITNEY & ASSOCIATES

(By) Douglas R. Whitney
Douglas R. Whitney, P. E.

DRW:rma

TELEPHONE
309 673-2131

TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-O-PAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT: Navy Building 1600A
North Chicago, Illinois

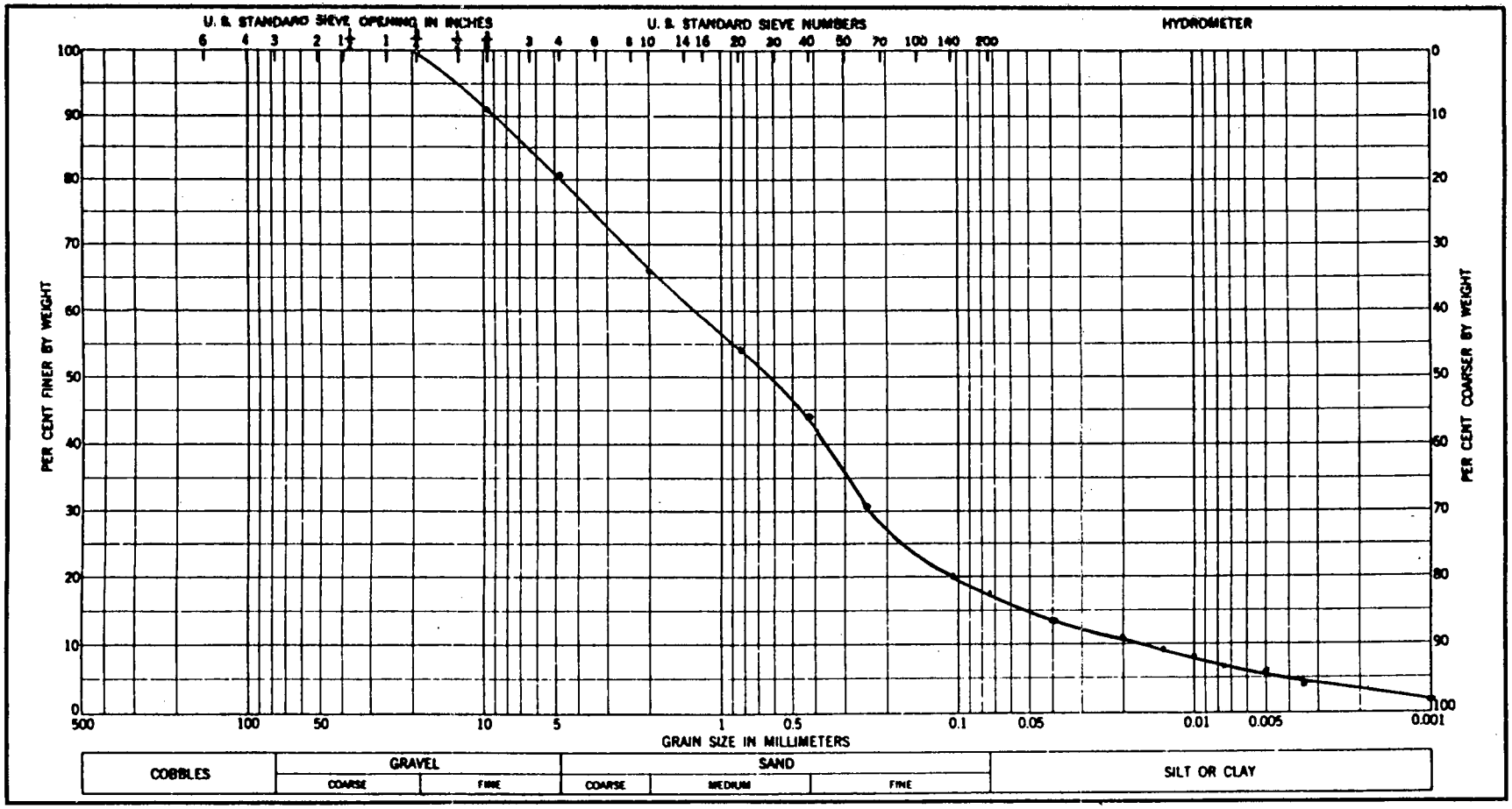
W. & A. FILE NO. 9136

DATE 11-18-97

CLIENT: Heritage Environmental
Lemont, Illinois

REPORT OF SOIL/AGGREGATE ANALYSIS

USN #10319



SOIL/AGGREGATE CLASSIFICATION SILTY SAND SM; Fine- To Medium-Grained; Considerable Coarse-Grained Sand And Fine-Grained Gravel

UNIFORMITY COEFFICIENT, $\frac{D_{60}}{D_{10}}$ = _____

EFFECTIVE GRAIN SIZE, D_{10} = 0.018

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 4.32
Specimen Diameter (cm): 4.11
Dry Unit Weight (pcf): 114.9
Moisture Before Test (%): 13.2
Moisture After Test (%): 16.1

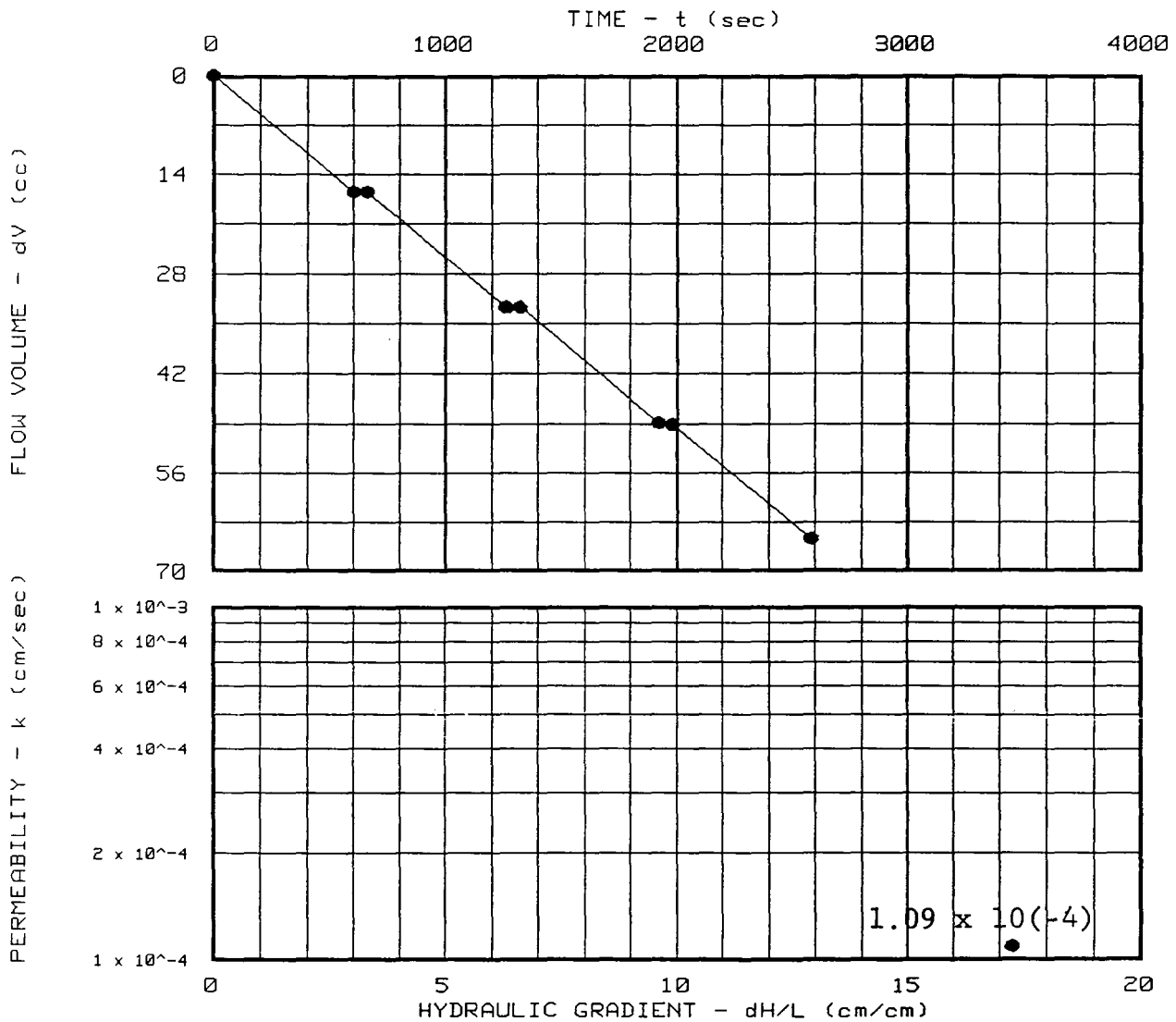
Run Number:	1 ●	2 ▲
Cell Pressure (psi):	9.0	
Test Pressure (psi):	6.0	
Back Pressure (psi):	4.9	
Diff. Head (psi):	1.1	
Flow Rate (cc/sec):	2.51 x 10^-2	
Perm. (cm/sec):	1.09 x 10^-4	

SAMPLE DATA:

Sample Identification: USN #10319

Visual Description: Brown SILTY SAND SM
Fine-Coarse Grained; Consid Co. Gravel
Remarks: ASTM D-5084 & IEPA
Test Parameters
Maximum Dry Density (pcf): -
Optimum Moisture Content (%): -

Percent Compaction:
Permeameter type: B-K Flexwall
Sample type: 1.6" S.S.



Project: NAVY BUILDING 1600A JOB #10319
Location: North Chicago, Illinois
Date: 11-12-97

PERMEABILITY TEST REPORT

WHITNEY & ASSOCIATES

Project No.: HER-1
File No.: 467
Lab No.: 3
Tested by: CMK
Checked by: JRK
Test: CH - Constant head

APPENDIX 10

Water Well Records

Recycled Paper

PUBLIC-INDUSTRIAL-COMMERCIAL DATABASE QUERY RESULTS
November 25, 1997

ISWS ID:	09704921
Name:	FULL MOON RESTAURANT
Well No:	1
Status:	I
Location:	09744N12E074D
Depth:	220
Type Log:	D
Const. Date:	1984
Driller:	MICHAEL GROSS
Lambert X/Y:	3437932,3377769

ISWS ID:	09704921
Name:	FULL MOON RESTAURANT
Well No:	2
Status:	I
Location:	09744N12E074D
Depth:	1000
Type Log:	D
Const. Date:	1992
Driller:	GEORGE E GAFFKE
Lambert X/Y:	3438034,3378029

ISWS ID:	09704940
Name:	PLANTATION CONFECTION CO
Well No:	1
Status:	I
Location:	09744N12E075E
Depth:	263
Type Log:	D
Const. Date:	1968
Driller:	HOOVER WATER WELL
Lambert X/Y:	3437441,3378621

ISWS ID:	09704945
Name:	SHOREACRES GOLF COURSE
Well No:	1
Status:	A
Location:	09744N12E094A
Depth:	285
Type Log:	-
Const. Date:	1920
Driller:	PETTIS
Lambert X/Y:	3448522,3375905

ISWS ID:	09704945
Name:	SHOREACRES GOLF COURSE
Well No:	3
Status:	I
Location:	09744N12E097A
Depth:	272
Type Log:	D
Const. Date:	1969
Driller:	HENRY BOYSEN CO
Lambert X/Y:	3446609,3376121

ISWS ID:	09704945
Name:	SHOREACRES GOLF COURSE
Well No:	2
Status:	I
Location:	09744N12E098D
Depth:	210
Type Log:	-
Const. Date:	1920
Driller:	PETTIS
Lambert X/Y:	3446090,3378336

ISWS ID:	09797090
Name:	STRAWBERRY 1 CONDOMINIUM DEVLP
Well No:	1
Status:	E
Location:	09744N12E076E
Depth:	215
Type Log:	D
Const. Date:	1972
Driller:	HENRY BOYSEN CO
Lambert X/Y:	3436689,3378966

ISWS ID:	09797090
Name:	STRAWBERRY 1 CONDOMINIUM DEVLP
Well No:	2
Status:	E
Location:	09744N12E076E
Depth:	295
Type Log:	D
Const. Date:	1972
Driller:	HENRY BOYSEN CO
Lambert X/Y:	3436493,3378464

PRIVATE WELL DATABASE QUERY RESULTS
November 25, 1997

Water Survey ID:	188305
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	04
Plot:	--
Owner:	SAGES LOCK CO
Driller:	FERGUSON
Constructed:	10241930
Permit #:	--
Depth:	210
Record Type:	O
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	188306
FIPS #:	097
Twnshp:	44N
Range:	2E
Sec:	05
Plot:	--
Owner:	CHICAGO HARDWARE FOUNDRY CO
Driller:	FERGUSON
Constructed:	05001929
Permit #:	--
Depth:	928
Record Type:	CO
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3442899,3383689

Water Survey ID:	189334
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	05
Plot:	--
Owner:	CHICAGO HARDWARE FOUNDRY CO #5
Driller:	--
Constructed:	00001920
Permit #:	--
Depth:	200
Record Type:	OGC

Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3442899,3383689

Water Survey ID:	188307
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	05
Plot:	--
Owner:	CHICAGO HARDWARE FOUNDRY CO
Driller:	FERGUSON
Constructed:	05001929
Permit #:	--
Depth:	206
Record Type:	CO
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3442899,3383689

Water Survey ID:	189333
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	05
Plot:	--
Owner:	CHICAGO HARDWARE FOUNDRY CO
Driller:	--
Constructed:	00001923
Permit #:	--
Depth:	928
Record Type:	OG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3442899,3383689

Water Survey ID:	188316
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	05
Plot:	1F
Owner:	N CHICAGO REFINERS #2
Driller:	HOOVER
Constructed:	12001970

Permit #:	--
Depth:	1276
Record Type:	ICX
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3445185,3384723

Water Survey ID:	188317
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	05
Plot:	5H
Owner:	ERNIE PETERSON PLUMBING INC
Driller:	HOOVER
Constructed:	07291981
Permit #:	098171
Depth:	242
Record Type:	RGX
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3442554,3386027

Water Survey ID:	188318
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	06
Plot:	--
Owner:	THOMPSON DYKE & ASSOC
Driller:	HOOVER
Constructed:	01061986
Permit #:	--
Depth:	225
Record Type:	A
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3437651,3383645

Water Survey ID:	188308
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	06
Plot:	--
Owner:	ABBOTT LAB
Driller:	--

Constructed:	00001952
Permit #:	--
Depth:	157
Record Type:	O
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3437651,3383645

Water Survey ID:	188319
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	06
Plot:	1E
Owner:	BALMES GREENHOUSE
Driller:	GAFFKE
Constructed:	03151983
Permit #:	106413
Depth:	190
Record Type:	RG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3439943,3383990

Water Survey ID:	188320
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	06
Plot:	2C
Owner:	LAKELAND BUS LINE #2
Driller:	HOOVER
Constructed:	12031971
Permit #:	015711
Depth:	107
Record Type:	RGX
Use:	IC
Type:	--
Aquifer:	UN
Lambert X/Y:	3439296,3382652

Water Survey ID:	232184
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	06

Plot:	5B
Owner:	ABBOTT LABORATORY
Driller:	HOOVER
Constructed:	00001988
Permit #:	--
Depth:	250
Record Type:	I
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3437341,3381972

Water Survey ID:	189332
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	06
Plot:	5B
Owner:	ABBOTT LABORATORY #2
Driller:	HOOVER
Constructed:	02151968
Permit #:	004233
Depth:	250
Record Type:	RG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3437341,3381972

Water Survey ID:	232183
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	06
Plot:	5D
Owner:	ABBOTT LABORATORY
Driller:	--
Constructed:	00001953
Permit #:	--
Depth:	270
Record Type:	I
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3437327,3383309

Water Survey ID:	188324
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	07
Plot:	--
Owner:	SEARLE TECH CENTER TEST HOLE 5
Driller:	MILLER
Constructed:	10001962
Permit #:	--
Depth:	168
Record Type:	OC
Use:	TH
Type:	--
Aquifer:	--
Lambert X/Y:	3437704,3378356

Water Survey ID:	188309
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	07
Plot:	--
Owner:	TROJAN OIL CO
Driller:	BOYSEN
Constructed:	07001940
Permit #:	--
Depth:	187
Record Type:	OG
Use:	IC
Type:	--
Aquifer:	UN
Lambert X/Y:	3437704,3378356

Water Survey ID:	188325
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	07
Plot:	--
Owner:	SEARLE TECHNOLOGICAL T H #6
Driller:	MILLER
Constructed:	10001962
Permit #:	--
Depth:	90
Record Type:	OC
Use:	TH
Type:	--
Aquifer:	UN
Lambert X/Y:	3437704,3378356

Water Survey ID:	188326
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	07
Plot:	4D
Owner:	FULL MOON RESTAURANT
Driller:	GROSS
Constructed:	05011984
Permit #:	111773
Depth:	220
Record Type:	RG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3438034,3378029

Water Survey ID:	240264
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	07
Plot:	5C
Owner:	CHUNG LEE
Driller:	SNELTEN
Constructed:	02111992
Permit #:	91-12-1628
Depth:	202
Record Type:	RG
Use:	DO
Type:	--
Aquifer:	BR
Lambert X/Y:	3437387,3377376

Water Survey ID:	188322
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	07
Plot:	5E
Owner:	PLANTATION BAKING CO
Driller:	HOOVER
Constructed:	04001968
Permit #:	--
Depth:	263
Record Type:	OICG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3437374,3378683

Water Survey ID:	188323
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	07
Plot:	5G
Owner:	PICKERS CONS CO
Driller:	BOYSEN
Constructed:	07001961
Permit #:	--
Depth:	162
Record Type:	OCG
Use:	IC
Type:	--
Aquifer:	UN
Lambert X/Y:	3437362,3379990

Water Survey ID:	188321
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	07
Plot:	8H
Owner:	PLANTATION BAKING CO
Driller:	HOOVER
Constructed:	05031968
Permit #:	004743
Depth:	263
Record Type:	RG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	3435401,3380632

Water Survey ID:	188310
FIPS #:	097
Twnshp:	44N
Range:	12E
Sec:	08
Plot:	--
Owner:	SHELL GAS STATION
Driller:	AUSHERMAN
Constructed:	00001930
Permit #:	--
Depth:	247
Record Type:	O
Use:	IC
Type:	--
Aquifer:	--
Lambert X/Y:	3442952,3378384

Water Survey ID:	188530
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	31
Plot:	--
Owner:	BALMES NURSERY
Driller:	BOYSEN
Constructed:	03081983
Permit #:	--
Depth:	0
Record Type:	A
Use:	IC
Type:	--
Aquifer:	--
Lambert X/Y:	3437597,3388935

Water Survey ID:	286788
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	31
Plot:	--
Owner:	AMHURST LAKE BUS. PARK #2
Driller:	EFFLANDT
Constructed:	08201990
Permit #:	90-16-0491
Depth:	260
Record Type:	RG
Use:	IC
Type:	DL
Aquifer:	BR
Lambert X/Y:	3437937,3387954

Water Survey ID:	286787
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	31
Plot:	--
Owner:	AMHURST LAKE BUS. PK. #1
Driller:	EFFLANDT
Constructed:	05081990
Permit #:	90-16-0490
Depth:	260
Record Type:	RG
Use:	IC
Type:	DL
Aquifer:	BR
Lambert X/Y:	3437937,3387954

Water Survey ID:	293519
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	31
Plot:	2G
Owner:	R.LEAVITT CONST.
Driller:	BEACH PUMP & WELL
Constructed:	02141997
Permit #:	097-0682-96
Depth:	75
Record Type:	RG
Use:	DO
Type:	DL
Aquifer:	UN
Lambert X/Y:	3439222,3390575

Water Survey ID:	229284
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	31
Plot:	5E
Owner:	AL CHRISTENSON LOT #12 & 13
Driller:	MICHAEL GROSS
Constructed:	03311991
Permit #:	90-16-0315
Depth:	238
Record Type:	RG
Use:	CS
Type:	--
Aquifer:	BR
Lambert X/Y:	3437265,3389262

Water Survey ID:	188531
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	31
Plot:	7F
Owner:	LAKE COUNTY FOR PRES
Driller:	GAFFKE
Constructed:	10071982
Permit #:	105116
Depth:	195
Record Type:	RG
Use:	IR
Type:	--
Aquifer:	BR
Lambert X/Y:	3435945,3389914

Water Survey ID:	230535
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	32
Plot:	--
Owner:	GARY NEPSTAD LOT 61
Driller:	BEACH PUMP & WELL
Constructed:	01181991
Permit #:	WW# 91-16-0044
Depth:	175
Record Type:	RG
Use:	DO
Type:	--
Aquifer:	BR
Lambert X/Y:	3442846,3388986

Water Survey ID:	188533
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	ABBOTT LABORATORIES
Driller:	BOYSEN
Constructed:	05061983
Permit #:	--
Depth:	134
Record Type:	A
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	188534
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	ABBOTT LABORATORIES
Driller:	BOYSEN
Constructed:	05061983
Permit #:	--
Depth:	112
Record Type:	A
Use:	IC
Type:	--
Aquifer:	--
Lambert X/Y:	--

Water Survey ID:	188511
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	ABBOTTS LABORATORY
Driller:	DROVER
Constructed:	05001921
Permit #:	--
Depth:	380
Record Type:	RGC
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	188535
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	ABBOTT LABORATORIES
Driller:	BOYSEN
Constructed:	05061983
Permit #:	--
Depth:	118
Record Type:	A
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	188514
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	CYCLONE FENCE CO
Driller:	--
Constructed:	07001929
Permit #:	--
Depth:	970
Record Type:	C
Use:	IC
Type:	--
Aquifer:	--
Lambert X/Y:	--

Water Survey ID:	188536
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	ABBOTT LABORATORIES
Driller:	BOYSEN
Constructed:	0506198
Permit #:	--
Depth:	82
Record Type:	A
Use:	IC
Type:	--
Aquifer:	UN
Lambert X/Y:	--

Water Survey ID:	188537
FIPS #:	097
Twnshp:	45N
Range:	2E
Sec:	33
Plot:	--
Owner:	AMERICAN STEEL & WIRE CO
Driller:	--
Constructed:	00001891
Permit #:	--
Depth:	2004
Record Type:	OG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	188538
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	AMERICAN STEEL & WIRE CO
Driller:	--
Constructed:	00001898
Permit #:	--
Depth:	2000
Record Type:	OG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	188539
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	AMERICAN STEEL & WIRE CO #1
Driller:	--
Constructed:	00001923
Permit #:	--
Depth:	2193
Record Type:	OG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	189335
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	ABBOTT LABORATORY
Driller:	GRAY
Constructed:	00001955
Permit #:	--
Depth:	1600
Record Type:	A
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	188513
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	AMERICAN STEEL & WIRE CO #2
Driller:	--
Constructed:	00001923
Permit #:	--
Depth:	2058
Record Type:	COG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	188512
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	AMERICAN STEEL & WIRE CO #5
Driller:	--
Constructed:	00001923
Permit #:	--
Depth:	2035
Record Type:	COG
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	188532
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	--
Owner:	ABBOTT LABORATORIES
Driller:	BOYSEN
Constructed:	05061983
Permit #:	--
Depth:	119
Record Type:	A
Use:	IC
Type:	--
Aquifer:	BR
Lambert X/Y:	--

Water Survey ID:	188515
FIPS #:	097
Twnshp:	45N
Range:	12E
Sec:	33
Plot:	2F
Owner:	AMERICAN STEEL & WIRE CO #4
Driller:	--
Constructed:	06001932
Permit #:	--
Depth:	0
Record Type:	C
Use:	IC
Type:	--
Aquifer:	--
Lambert X/Y:	3449694,3390056

APPENDIX 11

Site Classification Completion Report

Recycled Paper

The Agency is authorized to require this information under Section 4 and Title XVI of the Environmental Protection Act (415 ILCS 5/4, 5/57 - 57.17). Failure to disclose this information may result in a civil penalty of not to exceed $50,000.00 for the violation and an additional civil penalty of not to exceed $10,000.00 for each day during which the violation continues (415 ILCS 5/42). Any person who knowingly makes a false material statement or representation in any label, manifest, record, report, permit, or license, or other document filed, maintained or used for the purpose of compliance with Title XVI commits a Class 4 felony. Any second or subsequent offense after conviction hereunder is a Class 3 felony (415 ILCS 5/57.17). This form has been approved by the Forms Management Center.

Illinois Environmental Protection Agency
Leaking Underground Storage Tank Program
Site Classification Completion Report

A. Site Identification

IEMA Incident # (6 digit):_____ IEPA Generator # (10 digit): _____

Site Name: United States Navy, Great Lakes Training Center

Site Address (Not a P.O. Box): Building 1600 A, Ray Street

City: Great Lakes County: Lake

B. Site Information

1. Is this an amended report? Yes___ No X
2. Has a Site Classification Work Plan been approved? Yes___ No X
   Date of approval letter: _____

C. Site Classification Summary

1. This site is classified as:

NO FURTHER ACTION	_____	(applies to methods 1, 2 and pathway exclusion)
LOW PRIORITY	_____	(applies to methods 1 and 2 only)
HIGH PRIORITY	X	(applies to methods 1, 2 and pathway exclusion)

2. The method of site classification used was:

Method 1	X	
Method 2	_____	
Exposure Pathway Exclusion	_____	(proceed to Section J)

D. Site Classification by Methods 1 or 2

1. Is the UST(s) system located within the minimum or maximum setback zone or regulated recharge area of a potable water supply well? Yes___ No X
2. After completing Early Action measures, is there evidence that through natural or man-made pathways, migration of petroleum or vapors threaten human health or human safety or could cause explosions in basements, crawl spaces, utility conduits, storm or sanitary sewers, vaults or other confined spaces present or in the past? Yes___ No X
3. Is Class III Special Resource Groundwater located within 200 feet of the excavation? Yes___ No X

4. After completing Early Action measures, has a surface body of water been adversely affected (i.e. visible sheen, free product layer) by a release from an UST system? Yes___ No_X_

5. Has a groundwater quality standard or groundwater objective for any applicable indicator contaminant been exceeded at the property boundary line or 200 feet from the UST excavation, whichever is less? Yes_X_ No___

6. If Method One was chosen, indicate the rating, as described in the Illinois State Geological Survey Circular 532, with which the actual site geology is consistent. __A2__

7. If Method Two was chosen, answer the following questions regarding the first 15 feet of native material (below the invert elevation of the UST):

   a. Did the material contain unconsolidated sand, gravel, and/or sand and gravel that is 5 feet or more in thickness with 12 percent or less fines? Yes___ No___
   b. Did the material contain sandstone 10 feet or more in thickness, or fractured carbonate 15 feet or more in thickness? Yes___ No___
   c. Is the material capable of the following:

      i. sustaining a groundwater yield, from a 12 inch borehole, of 150 gallons per day or more from a thickness of 15 feet or less? Yes___ No___
      ii. does the material have a hydraulic conductivity of 1×10^{-4} cm/sec or greater? Yes___ No___

E. Site Evaluation

1. Physical Soil Classification:

   Provide the following:

   a. Soil borings

      1. A list of publications reviewed and preliminary conclusions concerning the site geology;
      2. Soil boring logs;
      3. A site map to scale and oriented north showing:

         a. Soil boring locations;
         b. UST system(s);
         c. 200 foot radius from UST system;
         d. Property boundaries.

   b. Method 1 soil properties test results (include calculations, methodologies, and complete laboratory reports)

      1. Soil particle analysis;

2. Soil moisture content;
3. Soil classification;
4. Unconfined compression test;
5. In-situ hydraulic conductivity; **OR**
6. Ex-situ hydraulic conductivity.

c. Method 2 soil properties test results (include calculations, methodologies, and complete laboratory reports):

1. Soil particle analysis;
2. Ex-situ hydraulic conductivity; **OR**
3. In-situ hydraulic conductivity and yield of geologic material.

2. Groundwater Investigation

Provide the following:

a. A discussion of how the monitoring well configuration provides the greatest likelihood of detecting migration of groundwater contamination;
b. Monitoring well construction diagrams;
c. A table showing static water elevations;
d. Sample collection shipment and preservation information;
e. Completed chain-of-custody form(s);
f. Copies of laboratory reports (include field and lab blanks);
g. Analytical results in tabular format;
h. A site map to scale and oriented north showing:

i. Monitoring well locations;
ii. Potentiometric surface map;
iii. Groundwater flow direction;
iv. 200 foot radius from UST system;
v. Property boundaries.

F. Water Well Survey

Provide the following:

1. The results of the survey conducted to identify all community water supply wells within 2,500 feet of the UST system and all potable water supply wells within 200 feet of the UST system (include copies of well logs and all correspondence to and from the Illinois State Water Survey and the Illinois State Geological Survey).

2. The local units of government contacted to determine if there is a local ordinance or policy regulating the usage of potable water supply wells.

3. A site map to scale showing all of the community water supply wells within 2,500 feet of the UST system and all potable water supply wells within 1,000 feet of the UST system (radii of 200, 400, 1,000 and 2,500 feet from the UST system should be marked on the map).

4. A table indicating the setback zone for each community or potable water supply well and the distance from the UST system to the well (the location of each well must be identified on the map by numbers corresponding to information provided in the table).

5. The sources consulted in determining whether the UST system is within the regulated recharge area of any community or potable water supply well.

G. Migration Pathways

Provide the following:

1. A discussion of the investigation conducted to identify all potential natural and man-made migration pathways that are on the site, rights-of-way attached to the site, or in any area surrounding the site that may be adversely affected as a result of a release of petroleum from the UST system.

2. A discussion of further investigations conducted to determine if there is evidence that migration of petroleum or vapors along such pathways threatens human health or the environment or may cause explosions in basements, crawl spaces, utility conduits, storm or sanitary sewers, vaults or other confined spaces.

3 A discussion of the findings based on the investigations performed.

4. A site map to scale and oriented north showing:

   a. The UST system(s) and excavation;
   b. Product and dispenser lines;
   c. Potential natural and man-made pathways on-site, in rights-of-way attached to the site or in areas that may be adversely affected by the release;
   d. Soil boring locations;
   e. Property boundaries.

H. Class III Special Resource Groundwater

Provide the following:

1. A discussion of the steps taken to determine if Class III groundwater exists within 200 feet of the site.

2. A site map to scale and oriented north showing:

   a. Location of Class III groundwater;
   b. Radius of 200 feet from the UST system(s).

I. Surface Bodies of Water

Provide the following:

1. A discussion of the steps taken to locate all surface bodies of water on site and within 100 feet of the site, and once located, the steps taken to determine if they have been adversely affected by the presence of a sheen or free product layer resulting from a release of petroleum from the UST system.
2. A site map to scale and oriented north showing the locations of the surface bodies of water on site and within 100 feet of the site.

J. Classification by Exposure Pathway Exclusion

1. Extent of contamination exceeding Tier 1 objectives

   Provide the following:

   a. A table showing the analytical results and depth of samples;
   b. A site map showing the soil sample location points and groundwater monitoring well locations;
   c. A site map showing the extent of soil and/or groundwater contamination exceeding Tier objectives;
   d. A cross-section of the site showing the areas of soil contamination exceeding Tier 1 objectives;

2. Physical soil characteristics

   Provide the results of the tests performed to determine the following:

   a. Whether or not the concentration of any organic contaminants exceeded the attenuation capacity of the soil.
   b. Whether or not the organic contaminants exceeded the soil saturation limit.
   c. Whether or not the soils exhibited any characteristics of reactivity for hazardous waste.
   d. The pH of the soils.
   e. Whether or not contaminated soils exhibited any characteristics of toxicity for hazardous waste.

3. Inhalation exposure route

   Demonstrate the following:

   a. An institutional control is in place that requires safety precautions for construction worker populations and compliance with (b) below.
   b. That any contaminant of concern within ten (10) feet of the land surface or within ten (10) feet of any man-made pathway does not exceed Tier 1 cleanup objective or that an Agency-approved engineered barrier is in place.

4. Ingestion exposure route

Demonstrate the following:

a. An institutional control is in place that requires safety precautions for construction worker populations and compliance with (b) below.
b. That any contaminant of concern within three (3) feet of the land surface does not exceed the Tier 1 cleanup objectives or an Agency-approved engineer barrier is in place.

5. Groundwater ingestion exposure route

Demonstrate the following:

a. The source of the release is not located within the minimum or maximum setback zone or regulated recharge area of a potable water supply well.
b. Any area within 2,500 feet from the source of the release is restricted under a local ordinance which prohibits the use of groundwater as a potable supply.
c. The concentration of any contaminant of concern in groundwater within the minimum or maximum setback zone of a potable water supply well will meet the applicable Tier 1 cleanup objective.
d. The concentration of any contaminant of concern in groundwater discharging into a surface water will meet the applicable surface water quality standard per 35 IAC Section 302.

K. Supporting Documentation

Provide the following:

1. A site map to scale and oriented north showing:

   a. UST system(s) and excavation;
   b. Product and dispenser lines;
   c. Pumps and islands;
   d. Underground utilities (sewer, gas, water, etc.);
   e. Nearby structures (buildings, roads, etc.);
   f. Location of the soil boring(s);
   g. Location of the monitoring wells;
   h. Property boundaries;
   i. 200 foot radius from the UST System(s).

2. A horizontal cross section showing the various geologic units and the depth to groundwater.

3. Laboratory Certification(s).

L. Signatures

I certify under penalty of law that this report, supporting documents and all attachments were prepared under my direction or supervision. To the best of my knowledge and belief, this report, supporting documents and all attachments are true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner

Name: _____

Title: _____

Address: _____

_____

Phone: _____

Signature: _____

Date: _____

Operator

Name: _____

Title: _____

Address: _____

_____

Phone: _____

Signature: _____

Date: _____

Consultant

Firm: Heritage Environmental Services, Inc.

Contact: Robert J. Millman

Title: Senior Project Engineer

Address: 15330 Canal Bank Road

Lemont, Illinois 60439

Phone: (630) 739-1151

Signature: _____

Date: _____

M. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. I also certify under penalty of law that the classification for this site is ☐ No Further Action ☐ Low Priority ☒ High Priority and that this classification satisfies all the requirements of 35 Illinois Administrative Code Part 732, Subpart C. In addition, I certify that there ☐ is ☒ is no evidence that, through natural or man-made pathways, migration of petroleum or vapors threaten human health or human safety or may cause explosions in basements, crawl spaces, utility conduits, storm or sanitary sewers, vaults or other confined spaces. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Professional Engineer **P. E. Seal**

Name: Robert J. Millman

Firm: Heritage Environmental Services, Inc.

Address: 15330 Canal Bank Road

Lemont, Illinois 60439

Phone: (630) 739-1151

Ill. Registration No.: 062-039024

License Expiration Date: 11/30/98

Signature: _____

Date: _____