PRELIMINARY REMEDIAL ACTION PLAN

for

25 MELVILLE PARK ROAD
MELVILLE, NEW YORK

May, 1996

ERI# 7150-96

PRELIMINARY REMEDIAL ACTION PLAN

25 Melville Park Road
Melville, New York

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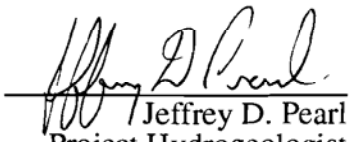

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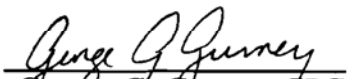

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1.0 INTRODUCTION

Environmental Remediation, Inc. (ERI) has prepared this Preliminary Remedial Action Plan (PRAP) for the commercial property located at 25 Melville Park Road in Melville, New York (Figure 1) for purposes of the New York State Department of Environmental Conservation (NYSDEC) Voluntary Cleanup Program (the Program). The PRAP presents the results of environmental investigations by ERI and other consultants at the subject property and recommends specific actions for remediation of contamination on the property.

This work was performed at the request of the Program applicant, WHCS Real Estate Limited Partnership (WHCS) of Irving, Texas. A Program application is included with the submission of this report. WHCS is a secured lender to the current site owner, Delco Development Company of Melville, New York (c/o API Melville Associates). The subject property is presently in receivership. The current tenants include Northville Industrial Corporation, Great Eastern Management, Inc. and Gilmore Securities and Company, Inc. These tenants maintain office space on the property. However, the building is not fully leased. In an effort to protect its rights to the subject property, which serves as WHCS's collateral, WHCS has conducted extensive investigations at the site, at considerable expense.

WHCS is prepared to undertake the proposed remedial action set forth in the PRAP. WHCS believes the PRAP presents a reasonable and effective strategy for addressing the conditions at the site. If agreement can expeditiously be reached to remediate the site based on the terms described herein, WHCS intends to foreclose and take title to the property. It is essential, however, that WHCS obtain prompt acceptance by NYSDEC of the proposed remedial terms, and that WHCS's responsibility for the remediation be limited to the conditions set forth in this PRAP.

The goal of this report is to present the site investigation and the PRAP to the NYSDEC for inclusion in the Program. Based on a review of the site information, the property clearly meets the requirements for inclusion in the program. Specifically, the Program recommends that a property be:

- Not subject to any existing corrective actions or closure actions under permit or order issued under the NYSDEC inactive hazardous waste disposal site remedial program;
- Not subject to any other enforcement action which would require the potentially responsible party (PRP) to remove or remediate a hazardous substance; and
- Contaminated with materials related to historic operations by previous property owners.

Based on the historical information collected by ERI and others, the subject site is not currently subject to corrective action or closure under permit or order issued under the NYSDEC inactive hazardous waste disposal site remedial program. In addition, the soil and groundwater contamination detected on the site appears to be related to historic operations conducted by a previous site occupant (the New York Twist Drill Company). The current site owner does not appear to have any financial connection or other relationship to the previous site owners. As such, ERI has concluded that the subject property meets the elements of the NYSDEC Voluntary Cleanup Program. The goal of entering into the Program is to achieve a "no further action status" once the cleanup goals are met.

The PRAP presents a phased approach to address the principal constituents detected in the soils and groundwater under the subject property. Specifically, the PRAP evaluates the extent of known contamination and makes recommendations for additional data collection where necessary; assesses potential remedial options for the defined contaminants; and makes recommendations for remedial action implementation. Under this phased approach, additional subsurface investigations will be

conducted before the final remedial design is presented. The PRAP also includes a Baseline Risk Assessment to evaluate current and future site risks. The results of the Risk Assessment are also used to derive target cleanup levels for groundwater (100 micrograms per liter (ug/L) for perchloroethene, trichloroethene and 1,1,1-trichloroethane).

Lastly, the PRAP proposes to remediate and monitor the subject site for a period of five to ten years. The remedial and monitoring requirements would be stepped down after a period of five years. The goal of the proposed remediation will always be to prevent off-site migration of contamination and to mitigate exposure risks.

1.1 Site Description

The subject property is located in the Village of Melville. Melville is located in Nassau County, Long Island, New York. Route 495 (the Long Island Expressway) is located an estimated 2,000 feet north of the property. The area in the vicinity of the subject property consists of mostly industrial and commercial properties.

Presently, the property is used as a two-story office building. As of January 1995, current occupants included Northville Industrial Corporation, Great Eastern Management, Inc. and Gilmore and Security Company, Inc. The building on the premises is served by municipal water and is heated by natural gas. The property is served by two on-site septic systems located to the south of the building. The nearest water supply well was identified approximately one-half mile north of the site. Two additional wells are located an estimated one mile south-southwest of the site. The property is located within the South Huntington Water District.

Historically, the property was occupied by the New York Twist Drill Company (NYTD). NYTD was present on-site from 1966 when the building was originally constructed through 1985. NYTD apparently manufactured high-speed carbon and carbide drills. After NYTD vacated the building, it was gutted and converted into a two story office building. This renovation also involved expanding the building footprint to the southeast (Figure 2).

According to the Suffolk County Department of Health Services, NYTD operated four underground storage tanks (USTs) on the property. Two 2,500 gallon industrial waste USTs were abandoned near the northeast corner of the building in 1991. A smaller (200 gallon) industrial UST was also apparently removed east of the building near the northern corner. This UST may have been associated with a former industrial septic system. A fourth waste oil UST was apparently removed circa 1993 and is represented by an asphalt patch near the southeastern corner of the building. Previous reports have also identified a former "discharge well" located near the north side of the entrance to the east loading dock. Reportedly, the use of the "discharge well" was discontinued around 1981.

1.2 Site Geology and Hydrogeology

According to the Surficial Geologic Map of New York, Lower Hudson Sheet (Cadwell, 1989), the surficial geology of the site consists of outwash sands and gravels formed in proglacial fluvial environments of the late Wisconsian (Woodfordian) Glaciation [app. 21-28 million years before present (m.y.b.p.)]. The materials generally consist of coarse to fine gravel with sand, being well-rounded and stratified, with the thickness of the deposit ranging from 6-65 feet.

According to the Geologic Map of New York, Lower Hudson Sheet (Fisher, Isachsen, Rickard, 1970, 1993), the underlying general geology of the site consists of coastal plain deposits of the upper Cretaceous Period (app. 70 m.y.b.p.). The deposits of the Monmouth Group, Matawan Group, and Magothy Formation generally consist of silty clay, glauconitic sandy clay, sand and gravel, with the thickness of the deposit ranging from 0-2,000 feet below grade (fbg).

According to a representative of the United States Geological Survey (USGS) in Comack, New York, the geology in the vicinity of the subject site has been characterized as glacial outwash sand and gravel to a depth of approximately 50 feet, beneath which is the Magothy sand and gravel deposit, which can be up to 600 feet in thickness. The Magothy Formation is described as a sand and gravel deposit with minor lenses of silt and clay concentrated in its upper portion. [It is anticipated that dense nonaqueous phase liquid contamination within the Magothy would be concentrated along the tops of these lenses. Therefore, the proposed vertical characterization study (as described later in this report) should define the extent of contamination within 150 feet below grade.] Below the Magothy Formation is the Raritan Clay, which is 100-300 feet thick. The Raritan Clay is reported to overlie the Lloyd Aquifer, which ranges in thickness from 100-300 feet. Competent crystalline metamorphic bedrock is reported to underlie the Lloyd Aquifer.

1.3 Previous Site Investigations

Several previous environmental investigations have been performed on the subject site. These include:

- A Phase I Environmental Site Assessment performed by AquaTerra dated March 1993;
- A Phase I Environmental Site Assessment with Subsurface Investigation performed by Fugro East, Inc. dated January 1995;
- An Additional Subsurface Investigation and Ground Penetrating Radar Letter Report by Fugro East dated January 1995;
- An Additional Subsurface Investigation Report by Fugro East dated October 1995; and
- Findings of the Petrex Soil Gas Survey Report by Northeast Research Institute and Rizzo Associates dated November 1995.

Fugro East performed a preliminary geophysical survey in January 1995 and identified two magnetic anomalies. One of the anomalies was interpreted as a 10,000 gallon fuel oil UST located on the northwestern side of the building. The second anomaly was interpreted as the two abandoned 2,500 gallon industrial waste USTs. A second Ground Penetrating Radar Survey confirmed these subsurface anomalies.

A hydropunch and well boring survey was conducted in December 1994 by Fugro. Six hydropunch well points and three borings were advanced on the property. In addition, six existing wells were identified on the property. (It could not be determined who installed these monitoring wells.) Seven soil samples were analyzed for total petroleum hydrocarbons (TPH) via gas chromatograph/flame ionization detector (GC/FID), 13 priority pollutant metals, cyanide and pH. Ten groundwater samples were analyzed for volatile organic compounds (VOCs) via Method 8260 and TPH via GC/FID. Seven of the samples were also analyzed for dissolved priority pollutant metals, cyanide and pH.

One soil sample (B-2) had a level of mercury detected [1.8 milligrams per kilograms (mg/kg)] which exceeded NYSDEC recommended cleanup levels for soil. Boring B-2 was located in the former industrial UST area west of the former industrial septic system (located near the northeastern corner of the building - see Figure 2). The soil sampling depth was unclear from the existing information.

The groundwater analytical results indicated that the area near the former waste oil UST (southeastern corner of the building) was contaminated with trichloroethene (TCE) and PCE. One

groundwater sample (HP-1) had detected PCE and TCE levels equaling 15,000 and 1,100 ug/L, respectively. The depth to groundwater beneath the property was encountered between 49 and 50 feet below grade. Fugro estimated the groundwater flow direction to be towards the south/southeast.

Follow-up soil and groundwater sampling was conducted by Fugro in January 1995. One additional hydropunch sample and one monitoring well were advanced. In addition, three borings were drilled. All of this additional sampling was conducted in the area of the former waste oil UST (where the elevated PCE and TCE levels were detected). Eleven soil samples were submitted for laboratory analysis and analyzed for TPH and VOCs via GC/FID and Method 8260, respectively. The soil sample depths ranged from 5 to 50 feet below grade. No VOCs or TPH levels were detected in the soil samples.

Fugro submitted three additional groundwater samples for analyses. One hydropunch point (HP-6) was advanced to 73 feet below grade. The analytical results indicated that higher levels of VOCs were detected near the water table-12,600 ug/L PCE (as compared to the deeper portion of the aquifer-7,300 ug/L PCE).

Four additional groundwater monitoring wells (MW-8 through MW-11) were installed by Fugro near the former waste oil UST in May 1995. Groundwater samples collected from these wells were analyzed for VOCs via Method 8260. The highest VOC values (TCE equaling 12,900 ug/L and PCE equaling 31,700 ug/L) were detected approximately 30 feet north of the former waste oil UST in well MW-8.

A soil gas survey was conducted on the property by Northeast Research Institute and Rizzo Associates in November 1995. Thirty-seven shallow (approximately one foot below grade) soil gas sampling points were installed on the east side of the building. The results of this survey showed that the highest relative response for PCE was near the loading dock (see Figure 2). The highest response levels for TCE were detected just north of well MW-8.

The sum of the previous investigations indicated that the source of the PCE and TCE groundwater contamination is located north of the former waste oil UST and south of the former septic system. The results of the Petrex (soil gas) survey suggested that the loading dock area may be the source of the PCE groundwater contamination.

The mercury soil contamination was revealed in the former industrial UST area. This area is located north of the area of PCE and TCE contamination. As discussed, only one soil sample from one boring had elevated levels of mercury detected.

1.4 Previous Off-Site Investigations

No evidence of previous off-site assessments has been found, and the search for previous assessments was not included in ERI's scope of work. However, a previous assessment performed on the subject site in 1993 by AquaTerra Environmental Services Corporation indicated that the I.W. Industries property, located directly to the east of the subject site, is classified as a Class 2 inactive hazardous waste disposal site by the NYSDEC. This classification indicates the I.W. Industries site presents a significant threat to public health or the environment, and that remedial action is required.

This previous assessment indicated that a State Pollution Discharge Elimination System (SPDES) permit was prepared for and groundwater sampling was conducted on the I.W. Industries site. Contaminants detected in a former SPDES outfall above the maximum allowed levels included metals (copper, iron, aluminum, lead and zinc), 1,2,4 trimethylbenzene, 1,3,5 trimethylbenzene, 1,2,4,5 tetramethylbenzene and xylenes. Contaminants detected in groundwater included cis-1,2

dichloroethene, lead and benzene. According to the report, the discharge ceased in September of 1984, two industrial waste pools were pumped and backfilled with clean fill, and the filtration system in the area was capped. The report indicated a NYSDEC representative, Mr. Robert Stewart, stated that a remedial investigation/feasibility study (RI/FS) had not been completed for the property.

The NYSDEC project manager for the I.W. Industries site, Mr. Chris LaFemina, was contacted by ERI to update the status of the site. Mr. LaFemina indicated the majority of the contamination and suspected sources (i.e. waste pools, discharges, etc.) were located in the west and southwest portions of the property, approximately 40 to 70 feet from the west property line of the 25 Melville Park Road site. Mr. LaFemina also indicated a Consent Order had been signed in March of 1995 which required a Remedial Investigation/Feasibility Study (RI/FS) be performed, and that the study was expected to be initiated in the spring or summer of 1996. Although no plume definition or off-site migration studies had been performed to date, Mr. La Femina did indicate that off-site migration of contaminants from the I.W. Industries site was a concern of the State.

2.0 ADDITIONAL INVESTIGATIONS

2.1 Rationale For Work Scope

ERI's work scope included the installation of additional groundwater monitoring points and the collection of additional soil and groundwater data. In addition, ERI also collected indoor air samples from selected interior locations (three). The purpose of this work was first to further evaluate the nature and extent of impacted soil and groundwater on the subject property, specifically in the areas of the loading dock and former industrial septic system/storage tank, and subsequently to establish remedial action objectives and evaluate remedial strategies and options. A second goal of this work was to evaluate whether any current risks to on-site workers exist due to indoor air inhalation. Ultimately, the goal of this report was to select a potential remedy and provide an estimate of associated costs for the 25 Melville Park Road property.

The additional subsurface investigation field activities were initiated on February 29, 1996. Four shallow groundwater monitoring wells and four soil borings were installed at the site. The field activities were completed on March 4, 1996, with the sampling of the four monitoring wells.

Four soil borings were advanced in the area of the former industrial septic system and the associated former 200 gallon UST (Figure 2). Selected soil samples were collected at various depth intervals and analyzed for VOCs via Method 8260, TPH via GC/FID (extractables) and for Resource Conservation and Recovery Act (RCRA) Metals. The goal of this portion of the study was to delineate the mercury contamination detected in boring B-2 and to evaluate if any VOC contamination exists near the old industrial waste septic system.

Four additional groundwater wells were installed north of MW-8. The objective of these additional groundwater data points was to evaluate the loading dock, the former discharge well area and the area north of MW-8 as a possible source of the VOC contamination. In addition, a second goal of this groundwater study was to define the horizontal extent of the VOC contamination. Groundwater samples were collected from the monitoring wells and analyzed for VOCs via Method 8260.

In addition to the groundwater samples, selected soil samples from the four newly installed monitoring wells were also submitted for laboratory analysis. Although no VOCs were detected in soil samples collected during previous sampling events in the area of high groundwater VOC contamination, these additional soil samples were collected to confirm the absence of soil VOC contamination. Seven soil samples from the monitoring well borings were submitted for the analysis of VOCs via Method 8260 and TPH via GC/FID (extractables). Due to insufficient

sample volume (recovery), the sample collected from MW-13 (45-47 fbg) was only analyzed for VOCs.

2.2 Pre-drilling Activities

Prior to drilling, ERI reviewed the existing data to determine placement of the soil borings/monitoring wells, considering factors such as potential on-site sources of contamination and the inferred groundwater flow direction. Prior to drilling, ERI also submitted a request to the New York Underground Facilities Protection Organization for underground utility clearance, which was documented as #570105.

2.3 Soil Boring and Monitoring Well Installation

Level II drilling activities were supervised by an ERI representative on February 29, March 1, and March 4, 1996. Weather conditions were generally partly cloudy to sunny and cold, with temperatures in the low to mid 30s (°F). Nine soil borings were installed, four of which were completed as groundwater monitoring wells.

The soil borings and monitoring wells were installed in the parking area and loading dock located east of the existing site building (Figure 2 and 3). Borings and monitoring wells were located as follows:

- **MW-12:** Monitoring well MW-12 was installed north of the existing monitoring well MW-8. The purpose of the well was to evaluate soil and groundwater conditions upgradient of an area of documented groundwater contamination (MW-8), and in the area of elevated soil gas concentrations of PCE. MW-12 was screened above a clay layer, which was encountered at a depth of approximately 56.5 fbg. This clay layer was not encountered in any of the subsequent soil borings.

- **MW-13:** Monitoring well MW-13 was located just east of the east loading dock. The purpose of the well was to evaluate soil and groundwater conditions downgradient of a potential source of contamination, the former "discharge well", and in the area of elevated soil gas concentrations of PCE.

- **MW-14:** Monitoring well MW-14 was installed immediately east of the loading dock. The purpose of the well was to evaluate soil and groundwater conditions in the vicinity of a potential release area, the loading dock.

- **MW-15:** Monitoring well MW-15 was installed east of the loading dock and the suspected location of the "discharge well". The purpose of this well was to evaluate soil and groundwater conditions associated with and potentially upgradient of the former discharge well.

- **SB-7:** Soil boring SB-7 was installed in the vicinity of the former industrial waste septic system leaching area. The purpose of the boring was to further delineate the mercury contaminated soil, and to evaluate the soil for the presence of VOCs. Refusal (possibly an old septic system pipe) was encountered at a depth of approximately 5.5 fbg, and the boring was abandoned.

- **SB-7A:** Soil boring SB-7A was installed adjacent to the abandoned boring SB-7 to collect samples below the depth of refusal which occurred in boring SB-7. The purpose of the boring was again to further delineate the mercury contaminated soil, and to evaluate the soil for the presence of VOCs in the vicinity of the former industrial waste septic system leaching area.

- **SB-8:** Soil boring SB-8 was installed in the approximate northern vicinity of the (possible) former industrial waste septic system holding tank. The purpose of the boring was to further delineate the mercury contaminated soil, and to evaluate the soil for the presence of VOCs.

- **SB-9:** Soil boring SB-9 was installed in the approximate southern vicinity of the (possible) former industrial waste septic system holding tank. The purpose of the boring was to further delineate the mercury contaminated soil, and to evaluate the soil for the presence of VOCs.

- **SB-10:** Soil boring SB-10 was installed in the vicinity of the former industrial waste septic system. The purpose of the boring was to further delineate the mercury contaminated soil, and to evaluate the soil for the presence of VOCs.

The soil and groundwater investigation was performed using a truck mounted drill rig and the hollow stem auger (4.25 inch inside diameter) drilling technique. Split spoon samples were collected from the surface and at various depth intervals. Since the geology of the site had already been established, a sampling interval of ten feet was used in some areas of documented lithology. The samples were field screened both immediately after retrieval and by the head space method using an HNu-photoionization detector (PID) for VOCs (Tables 4 and 5, Soils Field Screening Data). Soil boring activities and well installations were performed using equipment, auger flights, drilling rods and split spoon samplers which were steam cleaned prior to arrival at the site.

Four soil borings were completed as groundwater monitoring wells. Monitoring wells were constructed using two-inch diameter, flush-jointed polyvinyl chloride (PVC) well casing with a ten foot screen length of 10 slot PVC screen. The wells were placed to intercept approximately five to seven feet of the observed water table to allow for seasonal fluctuations in water levels. Lesser saturated screen intervals were used as appropriate when confining units were encountered (MW-12). The annular space surrounding each well screen was filled with Morie equivalent No. 2 inert silica filter gravel to an elevation two feet above the top of the screen. Above the sand, a two foot bentonite seal was placed to seal the well from the formation above. A concrete collar was poured around a flush-mounted, protective steel case to secure the wells.

Table 6 contains a Monitoring Well Construction Summary. Boring logs are included in Appendix A of this report.

2.4 Groundwater Elevation Survey and Flow Direction

The newly installed monitoring wells were surveyed relative to an arbitrary datum, and water level measurements were collected at the time of the groundwater sampling on March 4, 1996, using an electronic air/water interface. The surveyed well elevations and water level data were then used to calculate the direction of groundwater flow (Table 7). The direction of flow was calculated to be toward the southwest in the vicinity of the east loading dock at the time of the groundwater sampling. The groundwater gradient was calculated as 0.001 in the immediate vicinity of the loading dock, and 0.009 across the site using previous groundwater elevation data (October 1995). Fugro's (May 1995) measurements of the groundwater elevations downgradient of the loading dock indicate that the flow direction is more towards the south/southeast.

2.5 Soil Sampling and Analysis

Soil samples collected at various intervals from the soil borings were field screened for VOCs using an HNu PID. Based upon the field screening and site geology, a total of eleven soil samples were submitted for laboratory analysis. All samples were packed on ice, maintained at 4 degrees Centigrade, and transported to Matrix Analytical located in Hopkinton, Massachusetts for analysis. The soil samples from the borings which were completed as monitoring wells were analyzed for VOCs via EPA Method 8260 and TPH via GC/FID (extractables). The sample collected from

MW-13 (45-47 fbg) was submitted for VOC analysis only due to insufficient sample volume. The soil samples collected from the soil borings in the vicinity of the former industrial waste septic system were analyzed for VOCs via Method 8260, TPH via GC/FID (extractables) and RCRA metals. All soil sampling locations correspond to the monitoring well and soil boring locations illustrated in Figures 2 and 3.

2.6 Groundwater Sampling and Analysis

Groundwater sampling was conducted by ERI personnel on March 4, 1996. Water level measurements were recorded at each well before sampling. Five volumes of standing water were purged from each well prior to sampling. Each well was then sampled using a dedicated, disposable, polyethylene bailer and nylon cord. All measurement instruments were decontaminated with distilled water between monitoring wells.

All four groundwater samples were submitted for VOC analysis via Method 8260. Groundwater samples were collected in 40 milliliter (ml) glass vials preserved with hydrochloric acid (HCL), and were packed on ice, maintained at 4 degrees Centigrade and transported to Matrix Analytical in Hopkinton, Massachusetts for analysis.

2.7 Interior Air Sampling

Three interior sampling locations were sampled for indoor air concentrations of VOCs. The sampling methodology and results are discussed in Section 4.0 and in Appendix C (Health Risk Assessment).

2.8 Results of Soil Sampling and Analysis

The four soil borings which were completed as monitoring wells in the vicinity of the loading dock and former discharge well were advanced to approximately 55-57 fbg. Each of the four borings performed in the vicinity of the former industrial waste septic system and tank were advanced to a depth of 20 fbg. The material encountered at the site generally consisted of light brown to light tan, fine to coarse sand and gravel deposits. A light tan, coarse sand and gravel deposit was encountered in three of the four borings which were completed as monitoring wells, ranging from 48.5 fbg (MW-14) to approximately 55 fbg (MW-12, MW-13). A discontinuous medium gray clay unit was also observed at 56.5 fbg in MW-12. All soil samples were screened for VOCs after collection using standard head space methodology. Vapor concentrations were measured using an HNu-PID (10.2 eV lamp). Results of the field screening are presented in Table 4.

Relatively elevated levels of VOCs were detected in the soil samples analyzed. Laboratory analysis of the monitoring well soil samples revealed the presence of PCE above the NYSDEC soil cleanup objective of 1,400 micrograms per kilogram (ug/kg) in the sample collected from MW-13 at 54-54.7 fbg (30,000 (ug/kg)). TPH extractables representing diesel fuel, No. 2 fuel oil and lubricating oil were also detected in the samples collected from MW-12 at 45-47 fbg and MW-13 at 54-54.7 fbg.

Samples collected from the soil borings in the vicinity of the former industrial waste septic system exhibited relatively low levels of contaminants. Constituents detected included TPH extractables resembling lubricating oil (21 mg/kg, SB-9 at 20-22 fbg) and Nos. 4 and 6 heating oils (250 mg/kg, SB-10 at 05-07 fbg), and total metals including arsenic (0.5-2.5 mg/kg), barium (20-489 mg/kg), chromium (8 mg/kg), lead (0.5-2.1 mg/kg) and silver (2 mg/kg). Only barium exceeded the NYSDEC cleanup objective of 300 mg/kg.

According to the NYSDEC, no TPH regulatory guidance cleanup values would be applicable to the TPH values detected in the area of the former septic system. As an alternative, the NYSDEC

recommends characterizing the TPH contamination via Method 8270. To remain in place, the soil must not contain any individual contaminant greater than 10,000 ug/kg (10 mg/kg) via the 8270 method. Hence, additional characterization utilizing EPA Method 8270 is recommended in this area. However, based on the relatively low TPH values, it appears that minimal remediation, if any, would be required in the septic field area.

For the metal results, the NYSDEC recommends performing TCLP extraction to determine cleanup requirements. Based on the total metal levels presented above, it does not appear that the levels of metals detected would correspond to TCLP levels requiring cleanup.

Summaries of the soil analytical results are presented in Tables 8 and 9. A copy of the laboratory analytical report has been attached as Appendix B of this report.

A discussion of the nature, degree and extent of soil contamination on-site is contained in Section 3.1.

2.9 Results of Groundwater Sampling and Analysis

The four groundwater samples collected from monitoring wells MW-12, MW-13, MW-14 and MW-15 were analyzed for VOCs according to EPA method 8260. VOCs were detected in all four groundwater samples, ranging from 253 ug/L total VOCs (MW-15) to 72,400 ug/L total VOCs (MW-13). PCE was detected in all four samples above the NYSDEC water quality standard (5 ug/L) at 17,000 ug/L (MW-12), 59,000 ug/L (MW-13), 360 ug/L (MW-14) and 150 ug/L (MW-15). Additional constituents detected in all four samples above the water quality standards included TCE (63 to 7,600 ug/L), 1,1,1-trichloroethane (TCA) (13 to 1,300 ug/L), and cis-1,2-dichloroethene (13 to 4,500 ug/L). The sample collected from MW-12 contained additional constituents above NYSDEC standards including 1,1-dichloroethene (30 ug/L), trans-1,2-dichloroethene (15 ug/L), ethyl benzene (22 ug/L), toluene (16 ug/L), 1,2,4-trimethylbenzene (76 ug/L), 1,3,5- trimethylbenzene (35 ug/L), O-xylene (110 ug/L) and P, M-xylene (120 ug/L). In addition, 1,1-dichloroethene (14 ug/L) and trans-1,2-dichloroethene (5 ug/L) were detected equal to or above the standard in the samples collected from MW-15 and MW-14, respectively. A summary of the groundwater analytical results is presented in Table 10. A copy of the laboratory analytical report has been attached as Appendix B of this report.

A discussion of the nature, degree and extent of the groundwater contamination on-site is discussed in Section 3.2.

3.0 NATURE, DEGREE AND EXTENT OF CONTAMINATION

This section evaluates the nature, degree and extent of contamination in both the soils and groundwater. Both the previous investigation data and the data collected during the most recent soil and groundwater sampling event are used to evaluate these parameters. The nature, degree and extent of the contamination are used to develop remedial action alternatives.

3.1 Soils

Based upon the available data, soils under the subject site appear to have been impacted by VOCs in the vicinity of the east loading dock (Figures 2,3). PCE was detected in the soil above the NYSDEC cleanup objective for soil (1,400 ug/kg) in the sample collected from the MW-13 soil boring at 54--54.7 fbg (33,000 ug/kg). PCE was detected below the NYSDEC cleanup objective in the samples collected from MW-12 (45-47 fbg) and MW-13 (45-47 fbg) at 180 ug/kg. Well MW-13 is located east of the loading dock area and apparently directly downgradient of the former "discharge well". The surrounding monitoring wells (MW-14, MW-15 and MW-8) did not have any VOCs detected in the soil samples. Hence, it appears that the horizontal extent of the soil VOC

contamination is limited to the area immediately surrounding well MW-13. The vertical extent appears to be limited to an approximate 10 foot zone near the top of the water table. It should be noted, however, that some amount of residual contamination (PCE, TCE and other related compounds) may also be present below the water table. This will be determined during the vertical characterization study described later in this report.

3.2 Groundwater

VOCs were detected in the groundwater samples from monitoring wells MW-12, MW-13, MW-14 and MW-15. In descending order of cumulative concentration, tetrachloroethene (76,510 ug/L), PCE (12,223 ug/L), cis-1,2-dichloroethene (7,213 ug/L), and TCA (2,071 ug/L) were detected in these four wells. The concentrations of total VOCs detected were as follows: MW-13 (72,400 ug/L), MW-12 (24,461 ug/L), MW-14 (1,353 ug/L), and MW-15 (253 ug/L). It should be noted that the concentrations of PCE detected in the groundwater from wells MW-12 (17,000 ug/L) and MW-13 (59,000 ug/L) represent 11 and 39 percent, respectively, of the aqueous solubility of PCE (150,000 ug/L) at standard temperature and pressure (STP).

Figures 5 through 8 show the relative horizontal distribution of individual VOCs in the groundwater. In general, all of the compounds mapped (PCE, TCE, TCA and cis-1,2-dichloroethene) were detected in the highest concentrations near well MW-13. The compounds TCE and cis-1,2-dichloroethene were also detected at relatively high concentrations near well MW-7. Well MW-7 is located in an apparent downgradient direction from MW-13. Both TCE and cis-1,2-dichloroethene are degradation products of PCE. Hence, it appears that the source of the TCE and the cis-1,2-dichloroethene is the upgradient (near MW-13) high concentrations of PCE.

As discussed above, previous investigations indicated the presence of an abandoned "discharge well" near the northeast corner of the loading dock entrance, generally upgradient of MW-12 and MW-13 The greatest concentrations of VOCs in groundwater were detected in wells MW-12 (24,461 ug/L) and MW-13 (72,400 ug/L), which increased toward the area of the former discharge well. Based upon the field screening and laboratory analytical data, the source of the groundwater contamination in the vicinity of the loading dock appears to be the former discharge well.

The former discharge well is presumed to have been inactive since 1981 (Aqua Terra, 1993). Therefore, the well appears to constitute an inactive finite source of subsurface contamination. It should be noted that the exact location and specifications of the former discharge well are currently unknown. Based on the horizontal distribution of VOC contamination and the predicted groundwater flow direction, it appears that the former "discharge well" may have been located directly to the north/northeast of well MW-13.

3.3 Offsite

Based on the relatively low levels of VOCs detected in the soils and groundwater near the border of the 25 Melville Park Road property (wells MW-1, MW-2, and MW-3), it appears that the majority of the contamination is restricted to areas beneath the site.

However, it should also be noted that known contamination has been documented on the adjacent property, I.W. Industries. Contaminants detected in the groundwater samples collected from the western portion of this site (which abuts the 25 Melville Park Road property) include cis-1,2-dichloroethene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and xylenes. According to the NYSDEC project manager, Chris LaFemina, several sources of groundwater contamination were formerly located on the west side of the I.W. Industries building, adjacent to the subject site. Although plume definition and off-site migration studies have not been performed on the I.W. Industries property, Mr. LaFemina indicated off-site migration was a concern of the State. It also appears that the highest concentrations of contamination on the I.W. Industries site, according to

the NYSDEC, have been detected in the southwestern portion of the property. This area appears to be crossgradient relative to the highest concentrations detected on the 25 Melville Park Road site.

4.0 BASELINE RISK ASSESSMENT AND AIR SAMPLING

A baseline human health risk assessment was performed to assess the potential risks associated with exposure to constituents in groundwater at the site and to provide useful information in determining remedial actions. The methods used to perform the assessment were provided by the NYSDEC and the US Environmental Protection Agency (Risk Assessment Guidance for Superfund or "RAGS"). The methodology included four steps: hazard identification; exposure assessment; toxicity evaluation; and risk characterization. Exposure assumptions and fate and transport modeling are described in detail in the risk assessment contained in Appendices C and D.

Potential exposure pathways chosen for inclusion in the risk assessment depend largely on the constituents, the affected media, contaminant location, and the potentially impacted receptors, or populations. Completed pathways identified for the Melville site include inhalation of volatilized compounds from groundwater into the indoor air by current office workers and future ingestion of drinking water from a downgradient municipal well. First current and future exposure scenarios were modeled; then noncarcinogenic and carcinogenic risks were calculated. Cancer risk estimates were then compared to human health based risk levels that correspond to excess lifetime cancer risks set forth by the EPA and NYSDEC.

Potential current exposure stems from the possible volatilization of groundwater contaminants. These gaseous compounds could migrate through the soil and seep up through cracks in the building's foundation and into the indoor air. The modeled screening of the current exposure scenario indicated that the inhalation exposure could potentially present a human risk for carcinogenic substances. Because the model utilized numerous conservative assumptions, indoor air sampling was undertaken to assess the accuracy of the inhalation model. In particular, the model assumed that low levels of PCE, TCE and 1,1-dichloroethene migrated into the indoor air space. As such, the indoor air sampling program was performed to evaluate whether levels of PCE, TCE and 1,1-dichloroethene could be detected in indoor air. The air samples were collected in evacuated summa canisters over a time period of 6 to 8 hours during normal work hours in the building. Three air samples from separate indoor locations were collected on three separate days. (The air sampling locations are discussed in Appendix C.) The air samples were analyzed by the gas chromatography/mass spectrometry (GC/MS) method using cryo-focusing to concentrate potential organics. The detection limits ranged between 0.11 and 0.19 parts per billion (ppb). The analytical air sampling results are provided in Appendix E.

No detected levels of 1,1-dichloroethene were indicated from the air sampling results. Concentrations of PCE and TCE were entered into the risk assessment model and yielded chemical -specific excess lifetime cancer risks of 1.10×10^{-7} and 1.48×10^{-7}, respectively. The summed cancer risk based on actual air levels is 2.58×10^{-7}, well below regulatory benchmark levels of acceptable risk. This number indicates that there is no current inhalation risk from carcinogenic substances. Noncancer risks calculated using a hazard quotient indicated that there was no potential for adverse health effects. The results were based on the modeled levels produced from the screening model.

The future scenario assessed the residential ingestion of drinking water from a downgradient well. The concentrations of contaminants in the downgradient well were modeled using a two dimensional analytical contaminant transport program (Prince, 1994) employing conservative assumptions. The results of the future scenario showed that the hazard quotient for noncancer risks was less than one, indicating that based on the modeled concentrations, there did not appear to be a potential for any adverse health effects from ingesting water from a hypothetical

downgradient well. Cancer risks for the future scenario were significantly less that one in a million, the guidance level for carcinogenic substances set by the NYSDEC.

The future exposure scenario was based on plausible predicted uses of the site and site area. Land use in the immediate surrounding area is entirely light industrial and commercial. At the present time, it is unknown whether the South Huntington Water District will install an additional well in the immediate area. According to the Suffolk County Health Department, the Melville area is considered a deep recharge area. As such, the modeled groundwater concentrations predict the potential flow of on-site contamination from a recharge area towards the receptor (the downgradient water supply well). The future scenario risk assessment indicates that the site area as a recharge area does not adversely impact (in terms of carcinogenic and noncarcinogenic effects) the downgradient well.

5.0 REMEDIAL ACTION OBJECTIVES AND TARGET CLEANUP GOALS

This section presents the remedial action objectives and target cleanup goals. General response actions are identified that satisfy the remedial action objectives. Estimates of the quantities of contaminated soil and groundwater are also presented in this section, as these quantities influence the development and feasibility of a response action. It should be noted that prior to the development of a final remedial design, some additional characterization will be required to define the vertical extent of contamination in the aquifer.

5.1 Remedial Action Objectives

The remedial action should be designed to treat or effectively control the contaminated media so that the contaminants of concern do not migrate off the site or come into contact with humans or sensitive receptors. The levels of concern in the groundwater were delineated by the baseline risk assessment. The soil cleanup objectives were established by the NYSDEC. As identified in the baseline risk assessment, contaminated media of concern from a human health perspective are current contact with vapors from volatilization from the groundwater and the potential future contamination of off site groundwater. Currently, contaminated media are not in contact with humans or sensitive receptors at levels of concern.

The primary contaminant of concern for both soil and groundwater is PCE. TCE, cis-1,2-dichloroethene and TCA are also of concern in the groundwater only. Mercury was not found to be a significant concern. Recommended exposure limits are based on the baseline risk assessment and the soil cleanup objectives.

In summary, the remedial objectives for the 25 Melville Park Road site are:

- Isolation of the plume of contaminated groundwater from potential on- and off-site receptors; and
- Treatment of contaminated soils and groundwater to reduce the concentrations of Target Compounds to levels consistent with exposure limits identified in the baseline risk assessment and regulatory guidelines.

5.2 Target Cleanup Goals

Target cleanup goals have been established for soil and groundwater based on the NYSDEC 1994 TAGM (No, HWR-94-4046) and the baseline risk assessment, respectively. The soil and groundwater cleanup objectives are summarized in Table 11. The goal of both the soil and groundwater remediation will be to remediate the indicator compounds to the target cleanup goals. The indicator compounds were determined to be PCE, TCE and TCA (all VOCs). Only PCE was

detected in the soil samples. By comparison, all indicator compounds were detected in the groundwater samples. Additional compounds were also detected in the groundwater at concentrations much lower than the maximum concentrations of the indicator compounds. However, it is anticipated that the concentrations of the additional contaminants will be reduced to below applicable standards based on the implementation of the remediation program.

The comparisons presented (in Table 11) indicate that remedial actions will be necessary for both soils and groundwater to achieve the criteria. The groundwater cleanup goals presented are based on the risk assessment (Appendix C). The assessment utilized conservative assumptions in characterizing the extent of the current risk (to evaluate cleanup goals). The human health risk assessment provided a no-action baseline where risk posed by current and future exposures were evaluated. The modeled screening (summed risk level) of the current exposure scenario indicated that there was a potential human risk for carcinogenic substances. Cleanup goals were therefore derived using a back-calculation method using the benchmark "acceptable" summed risk level of 1e-6, or one in one million. To achieve that risk level, PCE should be cleaned up to 1,300 ug/L, while TCE should be cleaned up to 1,000 ug/L . The cleanup level for TCA was apportioned using a 45.3846 scaling factor (59/1.3) based upon the PCE cleanup goal calculation. As such, the TCA cleanup goal was calculated to be 29 ug/L. The remaining compounds were also apportioned using the scaling factor. If the calculated clean up value was below 5 ug/L (the New York State Groundwater Standard per Title 6, Chapter X Parts 700-705), then 5 ug/L as a default value was used. Such target cleanup goals should achieve a protection level based on plausible scenarios for the current use of the site and site area. It should be noted that actual air sampling data show that these cleanup levels, based on the inhalation screening model, are extremely protective. Details of these groundwater cleanup goal derivations are provided in Appendix C.

5.3 General Response Actions

The general response action for this site is to undertake feasible measures to effectively control the migration of contaminated groundwater and to reduce contamination levels so that human health risks under potential future exposure scenarios are minimized.

The selected general response action to address the solvent (PCE, TCA and TCE) contaminated soil and groundwater will be to combine three elements of remedial techniques including sparging the groundwater, pumping and treating the groundwater and extracting soil vapors. These general response actions are discussed in more detail in the subsequent section (Section 6).

Based on available data, the contamination appears to be associated with groundwater (to depths at least 20 feet below the water table) and soils near the water table, at depths of 50 feet. Extensive soil removal actions do not appear feasible in this setting. In addition, bioremediation options are limited by the mixed nature of the Target Compounds, (both anaerobically and aerobically degradable compounds are present).

Based on the foregoing, and recognizing the volatile nature of the Target Compounds, the use of air sparging/vapor extraction (treatment), combined with groundwater recovery and treatment (hydraulic isolation and treatment) are feasible and effective methods for addressing the contamination at this site.

5.4 Volume Estimates of Contaminated Soil and Groundwater

This section presents the estimated volumes of the source area contaminated soil and groundwater. These values were determined to aid in the development of the proposed remediation alternative. The estimates are based on existing information concerning site conditions and ERI's experience with similar investigations. Upon completion of the recommended additional investigation, these estimates may be revised.

5.4.1 Contaminated Soil

The volume of contaminated soil was calculated from the soil analytical data. Soil samples collected during the installation of wells MW-12 and MW-13 exhibited levels of solvent contamination above Target Cleanup Goals at depths between 45 and 55 fbg. Soil samples collected from surrounding wells (MW-14, MW-15 and MW-11) did not have any VOCs detected. Using the spatial configuration of detected VOCs in soils, an area 25 feet wide (east-west and approximately perpendicular to the groundwater flow direction) by 130 feet (north-south) was estimated. Therefore, the areal extent of contaminated soil is 3,250 square feet. Assuming that the contaminated soil thickness thins towards the edges of the area (with an average five feet thickness over its entire area), the total volume of contaminated soil was estimated to be 16,250 cubic feet or approximately 601 cubic yards. Figure 9 shows the estimated area of contaminated soil.

5.4.2 Contaminated Groundwater

Based upon total VOC isopleths (areas of equal concentration) of 100, 1,000, and 10,000 ug/L (Figure 4) estimates were prepared for the volume of contaminated groundwater and of the mass of contaminants in the groundwater beneath the site. Assumptions to the estimates included the following: only the upper 40 feet of the aquifer has been impacted (previous investigations indicated the concentration of PCE in the aquifer decreased from 12,600 ug/L at the water table to 7,200 ug/L at approximately 20 feet below the water table); and the areal extent of the 100 to 1,000 ug/L, 1,000 to 10,000 ug/L and greater than 10,000 ug/L contaminant plumes are 16,700, 4,750 and 5,600 square feet, respectively.

The volumes of contaminated groundwater within each of the isopleths were as follows: 586,510 gallons greater than 10,000 ug/L, 497,487 gallons between 10,000 and 1,000 ug/L, and 1,749,058 gallons between 1,000 and 100 ug/L. Therefore, the estimated mass of total VOC contamination within each plume is 48.9 lbs within the 10,000 ug/L plume, 4.2 lbs. within the 10,000 to 1,000 ug/L plume, and 1.5 lbs. within the 1,000 to 100 ug/L plume, for a total of approximately 54.6 lbs of total VOCs within the aquifer under the assumed conditions.

It should be noted that the estimate of vertical extent of contamination is limited by the absence of data for depths greater than 20 feet below the water table. It is possible that additional studies will show that the extent exceeds these estimates. If such is the case, the estimates will be revised appropriately.

6.0 Proposed Response Action

6.1 Air Sparging

To remediate the areas of relatively high groundwater VOC contamination, two air sparging wells are proposed. One sparging well will be located near well MW-13 (the highest area of detected contamination). The second sparging well will be located immediately north of MW-8 (Figure 10). The sparging wells are proposed to extend approximately 40 feet into the water table. Compressed air will be forced into the sparging wells and injected into the aquifer. This "sparging" should result in an increased rate of volatilization of the VOC contamination. It is anticipated that the sparging wells will have a 10 to 20 foot radius of influence. The goal of the air sparging will be to provide the primary means of remediation of the contaminated soils and groundwater at the site. The volatiles from the soils and groundwater will be ultimately recovered via the soil vapor/vacuum extraction system (which is described later in Section 6.3).

It should be noted that the depth of the setting for the air sparging system has been based on the characterization of the vertical extent of the observed contamination. Should the proposed

additional investigation efforts indicate a significantly different depth of contamination, the depth settings of the sparge system would be revised.

6.2 Groundwater Recovery System

To isolate the defined contaminant plume from off-site receptors, and to further treat the contaminated groundwater at the site, a groundwater extraction system is proposed. The groundwater extraction system would consist of two extraction wells screened an estimated 30 to 40 feet into the water table aquifer. The wells would extend to an estimated 80-90 feet below grade. One well would be located in the area of monitoring well MW-13. The proposed location of the second well would be directly southwest of monitoring well MW-8.

The extraction (recovery) wells would be capable of pumping between 20 and 40 gallons per minute each. The extracted groundwater would be treated on-site, and discharged to the New York State Department of Transportation (NYSDOT) storm sewer system adjacent and to the south of the site. The preliminary extraction well locations and resulting capture zone are shown on Figure 10. The capture (isolation) zone for the proposed remediation is estimated to be 130 feet in length and 50 feet in width. The goal of the groundwater pump and treat system will be to capture most of the shallow (contaminated) groundwater west of the eastern property border, east of the site building, north of well MW-10 and south of well MW-15.

The extracted groundwater would be treated by using a low profile air stripper. Air stripping is a process by which the volatile compounds in the liquid phase are transferred to the gas phase by a counter current air flow. The contaminated groundwater enters the top of the low profile unit and flows by gravity along a baffled aeration tray or multiple trays. A blower forces a specified volume of air per unit of time in the bottom of the unit and the air travels upward through small openings in the aeration tray(s) as the groundwater passes through the tray(s). The air forms a froth of bubbles on the aeration trays creating a large mass transfer area where the VOCs are volatilized. The air and the volatiles are vented out of the unit. Depending on the concentration of VOCs in the air stream, the air would either be discharged directly to the ambient air or treated by activated carbon units prior to discharge to the ambient air.

As discussed above, the treated groundwater from the stripping unit would be piped into the storm sewer system located along Melville Park Road. The storm sewer eventually discharges to a 14 acre recharge basin located an estimated 0.25 miles southeast of the site. This action would require compliance with New York State surface water standards. In addition, the discharge to the storm sewer would likely require a SPDES permit.

6.3 Vapor/Vacuum Extraction

A Soil Vapor/vacuum extraction system (VES) is typically applied where VOCs are present in the site soils. VES involves creating a vacuum in the soil by connecting a vacuum blower unit to screened piping that is either horizontally or vertically installed in the subsurface. With the vacuum applied, the VOC contamination present in the soil will volatilize and migrate towards the extraction well. In conjunction with the air sparging units, this system will provide a significant potential for mass transfer of VOCs from site soils and groundwater to the gaseous phase.

Based on similar studies conducted in the site area, it is anticipated that a VES well screened in the vadose zone (above the water table) should achieve a radius of influence of approximately 30 feet. At least three VES wells will be installed in the area of well MW-13 spaced an estimated 50 feet apart. Prior to the final design of the VES system, a pilot test will be conducted to determine the characteristics of the vadose and the nature of the air flow within this zone. Depending on the flow capacity of the VES wells, the system will be equipped with a 5 to 10 horsepower vacuum blower.

The exhaust from the VES will be discharged through a series of carbon units (likely two 1,000 pound carbon units) prior to emission to the ambient air via an exhaust stack.

6.4 Remediation Time Frame

The cleanup time for the extent of contaminated groundwater has been estimated. Based on a comparison to other similar remediation estimates in the site area, it is estimated that the groundwater remediation time to achieve the risk based groundwater standards for TCE (1,000 ug/L), TCA (28 ug/L), and PCE (1,300 ug/L) would be 5 to 10 years.

6.5 Monitoring

Periodic groundwater monitoring would be performed to confirm the absence of plume migration, and to monitor and assess any changes in the concentration of VOCs in the groundwater. The monitoring would also be conducted to evaluate the effectiveness of the groundwater and soil remediation over time.

For cost estimating purposes, it has been assumed that the groundwater monitoring program would consist of sampling eight existing monitoring wells. The samples would be analyzed in a laboratory for VOCs via method 8240. In addition, the flow characteristics of the aquifer during the groundwater pumping will be evaluated via groundwater elevation measurements in the monitoring wells.

The monitoring wells included in the proposed sampling program are MW-7, MW-8, MW-10, MW-12, MW-13, MW-14, MW-15. Figure 2 shows the locations of the monitoring wells. The actual environmental monitoring plan that would be implemented would be developed in detail and submitted for review and comment as part of the final design phase. The need for additional monitoring points would be assessed at that time.

For cost estimating purposes, it has been assumed that the environmental monitoring will be conducted on a semi-annual basis over the a ten-year remediation period. (The monitoring requirements may be reduced after five years to include only annual groundwater sampling and less monitoring wells.)

6.6 Additional Information Needs

The performance of this effort has indicated the need for additional data collection to:

- Further define the extent (primarily vertical) of groundwater contamination;
- Perform baseline monitoring to evaluate the condition of the aquifer over the entire site; and
- Provide a better basis for detailed design of the selected remedy.

It was earlier noted that the vertical extent of contamination was estimated at 40 feet. However, this value cannot be confirmed with the data available. To provide this confirmation, ERI recommends the installation of a series (probably two) of nested monitoring wells (at depths of 100 and 150 feet below the water table). If contamination appears to extend beyond a depth of 150 feet below the water table, additional wells will be installed at 50 foot intervals until the limits of contamination (or practical drilling capabilities) are encountered.

Subsequent to the installation of the additional nested wells, ERI recommends establishing baseline groundwater conditions. This would involve the collection and analysis of groundwater samples from all of the on-site monitoring wells. In addition, a groundwater elevation survey is

recommended to be performed concurrently. The elevation survey would evaluate both horizontal and vertical groundwater flow directions and gradients.

In order to properly evaluate groundwater isolation and recovery operations, additional data collection is necessary. First, the solid matrix (sand/gravel) should be evaluated for particles size distribution as part of the installation of wells. Groundwater iron and manganese levels, critical to the successful long-term operations of air stripping and sparging systems, must be determined. When high iron and/or manganese is encountered, operational staff must be made aware of the potential for deposition of oxides and loss of system efficiency.

To properly gage the effort of the isolation system, a 24-hour pump test is proposed to define aquifer characteristics. The results of this test will be used to define aquifer permeability and specific capacity, which in turn will allow a better estimation of the pumping rate/capture zone relationship. The pumping rate necessary to meet the capture zone (isolation) requirements will then be used to size the air-stripping (and other) system equipment.

To properly size the gaseous transfer operation (air sparging/VES), a pilot test of the system is necessary. The data collected from this test will be used to assess the radius of influence of both sparging and VES wells, and will be used to further refine system design and operational parameters.

6.7 Costs

The proposed costs for the remediation activities are presented below. Prior to the final design of the remediation system, the vertical extent of the VOC contamination in the area of well MW-13 should be determined. Previous investigations in the area of monitoring well MW-7 showed that PCE concentrations decreased with depth an estimated 43 percent over a 15 feet interval. Based on the current data, it is estimated that the dissolved solvent contamination extends 40 feet into the aquifer. To confirm the vertical extent of the solvent contamination, well nests are recommended. Following the nested wells installation, one additional groundwater sampling round and groundwater survey event (including all of the monitoring wells) is recommended. The cost to perform the additional vertical characterization, well sampling and groundwater survey is estimated to be $32,000.

The additional vertical characterization well sampling and groundwater survey will be incorporated into a final remedial design. It should be noted that the final remedial design will be overseen by a NYS Professional Engineer. The cost for conducting the final remedial design and report is estimated to be $10,000.

Based on the preliminary remedial design, a VES system is proposed to remediate the contaminated soils. In addition, to increase the volatilization of the groundwater contaminants, two air sparging points (wells) are proposed. Initially, three to five soil vapor wells will be installed. The VES wells will be screened in the deep vadose zone. Coincident with the VES installation, two air sparging points will be installed an estimated 20 feet into the aquifer (total depth approximately 75 fbg). Subsequently, a three to seven day soil gas/sparging pilot test will be conducted. The cost of installing the three to five VES points, two sparging wells and conducting the pilot test is estimated to be $22,000.

Ultimately, the precise configuration of the soil vapor gas system will depend on the final remedial design and the results of the pilot test. Currently, as discussed above, it is likely that a system equipped with a five to ten horse power blower will be required. In addition, two 1,000 pound carbon units will likely be necessary to treat the vapor discharge prior to emission to the atmosphere. The costs to provide such a unit , the possible installation of additional VES wells, and the associated piping is estimated to be $30,000.

The air sparging system will require an air compressor and appropriate piping and controls. The controls may be combined with the controls for the VES system. The costs associated with the air compressor, controls and piping for the sparging points is estimated to be $15,000.

The preliminary remedial action plan also requires that two groundwater recovery wells be installed. The recovery wells will likely be six inches in diameter and constructed with stainless steel well screen. The wells will be screened an estimated thirty to forty feet into the water table (approximately 80-90 feet total depth). The screened interval will be entirely below the water table. It is estimated that the screened length will be 20 feet. This will reduce excessive turbulence within the well and iron buildup. The cost for installing the recovery wells is estimated to be $30,000.

Based on the preliminary remedial action plan, it is likely that the groundwater discharge will be pumped through a low profile air stripper, through one 1,000 pound carbon unit and then discharged into the storm sewer. (It is likely that a SPDES permit will be required for the discharge into the storm sewer.) The exhaust from the air stripper will be manifolded into the exhaust from the VES system. The estimated cost for this equipment, associated piping and preparation of the SPDES permit is $32,000.

It is also anticipated that a short term pumping test will be required prior to system startup to evaluate the aquifer characteristics, the effluent concentrations and the appropriate long term pumping rates. The cost to conduct the pumping test and start the system up (and associated monitoring) is estimated to be $15,000 excluding water disposal costs, if required.

The carbon changeout costs will depend on the VES and groundwater effluent concentrations. A preliminary estimate for this item is $8,000 per year. (It should be noted that the carbon change out costs will likely decrease over time as the contaminant concentrations decrease.) The semi-annual groundwater monitoring costs are estimated to be $8,000. The general operations & maintenance (O&M) costs are estimated to be $15,000 per year. The O&M costs include electrical and general inspections of the systems. The O&M, carbon changeout and groundwater monitoring costs will be incurred for the life of the system operation.

A summary of the costs for the soil and groundwater remediation is presented in Table 12. It should be noted that the costs presented in Table 12 do not include any removal of mercury contaminated soil near the former septic system. As discussed previously, no levels of mercury were detected in this area during the most recent sampling round. In addition, the cost for removing the abandoned 10,000 gallon fuel oil tank (located on the northwest side of the building) was not included in the table. The cost of removing the UST will likely range between $12,000 and $37,000 (depending on how much contaminated soil requires removal).

7.0 Conclusions

The proposed remedial actions have been devised to treat and effectively control the contaminated media of concern. The cleanup goals presented are based both on published guidance values (soil) and the baseline risk assessment (groundwater). The costs presented for the remedial actions are predicated on definitive assumptions with regard to the extent of contamination.

All of the work defined herein is proposed to be performed under the NYS Voluntary Cleanup Program. As such, it is WHCS's goal to obtain a qualified release (i.e., no further action) from the NYSDEC upon completion of the proposed cleanup. To achieve this goal, WHCS is prepared to enter into a commitment with the NYSDEC to conduct a phased approach to remediate the site.

Specifically, this PRAP presents a phased approach which first recommends additional data collection to fill in gaps. The second phase will be to prepare and present a final remedial design. Subsequently, the remedial measures will be implemented to achieve the cleanup objectives presented in this PRAP. It should be noted that the remedial actions are based on available data and certain assumptions regarding the extent of the vertical contamination.

At present, it is anticipated that the remediation system will be run and monitored for a period of 5 to 10 years to achieve clean up goals for TCE, PCE and TCA (indicator constituents) in the groundwater. WHCS proposes that the system be stepped down after five years of effective operation. This will include, as appropriate, reducing the pumping rate of the recovery wells and/or lowering the venting and sparge volumes. In addition, the periodic monitoring may be reduced from a semi-annual basis to an annual basis. The goal of the stepped down remediation will continue to prevent any contamination from migrating off site (thus impacting water supply wells) and to mitigate the risk of exposure via indoor air inhalation.

REFERENCES:

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TABLES

TABLE 1

PREVIOUS SOIL ANALYTICAL RESULTS FROM DECEMBER 19 AND 20, 1994 25 MELVILLE PARK ROAD MELVILLE, NEW YORK

Analyte	HP-1	HP-2	HP-4	HP-5	B-1	B-2	B-3	NYSDEC Soil Cleanup Objective
TPH	BDL	26	BDL	BDL	35	420	BDL	NS
13-PP METALS								
arsenic	BDL	BDL	N/A	1.5	2.4	1.6	1.9	7.5
chromium	1.5	2.2	N/A	2.6	5.5	2.9	2.5	10
copper	BDL	2.8	N/A	BDL	24	4.8	BDL	25
mercury	BDL	BDL	N/A	BDL	BDL	**1.8**	BDL	0.1
lead	1.2	3.1	N/A	1.1	5.5	2.2	1.1	SB
zinc	4.3	5.5	N.A	4.4	17	6.8	4.5	20
cyanide	BDL	BDL	N/A	BDL	BDL	24	BDL	NS
pH	6.7	7.7	N/A	7.2	8.0	8.0	6.5	NS

Results presented in milligrams per kilogram
TPH =Total petroleum hydrocarbons by gas chromatography using flame ionization detection
13 PP METALS =13 Priority Pollutant Metals
Standard = NYSDEC Technical and Administrative Guidance Memorandum (TAGM) No. HWR-94-4046
N/A Not analyzed
BDL Below laboratory detection limits
NS No standard
SB Site background
All other target compounds not listed were below laboratory detection limits

TABLE 2

PREVIOUS SOIL ANALYTICAL RESULTS FROM JANUARY 25, 1995
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK

Sample I.D.	Sample Depth (feet)	HNu (ppm)	VOCs (ug/kg)	TPH (mg/kg)
HP6/1012	10-12	88	BDL (1)	BDL
HP6/2022	20-22	195	BDL (1)	BDL
HP6/3032	30-32	250	BDL (1)	BDL
HP6/4042	40-42	175	BDL (1)	BDL
HP6/BTTM*	45-50	92	BDL (1)	BDL
B4/5-7	5-7	130	BDL (1)	BDL
B4/15-17	15-17	12	BDL (1)	BDL
B5/5-7	5-7	10	BDL (1)	BDL
B5/15-17	15-17	4	BDL (1)	BDL
B6/5-7	5-7	8	BDL (1)	BDL
B6/15-17	15-17	5	BDL (1)	BDL
MW-8	5-7	BDL	NA	NA
MW-8	10-12	BDL	NA	NA
MW-9	5-7	BDL	NA	NA
MW-9	10-12	BDL	NA	NA
MW-10	5-7	4.8	NA	NA
MW-10	10-12	3.1	NA	NA
MW-11	5-7	44.7	NA	NA
MW-11	10-12	472	BDL (2)	NA

* =sample was collected off the auger due to lack of spoon sample recovery and is believed to be from a depth of approximately 45 to 50 feet.

HNu -field screening of samples with HNu photoionization detector

(1) VOCs -laboratory analysis of volatile organic compounds by EPA Method 8260

(2) VOCs -laboratory analysis of volatile organic compounds by EPA Method 8120

TPH -laboratory analysis of total petroleum hydrocarbons by gas chromatography

BDL -compound(s) not detected above minimum laboratory detection limits

ppm -parts per million

ug/kg -micrograms per kilogram

TABLE 3

PREVIOUS GROUNDWATER ANALYTICAL RESULTS
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK
(IN UG/L)

COMPOUND	1,1-DCA	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE
MW-1 (12/20/94)	BDL	BDL	BDL	23	5	BDL
MW-2 (12/20/94)	5	35	BDL	120	23	51
MW-3 (12/20/94)	10	28	BDL	110	21	48
MW-4 (12/20/94)	BDL	BDL	BDL	BDL	BDL	BDL
MW-5 (12/20/94)	BDL	BDL	BDL	BDL	BDL	BDL
MW-6 (12/20/94)	BDL	BDL	BDL	BDL	BDL	BDL
MW-7 (1/25/95)	BDL	1,600	BDL	12,600	180	5,200
MW-7 (5/31/95)	25	BDL	52	8,300	61	3,200
MW-8 (5/31/95)	17	BDL	65	31,700	270	12,900
MW-9 (5/31/95)	8.1	BDL	14	330	21	290
MW-10 (5/31/95)	8.7	BDL	12	640	24	670
MW-11 (5/31/95)	BDL	BDL	BDL	1,200	16	260
HP-1 (12/20/94)	BDL	BDL	BDL	15,000	BDL	1,100
HP-2 (12/20/94)	BDL	6	BDL	28	5	BDL
HP-4 (12/20/94)	BDL	BDL	BDL	BDL	BDL	BDL
HP-5 (12/20/94)	BDL	BDL	BDL	5	BDL	BDL
HP-6 (1/25/95)	BDL	630	BDL	7,300	80	1,800
STANDARD	**NS**	**70**	**100**	**5**	**200**	**5**

Notes:

Sampling dates indicated in parentheses.
DCA -dichloroethane
DCE -dichloroethene
PCE -perchloroethene
TCA -trichloroethane
BDL -Below laboratory detection limits
NS -No standard

TABLE 4

SOILS FIELD SCREENING DATA
MONITORING WELLS
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK

Location	Sample Depth (fbg)	HNu Measurement (ppm)
MW-12	0.5-2.5	0.0
	2.5-4.5	0.0
	10-12	0.0
	20-22	0.0
	30-32	0.0
	40-42	0.0
	45-47	**9.0**
	50-52	**2.0**
	55-56.5	**30.**
	56.5-57	**7.0**
MW-13	0.5-2.5	0.0
	05-10	0.0
	15-17	0.0
	25-27	0.0
	35-37	0.0
	40-42	**1.0**
	45-47	**2.0**
	50-52	**40.**
	54-54'8"	**120.***
	54'8"-55'8"	**50.**
MW-14	03-05	**25**
	08-10	**2.0**
	18-20	**2.0**
	28-30	0.0
	38-40	0.0
	43-45	**0.5**
	48-50	**1.0**
	53-55	**1.5**
MW-15	0.5-2.5	0.0
	10-12	0.0
	20-22	0.0
	30-32	0.0
	40-42	0.0
	45-47	0.0
	50-52	**0.5**
	55-57	**1.0**

* - ambient screening due to insufficient sample volume for head space screening

TABLE 5

SOILS FIELD SCREENING DATA
SOIL BORINGS
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK

Location	Sample Depth (fbg)	HNu Measurement (ppm)
SB-7	01-03	0.0
	05-07	0.0
SB-7A	10-12	0.0
	15-17	0.0
	20-22	0.0
SB-8	01-03	0.0
	05-07	0.0
	10-12	0.0
	15-17	0.0
	20-22	0.0
SB-9	01-03	0.0
	05-07	0.0
	10-12	0.0
	15-17	0.0*
	20-22	0.0
SB-10	01-03	0.0
	05-07	0.0
	10-12	0.0
	15-17	0.0
	20-22	0.0

* - ambient screening due to insufficient sample volume for head space screening

TABLE 6

MONITORING WELL CONSTRUCTION SUMMARY
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK

Well Designation	Well Depth	Screened Interval	Elevation
MW-8*	60	40-60	100.00 feet
MW-12	56.5	46.5-56.5	100.39 feet
MW-13	58	48-58	100.44 feet
MW-14	56	46-56	99.09 feet
MW-15	58.5	48.5-58.5	99.82 feet

* - Installed by others
1- Elevation based on an arbitrary datum (MW-8)
2- Well depths and screened intervals presented in "feet below grade".

TABLE 7

GROUNDWATER ELEVATION SURVEY
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK

Well Location	Elevation	Depth to Water	Water Level Elevation
MW-8	100.00 feet	51.13	48.87
MW-12	100.39 feet	51.46	48.93
MW-13	100.44 feet	51.46	48.98
MW-14	99.09 feet	50.15	48.94
MW-15	99.82 feet	50.81	49.01

1- Elevations based on arbitrary datum.
2- Depths in "feet below grade".

TABLE 8

SOIL ANALYTICAL SUMMARY
MONITORING WELL BORINGS
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK
FEBRUARY 29 - MARCH 4, 1996

Compound	Units	MW12 45-47	MW12 55-56.5	MW13 45-47	MW13 54-54.7	MW-14 03-05	MW14 43-45	MW15 50-52	NYSDEC Soil Cleanup Objective *
tetrachloroethene	ug/kg	180	ND	180	**30,000**	ND	ND	ND	1,400
TPH-diesel/#2	mg/kg	290	ND	NA	550	ND	ND	ND	N/A
TPH-lubricating oil	mg/kg	1,100	ND	NA	450	ND	ND	ND	N/A
TPH-#4/#6	mg/kg	ND	ND	NA	ND	ND	ND	ND	N/A

ND - Not detected
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
* - NYSDEC TAGM:No. HWR-94-4046
Sampling depths indicated in feet below grade.

TABLE 9

SOIL ANALYTICAL SUMMARY (current investigation)
SEPTIC SOIL BORINGS
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK
FEBRUARY 29 - MARCH 4, 1996

	Units	SB-7A 10-12	SB-8 15-17	SB-9 20-22	SB-10 05-07	NYSDEC Soil Cleanup Objective
tetrachloroethene	ug/kg	ND	ND	ND	ND	1,400
TPH-diesel/#2	mg/kg	ND	ND	ND	ND	N/A
TPH-lubricating oil	mg/kg	ND	ND	21	ND	N/A
TPH-#4/#6	mg/kg	ND	ND	ND	250	N/A
arsenic	mg/kg	ND	ND	0.5	2.5	7.5 or SB
barium	mg/kg	23	58	**489**	20	300 or SB
chromium	mg/kg	ND	ND	ND	8	10 or SB
lead	mg/kg	0.5	0.6	0.7	2.1	SB
silver	mg/kg	ND	ND	ND	2	SB

ND - Not detected
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
NYSDEC TAGM, No. HWR-94-4046
Sample depth indicated in feet below grade
SB - Site Background

TABLE 10

GROUNDWATER ANALYTICAL SUMMARY (current investigation)
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK
MARCH 4, 1996
All Units in ug/L

	MW-12	MW-13	MW-14	MW-15	NYSDEC WQ Standard
tetrachloroethene	**17,000**	**59,000**	**360**	**150**	5
trichloroethene	**4,300**	**7,600**	**260**	**63**	5
cis 1,2 dichloroethene	**2,000**	**4,500**	**700**	**13**	5
1,1,1 trichloroethane	**730**	**1,300**	**28**	**13**	5
1,1 dichloroethene	**30**	ND*	ND	**14**	5
trans 1,2 dichloroethene	**15**	ND*	**5**	ND	5
ethyl benzene	**22**	ND*	ND	ND	5
naphthalene	7	ND*	ND	ND	10
toluene	**16**	ND*	ND	ND	5
1,2,4 trimethylbenzene	**76**	ND*	ND	ND	5
1,3,5 trimethylbenzene	**35**	ND*	ND	ND	5
O-xylene	**110**	ND*	ND	ND	5
P,M xylene	**120**	ND*	ND	ND	5
Total VOCs	24,461	72,400	1,353	253	N/A

ND - Not Detected above the analytical detection limit
ND* - Detection limit of 500 ug/L due to nature of sample
Bold number denotes equal to or above the NYSDEC WQ Standard.

TABLE 11

TARGET CLEANUP GOALS
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK

COC (1)	Soil (2)	Groundwater(3)	Soil Criteria(4)	GW Criteria(5)
Perchloroethene	30,000 ppb	59,000 ppb	1,400 ppb	1,300 ppb
Trichloroethene	ND	7,600 ppb	700 ppb	1,000 ppb
1,1,1-Trichloroethane	ND	1,300 ppb	760 ppb	29 ppb

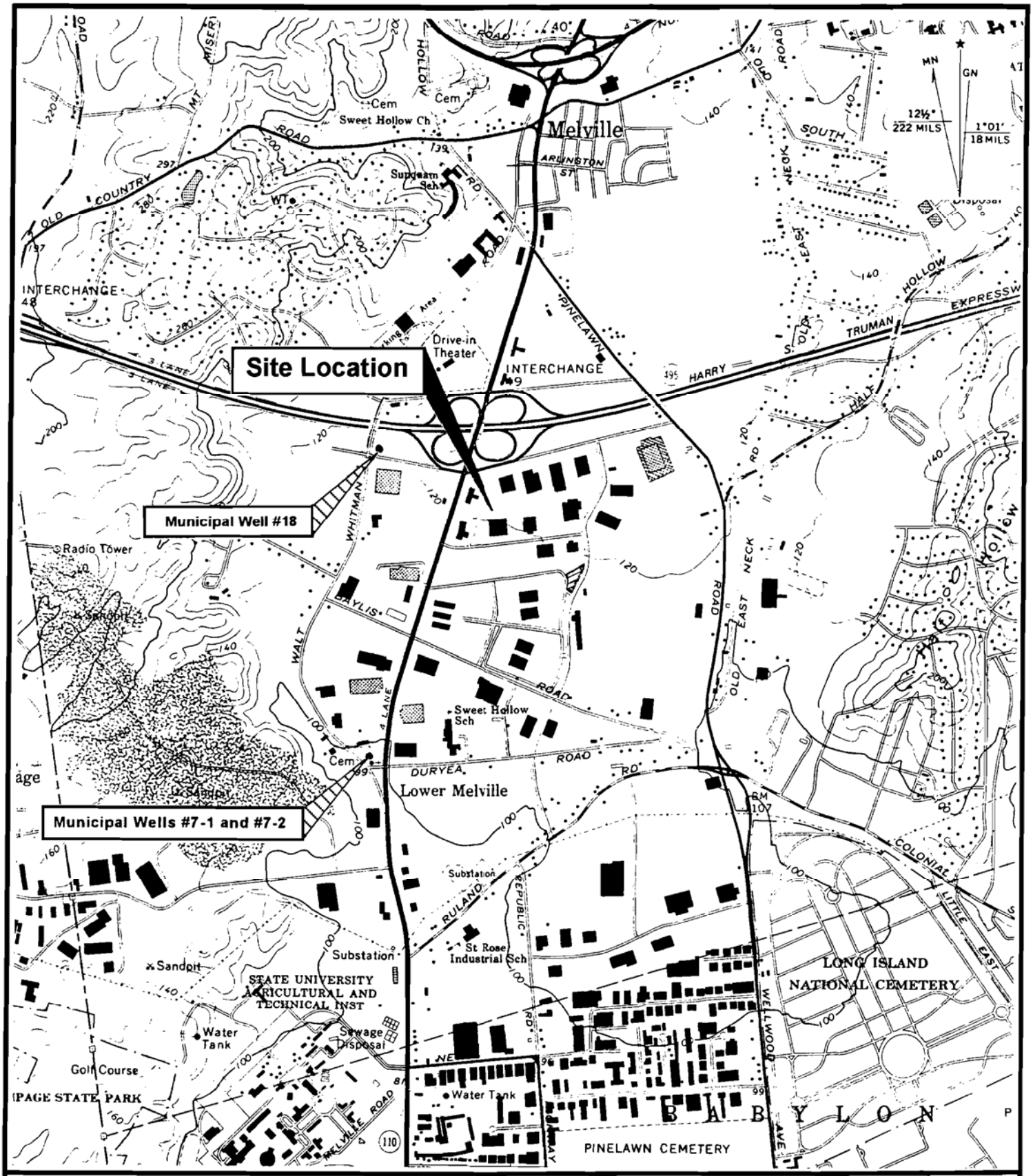
(1) Contaminant of Concern
(2) Highest concentration detected in on-site soils
(3) Highest concentration detected in on-site groundwater
(4) Soil criteria based NYSDEC TAGM,No. HWR-94-4046.
(5) Groundwater criteria based on Baseline Risk Assessment
ND-Not Detected
ppb - parts per billion, ug/L.

TABLE 12
SUMMARY OF REMEDIAL COSTS
25 MELVILLE PARK ROAD
MELVILLE, NEW YORK

ACTIVITY	CAPITAL & DIRECT COST	OPERATION & MAINTENANCE COSTS (ONLY FIRST YEAR GIVEN)	TOTAL (10 YEARS OF OPERATION)	TOTAL IN PRESENT WORTH (10 YEARS OF OPERATION)
Vertical Characterization	$33,000	NA	$33,000	$33,000
Final Remedial Design	$15,000	NA	$15,000	$15,000
VES Well Installation/Sparge Point Installation VES pilot Test	$18,000	NA	$18,000	$18,000
Installation of VES wells, associated piping, vacuum blower, carbon absorption units and exhaust stack	$30,000	NA	$30,000	$30,000
Installation of Air Sparge Compressor Piping and Controls	$15,000	NA	$15,000	$15,000
Installation of GW Recovery Wells (2) and associated piping	$30,000	NA	$30,000	$30,000
Installation of low profile air stripper, associated piping and carbon absorption units	$30,000	NA	$30,000	$30,000
System Start-up/Pump Test	$15,000	NA	$15,000	$15,000
Carbon Changeouts	NA	$8,000	$80,000	$62,414
General O&M	NA	$15,000	$150,000	$117,029
Semi-Annual Monitoring		$8,000	$80,000	$62,414
SUBTOTAL	$186,000	$31,000	$496,000	$427,857
TOTAL PLUS 15% CONTINGENCY	$213,900	$35,650	$570,400	$492,036

NA = Not Applicable
Present worth costs determined based on a 6 percent annual interest rate.

FIGURES



ERI

87 Church Street - East Hartford, Connecticut 06108

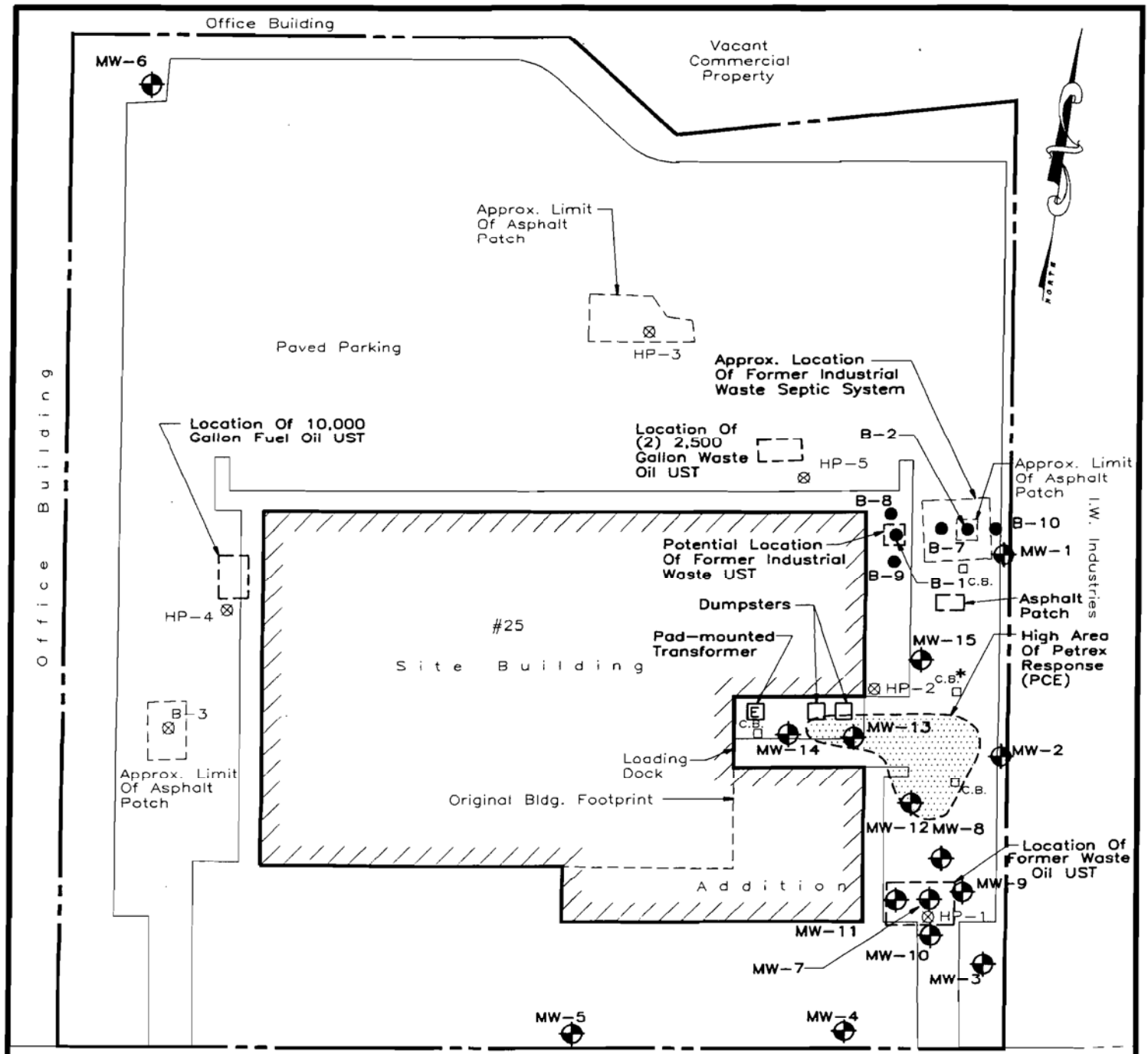
25 Melville Park Road
Melville, New York
Project No.: 7150-96

Photorevison Date: 1979
Scale - 1:24000"
Base Map U.S.G.S. Quadrangle(s):
Huntington, New York

QUADRANGLE LOCATION

SITE LOCATION MAP

Figure 1



LEGEND

MW-12 Monitoring Well Location

B-4 Boring Location

HP-5 Existing Monitoring Well/Boring Locations

C.B.* Catch Bosin Inlets From North And Northwest (10" PVC, 10" Aluminum, 4" Unknown)

General Instrument

ERI

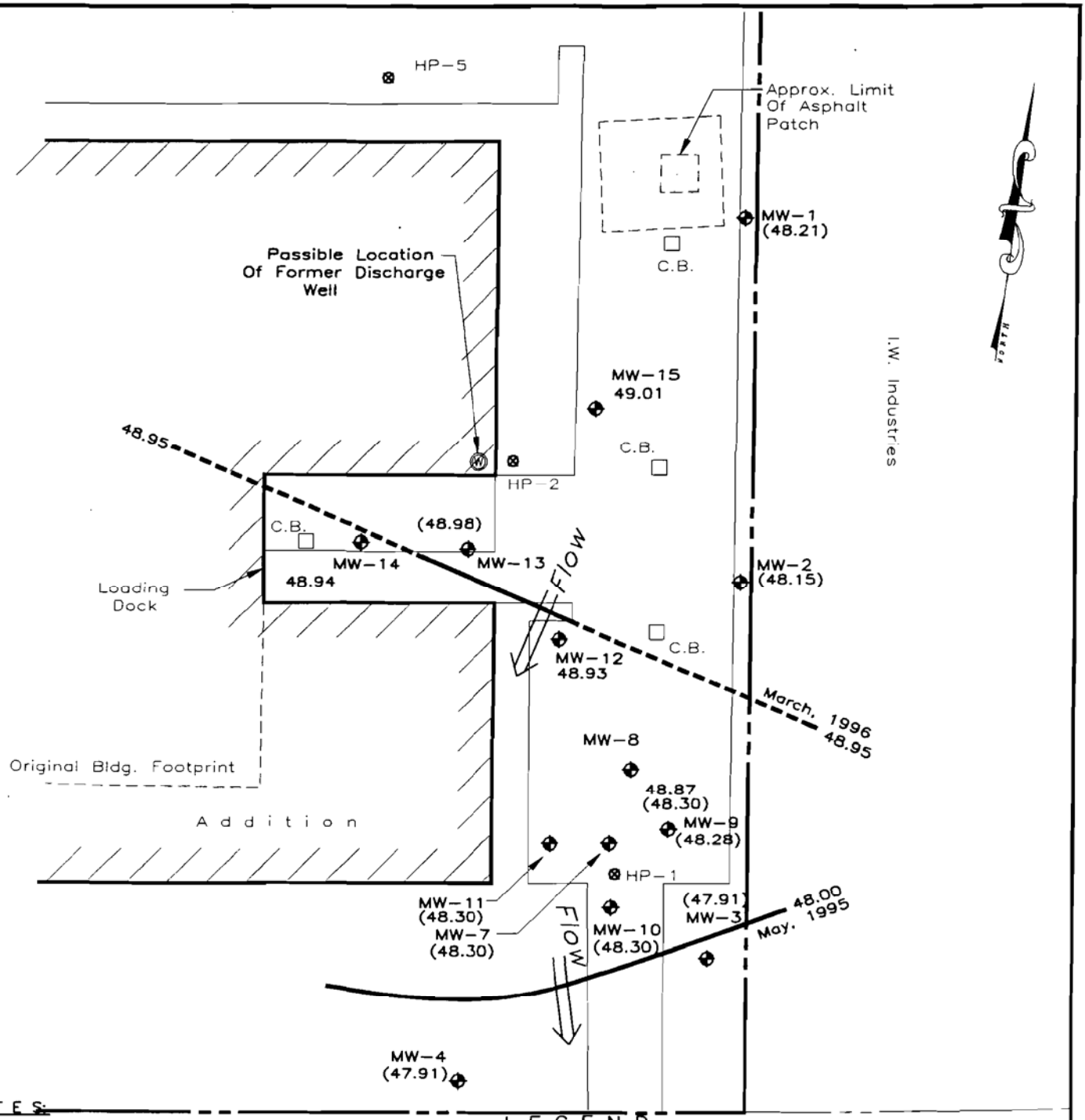
87 Church Street - East Hartford, Connecticut 06108

25 Melville Park Road
Melville, New York
Project No.: 7150-96

Date: February, 1996
Scale: 1"=80'
Reference Maps: Information taken from site reconnaisance & Fugro Site Plan.

SITE PLAN

Figure **2**



NOTES:

1. *Vertical & horizontal locations of monitoring points determined by site survey conducted by Environmental Remediation, Inc. personnel.*
2. *Groundwater elevations are based on an assumed benchmark of 100.00 feet.*
3. *Groundwater contours are based on measurements made on 3/4/96(ERI) and 5/31/95(Fugro). Fluctuations in the level may occur due to factors not accounted for at the time measurements were made.*
4. *Groundwater contours & flow directions assume homogeneous, isotropic aquifer conditions and horizontal flow.*
5. *Groundwater contours are interpolated between data points and inferred in other areas.*

LEGEND

- Monitoring Well
- Flow — Groundwater Flow Direction
- 48.98 — Groundwater Elevation (Feet) March, 1996
- (47.91) — Groundwater Elevation (Feet) May, 1995
- ——— Groundwater Contour (Feet)
- - - - - (Dashed Where Inferred)

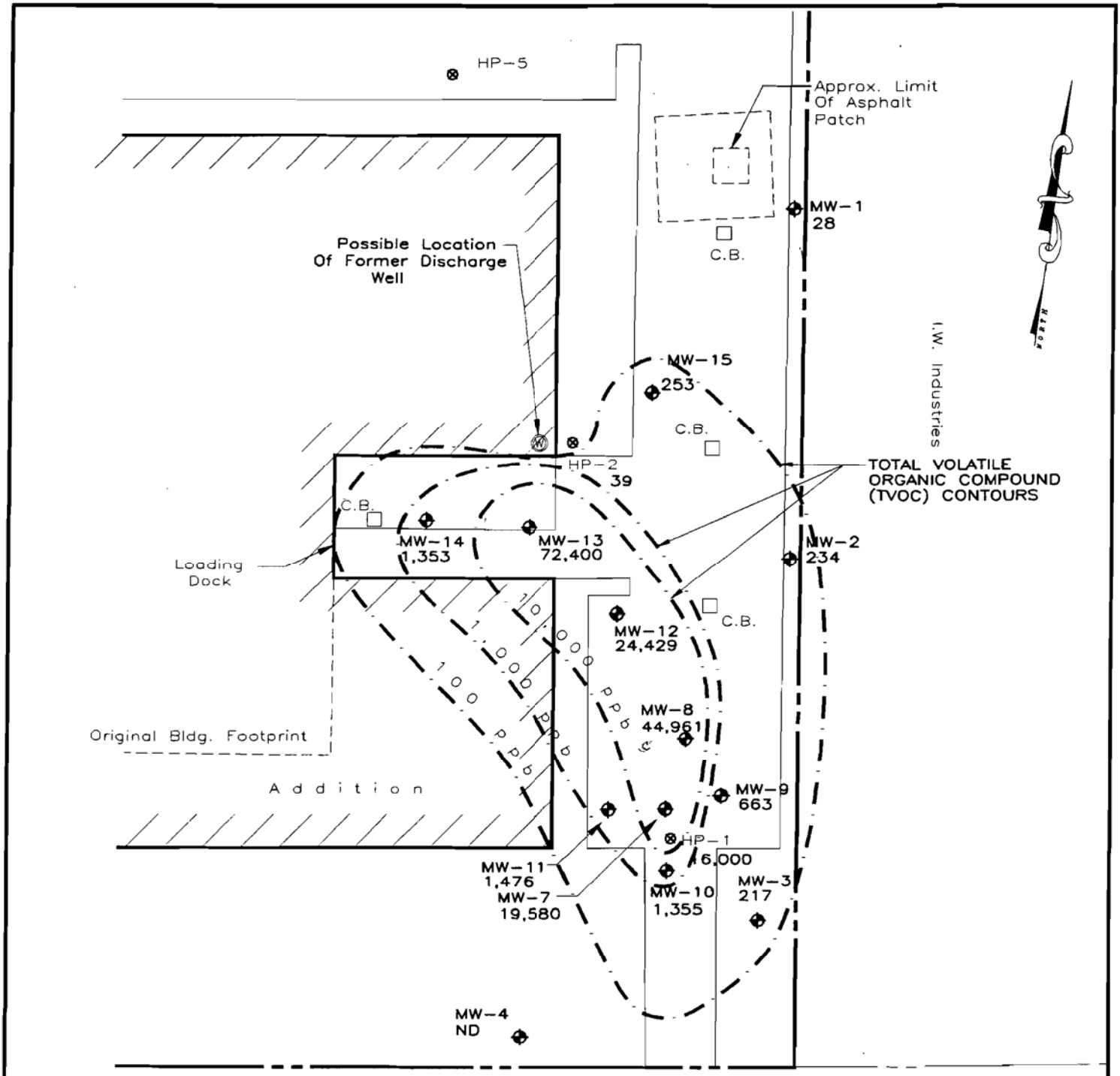
ERI
87 Church Street - East Hartford, Connecticut 06108

25 Melville Park Road
Melville, New York
Project No.: 7150-96

Date: March, 1996
Approx. Scale: 1"=40'
Reference Maps: Information taken from site reconnaisance & Fugro Site Plan.

GROUNDWATER CONTOUR MAP

Figure **3**



19,580 Denotes highest level detected to date showing Total Volatile Organic Concentrations in groundwater (ppb)

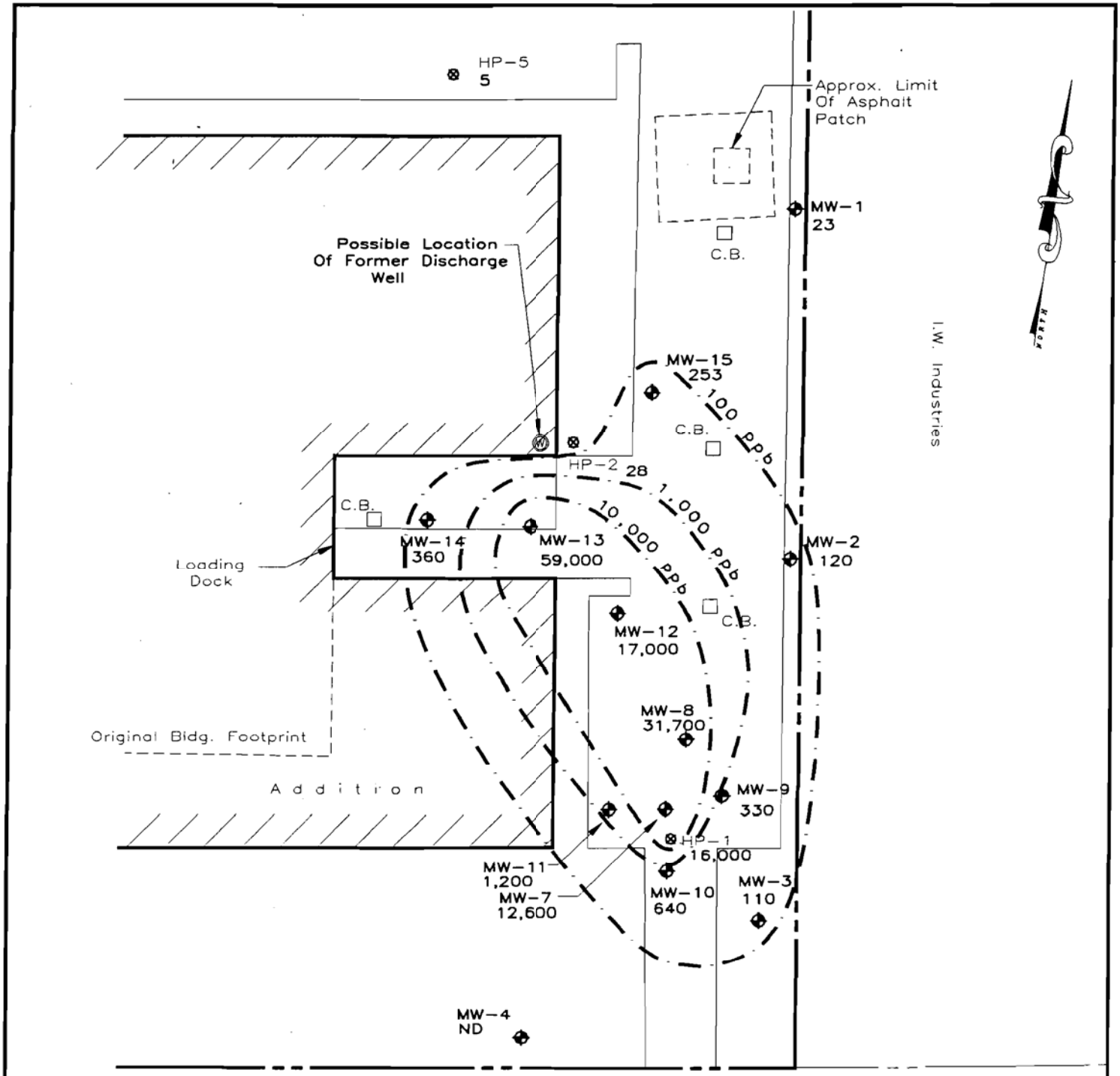
ERI
87 Church Street - East Hartford, Connecticut 06108

25 Melville Park Road
Melville, New York
Project No.: 7150-96

Date: March, 1996
Approx. Scale: 1" =40'
Reference Maps: Information taken from site reconnaisance & Fugro Site Plan.

TVOC CONCENTRATIONS IN GROUNDWATER

Figure 4



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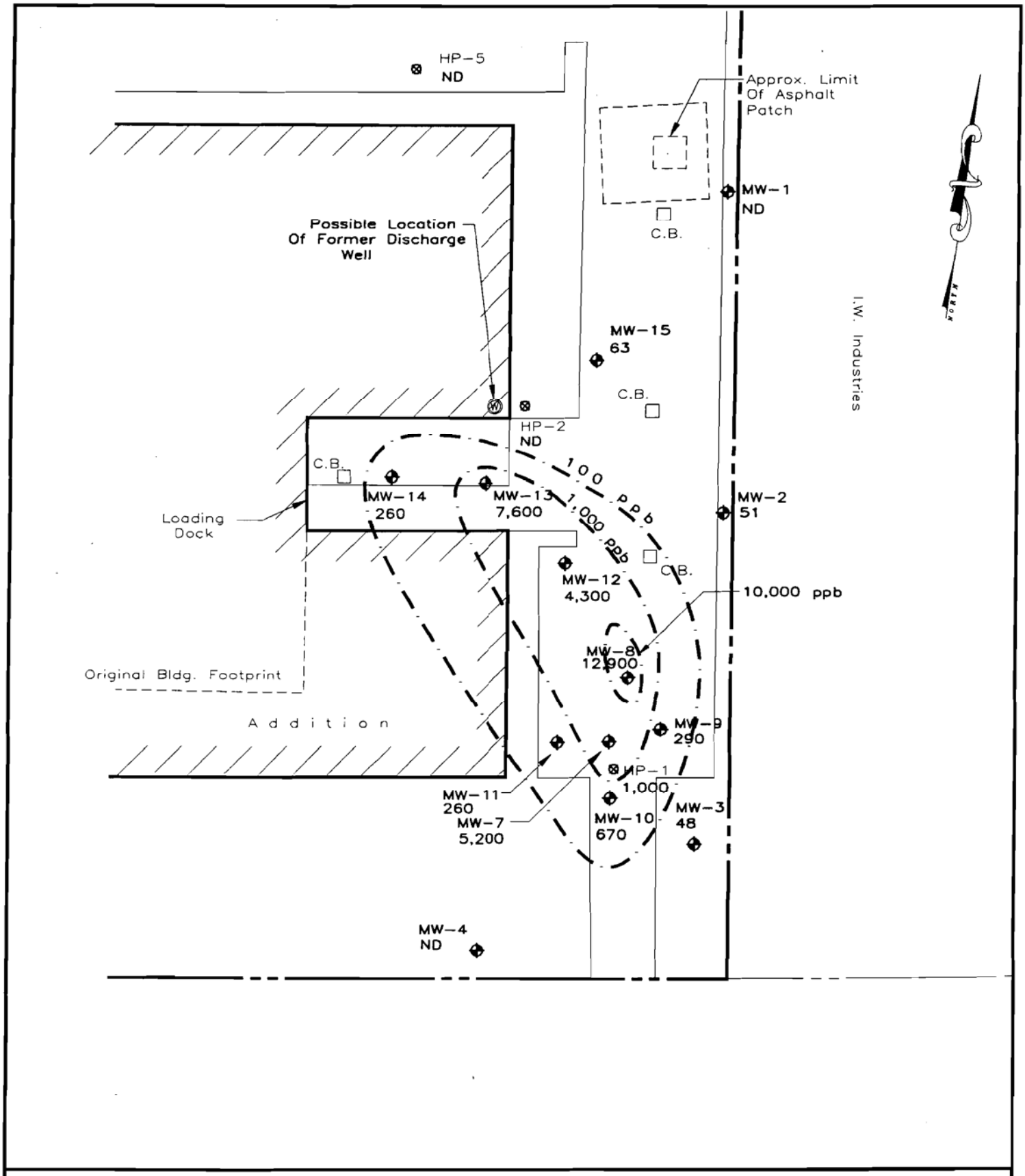
25 Melville Park Road
Melville, New York
Project No.: 7150-96

Date: March, 1996
Approx. Scale: 1"=40'
Reference Maps: Information taken from site reconnaisance & Fugro Site Plan.

PCE CONCENTRATIONS IN GROUNDWATER

Figure 5



ERI

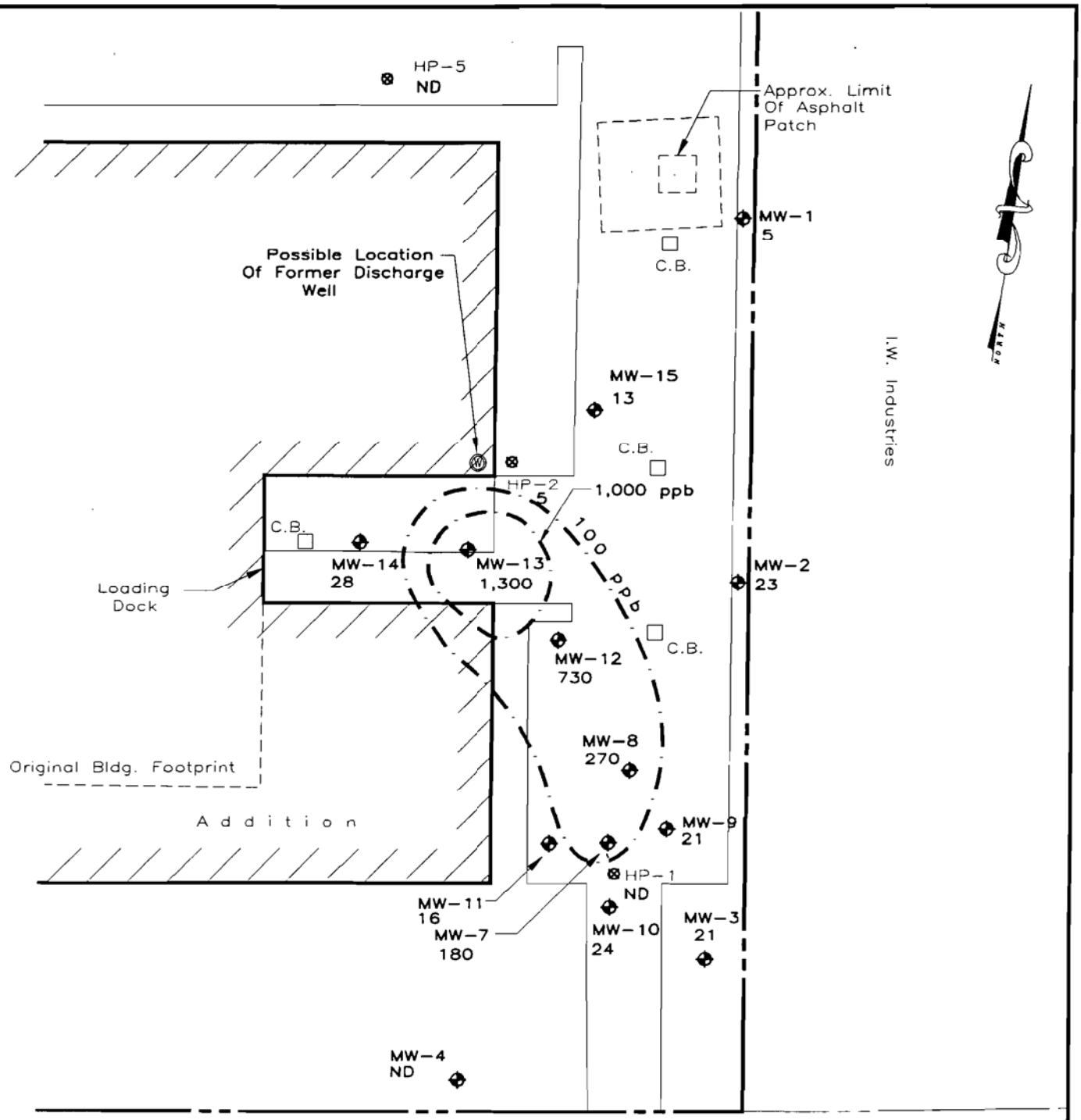
87 Church Street – East Hartford, Connecticut 06108

Date: March, 1996
Approx. Scale: 1"=40'
Reference Maps: Information taken from site reconnaisance & Fugro Site Plan.

25 Melville Park Road
Melville, New York
Project No.: 7150-96

TCE CONCENTRATIONS IN GROUNDWATER

Figure 6



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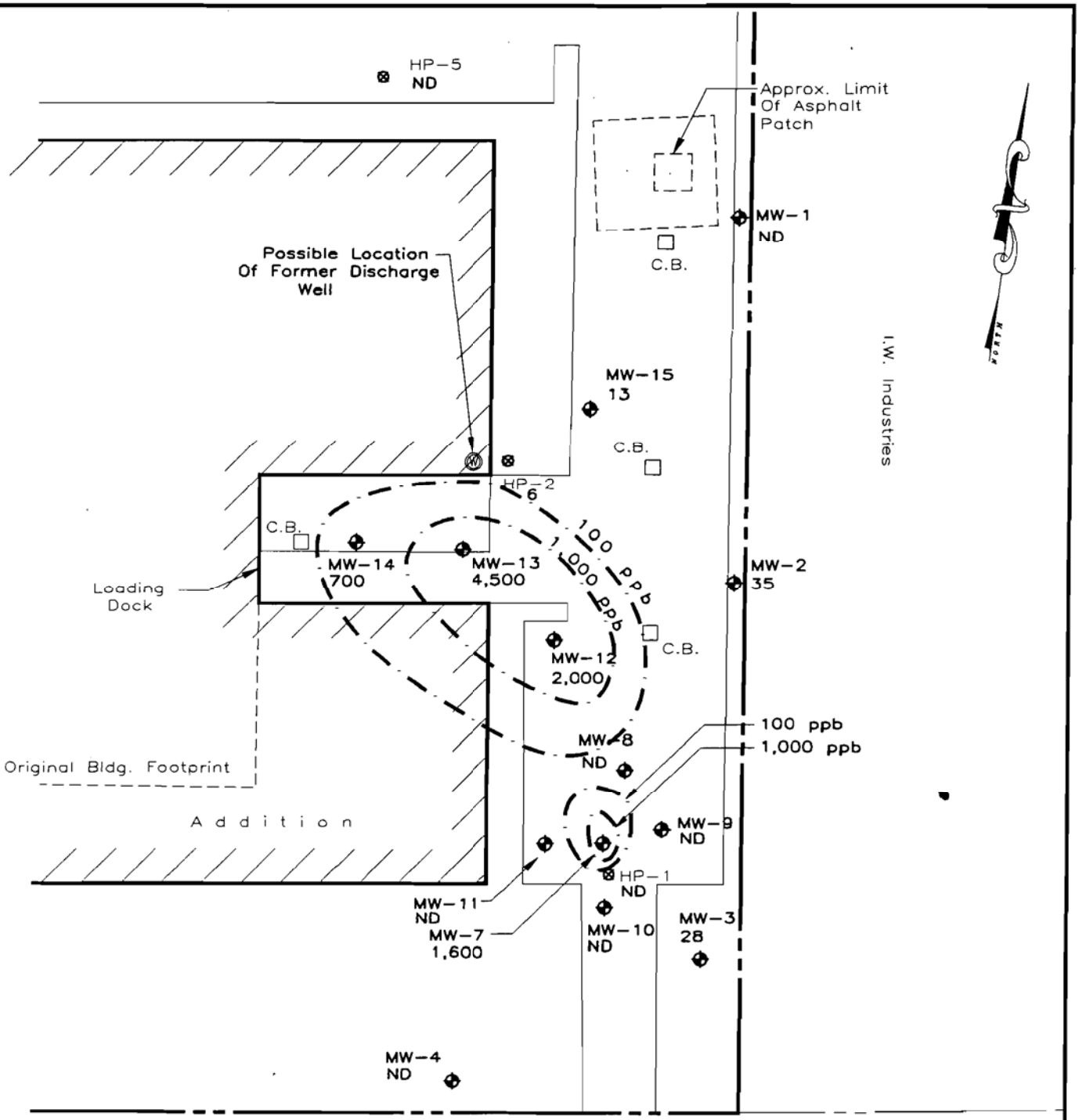
87 Church Street - East Hartford, Connecticut 06108

25 Melville Park Road
Melville, New York
Project No.: 7150-96

Date: March, 1996
Approx. Scale: 1"=40'
Reference Maps: Information taken from site reconnaisance & Fugro Site Plan.

1,1,1-TCA CONCENTRATIONS IN GROUNDWATER

Figure **7**



ERI

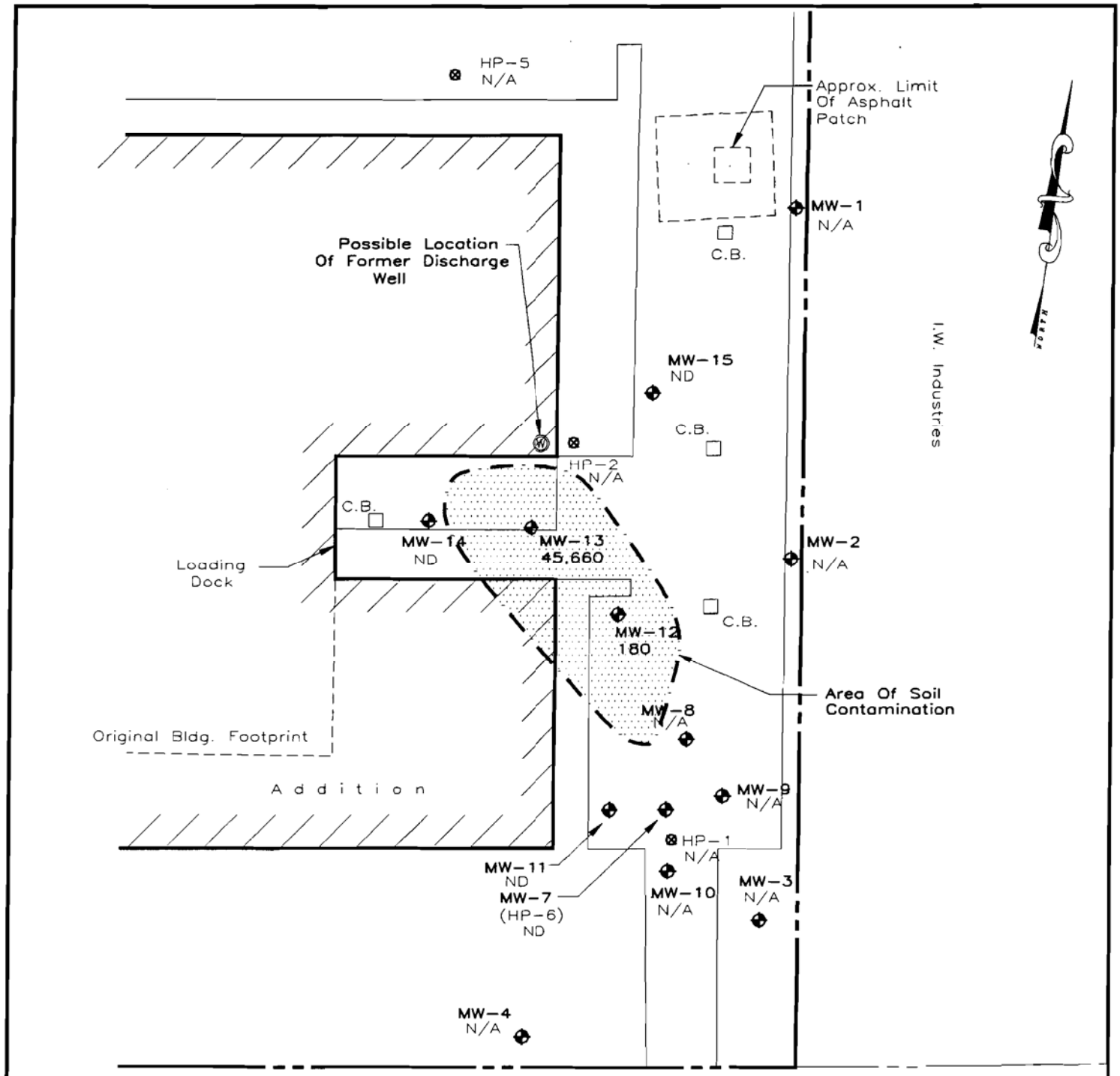
87 Church Street – East Hartford, Connecticut 06108

Date: March, 1996
Approx. Scale: 1"=40'
Reference Maps: Information taken from site reconnaisance & Fugro Site Plan.

25 Melville Park Road
Melville, New York
Project No.: 7150-96

cis 1,2-DCE CONCENTRATIONS IN GROUNDWATER

Figure **8**



LEGEND

⊕	Monitoring Well
180	Total Volatile Organic Concentrations (ppb)
ND	None Detected
N/A	Not Applicable (TVOCs not measured in soil samples)

ERI

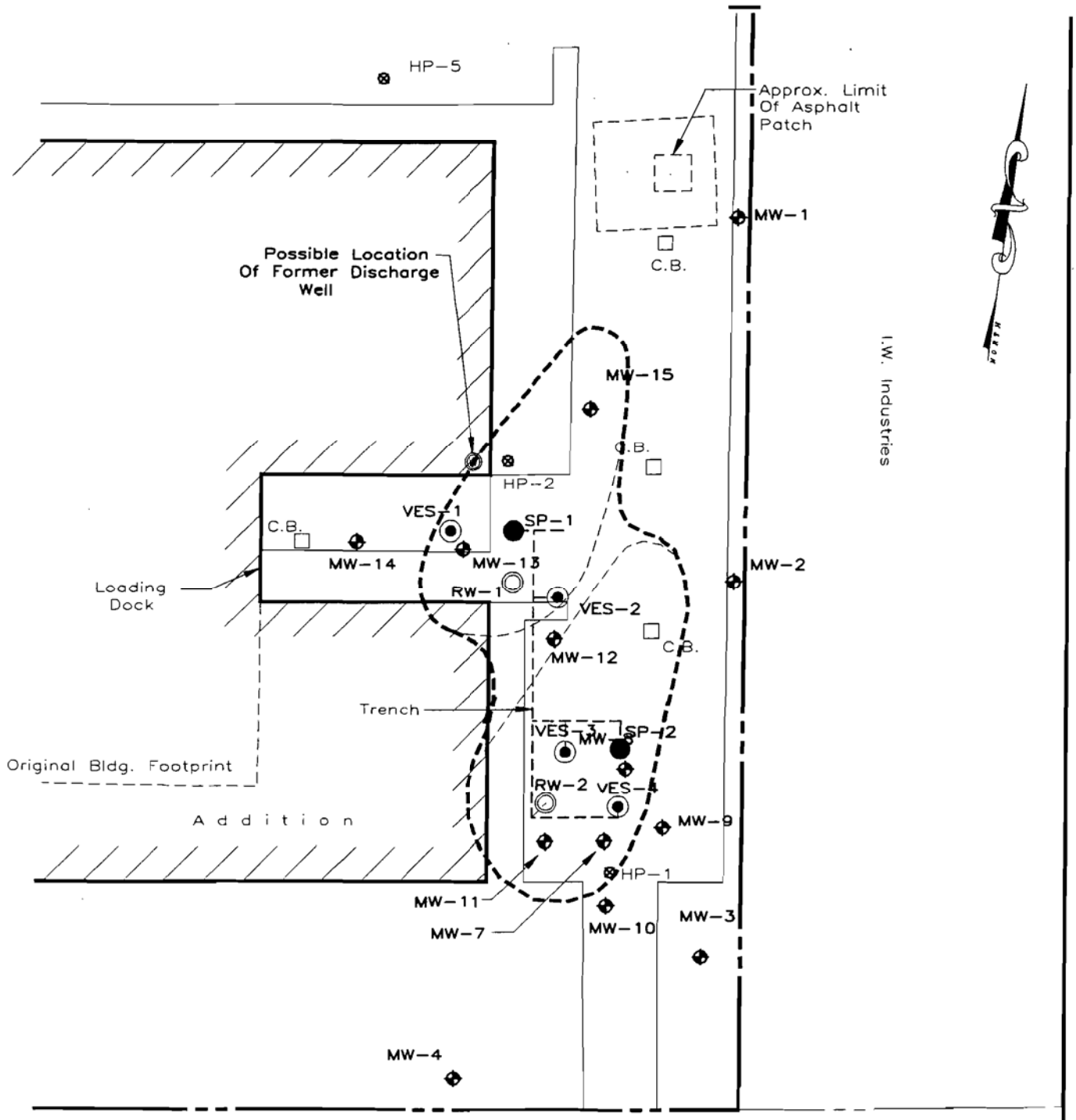
87 Church Street - East Hartford, Connecticut 06108

25 Melville Park Road
Melville, New York
Project No.: 7150-96

Date: March, 1996
Approx. Scale: 1"=40'
Reference Maps: Information taken from site reconnaisance & Fugro Site Plan.

ESTIMATED AREA OF SOIL CONTAMINATION

Figure 9



L E G E N D

- Area Of Influence
- MW-1 Monitoring Well
- RW-1 Recovery Well *
- VES-1 Vapor Extraction Well
- SP-1 Sparging Point

*NOTE:
RW-1 @ 35 gpm
RW-2 @ 40 gpm

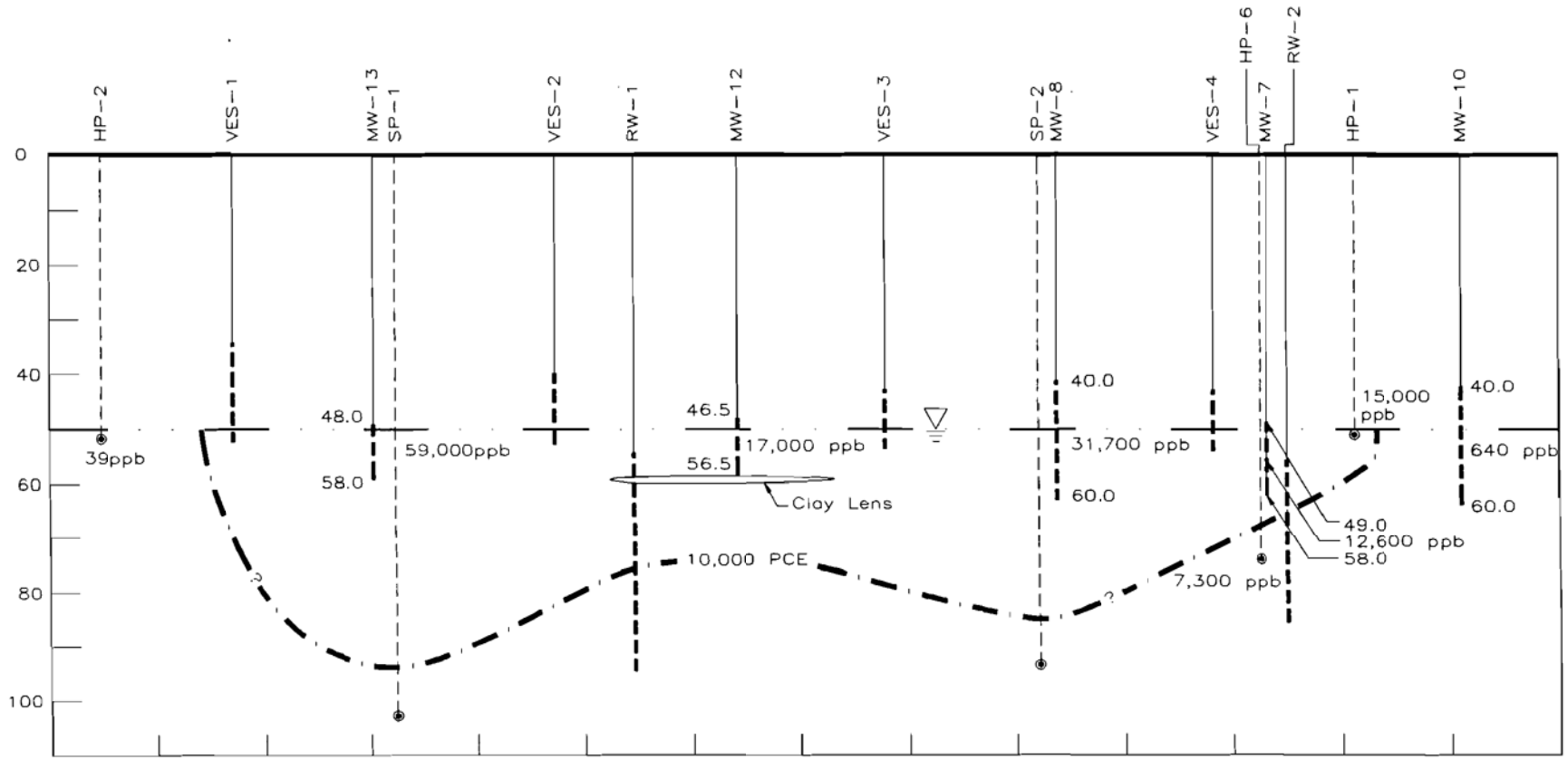
ERI
87 Church Street - East Hartford, Connecticut 06108

25 Melville Park Road
Melville, New York
Project No.: 7150-96

Date: March, 1996
Approx. Scale: 1"=40'
Reference Maps: Information taken from site reconnaisance & Fugro Site Plan.

PRELIMINARY REMEDIAL DESIGN

Figure **10**



Preliminary Remedial Design Cross-Section

Scale : Horiz. 1/8"=10'
Vert. 1/8"=20'

LEGEND

MW-1 Monitoring Well
HP-1 Hydropunch Well
RW-1 Proposed Remedial Well
SP-1 Sparging Point
VES-1 Vapor Extraction Well

7,300 ppb Measured Tetrachloroethane (PCE) concentrations in groundwater (ppb-parts per billion) top and bottom of screened interval indicated in feet.

ERI
87 Church Street - East Hartford, Connecticut 06108

Date: March, 1996
Scale: 1/8" = 1'-0"
Reference Maps: Information taken from site reconnaisance.

25 Melville Park Road
Melville, New York
Project No.: 7150-96

Cross Section

Figure 11

Appendix A

Boring Logs/Well Installation Diagrams

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number MW-12 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING	SAMPLING
Size: _____	Type: SS Other: _____
Hammer: _____ lb.	Hammer: 140 lb.
Fall: _____	Fall: 30"

GROUNDWATER READINGS			
DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
			3"	05-2.5	8, 24,	light tan to medium brown fine to coarse			0.0
					31, 38	sand (fill); dry			
			16"	2.5-4.5	41, 58,	(fill-typical); dry			0.0
					65, 66				
5									
10			15"	10-12	14, 17	tan to light brown, medium to coarse			0.0
					21, 26	sand to gravel, some pebbles (typical-			
						rounded to sub-rounded); dry			
15									
20			14"	20-22	17, 24	tan to light brown, medium to coarse			0.0
					25, 30	sand & gravel, some pebbles; dry			
25									
30			13"	30-32	6, 8, 12,	light tan to light red-brown fine to			0.0
					29	coarse sand, trace pebbles; dry			
35									

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number MW-12 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING	SAMPLING
Size: _____	Type: SS Other: _____
Hammer: _____ lb.	Hammer: 140 lb.
Fall: _____	Fall: 30"

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
40			13"	40-42	10, 14, 21, 52	light tan medium to coarse sand and gravel, trace pebbles, slightly reddish at tip; dry			0.0
						light tan medium to coarse sand and			3.5
45			12"	45-47	17, 21, 48, 17	gravel, trace pebbles; residual clear moisture			
50			18"	50-52	15, 39, 46, 42	light tan fine to coarse sand, reddish at tip, slightly moist at tip	WT 51, 46		0.0
55			24"	55-57	7, 15,				sand 25
				55-56.6	100/5"	lt. tan fine to coarse sand & gravel, wet			clay 4
				56.6-57		medium gray clay; slightly varved			
						Set well at 56.6			
60									
65									
70									
75									

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number MW-13 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING	SAMPLING
Size: _____	Type: SS Other: _____
Hammer: _____ lb.	Hammer: 140 lb.
Fall: _____	Fall: 30"

GROUNDWATER READINGS			
DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas. Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
			12"	05-2.5	5, 20	(fill typical)			0.0
					25, 24				
5									
10			13"	05-10	14, 26,	(fill typical)			0.0
					33, 33				
15			16"	15-17	12, 18,	light tan medium to coarse sand and			0.0
					21, 19	gravel, little pebbles; dry			
20									
25			14"	25-27	11, 17,	light tan fine to coarse sand, trace			0.0
					32, 31	pebbles; dry			
30									
35			16"	35-37	10, 20,	light tan medium to coarse sand and			0.0
					23, 25	gravel, reddish at 36:, trace pebbles; dry			

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number MW-13 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING	SAMPLING
Size: _____	Type: SS Other: _____
Hammer: _____ lb.	Hammer: 140 lb.
Fall: _____	Fall: 30"

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
40			10"	40-42	8, 12, 37, 23	light tan to red brown fine to coarse sand and gravel, residual clear moisture			1.5
45			<1"	45-47	20, 50/3	light tan to light red-brown fine to coarse sand & gravel, residual clear moisture			1.5
50			12"	50-52	12, 23, 17, 26	light tan fine to coarse sand, slightly moist			70.0
			20"	54-56	7, 41 57, 50/3	54-54.8=medium gray medium to coarse sand and gravel, wet			120.0
55						54.8-55.8=light tan to medium brown, medium to coarse sand & gravel; wet			>5
			24"	55-57	10, 15, 23, 17	55-56=medium gray, medium to coarse sand and gravel			
						56-57=light tan to medium brown medium to coarse snad and gravel			
60									
65									
70									
75									

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number MW-14 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING	SAMPLING
Size: _____	Type: SS Other: _____
Hammer: _____ lb.	Hammer: 140 lb.
Fall: _____	Fall: 30"

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
			12"	03-05	7, 6, 10, 15	(fill typical)			1.0
			14"	08-10	13, 12, 12, 14	light tan to light reddish tan, fine to coarse sand, trace pebbles, dry to slightly moist			1.0
			12"	18-20	16, 26, 18, 14	light tan to light brown, fine to coarse sand, little pebbles, dry			0.0
			16"	28-30	15, 20, 32, 43	light tan to light red-brown, fine to coarse sand, trace pebbles, reddish at tip; dry			0.0
			14"	38-40	11, 16, 21, 31	light tan to light red-brown, fine to coarse sand, trace pebbles, reddish at 38.8; dry			0.0

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number MW-14 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING

Size: _____
Hammer: _____ lb.
Fall: _____

SAMPLING

Type: SS Other: _____
Hammer: 140 lb.
Fall: 30"

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
40									
			12"	43-45	18, 36,	light tan to light red-brown, fine to			0.0
					104, 48	coarse sand and pebbles, cobble @ 45;			
						dry			
45									
			12"	48-50	34, 47, 10,10	48-48.6=light to medium brown, fine to coarse sand, trace gravel, little pebbles,moist			0.0
						48.6-49=light tan coarse sand and gravel; moist			
50						Water at 49'; set well at 56'			
			13"	53-55	5, 14,	light tan coarse sand and gravel; wet			0.0
					51, 70				
55									
60									
65									
70									
75									

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number MW-15 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING	SAMPLING
Size: _____	Type: SS Other: _____
Hammer: _____ lb.	Hammer: 140 lb.
Fall: _____	Fall: 30"

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
			17"	05-2.5	14, 24, 31, 37	(fill typical -with wood fragments)			0.0
5									
10			14"	10-12	11, 14, 17, 23	light tan to light brown fine to coarse sand, trace pebbles, gravel, reddish at 10.3; dry			0.0
15									
20			12"	20-22	11, 17, 22, 25	light tan to light brown, fine to coarse sand, trace pebbles, gravel			0.0
25									
30				30-32	7, 12, 23, 31	light tan to light brown, fine to coarse sand, trace gravel, little pebbles; dry			
35									

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number MW-15 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING	SAMPLING
Size: _____	Type: SS Other: _____
Hammer: _____ lb.	Hammer: 140 lb.
Fall: _____	Fall: 30"

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
40			12"	40-42	12, 30, 26, 37	light tan to light brown, fine to coarse sand, trace gravel, little pebbles, dry			0.0
45			6"	45-47	11, 19, 26, 32	light tan to light brown, fine to coarse sand, trace gravel, little pebbles, dry			0.0
50			14"	50-52	14, 26, 46, 25	light tan to light brown, fine to coarse sand and gravel, some pebbles, (sub-angular), poorly sorted; dry			0.0
55			21"	55-57	15, 23, 41, 27	light tan medium to coarse sand, little gravel; wet Water at 41.5; set well at 48.5			
60									
65									
70									
75									

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number SB-7 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING	SAMPLING
Size: _____	Type: SS Other: _____
Hammer: _____ lb.	Hammer: 140 lb.
Fall: _____	Fall: 30"

GROUNDWATER READINGS			
DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
			12"	0.1-0.3	18, 25, 23, 19	(fill - typical)			0.0
5			1"	0.5-0.7	14, 50/3	(fill-typical) refusal at 5.5. Gray, fibrous pipe fragment in spoon			0.0

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number SB-7A Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING
Size: _____
Hammer: _____ lb.
Fall: _____

SAMPLING
Type: SS Other: _____
Hammer: 140 lb.
Fall: 30"

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
10			10"	10-12	6, 9, 11, 17	light to medium tan, fine to coarse sand little gravel, pebbles; dry			0.0
15			12"	15-17	8, 8, 12, 23	light to medium tan, fine to coarse sand, trace gravel, pebbles; dry			0.0
20			13"	20-22	6, 11, 12, 15	light to medium tan, fine to coarse sand, trace gravel, pebbles; dry			0.0

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number SB-8 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING

Size: _____
Hammer: _____ lb.
Fall: _____

SAMPLING

Type: SS Other: _____
Hammer: 140 lb.
Fall: 30"

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	SAMPLE Pen/Rec. (inches)	SAMPLE Depth (fbg)	SAMPLE Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
			14"	01-0.3	6, 15, 12, 11	01-1.5=dark gray to black, fine to coarse sand, little silt; dry 1.5-2.0=medium tan to medium red-brown, fine to coarse sand and gravel, trace pebbles, silt			0.0
5			NR	05-07	10, 25, 32, 37	no recovery			0.0
10			12"	10-12	14, 19, 18, 21	light tan to light red-brown, fine to coarse sand, trace gravel, pebbles;dry			0.0
15			14"	15-17	9, 17, 20, 22	light tan to light red-brown, fine to coarse sand, trace gravel, pebbles; dry			0.0
20			12"	20-22	18, 16, 25, 30	light tan to light brown, fine to coarse sand and gravel, little pebbles; dry			0.0
25									
30									
35									

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number SB-9 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING	SAMPLING
Size: _____	Type: SS Other: _____
Hammer: _____ lb.	Hammer: 140 lb.
Fall: _____	Fall: 30"

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
			12"	01-03	9, 18,	01-1.5=dark gray to black, fine to coarse sand,little silt, dry			0.0
					36, 35	1.5-2.0=medium tan to medium red-brown, fine to coarse sand and gravel, trace pebbles, silt; dry			
5			8"	05-07	3, 5,	light tan to medium brown, fine to			0.0
					6, 9	coarse sand, little gravel, pebbles; dry			
10			13"	10-12	8, 12,	light red-brown, fine to coarse sand,			0.0
					18, 22	little pebbles, trace gravel; dry			
15			NR	15-17	9, 16,	no recovery			0.0
					21, 30				
20			12"	20-22	9, 14	light tan to light brown, fine to coarse			0.0
					20, 25	sand, trace gravel, some pebbles; dry			
25									
30									
35									

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

ENVIRONMENTAL REMEDIATION, INC. 87 Church Street East Hartford, CT 06108	PROJECT Melville, New York	Report of Boring Number SB-10 Sheet ___ of ___ Date _____ File _____

Boring Co. Seaboard
Foreman D. Pritcher
ERI Inspector J. Pearl

Boring Location _____
Ground Elevation _____
Date Started _____ Date Ended _____

CASING	SAMPLING
Size: _____	Type: SS Other: _____
Hammer: _____ lb.	Hammer: 140 lb.
Fall: _____	Fall: 30"

GROUNDWATER READINGS			
DATE	DEPTH	CASING AT	STABILIZATION

Depth (fbg)	Cas Bl./Ft.	SAMPLE NO.	Pen/Rec. (inches)	Depth (fbg)	Blows/6"	Sample Description	Strat/Chg & Gen. Desc.	Equipment Installed	PID (ppm)
			4"	01-03	n/a *	(fill typical)			0.0
5			8"	05-07	n/a *	light tan to dark brown, fine to coarse sand, trace pebbles, dry (probable fill)			0.0
10			12"	10-12	n/a 19, 20, 18	light tan to light brown, fine to coarse sand, trace gravel, little pebbles; dry			0.0
15			14"	15-17	13, 13 17, 18	light tan to light brown, fine to coarse sand, some gravel, trace pebbles, dry			0.0
20			14"	20-22	13, 26, 24, 28	light tan to medium brown, fine to coarse sand, gravel and pebbles; dry			0.0
25									
30									
35									

REMARKS:

NOTES: 1) The Stratification lines represent the approximate boundary between soil types and the transition may be gradual. 2) Water level readings have been made in the drillholes at times and under conditions stated on the boring logs. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurement were made.

Appendix B

Analytical Data

ANALYTICAL DATA SUMMARY

Report Date: 03/12/96

Account: Environmental Remediation Inc.
Address: 87 Church Street
East Hartford, CT 06108
203-290-9300

Project Manager: J.Pearl
Project Name: Melville, NY (3-5-96)
Project No.:

Sample Information:

Laboratory ID	Client/Field ID	Laboratory ID	Client/Field ID
60650726-001	MW-12 GW	60650726-006	SB-8 15-17
60650726-002	MW-13 GW	60650726-007	SB-7A 10-12
60650726-003	MW-14 GW	60650726-008	SB-10 05-07
60650726-004	MW-15 GW	60650726-009	QC Report -Water
60650726-005	SB-9 20-22	60650726-010	QC Report -Soil

Reviewed by

Christine A. Larkin
Laboratory Manager

Lab Certifications

EPA ID: No. MA059
Massachusetts: No. M-MA059
Maine: Reciprocity
Rhode Island: No. 87
South Carolina: No. 88011
Florida(DEP): QA Plan No. 900437G
Florida(HRS): No. E87290
Connecticut: No. PH0515
New York: ELAP No. 11116
New Hampshire: No. 2041

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-001	Date Sampled:	03/04/96 12:30
Client ID:	MW-12 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/l	100	8260	sd	03/07/96
Acrolein	ND	ug/l	100	8260	sd	03/07/96
Acrylonitrile	ND	ug/l	100	8260	sd	03/07/96
Benzene	ND	ug/l	1	8260	sd	03/07/96
Bromobenzene	ND	ug/l	5	8260	sd	03/07/96
Bromochloromethane	ND	ug/l	5	8260	sd	03/07/96
Bromodichloromethane	ND	ug/l	5	8260	sd	03/07/96
Bromoform	ND	ug/l	5	8260	sd	03/07/96
Bromomethane	ND	ug/l	5	8260	sd	03/07/96
2-Butanone	ND	ug/l	100	8260	sd	03/07/96
n-Butylbenzene	ND	ug/l	5	8260	sd	03/07/96
sec-Butylbenzene	ND	ug/l	5	8260	sd	03/07/96
tert-Butylbenzene	ND	ug/l	5	8260	sd	03/07/96
Carbon Disulfide	ND	ug/l	5	8260	sd	03/07/96
Carbon Tetrachloride	ND	ug/l	5	8260	sd	03/07/96
Chlorobenzene	ND	ug/l	5	8260	sd	03/07/96
Chloroethane	ND	ug/l	5	8260	sd	03/07/96
2-Chloroethylvinyl Ether	ND	ug/l	5	8260	sd	03/07/96
Chloroform	ND	ug/l	5	8260	sd	03/07/96
Chloromethane	ND	ug/l	5	8260	sd	03/07/96
2-Chlorotoluene	ND	ug/l	5	8260	sd	03/07/96
4-Chlorotoluene	ND	ug/l	5	8260	sd	03/07/96
1,2-Dibromo-3-Chloropropane	ND	ug/l	5	8260	sd	03/07/96
Dibromochloromethane	ND	ug/l	5	8260	sd	03/07/96
1,2-Dibromoethane	ND	ug/l	5	8260	sd	03/07/96

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-001	Date Sampled:	03/04/96 12:30
Client ID:	MW-12 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/l	5	8260	sd	03/07/96
1,2-Dichlorobenzene	ND	ug/l	5	8260	sd	03/07/96
1,3-Dichlorobenzene	ND	ug/l	5	8260	sd	03/07/96
1,4-Dichlorobenzene	ND	ug/l	5	8260	sd	03/07/96
Dichlorodifluoromethane	ND	ug/l	5	8260	sd	03/07/96
1,1-Dichloroethane	ND	ug/l	5	8260	sd	03/07/96
1,2-Dichloroethane	ND	ug/l	5	8260	sd	03/07/96
1,1-Dichloroethene	30	ug/l	5	8260	sd	03/07/96
cis-1,2-Dichloroethene	2,000	ug/l	5	8260	sd	03/07/96
trans-1,2-Dichloroethene	15	ug/l	5	8260	sd	03/07/96
1,2-Dichloropropane	ND	ug/l	5	8260	sd	03/07/96
1,3-Dichloropropane	ND	ug/l	5	8260	sd	03/07/96
2,2-Dichloropropane	ND	ug/l	5	8260	sd	03/07/96
1,1-Dichloropropene	ND	ug/l	5	8260	sd	03/07/96
cis-1,3-Dichloropropene	ND	ug/l	5	8260	sd	03/07/96
trans-1,3-Dichloropropene	ND	ug/l	5	8260	sd	03/07/96
Ethylbenzene	22	ug/l	5	8260	sd	03/07/96
Hexachlorobutadiene	ND	ug/l	5	8260	sd	03/07/96
2-Hexanone	ND	ug/l	5	8260	sd	03/07/96
Iodomethane	ND	ug/l	5	8260	sd	03/07/96
Isopropylbenzene	ND	ug/l	5	8260	sd	03/07/96
p-Isopropyltoluene	ND	ug/l	5	8260	sd	03/07/96
Methylene Chloride	ND	ug/l	5	8260	sd	03/07/96
4-Methyl-2-Pentanone	ND	ug/l	50	8260	sd	03/07/96
MTBE	ND	ug/l	5	8260	sd	03/07/96

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-001	Date Sampled:	03/04/96 12:30
Client ID:	MW-12 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	7	ug/l	5	8260	sd	03/07/96
n-Propylbenzene	ND	ug/l	5	8260	sd	03/07/96
Styrene	ND	ug/l	5	8260	sd	03/07/96
1,1,1,2-Tetrachloroethane	ND	ug/l	5	8260	sd	03/07/96
1,1,2,2-Tetrachloroethane	ND	ug/l	5	8260	sd	03/07/96
Tetrachloroethene	17,000	ug/l	5	8260	sd	03/07/96
Toluene	16	ug/l	5	8260	sd	03/07/96
1,2,3-Trichloropropane	ND	ug/l	5	8260	sd	03/07/96
1,2,3-Trichlorobenzene	ND	ug/l	5	8260	sd	03/07/96
1,2,4-Trichlorobenzene	ND	ug/l	5	8260	sd	03/07/96
1,1,1-Trichloroethane	730	ug/l	5	8260	sd	03/07/96
1,1,2-Trichloroethane	ND	ug/l	5	8260	sd	03/07/96
Trichloroethene	4,300	ug/l	5	8260	sd	03/07/96
Trichlorofluoromethane	ND	ug/l	5	8260	sd	03/07/96
1,2,4-Trimethylbenzene	76	ug/l	5	8260	sd	03/07/96
1,3,5-Trimethylbenzene	35	ug/l	5	8260	sd	03/07/96
Vinyl Acetate	ND	ug/l	5	8260	sd	03/07/96
Vinyl Chloride	ND	ug/l	2	8260	sd	03/07/96
o-Xylene	110	ug/l	5	8260	sd	03/07/96
p-m-Xylene	120	ug/l	5	8260	sd	03/07/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	107	Percent			sd	03/07/96
Dibromofluoromethane	83	Percent			sd	03/07/96
Toluene-D8	111	Percent			sd	03/07/96

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Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-002	Date Sampled:	03/04/96 13:00
Client ID:	MW-13 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/l	10000	8260	db	03/12/96
Acrolein	ND	ug/l	10000	8260	db	03/12/96
Acrylonitrile	ND	ug/l	10000	8260	db	03/12/96
Benzene	ND	ug/l	100	8260	db	03/12/96
Bromobenzene	ND	ug/l	500	8260	db	03/12/96
Bromochloromethane	ND	ug/l	500	8260	db	03/12/96
Bromodichloromethane	ND	ug/l	500	8260	db	03/12/96
Bromoform	ND	ug/l	500	8260	db	03/12/96
Bromomethane	ND	ug/l	500	8260	db	03/12/96
2-Butanone	ND	ug/l	10000	8260	db	03/12/96
n-Butylbenzene	ND	ug/l	500	8260	db	03/12/96
sec-Butylbenzene	ND	ug/l	500	8260	db	03/12/96
tert-Butylbenzene	ND	ug/l	500	8260	db	03/12/96
Carbon Disulfide	ND	ug/l	500	8260	db	03/12/96
Carbon Tetrachloride	ND	ug/l	500	8260	db	03/12/96
Chlorobenzene	ND	ug/l	500	8260	db	03/12/96
Chloroethane	ND	ug/l	500	8260	db	03/12/96
2-Chloroethylvinyl Ether	ND	ug/l	500	8260	db	03/12/96
Chloroform	ND	ug/l	500	8260	db	03/12/96
Chloromethane	ND	ug/l	500	8260	db	03/12/96
2-Chlorotoluene	ND	ug/l	500	8260	db	03/12/96
4-Chlorotoluene	ND	ug/l	500	8260	db	03/12/96
1,2-Dibromo-3-Chloropropane	ND	ug/l	500	8260	db	03/12/96
Dibromochloromethane	ND	ug/l	500	8260	db	03/12/96
1,2-Dibromoethane	ND	ug/l	500	8260	db	03/12/96

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FINAL REPORT

Client Information

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-002	Date Sampled:	03/04/96 13:00
Client ID:	MW-13 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/l	500	8260	db	03/12/96
1,2-Dichlorobenzene	ND	ug/l	500	8260	db	03/12/96
1,3-Dichlorobenzene	ND	ug/l	500	8260	db	03/12/96
1,4-Dichlorobenzene	ND	ug/l	500	8260	db	03/12/96
Dichlorodifluoromethane	ND	ug/l	500	8260	db	03/12/96
1,1-Dichloroethane	ND	ug/l	500	8260	db	03/12/96
1,2-Dichloroethane	ND	ug/l	500	8260	db	03/12/96
1,1-Dichloroethene	ND	ug/l	500	8260	db	03/12/96
cis-1,2-Dichloroethene	4,500	ug/l	500	8260	db	03/12/96
trans-1,2-Dichloroethene	ND	ug/l	500	8260	db	03/12/96
1,2-Dichloropropane	ND	ug/l	500	8260	db	03/12/96
1,3-Dichloropropane	ND	ug/l	500	8260	db	03/12/96
2,2-Dichloropropane	ND	ug/l	500	8260	db	03/12/96
1,1-Dichloropropene	ND	ug/l	500	8260	db	03/12/96
cis-1,3-Dichloropropene	ND	ug/l	500	8260	db	03/12/96
trans-1,3-Dichloropropene	ND	ug/l	500	8260	db	03/12/96
Ethylbenzene	ND	ug/l	500	8260	db	03/12/96
Hexachlorobutadiene	ND	ug/l	500	8260	db	03/12/96
2-Hexanone	ND	ug/l	500	8260	db	03/12/96
Iodomethane	ND	ug/l	500	8260	db	03/12/96
Isopropylbenzene	ND	ug/l	500	8260	db	03/12/96
p-Isopropyltoluene	ND	ug/l	500	8260	db	03/12/96
Methylene Chloride	ND	ug/l	500	8260	db	03/12/96
4-Methyl-2-Pentanone	ND	ug/l	5000	8260	db	03/12/96
MTBE	ND	ug/l	500	8260	db	03/12/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-002	Date Sampled:	03/04/96 13:00
Client ID:	MW-13 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	ND	ug/l	500	8260	db	03/12/96
n-Propylbenzene	ND	ug/l	500	8260	db	03/12/96
Styrene	ND	ug/l	500	8260	db	03/12/96
1,1,1,2-Tetrachloroethane	ND	ug/l	500	8260	db	03/12/96
1,1,2,2-Tetrachloroethane	ND	ug/l	500	8260	db	03/12/96
Tetrachloroethene	59,000	ug/l	500	8260	db	03/12/96
Toluene	ND	ug/l	500	8260	db	03/12/96
1,2,3-Trichloropropane	ND	ug/l	500	8260	db	03/12/96
1,2,3-Trichlorobenzene	ND	ug/l	500	8260	db	03/12/96
1,2,4-Trichlorobenzene	ND	ug/l	500	8260	db	03/12/96
1,1,1-Trichloroethane	1,300	ug/l	500	8260	db	03/12/96
1,1,2-Trichloroethane	ND	ug/l	500	8260	db	03/12/96
Trichloroethene	7,600	ug/l	500	8260	db	03/12/96
Trichlorofluoromethane	ND	ug/l	500	8260	db	03/12/96
1,2,4-Trimethylbenzene	ND	ug/l	500	8260	db	03/12/96
1,3,5-Trimethylbenzene	ND	ug/l	500	8260	db	03/12/96
Vinyl Acetate	ND	ug/l	500	8260	db	03/12/96
Vinyl Chloride	ND	ug/l	200	8260	db	03/12/96
o-Xylene	ND	ug/l	500	8260	db	03/12/96
p-m-Xylene	ND	ug/l	500	8260	db	03/12/96
The detection limit reported is based on a X100 dilution of the sample.						
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	109	Percent			db	03/12/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-002	Date Sampled:	03/04/96 13:00
Client ID:	MW-13 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
SURROGATE STUDIES - VOLATILES						
Dibromofluoromethane	100	Percent			db	03/12/96
Toluene-D8	110	Percent			db	03/12/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-003	Date Sampled:	03/04/96 13:30
Client ID:	MW-14 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/l	100	8260	sd	03/08/96
Acrolein	ND	ug/l	100	8260	sd	03/08/96
Acrylonitrile	ND	ug/l	100	8260	sd	03/08/96
Benzene	ND	ug/l	1	8260	sd	03/08/96
Bromobenzene	ND	ug/l	5	8260	sd	03/08/96
Bromochloromethane	ND	ug/l	5	8260	sd	03/08/96
Bromodichloromethane	ND	ug/l	5	8260	sd	03/08/96
Bromoform	ND	ug/l	5	8260	sd	03/08/96
Bromomethane	ND	ug/l	5	8260	sd	03/08/96
2-Butanone	ND	ug/l	100	8260	sd	03/08/96
n-Butylbenzene	ND	ug/l	5	8260	sd	03/08/96
sec-Butylbenzene	ND	ug/l	5	8260	sd	03/08/96
tert-Butylbenzene	ND	ug/l	5	8260	sd	03/08/96
Carbon Disulfide	ND	ug/l	5	8260	sd	03/08/96
Carbon Tetrachloride	ND	ug/l	5	8260	sd	03/08/96
Chlorobenzene	ND	ug/l	5	8260	sd	03/08/96
Chloroethane	ND	ug/l	5	8260	sd	03/08/96
2-Chloroethylvinyl Ether	ND	ug/l	5	8260	sd	03/08/96
Chloroform	ND	ug/l	5	8260	sd	03/08/96
Chloromethane	ND	ug/l	5	8260	sd	03/08/96
2-Chlorotoluene	ND	ug/l	5	8260	sd	03/08/96
4-Chlorotoluene	ND	ug/l	5	8260	sd	03/08/96
1,2-Dibromo-3-Chloropropane	ND	ug/l	5	8260	sd	03/08/96
Dibromochloromethane	ND	ug/l	5	8260	sd	03/08/96
1,2-Dibromoethane	ND	ug/l	5	8260	sd	03/08/96

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	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-003	Date Sampled:	03/04/96 13:30
Client ID:	MW-14 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/l	5	8260	sd	03/08/96
1,2-Dichlorobenzene	ND	ug/l	5	8260	sd	03/08/96
1,3-Dichlorobenzene	ND	ug/l	5	8260	sd	03/08/96
1,4-Dichlorobenzene	ND	ug/l	5	8260	sd	03/08/96
Dichlorodifluoromethane	ND	ug/l	5	8260	sd	03/08/96
1,1-Dichloroethane	ND	ug/l	5	8260	sd	03/08/96
1,2-Dichloroethane	ND	ug/l	5	8260	sd	03/08/96
1,1-Dichloroethene	ND	ug/l	5	8260	sd	03/08/96
cis-1,2-Dichloroethene	700	ug/l	5	8260	sd	03/08/96
trans-1,2-Dichloroethene	5	ug/l	5	8260	sd	03/08/96
1,2-Dichloropropane	ND	ug/l	5	8260	sd	03/08/96
1,3-Dichloropropane	ND	ug/l	5	8260	sd	03/08/96
2,2-Dichloropropane	ND	ug/l	5	8260	sd	03/08/96
1,1-Dichloropropene	ND	ug/l	5	8260	sd	03/08/96
cis-1,3-Dichloropropene	ND	ug/l	5	8260	sd	03/08/96
trans-1,3-Dichloropropene	ND	ug/l	5	8260	sd	03/08/96
Ethylbenzene	ND	ug/l	5	8260	sd	03/08/96
Hexachlorobutadiene	ND	ug/l	5	8260	sd	03/08/96
2-Hexanone	ND	ug/l	5	8260	sd	03/08/96
Iodomethane	ND	ug/l	5	8260	sd	03/08/96
Isopropylbenzene	ND	ug/l	5	8260	sd	03/08/96
p-Isopropyltoluene	ND	ug/l	5	8260	sd	03/08/96
Methylene Chloride	ND	ug/l	5	8260	sd	03/08/96
4-Methyl-2-Pentanone	ND	ug/l	50	8260	sd	03/08/96
MTBE	ND	ug/l	5	8260	sd	03/08/96

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	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-003	Date Sampled:	03/04/96 13:30
Client ID:	MW-14 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	ND	ug/l	5	8260	sd	03/08/96
n-Propylbenzene	ND	ug/l	5	8260	sd	03/08/96
Styrene	ND	ug/l	5	8260	sd	03/08/96
1,1,1,2-Tetrachloroethane	ND	ug/l	5	8260	sd	03/08/96
1,1,2,2-Tetrachloroethane	ND	ug/l	5	8260	sd	03/08/96
Tetrachloroethene	360	ug/l	5	8260	sd	03/08/96
Toluene	ND	ug/l	5	8260	sd	03/08/96
1,2,3-Trichloropropane	ND	ug/l	5	8260	sd	03/08/96
1,2,3-Trichlorobenzene	ND	ug/l	5	8260	sd	03/08/96
1,2,4-Trichlorobenzene	ND	ug/l	5	8260	sd	03/08/96
1,1,1-Trichloroethane	28	ug/l	5	8260	sd	03/08/96
1,1,2-Trichloroethane	ND	ug/l	5	8260	sd	03/08/96
Trichloroethene	260	ug/l	5	8260	sd	03/08/96
Trichlorofluoromethane	ND	ug/l	5	8260	sd	03/08/96
1,2,4-Trimethylbenzene	ND	ug/l	5	8260	sd	03/08/96
1,3,5-Trimethylbenzene	ND	ug/l	5	8260	sd	03/08/96
Vinyl Acetate	ND	ug/l	5	8260	sd	03/08/96
Vinyl Chloride	ND	ug/l	2	8260	sd	03/08/96
o-Xylene	ND	ug/l	5	8260	sd	03/08/96
p-m-Xylene	ND	ug/l	5	8260	sd	03/08/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	113	Percent			sd	03/08/96
Dibromofluoromethane	100	Percent			sd	03/08/96
Toluene-D8	106	Percent			sd	03/08/96

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Client Information

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-004	Date Sampled:	03/04/96 14:00
Client ID:	MW-15 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/l	100	8260	sd	03/08/96
Acrolein	ND	ug/l	100	8260	sd	03/08/96
Acrylonitrile	ND	ug/l	100	8260	sd	03/08/96
Benzene	ND	ug/l	1	8260	sd	03/08/96
Bromobenzene	ND	ug/l	5	8260	sd	03/08/96
Bromochloromethane	ND	ug/l	5	8260	sd	03/08/96
Bromodichloromethane	ND	ug/l	5	8260	sd	03/08/96
Bromoform	ND	ug/l	5	8260	sd	03/08/96
Bromomethane	ND	ug/l	5	8260	sd	03/08/96
2-Butanone	ND	ug/l	100	8260	sd	03/08/96
n-Butylbenzene	ND	ug/l	5	8260	sd	03/08/96
sec-Butylbenzene	ND	ug/l	5	8260	sd	03/08/96
tert-Butylbenzene	ND	ug/l	5	8260	sd	03/08/96
Carbon Disulfide	ND	ug/l	5	8260	sd	03/08/96
Carbon Tetrachloride	ND	ug/l	5	8260	sd	03/08/96
Chlorobenzene	ND	ug/l	5	8260	sd	03/08/96
Chloroethane	ND	ug/l	5	8260	sd	03/08/96
2-Chloroethylvinyl Ether	ND	ug/l	5	8260	sd	03/08/96
Chloroform	ND	ug/l	5	8260	sd	03/08/96
Chloromethane	ND	ug/l	5	8260	sd	03/08/96
2-Chlorotoluene	ND	ug/l	5	8260	sd	03/08/96
4-Chlorotoluene	ND	ug/l	5	8260	sd	03/08/96
1,2-Dibromo-3-Chloropropane	ND	ug/l	5	8260	sd	03/08/96
Dibromochloromethane	ND	ug/l	5	8260	sd	03/08/96
1,2-Dibromoethane	ND	ug/l	5	8260	sd	03/08/96

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-004	Date Sampled:	03/04/96 14:00
Client ID:	MW-15 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/l	5	8260	sd	03/08/96
1,2-Dichlorobenzene	ND	ug/l	5	8260	sd	03/08/96
1,3-Dichlorobenzene	ND	ug/l	5	8260	sd	03/08/96
1,4-Dichlorobenzene	ND	ug/l	5	8260	sd	03/08/96
Dichlorodifluoromethane	ND	ug/l	5	8260	sd	03/08/96
1,1-Dichloroethane	ND	ug/l	5	8260	sd	03/08/96
1,2-Dichloroethane	ND	ug/l	5	8260	sd	03/08/96
1,1-Dichloroethene	14	ug/l	5	8260	sd	03/08/96
cis-1,2-Dichloroethene	13	ug/l	5	8260	sd	03/08/96
trans-1,2-Dichloroethene	ND	ug/l	5	8260	sd	03/08/96
1,2-Dichloropropane	ND	ug/l	5	8260	sd	03/08/96
1,3-Dichloropropane	ND	ug/l	5	8260	sd	03/08/96
2,2-Dichloropropane	ND	ug/l	5	8260	sd	03/08/96
1,1-Dichloropropene	ND	ug/l	5	8260	sd	03/08/96
cis-1,3-Dichloropropene	ND	ug/l	5	8260	sd	03/08/96
trans-1,3-Dichloropropene	ND	ug/l	5	8260	sd	03/08/96
Ethylbenzene	ND	ug/l	5	8260	sd	03/08/96
Hexachlorobutadiene	ND	ug/l	5	8260	sd	03/08/96
2-Hexanone	ND	ug/l	5	8260	sd	03/08/96
Iodomethane	ND	ug/l	5	8260	sd	03/08/96
Isopropylbenzene	ND	ug/l	5	8260	sd	03/08/96
p-Isopropyltoluene	ND	ug/l	5	8260	sd	03/08/96
Methylene Chloride	ND	ug/l	5	8260	sd	03/08/96
4-Methyl-2-Pentanone	ND	ug/l	50	8260	sd	03/08/96
MTBE	ND	ug/l	5	8260	sd	03/08/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-004	Date Sampled:	03/04/96 14:00
Client ID:	MW-15 GW	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	ND	ug/l	5	8260	sd	03/08/96
n-Propylbenzene	ND	ug/l	5	8260	sd	03/08/96
Styrene	ND	ug/l	5	8260	sd	03/08/96
1,1,1,2-Tetrachloroethane	ND	ug/l	5	8260	sd	03/08/96
1,1,2,2-Tetrachloroethane	ND	ug/l	5	8260	sd	03/08/96
Tetrachloroethene	150	ug/l	5	8260	sd	03/08/96
Toluene	ND	ug/l	5	8260	sd	03/08/96
1,2,3-Trichloropropane	ND	ug/l	5	8260	sd	03/08/96
1,2,3-Trichlorobenzene	ND	ug/l	5	8260	sd	03/08/96
1,2,4-Trichlorobenzene	ND	ug/l	5	8260	sd	03/08/96
1,1,1-Trichloroethane	13	ug/l	5	8260	sd	03/08/96
1,1,2-Trichloroethane	ND	ug/l	5	8260	sd	03/08/96
Trichloroethene	63	ug/l	5	8260	sd	03/08/96
Trichlorofluoromethane	ND	ug/l	5	8260	sd	03/08/96
1,2,4-Trimethylbenzene	ND	ug/l	5	8260	sd	03/08/96
1,3,5-Trimethylbenzene	ND	ug/l	5	8260	sd	03/08/96
Vinyl Acetate	ND	ug/l	5	8260	sd	03/08/96
Vinyl Chloride	ND	ug/l	2	8260	sd	03/08/96
o-Xylene	ND	ug/l	5	8260	sd	03/08/96
p-m-Xylene	ND	ug/l	5	8260	sd	03/08/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	112	Percent			sd	03/08/96
Dibromofluoromethane	101	Percent			sd	03/08/96
Toluene-D8	104	Percent			sd	03/08/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-005	Date Sampled:	03/04/96 11:30
Client ID:	SB-9 20-22	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
SAMPLE PREPARATION						
Metal Digestion	03/07/96			3051		
Mercury Digestion	03/07/96			7470/7471		
TRACE METALS						
Arsenic	0.5	mg/kg	0.5	7061	th	03/07/96
Barium	489	mg/kg	1.0	6010A	th	03/11/96
Cadmium	ND	mg/kg	0.5	7131	da	03/07/96
Chromium	ND	mg/kg	2.0	6010A	th	03/11/96
Lead	0.7	mg/kg	10	6010A	da	03/11/96
Lead analysis performed by method 7421 Detection Limit is 0.1 mg/kg						
Mercury	ND	mg/kg	0.1	7471	mm	03/07/96
Selenium	ND	mg/kg	0.5	7741	th	03/07/96
Silver	ND	mg/kg	2.0	6010A	th	03/08/96
VOLATILE ORGANICS						
Acetone	ND	ug/kg	100	8260	jw	03/08/96
Acrolein	ND	ug/kg	100	8260	jw	03/08/96
Acrylonitrile	ND	ug/kg	100	8260	jw	03/08/96
Benzene	ND	ug/kg	1	8260	jw	03/08/96
Bromobenzene	ND	ug/kg	5	8260	jw	03/08/96
Bromochloromethane	ND	ug/kg	5	8260	jw	03/08/96
Bromodichloromethane	ND	ug/kg	5	8260	jw	03/08/96
Bromoform	ND	ug/kg	5	8260	jw	03/08/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-005	Date Sampled:	03/04/96 11:30
Client ID:	SB-9 20-22	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Bromomethane	ND	ug/kg	5	8260	jw	03/08/96
2-Butanone	ND	ug/kg	100	8260	jw	03/08/96
n-Butylbenzene	ND	ug/kg	5	8260	jw	03/08/96
sec-Butylbenzene	ND	ug/kg	5	8260	jw	03/08/96
tert-Butylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Carbon Disulfide	ND	ug/kg	5	8260	jw	03/08/96
Carbon Tetrachloride	ND	ug/kg	5	8260	jw	03/08/96
Chlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
Chloroethane	ND	ug/kg	5	8260	jw	03/08/96
2-Chloroethylvinyl Ether	ND	ug/kg	5	8260	jw	03/08/96
Chloroform	ND	ug/kg	5	8260	jw	03/08/96
Chloromethane	ND	ug/kg	5	8260	jw	03/08/96
2-Chlorotoluene	ND	ug/kg	5	8260	jw	03/08/96
4-Chlorotoluene	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	5	8260	jw	03/08/96
Dibromochloromethane	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dibromoethane	ND	ug/kg	5	8260	jw	03/08/96
Dibromomethane	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,3-Dichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,4-Dichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
Dichlorodifluoromethane	ND	ug/kg	5	8260	jw	03/08/96
1,1-Dichloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dichloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,1-Dichloroethene	ND	ug/kg	5	8260	jw	03/08/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-005	Date Sampled:	03/04/96 11:30
Client ID:	SB-9 20-22	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
cis-1,2-Dichloroethene	ND	ug/kg	5	8260	jw	03/08/96
trans-1,2-Dichloroethene	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dichloropropane	ND	ug/kg	5	8260	jw	03/08/96
1,3-Dichloropropane	ND	ug/kg	5	8260	jw	03/08/96
2,2-Dichloropropane	ND	ug/kg	5	8260	jw	03/08/96
1,1-Dichloropropene	ND	ug/kg	5	8260	jw	03/08/96
cis-1,3-Dichloropropene	ND	ug/kg	5	8260	jw	03/08/96
trans-1,3-Dichloropropene	ND	ug/kg	5	8260	jw	03/08/96
Ethylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Hexachlorobutadiene	ND	ug/kg	5	8260	jw	03/08/96
2-Hexanone	ND	ug/kg	5	8260	jw	03/08/96
Iodomethane	ND	ug/kg	5	8260	jw	03/08/96
Isopropylbenzene	ND	ug/kg	5	8260	jw	03/08/96
p-Isopropyltoluene	ND	ug/kg	5	8260	jw	03/08/96
Methylene Chloride	ND	ug/kg	5	8260	jw	03/08/96
4-Methyl-2-Pentanone	ND	ug/kg	50	8260	jw	03/08/96
MTBE	ND	ug/kg	5	8260	jw	03/08/96
Naphthalene	ND	ug/kg	5	8260	jw	03/08/96
n-Propylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Styrene	ND	ug/kg	5	8260	jw	03/08/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	8260	jw	03/08/96
Tetrachloroethene	ND	ug/kg	5	8260	jw	03/08/96
Toluene	ND	ug/kg	5	8260	jw	03/08/96
1,2,3-Trichloropropane	ND	ug/kg	5	8260	jw	03/08/96

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FINAL REPORT

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-005	Date Sampled:	03/04/96 11:30
Client ID:	SB-9 20-22	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
1,2,3-Trichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,2,4-Trichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,1,1-Trichloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,1,2-Trichloroethane	ND	ug/kg	5	8260	jw	03/08/96
Trichloroethene	ND	ug/kg	5	8260	jw	03/08/96
Trichlorofluoromethane	ND	ug/kg	5	8260	jw	03/08/96
1,2,4-Trimethylbenzene	ND	ug/kg	5	8260	jw	03/08/96
1,3,5-Trimethylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Vinyl Acetate	ND	ug/kg	5	8260	jw	03/08/96
Vinyl Chloride	ND	ug/kg	2	8260	jw	03/08/96
o-Xylene	ND	ug/kg	5	8260	jw	03/08/96
p-m-Xylene	ND	ug/kg	5	8260	jw	03/08/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	103	Percent			jw	03/08/96
Dibromofluoromethane	98	Percent			jw	03/08/96
Toluene-D8	103	Percent			jw	03/08/96
MISCELLANEOUS TESTING						
Percent Moisture	2.9	Percent			rw	03/06/96
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Pet. Hydrocarbons C8 - C40	21	mg/kg	5	8015B (Prop.)	jw	03/11/96

Comment: The Extractable Petroleum Hydrocarbon quantitation includes target and/or non-target Petroleum Hydrocarbons in the C8 - C40 range. Target hydrocarbon quantitation is based on the response factor of a standard for the fuel identified. Non-target quantitation is based on the response factor of a diesel fuel standard.

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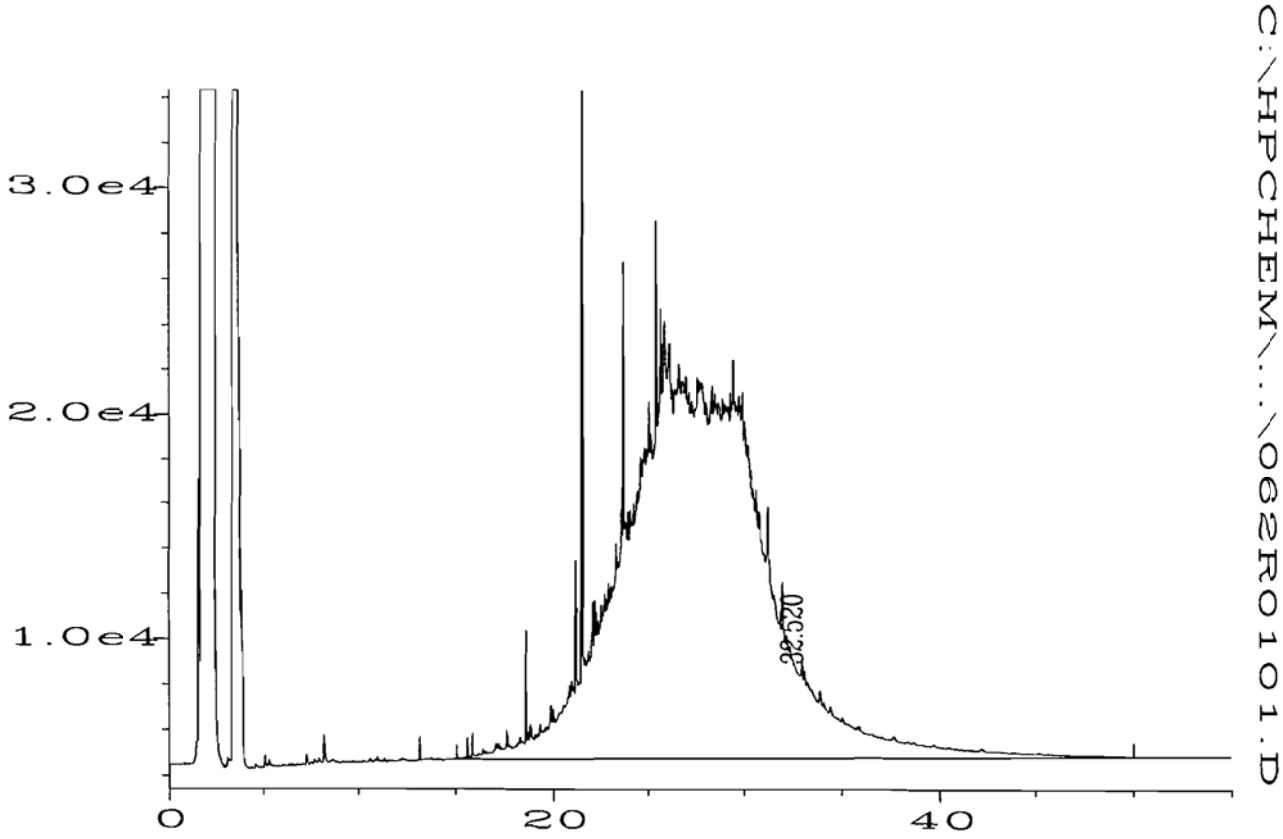
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-005	Date Sampled:	03/04/96 11:30
Client ID:	SB-9 20-22	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Petroleum Hydrocarbon ID	The chromatographic pattern for this sample most closely resembles lubricating oil.					
Diesel/#2 Fuel Oil	ND				jw	03/11/96
Kerosene (#1)/Jet Fuel	ND				jw	03/11/96
Petroleum Naphtha	ND				jw	03/11/96
Paint Thinner	ND				jw	03/11/96
Lubricating Oil	21				jw	03/11/96
#4 Fuel Oil/#6 Fuel Oil	ND				jw	03/11/96
Chromatogram File	031196-062R				jw	03/11/96



Report Date: 03/12/96	
Account Name: Environmental Remediation Inc.	
Project Name: Melville, NY	**Project No:**
Client ID: SB-9 20-22	**Lab ID:** 60650726-005
Analysis Date: 03/11/96	**File No:** 031196-062R

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-006	Date Sampled:	03/04/96 12:45
Client ID:	SB-8 15-17	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
SAMPLE PREPARATION						
Metal Digestion	03/07/96			3051		
Mercury Digestion	03/07/96			7470/7471		
TRACE METALS						
Arsenic	ND	mg/kg	0.5	7061	th	03/07/96
Barium	58	mg/kg	1.0	6010A	th	03/11/96
Cadmium	ND	mg/kg	0.5	7131	da	03/07/96
Chromium	ND	mg/kg	2.0	6010A	th	03/11/96
Lead	0.6	mg/kg	10	6010A	da	03/11/96
Lead analysis performed by method 7421 Detection Limit is 0.1 mg/kg						
Mercury	ND	mg/kg	0.1	7471	mm	03/07/96
Selenium	ND	mg/kg	0.5	7741	th	03/07/96
Silver	ND	mg/kg	2.0	6010A	th	03/08/96
VOLATILE ORGANICS						
Acetone	ND	ug/kg	100	8260	jw	03/08/96
Acrolein	ND	ug/kg	100	8260	jw	03/08/96
Acrylonitrile	ND	ug/kg	100	8260	jw	03/08/96
Benzene	ND	ug/kg	1	8260	jw	03/08/96
Bromobenzene	ND	ug/kg	5	8260	jw	03/08/96
Bromochloromethane	ND	ug/kg	5	8260	jw	03/08/96
Bromodichloromethane	ND	ug/kg	5	8260	jw	03/08/96
Bromoform	ND	ug/kg	5	8260	jw	03/08/96

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	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-006	Date Sampled:	03/04/96 12:45
Client ID:	SB-8 15-17	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Bromomethane	ND	ug/kg	5	8260	jw	03/08/96
2-Butanone	ND	ug/kg	100	8260	jw	03/08/96
n-Butylbenzene	ND	ug/kg	5	8260	jw	03/08/96
sec-Butylbenzene	ND	ug/kg	5	8260	jw	03/08/96
tert-Butylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Carbon Disulfide	ND	ug/kg	5	8260	jw	03/08/96
Carbon Tetrachloride	ND	ug/kg	5	8260	jw	03/08/96
Chlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
Chloroethane	ND	ug/kg	5	8260	jw	03/08/96
2-Chloroethylvinyl Ether	ND	ug/kg	5	8260	jw	03/08/96
Chloroform	ND	ug/kg	5	8260	jw	03/08/96
Chloromethane	ND	ug/kg	5	8260	jw	03/08/96
2-Chlorotoluene	ND	ug/kg	5	8260	jw	03/08/96
4-Chlorotoluene	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	5	8260	jw	03/08/96
Dibromochloromethane	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dibromoethane	ND	ug/kg	5	8260	jw	03/08/96
Dibromomethane	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,3-Dichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,4-Dichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
Dichlorodifluoromethane	ND	ug/kg	5	8260	jw	03/08/96
1,1-Dichloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dichloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,1-Dichloroethene	ND	ug/kg	5	8260	jw	03/08/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-006	Date Sampled:	03/04/96 12:45
Client ID:	SB-8 15-17	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
cis-1,2-Dichloroethene	ND	ug/kg	5	8260	jw	03/08/96
trans-1,2-Dichloroethene	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dichloropropane	ND	ug/kg	5	8260	jw	03/08/96
1,3-Dichloropropane	ND	ug/kg	5	8260	jw	03/08/96
2,2-Dichloropropane	ND	ug/kg	5	8260	jw	03/08/96
1,1-Dichloropropene	ND	ug/kg	5	8260	jw	03/08/96
cis-1,3-Dichloropropene	ND	ug/kg	5	8260	jw	03/08/96
trans-1,3-Dichloropropene	ND	ug/kg	5	8260	jw	03/08/96
Ethylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Hexachlorobutadiene	ND	ug/kg	5	8260	jw	03/08/96
2-Hexanone	ND	ug/kg	5	8260	jw	03/08/96
Iodomethane	ND	ug/kg	5	8260	jw	03/08/96
Isopropylbenzene	ND	ug/kg	5	8260	jw	03/08/96
p-Isopropyltoluene	ND	ug/kg	5	8260	jw	03/08/96
Methylene Chloride	ND	ug/kg	5	8260	jw	03/08/96
4-Methyl-2-Pentanone	ND	ug/kg	50	8260	jw	03/08/96
MTBE	ND	ug/kg	5	8260	jw	03/08/96
Naphthalene	ND	ug/kg	5	8260	jw	03/08/96
n-Propylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Styrene	ND	ug/kg	5	8260	jw	03/08/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	8260	jw	03/08/96
Tetrachloroethene	ND	ug/kg	5	8260	jw	03/08/96
Toluene	ND	ug/kg	5	8260	jw	03/08/96
1,2,3-Trichloropropane	ND	ug/kg	5	8260	jw	03/08/96

Matrix Analytical, Inc.
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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-006	Date Sampled:	03/04/96 12:45
Client ID:	SB-8 15-17	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
1,2,3-Trichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,2,4-Trichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,1,1-Trichloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,1,2-Trichloroethane	ND	ug/kg	5	8260	jw	03/08/96
Trichloroethene	ND	ug/kg	5	8260	jw	03/08/96
Trichlorofluoromethane	ND	ug/kg	5	8260	jw	03/08/96
1,2,4-Trimethylbenzene	ND	ug/kg	5	8260	jw	03/08/96
1,3,5-Trimethylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Vinyl Acetate	ND	ug/kg	5	8260	jw	03/08/96
Vinyl Chloride	ND	ug/kg	2	8260	jw	03/08/96
o-Xylene	ND	ug/kg	5	8260	jw	03/08/96
p-m-Xylene	ND	ug/kg	5	8260	jw	03/08/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	103	Percent			jw	03/08/96
Dibromofluoromethane	99	Percent			jw	03/08/96
Toluene-D8	101	Percent			jw	03/08/96
MISCELLANEOUS TESTING						
Percent Moisture	2.6	Percent			rw	03/06/96
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Pet. Hydrocarbons C8 - C40	ND	mg/kg	5	8015B (Prop.)	jw	03/09/96

Comment: The Extractable Petroleum Hydrocarbon quantitation includes target and/or non-target Petroleum Hydrocarbons in the C8 - C40 range. Target hydrocarbon quantitation is based on the response factor of a standard for the fuel identified. Non-target quantitation is based on the response factor of a diesel fuel standard.

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FINAL REPORT

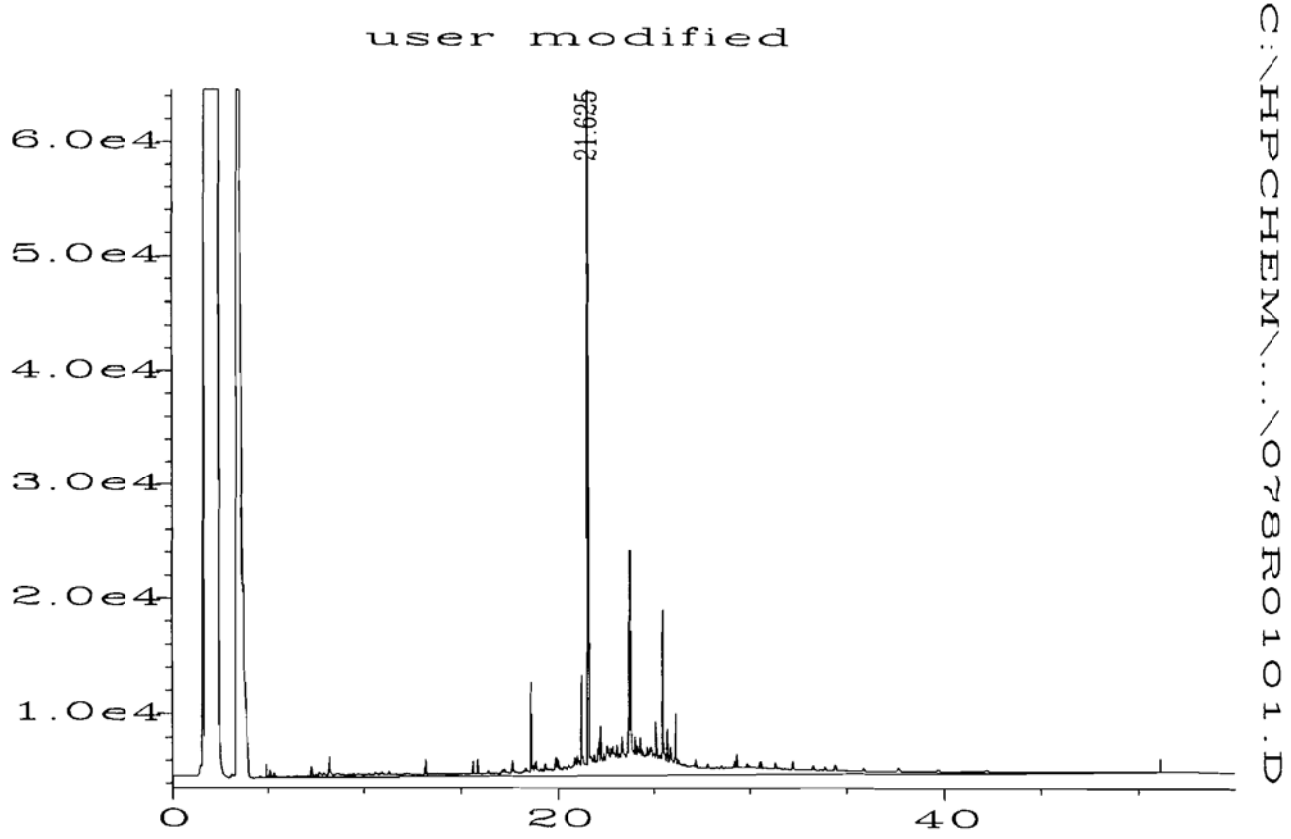
Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-006	Date Sampled:	03/04/96 12:45
Client ID:	SB-8 15-17	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Diesel/#2 Fuel Oil	ND				jw	03/09/96
Kerosene (#1)/Jet Fuel	ND				jw	03/09/96
Petroleum Naphtha	ND				jw	03/09/96
Paint Thinner	ND				jw	03/09/96
Lubricating Oil	ND				jw	03/09/96
#4 Fuel Oil/#6 Fuel Oil	ND				jw	03/09/96
Chromatogram File	030896-078R				jw	03/09/96



Report Date: 03/12/96	
Account Name: Environmental Remediation Inc.	
Project Name: Melville, NY	**Project No:**
Client ID: SB-8 15-17	**Lab ID:** 60650726-006
Analysis Date: 03/09/96	**File No:** 030896-078R

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-007	Date Sampled:	03/04/96 10:10
Client ID:	SB-7A 10-12	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
SAMPLE PREPARATION						
Metal Digestion	03/07/96			3051		
Mercury Digestion	03/07/96			7470/7471		
TRACE METALS						
Arsenic	ND	mg/kg	0.5	7061	th	03/07/96
Barium	23	mg/kg	1.0	6010A	th	03/11/96
Cadmium	ND	mg/kg	0.5	7131	da	03/07/96
Chromium	ND	mg/kg	2.0	6010A	th	03/11/96
Lead	0.5	mg/kg	10	6010A	da	03/11/96
Lead analysis performed by method 7421 Detection Limit is 0.1 mg/kg						
Mercury	ND	mg/kg	0.1	7471	mm	03/07/96
Selenium	ND	mg/kg	0.5	7741	th	03/07/96
Silver	ND	mg/kg	2.0	6010A	th	03/08/96
VOLATILE ORGANICS						
Acetone	ND	ug/kg	100	8260	jw	03/08/96
Acrolein	ND	ug/kg	100	8260	jw	03/08/96
Acrylonitrile	ND	ug/kg	100	8260	jw	03/08/96
Benzene	ND	ug/kg	1	8260	jw	03/08/96
Bromobenzene	ND	ug/kg	5	8260	jw	03/08/96
Bromochloromethane	ND	ug/kg	5	8260	jw	03/08/96
Bromodichloromethane	ND	ug/kg	5	8260	jw	03/08/96
Bromoform	ND	ug/kg	5	8260	jw	03/08/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-007	Date Sampled:	03/04/96 10:10
Client ID:	SB-7A 10-12	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Bromomethane	ND	ug/kg	5	8260	jw	03/08/96
2-Butanone	ND	ug/kg	100	8260	jw	03/08/96
n-Butylbenzene	ND	ug/kg	5	8260	jw	03/08/96
sec-Butylbenzene	ND	ug/kg	5	8260	jw	03/08/96
tert-Butylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Carbon Disulfide	ND	ug/kg	5	8260	jw	03/08/96
Carbon Tetrachloride	ND	ug/kg	5	8260	jw	03/08/96
Chlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
Chloroethane	ND	ug/kg	5	8260	jw	03/08/96
2-Chloroethylvinyl Ether	ND	ug/kg	5	8260	jw	03/08/96
Chloroform	ND	ug/kg	5	8260	jw	03/08/96
Chloromethane	ND	ug/kg	5	8260	jw	03/08/96
2-Chlorotoluene	ND	ug/kg	5	8260	jw	03/08/96
4-Chlorotoluene	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	5	8260	jw	03/08/96
Dibromochloromethane	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dibromoethane	ND	ug/kg	5	8260	jw	03/08/96
Dibromomethane	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,3-Dichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,4-Dichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
Dichlorodifluoromethane	ND	ug/kg	5	8260	jw	03/08/96
1,1-Dichloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dichloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,1-Dichloroethene	ND	ug/kg	5	8260	jw	03/08/96

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FINAL REPORT

Client Information

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-007	Date Sampled:	03/04/96 10:10
Client ID:	SB-7A 10-12	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
cis-1,2-Dichloroethene	ND	ug/kg	5	8260	jw	03/08/96
trans-1,2-Dichloroethene	ND	ug/kg	5	8260	jw	03/08/96
1,2-Dichloropropane	ND	ug/kg	5	8260	jw	03/08/96
1,3-Dichloropropane	ND	ug/kg	5	8260	jw	03/08/96
2,2-Dichloropropane	ND	ug/kg	5	8260	jw	03/08/96
1,1-Dichloropropene	ND	ug/kg	5	8260	jw	03/08/96
cis-1,3-Dichloropropene	ND	ug/kg	5	8260	jw	03/08/96
trans-1,3-Dichloropropene	ND	ug/kg	5	8260	jw	03/08/96
Ethylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Hexachlorobutadiene	ND	ug/kg	5	8260	jw	03/08/96
2-Hexanone	ND	ug/kg	5	8260	jw	03/08/96
Iodomethane	ND	ug/kg	5	8260	jw	03/08/96
Isopropylbenzene	ND	ug/kg	5	8260	jw	03/08/96
p-Isopropyltoluene	ND	ug/kg	5	8260	jw	03/08/96
Methylene Chloride	ND	ug/kg	5	8260	jw	03/08/96
4-Methyl-2-Pentanone	ND	ug/kg	50	8260	jw	03/08/96
MTBE	ND	ug/kg	5	8260	jw	03/08/96
Naphthalene	ND	ug/kg	5	8260	jw	03/08/96
n-Propylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Styrene	ND	ug/kg	5	8260	jw	03/08/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	8260	jw	03/08/96
Tetrachloroethene	ND	ug/kg	5	8260	jw	03/08/96
Toluene	ND	ug/kg	5	8260	jw	03/08/96
1,2,3-Trichloropropane	ND	ug/kg	5	8260	jw	03/08/96

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FINAL REPORT

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-007	Date Sampled:	03/04/96 10:10
Client ID:	SB-7A 10-12	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
1,2,3-Trichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,2,4-Trichlorobenzene	ND	ug/kg	5	8260	jw	03/08/96
1,1,1-Trichloroethane	ND	ug/kg	5	8260	jw	03/08/96
1,1,2-Trichloroethane	ND	ug/kg	5	8260	jw	03/08/96
Trichloroethene	ND	ug/kg	5	8260	jw	03/08/96
Trichlorofluoromethane	ND	ug/kg	5	8260	jw	03/08/96
1,2,4-Trimethylbenzene	ND	ug/kg	5	8260	jw	03/08/96
1,3,5-Trimethylbenzene	ND	ug/kg	5	8260	jw	03/08/96
Vinyl Acetate	ND	ug/kg	5	8260	jw	03/08/96
Vinyl Chloride	ND	ug/kg	2	8260	jw	03/08/96
o-Xylene	ND	ug/kg	5	8260	jw	03/08/96
p-m-Xylene	ND	ug/kg	5	8260	jw	03/08/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	107	Percent			jw	03/08/96
Dibromofluoromethane	97	Percent			jw	03/08/96
Toluene-D8	105	Percent			jw	03/08/96
MISCELLANEOUS TESTING						
Percent Moisture	3.0	Percent			rw	03/06/96
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Pet. Hydrocarbons C8 - C40	ND	mg/kg	5	8015B (Prop.)	jw	03/09/96

Comment: The Extractable Petroleum Hydrocarbon quantitation includes target and/or non-target Petroleum Hydrocarbons in the C8 - C40 range. Target hydrocarbon quantitation is based on the response factor of a standard for the fuel identified. Non-target quantitation is based on the response factor of a diesel fuel standard.

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FINAL REPORT

Client Information

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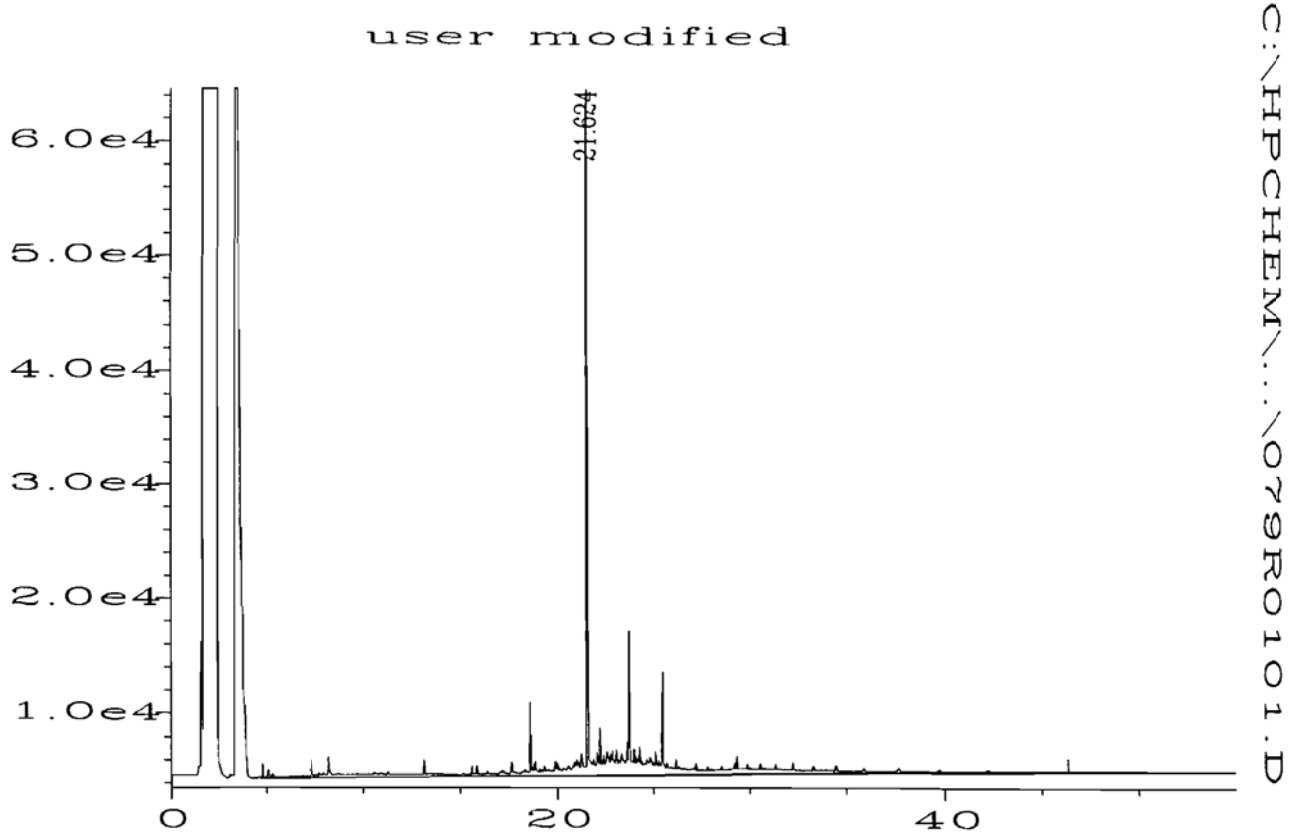
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-007	Date Sampled:	03/04/96 10:10
Client ID:	SB-7A 10-12	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Diesel/#2 Fuel Oil	ND				jw	03/09/96
Kerosene (#1)/Jet Fuel	ND				jw	03/09/96
Petroleum Naphtha	ND				jw	03/09/96
Paint Thinner	ND				jw	03/09/96
Lubricating Oil	ND				jw	03/09/96
#4 Fuel Oil/#6 Fuel Oil	ND				jw	03/09/96
Chromatogram File	030896-79R				jw	03/09/96



Report Date: 03/12/96	
Account Name: Environmental Remediation Inc.	
Project Name: Melville, NY	**Project No:**
Client ID: SB-7A 10-12	**Lab ID:** 60650726-007
Analysis Date: 03/09/96	**File No:** 030896-079R

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-008	Date Sampled:	03/04/96 08:45
Client ID:	SB-10 05-07	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
SAMPLE PREPARATION						
Metal Digestion	03/07/96			3051		
Mercury Digestion	03/07/96			7470/7471		
TRACE METALS						
Arsenic	2.5	mg/kg	0.5	7061	th	03/07/96
Barium	20	mg/kg	1.0	6010A	th	03/11/96
Cadmium	ND	mg/kg	0.5	7131	da	03/07/96
Chromium	8.0	mg/kg	2.0	6010A	th	03/11/96
Lead	2.1	mg/kg	10	6010A	da	03/11/96
Lead analysis performed by method 7421 Detection Limit is 0.1 mg/kg						
Mercury	ND	mg/kg	0.1	7471	mm	03/07/96
Selenium	ND	mg/kg	0.5	7741	th	03/07/96
Silver	2.0	mg/kg	2.0	6010A	th	03/08/96
VOLATILE ORGANICS						
Acetone	ND	ug/kg	500	8260	db	03/12/96
Acrolein	ND	ug/kg	500	8260	db	03/12/96
Acrylonitrile	ND	ug/kg	500	8260	db	03/12/96
Benzene	ND	ug/kg	5	8260	db	03/12/96
Bromobenzene	ND	ug/kg	25	8260	db	03/12/96
Bromochloromethane	ND	ug/kg	25	8260	db	03/12/96
Bromodichloromethane	ND	ug/kg	25	8260	db	03/12/96
Bromoform	ND	ug/kg	25	8260	db	03/12/96

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	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-008	Date Sampled:	03/04/96 08:45
Client ID:	SB-10 05-07	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Bromomethane	ND	ug/kg	25	8260	db	03/12/96
2-Butanone	ND	ug/kg	500	8260	db	03/12/96
n-Butylbenzene	ND	ug/kg	25	8260	db	03/12/96
sec-Butylbenzene	ND	ug/kg	25	8260	db	03/12/96
tert-Butylbenzene	ND	ug/kg	25	8260	db	03/12/96
Carbon Disulfide	ND	ug/kg	25	8260	db	03/12/96
Carbon Tetrachloride	ND	ug/kg	25	8260	db	03/12/96
Chlorobenzene	ND	ug/kg	25	8260	db	03/12/96
Chloroethane	ND	ug/kg	25	8260	db	03/12/96
2-Chloroethylvinyl Ether	ND	ug/kg	25	8260	db	03/12/96
Chloroform	ND	ug/kg	25	8260	db	03/12/96
Chloromethane	ND	ug/kg	25	8260	db	03/12/96
2-Chlorotoluene	ND	ug/kg	25	8260	db	03/12/96
4-Chlorotoluene	ND	ug/kg	25	8260	db	03/12/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	25	8260	db	03/12/96
Dibromochloromethane	ND	ug/kg	25	8260	db	03/12/96
1,2-Dibromoethane	ND	ug/kg	25	8260	db	03/12/96
Dibromomethane	ND	ug/kg	25	8260	db	03/12/96
1,2-Dichlorobenzene	ND	ug/kg	25	8260	db	03/12/96
1,3-Dichlorobenzene	ND	ug/kg	25	8260	db	03/12/96
1,4-Dichlorobenzene	ND	ug/kg	25	8260	db	03/12/96
Dichlorodifluoromethane	ND	ug/kg	25	8260	db	03/12/96
1,1-Dichloroethane	ND	ug/kg	25	8260	db	03/12/96
1,2-Dichloroethane	ND	ug/kg	25	8260	db	03/12/96
1,1-Dichloroethene	ND	ug/kg	25	8260	db	03/12/96

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	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-008	Date Sampled:	03/04/96 08:45
Client ID:	SB-10 05-07	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
cis-1,2-Dichloroethene	ND	ug/kg	25	8260	db	03/12/96
trans-1,2-Dichloroethene	ND	ug/kg	25	8260	db	03/12/96
1,2-Dichloropropane	ND	ug/kg	25	8260	db	03/12/96
1,3-Dichloropropane	ND	ug/kg	25	8260	db	03/12/96
2,2-Dichloropropane	ND	ug/kg	25	8260	db	03/12/96
1,1-Dichloropropene	ND	ug/kg	25	8260	db	03/12/96
cis-1,3-Dichloropropene	ND	ug/kg	25	8260	db	03/12/96
trans-1,3-Dichloropropene	ND	ug/kg	25	8260	db	03/12/96
Ethylbenzene	ND	ug/kg	25	8260	db	03/12/96
Hexachlorobutadiene	ND	ug/kg	25	8260	db	03/12/96
2-Hexanone	ND	ug/kg	25	8260	db	03/12/96
Iodomethane	ND	ug/kg	25	8260	db	03/12/96
Isopropylbenzene	ND	ug/kg	25	8260	db	03/12/96
p-Isopropyltoluene	ND	ug/kg	25	8260	db	03/12/96
Methylene Chloride	ND	ug/kg	25	8260	db	03/12/96
4-Methyl-2-Pentanone	ND	ug/kg	250	8260	db	03/12/96
MTBE	ND	ug/kg	25	8260	db	03/12/96
Naphthalene	ND	ug/kg	25	8260	db	03/12/96
n-Propylbenzene	ND	ug/kg	25	8260	db	03/12/96
Styrene	ND	ug/kg	25	8260	db	03/12/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	25	8260	db	03/12/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	25	8260	db	03/12/96
Tetrachloroethene	ND	ug/kg	25	8260	db	03/12/96
Toluene	ND	ug/kg	25	8260	db	03/12/96
1,2,3-Trichloropropane	ND	ug/kg	25	8260	db	03/12/96

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-008	Date Sampled:	03/04/96 08:45
Client ID:	SB-10 05-07	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
1,2,3-Trichlorobenzene	ND	ug/kg	25	8260	db	03/12/96
1,2,4-Trichlorobenzene	ND	ug/kg	25	8260	db	03/12/96
1,1,1-Trichloroethane	ND	ug/kg	25	8260	db	03/12/96
1,1,2-Trichloroethane	ND	ug/kg	25	8260	db	03/12/96
Trichloroethene	ND	ug/kg	25	8260	db	03/12/96
Trichlorofluoromethane	ND	ug/kg	25	8260	db	03/12/96
1,2,4-Trimethylbenzene	ND	ug/kg	25	8260	db	03/12/96
1,3,5-Trimethylbenzene	ND	ug/kg	25	8260	db	03/12/96
Vinyl Acetate	ND	ug/kg	25	8260	db	03/12/96
Vinyl Chloride	ND	ug/kg	10	8260	db	03/12/96
o-Xylene	ND	ug/kg	25	8260	db	03/12/96
p-m-Xylene	ND	ug/kg	25	8260	db	03/12/96
The detection limit reported is based on a X5 dilution of the sample. Detection limit due to matrix interference.						
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	106	Percent			db	03/12/96
Dibromofluoromethane	105	Percent			db	03/12/96
Toluene-D8	104	Percent			db	03/12/96
MISCELLANEOUS TESTING						
Percent Moisture	4.0	Percent			rw	03/06/96

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F I N A L R E P O R T

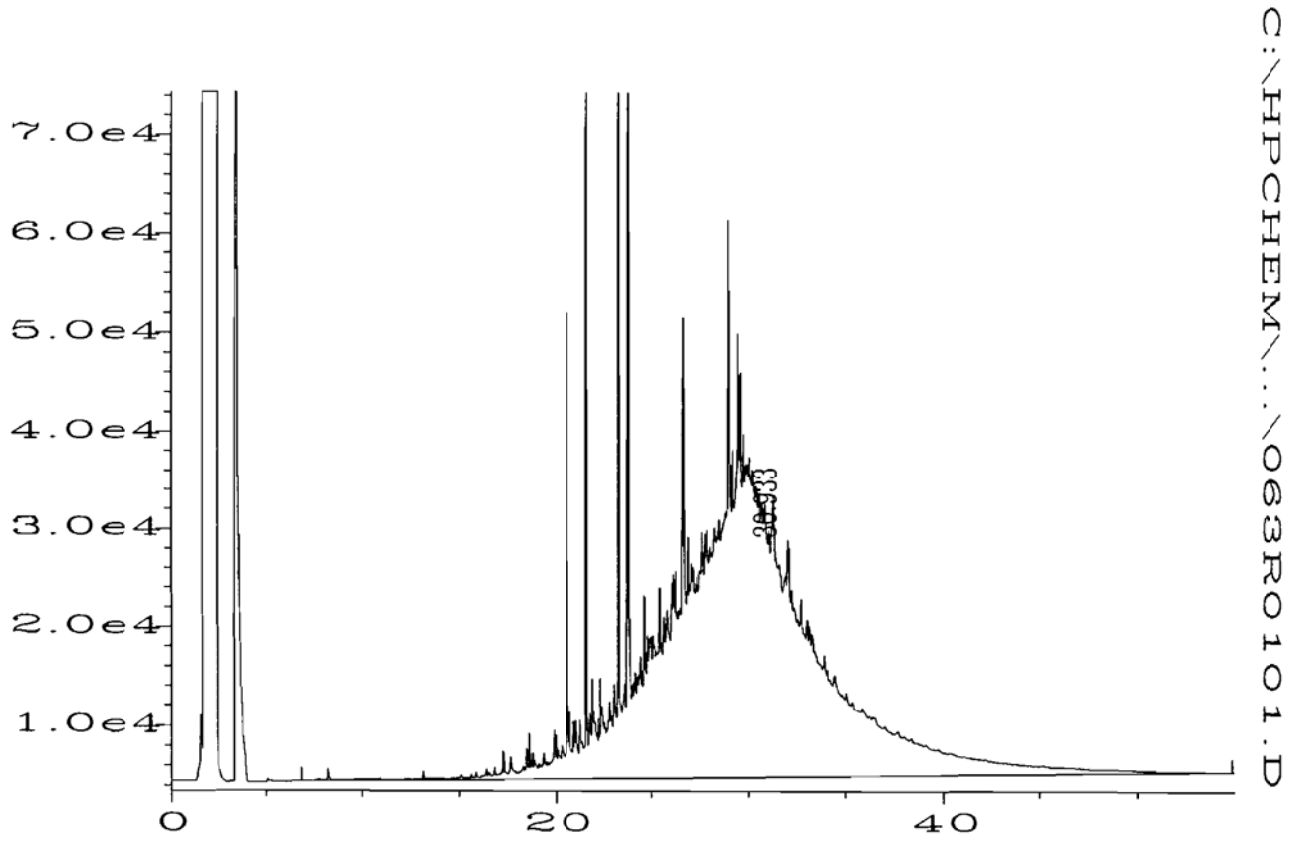
Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60650726-008	Date Sampled:	03/04/96 08:45
Client ID:	SB-10 05-07	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Pet. Hydrocarbons C8 - C40	250	mg/kg	25	8015B (Prop.)	jw	03/11/96
Comment:	The Extractable Petroleum Hydrocarbon quantitation includes target and/or non-target Petroleum Hydrocarbons in the C8 - C40 range. Target hydrocarbon quantitation is based on the response factor of a standard for the fuel identified. Non-target quantitation is based on the response factor of a diesel fuel standard.					
Extractable Petroleum Hydrocarbon ID	This sample most closely resembles #6 Fuel Oil/Asphalt. Due to similarities in their chromatographic patterns, it is not possible to distinguish between the two.					
Diesel/#2 Fuel Oil	ND				jw	03/11/96
Kerosene (#1)/Jet Fuel	ND				jw	03/11/96
Petroleum Naphtha	ND				jw	03/11/96
Paint Thinner	ND				jw	03/11/96
Lubricating Oil	ND				jw	03/11/96
#4 Fuel Oil/#6 Fuel Oil	250				jw	03/11/96
Chromatogram File	031196-063R				jw	03/11/96



Report Date: 03/12/96	
Account Name: Environmental Remediation Inc.	
Project Name: Melville, NY	**Project No:**
Client ID: SB-10 05-07	**Lab ID:** 60650726-008
Analysis Date: 03/11/96	**File No:** 031196-063R

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	

Sample Information

Lab ID:	60650726-009	Date Sampled:	/ / :
Client ID:	QC Report -Water	Date Received:	03/05/96 : 0
Matrix:	Water	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
METHOD BLANKS						
Method Blank - Volatile	ND	ug/l		8260		
MATRIX SPIKE STUDIES - VOLATILES						
Sample ID:	0718-001					
Benzene	86	Percent				
Chlorobenzene	73	Percent				
1,1-Dichloroethene	90	Percent				
Toluene	86	Percent				
Trichloroethene	86	Percent				

METHOD SUMMARIES

Volatile organic analysis is performed using H/P 5995 or 5970 GC/MS, Tekmar purge and trap, and ALS autosampler. Chromatography incorporates packed and megabore columns. Data reduction is performed on RTE 1000 and ChemStation systems. Tuning is based on BFB standards. Procedural guidelines follow EPA 624 or SW846 for all analyses.

METHOD REFERENCES

1. Test Methods For Evaluating Solid Waste: Physical Chemical Methods. EPA SW 846. November 1986.
2. Methods For Chemical Analysis of Water and Wastes. EPA 600/4-79-200. Revised March 1983.
3. Standard Methods For Examination of Water and Wastewater. APHA-AWWA-WACF., 17th Edition. 1989.

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FINAL REPORT

Client Information

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	

Sample Information

Lab ID:	60650726-010	Date Sampled:	/ / :
Client ID:	QC Report -Soil	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
DUPLICATE STUDIES						
Arsenic ID:	0726-005					
Arsenic Variance:	0	Percent				
Barium ID:	0726-005					
Barium Variance:	9	Percent				
Cadmium ID:	0726-005					
Cadmium Variance:	0	Percent				
Chromium ID:	0726-005					
Chromium Variance:	0	Percent				
Lead ID:	0726-005					
Lead Variance:	16	Percent				
Mercury ID:	0726-005					
Mercury Variance:	0	Percent				
Selenium ID:	0726-005					
Selenium Variance:	0	Percent				
Silver ID:	0726-005					
Silver Variance:	0	Percent				
MATRIX SPIKE STUDIES - METALS						
Arsenic ID:	0726-005					
Arsenic Recovery:	103	Percent				
Barium ID:	0726-005					
Barium Recovery:	125	Percent				
Cadmium ID:	0726-005					
Cadmium Recovery:	94	Percent				
Chromium ID:	0726-005					

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	

Sample Information

Lab ID:	60650726-010	Date Sampled:	/ / :
Client ID:	QC Report -Soil	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
MATRIX SPIKE STUDIES - METALS						
Chromium Recovery	105	Percent				
Lead ID:	0726-005					
Lead Recovery:	106	Percent				
Mercury ID:	0726-005					
Mercury Recovery:	80	Percent				
Selenium ID:	0726-005					
Selenium Recovery:	78	Percent				
Silver ID:	0726-005					
Silver Recovery:	28	Percent				
METHOD BLANKS						
Method Blank - Volatile	ND	ug/l		8260		
MATRIX SPIKE STUDIES - VOLATILES						
Sample ID:	0723-005					
Benzene	92	Percent				
Chlorobenzene	85	Percent				
1,1-Dichloroethene	86	Percent				
Toluene	81	Percent				
Trichloroethene	80	Percent				

METHOD SUMMARIES

Metal analysis is performed on digested extracts using Atomic Absorption or ICP Spectroscopy. AA samples are atomized using FASTAC auto deposition and are automatically deposited into graphite cells or directly into flame. ICP samples are automatically sampled, nebulized, and transported into the plasma torch. Final results are produced by auto data/reduction and graphics printer.

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FINAL REPORT

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	

Sample Information

Lab ID:	60650726-010	Date Sampled:	/ / :
Client ID:	QC Report -Soil	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed

METHOD SUMMARIES

NOTE: Analytical results have been corrected and are reported on a dry weight basis. If required, detection limits can also be corrected to dry weight using the percent moisture data included in this report.

Extractable and Purgeable Petroleum Hydrocarbon Analysis is based on SW-846 Proposed Method 8015B. Extractable Petroluem Hydrocarbons are prepared by solvent extraction and analyzed using Gas Chromatography-Flame Ionization Detection (GC-FID). Purgeable Petroleum Hydrocarbons are prepared by purge and trap and analyzed using GC-FID.

Volatile organic analysis is performed using H/P 5995 or 5970 GC/MS, Tekmar purge and trap, and ALS autosampler. Chromatography incorporates packed and megabore columns. Data reduction is performed on RTE 1000 and ChemStation systems. Tuning is based on BFB standards. Procedural guidelines follow EPA 624 or SW846 for all analyses.

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-5-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	

Sample Information

Lab ID:	60650726-010	Date Sampled:	/ / :
Client ID:	QC Report -Soil	Date Received:	03/05/96 : 0
Matrix:	Soil	Date Reported:	03/12/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed

METHOD REFERENCES

1. Test Methods For Evaluating Solid Waste: Physical Chemical Methods. EPA SW 846. November 1986.
2. Methods For Chemical Analysis of Water and Wastes. EPA 600/4-79-200. Revised March 1983.
3. Standard Methods For Examination of Water and Wastewater. APHA-AWWA-WACF., 17th Edition. 1989.

MAR 5 '96 12:56

3-05-1996 12:58PM FROM ENVIRONMENTAL 8602909009

8602909009 PAGE.002

Project Information

Project Name: Melville NY
Project No.:
Project Location: Melville NY
Project Manager: J. Pearl
Sampler(s): J. Pearl
PO #: Lab Quote #:
Turn-Around: ☐ Standard 10 business days ☐ Other (specify):
Note: TATs less than 10 days must be pre-approved!

Client Information

Send Reports to: J. Pearl
Company: EPI
Address: 87 Church St E Hartford, CT
Phone: 860 290-9300
Fax: " " 9009
Account # (Lab Use Only)
Reporting Requirements: ☐ Mail ☐ Priority
Preliminary: ☐ FAX ☐ Verbal by \ \
Final Report: ☐ FAX ☐ Verbal by \ \

Form No. Page 1 of 1

FILTRATION (0.45 um) & PRESERVATION INFORMATION

FILTRATION	PRESERVATION
☐ DONE	☐ DONE
☐ NOT NEEDED	☐ NOT NEEDED
☐ LAB TO DO*	☐ LAB TO DO*

**Please specify which samples need to be filtered and/or preserved by the lab.*

IF SPECIAL OR NON-ROUTINE DETECTION LIMITS ARE REQUIRED, PLEASE CALL THE LAB.

TOTAL # OF BOTTLES

Lab ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source / Matrix	Analyses (write test methods above & "x's" below for each sample to be tested)										Sample Remarks (below)
					8260	TPH-GC	RCRA metals								
	MW-12 GW	3/4/96	1230	GW	X's										
	MW-13 GW		1300												
	MW-14 GW		1330												
	MW-15 GW		1400												
	SB-9 20-22		1150	Soil		X's	X's								
	SB-8 15-17		1245												
	SB-7A 10-12		1010												
	SB-10 05-07		0845												

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748
Phone: (800) 362-8749
Fax: (508) 435-2497

NOTES:

CHAIN-OF-CUSTODY RECORD

Relinquished By:	Date/Time	Received By:	Date/Time	Condition of Samples Upon Arrival
	3/5/96 1240		3/5/96 1240	☐ 60650726-001
			3-5-96 3:00	

ANALYTICAL DATA SUMMARY

Report Date: 03/11/96

Account: Environmental Remediation Inc.
Address: 87 Church Street
East Hartford, CT 06108
203-290-9300

Project Manager: J.Pearl
Project Name: Melville, NY (3-4-96)
Project No.:

Sample Information:

Laboratory ID	Client/Field ID	Laboratory ID	Client/Field ID
60640706-001	MW12 45-47	60640706-005	MW14 03-05
60640706-002	MW12 55-56'6"	60640706-006	MW14 43-45
60640706-003	MW13 45-47	60640706-007	MW15 50-52
60640706-004	MW13 54-54'8"	60640706-008	QC Report -Soil

Reviewed by

Christine A. Larkin
Laboratory Manager

Lab Certifications

EPA ID: No. MA059
Massachusetts: No. M-MA059
Maine: Reciprocity
Rhode Island: No. 87
South Carolina: No. 88011
Florida(DEP): QA Plan No. 900437G
Florida(HRS): No. E87290
Connecticut: No. PH0515
New York: ELAP No. 11116
New Hampshire: No. 2041

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-001	Date Sampled:	02/29/96 10:40
Client ID:	MW12 45-47	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/kg	100	8260	db	03/06/96
Acrolein	ND	ug/kg	100	8260	db	03/06/96
Acrylonitrile	ND	ug/kg	100	8260	db	03/06/96
Benzene	ND	ug/kg	1	8260	db	03/06/96
Bromobenzene	ND	ug/kg	5	8260	db	03/06/96
Bromochloromethane	ND	ug/kg	5	8260	db	03/06/96
Bromodichloromethane	ND	ug/kg	5	8260	db	03/06/96
Bromoform	ND	ug/kg	5	8260	db	03/06/96
Bromomethane	ND	ug/kg	5	8260	db	03/06/96
2-Butanone	ND	ug/kg	100	8260	db	03/06/96
n-Butylbenzene	ND	ug/kg	5	8260	db	03/06/96
sec-Butylbenzene	ND	ug/kg	5	8260	db	03/06/96
tert-Butylbenzene	ND	ug/kg	5	8260	db	03/06/96
Carbon Disulfide	ND	ug/kg	5	8260	db	03/06/96
Carbon Tetrachloride	ND	ug/kg	5	8260	db	03/06/96
Chlorobenzene	ND	ug/kg	5	8260	db	03/06/96
Chloroethane	ND	ug/kg	5	8260	db	03/06/96
2-Chloroethylvinyl Ether	ND	ug/kg	5	8260	db	03/06/96
Chloroform	ND	ug/kg	5	8260	db	03/06/96
Chloromethane	ND	ug/kg	5	8260	db	03/06/96
2-Chlorotoluene	ND	ug/kg	5	8260	db	03/06/96
4-Chlorotoluene	ND	ug/kg	5	8260	db	03/06/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	5	8260	db	03/06/96
Dibromochloromethane	ND	ug/kg	5	8260	db	03/06/96
1,2-Dibromoethane	ND	ug/kg	5	8260	db	03/06/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-001	Date Sampled:	02/29/96 10:40
Client ID:	MW12 45-47	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/kg	5	8260	db	03/06/96
1,2-Dichlorobenzene	ND	ug/kg	5	8260	db	03/06/96
1,3-Dichlorobenzene	ND	ug/kg	5	8260	db	03/06/96
1,4-Dichlorobenzene	ND	ug/kg	5	8260	db	03/06/96
Dichlorodifluoromethane	ND	ug/kg	5	8260	db	03/06/96
1,1-Dichloroethane	ND	ug/kg	5	8260	db	03/06/96
1,2-Dichloroethane	ND	ug/kg	5	8260	db	03/06/96
1,1-Dichloroethene	ND	ug/kg	5	8260	db	03/06/96
cis-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/06/96
trans-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/06/96
1,2-Dichloropropane	ND	ug/kg	5	8260	db	03/06/96
1,3-Dichloropropane	ND	ug/kg	5	8260	db	03/06/96
2,2-Dichloropropane	ND	ug/kg	5	8260	db	03/06/96
1,1-Dichloropropene	ND	ug/kg	5	8260	db	03/06/96
cis-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/06/96
trans-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/06/96
Ethylbenzene	ND	ug/kg	5	8260	db	03/06/96
Hexachlorobutadiene	ND	ug/kg	5	8260	db	03/06/96
2-Hexanone	ND	ug/kg	5	8260	db	03/06/96
Iodomethane	ND	ug/kg	5	8260	db	03/06/96
Isopropylbenzene	ND	ug/kg	5	8260	db	03/06/96
p-Isopropyltoluene	ND	ug/kg	5	8260	db	03/06/96
Methylene Chloride	ND	ug/kg	5	8260	db	03/06/96
4-Methyl-2-Pentanone	ND	ug/kg	50	8260	db	03/06/96
MTBE	ND	ug/kg	5	8260	db	03/06/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-001	Date Sampled:	02/29/96 10:40
Client ID:	MW12 45-47	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	ND	ug/kg	5	8260	db	03/06/96
n-Propylbenzene	ND	ug/kg	5	8260	db	03/06/96
Styrene	ND	ug/kg	5	8260	db	03/06/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/06/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/06/96
Tetrachloroethene	180	ug/kg	5	8260	db	03/06/96
Toluene	ND	ug/kg	5	8260	db	03/06/96
1,2,3-Trichloropropane	ND	ug/kg	5	8260	db	03/06/96
1,2,3-Trichlorobenzene	ND	ug/kg	5	8260	db	03/06/96
1,2,4-Trichlorobenzene	ND	ug/kg	5	8260	db	03/06/96
1,1,1-Trichloroethane	ND	ug/kg	5	8260	db	03/06/96
1,1,2-Trichloroethane	ND	ug/kg	5	8260	db	03/06/96
Trichloroethene	ND	ug/kg	5	8260	db	03/06/96
Trichlorofluoromethane	ND	ug/kg	5	8260	db	03/06/96
1,2,4-Trimethylbenzene	ND	ug/kg	5	8260	db	03/06/96
1,3,5-Trimethylbenzene	ND	ug/kg	5	8260	db	03/06/96
Vinyl Acetate	ND	ug/kg	5	8260	db	03/06/96
Vinyl Chloride	ND	ug/kg	2	8260	db	03/06/96
o-Xylene	ND	ug/kg	5	8260	db	03/06/96
p-m-Xylene	ND	ug/kg	5	8260	db	03/06/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	86	Percent			db	03/06/96
Dibromofluoromethane	104	Percent			db	03/06/96
Toluene-D8	93	Percent			db	03/06/96

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Client Information

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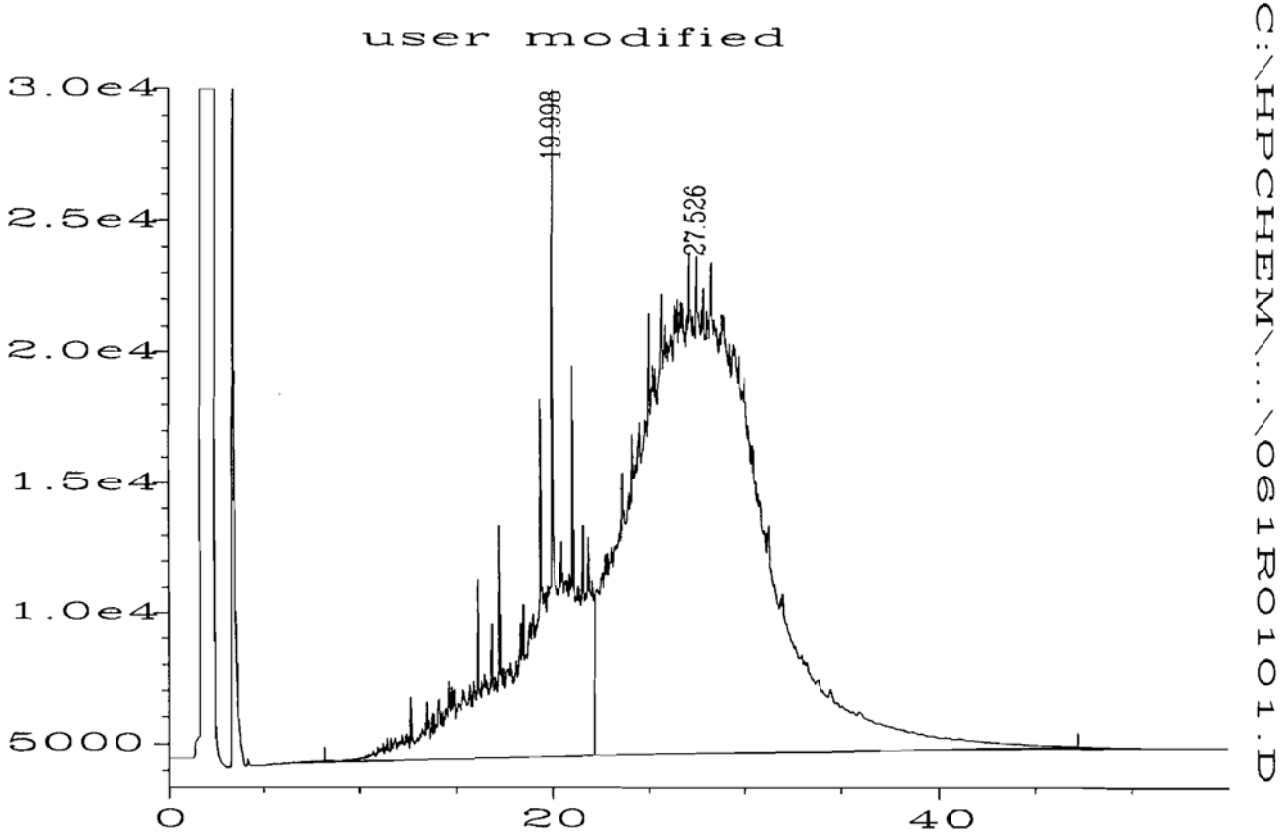
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-001	Date Sampled:	02/29/96 10:40
Client ID:	MW12 45-47	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
MISCELLANEOUS TESTING						
Percent Moisture	12.8	Percent			rw	03/05/96
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Pet. Hydrocarbons C8 - C40	1,400	mg/kg	250	8015B (Prop.)	ck	03/07/96
Comment:	The Extractable Petroleum Hydrocarbon quantitation includes target and/or non-target Petroleum Hydrocarbons in the C8 - C40 range. Target hydrocarbon quantitation is based on the response factor of a standard for the fuel identified. Non-target quantitation is based on the response factor of a diesel fuel standard.					
Extractable Petroleum Hydrocarbon ID	See note:				ck	03/07/96
The chromatographic pattern for this sample most closely resembles a mix of diesel and lubricating oil.						
Diesel/#2 Fuel Oil	290				ck	03/07/96
Kerosene (#1)/Jet Fuel	ND				ck	03/07/96
Petroleum Naphtha	ND				ck	03/07/96
Paint Thinner	ND				ck	03/07/96
Lubricating Oil	1,100				ck	03/07/96
#4 Fuel Oil/#6 Fuel Oil	ND				ck	03/07/96
Chromatogram File	030696-61R				ck	03/07/96



Report Date: 03/11/96	
Account Name: ERI	**Extractable Petroleum Hydrocarbons**
Project Name: Melville, NY	**Project No:**
Client ID: MW12 45-47	**Lab ID:** 60640706-001
Analysis Date: 03/07/96	**File No:** 030696-61R

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-002	Date Sampled:	02/29/96 11:30
Client ID:	MW12 55-56'6"	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/kg	100	8260	db	03/05/96
Acrolein	ND	ug/kg	100	8260	db	03/05/96
Acrylonitrile	ND	ug/kg	100	8260	db	03/05/96
Benzene	ND	ug/kg	1	8260	db	03/05/96
Bromobenzene	ND	ug/kg	5	8260	db	03/05/96
Bromochloromethane	ND	ug/kg	5	8260	db	03/05/96
Bromodichloromethane	ND	ug/kg	5	8260	db	03/05/96
Bromoform	ND	ug/kg	5	8260	db	03/05/96
Bromomethane	ND	ug/kg	5	8260	db	03/05/96
2-Butanone	ND	ug/kg	100	8260	db	03/05/96
n-Butylbenzene	ND	ug/kg	5	8260	db	03/05/96
sec-Butylbenzene	ND	ug/kg	5	8260	db	03/05/96
tert-Butylbenzene	ND	ug/kg	5	8260	db	03/05/96
Carbon Disulfide	ND	ug/kg	5	8260	db	03/05/96
Carbon Tetrachloride	ND	ug/kg	5	8260	db	03/05/96
Chlorobenzene	ND	ug/kg	5	8260	db	03/05/96
Chloroethane	ND	ug/kg	5	8260	db	03/05/96
2-Chloroethylvinyl Ether	ND	ug/kg	5	8260	db	03/05/96
Chloroform	ND	ug/kg	5	8260	db	03/05/96
Chloromethane	ND	ug/kg	5	8260	db	03/05/96
2-Chlorotoluene	ND	ug/kg	5	8260	db	03/05/96
4-Chlorotoluene	ND	ug/kg	5	8260	db	03/05/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	5	8260	db	03/05/96
Dibromochloromethane	ND	ug/kg	5	8260	db	03/05/96
1,2-Dibromoethane	ND	ug/kg	5	8260	db	03/05/96

Matrix Analytical, Inc.
106 South Street
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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-002	Date Sampled:	02/29/96 11:30
Client ID:	MW12 55-56'6"	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/kg	5	8260	db	03/05/96
1,2-Dichlorobenzene	ND	ug/kg	5	8260	db	03/05/96
1,3-Dichlorobenzene	ND	ug/kg	5	8260	db	03/05/96
1,4-Dichlorobenzene	ND	ug/kg	5	8260	db	03/05/96
Dichlorodifluoromethane	ND	ug/kg	5	8260	db	03/05/96
1,1-Dichloroethane	ND	ug/kg	5	8260	db	03/05/96
1,2-Dichloroethane	ND	ug/kg	5	8260	db	03/05/96
1,1-Dichloroethene	ND	ug/kg	5	8260	db	03/05/96
cis-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/05/96
trans-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/05/96
1,2-Dichloropropane	ND	ug/kg	5	8260	db	03/05/96
1,3-Dichloropropane	ND	ug/kg	5	8260	db	03/05/96
2,2-Dichloropropane	ND	ug/kg	5	8260	db	03/05/96
1,1-Dichloropropene	ND	ug/kg	5	8260	db	03/05/96
cis-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/05/96
trans-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/05/96
Ethylbenzene	ND	ug/kg	5	8260	db	03/05/96
Hexachlorobutadiene	ND	ug/kg	5	8260	db	03/05/96
2-Hexanone	ND	ug/kg	5	8260	db	03/05/96
Iodomethane	ND	ug/kg	5	8260	db	03/05/96
Isopropylbenzene	ND	ug/kg	5	8260	db	03/05/96
p-Isopropyltoluene	ND	ug/kg	5	8260	db	03/05/96
Methylene Chloride	ND	ug/kg	5	8260	db	03/05/96
4-Methyl-2-Pentanone	ND	ug/kg	50	8260	db	03/05/96
MTBE	ND	ug/kg	5	8260	db	03/05/96

Matrix Analytical, Inc.
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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-002	Date Sampled:	02/29/96 11:30
Client ID:	MW12 55-56'6"	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	ND	ug/kg	5	8260	db	03/05/96
n-Propylbenzene	ND	ug/kg	5	8260	db	03/05/96
Styrene	ND	ug/kg	5	8260	db	03/05/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/05/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/05/96
Tetrachloroethene	ND	ug/kg	5	8260	db	03/05/96
Toluene	ND	ug/kg	5	8260	db	03/05/96
1,2,3-Trichloropropane	ND	ug/kg	5	8260	db	03/05/96
1,2,3-Trichlorobenzene	ND	ug/kg	5	8260	db	03/05/96
1,2,4-Trichlorobenzene	ND	ug/kg	5	8260	db	03/05/96
1,1,1-Trichloroethane	ND	ug/kg	5	8260	db	03/05/96
1,1,2-Trichloroethane	ND	ug/kg	5	8260	db	03/05/96
Trichloroethene	ND	ug/kg	5	8260	db	03/05/96
Trichlorofluoromethane	ND	ug/kg	5	8260	db	03/05/96
1,2,4-Trimethylbenzene	ND	ug/kg	5	8260	db	03/05/96
1,3,5-Trimethylbenzene	ND	ug/kg	5	8260	db	03/05/96
Vinyl Acetate	ND	ug/kg	5	8260	db	03/05/96
Vinyl Chloride	ND	ug/kg	2	8260	db	03/05/96
o-Xylene	ND	ug/kg	5	8260	db	03/05/96
p-m-Xylene	ND	ug/kg	5	8260	db	03/05/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	95	Percent			db	03/05/96
Dibromofluoromethane	103	Percent			db	03/05/96
Toluene-D8	96	Percent			db	03/05/96

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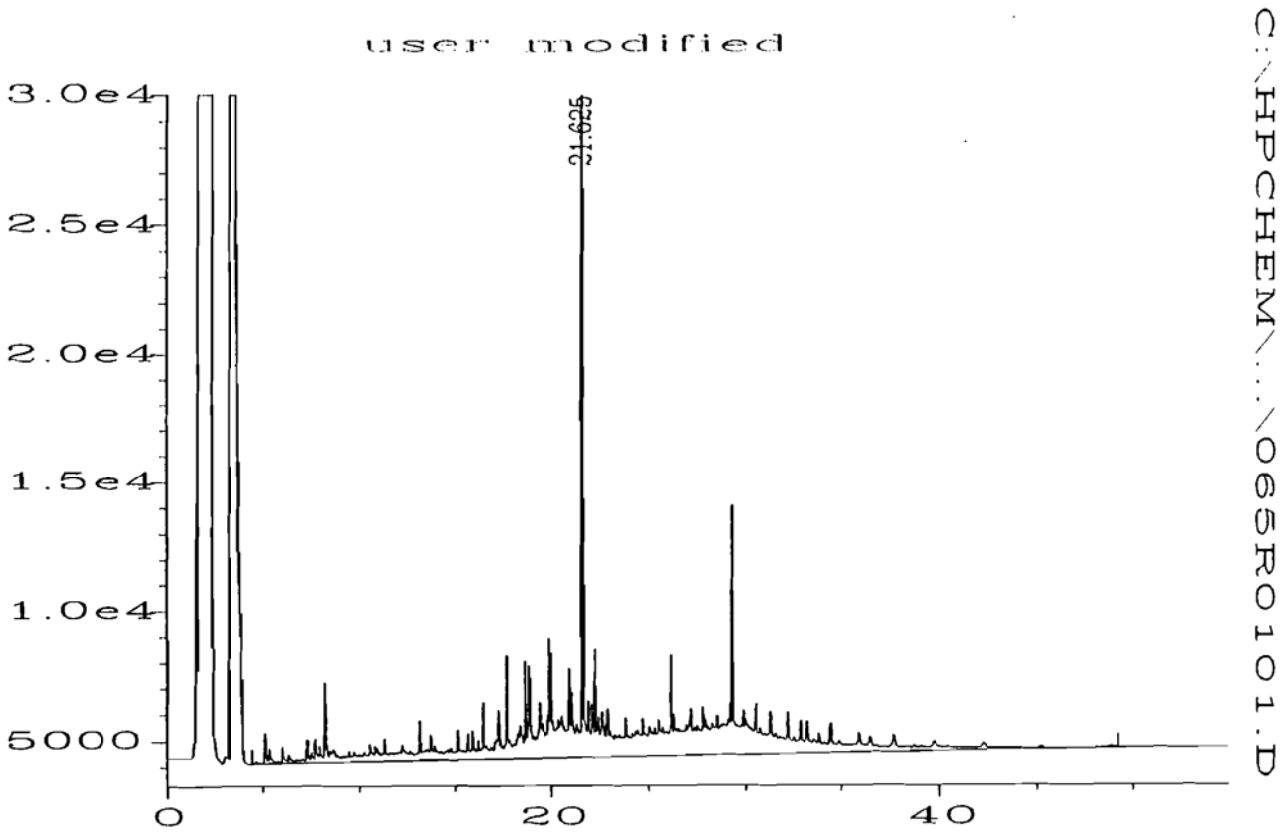
Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-002	Date Sampled:	02/29/96 11:30
Client ID:	MW12 55-56'6"	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
MISCELLANEOUS TESTING						
Percent Moisture	14.2	Percent			rw	03/05/96
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Pet. Hydrocarbons C8 - C40	ND	mg/kg	5	8015B (Prop.)	ck	03/07/96
Comment:	The Extractable Petroleum Hydrocarbon quantitation includes target and/or non-target Petroleum Hydrocarbons in the C8 - C40 range. Target hydrocarbon quantitation is based on the response factor of a standard for the fuel identified. Non-target quantitation is based on the response factor of a diesel fuel standard.					
Extractable Petroleum Hydrocarbon ID	The chromatographic pattern for this sample is not characteristic of any of the petroleum hydrocarbons listed below.					
Diesel/#2 Fuel Oil	ND				ck	03/07/96
Kerosene (#1)/Jet Fuel	ND				ck	03/07/96
Petroleum Naphtha	ND				ck	03/07/96
Paint Thinner	ND				ck	03/07/96
Lubricating Oil	ND				ck	03/07/96
#4 Fuel Oil/#6 Fuel Oil	ND				ck	03/07/96
Chromatogram File	030696-63R				ck	03/07/96



Report Date: 03/11/96	
Account Name: ERI	**Extractable Petroleum Hydrocarbons**
Project Name: Melville, NY	**Project No:**
Client ID: MW12 55- 58'6"	**Lab ID:** 60640706-002
Analysis Date: 03/07/96	**File No:** 030696-63R

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-003	Date Sampled:	02/29/96 16:10
Client ID:	MW13 45-47	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/kg	100	8260	db	03/05/96
Acrolein	ND	ug/kg	100	8260	db	03/05/96
Acrylonitrile	ND	ug/kg	100	8260	db	03/05/96
Benzene	ND	ug/kg	1	8260	db	03/05/96
Bromobenzene	ND	ug/kg	5	8260	db	03/05/96
Bromochloromethane	ND	ug/kg	5	8260	db	03/05/96
Bromodichloromethane	ND	ug/kg	5	8260	db	03/05/96
Bromoform	ND	ug/kg	5	8260	db	03/05/96
Bromomethane	ND	ug/kg	5	8260	db	03/05/96
2-Butanone	ND	ug/kg	100	8260	db	03/05/96
n-Butylbenzene	ND	ug/kg	5	8260	db	03/05/96
sec-Butylbenzene	ND	ug/kg	5	8260	db	03/05/96
tert-Butylbenzene	ND	ug/kg	5	8260	db	03/05/96
Carbon Disulfide	ND	ug/kg	5	8260	db	03/05/96
Carbon Tetrachloride	ND	ug/kg	5	8260	db	03/05/96
Chlorobenzene	ND	ug/kg	5	8260	db	03/05/96
Chloroethane	ND	ug/kg	5	8260	db	03/05/96
2-Chloroethylvinyl Ether	ND	ug/kg	5	8260	db	03/05/96
Chloroform	ND	ug/kg	5	8260	db	03/05/96
Chloromethane	ND	ug/kg	5	8260	db	03/05/96
2-Chlorotoluene	ND	ug/kg	5	8260	db	03/05/96
4-Chlorotoluene	ND	ug/kg	5	8260	db	03/05/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	5	8260	db	03/05/96
Dibromochloromethane	ND	ug/kg	5	8260	db	03/05/96
1,2-Dibromoethane	ND	ug/kg	5	8260	db	03/05/96

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-003	Date Sampled:	02/29/96 16:10
Client ID:	MW13 45-47	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/kg	5	8260	db	03/05/96
1,2-Dichlorobenzene	ND	ug/kg	5	8260	db	03/05/96
1,3-Dichlorobenzene	ND	ug/kg	5	8260	db	03/05/96
1,4-Dichlorobenzene	ND	ug/kg	5	8260	db	03/05/96
Dichlorodifluoromethane	ND	ug/kg	5	8260	db	03/05/96
1,1-Dichloroethane	ND	ug/kg	5	8260	db	03/05/96
1,2-Dichloroethane	ND	ug/kg	5	8260	db	03/05/96
1,1-Dichloroethene	ND	ug/kg	5	8260	db	03/05/96
cis-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/05/96
trans-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/05/96
1,2-Dichloropropane	ND	ug/kg	5	8260	db	03/05/96
1,3-Dichloropropane	ND	ug/kg	5	8260	db	03/05/96
2,2-Dichloropropane	ND	ug/kg	5	8260	db	03/05/96
1,1-Dichloropropene	ND	ug/kg	5	8260	db	03/05/96
cis-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/05/96
trans-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/05/96
Ethylbenzene	ND	ug/kg	5	8260	db	03/05/96
Hexachlorobutadiene	ND	ug/kg	5	8260	db	03/05/96
2-Hexanone	ND	ug/kg	5	8260	db	03/05/96
Iodomethane	ND	ug/kg	5	8260	db	03/05/96
Isopropylbenzene	ND	ug/kg	5	8260	db	03/05/96
p-Isopropyltoluene	ND	ug/kg	5	8260	db	03/05/96
Methylene Chloride	ND	ug/kg	5	8260	db	03/05/96
4-Methyl-2-Pentanone	ND	ug/kg	50	8260	db	03/05/96
MTBE	ND	ug/kg	5	8260	db	03/05/96

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-003	Date Sampled:	02/29/96 16:10
Client ID:	MW13 45-47	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	ND	ug/kg	5	8260	db	03/05/96
n-Propylbenzene	ND	ug/kg	5	8260	db	03/05/96
Styrene	ND	ug/kg	5	8260	db	03/05/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/05/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/05/96
Tetrachloroethene	180	ug/kg	5	8260	db	03/05/96
Toluene	ND	ug/kg	5	8260	db	03/05/96
1,2,3-Trichloropropane	ND	ug/kg	5	8260	db	03/05/96
1,2,3-Trichlorobenzene	ND	ug/kg	5	8260	db	03/05/96
1,2,4-Trichlorobenzene	ND	ug/kg	5	8260	db	03/05/96
1,1,1-Trichloroethane	ND	ug/kg	5	8260	db	03/05/96
1,1,2-Trichloroethane	ND	ug/kg	5	8260	db	03/05/96
Trichloroethene	ND	ug/kg	5	8260	db	03/05/96
Trichlorofluoromethane	ND	ug/kg	5	8260	db	03/05/96
1,2,4-Trimethylbenzene	ND	ug/kg	5	8260	db	03/05/96
1,3,5-Trimethylbenzene	ND	ug/kg	5	8260	db	03/05/96
Vinyl Acetate	ND	ug/kg	5	8260	db	03/05/96
Vinyl Chloride	ND	ug/kg	2	8260	db	03/05/96
o-Xylene	ND	ug/kg	5	8260	db	03/05/96
p-m-Xylene	ND	ug/kg	5	8260	db	03/05/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	92	Percent			db	03/05/96
Dibromofluoromethane	103	Percent			db	03/05/96
Toluene-D8	97	Percent			db	03/05/96

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-003	Date Sampled:	02/29/96 16:10
Client ID:	MW13 45-47	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
MISCELLANEOUS TESTING						
Percent Moisture	12.8	Percent			rw	03/06/96

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-004	Date Sampled:	02/29/96 17:25
Client ID:	MW13 54-54'8"	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/kg	5000	8260	db	03/09/96
Acrolein	ND	ug/kg	5000	8260	db	03/09/96
Acrylonitrile	ND	ug/kg	5000	8260	db	03/09/96
Benzene	ND	ug/kg	50	8260	db	03/09/96
Bromobenzene	ND	ug/kg	250	8260	db	03/09/96
Bromochloromethane	ND	ug/kg	250	8260	db	03/09/96
Bromodichloromethane	ND	ug/kg	250	8260	db	03/09/96
Bromoform	ND	ug/kg	250	8260	db	03/09/96
Bromomethane	ND	ug/kg	250	8260	db	03/09/96
2-Butanone	ND	ug/kg	5000	8260	db	03/09/96
n-Butylbenzene	1,200	ug/kg	250	8260	db	03/09/96
sec-Butylbenzene	560	ug/kg	250	8260	db	03/09/96
tert-Butylbenzene	ND	ug/kg	250	8260	db	03/09/96
Carbon Disulfide	ND	ug/kg	250	8260	db	03/09/96
Carbon Tetrachloride	ND	ug/kg	250	8260	db	03/09/96
Chlorobenzene	ND	ug/kg	250	8260	db	03/09/96
Chloroethane	ND	ug/kg	250	8260	db	03/09/96
2-Chloroethylvinyl Ether	ND	ug/kg	250	8260	db	03/09/96
Chloroform	ND	ug/kg	250	8260	db	03/09/96
Chloromethane	ND	ug/kg	250	8260	db	03/09/96
2-Chlorotoluene	ND	ug/kg	250	8260	db	03/09/96
4-Chlorotoluene	ND	ug/kg	250	8260	db	03/09/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	250	8260	db	03/09/96
Dibromochloromethane	ND	ug/kg	250	8260	db	03/09/96
1,2-Dibromoethane	ND	ug/kg	250	8260	db	03/09/96

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-004	Date Sampled:	02/29/96 17:25
Client ID:	MW13 54-54'8"	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/kg	250	8260	db	03/09/96
1,2-Dichlorobenzene	ND	ug/kg	250	8260	db	03/09/96
1,3-Dichlorobenzene	ND	ug/kg	250	8260	db	03/09/96
1,4-Dichlorobenzene	ND	ug/kg	250	8260	db	03/09/96
Dichlorodifluoromethane	ND	ug/kg	250	8260	db	03/09/96
1,1-Dichloroethane	ND	ug/kg	250	8260	db	03/09/96
1,2-Dichloroethane	ND	ug/kg	250	8260	db	03/09/96
1,1-Dichloroethene	ND	ug/kg	250	8260	db	03/09/96
cis-1,2-Dichloroethene	ND	ug/kg	250	8260	db	03/09/96
trans-1,2-Dichloroethene	ND	ug/kg	250	8260	db	03/09/96
1,2-Dichloropropane	ND	ug/kg	250	8260	db	03/09/96
1,3-Dichloropropane	ND	ug/kg	250	8260	db	03/09/96
2,2-Dichloropropane	ND	ug/kg	250	8260	db	03/09/96
1,1-Dichloropropene	ND	ug/kg	250	8260	db	03/09/96
cis-1,3-Dichloropropene	ND	ug/kg	250	8260	db	03/09/96
trans-1,3-Dichloropropene	ND	ug/kg	250	8260	db	03/09/96
Ethylbenzene	ND	ug/kg	250	8260	db	03/09/96
Hexachlorobutadiene	ND	ug/kg	250	8260	db	03/09/96
2-Hexanone	ND	ug/kg	250	8260	db	03/09/96
Iodomethane	ND	ug/kg	250	8260	db	03/09/96
Isopropylbenzene	ND	ug/kg	250	8260	db	03/09/96
p-Isopropyltoluene	2,200	ug/kg	250	8260	db	03/09/96
Methylene Chloride	ND	ug/kg	250	8260	db	03/09/96
4-Methyl-2-Pentanone	ND	ug/kg	2500	8260	db	03/09/96
MTBE	ND	ug/kg	250	8260	db	03/09/96

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106 South Street
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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-004	Date Sampled:	02/29/96 17:25
Client ID:	MW13 54-54'8"	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	ND	ug/kg	250	8260	db	03/09/96
n-Propylbenzene	ND	ug/kg	250	8260	db	03/09/96
Styrene	ND	ug/kg	250	8260	db	03/09/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	250	8260	db	03/09/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	250	8260	db	03/09/96
Tetrachloroethene	30,000	ug/kg	250	8260	db	03/09/96
Toluene	ND	ug/kg	250	8260	db	03/09/96
1,2,3-Trichloropropane	ND	ug/kg	250	8260	db	03/09/96
1,2,3-Trichlorobenzene	ND	ug/kg	250	8260	db	03/09/96
1,2,4-Trichlorobenzene	ND	ug/kg	250	8260	db	03/09/96
1,1,1-Trichloroethane	ND	ug/kg	250	8260	db	03/09/96
1,1,2-Trichloroethane	ND	ug/kg	250	8260	db	03/09/96
Trichloroethene	ND	ug/kg	250	8260	db	03/09/96
Trichlorofluoromethane	ND	ug/kg	250	8260	db	03/09/96
1,2,4-Trimethylbenzene	6,600	ug/kg	250	8260	db	03/09/96
1,3,5-Trimethylbenzene	4,100	ug/kg	250	8260	db	03/09/96
Vinyl Acetate	ND	ug/kg	250	8260	db	03/09/96
Vinyl Chloride	ND	ug/kg	100	8260	db	03/09/96
o-Xylene	ND	ug/kg	250	8260	db	03/09/96
p-m-Xylene	ND	ug/kg	250	8260	db	03/09/96
The detection limit reported is based on a X50 dilution of the sample.						
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	102	Percent			db	03/09/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-004	Date Sampled:	02/29/96 17:25
Client ID:	MW13 54-54'8"	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
SURROGATE STUDIES - VOLATILES						
Dibromofluoromethane	120	Percent			db	03/09/96
Toluene-D8	99	Percent			db	03/09/96
MISCELLANEOUS TESTING						
Percent Moisture	19.2	Percent			rw	03/05/96
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Pet. Hydrocarbons C8 - C40	1,000	mg/kg	50	8015B (Prop.)	ck	03/07/96
Comment:	The Extractable Petroleum Hydrocarbon quantitation includes target and/or non-target Petroleum Hydrocarbons in the C8 - C40 range. Target hydrocarbon quantitation is based on the response factor of a standard for the fuel identified. Non-target quantitation is based on the response factor of a diesel fuel standard.					
Extractable Petroleum Hydrocarbon ID	The chromatographic pattern for this sample most closely resembles a mixture of diesel/#2 fuel oil and lubricating oil.					
Diesel/#2 Fuel Oil	550				ck	03/07/96
Kerosene (#1)/Jet Fuel	ND				ck	03/07/96
Petroleum Naphtha	ND				ck	03/07/96
Paint Thinner	ND				ck	03/07/96
Lubricating Oil	450				ck	03/07/96

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FINAL REPORT

Client Information

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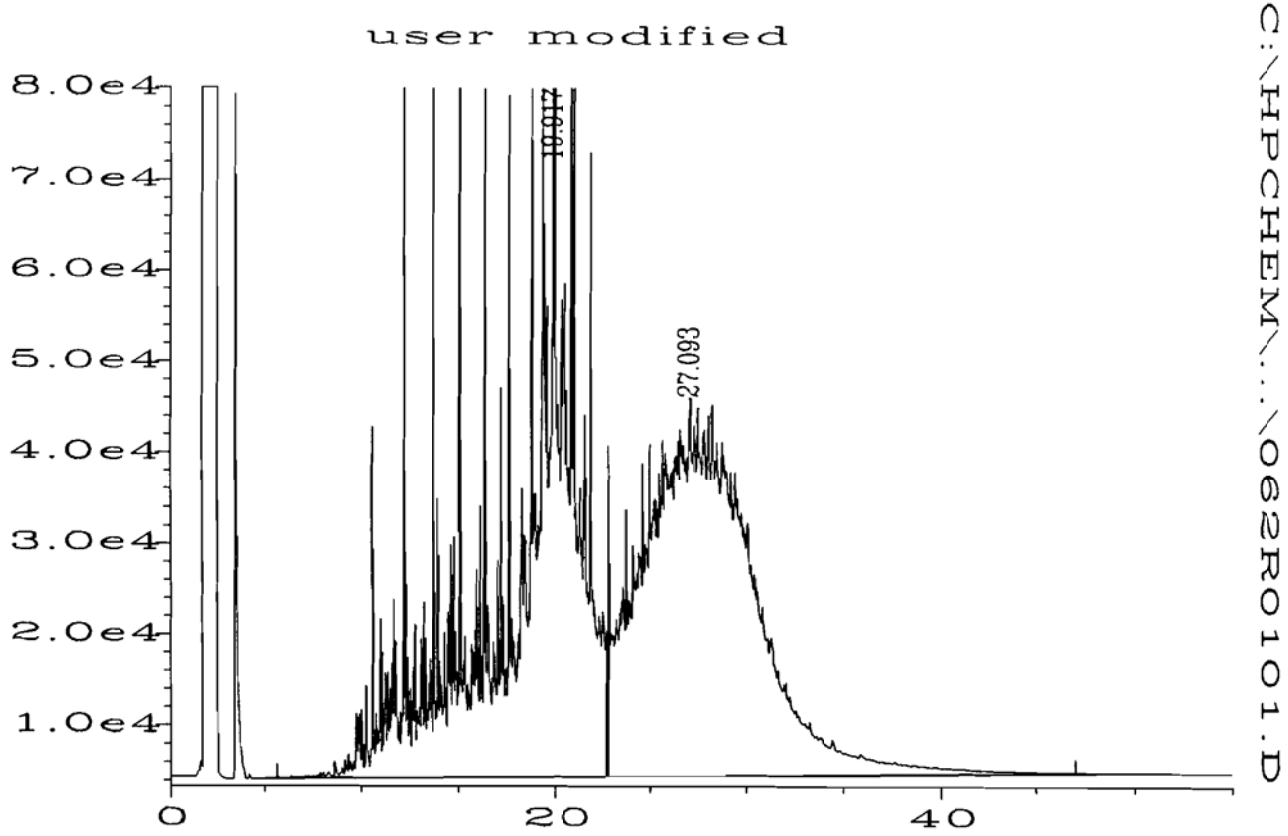
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-004	Date Sampled:	02/29/96 17:25
Client ID:	MW13 54-54'8"	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
#4 Fuel Oil/#6 Fuel Oil	ND				ck	03/07/96
Chromatogram File	030696-62R				ck	03/07/96



Report Date: 03/11/96	
Account Name: ERI	**Extractable Petroleum Hydrocarbons**
Project Name: Melville, NY	**Project No:**
Client ID: MW13 54-54 ' 8"	**Lab ID:** 60640706-004
Analysis Date: 03/07/96	**File No:** 030696-62R

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-005	Date Sampled:	03/01/96 09:30
Client ID:	MW14 03-05	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/kg	100	8260	db	03/07/96
Acrolein	ND	ug/kg	100	8260	db	03/07/96
Acrylonitrile	ND	ug/kg	100	8260	db	03/07/96
Benzene	ND	ug/kg	1	8260	db	03/07/96
Bromobenzene	ND	ug/kg	5	8260	db	03/07/96
Bromochloromethane	ND	ug/kg	5	8260	db	03/07/96
Bromodichloromethane	ND	ug/kg	5	8260	db	03/07/96
Bromoform	ND	ug/kg	5	8260	db	03/07/96
Bromomethane	ND	ug/kg	5	8260	db	03/07/96
2-Butanone	ND	ug/kg	100	8260	db	03/07/96
n-Butylbenzene	ND	ug/kg	5	8260	db	03/07/96
sec-Butylbenzene	ND	ug/kg	5	8260	db	03/07/96
tert-Butylbenzene	ND	ug/kg	5	8260	db	03/07/96
Carbon Disulfide	ND	ug/kg	5	8260	db	03/07/96
Carbon Tetrachloride	ND	ug/kg	5	8260	db	03/07/96
Chlorobenzene	ND	ug/kg	5	8260	db	03/07/96
Chloroethane	ND	ug/kg	5	8260	db	03/07/96
2-Chloroethylvinyl Ether	ND	ug/kg	5	8260	db	03/07/96
Chloroform	ND	ug/kg	5	8260	db	03/07/96
Chloromethane	ND	ug/kg	5	8260	db	03/07/96
2-Chlorotoluene	ND	ug/kg	5	8260	db	03/07/96
4-Chlorotoluene	ND	ug/kg	5	8260	db	03/07/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	5	8260	db	03/07/96
Dibromochloromethane	ND	ug/kg	5	8260	db	03/07/96
1,2-Dibromoethane	ND	ug/kg	5	8260	db	03/07/96

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		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-005	Date Sampled:	03/01/96 09:30
Client ID:	MW14 03-05	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/kg	5	8260	db	03/07/96
1,2-Dichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,3-Dichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,4-Dichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
Dichlorodifluoromethane	ND	ug/kg	5	8260	db	03/07/96
1,1-Dichloroethane	ND	ug/kg	5	8260	db	03/07/96
1,2-Dichloroethane	ND	ug/kg	5	8260	db	03/07/96
1,1-Dichloroethene	ND	ug/kg	5	8260	db	03/07/96
cis-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/07/96
trans-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/07/96
1,2-Dichloropropane	ND	ug/kg	5	8260	db	03/07/96
1,3-Dichloropropane	ND	ug/kg	5	8260	db	03/07/96
2,2-Dichloropropane	ND	ug/kg	5	8260	db	03/07/96
1,1-Dichloropropene	ND	ug/kg	5	8260	db	03/07/96
cis-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/07/96
trans-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/07/96
Ethylbenzene	ND	ug/kg	5	8260	db	03/07/96
Hexachlorobutadiene	ND	ug/kg	5	8260	db	03/07/96
2-Hexanone	ND	ug/kg	5	8260	db	03/07/96
Iodomethane	ND	ug/kg	5	8260	db	03/07/96
Isopropylbenzene	ND	ug/kg	5	8260	db	03/07/96
p-Isopropyltoluene	ND	ug/kg	5	8260	db	03/07/96
Methylene Chloride	ND	ug/kg	5	8260	db	03/07/96
4-Methyl-2-Pentanone	ND	ug/kg	50	8260	db	03/07/96
MTBE	ND	ug/kg	5	8260	db	03/07/96

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	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-005	Date Sampled:	03/01/96 09:30
Client ID:	MW14 03-05	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	ND	ug/kg	5	8260	db	03/07/96
n-Propylbenzene	ND	ug/kg	5	8260	db	03/07/96
Styrene	ND	ug/kg	5	8260	db	03/07/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/07/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/07/96
Tetrachloroethene	ND	ug/kg	5	8260	db	03/07/96
Toluene	ND	ug/kg	5	8260	db	03/07/96
1,2,3-Trichloropropane	ND	ug/kg	5	8260	db	03/07/96
1,2,3-Trichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,2,4-Trichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,1,1-Trichloroethane	ND	ug/kg	5	8260	db	03/07/96
1,1,2-Trichloroethane	ND	ug/kg	5	8260	db	03/07/96
Trichloroethene	ND	ug/kg	5	8260	db	03/07/96
Trichlorofluoromethane	ND	ug/kg	5	8260	db	03/07/96
1,2,4-Trimethylbenzene	ND	ug/kg	5	8260	db	03/07/96
1,3,5-Trimethylbenzene	ND	ug/kg	5	8260	db	03/07/96
Vinyl Acetate	ND	ug/kg	5	8260	db	03/07/96
Vinyl Chloride	ND	ug/kg	2	8260	db	03/07/96
o-Xylene	ND	ug/kg	5	8260	db	03/07/96
p-m-Xylene	ND	ug/kg	5	8260	db	03/07/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	92	Percent			db	03/07/96
Dibromofluoromethane	104	Percent			db	03/07/96
Toluene-D8	97	Percent			db	03/07/96

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-006	Date Sampled:	03/01/96 11:05
Client ID:	MW14 43-45	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	ND	ug/kg	5	8260	db	03/07/96
n-Propylbenzene	ND	ug/kg	5	8260	db	03/07/96
Styrene	ND	ug/kg	5	8260	db	03/07/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/07/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/07/96
Tetrachloroethene	ND	ug/kg	5	8260	db	03/07/96
Toluene	ND	ug/kg	5	8260	db	03/07/96
1,2,3-Trichloropropane	ND	ug/kg	5	8260	db	03/07/96
1,2,3-Trichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,2,4-Trichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,1,1-Trichloroethane	ND	ug/kg	5	8260	db	03/07/96
1,1,2-Trichloroethane	ND	ug/kg	5	8260	db	03/07/96
Trichloroethene	ND	ug/kg	5	8260	db	03/07/96
Trichlorofluoromethane	ND	ug/kg	5	8260	db	03/07/96
1,2,4-Trimethylbenzene	ND	ug/kg	5	8260	db	03/07/96
1,3,5-Trimethylbenzene	ND	ug/kg	5	8260	db	03/07/96
Vinyl Acetate	ND	ug/kg	5	8260	db	03/07/96
Vinyl Chloride	ND	ug/kg	2	8260	db	03/07/96
o-Xylene	ND	ug/kg	5	8260	db	03/07/96
p-m-Xylene	ND	ug/kg	5	8260	db	03/07/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	97	Percent			db	03/07/96
Dibromofluoromethane	102	Percent			db	03/07/96
Toluene-D8	98	Percent			db	03/07/96

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FINAL REPORT

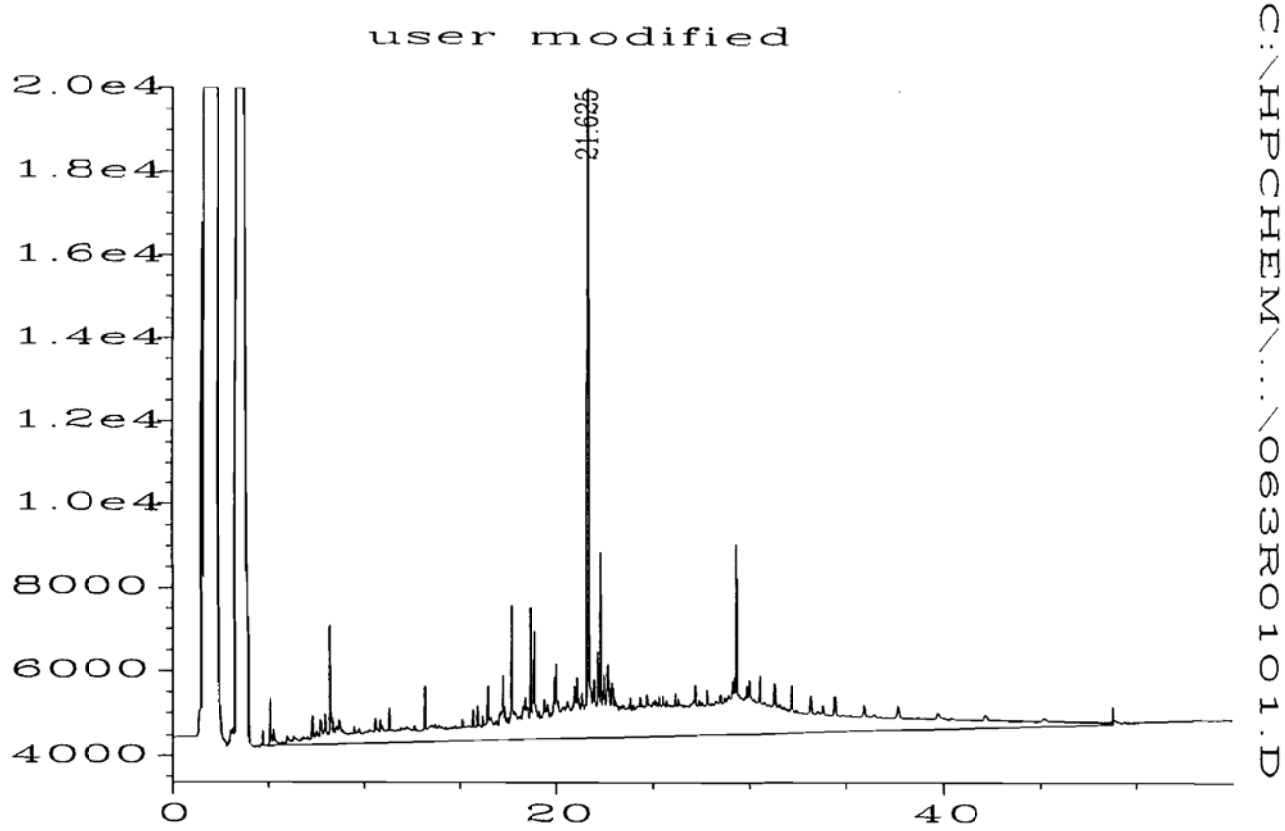
Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-005	Date Sampled:	03/01/96 09:30
Client ID:	MW14 03-05	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
MISCELLANEOUS TESTING						
Percent Moisture	15.3	Percent			rw	03/05/96
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Pet. Hydrocarbons C8 - C40	ND	mg/kg	5	8015B (Prop.)	ck	03/07/96
Comment:	The Extractable Petroleum Hydrocarbon quantitation includes target and/or non-target Petroleum Hydrocarbons in the C8 - C40 range. Target hydrocarbon quantitation is based on the response factor of a standard for the fuel identified. Non-target quantitation is based on the response factor of a diesel fuel standard.					
Extractable Petroleum Hydrocarbon ID	The chromatographic pattern for this sample is not characteristic of any of the petroleum hydrocarbons listed below.					
Diesel/#2 Fuel Oil	ND				ck	03/07/96
Kerosene (#1)/Jet Fuel	ND				ck	03/07/96
Petroleum Naphtha	ND				ck	03/07/96
Paint Thinner	ND				ck	03/07/96
Lubricating Oil	ND				ck	03/07/96
#4 Fuel Oil/#6 Fuel Oil	ND				ck	03/07/96
Chromatogram File	030696-65R				ck	03/07/96



Report Date: 03/11/96	
Account Name: ERI	**Extractable Petroleum Hydrocarbons**
Project Name: Melville, NY	**Project No:**
Client ID: MW14 03-05	**Lab ID:** 60640706-005
Analysis Date: 03/07/96	**File No:** 030696-65R

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-006	Date Sampled:	03/01/96 11:05
Client ID:	MW14 43-45	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/kg	100	8260	db	03/07/96
Acrolein	ND	ug/kg	100	8260	db	03/07/96
Acrylonitrile	ND	ug/kg	100	8260	db	03/07/96
Benzene	ND	ug/kg	1	8260	db	03/07/96
Bromobenzene	ND	ug/kg	5	8260	db	03/07/96
Bromochloromethane	ND	ug/kg	5	8260	db	03/07/96
Bromodichloromethane	ND	ug/kg	5	8260	db	03/07/96
Bromoform	ND	ug/kg	5	8260	db	03/07/96
Bromomethane	ND	ug/kg	5	8260	db	03/07/96
2-Butanone	ND	ug/kg	100	8260	db	03/07/96
n-Butylbenzene	ND	ug/kg	5	8260	db	03/07/96
sec-Butylbenzene	ND	ug/kg	5	8260	db	03/07/96
tert-Butylbenzene	ND	ug/kg	5	8260	db	03/07/96
Carbon Disulfide	ND	ug/kg	5	8260	db	03/07/96
Carbon Tetrachloride	ND	ug/kg	5	8260	db	03/07/96
Chlorobenzene	ND	ug/kg	5	8260	db	03/07/96
Chloroethane	ND	ug/kg	5	8260	db	03/07/96
2-Chloroethylvinyl Ether	ND	ug/kg	5	8260	db	03/07/96
Chloroform	ND	ug/kg	5	8260	db	03/07/96
Chloromethane	ND	ug/kg	5	8260	db	03/07/96
2-Chlorotoluene	ND	ug/kg	5	8260	db	03/07/96
4-Chlorotoluene	ND	ug/kg	5	8260	db	03/07/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	5	8260	db	03/07/96
Dibromochloromethane	ND	ug/kg	5	8260	db	03/07/96
1,2-Dibromoethane	ND	ug/kg	5	8260	db	03/07/96

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Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-006	Date Sampled:	03/01/96 11:05
Client ID:	MW14 43-45	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/kg	5	8260	db	03/07/96
1,2-Dichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,3-Dichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,4-Dichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
Dichlorodifluoromethane	ND	ug/kg	5	8260	db	03/07/96
1,1-Dichloroethane	ND	ug/kg	5	8260	db	03/07/96
1,2-Dichloroethane	ND	ug/kg	5	8260	db	03/07/96
1,1-Dichloroethene	ND	ug/kg	5	8260	db	03/07/96
cis-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/07/96
trans-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/07/96
1,2-Dichloropropane	ND	ug/kg	5	8260	db	03/07/96
1,3-Dichloropropane	ND	ug/kg	5	8260	db	03/07/96
2,2-Dichloropropane	ND	ug/kg	5	8260	db	03/07/96
1,1-Dichloropropene	ND	ug/kg	5	8260	db	03/07/96
cis-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/07/96
trans-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/07/96
Ethylbenzene	ND	ug/kg	5	8260	db	03/07/96
Hexachlorobutadiene	ND	ug/kg	5	8260	db	03/07/96
2-Hexanone	ND	ug/kg	5	8260	db	03/07/96
Iodomethane	ND	ug/kg	5	8260	db	03/07/96
Isopropylbenzene	ND	ug/kg	5	8260	db	03/07/96
p-Isopropyltoluene	ND	ug/kg	5	8260	db	03/07/96
Methylene Chloride	ND	ug/kg	5	8260	db	03/07/96
4-Methyl-2-Pentanone	ND	ug/kg	50	8260	db	03/07/96
MTBE	ND	ug/kg	5	8260	db	03/07/96

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

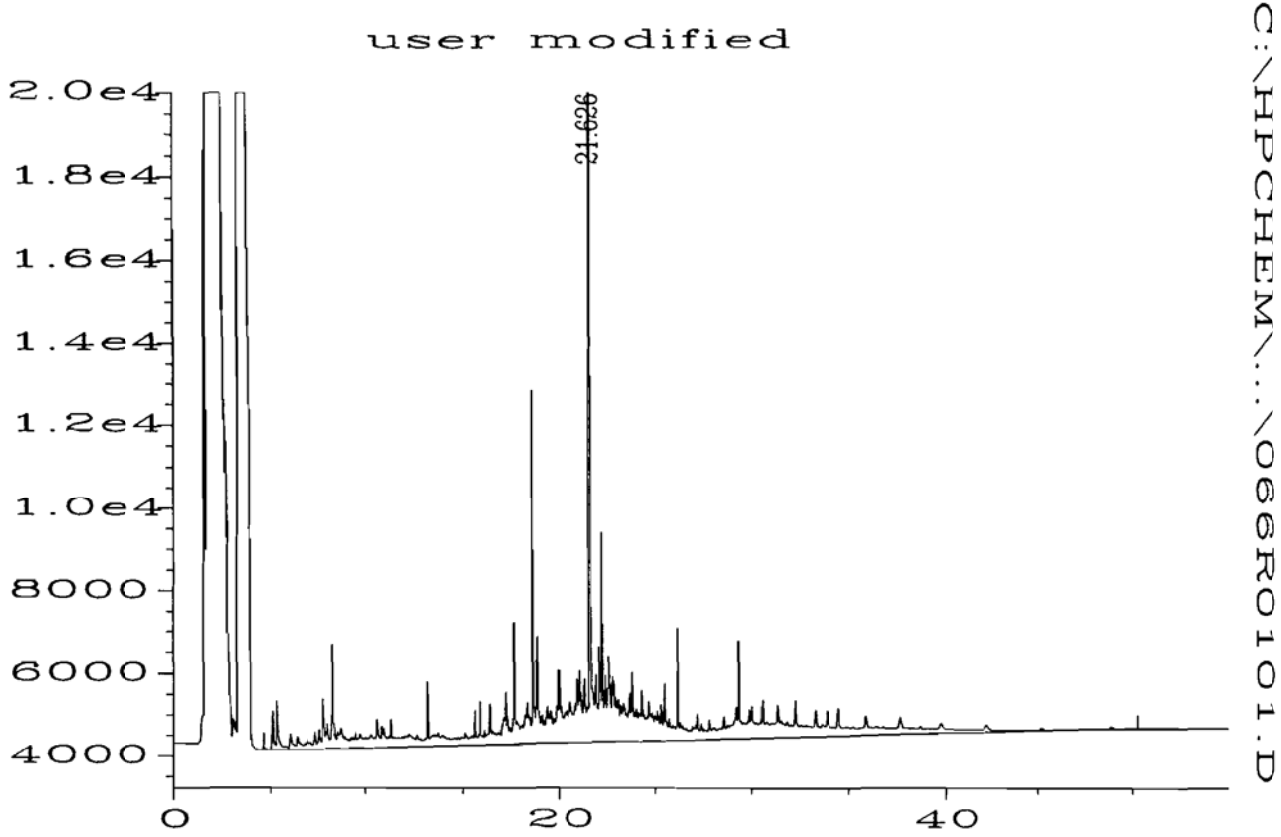
Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-006	Date Sampled:	03/01/96 11:05
Client ID:	MW14 43-45	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
MISCELLANEOUS TESTING						
Percent Moisture	12.5	Percent			rw	03/05/96
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Pet. Hydrocarbons C8 - C40	ND	mg/kg	5	8015B (Prop.)	ck	03/07/96
Comment:	The Extractable Petroleum Hydrocarbon quantitation includes target and/or non-target Petroleum Hydrocarbons in the C8 - C40 range. Target hydrocarbon quantitation is based on the response factor of a standard for the fuel identified. Non-target quantitation is based on the response factor of a diesel fuel standard.					
Extractable Petroleum Hydrocarbon ID	The chromatographic pattern for this sample is not characteristic of any of the petroleum hydrocarbons listed below.					
Diesel/#2 Fuel Oil	ND				ck	03/07/96
Kerosene (#1)/Jet Fuel	ND				ck	03/07/96
Petroleum Naphtha	ND				ck	03/07/96
Paint Thinner	ND				ck	03/07/96
Lubricating Oil	ND				ck	03/07/96
#4 Fuel Oil/#6 Fuel Oil	ND				ck	03/07/96
Chromatogram File	030696-65R				ck	03/07/96



Report Date: 03/11/96	
Account Name: ERI	**Extractable Petroleum Hydrocarbons**
Project Name: Melville, NY	**Project No:**
Client ID: MW14 43-45	**Lab ID:** 60640706-006
Analysis Date: 03/07/96	**File No:** 030696-66R

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Hopkinton, MA 01748-2295
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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-007	Date Sampled:	03/01/96 15:35
Client ID:	MW15 50-52	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Acetone	ND	ug/kg	100	8260	db	03/07/96
Acrolein	ND	ug/kg	100	8260	db	03/07/96
Acrylonitrile	ND	ug/kg	100	8260	db	03/07/96
Benzene	ND	ug/kg	1	8260	db	03/07/96
Bromobenzene	ND	ug/kg	5	8260	db	03/07/96
Bromochloromethane	ND	ug/kg	5	8260	db	03/07/96
Bromodichloromethane	ND	ug/kg	5	8260	db	03/07/96
Bromoform	ND	ug/kg	5	8260	db	03/07/96
Bromomethane	ND	ug/kg	5	8260	db	03/07/96
2-Butanone	ND	ug/kg	100	8260	db	03/07/96
n-Butylbenzene	ND	ug/kg	5	8260	db	03/07/96
sec-Butylbenzene	ND	ug/kg	5	8260	db	03/07/96
tert-Butylbenzene	ND	ug/kg	5	8260	db	03/07/96
Carbon Disulfide	ND	ug/kg	5	8260	db	03/07/96
Carbon Tetrachloride	ND	ug/kg	5	8260	db	03/07/96
Chlorobenzene	ND	ug/kg	5	8260	db	03/07/96
Chloroethane	ND	ug/kg	5	8260	db	03/07/96
2-Chloroethylvinyl Ether	ND	ug/kg	5	8260	db	03/07/96
Chloroform	ND	ug/kg	5	8260	db	03/07/96
Chloromethane	ND	ug/kg	5	8260	db	03/07/96
2-Chlorotoluene	ND	ug/kg	5	8260	db	03/07/96
4-Chlorotoluene	ND	ug/kg	5	8260	db	03/07/96
1,2-Dibromo-3-Chloropropane	ND	ug/kg	5	8260	db	03/07/96
Dibromochloromethane	ND	ug/kg	5	8260	db	03/07/96
1,2-Dibromoethane	ND	ug/kg	5	8260	db	03/07/96

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-007	Date Sampled:	03/01/96 15:35
Client ID:	MW15 50-52	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Dibromomethane	ND	ug/kg	5	8260	db	03/07/96
1,2-Dichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,3-Dichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,4-Dichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
Dichlorodifluoromethane	ND	ug/kg	5	8260	db	03/07/96
1,1-Dichloroethane	ND	ug/kg	5	8260	db	03/07/96
1,2-Dichloroethane	ND	ug/kg	5	8260	db	03/07/96
1,1-Dichloroethene	ND	ug/kg	5	8260	db	03/07/96
cis-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/07/96
trans-1,2-Dichloroethene	ND	ug/kg	5	8260	db	03/07/96
1,2-Dichloropropane	ND	ug/kg	5	8260	db	03/07/96
1,3-Dichloropropane	ND	ug/kg	5	8260	db	03/07/96
2,2-Dichloropropane	ND	ug/kg	5	8260	db	03/07/96
1,1-Dichloropropene	ND	ug/kg	5	8260	db	03/07/96
cis-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/07/96
trans-1,3-Dichloropropene	ND	ug/kg	5	8260	db	03/07/96
Ethylbenzene	ND	ug/kg	5	8260	db	03/07/96
Hexachlorobutadiene	ND	ug/kg	5	8260	db	03/07/96
2-Hexanone	ND	ug/kg	5	8260	db	03/07/96
Iodomethane	ND	ug/kg	5	8260	db	03/07/96
Isopropylbenzene	ND	ug/kg	5	8260	db	03/07/96
p-Isopropyltoluene	ND	ug/kg	5	8260	db	03/07/96
Methylene Chloride	ND	ug/kg	5	8260	db	03/07/96
4-Methyl-2-Pentanone	ND	ug/kg	50	8260	db	03/07/96
MTBE	ND	ug/kg	5	8260	db	03/07/96

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Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-007	Date Sampled:	03/01/96 15:35
Client ID:	MW15 50-52	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Naphthalene	ND	ug/kg	5	8260	db	03/07/96
n-Propylbenzene	ND	ug/kg	5	8260	db	03/07/96
Styrene	ND	ug/kg	5	8260	db	03/07/96
1,1,1,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/07/96
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	8260	db	03/07/96
Tetrachloroethene	ND	ug/kg	5	8260	db	03/07/96
Toluene	ND	ug/kg	5	8260	db	03/07/96
1,2,3-Trichloropropane	ND	ug/kg	5	8260	db	03/07/96
1,2,3-Trichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,2,4-Trichlorobenzene	ND	ug/kg	5	8260	db	03/07/96
1,1,1-Trichloroethane	ND	ug/kg	5	8260	db	03/07/96
1,1,2-Trichloroethane	ND	ug/kg	5	8260	db	03/07/96
Trichloroethene	ND	ug/kg	5	8260	db	03/07/96
Trichlorofluoromethane	ND	ug/kg	5	8260	db	03/07/96
1,2,4-Trimethylbenzene	ND	ug/kg	5	8260	db	03/07/96
1,3,5-Trimethylbenzene	ND	ug/kg	5	8260	db	03/07/96
Vinyl Acetate	ND	ug/kg	5	8260	db	03/07/96
Vinyl Chloride	ND	ug/kg	2	8260	db	03/07/96
o-Xylene	ND	ug/kg	5	8260	db	03/07/96
p-m-Xylene	ND	ug/kg	5	8260	db	03/07/96
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene	95	Percent			db	03/07/96
Dibromofluoromethane	103	Percent			db	03/07/96
Toluene-D8	98	Percent			db	03/07/96

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Client Information

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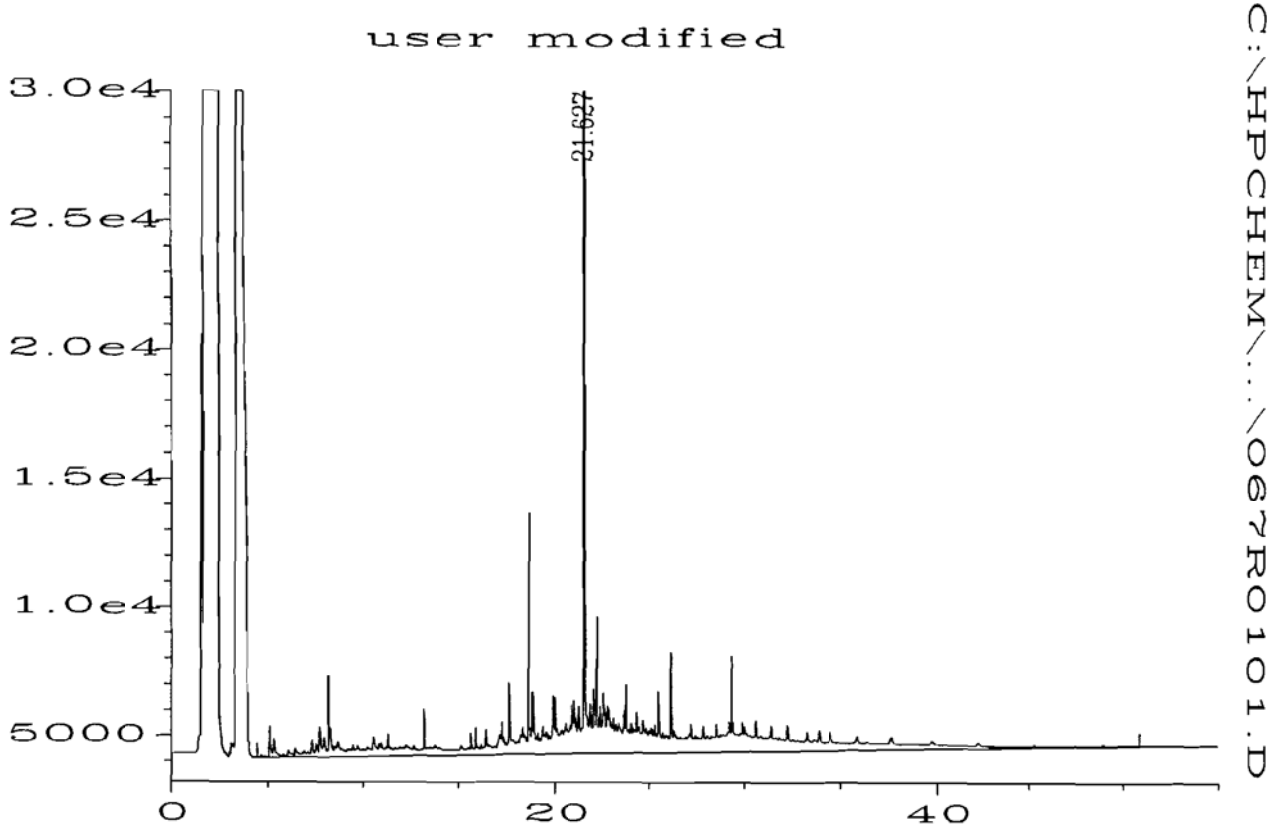
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	Environmental Remediation Inc.

Sample Information

Lab ID:	60640706-007	Date Sampled:	03/01/96 15:35
Client ID:	MW15 50-52	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
MISCELLANEOUS TESTING						
Percent Moisture	4.1	Percent			rw	03/05/96
EXTRACT. PETROLEUM HYDROCARBON ANALYSIS						
Extractable Pet. Hydrocarbons C8 - C40	ND	mg/kg	5	8015B (Prop.)	ck	03/07/96
Comment:	The Extractable Petroleum Hydrocarbon quantitation includes target and/or non-target Petroleum Hydrocarbons in the C8 - C40 range. Target hydrocarbon quantitation is based on the response factor of a standard for the fuel identified. Non-target quantitation is based on the response factor of a diesel fuel standard.					
Extractable Petroleum Hydrocarbon ID	The chromatographic pattern for this sample is not characteristic of any of the petroleum hydrocarbons listed below.					
Diesel/#2 Fuel Oil	ND				ck	03/07/96
Kerosene (#1)/Jet Fuel	ND				ck	03/07/96
Petroleum Naphtha	ND				ck	03/07/96
Paint Thinner	ND				ck	03/07/96
Lubricating Oil	ND				ck	03/07/96
#4 Fuel Oil/#6 Fuel Oil	ND				ck	03/07/96
Chromatogram File	030696-67R				ck	03/07/96



Report Date: 03/11/96	
Account Name: ERI	**Extractable Petroleum Hydrocarbons**
Project Name: Melville, NY	**Project No:**
Client ID: MW15 50-52	**Lab ID:** 60640706-007
Analysis Date: 03/07/96	**File No:** 030696-67R

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Hopkinton, MA 01748-2295
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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	

Sample Information

Lab ID:	60640706-008	Date Sampled:	/ / :
Client ID:	QC Report -Soil	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
METHOD BLANKS						
Method Blank - Volatile	ND	ug/l		8260		
MATRIX SPIKE STUDIES - VOLATILES						
Sample ID:	0706-001					
Benzene	88	Percent				
Chlorobenzene	98	Percent				
1,1-Dichloroethene	94	Percent				
Toluene	87	Percent				
Trichloroethene	87	Percent				

METHOD SUMMARIES

NOTE: Analytical results have been corrected and are reported on a dry weight basis. If required, detection limits can also be corrected to dry weight using the percent moisture data included in this report.

Extractable and Purgeable Petroleum Hydrocarbon Analysis is based on SW-846 Proposed Method 8015B. Extractable Petroluem Hydrocarbons are prepared by solvent extraction and analyzed using Gas Chromatography-Flame Ionization Detection (GC-FID). Purgeable Petroleum Hydrocarbons are prepared by purge and trap and analyzed using GC-FID.

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FINAL REPORT

Client Information

Account:	Environmental Remediation Inc.	Project Name:	Melville, NY (3-4-96)
Address:	87 Church Street	Project Number:	
	East Hartford, CT 06108	Project Manager:	J.Pearl
		Sampler Name:	

Sample Information

Lab ID:	60640706-008	Date Sampled:	/ / :
Client ID:	QC Report -Soil	Date Received:	03/04/96 : 0
Matrix:	Soil	Date Reported:	03/11/96

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed

METHOD SUMMARIES

Volatile organic analysis is performed using H/P 5995 or 5970 GC/MS, Tekmar purge and trap, and ALS autosampler. Chromatography incorporates packed and megabore columns. Data reduction is performed on RTE 1000 and ChemStation systems. Tuning is based on BFB standards. Procedural guidelines follow EPA 624 or SW846 for all analyses.

METHOD REFERENCES

1. Test Methods For Evaluating Solid Waste: Physical Chemical Methods. EPA SW 846. November 1986.
2. Methods For Chemical Analysis of Water and Wastes. EPA 600/4-79-200. Revised March 1983.
3. Standard Methods For Examination of Water and Wastewater. APHA-AWWA-WACF., 17th Edition. 1989.

Project Information

Project Name: Melville, NY
Project No.:
Project Location: Melville NY
Project Manager: J. Pearl
Sampler(s): J. Pearl

PO #: Lab Quote #:
Turn-Around: ☐ Standard 10 business days ☐ Other (specify):
Note: TATs less than 10 days must be pre-approved!

Client Information

Send Reports to: J. Pearl
Company: ERI
Address: 87 ~~Elm~~ Church St
E. Hartford CT
Phone: 860 290-9300
Fax: 860 290-9300
Account # (Lab Use Only)
Reporting Requirements: ☐ Mail ☐ Priority
Preliminary: ☐ FAX ☐ Verbal by \ \
Final Report: ☐ FAX ☐ Verbal by \ \

8260
TPH-GC

m No age

FILTRATION (0.45 um) & PRESERVATION INFORMATION

FILTRATION	PRESERVATION
☐ DONE	☐ DONE
☐ NOT NEEDED	☐ NOT NEEDED
☐ LAB TO DO*	☐ LAB TO DO*

**Please specify which samples need to be filtered and/or preserved by the lab.*

IF SPECIAL OR NON-ROUTINE DETECTION LIMITS ARE REQUIRED, PLEASE CALL THE LAB.

TOTAL # OF BOTTLES

Lab ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source / Matrix	Analyses (write test methods above & "x's" below for each sample to be tested)	Sample Remarks (below)
	MW12 45-47	2/29/96	1040	Soil	X X	
	MW12 55-56'6"		1130		X X	
	MW13 45-47		1610		X	
	MW13 54-54'8"		1725		X X	
	MW14 03-05	3/1/96	0930		X X	
	MW14 43-45		1105		X X	
	MW15 50-52		1535		X X	

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Phone: (800) 362-8749
Fax: (508) 435-2497

NOTES:

60640706-001

CHAIN-OF-CUSTODY RECORD

Relinquished By:	Date/Time	Received By:	Date/Time
	3/2/96 1515		3/4/96 2:05
	3/4/96 7:10		3-4-96 8:00

Condition of Samples Upon Arrival
☐ Acceptable ☐ Problem(s)

Appendix C
Baseline Risk Assessment

BASELINE RISK ASSESSMENT

1.0 Baseline Risk Assessment Overview

- 1.1 Hazard Identification
- 1.2 Toxicity Assessment
- 1.3 Exposure Assessment
- 1.4 Risk Characterization
- 1.5 Uncertainty

2.0 Hazard Identification

3.0 Toxicity Assessment

4.0 Human Exposure Assessment

- 4.1 Current Scenario: Inhalation
- 4.2 Future Scenario: Drinking Water Ingestion (Groundwater Model)

5.0 Incomplete Pathways

- 5.1 Risk Characterization
- 5.2 Risk Results
- 5.3 Uncertainty

Attachment 1 Crack Equation

Table 1 Toxicity Values for Indicator Compounds
Table 2 Summary of Potential Risks and Hazard Indices

1.0 BASELINE RISK ASSESSMENT OVERVIEW

A baseline human health risk assessment was conducted to evaluate the potential risk associated with exposure to constituents in groundwater at the Melville site. This baseline assessment provides background information useful in determining whether remedial action is required and if so, what cleanup levels are appropriate. Methods and assumptions outlined for use for the New York State Department of Environmental Conservation (NYSDEC) inactive hazardous waste disposal site remedial program vis-a-vis the *Division Technical and Administrative Guidance Memorandum on the Determination of Soil Cleanup Objectives and Cleanup Levels* (HWR-94-4046) were consulted. Methods for risk assessment followed protocols set forth in the U.S. Environmental Protection Agency's Risk Assessment Guidance for Superfund, Volume I Part A - Human Health Evaluation Manual (EPA/540/1-89/002).

Risk assessment methodology includes four steps: hazard identification; exposure assessment; toxicity evaluation; and risk characterization. These steps are briefly described with detail as to what is specifically included for this site's analysis.

1.1 Hazard Identification

In order to conduct a quantitative risk assessment, a subset of chemicals is typically chosen for inclusion in the detailed analysis. Indicator chemicals are usually those compounds which are most toxic, mobile, prevalent, and persistent, or which may be associated with historical site use. Such a selection allows the estimation of the majority of the potential risk using a manageable number of substances.

1.2 Toxicity Assessment

The purpose of the toxicity assessment is to identify the types of adverse health effects a compound may cause, and to define the relationship between the dose of a compound and the likelihood and magnitude of an adverse effect (response). Adverse health effects are characterized by EPA as carcinogenic or noncarcinogenic. Dose-response relationships are for oral exposure and for exposure by inhalation.

A brief literature review is presented for each of the selected compounds. The literature is reviewed to identify the potential magnitude of response with exposure to a specific chemical. The toxicity profiles qualitatively describe the potential adverse health effects associated with the compounds. In addition, quantitative toxicity values are reported. These values are used in the subsequent risk assessment to estimate the magnitude of the potential risk associated with the exposure. For chemicals not reported in EPA's Integrated Risk Information System (IRIS) database, EPA Health Effects Assessment Summary Tables (HEAST) were consulted. In the case of compounds with no value for a particular route of exposure, such as inhalation, then route-to-route extrapolation was considered at the suggestion of the New York State Department of Health (NYSDOH).

1.3 Exposure Assessment

This step of the risk assessment process consists of characterizing the exposure setting and identifying the potential exposure pathways. Population characteristics are evaluated and current and future pathways are considered. Once the qualitative evaluation is complete, potential receptors and pathways are selected for quantitative evaluation in the risk assessment, and then potential exposures are assessed. Exposure point concentrations are provided by either direct sampling of the air or water or soil, or through the use of predictive modeling. Potential exposure assumptions are obtained from EPA risk assessment guidance and by making conservative assumptions about site-specific conditions. For purposes of this risk assessment, a current exposure assessment was evaluated for on-site indoor office workers. In addition, a future off-site receptor was considered, a person drinking from the municipal drinking water well located southwest of the site.

1.4 Risk Characterization

Risk characterization is the last step where information gathered from the three previous steps are combined to characterize the cancer and the non-cancer risks associated with the exposure scenario(s). The exposure doses estimated for each exposure pathway are combined with the toxicity values identified in the Toxicity Assessment to estimate the potential risk for each compound from that pathway. Non-cancer adverse health effects are characterized by a hazard quotient, which is a ratio of the estimated exposure dose and a reference dose. Derived by the EPA, the Reference Dose (RfD) is often used as the comparison dose. Excess lifetime cancer risk is estimated by multiplying the estimated dose by the cancer slope factor, resulting in a unitless probability value of contracting cancer above background rates for particular exposure conditions.

1.5 Uncertainty

A brief discussion of the major sources of uncertainty is presented. Various aspects of the risk assessment process introduce elements of uncertainty, such as the use of modeling constituent concentrations in groundwater off-site. Toxicity values incorporate safety factors to account for uncertainties associated with extrapolation toxicity data for laboratory animals to humans, for example.

2.0 HAZARD IDENTIFICATION

The objective of the hazard identification process is to identify representative compounds and concentrations to use as exposure point concentrations or as inputs for modeling to predict exposure point concentrations. Several sets of monitoring well and soil data were evaluated in order to select the indicator compounds to be used in the detailed risk assessment analysis: MW-1 through MW-7 were sampled in January 1995; Hydropunch™ HP-1 through HP-6, in December 1994. Sampling round of May 1995 yielded MW-8 through MW-11; while sampling round taken in March 1996 produced data for MW-12 through MW-15. Sampling analysis, which focused on assessing the presence of volatile organic compounds and metals is described in greater detail in Sections 2 and 3. As part of the hazard identification, the following compounds were selected for subsequent analysis: perchloroethene (PCE) , trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), 1,1,1-trichloroethane (TCA), and 1,1-dichloroethane (1,1-DCA). These indicator chemicals were all present in the various sampling rounds and in the highest concentrations. MW-12 revealed the presence of additional volatile organic compounds (e.g., ethyl benzene, toluene, trimethylbenzenes, and xylene), but at concentrations much lower than the maximum concentrations of other selected compounds. Based on relative concentration levels, a screening assessment found that the selected indicator chemicals account for the majority of the risk posed by the contamination. Therefore, the additional VOCs were not chosen for inclusion in the risk assessment.

Well depths for all wells were between 50 and 57 feet below grade (fbg), with the exception of HP-6 which was advanced to the depth of 76 fbg. Sampling locations are indicated in Figure 2 of the PRAP. Spatial and temporal variations made it difficult to choose characteristic sampling data. Because there are several monitoring wells, sets of which have been sampled at various times, professional judgment was exercised to choose wells indicative of the potential source of groundwater contamination. Monitoring wells MW-12 and MW-13 were sampled in the most recent sampling round and, in general, showed the highest concentration of detected compounds at the site. Data from MW-12 and MW-13 were therefore chosen on the basis on spatial and temporal suitability. To be consistent with the choice of highest concentrations, data from MW-8 and MW-7 were also used to represent TCE and 1,1-DCA, respectively.

As shown in Tables 1 and 8 of the PRAP, soil samples collected either through soil borings or soil samples from well installations or hydropunches did not reveal detectable levels of sampled compounds with the exception of the following: 1) mercury (1,800 ug/kg) was found in the SB-2 samples collected in January 1995; and 2) soil sampled from MW-13 revealed PCE (30,000 ug/kg) in excess of the soil cleanup objectives (1.4 ppm or 1,400 ug/kg) identified in the NYSDEC's inactive hazardous waste site soil cleanup document[1]. Soil samples were collected at various depths above the water table. HNu readings taken in the May 1995 sampling round revealed concentrations of volatile organic compounds below detection limit levels. Data collected during the November 1995 soil gas survey indicate the presence of PCE in soil. The highest soil gas results for TCE and PCE were located near MW-12 and MW-13. This suggests further that MW-12 and MW-13 data likely represent the area of highest concentration at the site.

3.0 TOXICITY ASSESSMENT

Toxicity profiles are presented in Appendix D. A brief discussion of the studies used to derive the toxicity values is included for each of the chemicals: PCE, TCE, TCA, cis-1,2-DCE, 1,1- DCA, trans-1,2-DCE, and 1,1-DCE. Some of the values reported by the EPA have been withdrawn for further agency review. This is particularly true for carcinogens, including PCE and TCE, because the EPA is overhauling their weight-of-evidence classification scheme. The Carcinogenic Assessment Guidelines have been revised and are out for public comment in the Federal Register.

Compounds with known or potential noncarcinogenic effects are assumed to have a dose below which no adverse effect occurs. This dose is called the threshold dose. An estimate of the true threshold is called a No-Observed-Adverse-Effect-Level (NOAEL). The lowest dose at which an adverse effect occurs is called a Lowest-Observed-Adverse-Effect-Level (LOAEL). By applying uncertainty factors to the NOAEL or the LOAEL, Reference Doses (RfDs) for chronic exposures to compounds with noncarcinogenic effects have been developed by EPA (1992, 1993). The uncertainty factors account for uncertainties associated with health effects of using an animal study to derive a human dose-response value, extrapolating from high to low doses, and evaluating sensitive populations. An RfD will not result in non-carcinogenic effects, even if daily exposures were to occur for a lifetime. RfDs and exposure doses are expressed in units of milligrams of compound per kilogram of body weight per day (mg/kg-day). Table 1C lists RfDs for site constituents and their sources.

The underlying assumption of regulatory risk assessment for compounds with known or assumed potential carcinogenic effects is that no threshold dose exists. In other words, it is assumed that a finite level of risk is associated with any does above zero. EPA's Human Health Assessment Group (HHAG) uses computerized models to extrapolate observed responses at high doses used in

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[1] New York State Department of Environmental Conservation Technical and Administrative Guidance Memorandum on Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-94-4046) January 24, 1994.

animal studies to predict responses in humans at low doses encountered in environmental situations. The models developed by HHAG assume no threshold and usually use animal data to develop an estimate of the carcinogenic potency of a compound. This numerical estimate is referred to by EPA as a cancer slope factor (CSF).

4.0 HUMAN EXPOSURE ASSESSMENT

The purpose of the exposure assessment is to identify complete exposure pathways for both current and future site use scenarios. The selection of exposure pathways requires a qualitative assessment of the completeness of the pathways. There are four elements that constitute a complete exposure pathway:

1. A source and mechanism of chemical release to the environment;

2. An environmental transport medium, such as groundwater;

3. An exposure point, or point of potential contact with agent or substance; and

4. A receptor with a route of exposure at the point of contact, such as inhalation or dermal contact.

Complete pathways chosen for this risk assessment include inhalation of volatilized compounds in the indoor air by *current* office workers and *future* ingestion of drinking water from an assumed downgradient municipal well. .

Current site use includes commercial office space. The potential exists for exposure to compounds in groundwater and soil. Groundwater constituents could volatilize and seep through the soil and in to the indoor air via cracks in the building's slab. Therefore, indoor workers are a potential receptor. The site is a 6.1 acre property located in the midst of a light industrial and commercial business area of Melville, NY. (A summary of the site description is presented in Section 1.1 of the PRAP.) The office building at the site houses three different companies with the majority of the workers occupying the second floor. There are large paved parking areas to the east and north of the building. The property is surrounded by other light industrial and commercial establishments. There are no residential domiciles within a 1/4 mile radius of the site. Melville, New York has a population of approximately 12,400[1]. Drinking water for the office occupants is supplied by the South Huntington Water District via two municipal drinking wells (#7-1 and 7-2) located southwest of the site as indicated on Figure 1 of the PRAP. These wells pump into a distribution system which serves a population of 55,000 people. The water is treated with chlorine at the well site prior to entering the distribution system. Based on information requested from the engineering firm supporting the South Huntington Water District, water supplied by the above wells will not be sufficient to meet the water demand within five years as District expansion and development is creating additional water demands. In response to that increase in demand, additional wells are expected to be installed and there are no current plans to decommission any district wells.

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[1] Based on a conversation with the Huntington Town Hall 4/26/96.

4.1 Current Scenario: Inhalation Using a Fate and Transport Model

For purposes of this risk assessment, an inhalation scenario was evaluated for current office workers using two approaches: a fate and transport model used to predict indoor air concentrations and actual air sampling results (Table 2C). Air monitoring was undertaken because the screening analysis indicated that the modeled inhalation exposure could potentiallly present human health risks posed by the carcinogenic compounds, PCE, TCE and 1,1-DCE. Because the model utilized numerous conservative assumptions, indoor air sampling was undertaken to assess the accuracy of the inhalation model. The scenario employing the model used to predict indoor air concentrations is presented first, then the sampling results approach is described.

Current site use includes three companies whose [indoor] office workers predominantly occupy the second floor of the building. The workers have no potential exposure to constituents in soil and no direct contact exposure to constituents in groundwater. However, volatile constituents in groundwater may volatilize from the groundwater through the vadose zone and into the existing office space. Workers could then be exposed to constituents via inhalation of indoor air through the cracks in the building foundation. Concentrations of those compounds in indoor air were initially predicted using a fate and transport model as a way to screen for the need for actual indoor air monitoring. Exposure via inhalation of volatile emissions from groundwater to air inside the building is a function of the following components: constituent concentration in groundwater; receptor inhalation rate; frequency and duration of contact; receptor body weight; and, a factor describing the concentration of constituents volatilized to indoor air (assuming a certain concentration in groundwater). The equation used to estimate the volatile inhalation intake is:

$$\text{Intake (mg/kg per day)} = \frac{CA \times IR \times EF \times ED}{BW \times AT}$$

where:

CA = Concentration in air (mg/m^3)
IR = Inhalation rate (m^3/hour)
ET = Exposure time (hours/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
BW = Body weight (kg)
AT = Averaging time (days)

Inhalation rate: An inhalation rate of 0.6 m^3/hour was assumed for an office worker. This value represents a moderate level of activity for adults. U.S. EPA Superfund risk assessment guidance (U.S. EPA, 1991) recommends varying inhalation rates depending on the level activity.

Exposure time, frequency and duration: As recommended in U.S. EPA guidance (U.S. EPA, 1991), an exposure frequency of 8 hours per day and 250 days per year was assumed for office workers. This assumes that the average worker works 50 weeks out the year and for 25 years at the same job.

Body weight: As recommended by U.S. EPA, a body weight of 70 kg was assumed for adults (U.S. EPA, 1991).

Averaging time. As recommended by U.S. EPA, an averaging time equivalent to a employment career of 25 years (9125 days) was used to estimate potential cancer risk for all receptors under the U.S. paradigm (U.S. EPA, 1989). To estimate potential hazard quotients, an averaging time equal to the exposure duration was used.

The concentration in air was derived using the following equation:

$$CA = CS \times VF_{wesp}$$

where:

CS = Concentration in groundwater (mg/L)
VF_{wesp} = Volatilization Factor [$(mg/m^3)/(mg/L)$]

Volatile emission factor: This term relates the constituent concentration in groundwater to a concentration volatilized to indoor air. The factor is derived from the relationship presented in the American Society for Testing and Materials' Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites (ASTM, 1995). The VF_{wesp} is multiplied by a constituent concentration in groundwater to derive a concentration in air. The equation used to derive VF_{wesp} is:

(See Attachment "1" for Equation)

where: H = dimensionless Henry's law constant (compound-specific, a unitless)

D^{effws} = Effective diffusion coefficient between groundwater and soil surface (cm^2/sec)

LGW = Depth to groundwater (cm)

ER = Air exchange rate (1/sec)

LB = Enclosed space volume/infiltration area ratio (cm)

D^{eff}_{crack} = Effective diffusion coefficient through foundation cracks

L_{crack} = Enclosed space foundation thickness (cm)

n = areal fraction of cracks in foundation (cm^2/cm^2)

D^{effs} = Effective diffusion coefficient in soil based on vapor phase concentration (cm^2/sec)

D^{eff}_{crack} = Effective diffusion coefficient through foundation cracks (cm^2/sec)

D^{eff}_{cap} = Effective diffusion coefficient through capillary fringe (cm^2/sec)

D^{air} = Molecular diffusivity in air (cm^2/sec)

D^{wat} = Molecular diffusivity in water (cm^2/sec)

oas = Volumetric air content in vadose zone soils (cm^3 air/cm^3 soil)

ows = Volumetric water content in vadose zone soils (cm^3 water/cm^3 soil)

oacap = Volumetric air content in capillary fringe soils (cm^3 air/cm^3 soil)

owcap = Volumetric water content in capillary fringe soils (cm^3 water/cm^3 soil)

oacrack = Volumetric air content in foundation cracks (cm^3 air/cm^3 soil)

owcrack = Volumetric water content in foundation cracks (cm^3 water/cm^3 soil)

Molecular diffusivity in air and water: Parameter values for molecular diffusivity in air were obtained from EPA (1994) Region IX's Preliminary Remedial Goal (PRG) tables. Because molecular diffusivity in water tends to vary less than molecular diffusivity in air, and because values for molecular diffusivity in water are less readily available than values for molecular diffusivity in air, a value for molecular diffusivity in water of $1x10^{-5}$ cm^2/sec was assumed for all constituents.

Depth to groundwater, thickness of vadose zone, and thickness of capillary fringe: Based upon the water level data provided in Table 7 (PRAP), a depth to groundwater of 50 feet (equivalent to 1525 cm) was assumed. The model assumes depth to groundwater in the sum of the thickness of the vadose zone and the thickness of the capillary fringe. Site-specific information about the thickness of the vadose zone and the capillary fringe is unavailable. Therefore, the thickness of the capillary fringe was assumed to be 5 cm, the default value provided in the ASTM guidance (ASTM, 1995). The thickness of the vadose zone is then estimated as 1520 cm.

Air exchange rate: Because site-specific information on the capacity of the existing building's ventilation system is not available, an air exchange rate of one air change per hour (typical for office buildings) was assumed. This value is equivalent to 0.00028 sec^{-1}.

Enclosed space volume to infiltration area ratio: The space into which constituents in soil vapor are assumed to mix is assumed to be an office within the on-site building. The dimensions of the office are assumed to be 10 feet long by 10 feet wide by 8 feet high. The volume of this space is 2.27E+7 cm^3. Based upon information obtained during the site visit, the building is construction on a slab foundation. The area of infiltration is then the area of the floor of the room, or approximately 92,900 cm^2.

Foundation thickness: No site-specific information is available about the thickness of the foundation. The default value presented in the ASTM guidance (15 cm) is used in this risk assessment.

Areal fraction of foundation cracks: According to the model, vapors are assumed to infiltrate the building via cracks in the foundation. Because no site-specific information is available about the nature of cracks (if any) in the existing building's foundation, reasonable, but conservative assumptions were made. Cracks averaging 0.5 cm wide were assumed to extend the entire length of the enclosed space (10 feet). A crack was assumed to exist every two feet (i.e., a total of five 10-foot long cracks) along the width of the assumed space. The area of the cracks is therefore (5 cracks) x (10 feet/crack) x (0.5 cm wide) = 762 cm^2. As mentioned above, the area of the floor of the room is 9.29E+4 cm^2. The area of the cracks is estimated above to be 762 cm^2. The ratio of the area of the cracks to the total foundation area in the room is 0.0082.

Volumetric air content and volumetric water content: A total soil porosity value of 0.35 was assumed. Site-specific information about air-filled and water-filled pore volume was not available. Therefore, default values provided in ASTM (1995) were used in the risk assessment. In the vadose zone, water content is assumed to be 0.12 cm^3/cm^3. The air content is then calculated as

the difference between the total porosity and the water-filled porosity, or 0.23 cm^3/cm^3. Air content and water content in the foundation cracks are assumed to equal air content and water content, respectively, in the vadose zone. In the capillary fringe, the water content is assumed to be 10% of total porosity, or .035 cm3/cm3 and air content is assumed to equal the difference between the total porosity and the water-filled porosity, or 0.315 cm^3/cm^3. Within each medium, the sum of the volumetric air content and the volumetric water content is 0.35 cm^3/cm^3.

4.2 CURRENT SCENARIO : Inhalation Using Air Sampling Results

The equation used to estimate the inhaltion intake of volatiles is the same as described above. The only differnece is that the CA value, concentration in air (mg/m3), comes from the actual sampling results. As described in the PRAP (Section 4.0), air samples were taken in three different locations to account for the spatial variation of the office space configuration. The three locations included the first floor, three-story high atrium located in the center of the building; the first floor office used by the site manager; and the open office space on the eastern side of the building near the loading dock. Atrium samples were collected to approximate total mixing that might occur based on air flow exchanges. Loading dock samples were obtained in order to capture the closest location to the monitoring well yielding the highest concentrattons of groundwater constituents. Samples taken in the small auxillary office used by the site manager were done so to best approximate the space used in the fate and transport model. In order to account for temporal and climatological variations, air levels were sampled on three consecutive days.

Sample results are reported in parts per billion [air] volume, or ppbV. These values, converted to ppmV, were then transformed into air concentration equivalents using the following equation:

$$\text{air concentration } (mg/mg^3) = [ppmV \times MW] / 24.45$$

where:

MW = molecular weight of compound
ppmV = sampling level
24.45 = conversion factor

The conversion factor is used to allow conversion of an air volume to a mass per volume equivalent. Table 2C presents the ppmV and the converted mass per volume air concentrations for each location for each day for PCE and TCE. Data for 1,1-DCE are not includd in this table because all samples revealed nondetectable levels. Table 2C also presents averages calculated across days and across sampling locations. In addition to an average calculation, geometric means were calculated across sampling locations as well as across days. For each chemical, both the worst case value (representing the highest sampling value) and the geometric mean of all samples taken were used in the inhalation equation.

4.3 FUTURE SCENARIO: Drinking Water Ingestion

For purposes of this risk assessment, it is assumed that the southwestern wells are directly downgradient from the site. Groundwater flow direction, however, has been assessed as moving in a southeasterly direction. This conservative assumption of downgradient locations is an attempt to account for cross gradient perturbations as well as the fact that Long Island has a sole source aquifer. The nearest municipal well #18 is located northwest and upgradient of the site. The downgradient municipal wells (#7-1 and # 7-2) are currently in use and there is some evidence to support that the plume of contamination has not yet migrated off-site. However, in the interest of public health it is appropriate to assess the potential impact that migrating constituents may have on the drinking water well. Therefore ingestion is a future pathway assessed for the project.

The future pathway uses exposure point concentrations derived using the Prince Analytical Model #5, a two-dimensional mass transport model. The model estimates the travel time and breakthrough as well as the maximum concentrations expected at the theoretical downgradient receptor, municipal drinking water wells #7-1 and # 7-2. The derived maximum concentrations were used as drinking well exposure point concentrations in assessing the future risks associated with a residential receptor's potential exposure via ingestion of drinking water. First, the intake equation is described, followed by a description of the fate and transport model.

The actual drinking water ingestion scenario parameters consider the following: concentration of compound in the water; water ingestion rate; frequency and duration of exposure and receptor body weight. The equation used to estimate water ingestion intake is:

$$\text{Intake (mg/kg per day)} = \frac{CW \times IR \times EF \times ED}{BW \times AT}$$

where:

	CW	=	Concentration in water (mg/L)
	IR	=	Water ingestion rate (L/day)
	EF	=	Exposure frequency (days/year)
	ED	=	Exposure duration (years)
	AT	=	Averaging time (days)
	BW	=	Body weight (kg)

Concentration in water: The concentration of constituents in water were predicted using PRINCE model.

Water ingestion rate: U.S. EPA Superfund risk assessment guidance (U.S. EPA, 1991) recommends a drinking water ingestion rate of 2 L/day for adults and 1 L/day for children. These values are used in the risk assessment. In calculating the non cancer risk the child is used because the dose per body weight basis of the child is a more sensitive.

Exposure frequency and duration: As recommended in U.S. EPA guidance (U.S. EPA, 1991), an exposure frequency of 350 days per year was assumed for both children and adults. The child's exposure is assumed to occur over a period of six years, and the adult's exposure is assumed to be 24 years, for a total exposure duration of 30 years.

Body weight: As recommended by U.S. EPA, a body weight of 70 kg was assumed for adults and a body weight of 15 kg was assumed for children (U.S. EPA, 1991).

Averaging time. As recommended by U.S. EPA, an averaging time equivalent to a lifetime of 70 years (25,500 days) was used to estimate potential cancer risk for all receptors under the U.S. paradigm (U.S. EPA, 1989). To estimate potential hazard quotients, an averaging time equal to the exposure duration was used.

A two-dimensional groundwater model (Prince, 1994) was run to estimate the travel time and breakthrough concentration for selected indicator constituents at a theoretical downgradient receptor (municipal drinking water wells #7-1 and #7-2) from the subject site. The model assumed the following:

- Contaminant transport is two-dimensional and occurs at the water table within an infinite, homogeneous and isotropic aquifer. Note: contaminants of concern are predominantly dense hydrocarbons.
- The concentration boundary condition at the source has a Gaussian distribution.
- The theoretical receptor is located one mile directly downgradient of the subject site. Note: the public water supply wells which have been identified are not located directly downgradient of the subject site.
- Effects of nearby public water supply wells on regional flow conditions are nominal. Note: specific geologic and hydrogeologic data for the wells was not readily available from the South Huntington Water District and its engineering firm.
- Fate and transport mechanisms estimated from site specific data are representative of the regional aquifer.

Once the model was calibrated to the field data for PCE, the only parameters which were changed in order to calibrate the model for the remaining contaminants of interest were Cmax (maximum concentration) and K (first order decay constant). The following is a description of the input parameters used in the analytical model (Prince, 1994):

<u>K - First Order Decay Constant - contaminant (constant):</u>

K is the first order decay constant for the contaminant of interest in units [1/T]. Typical reported values for chlorinated compounds such as PCE, TCE, 1,1-DCE, 1,1,1-TCA and 1,1-DCA range from 0.00013/day to 0.0038/day.

K remained constant in the models (0.0009/day) at a value which was toward the low end of the referenced range for chlorinated hydrocarbons (0.00013/day to 0.0038/day), while still accounting for a limited degree of biodegradation.

Gamma - First Order Decay Constant - source (constant):

Gamma is the first order decay constant for the Gaussian distribution boundary condition source in units [1/T]. Gamma is used when the source strength is diluted (for example rainfall) or decays (for example biodegradation, reductive chlorination) exponentially with time.

Gamma remained equal to zero for the subject site model.

DX - Longitudinal Dispersion Coefficient (constant):

DX is the longitudinal dispersion coefficient in units [L^{2}/T]. Reported values of DX range from 1.7 to 3.1 feet in carefully controlled field experiments and from 9.8 to 98.4 feet in calibrated modeling studies. EPA has recommended the following relationship: DX=0.1x, where x equals the distance of interest. Professor Neuman recommends using the relationship DX=0.0175 (L)1.46, where L equals the flow length.

DX remained constant at 200 feet, within the generally representative range (up to 300 feet) for a sandy aquifer (Freeze and Cherry, 1979).

DY - Transverse Dispersion Coefficient (constant):

DY is the transverse dispersion coefficient in units [L^{2}/T]. Values of DY range from 0.003 to 0.16 feet in carefully controlled field experiments and from 3.3 to 32.8 field in calibrated modeling studies.

DY remained constant at 50 feet, within the generally representative range (up to 150 feet) for a sandy aquifer (Freeze and Cherry, 1979).

V - Uniform Groundwater Seepage Velocity (constant):

V is the uniform groundwater seepage velocity and is calculated from Darcy's Law as (K/n)(i), where K is the hydraulic conductivity [L/T], n is the effective porosity and i is the hydraulic gradient.

V for the subject model was calculated as 0.57, using K=200 ft/day, n=35%, and i=0.001.

RD (or R_f)- Retardation Factor (variable):

RD is the retardation factor and is dimensionless. The retardation factor can be estimated by the following relationship: $RD = \{1+[K_d*Dp*(1-n)]/n\}$, where Dp is the particle density, n is the effective porosity, and K_d is the distribution coefficient, defined by the expression $K_d = K_{oc}*f_{oc}$, where K_{oc} is the organic carbon partitioning coefficient, and f_{oc} is the organic carbon content fraction of the soil.

The retardation factor was calculated for each contaminant using constant values for Dp (2.65 g/cm ^{3}) and n (35%). K_d was calculated for each compound using values for f_{oc}=0.0004 (Ground Water Quality, Ward, Giger and McCarty, 1985) and for K_{OC} (Basics of Pump-and-Treat Ground-Water Remediation Technology, EPA, March 1990). The following values for K_{OC} were used: PCE at 277, TCA at 152, TCE at 126, cis 1,2-DCE at 49, 1,1-DCE at 65, trans 1,2-DCE at 59 and 1,1-DCA at 30.

The retardation factors were calculated as follows: PCE at 1.55, TCA at 1.30, TCE at 1.25, cis 1,2-DCE at 1.10, 1,1-DCE at 1.13 trans 1,2-DCE at 1.12 and 1,1-DCA at 1.06.

X_O - Coordinate (constant):

X_O is the x-location of the center of the Gaussian distribution boundary condition source. Xo was set equal to zero for the subject model.

Y_O - Coordinate (constant):

Y_O is the y-location of the center of the Gaussian distribution boundary condition source. Yo was set equal to zero for the subject model.

S - Standard Deviation (constant):

S is the standard deviation of the Gaussian distribution boundary condition source in units of [L]. As a rough approximation, typical values for S range from 15 to 50% of the source length. This parameter was set equal to 3 for the subject model.

Theta - Groundwater Flow Direction (constant):

Theta is the direction of the uniform groundwater velocity, measured positive counterclockwise from the x-axis in degrees. Theta for the subject model was set equal to zero, to assume flow along the x-axis directly toward a downgradient receptor.

TON - Time On (constant):

TON is the initial starting time when the concentrations along the Gaussian source are activated. TON was set equal to zero for the subject model (approximately 1966).

TOFF - Time Off (constant):

TOFF is the ending time when the concentrations along the Gaussian source are turned off. TOFF was set equal to 10950 days, or approximately 30 years, for the subject model (approximately 1996). This represents the approximate active period for the subject site source.

CMax - Maximum Concentration (variable):

CMax is the maximum concentration of the Gaussian source and occurs at the center of the source located at Xo, Yo (above). CMax was set equal to the maximum concentration observed for each contaminant of interest.

The following Cmax values were used: PCE at 59,000 ug/L, TCE at 12,900 ug/L, 1,1,1-TCA at 1,300 ug/L, cis 1,2-DCE at 4,500 ug/L, 1,1-DCE at 30 ug/L, trans 1,2-DCE at 65 ug/L and 1,1-DCA at 25.

NGAUSPT - Number of Gauss-Legendre Quadrature Points (constant):

NGAUSPT is the number of points used in the numerical integration scheme, and must be one of the following: 4,5,6,10,15,20,30,40,50,60,80,104 or 256. Generally, 20 points is sufficient for most problems, but more points will be required for more accurate results.

The number of Gauss-Legendre Quadrature Points for the subject model was set equal to 60.

Once the contaminant of interest was modeled on a two-dimensional plane, the calibrated parameters were used to project the breakthrough of the contaminant at a theoretical receptor located one mile immediately downgradient of the subject site. All parameters used in the 2-d model remained unchanged during the breakthrough analysis. The start and end times for the breakthrough curve were adjusted to most accurately depict the curve.

The results of the breakthrough analysis are presented below.

	Initial Breakthrough [year(#yrs)]	Maximum Breakthrough [year(#yrs)/ug/L]}	Breakthrough Termination [year(#yrs)]
PCE	1974(-22)	2002(7)/0.066	2033(37)
TCE	1973(-23)	2000(4)/0.028	2029(33)
1,1,1-TCA	1973(-23)	1999(3)/0.0039	2029(33)
cis 1,2-DCE	1972(-24)	2000(4)/0.032	2026(30)
1,1-DCE	1973(-23)	1999(3)/9.1e-5	2031(35)
trans 1,2-DCE	1971(-25)	1997(1)/9.7e-6	2029(33)
1,1-DCA	1974(-22)	1995(-1)/0.00021	2031(35)

5.0 INCOMPLETE PATHWAYS

Current activity patterns suggest that no complete exposure pathways exist for soil at the site. Current on-site workers may walk out on to the grassy areas for a stroll at lunch or break time, but these areas are not affected. There is no evidence that workers would come in contact with subsurface soil. Potential future receptors, utility workers, could come in contact with subsurface soil as there are underground gas, water, and electric lines. These lines are typically buried at a depth of 5 feet. A soil gas survey conducted in November 1995 indicated the presence of PCE in soil gas closest to the loading dock (see Figure 2 from the PRAP). Because concentrations in soil are relatively low, and the most likely potential exposure (utility receptor) would be of short duration (a few days or weeks, once per lifetime), it is unlikely such an exposure would pose a potential risk exceeding relevant benchmarks. The Petrex survey captures gaseous readings as a function of ion distribution. By definition, the soil gas does not necessarily imply that the soil is the contaminated source, but rather suggests that the gas is stemming from volatilization from groundwater.

5.1 Risk Characterization

The risk characterization for each pathway combined the results of the exposure assessment and the toxicity assessment to estimate potential risks to receptors. Noncarcinogenic and carcinogenic risks for each chemical and exposure route for each receptor were estimated using the methods described earlier. Hazard indices for all noncarcinogenic compounds were derived by summing the individual Hazard Quotients for each chemical (see Table 3C). The Hazard Quotient is estimated using the following equation:

HQ (ratio) = Intake estimate (mg/kg-day) -
Reference Dose (mg/kg-day)

Excess lifetime cancer risks were estimated for each chemical and then totaled for the particular exposure scenario. The excess lifetime cancer risk is derived with the following equation:

$$\text{Risk} = \text{CSF (mg/kg-day)}^{-1} \times \text{Intake Estimate (mg/kg-day)}$$

where: CSF represents the Cancer Slope Factor.

5.2 Risk Results

Tables 4C through 9C present the results of both the current exposure scenario (office workers) and the future scenario (residential ingestion of drinking water). Based on the current office worker exposure scenario using actual sampling data, the summed excess lifetime cancer risk experienced is estimated to be 2.58E-7, or 2.6 in 10,000,000. These calculated risk levels are within acceptable levels as set by the various regulatory agencies, including the NYSDEC. Modeled noncancer risks represented by the Hazard Quotient for the office worker scenario was estimated to be less than one, or 0.0966. This means that the estimated exposure dose does not exceed the reference dose.

Future exposures stemming from the ingestion of drinking water yielded a excess lifetime cancer risk of 5.56E-8, or approximately 0.056 in 1 million. Estimates for the same scenario for non cancer risks were less than one, or 6.30E-4, or 0.00063. This means that the estimated exposure dose does not exceed the reference dose.

5.2 Back-Calculations for Target Cleanup Goals

Risk assessment can be used to derive target cleanup levels by utilizing a specified risk management goal and back-calculating to the appropriate concentration levels in the medium of concern. For this project, target cleanup goals are developed for constituents in groundwater. Based on the excess cancer risk levels for B2 carcinogens as identified by the NYSDEC, a summed risk level of 1×10^{-6} was chosen. The corresponding risk values are presented in Tables 10C and 11C. Based on that level, as is illustrated in Table 11C , target cleanup goal for PCE equals 1.3 mg/L or 1,300 ug/L; and the goal for TCE is 1.0 mg/L or 1,000 ug/L. Values for the remaining compounds were based on an apportioned scaling, whereby a factor of 1/45.3846 was applied to each current concentration. The models used are designed to run forwards and backwards so that back calculation is possible.

5.3 Uncertainty

There are numerous sources of uncertainty used throughout the risk assessment. For instance, EPA derived toxicity values use safety factors in extrapolating from animal data to humans. Further uncertainty is introduced when route-to-route extrapolations are made for compounds with no data, for example for inhalation. Conservative assumptions in this risk assessment were made regarding worker and resident exposures. Such exposure assumptions often contribute significantly to uncertainty in the analysis.

When modeling is used to estimate an exposure point concentration as was done for drinking water concentrations, additional factors of uncertainty are further introduced into the analysis. In the case of the groundwater transport model, maximum concentrations were used as the ingested concentrations with no degradation accounted for in the ingestion model. Maximum predicted concentrations were assumed over the entire exposure duration. Conservative approaches were almost always taken

ATTACHMENT 1

CRACK EQUATION

$$VF_{vap} = \frac{H\left[\frac{D_{ws}^{eff}/L_{GW}}{ER \times L_B}\right]}{1+\left[\frac{D_{ws}^{eff}/L_{GW}}{ER \times L_B}\right]+\left[\frac{D_{wc}^{eff}/L_{GW}}{\left(D_{crack}^{eff}/L_{crack}\right)\eta}\right]} \times 1000 \quad \frac{L}{m^3}$$

and

$$D_{ws}^{eff} = \left(h_{cap}+h_v\right)\left[\frac{h_{cap}}{D_{cap}^{eff}}+\frac{h_v}{D_s^{eff}}\right]^{-1}$$

and

$$D_{cap}^{eff} = D^{air}\frac{\theta_{acap}^{3.33}}{\theta_T^2}+D^{wat}\frac{1}{H}\frac{\theta_{wcap}^{3.33}}{\theta_T^2}$$

and

$$D_s^{eff} = D^{air}\frac{\theta_{as}^{3.33}}{\theta_T^2}+D^{wat}\frac{1}{H}\frac{\theta_{ws}^{3.33}}{\theta_T^2}$$

and

$$D_{crack}^{eff} = D^{air}\frac{\theta_{acrack}^{3.33}}{\theta_T^2}+D^{wat}\frac{1}{H}\frac{\theta_{wcrack}^{3.33}}{\theta_T^2}$$

TABLE 1 C
TOXICITY VALUES FOR INDICATOR COMPOUNDS

			ORAL ROUTE OF EXPOSURE				*INHALATION ROUTE OF EXPOSURE*			
Compound	**MW Concentration (ug/l)**	**MW Source**	**RfD Value (mg/kg-d)**	**RfD Source**	**CSF Value 1/(mg/kg-d)**	**CSF Source**	**RfC Value**	**RfC Source**	**CSF Value 1/(mg/kg-d)**	**CSF Source**
Tetrachloroethene (PCE)	59,000	MW-13	1.00E-02	IRIS	5.2E-02	STSC prov.	pending	IRIS	2.00E-03	STSC prov.
Trichloroethene (TCE)	12,900	MW-8	NA	NA	1.1E-02	STSC prov.	NA	NA	6.0E-03	STSC prov.
1,1,1-Trichloroethane (TCA)	1300	MW-13	9.00E-02	HEAST	NA	NA	3.00E-01	HEAST	ND	IRIS
cis 1,2-Dichloroethene (c-1,2-DCE)	4500	MW-13	1E-02	HEAST	NA	NA	1.00E-02	R-to-R extrap	ND	IRIS
1,1-Dichloroethene (1,1-DCE)	30	MW-12	9.00E-03	IRIS	NA	NA	9.00E-03	R-to-R extrap	1.2E+00	HEAST
trans 1,2-Dichloroethene (t-1,2-DCE)	65	MW-8	2.00E-02	IRIS	ND	IRIS	2.00E-02	R-to-R extrap	ND	IRIS
1,1-Dichloroethane (DCA)	25	MW-7	1.00E-01	HEAST	NA	NA	5.00E-01	HEAST #	NA	NA

KEY:

MW = Monitoring Well
STSC = Superfund Technical Support Center provisional values 4/24/96
IRIS = EPA Integrated Risk Information System download 4/18/96
HEAST = EPA Health Effects Summary Tables FY95
RfD = EPA-derived Reference Dose
RfC = EPA-derived Reference Concentration
CSF = EPA-derived Cancer Slope Factor
R-to-R extrap = Route-to-route extrapolation per NYSDOH recommendations
# = Alternate Methods per HEAST
NA = not applicable
ND = no data

Table 2C Air Sampling Results

AIR SAMPLES: parts per million volume

PCE	ATRIUM (ppmV)	LDOCK (ppmV)	OFFICE (ppmV)	***Total Geomean***
5/14	4.20E-04	4.70E-04	3.60E-04	4.17E-04
5/15	5.10E-04	5.10E-04	3.60E-04	4.60E-04
5/16	4.80E-04	1.05E-03	4.50E-04	6.60E-04
average	4.70E-04	6.77E-04	3.90E-04	5.12E-04
geomean	4.68E-04	6.31E-04	3.88E-04	4.86E-04
MW=	165.8			

Concentration Equivalents: milligrams per cubic meter

	ATRIUM (mg/m3)	LDOCK (mg/m3)	OFFICE (mg/m3)	***Total Geomean***
	2.85E-03	3.19E-03	2.44E-03	2.83E-03
	3.46E-03	3.46E-03	2.44E-03	3.12E-03
	3.25E-03	7.12E-03	3.05E-03	4.48E-03
average	3.19E-03	4.59E-03	2.64E-03	3.47E-03
geomean	3.18E-03	4.28E-03	2.63E-03	3.29E-03

TCE	ATRIUM (ppbV)	LDOCK (ppbV)	OFFICE (ppbV)	***Total Geomean***
5/14	1.50E-04	1.70E-04	6.50E-04	3.23E-04
5/15	2.10E-04	3.10E-04	5.40E-04	3.53E-04
5/16	1.90E-04	2.80E-04	3.00E-04	2.57E-04
average	1.83E-04	2.53E-04	4.97E-04	3.11E-04
geomean	1.82E-04	2.45E-04	4.72E-04	2.76E-04
MW=	130.4			

	ATRIUM (mg/m3)	LDOCK (mg/m3)	OFFICE (mg/m3)	***Total Geomean***
	8.00E-04	9.07E-04	3.47E-03	1.72E-03
	1.12E-03	1.65E-03	2.88E-03	1.88E-03
	1.01E-03	1.49E-03	1.60E-03	1.37E-03
average	9.78E-04	1.35E-03	2.65E-03	1.66E-03
geomean	9.68E-04	1.31E-03	2.52E-03	1.47E-03

MW = molecular weight of compound
LDOCK = loading dock

TABLE 3C

SUMMARY OF POTENTIAL RISKS AND HAZARD INDICES

	Current Scenario Office Worker - Inhalation		*Future Scenario* Drinking Water Ingestion	
Compound	**HAZARD QUOTIENT**	**EXCESS CANCER RISK**	**HAZARD QUOTIENT**	**EXCESS CANCER RISK**
PCE	see cancer	1.10E-07	4.22E-04	5.10E-08
TCE	see cancer	1.48E-07	see cancer	4.58E-09
1,1,1-TCA	3.91E-04	see HQ	2.77E-06	see HQ
cis 1,2-DCE	8.39E-02	see HQ	2.05E-04	see HQ
1,1-DCE	1.17E-02	Nondetect	6.46E-07	see HQ
trans 1,2-DCE	6.06E-04	see HQ	3.10E-08	see HQ
1,1-DCA	4.67E-07	see HQ	1.34E-07	see HQ
TOTAL	9.66E-02	2.58E-07	6.31E-04	5.56E-08

Potential Hazard Quotient Following Exposure via Inhalation

Scenario: Office builidng
Receptor: Office workers
Intake (mg/kg-day) = $\frac{CA \times IR \times ET \times EF \times ED}{BW \times AT}$

Hazard Quotient (HQ) = Intake (mg/kg-day) / RfD (mg/kg-day)

Parameter (units)	Value
CA: Chemical conc. in air (mg/m3)	see below
IR: Inhalation rate (m3/hr)	0.6
ET: Exposure time (hr/day)	8
EF: Exposure frequency (days/year)	250
ED: Exposure duration (years)	25
BW: Body weight (kg)	70
AT: Averaging time (days)	9125
RfD: Reference Dose (mg/kg-d)	see below

Compound	Conc. in GW (mg/L)	VFwesp (mg/m3)/ (mg/L)	Conc. in air (mg/m3)	Intake (mg/kg/d)	RfC (mg/kg-d)	Inhalation HQ
PCE	59	1.12E-02	6.61E-01	3.10E-02	pending	
TCE	12.9	5.28E-03	6.81E-02	3.20E-03	NA	
1,1,1-TCA	1.3	1.92E-03	2.50E-03	1.17E-04	3.00E-01	3.91E-04
cis-1,2-DCE	4.5	3.97E-03	1.79E-02	8.39E-04	1.00E-02	8.39E-02
1,1-DCE	0.03	7.48E-02	2.24E-03	1.05E-04	9.00E-03	1.17E-02
trans 1,2-DCE	0.065	3.97E-03	2.58E-04	1.21E-05	2.00E-02	6.06E-04
1,1-DCA	0.025	1.99E-04	4.98E-06	2.34E-07	5.00E-01	4.67E-07
					SUM HI	9.66E-02

Compound	*RfC Source*	RfC Value (mg/kg-d)
PCE	IRIS	pending
TCE	NA	NA
1,1,1-TCA	HEAST	3.00E-01
cis-1,2-DCE	R-to-R extrap	1.00E-02
1,1-DCE	R-to-R extrap	9.00E-03
trans 1,2-DCE	R-to-R extrap	2.00E-02
1,1-DCA	HEAST #	5.00E-01

Route to Route extrapolation was used for 1,2-DCE (cis, trans), 1,1-DCE

TABLE 5C MODELED VALUES

Potential Carcinogenic Risk Following Exposure via Inhalation

Scenario: Office Building
Receptor: Office workers
Intake (mg/kg-day) = $\frac{CA \times IR \times ET \times EF \times ED}{BW \times AT}$

Risk = Intake (mg/kg-day) x CSF [1/(mg/kg-day)]

Parameter (units)	Value
CA: Chemical conc. in air (mg/m3)	see below
IR: Inhalation rate (m3/hr)	0.6
ET: Exposure time (hr/day)	8
EF: Exposure frequency (days/year)	250
ED: Exposure duration (years)	25
BW: Body weight (kg)	70
AT: Averaging time (days)	25550
CSF: Cancer Slope Factor [1/(mg/kg-day)	see below

Compound	Conc. in GW (mg/L)	VFwesp (mg/m3)/ (mg/L)	Conc. in air (mg/m3)	Intake (mg/kg/d)	CSF 1/(mg/kg-d)	Inhalation Risk
PCE	59	1.12E-02	6.61E-01	1.11E-02	2.00E-03	2.22E-05
TCE	12.9	5.28E-03	6.81E-02	1.14E-03	6.00E-03	6.85E-06
1,11-TCA	1.3	1.92E-03	2.50E-03	4.19E-05	ND	0.00E+00
cis-1,2-DCE	4.5	3.97E-03	1.79E-02	3.00E-04	ND	0.00E+00
1,1-DCE	0.03	7.48E-02	2.24E-03	3.76E-05	1.20E+00	4.52E-05
trans 1,2-DCE	0.065	3.97E-03	2.58E-04	4.33E-06	ND	0.00E+00
1,1-DCA	0.025	1.99E-04	4.98E-06	8.34E-08	ND	0.00E+00
					SUM RISK	7.42E-05

Compound	*CSF Source*	*CSF Value* 1/(mg/kg-d)
PCE	STSC prov.	2.00E-03
TCE	STSC prov.	6.00E-03
1,1,1-TCA	IRIS	ND
cis-1,2-DCE	IRIS	ND
1,1-DCE	HEAST	1.20E+00
trans 1,2-DCE	IRIS	ND
1,1-DCA	NA	NA

Potential Hazard Quotient Following Exposure via Inhalation

Scenario: Office builidng
Receptor: Office workers
Intake (mg/kg-day) = $\frac{CA \times IR \times ET \times EF \times ED}{BW \times AT}$

Hazard Quotient (HQ) = Intake (mg/kg-day) / RfD (mg/kg-day)

Parameter (units)	**Value**
CA: Chemical conc. in air (mg/m3)	see below
IR: Inhalation rate (m3/hr)	0.6
ET: Exposure time (hr/day)	8
EF: Exposure frequency (days/year)	250
ED: Exposure duration (years)	25
BW: Body weight (kg)	70
AT: Averaging time (days)	9125
RfD: Reference Dose (mg/kg-d)	see below

Compound	**Conc. in air** (mg/m3)	**Intake** (mg/kg/d)	**RfC** (mg/kg-d)	**Inhalation HQ**
PCE	3.29E-03	1.55E-04	pending	
TCE	1.47E-03	6.90E-05	NA	
1,1,1-TCA	--	0.00E+00	3.00E-01	0.00E+00
cis-1,2-DCE	--	0.00E+00	1.00E-02	0.00E+00
1,1-DCE	--	0.00E+00	9.00E-03	0.00E+00
trans 1,2-DCE	--	0.00E+00	2.00E-02	0.00E+00
1,1-DCA	--	0.00E+00	5.00E-01	0.00E+00
			SUM HI	0.00E+00

Compound	*RfC Source*	RfC Value (mg/kg-d)
PCE	IRIS	pending
TCE	NA	NA
1,1,1-TCA	HEAST	3.00E-01
cis-1,2-DCE	R-to-R extrap	1.00E-02
1,1-DCE	R-to-R extrap	9.00E-03
trans 1,2-DCE	R-to-R extrap	2.00E-02
1,1-DCA	HEAST #	5.00E-01

Route to Route extrapolation was used for 1,2-DCE (cis, trans), 1,1-DCE

Potential Carcinogenic Risk Following Exposure via Inhalation

Scenario: Office Building
Receptor: Office workers
Intake (mg/kg-day) = $\frac{CA \times IR \times ET \times EF \times ED}{BW \times AT}$

Risk = Intake (mg/kg-day) x CSF [1/(mg/kg-day)]

Parameter (units)	Value
CA: Chemical conc. in air (mg/m3)	see below
IR: Inhalation rate (m3/hr)	0.6
ET: Exposure time (hr/day)	8
EF: Exposure frequency (days/year)	250
ED: Exposure duration (years)	25
BW: Body weight (kg)	70
AT: Averaging time (days)	25550
CSF: Cancer Slope Factor [1/(mg/kg-day	see below

Compound	Conc. in air (mg/m3)	Intake (mg/kg/d)	CSF 1/(mg/kg-d)	Inhalation Risk
PCE	3.29E-03	5.52E-05	2.00E-03	1.10E-07
TCE	1.47E-03	2.47E-05	6.00E-03	1.48E-07
1,11-TCA		0.00E+00	ND	0.00E+00
cis-1,2-DCE		0.00E+00	ND	0.00E+00
1,1-DCE	**	0.00E+00	1.20E+00	0.00E+00
trans 1,2-DCE		0.00E+00	ND	0.00E+00
1,1-DCA		0.00E+00	ND	0.00E+00
			SUM RISK	2.58E-07

Compound	*CSF Source*	*CSF Value* 1/(mg/kg-d)
PCE	STSC prov.	2.00E-03
TCE	STSC prov.	6.00E-03
1,1,1-TCA	IRIS	ND
cis-1,2-DCE	IRIS	ND
1,1-DCE	HEAST	1.20E+00
trans 1,2-DCE	IRIS	ND
1,1-DCA	NA	NA

** = Values based on air sampling were non-detectable

Potential Hazard Quotient Following Exposure via Drinking Water Ingestion

Scenario: Drinking water from downgradient well
Receptor:
Intake (mg/kg-day) = $\frac{CW \times IR \times EF \times ED}{BW \times AT}$

Hazard Quotient (HQ) = Intake (mg/kg-day) / RfD (mg/kg-d)

Parameter (units)	Value
CW: Chemical conc. in water (mg/L)	see below
IR: Ingestion rate (L/day)	1
EF: Exposure frequency (days/year)	350
ED: Exposure duration (years)	6
BW: Body weight (kg)	15
AT: Averaging time (days)	2190
RfD: Reference dose (mg/kg-d)	see below

Compound	Conc. in water (mg/L)	Intake (mg/kg-day)	RfD (mg/kg-d)	Drinking Water Ingestion HQ
PCE	6.60E-05	4.22E-06	1.00E-02	4.22E-04
TCE	2.80E-05	1.79E-06	NA	
1,1,1- TCA	3.90E-06	2.49E-07	9.00E-02	2.77E-06
cis 1,2-DCE	3.20E-05	2.05E-06	1.00E-02	2.05E-04
1,1-DCE	9.1E-08	5.82E-09	9.00E-03	6.46E-07
trans 1,2-DCE	9.70E-09	6.20E-10	2.00E-02	3.10E-08
1,1-DCA	2.10E-07	1.34E-08	1.00E-01	1.34E-07
			SUM HI	6.30E-04

Compound	RfD Source	RfD Value (mg/kg-d)
PCE	IRIS	1.00E-02
TCE	NA	NA
1,1,1- TCA	HEAST	9.00E-02
cis 1,2-DCE	HEAST	1.00E-02
1,1-DCE	IRIS	9.00E-03
trans 1,2-DCE	IRIS	2.00E-02
1,1-DCA	HEAST	1.00E-01

Potential Carcinogenic Risk Following Exposure via Drinking Water Ingestion

Scenario: Drinking water from downgradient well
Receptor: lifetime resident

$$\text{Intake (mg/kg-day)} = \frac{CW \times IRw \times EF}{AT}$$

where:

$$IRw = \frac{IRc \times EDc}{BWc} + \frac{IRa \times EDa}{BWa}$$

Risk = Intake (mg/kg-day) x CSF [1/(mg/kg-day)]

Parameter (units)	Value
CW: Chemical conc. in water (mg/L)	see below
IRc: Ingestion rate - child (L/day)	1
IRa: Ingestion rate - adult (L/day)	2
IRw: Ingestion rate-weighted (L-y/day-kg)	1.1
EF: Exposure frequency (days/year)	350
EDc: Exposure duration - child (years)	6
EDa: Exposure duration - adult (years)	24
BWc: Body weight - child (kg)	15
BWa: Body weight - adult (kg)	70
AT: Averaging time (days)	25550
CSF: Cancer Slope Factor [1/(mg/kg-day)]	see below

Compound	Conc. in water (mg/L) (mg/L)	Intake (mg/kg-day)	CSF 1/(mg/kg-day)	Drinking Water Ingestion Risk
PCE	6.60E-05	9.82E-07	5.20E-02	5.10E-08
TCE	2.8E-05	4.16E-07	1.10E-02	4.58E-09
			SUM RISK	5.56E-08

Compound	*CFS Source*	*CFS Value* 1/(mg/kg-d)
PCE	IRIS inhalation	5.20E-02
TCE	IRIS oral	1.10E-02

Potential Hazard Quotient Following Exposure via Inhalation

Scenario: Office builidng
Receptor: Office workers
Intake (mg/kg-day) = $\frac{CA \times IR \times ET \times EF \times ED}{BW \times AT}$

Hazard Quotient (HQ) = Intake (mg/kg-day) / RfD (mg/kg-day)

Parameter (units)	Value
CA: Chemical conc. in air (mg/m3)	see below
IR: Inhalation rate (m3/hr)	0.6
ET: Exposure time (hr/day)	8
EF: Exposure frequency (days/year)	250
ED: Exposure duration (years)	25
BW: Body weight (kg)	70
AT: Averaging time (days)	9125
RfD: Reference Dose (mg/kg-d)	see below

Cleanup concentrations for noncarcinogens were calculated based on multiplying the concentration by the scaling factor below of 1,300/59,000, or 0.022. Values calculated to be less than the TAGM cleanup value are assigned the default TAGM cleanup value.

Scaling factor 0.0220339

Compound	Conc. in GW (mg/L)	VFwesp (mg/m3)/ (mg/L)	Conc. in air (mg/m3)	Intake (mg/kg/d)	RfC (mg/kg-d)	Inhalation HQ
PCE	--	1.12E-02	0.00E+00	0.00E+00	pending	
TCE	--	5.28E-03	0.00E+00	0.00E+00	NA	
1,1,1-TCA	2.86E-02	1.92E-03	5.50E-05	2.58E-06	3.00E-01	8.61E-06
cis-1,2-DCE	9.92E-02	3.97E-03	3.94E-04	1.85E-05	1.00E-02	1.85E-03
1,1-DCE	--	7.48E-02	0.00E+00	0.00E+00	9.00E-03	0.00E+00
trans 1,2-DCE	5.00E-03	3.97E-03	1.99E-05	9.32E-07	2.00E-02	4.66E-05
1,1-DCA	5.00E-03	1.99E-04	9.95E-07	4.67E-08	5.00E-01	9.35E-08
					SUM HI	1.90E-03

Compound	*RfC Source*	RfC Value (mg/kg-d)
PCE	IRIS	pending
TCE	NA	NA
1,1,1-TCA	HEAST	3.00E-01
cis-1,2-DCE	R-to-R extrap	1.00E-02
1,1-DCE	R-to-R extrap	9.00E-03
trans 1,2-DCE	R-to-R extrap	2.00E-02
1,1-DCA	HEAST #	5.00E-01

Route to Route extrapolation was used for 1,2-DCE (cis, trans), 1,1-DCE

Potential Carcinogenic Risk Following Exposure via Inhalation

Scenario: Office Building
Receptor: Office workers
Intake (mg/kg-day) = $\frac{CA \times IR \times ET \times EF \times ED}{BW \times AT}$

Risk = Intake (mg/kg-day) x CSF [1/(mg/kg-day)]

Parameter (units)	Value
CA: Chemical conc. in air (mg/m3)	see below
IR: Inhalation rate (m3/hr)	0.6
ET: Exposure time (hr/day)	8
EF: Exposure frequency (days/year)	250
ED: Exposure duration (years)	25
BW: Body weight (kg)	70
AT: Averaging time (days)	25550
CSF: Cancer Slope Factor [1/(mg/kg-day	see below

Compound	Conc. in GW (mg/L)	VFwesp (mg/m3)/ (mg/L)	Conc. in air (mg/m3)	Intake (mg/kg/d)	CSF 1/(mg/kg-d)	Inhalation Risk	EPA Cancer Class
PCE	1.3	1.12E-02	1.46E-02	2.44E-04	2.00E-03	4.88E-07	C*
TCE	1	5.28E-03	5.28E-03	8.86E-05	6.00E-03	5.31E-07	B2*
1,11-TCA	--	1.92E-03	0.00E+00	0.00E+00	ND	0.00E+00	
cis-1,2-DCE	--	3.97E-03	0.00E+00	0.00E+00	ND	0.00E+00	
1,1-DCE	##	7.48E-02	0.00E+00	0.00E+00	1.20E+00	0.00E+00	C*
trans 1,2-DCE	--	3.97E-03	0.00E+00	0.00E+00	ND	0.00E+00	
1,1-DCA	--	1.99E-04	0.00E+00	0.00E+00	ND	0.00E+00	
					SUM RISK	1.02E-06	

Compound	*CSF Source*	*CSF Value* 1/(mg/kg-d)
PCE	STSC prov.	2.00E-03
TCE	STSC prov.	6.00E-03
1,1,1-TCA	IRIS	ND
cis-1,2-DCE	IRIS	ND
1,1-DCE	HEAST	1.20E+00
trans 1,2-DCE	IRIS	ND
1,1-DCA	NA	NA

* = EPA is currently re-evaluating their entire weight -of-evidence classification scheme for carcinogens
= Cleanup value will be the default .005 ug/l or 5 ppb per NYSDEC HWR-94-4046

Appendix D

Toxicity Profiles for Indicator Compounds

A brief toxicity profile for each of the indicator compounds is presented.

PERCHLOROETHENE (TETRACHLOROETHENE)

The U.S. EPA has withdrawn the carcinogenicity assessment for tetrachloroethene (U.S. EPA, 1996). The Integrated Risk Information System (IRIS) does report an oral Reference Dose (RfD) for non carcinogenic health effects (U.S. EPA, 1993).

Derivation of the Oral Risk Reference Dose

The oral RfD reported for tetrachloroethene is 0.01 mg/kg/day, with an uncertainty factor of 1000 applied (U.S. EPA, 1996). This uncertainty factor arises from multiplying factors of 10 to account for intrahuman variability, interspecies variability, and extrapolation of a subchronic effect level to its chronic equivalent. The principal study from which the oral risk RfD was derived was a six-week mouse gavage study (Buben and O'Flaherty, 1985). Swiss-Cox mice were exposed to tetrachloroethene in corn oil by gavage at doses of 0, 20, 100, 200, 500, 1500, and 2000 mg/kg, 5 days/week for 6 weeks.

Parameters indicating liver toxicity were evaluated. Increased triglycerides and significantly higher liver weight/body weight ratios were found at the 100 mg/kg dose as compared to controls. At higher doses, hepatotoxic effects included decreased DNA content and hepatocellular necrosis, degeneration and polyploidy. Conversion to a 7 day/week dose schedule gave a NOAEL of 14 mg/kg/day and a LOAEL of 71 mg/kg/day.

A NOAEL of 14 mg/kg/day was also established in a second study in which groups of 20 Sprague-Dawley rats of both sexes were administered doses of 14, 400 or 1400 mg/kg/day in drinking water (Hayes et al., 1986). Males in the high-dose group and females in the two highest dose groups exhibited depressed body weights. Other data also support these findings. Hepatotoxicity (centrilobular swelling) was observed in mice exposed to doses of tetrachloroethene as low as 100 mg/kg/day by gavage for 11 days (Schumann et al., 1980). Rats are less sensitive to the effects of tetrachloroethene as evidenced by increased liver weights in mice exposed to 250 mg/kg while doses of 1000 mg/kg/day were required in rats.

Utilization of the very short-term principal studies for conversion to longer term effects is supported by several studies. Inhalation studies indicated that the uncertainty factor of 10 is adequate for converting subchronic effects to their chronic equivalents; none are inconsistent with the 14 mg/kg/day NOAEL. Mice exposed for 30 and 120 days showed similarly elevated liver weight/body weight ratios, and liver enlargement and hepatocyte vacuolization were found to be reversible lesions for mice exposed to low concentrations of tetrachloroethene (Kjellstrand et al., 1984). Overall, medium confidence is placed in the RfD because the data base is relatively extensive, although no individual study is as complete as desirable.

Derivation of the Oral Cancer Slope Factor

(U.S. EPA, 1996) reports that tetrachloroethene is currently being evaluated by the U.S. EPA for evidence of human carcinogenic potential. Therefore, IRIS does not provide a cancer slope factor. The oral reference dose of 5.2×10^{-2} $(mg/kg\text{-}day)^{-1}$ is based on a mouse gavage study performed by the National Cancer Institute (NCI, 1977). This value is reported as a "provisional value" by the Superfund Technical Support Center. The Risk Assessment Issue Paper highlighting carcinogenicity for perchloroethene cited the 1985 Health Assessment Document (HAD) as the source for the upper bound risk estimates. While these values are not yet verified by the IRIS-CRAVE Work group, the estimates are viewed as useful information in the context of the information in the 198-1987 period.

Derivation of the Inhalation Cancer Slope Factor

IRIS (U.S. EPA, 1996) does not report an inhalation cancer slope factor for tetrachloroethene. AN interim value suggested for use is the slope factor featured in the 1987 HAD Addendum. The inhalation cancer slope factor of 2.0×10^{-3} $(mg/kg\text{-}day)^{-1}$ is based on an inhalation study on rats and mice, performed by the National Toxicology Program (NTP) (1986).

REFERENCES

Buben, J.A. and E.J. O'Flaherty. 1985. Delineation of the role of metabolism in the hepatoxicity of trichloroethene and perchloroethene: A dose-effect study. Toxicol. Appl. Pharmacol. 78:105-122.

Hayes, J.R., L.W. Condie and J.F. Borzelleca. 1986. The subchronic toxicity of tetrachloroethene (perchloroethene) administered in the drinking water of rats. Fund. Appl. Toxicol. 7(1):119-125.

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Kjellstrand, P., B. Holmquist, M. Kanje, et al. 1984. Perchloroethene: Effects on body and organ weights and plasma butyrylcholinesterase activity in mice. Acta Pharmacol. Toxicol. 54(5):414-424.

TRICHLOROETHENE (TRICHLOROETHENE)

The carcinogenicity assessment for trichloroethene has been withdrawn from IRIS (U.S. EPA, 1996). Trichloroethene was formerly classified by the U.S. EPA as a Class B2 carcinogen (a probable human carcinogen), and cancer slope factors were provided for both oral and inhalation exposures. However, "provisional values" are reported in the Superfund Technical Support Center's Risk Assessment Issue Paper for carcinogenicity information for trichloroethene (TCE). No RfDs were available in IRIS or the Health Effects Assessment Summary Tables (U.S. EPA, 1995).

Derivation of the Oral Cancer Slope Factor

The oral cancer slope factor reported for trichloroethene is 1.1E-02 $(mg/kg\text{-}day)^{-1}$ which is a geometric mean of the data from male and female mice in two studies done by NTP (1983) and NCI (1976). These cancer slope factors were 0.019 (male) and 0.0080 (female) $(mg/kg\text{-}day)^{-1}$ in the NTP study and 0.018 (male) and 0.0058 (female) $(mg/kg\text{-}day)^{-1}$ in the NCI study using the linearized multistage procedure for extrapolation to low dose. These factors are based not on administered dose but on the amount metabolized to the toxic chemical intermediate.

The NTP (1983) study exposed male and female B6C3F1 mice to trichloroethene containing no detectable epoxides, by corn oil gavage of 1000 mg/kg-day (equivalent to a human lifetime average metabolized dose of 47.4 and 45.6 mg/kg-day for males and females, respectively). Groups of 50 mice were exposed for 5 days/week for 103 weeks. A significant increase in hepatocellular carcinomas was found in both male and female mice. The NCI (1976) study also used B6C3F1 mice, but exposed them to two dose levels of trichloroethene. Groups of 50 males and 50 females were treated 5 days/week for 78 weeks by corn oil gavage with epoxide-stabilized trichloroethene. The doses reported, as time weighted averages, were 1169 and 2339 mg/kg for males and 869 and 1739 mg/kg for females. Extrapolation to human equivalent lifetime average metabolized doses gives 45.1 and 85.8 mg/kg-day for males and 31.7 and 61.4 mg/kg-day for females. A dose-dependent increase in hepatocellular carcinomas was observed for animals of both sexes. There was little toxicity in this study that was not attributed to tumor development.

The slope factors for the male and female B6C3F1 mice were very close in two independent studies (within a factor of 3) providing medium to high confidence in the oral cancer slope factor. Adequate numbers of animals were studied and tumor incidences were significantly elevated in a comparable fashion. These studies used to derived the oral slope factor are summarized in the 1895 Health Assessment Document.

Derivation of the Inhalation Cancer Slope Factor

The inhalation cancer slope factor for TCE is 6.0-03 $(mg/kg\text{-}day)^{-1}$, and the unit risk is 1.7×10^{-6} $(ug/m^3)^{-1}$. The inhalation cancer slope factor is a revision to the previously reported value of 1.7E-02 $(mg/kg\text{-}day)^{-1}$ which was derived following an evaluation of seven dose-response data sets from inhalation studies reported by Maltoni et al. (1986), and Fukuda et al. (1983). Maltoni et al. (1986) reported significantly increased leydig cell tumors in male Sprague-Dawley rats, liver and lung tumors in male Swiss mice, lung tumors in female Swiss mice, and liver and lung tumors in female B6C3F1 mice. Fukuda et al. (1983) reported significantly increased lung tumors in female ICR mice.

Maltoni et al. (1986) exposed the rats and mice in all experiments to 0, 100, 300, and 600 ppm trichloroethene. The rats were exposed 5 days/week for 2 years, while the mice were exposed 5 days/week for 78 weeks. Fukuda et al. (1983) exposed the female ICR mice to 0, 50, 150, and 450 ppm trichloroethene, 5 days/week for 2 years. These exposure concentrations were converted to animal metabolized doses which were subsequently converted to human equivalent doses by scaling on the basis of body surface area.

The linearized multistage model was used to derive cancer slope estimates from these seven data sets. The resulting slope estimates range from 7.1E-03 to 2.7E-02 $(mg/kg\text{-}day)^{-1}$, using the human equivalent doses. These slope estimates fall within a narrow range and are comparable to the previously derived inhalation cancer slope factor of 1.3E-02 $(mg/kg\text{-}day)^{-1}$, which was based on the NTP/NCI mouse gavage studies.

Given the narrow range of the slope estimates for the mouse lung and liver tumors, a geometric mean for each tumor type was calculated across the different mouse strains. The rat leydig cell response data required no averaging since the results were based on a single study. The resulting cancer slope estimates are 8.7E-03, 1.7E-02, and 2.7E-02 $(mg/kg\text{-}day)^{-1}$. The mouse lung and the rat leydig cell data were found to represent the most sensitive tumorigenic responses.

The previous cancer slope estimate of 1.7E-02 $(mg/kg\text{-}day)^{-1}$ based on the mouse lung data was chosen by the U.S. EPA (1987) because it reflects the impact of first-pass metabolic activation in pulmonary tissue, and is derived from multiple mouse strains and sexes. However, newly available animal bioassay data supported a revision to the inhalation upper bound estimate as reported in the June 1987 Addendum to the Health Assessment Document. The inhalation slope factor cited in the Superfund Technical Support Center's Risk Assessment Issue Paper for carcinogenicity for TCE is 6.0E-3 $(mg/kg\text{-}day)^{-1}$.

REFERENCES

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Maltoni, C., G. Lefemine, G. Cotti. 1986. Experimental Research on Trichloroethene. Carcinogenesis. Archiv. Res. Industrial Carcinogenesis Series. Maltoni, C., Mehlman, M.A., eds., Vol. V Princeton Scientific Publishing Co., Inc., Princeton, NJ, p. 393.

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U.S. EPA. 1987. Evaluation of the Potential Carcinogenecity of Trichloroethene: In Support of Reportable Quantity Adjustments Pursuant to CERCLA Section 102. Office of Health and Environmental Assessment, Washington, DC. EPA/600/8-89/045A.

trans-1,2-DICHLOROETHENE

The U.S. EPA has derived an oral RfD that is verified and is available on IRIS (U.S. EPA, 1996), however, no inhalation Reference Concentration (RfC) is available. Trans-1,2-dichloroethene has not been evaluated by U.S. EPA for evidence of human carcinogenic potential.

Derivation of the Oral Risk Reference Dose

The U.S. EPA-derived oral RfD of 0.02 mg/kg/day for trans-1,2-DCE is based upon a study by Barnes et al. (1985). In this study, male and female CD-1 mice were given trans-1,2-DCE in their drinking water for 90 days at concentrations of 0.1, 1.0, or 2.0 mg/L. Based on fluid consumption, it was calculated that males received doses of 17, 175, or 387 mg/kg/day and that females received doses of 23, 224, or 452 mg/kg/day.

No significant changes in terminal body weight or gross pathology were noted in either sex at any dose level. However, in male mice, significant increases in serum alkaline phosphatase levels at the 175 and 387 mg/kg/day were reported, as well as reduced liver glutathione concentrations at the highest dose. In females, the thymus-to-body weight ratio was significantly decreased at both 224 or 452 mg/kg/day, while the lung weight was reduced at only the highest dose. The levels of SGOT and SGPT were decreased at the two higher doses and the level of aniline hydroxylase were decreased at all three doses in females.

The U.S. EPA determined that the critical effect upon which to base the NOAEL was the increased serum alkaline phosphatase in male mice. The NOAEL is 17 mg/kg/day and the LOAEL is 175 mg/kg/day. Using an uncertainty factor of 1000 to extrapolate data from animals to humans and from subchronic to chronic, and in order to be protective of sensitive human sub populations, results in an oral RfD of 0.02 mg/kg/day.

The U.S. EPA feels that the principal study was well designed except for dose spacing, but that the data base included only subchronic studies and there is a lack of data on reproductive and developmental toxicity. The confidence in the study is medium, and it is low in the data base and the RfD (U.S. EPA, 1996).

REFERENCES

Barnes, D.W., V.M. Sanders, K.L. White, Jr., et al. 1985. Toxicology of trans-1,2-dichloroethene in the mouse. Drug Chem. Toxicol. 8:373-392.

cis-1,2-DICHLOROETHENE (cis-1,2-DICHLOROETHENE)

HEAST provides an oral RfD for cis-1,2-dichloroethene (U.S. EPA, 1995). The U.S. EPA has classified cis-1,2-dichloroethene as a Group D (not classifiable) carcinogen based on no human or animal data and generally non positive results in mutagenicity assays (U.S. EPA, 1996).

Derivation of the Oral Reference Dose

The oral RfD for cis-1,2-dichloroethene is 1.0E-02 mg/kg-day (HEAST, 1995). It is based on an oral gavage study in rats (McCauley et al., no date). Decreased hemoglobin and hematocrit were the critical effects observed. The RfD is calculated from a NOAEL using an uncertainty factor of 3000.

REFERENCES

U.S. EPA. 1995. Health Effects Assessment Summary Tables (HEAST). Annual, F.Y. 1995 Annual. Office of Solid Waste and Emergency Response, Washington, DC.

McCauley, P.T., M. Robinson, L.W. Condie, et al. No Date. The effects of sub acute and subchronic oral exposure to cis-1,2-dichloroethene in rats. Health Effects Research Laboratory, U.S. EPA, Cincinnati, Ohio.

1,1,1-TRICHLOROETHANE

IRIS (U.S. EPA, 1996) reports that 1,1,1-trichloroethane is classified as Class D (not classifiable). IRIS further reports that the oral reference dose for 1,1,1-trichloroethane has been withdrawn as of 2/1/96. The Health Effects Assessment Summary Tables (U.S. EPA, 1995) lists no toxicity values for 1,1,1-trichloroethane.

Derivation of the Oral Risk Reference Dose

In the absence of new, refined information, the following discussion is based on the previously reported oral risk RfD of 0.09 mg/kg/day. It is based on conversion of data from an inhalation study (Torkelson et al., 1958) to an estimated oral dose. This study showed that guinea pigs were the most sensitive of the species tested (rats, rabbits, guinea pigs, and monkeys). Animals were exposed to 500, 1000, 2000 or 10,000 ppm 1,1,1-trichloroethane in air. A NOAEL of 500 ppm was obtained for guinea pigs after an exposure of 7 hr/day, 5 days/week for 6 months (converted to 90 mg/kg/day). A LOAEL of 1000 ppm (3 hr/day, 5 days/week for 3 months) produced fatty changes in the liver and a statistically significant increase in liver weights in groups of five female guinea pigs. Route-to-route extrapolation was performed. Dose conversion assumed an inhalation retention factor of 0.3 and the ventilation rate and body weight of the guinea pig were assumed to be 0.23 m^3/day and 0.43 kg, respectively. Other studies in the literature do not appear to be entirely consistent with these results. Exposures of 650 ppm appeared to have some effects including growth retardation.

An uncertainty factor of 1000 was applied from multiplication of factors of 10 each for use of a subchronic assay, for extrapolation from animal data and for protection of sensitive human sub populations.

Derivation of the Inhalation Risk Reference Dose

Again, in the absence of updated information, the following presentation of the previously reported RfD for inhalation exposures of 0.3 mg/kg/day is also based on the Torkelson et al. (1958) paper as described above. The same NOAEL was used which corresponds to a dose of 304 mg/kg/day. An uncertainty factor of 1000 was used to account for interspecies variability, to be protective of sensitive human sub populations, and because the study was subchronic.

REFERENCES

U.S. EPA. 1995. Health Effects Assessment Summary Tables (HEAST). Annual, F.Y. 1995 Annual. Office of Solid Waste and Emergency Response, Washington, DC.

Torkelson Reference for TCA

1,1-DICHLOROETHANE

IRIS (U.S. EPA, 1996) does not include information on 1,1-dichloroethane. The Health Effects Assessment Summary Tables (U.S. EPA, 1995) were consulted, and an oral RfD and an inhalation RfC were reported. No cancer slope factors were listed in HEAST.

Derivation of the Oral Risk Reference Dose

The basis for the oral RfD of 0.1 mg/kg/day is the work done by Hofmann et al. (1971) with an uncertainty factor of 1000. This study was a subchronic inhalation study, so route-to-route extrapolation from inhalation to oral exposure was used to define a NOEL for rats of 115 mg/kg/day. Multiplying by 70 kg and dividing by an uncertainty factor of 1000 (10 for interspecies variability, 10 to be protective of sensitive human sub populations, and 10 to extrapolate from subchronic to chronic exposure) results in an RfD of 0.1 mg/kg/day.

Hofmann et al. (1971) exposed groups of 10 rats, 4 cats, 4 rats and 10 guinea pigs to 500 ppm (about 2025 mg/m^3) 1,1-dichloroethane 6 hours/day, 5 days/week for 13 weeks. No effects were reported in any of the animals tested. Exposure to 1000 ppm (about 4050 mg/m^3) 6 hours/day, 5 days/week using the same test animals continued for another 13 weeks. The only animal in which adverse effects were noted was the cat. Blood urea nitrogen levels were immediately elevated and rose steadily to week 24, when they peaked at about 3 times the control levels. Histopathological examination of the cats revealed renal tubular dilatation and degeneration, indicating renal damage.

Derivation of the Inhalation Risk Reference Dose

An inhalation reference concentration of 0.5 mg/m^3 is listed in HEAST Table 2: Alternate Methods (U.S. EPA, 1995). The value was derived from the oral dose-response value using methods not current with the interim inhalation methodology used by the RfD/RfC Work Group.

REFERENCES

Hofman, H.T., H. Birnstiel, and P. Jobst. 1971. On the inhalation toxicity of 1,1- and 1,2-dichloroethane. Arch. Toxikol. 27:248-265.

Appendix E

ENSR Air Sampling

ENSR AIR TOXICS SPECIALTY LABORATORY
ANALYTICAL SUMMARY OF RESULTS

Client: 25 Melville Park Road
ENSR Project #: 8606-414
Lab ID #: 960060; 960061

Client Sample ID	Field Blank		Atrium		Loading Dock		Louis Office		Atrium	
Date Sampled	6/16/96		6/14/96		6/14/96		6/14/96		6/16/96	
Date Analyzed	6/16/96		6/16/96		6/16/96		6/16/96		6/16/96	
Compound	ng/L	ppbV	ng/L	ppbV	ng/L	ppbV	ng/L	ppbV	ng/L	ppbV
1,1-Dichloroethylene	0.76 U	0.19 U	0.76 U	0.19 U	0.76 U	0.19 U	0.76 U	0.19 U	0.76 U	0.19 U
Trichloroethylene	0.76 U	0.14 U	1.0	0.19	0.94	0.17	4.4	0.81	1.4	0.25
Tetrachloroethylene	0.76 U	0.11 U	2.9	0.42	3.2	0.47	2.5	0.36	3.5	0.51

Client Sample ID	Loading Dock		Loius Office		Atrium		Loading Dock		Louis Office	
Date Sampled	6/16/96		6/16/96		6/16/96		6/16/96		6/16/96	
Date Analyzed	6/16/96		6/16/96		6/17/96		6/17/96		6/17/96	
Compound	ng/L	ppbV	ng/L	ppbV	ng/L	ppbV	ng/L	ppbV	ng/L	ppbV
1,1-Dichloroethylene	0.76 U	0.19 U	0.76 U	0.19 U	0.76 U	0.19 U	0.76 U	0.19 U	0.76 U	0.19 U
Trichloroethylene	1.7	0.31	2.9	0.54	1.3	0.23	1.9	0.36	1.7	0.31
Tetrachloroethylene	3.5	0.51	2.5	0.36	4.1	0.60	9.0	1.30	2.9	0.42

U = undetected at specified detection limit
J = estimated value, below the detection limit
E = estimated value, exceeds calibration range
B = analyte found in blank(s)

ENSR AIR TOXICS SPECIALTY LABORATORY
QUALITY CONTROL RESULTS - DUPLICATES

Client: 26 Melville Park Road
ENSR Project #: 6606-414
Lab ID #: 960060; 960061

Client Sample ID	Louis Office		Duplicate		
Date Sampled	6/16/96		6/16/96		
Date Analyzed	6/16/96		6/16/96		
Compound	ng/L	ppbV	ng/L	ppbV	RPD
1,1-Dichloroethylene	0.76 U	0.19 U	0.76 U	0.19 U	NC
Trichloroethylene	2.9	0.54	3.5	0.64	11
Tetrachloroethylene	2.5	0.36	2.2	0.32	6.5

Client Sample ID	Louis Office		Duplicate		
Date Sampled	6/16/96		6/16/96		
Date Analyzed	6/17/96		6/17/96		
Compound	ng/L	ppbV	ng/L	ppbV	RPD
1,1-Dichloroethylene	0.76 U	0.19 U	0.76 U	0.19 U	NC
Trichloroethylene	1.7	0.31	1.4	0.26	12
Tetrachloroethylene	2.9	0.42	2.6	0.36	9.3

U = undetected at specified detection limit
J = estimated value, below the detection limit
E = estimated value, exceeds calibration range
B = analyte found in blank(s)
NC = not calculable
RPD = relative percent difference