ENVIRONMENTAL SITE ASSESSMENT
FINAL REPORT

228 SALEM STREET
WOBURN, MASSACHUSETTS

PREPARED FOR:
THE MAGGIORE COMPANIES

PREPARED BY:

21E INC.
330 BOSTON ROAD
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PROJECT NUMBER 90-0505-2 - DATED 08/10/93

21E INC.

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INTRODUCTION

21E INC.

1. INTRODUCTION

21E Inc. was contracted by Mr. Paul Maggiore of The Maggiore Companies to conduct a Phase I - Limited Site Investigation Update on property located at 228 Salem Street in Woburn, MA. The purpose of this study was to determine if any evidence exists of a release or threat of release of oil or hazardous materials on the subject property since the date of the last 21E Inc. report. A Phase I - Limited Site Investigation was performed by 21E Inc. on 12/26/90 Project No. 90-0505-1.

The scope of work for this investigation included an update of municipal, state, and historical records from December 26, 1990, to the present and an inspection of the site. For convenience, a summary of previous investigations has been provided. The Woburn and Boston Offices of the Department of Environmental Protection were visited as well as the Boston office of the Environmental Protection Agency. All available files were reviewed for properties within a half mile radius of the site under investigation. Groundwater samples were collected from seven on-site monitoring wells and analyzed for selected parameters.

DESCRIPTION

2. DESCRIPTION

2.1 SITE OWNERSHIP AND LOCATION

According to the Woburn Assessors' Office, 228 Salem Street is owned by Diana Riley. Other sources reveal that the property is owned by Wedel Corporation and has been since 1985. As shown in the northwest corner of the USGS Boston North, MA 7.5 X 15 minute series topographic quadrangle map, the site is located approximately 2,500 feet west of the Aberjona River, 3,350 feet northeast of Woburn High School, and 2,700 feet northwest of Whittemore Pond (see Figure 1). The boundaries of the site are shown on maps 16 and 21, x coordinates 698264, y coordinate 542743 of the City of Woburn Assessors' plans. The northeast portion of this lot is to be subdivided and addressed separately from the majority of the parcel.

2.2 SITE DESCRIPTION

According to the Woburn Assessors' Office, the property is approximately 10 acres in area. The property lies between the 15 and 30 meter contours on the USGS Boston North, MA quadrangle. The topography of the site slopes to the northeast. No buildings exist on the site but a paved parking area and the brick floor of the buildings that previously existed on the site are still present in the central portion of the property. The site is bordered by Wildwood Avenue to the west, Salem Street to the South, Boston and Maine Railroad to the east, and properties occupied by BASF and Toxikon Laboratories to the north. A depression in the northeast corner of the site was filled with water during several visits to the site. This was the only area where standing water existed. According to Mr. John J. Riley, this area is a pond which was constructed, as required by the City of Woburn Planning Board, for drainage purposes when the rear 6 acres were developed. Vegetation on the property was abundant and appeared to be healthy.

BACKGROUND

3. BACKGROUND

As part of this project, previously prepared reports on the property located at 228 Salem Street in Woburn, MA were reviewed. The following section summarizes the materials presented in the YE^{2}ARS report entitled "Hydrogeologic Investigation of the John J. Riley Tanning Company" (hereafter referred to as YE^{2}ARS report) and the GEI report entitled "21E Assessment of J. J. Riley Property" dated April 19, 1985 (hereafter referred to as GEI report). The previous report prepared by 21E Inc. entitled "Final Report Environmental Site Assessment 228 Salem Street Woburn, MA," and dated December 26, 1990 (hereafter referred to as previous 21E Inc. report) is also summarized in this section. Other documents have also been reviewed and pertinent data from those sources has also been presented in this section.

J.J. Riley Tanning Company operated on the property from approximately 1915 to 1989 when operations ceased and all equipment was removed. Currently, the property is vacant. Previously, the operation existed on 15.8 acres of land. Since the previous reports, the back (northwest) area of the property has been subdivided and no longer is part of the Riley site. The current assessment was completed on approximately 10 acres of land. Formerly, the tanning operations took place in Buildings 1 and 2. To the north of Building 1 is the former location of the bag house and lagoon, which were utilized to store buffing dust until materials were removed as leather scrap. To the east of the lagoon is the former location of three underground fuel oil tanks and the power plant. To the north of the lagoon and power plant was the former hide storage area, which comprised about 51,000 square feet. On the northwestern portion of the current property, the lot is bounded by the drainage ditch. A sewer easement runs through the property between the former locations of Building 1 and 2. A currently unused industrial supply production well (PW#1) is located in the northeast portion of the property.

The property is bordered to the south by Salem Street, to the west by Wildwood Avenue, to the northwest by BASF and by Toxikon Laboratories to the northeast. The abutting lot to the northwest, currently occupied by the BASF Co., was formerly utilized by the Riley Company. The lot occupied by Toxikon Laboratories was formerly occupied by Bio Assay Inc. To the east, the property is bordered by land owned by B&M Railroad. Across the B&M Railroad land located to the northeast of the Site is land currently owned by Wildwood Conservation Trust. This land was formerly owned by the Beatrice Food Company and an industrial supply production well (PW#2) exists on this land which was

formerly utilized by the operations at 220 Salem Street. Across Salem Street to the south is currently an office building. This lot, 215 Salem Street, is the former location of a leather tannery, Murray Leather Co. Also across Salem Street to the south is a concrete form operation and a building which formerly housed a banding saws and knife company. A florist is located across Wildwood Avenue to the west of the Site.

Tanning operations on-site were primarily in the preparation of hides into leather for shoes. The facility was considered a medium sized operation. The process at the Riley site used the chrome tanning method.

The Riley facility used hexavalent chromium as a raw material in the chrome tanning method. However, prior to introduction into the tanning process the chromium (hexavalent) was converted to trivalent chromium. Trivalent chromium is NOT a hazardous substance according to the EPA although it is a priority pollutant metal. Chemicals formerly used on the Site which are hazardous substances were benzidine based dyes, phenolic based detergents (for soaking of hides), ortho-dichlorobenzene (for disinfecting), butyl acetate (as a solvent for lacquers and finishing products), and 1,1,1-trichloroethane (for cleaning one embossing plate prior to 1979). Several other chemicals not classified as hazardous substances were also used at the Site. Butoxyethanol, diisobutyl ketone, and methoxyethanol are volatile compounds which were used as solvents in carrying lacquers and finishing products. Fuel oil was used for the power plant.

The tanning process at the Riley site produced several waste products. One of these products was the sludge collected in the lagoon in the northwest portion of the site. These solids were dredged periodically from the lagoon and from the catch basin and landfilled on-site. According to previous reports, EP toxicity tests have been done on the material landfilled on-site and all levels including hexavalent chromium and total chromium are within acceptable levels. According to 310 CMR 30.125 (4)(e) wastewater treatment sludges and leather scraps from the leather industries are specifically not included as hazardous wastes "provided they do not fail the test for the characteristics of EP toxicity..." Buffing dust was also produced during the process. This dust was disposed of in a lagoon on-site. Buffing dust, which is primarily composed of leather particles, is not considered a hazardous waste according to the EPA and DEP 310 CMR 30.125 (4)(e). According to information obtained from Mr. Riley, the buffing dust has been removed from the Site.

Between November of 1980 and March of 1981, Ecology and

Environment, Inc., under contract to the EPA, sampled groundwater from PW#1 and PW#2. The results revealed levels of volatile organic compounds in both samples. Levels in PW#2, 28 to 1372 ppb (parts per billion) were significantly higher than from PW#1, 10 to 53 ppb. The source of contamination was not determined. According to the YE^{2}ARS report "some of the contaminants present in PW#1 and PW#2 are also present in the City of Woburn's Municipal Production Wells G and H, which are located approximately 2000 feet northeast of Riley Production Well #2, and east of the Aberjona River (EPA, 1981)." Groundwater samples obtained from PW#1 were additionally analyzed for Priority Pollutants, no levels of benzidine were reported as detected.

As part of the investigation conducted by YE^{2}ARS, nine (9) test pits were excavated on the 15.8 acre site. Three of the test pits (TP-7, TP-8, and TP-9) were located on the front (southern) 10 acres. TP-7 was excavated to a depth of 9'4", TP-8 to 6.5', and TP-9 to 7'. Six (6) monitoring wells (which no longer exist) were installed on the property by YE^{2}ARS in 1983. Methods used by YE^{2}ARS to determine that bedrock was encountered and the screening length of the monitoring wells was not available. Four of the six wells (B-1, B-2, B-3c, and B-6b) were installed in the front 10 acres. Refer to Figure 2 for former test pit and monitoring well locations. With the exception of B-6b, the wells were installed to bedrock. Groundwater levels in the four wells ranged from about 4 feet below grade in B-6b, to 37 feet in B-3c. Wells were surveyed and the groundwater flow direction was calculated to be west to east across the site. This flow direction was calculated while PW#2 was pumping under normal conditions.

Groundwater samples collected by YE^{2}ARS in 1983 from wells B-1, B-2 and PW#1 were analyzed for chlorinated volatile organic compounds by EPA method 601. The results revealed no levels of chlorinated solvents in B-1 above the detection limit of 0.1 ppb. Groundwater from PW#1 was found to contain 0.4 ppb of trans-1,2-dichloroethene and 0.4 ppb of trichloroethene (TCE). 0.7 ppb trans-1,2-dichloroethene and 2.3 ppb of chlorobenzene were detected in the groundwater from B-2. This is a substantial decrease from the number and quantity of volatile organic compounds reported in 1980/1981 by Ecology & Environment, Inc.

Both reports concluded that the Riley tannery is not a probable source of contamination of Production Well #2. It was also concluded that the Riley site is not a probable source of the contamination detected in the City of Woburn's Municipal Wells G & H.

The former underground tanks were removed in November of

1989 by Clean Harbors. According to a 1982 DEQE (now DEP) Division of Air Quality Control material storage sheet, the former tanks were all 15,000 gallons in capacity and 2 years old. Two of the tanks were used for the storage of #6 fuel oil and the other tank was used to store #2 fuel oil. A Woburn Fire Department Report stated that the three tanks were removed in November of 1989 and the excavation was free of product. Also stated in the report was that no penetrations were noted in any of the tanks. The excavation was backfilled with the existing fill, according to the report. One soil sample from the tank removal was analyzed by Clean Harbors laboratory. The sample was found to contain 110 ppm (parts per million) of petroleum hydrocarbon/oil & grease by IR. EPA Method 503 (Standard Methods) present five methods distinguished by A through E designations. The Clean Harbors results indicate that D (extraction for sludges), E (petroleum fractionation) and B (infra red) were utilized.

Upon inspection of the property by 21E Inc., it was observed that the wells installed by YE^{2}ARS were no longer existing on-site. However, 21E Inc. did note that three additional wells were located on the site. Information provided by Mr. Riley indicates that these wells were installed under authorization of Beatrice Foods through instruction by their counsel, Hale & Dorr. These wells were reportedly installed in July 1989 by Geraghty & Miller, Inc. 21E Inc. was unable to access the boring logs and drilling information as 21E Inc. was not contracted by Beatrice Foods.

In May 1990, based upon the above information, 21E Inc. installed four additional wells on the property, screened soil samples in the field and then again at 21E Inc. facilities under controlled conditions. Selected soil samples were delivered to the laboratory for chemical analysis.

21E Inc. analyzed selected groundwater samples obtained from seven wells (three existing and four new) for concentrations of the eight RCRA metals, volatile organic compounds, petroleum hydrocarbons and semivolatile (acid/base/neutral) compounds. These analyses were chosen based upon the chemicals formerly used or detected at the property. For example, semivolatile analysis will detect benzidine and phenols, whereas, volatile organic analysis will detect the chlorinated and aromatic solvents. Three soil samples were submitted for laboratory analysis. No levels of RCRA metals were found above the commonly expected ranges. See Table 1, page 18, 12/26/90 21E Inc. report.

Groundwater samples were collected and analyzed from the seven wells. No volatile organic compounds were reported in any

of the seven groundwater samples above the detection limit of 1 ppb. There were also no levels of petroleum hydrocarbons discovered above the detection limit of 0.1 ppm in the five wells tested. Semivolatile analysis of the groundwater samples from the two wells, reported no levels of semivolatile compounds including pesticides and PCBs. Total RCRA metals analysis of the three groundwater samples tested revealed no levels above the Drinking Water Standards as set forth by the Massachusetts Department of Environmental Protection.

It was the opinion of 21E Inc. at the time of the previous report that based on the data collected in the study, there was no evidence of a release or threat of release of oil or hazardous materials on the site under assessment.

UPDATE INVESTIGATION

4. UPDATE INVESTIGATION

SITE ASSESSMENT

An inspection of the property was conducted by 21E Inc. personnel on April 16, 1993. The site is currently vacant of any structures except for a small brick pumping station in the northeast corner of the property. Buildings that previously existed on this site were razed in 1991, according to Jack Fralick of the Woburn Health Department. Portions of the foundations and brick floors of the buildings that existed on this site are still present and a chain link fence almost completely encompasses the property. The only area not encompassed in the fencing is the former parking area. Access is limited to this area by concrete barriers.

The topography of the site gradually slopes to the northeast while the grade is much steeper in the northeast corner of the property. Just north of the pumping station a drainage depression exists that extends from west to east towards the railroad tracks. All portions of the site that are currently unpaved, are covered with vegetation that appears to be healthy.

A dark tar-like substance appeared to be advancing through cracks in the pavement in the north central portion of the site, presumably due to the uncommonly large volume of rain and melting snow this spring. This material was only observed on the visits during heavy rain periods.

21E Inc. has reinspected the property several times since the tar-like substance was observed. It has not been observed "oozing" since the heavy rains. In addition, during a site visit on June 25, 1993, the materials noted appear to be asphalt sealant or coatings which are traveling from the point of application. It is our opinion that the materials appear to be asphaltic in nature.

ZONING

The property is currently zoned for use as an industrial park. The site lies in Flood Zone C, an area of minimal flooding, according to FIRM maps.

SITE UTILITIES

The site is connected to city water and sewer service. No electric power lines enter the property from overhead. An industrial supply production well exists on the site in the

northeast corner of the property but it is no longer in use. Seven previously installed monitoring wells are still present on the site. The closest city wells are Wells G and H, 2,075 and 2,525 feet northwest of the site respectively, however, these wells were shut down in the early 1980s. The closest active water supply is an MWRA drawing system located 4,500 feet south southeast of the site. The water for this system is held in Spot Pond on the Stoneham/Melrose line. Due to the fact that a drawing system does not always provide an adequate supply of water, the wells at Horn Pond, about two miles southwest of the site, can also provide water for the site.

ABOVE/UNDERGROUND STORAGE TANKS

Conversations with the Woburn Fire Department and a review of their files revealed that there are currently no above or underground storage tanks on the site. However, in November of 1989, three 15,000 gallon underground tanks were removed from this site. Two of the tanks had been used to store #6 fuel oil, while the third stored #2 fuel oil. All three tanks were removed without incident. According to Fire Department records, the three tanks had been installed in 1981. There is currently no permit for storage tanks for this property on file with the Woburn City Clerk's Office.

Files were also reviewed concerning above/underground storage tanks on nearby properties. Walter C. and Dana H. Fowle own property 50 feet south of the site at 235 Salem Street. No tanks currently exist on this property but the Fire Department did provide information on former tanks. The property contained a number of aboveground #2 fuel oil tanks until the 1940s. The number, size, and date of installation of these tanks is unknown (according to Bill Sweeney of the Woburn Fire Department's Fire Prevention Office, these and many subsequent tanks were installed before accurate records were kept). In the 1940s, the above ground tanks were removed and a single 1,000 gallon underground #2 fuel oil tank was installed. In the 1950s the 1,000 gallon tank was filled with sand and a 5,000 gallon underground #2 fuel oil tank was installed. On January 8th, 1993 both of these tanks were removed without incident according to the Fire Department. On the same date a 4,000 gallon waste oil tank was removed. During the procedure the tank split and a spill ensued. Fire Department records indicated that approximately 50 square yards of soil was contaminated. No further information on the 4,000 gallon tank was available.

Murphy Waste Oil at 252 Salem Street, 100 feet east of the site, has recently undergone a partial closure supervised by Clean Harbors. Until early 1988, this property contained

nineteen storage tanks of various sizes. In March of 1988, fourteen storage tanks were removed from the property (two 20,000 gallon, five 12,000 gallon, two 10,000 gallon, two 5000 gallon, two 2,000 gallon and one 275 gallon tanks). All removed tanks were transported to John C. Tombarello & Sons. This left one 30,000 gallon, one 20,000 gallon and three 10,000 gallon tanks on the property. There were no records available as to the age of either the fourteen tanks removed nor the five remaining tanks. In June of 1988, two new storage tanks (one 20,000 gallon and one 10,000 gallon) and a 1,500 gallon receiver tank were installed. There is currently a permit on record in the City Clerk's Office for storage of up to 125,000 gallons of waste oil on the property. As of June 30, 1992, the DEP declared the company to be in compliance with all regulations regarding hazardous waste storage. The Woburn Fire Department had no records of any spills on this property.

Rivinius & Sons, Inc. located at 225 Salem Street, 50 feet south of the site, has a permit to store 2,000 gallons of Class A fluids aboveground. The City Clerk's Office also provided information on a tank removal on this property. On June 26, 1987, a 6,000 gallon oil tank was pumped out and cleaned. 600 gallons of oil were removed for disposal to a contracted facility. Fire Department Records revealed that the removed tank consisted of two chambers and contained a hydrocarbon mixture.

Johnson Brothers Greenhouse Inc. at 200 Wildwood Street, 50 feet west of the site, was granted a permit on September 4, 1968, for the storage of 40,000 gallons of heavy fuel oil. The Fire Department had no record of tanks on this property.

Severance Trucking located at 7 Walnut Hill Park, 875 feet south southeast of the site, has five underground tanks which include: one 5,000 gallon gasoline tank that is 19 years old, three 5,000 gallon diesel tanks, two of which are 11 years old and one which is 17 years old, and one 500 gallon waste oil tank that is 9 years old. On June 22, 1986, one of the diesel tanks failed a tightness test. Further investigations revealed that the tank was leaking at a rate of 0.083 gallons per hour. No tank removal permits or further reports were present in the file for this property.

The only other storage permit on file for the surrounding area belongs to New England Aerosol and Packing, Inc. at 6 Aberjona Drive, 1,675 feet east of the site. They are allowed to store up to 500 gallons of Class A toluene and zylol paint thinners and up to 6,000 gallons of Class B anilin oil or Class C naphtha (not to exceed 6,000 gallons aggregate). Neither the Fire Department nor the Woburn Health Department had any records

of problems on this property.

MUNICIPAL FILE REVIEW

The Woburn Assessors Office supplied information concerning the site's ownership, location, abutters and zoning. The Conservation Department provided information on flood zones and wetlands. Lynne Davis of the Conservation Commission revealed that no wetlands maps exist for the property. However, due to the fact that water accumulates in the northeast corner of the site, and previous reports have called this area a wetland, she stated that the portion of the site where the depression exists could be considered an isolated area subject to flooding. According to Mr. Riley, this area is the detection pond which the City of Woburn Planning Board required during the development of the back 6 acres in 1987. The Health Department had no information concerning complaints or violations on the site. However, according to Jack Fralick, the Woburn Health Inspector, several environmental assessments and DEP and EPA investigations have been completed for the site and its surrounding properties due to the contamination of Wells G and H which is listed 296th on the National Priority List. These properties include: Whitney Barrel at 256 Salem Street, Aberjona Automotive at 280 Salem Street, Dowd Enterprises at 99 Wildwood Avenue, Murphy's Waste Oil at 252 Salem Street, and Sutherland Foundry at 3 Aberjona Drive. The Woburn Fire Department and City Clerk's office provided above/underground storage tank information.

EPA/DEP FILE REVIEW

A review of Incident Response Files, Hazardous Waste Generator List, and Water Supply Overlays from the Woburn office of the DEP and from the 21E Inc. in-house database revealed that the property under assessment is listed as DEP site number 3-0486. A report from 1985, revealed that water samples were taken from the production well that is located west of the railroad property and northeast on the property under assessment. The water from PW #1 was reported to be contaminated with 1,1,1-trichloroethane (28 ppb), trans-1,2-dichloroethene (12 ppb), trichloroethene (53 ppb), and chlorobenzene (10 ppb). According to a report, several chemicals had been used on the site including: benzidine, phenols, 1,1,1-trichloroethane, butyl acetate, ortho-dichlorobenzene, and fuel oil.

A review of the Miscellaneous File for the City of Woburn revealed that a memorandum and a letter were filed for the site under assessment. The memorandum, dated September 20, 1985, was regarding an odor emanating from J.J. Riley Co. A Sanitary Engineer for the City of Woburn identified the odor as hydrogen

sulfide and determined that further investigation was necessary. The site under assessment is also listed on the RCRA List as a hazardous waste generator (MAD001035872).

Files were also reviewed for properties within a half mile radius of the site under assessment. A report was filed for Sutherland Foundry (site no. 3-0195) on December 31, 1985. This property is located at 3 Aberjona Drive, 1,600 feet east of the site topographically downgradient. Soil testing during the removal of the tank on 11/21/85, revealed that three or four cubic yards of soil had been contaminated by spills during past filling of the tank. It was recommended to the owner of the property that the soil be removed and disposed of properly.

A letter from the Division of Water Control dated 10/10/80, was reviewed for the property across the B&M railroad tracks currently owned by Wildwood Conservation Trust. This property is topographically downgradient from the subject property. This letter revealed that old barrels containing hazardous waste were discovered at the site, which was then owned by Beatrice. The letter demanded that the barrels be removed to an authorized disposal location.

On December 24, 1986, a report was filed for 99 Wildwood Avenue (site no. 3-1063), currently Dowd Enterprises, which abuts the site to the north and lies at the same topographic gradient as the site under assessment. The report revealed that no significant amounts of organics, cyanide, or phenolic compounds were detected and no hazardous materials were present on the property in quantities that could result in liability under state law. No further information was available for this property.

Also to the north of the site is 225 Wildwood Avenue (site no. 3-1966), currently Toxikon Laboratories, which lies at the same topographic gradient as the subject property. A report filed on June 24, 1988, revealed that soil samples obtained from the property contained low levels of volatile compounds as well as chromium, lead, barium, and arsenic. All detected concentrations were below federal limits. Ground water samples from the property revealed metal contamination but, because the nearby public water wells "G" and "H" have been closed due to contamination by volatile compounds, it was determined by that consultant that the ground water contamination posed no threat.

A proposal to remove contaminated soil from Murphy's Waste Oil (site no. 3-2195), located on 252 Salem Street, was reviewed. This property is 150 feet east of the site and topographically downgradient. In a letter to DEP dated February 17, 1989, it was

revealed that 1500 cubic yards of petroleum contaminated soil existed below eight feet of fill material at this property. Ground water samples taken on 2/3/93, revealed BTEX contamination in only one well at a level of 28 ppb, total oil and grease contamination levels ranging from 23-48 ppm, and petroleum contamination levels ranging from 1.3-40 ppm. Soil samples taken 1/31/89 and 2/3/89 revealed BTEX contamination in only two borings at concentrations of 10 and 22 ppb. Total oil and grease contamination was as high as 26,000 ppm on this property, while petroleum hydrocarbon contamination levels ranged from 13-20,000 ppm. According to the letter, it was proposed that the contaminated soil be removed and stored on and covered by polyethylene sheets. As of 2/17/89, a Phase I assessment was in process on this property.

The review of a report on the former Whitney Barrel Company (site no. 3-0534) located at 256 Salem Street, 400 feet east of the site and topographically downgradient, revealed the occurrence of extreme contamination. While attempting to advance a soil boring at this site, black sludge like material was encountered at 3.5 feet by a remedial investigation contractor for the Wells G and H site. VOC vapors were detected at a concentration of 250 ppm. As a result of these findings a Notice of Responsibility was issued in December of 1986. Soil samples from the property were discovered to be contaminated with the following: four metals - antimony, arsenic, lead, and mercury; volatile organic compounds - in one sample at a concentration exceeding 100 ug/kg (ppb - parts per billion); base/neutral extractable compounds; the pesticide chlordane - the highest concentration being 26.8 mg/kg (ppm - parts per million); and PCBs in concentrations up to 94.8 mg/kg (ppm). The ground water at the property contained many of the same contaminants except for antimony, lead, and chlordane. The highest concentrations of many of the contaminants at the Whitney Barrel property were discovered in sediments retained in floor drains within the building that exists on that property.

Wells G & H is a DEP site (site no. 3-0479) and is listed 296th on Superfund's National Priority List. It is located 1,600 feet northeast of the site under assessment and topographically downgradient. The latest report on this site was filed in 1987 and stated that five properties have contributed to the contamination of Wells G & H. The groundwater in the Wells G & H area was determined to be primarily contaminated with trichloroethene (TCE), tetrachloroethene (PCE), and polyaromatic hydrocarbons (PAHs). The sources of contamination were determined to be Wildwood Conservation Trust, Olympia Nominee, Unifirst, W.R. Grace, and New England Plastics. The highest level of TCE and PCE contamination in soil, 100,000 ppb and

1,200,000 ppb respectively, was discovered at New England Plastics. The highest level of PAH contamination in soil, 43,000 ppb, was discovered at the Wildwood Conservation Trust property.

Groundwater flow direction and advancing contaminant plumes were assayed to determine the source of particular contaminants at Wells G & H. A plume of TCE existed in the overburden and bedrock aquifer at the W.R. Grace property, a plume of PCE existed in the overburden and bedrock aquifers at the Unifirst and New England Plastics properties, and the overburden at the Wildwood and Olympia Nominee properties contained TCE. No further information on this site was available from either DEP or EPA at the time of review.

A review of the miscellaneous file for Woburn revealed two incident response reports. The reports, dated 3/5/90 and 6/10/90, were filed for a property at 239 Salem Street, located across Salem Street to the south and at the same topographic gradient as the subject property. An oil line leaked and an unknown amount of #2 heating oil bubbled up into the basement of the building. The line was replaced and the contaminated soil removed.

A review of the spills list for the City of Woburn revealed the following spills (one on site) occurred within a half mile radius of the site:

Imperial Transportation on 228 Salem St. - 500 gallons of #6 fuel oil was spilled on 12/24/86

3 Aberjona Dr. - degreasing solvents spilled on 6/17/88

All Electric on Aberjona Way - a spill occurred on 11/29/83

Continental Court Apartments on Beach St. & Continental Way - 30 gallons of #2 fuel oil was spilled on 4/4/84

5 Crescent St. - 1-10 gallons of waste oil was spilled on 3/21/89

252 Salem St. - 10-50 gallons of hydraulic fluid was spilled on 8/3/90

275 Salem St. - miscellaneous oil was spilled on 9/24/91

239 Salem St. - #2 fuel oil was spilled on 3/5/90

Jack Whitney on 256 Salem St. - 10 gallons of #2 fuel oil was spilled on 1/14/86 - 10-50 gallons of waste/diesel oil was spilled on 3/26/90

250-252 Salem St. - diesel fuel was spilled on 12/17/87

S.S. Pierce Co. on 10 Wildwood St - 60 gallons of gasoline was spilled on 2/2/81

A review of the RCRA Hazardous Waste Generators List revealed the following generators are located within a half mile of the site:

MAD019722594 - Aberjona Auto Parts - 278-280 Salem St.
MAD085604544 - Bioassay Systems Corp. - 225 Wildwood Ave.
MAD059709618 - Consolidated Freightways - 295 Salem St.
MAD980522049 - General Electric - 215 Salem St.
MAD000358655 - Bill Murphy Waste Oil - 263 Salem St.
MAD066588005 - Murphy's Waste Oil Service - 252 Salem St.
MAD036331336 - New England Aerosol Inc. - 6 Aberjona Dr.
MAD985267087 - Phil's Auto Service - 256 Salem St.
MAD046397949 - Salem Street Auto Body Inc. - 111 Salem St.
MAD982190878 - Schneider Auto Repair - 275 Salem St.
MAD075362129 - Schneider Bros. Auto Body Inc. - 275R Salem St.
MAD982196636 - Toxikon Corp. - 225 Wildwood Ave.
MAD019725324 - Whitney Barrel Co. - 256 Salem St.
MAD981065030 - Woburn Foreign Motors Bodyshop - 5 Aberjona Rd.

FIELD METHODS

5. FIELD METHODS

GROUND WATER SAMPLE COLLECTION

Groundwater from six of the seven on site monitoring wells was sampled on April 16, 1993. The seventh well, MW2, was not sampled at that time due to what was believed to be an obstruction or break in the PVC pipe that prevented the bailer from being lowered more than approximately 20 feet down the well. Upon further inspection, it was found that the PVC riser pipe was bent not broken, probably from the combination of having a heavy concrete block placed on the well so that it would not be damaged during building demolition, and winter frost heaves. After determining that MW2 was indeed intact, it was purged using a combination of a KV Systems submersible pump in series with a peristaltic pump and sampled with a one inch diameter stainless steel bottom filling bailer (See Appendix B).

Groundwater samples from monitoring wells MW1, MW2, MW3, MW4, RR-1, RR-2, and RR-3, were obtained for determination of volatile organic compounds via EPA method 8240. Groundwater samples from monitoring wells MW3, MW4, RR-1, and RR-2 were analyzed for concentrations of petroleum hydrocarbons. These wells were selected due to their locations both directly upgradient and down gradient of the former underground tank area. Groundwater samples from MW1, MW4, RR-1, and RR-2 were analyzed for concentrations of total Priority Pollutant metals. These wells were selected to collect background information (MW1) and from locations down gradient of former lagoons, catch basins and reported disposal areas (MW4, RR-1 and RR-2). Groundwater samples from MW3, MW4, and RR-2 were analyzed for concentrations of semi-volatile compounds. These wells were chosen based on their proximity to potential source areas, ie; lagoons and catch basins. A strict quality control program was utilized during the sampling procedures. Groundwater sampling was conducted according to 21E Inc. standard operating procedures.

Prior to sampling, groundwater level measurements were obtained with a water level indicator meter, Model 51453 manufactured by Slope Indicator, Co. Depth to the groundwater table was measured to the nearest 1/100th of an foot. Three standing well volumes were calculated for each monitoring well using the obtained groundwater level measurements and the specific monitoring well construction design. Three standing well volumes were purged from the monitoring wells using either a stainless steel bailer, a Masterflex peristaltic pump system equipped with dedicated PVC tubing, or the peristaltic pump

attached to a KV System submersible pump. The submersible pump and bailer are thoroughly cleaned with methanol and distilled water before sampling and between each monitoring well sampled. New PVC tubing is utilized for each monitoring well.

After recharge, groundwater samples were collected using a bottom filling stainless steel bailer. The bailer was thoroughly cleaned with methanol and distilled water before sampling and between each monitoring well sampled. New nylon rope was used for each well. Prior to filling the sample bottles, the bailer was rinsed with well water by filling and emptying the bailer three times. No unusual odors were detected during the purging and sampling activities.

Field/equipment blanks are a necessary procedure when sampling. An equipment blank was collected for volatile organic analysis but analysis was put on HOLD until necessary to complete. Equipment blanks are collected after sampling a suspected contaminated area. Since no suspected contaminated samples were collected, field/equipment blanks were not collected for every analysis.

Groundwater samples scheduled for volatile organic compound analysis (EPA Method 8240) were collected in new (certified cleaned) 40mL amber vials with a teflon seal cover. Care was taken to ensure no air bubbles were trapped in the samples. Two vials were collected from each well. VOA samples were preserved with HCl. The samples collected for metals analysis were collected in new (certified clean) HNO_3 preserved bottles. The remainder of the groundwater samples were collected in new (certified clean) 1000mL amber jars. Turbidity, low to moderate, was noted in the groundwater during sampling.

Groundwater samples from MW4 and RR-2 were recollected on May 5, 1993 for metals analysis. These samples were collected in new (certified cleaned) unpreserved bottles and immediately delivered to the laboratory for filtering, preservation and analysis.

Samples were immediately stored in a cold-packed cooler until shipment to a laboratory for analysis. Groundwater samples were hand delivered to the respective laboratories. Chain-of-custody forms were prepared and are included in Appendix C.

Groundwater samples were scheduled for volatile organic compound analysis (EPA method 8240), priority pollutant metals analysis, and semi-volatile organic analysis (EPA method 625) at Accutest Laboratories of New England, Inc. in Marlborough, MA.

Because 21E Inc. found that petroleum hydrocarbon methodologies are not consistent from laboratory to laboratory, groundwater analysis for petroleum hydrocarbons was scheduled at Environmental Consulting Laboratory, Inc. of Billerica, MA which sepecializes in petroleum hydrocarbon analysis by GC/FID.

ECL's detection limit for PHCs by GC/FID is 100 parts per billion. In general, the detection limit for Oil & Grease is in the part per million range (10 times higher). With regard to accurate quantitation, both Standard Methods 5520 F (formerly 503) and DEP Policy #WSC-401-91. 5520 F Oil and Grease/Hydrocarbon states that "the more polar hydrocarbons may be adsorbed by the silica gel" and "fatty matter recovered by the procedures for the determination of oil and grease also interfere." WSC-401-91 states that the oil and grease method (even IR and hydrocarbon cleanup) are subject to interferences (see Table 6 of Policy). Also see page 42 of the Policy for a more detailed description of possible interferences.

During the previous 21E Inc. investigation, the monitoring wells on the property were surveyed and depth to groundwater measurements were collected and converted to elevations to define the potentiometric surface or water table. The measurements were used to calculate the inferred groundwater flow direction, which was determined to be east. As part of this report, the inferred groundwater flow direction was calculated again using the most recent groundwater data and was determined to be east (see Figure 5).

RESULTS

6. RESULTS

CHEMICAL ANALYSIS

As previously described, groundwater samples were collected for selected laboratory analysis. The specific analysis chosen for each well was dependent on the location of the well. (See Field Methods for description of well locations.) For a summary of results refer to Table 1 and Appendix A.

VOLATILE ORGANIC COMPOUND ANALYSIS (EPA method 8240)

Six groundwater samples were analyzed for volatile organic compounds by EPA method 8240 at Accutest Laboratories of New England, Inc. in Marlborough, MA. VOA (volatile organic analysis) was performed due to the past solvent usage on the property and the previous analytical data generated from on- and off-site sources. This analytical method uses a purge and trap unit attached to a gas chromatograph with a mass spectrometer detector (GC/MS). Groundwater samples from MW1, MW3, MW4, RR-1, RR-2, and RR-3 were submitted for analysis of volatile organic compounds. The laboratory reported no levels of volatile organic compounds above the detection limit in any of the samples. The detection limit was 5.0 parts per billion (ppb) for most analytes.

PETROLEUM HYDROCARBON ANALYSIS

Four groundwater samples were submitted for petroleum hydrocarbon (PHC) analysis at Environmental Consulting Laboratory, Inc. of Billerica, MA. PHC analysis was chosen due to the past and present petroleum storage in the area and on the subject property. This method uses a solvent extraction of the sample, followed by concentration of the extract then injection into a gas chromatograph with a flame ionization detector (GC/FID).

The wells selected for PHC analysis are located surrounding the former underground tank area both in upgradient and down gradient locations. MW1 was selected for analysis to determine the possibility of background levels or off-site sources. MW3 was selected to represent an upgradient of the former tank area onsite location. Two wells located down gradient of the former tank area (MW4 and RR-2) were selected to determine if any possible contamination had migrated. The results of the four groundwater samples analyzed, MW1, MW3, MW4, and RR-2, reveal no

levels of petroleum hydrocarbons above the detection limit of 0.1 ppm.

PRIORITY POLLUTANT METALS

Four groundwater samples (MW1, MW4, RR-1, and RR-2) were analyzed for Priority Pollutant metals. MW1 was selected to represent background conditions. The proximity of RR-1 to the former lagoon and bag house compelled its selection for metals analysis. MW4 was selected for metals analysis due to its location immediately down gradient of the former hide storage area and former lagoon. The down gradient well RR-2 was sampled for metals to determine if any migration had occurred. Priority Pollutant metals include arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), lead (Pb), mercury (Hg), selenium (Se), silver (Ag), antimony (Sb), copper (Cu), nickel (Ni), thallium (Tl), and zinc (Zn). This method uses an acid digestion of the sample followed by analysis on a graphite furnace, or an atomic absorption unit, or an inductively coupled argon plasma instrument; with the exception of mercury which utilizes a cold vapor extraction procedure. See Table for summary of results.

The groundwater sample obtained from MW1 was reported to contain Arsenic at 0.010 ppm, Chromium at 0.039 ppm Copper at 0.040 ppm, Lead at 0.017 ppm, Nickel at 0.040 ppm, and Zinc at 0.15 ppm. The other metals were not reported above the method detection limit. The following metals were detected in MW4, As at 0.16 ppm, Be at 0.009 ppm, Cd at 0.019 ppm, Cr at 0.57 ppm, Cu at 0.56 ppm, Pb at 0.11 ppm, Ni at 0.30 ppm, Tl at 0.002 ppm, and zinc at 0.85 ppm. Antimony, mercury, selenium and silver were not reported above the method detection limit. RR-1 was reported to contain As at 0.021 ppm, Cr at 0.11 ppm, Cu at 0.078 ppm, Pb at 0.020 ppm, Ni at 0.080 ppm, Tl at 0.001 ppm, and Zn at 0.22 ppm. Antimony, beryllium, cadmium, mercury, selenium, and silver were not reported above the method detection limit. RR-2 was reported to contain As at 0.066 ppm, Cr at 0.20 ppm, Cu at 0.30 ppm, Pb at 0.055 ppm, Ni at 0.10 ppm, Tl at 0.002 ppm, and Zn at 0.68 ppm. Antimony, beryllium, cadmium, mercury, selenium, and silver were not reported above the method detection limit.

Although the groundwater onsite is not utilized as drinking water, the most commonly accepted set of standards are drinking water standards. The Safe Drinking Water Act (SDWA) has established standards at 0.05 ppm for arsenic, 0.01 ppm for cadmium, 0.05 ppm for chromium, 0.05 ppm for lead, 0.002 ppm for mercury, 0.01 ppm for selenium, and 0.05 ppm for silver. A draft version of ground water parameters according to the Code of Massachusetts Regulations is set to be finalized in the summer or

fall of 1993. The new regulations set standards for antimony at 0.006 ppm, arsenic at 0.05 ppm, beryllium at 0.004 ppm, cadmium at 0.005 ppm, chromium at 0.10 ppm, lead at 0.015 ppm, mercury at 0.002 ppm, nickel at 0.10 ppm, selenium at 0.05 ppm, silver at 0.05 ppm, thallium at 0.002 ppm, and zinc at 1.0 ppm. Levels of lead in MW1 are above the groundwater standards but below SDWA levels. Arsenic, beryllium, cadmium, chromium, lead and nickel are above the groundwater standards and SDWA levels in the groundwater collected at MW4 on April 15, 1993, except for nickel which has no SDWA level set. The groundwater sample collected at RR-1 reportedly contains levels of chromium and lead above the groundwater standards. Lead and chromium in RR-1 are above SDWA limits. Levels of arsenic, chromium and lead are above groundwater standards and SDWA limits in the groundwater collected from RR-2 on April 16, 1993.

Upon receipt of the analytical results, a review of field sampling notes was undertaken. The field notes indicate low to moderate turbidity in the groundwater samples collected during the April 15 and 16, 1993 sampling round. Turbidity, in general, indicates soil particles are suspended in the groundwater sample. Based on this observation and knowledge of the site and area, 21E Inc. proposed to resample at least two of the wells. During the second sampling of wells MW4 and RR-2, the samples were collected in unpreserved bottles. Samples were immediately hand delivered to the laboratory to be filtered prior to preservation. The purpose of this filtration was to remove all suspended particles and determine the true metallic content dissolved in the ground water samples. The second sampling of MW4 revealed that none of the thirteen Priority Pollutant Metals were reported above the method detection limit. The second sampling of RR-2 reported that zinc was present at a level of 0.053 ppm which is below the new draft groundwater standard set by the Code of Massachusetts Regulations and SDWA limits. All other metals were not reported above the method detection limit.

SEMIVOLATILE ORGANIC ANALYSIS (EPA method 625)

Three groundwater samples were chosen for semivolatile organic analysis (acid/base/neutral, ABN) at Accutest Laboratories of New England, Inc. in Marlborough, MA. ABN analysis was performed due to the past usage of benzidine and phenols in the manufacturing process on-site. MW3 and MW4 were selected for analysis due to their proximity to and down gradient location of possible source areas, ie; lagoon, bag house and hide storage areas. RR-2 was selected for analysis due to its location down gradient on the site. This method uses a solvent

extraction at an alkaline pH followed by a solvent extraction at an acidic pH. The extracts are concentrated then injected into a gas chromatograph with a mass spectrometer detector. Ground water samples from MW3, MW4, and RR-2 were submitted for analysis of semivolatile organic compounds. The results reported that MW3, MW4 and RR-2 contained butyl benzyl phthalate at concentrations of 23 ppb, 20 ppb, and 15 ppb respectively. Di-n-butyl phthalate was reported in both MW3 and MW4 at a concentration of 28 ppb and in RR-2 at a concentration of 30 ppb. However, both of these compounds, which are common laboratory contaminants were detected in the laboratory blank as well. The remaining semivolatile compounds, including pesticides and PCBs, were not reported above the method detection limit of 10 ppb in the groundwater samples analyzed.

SUMMARY AND CONCLUSION

7. SUMMARY AND CONCLUSION

The purpose of this investigation was to determine if a release or threat of release of oil or hazardous materials exists on the property located at 228 Salem Street in Woburn, MA since the previous 21E Inc. report dated 12/26/90. All pertinent information gathered has been presented herein. 21E Inc. has attempted to provide an accurate description of site conditions within the scope of this project.

The property is the former location of the Riley tanning company which began operations at the Site in approximately 1915. The Riley tanning company was a medium sized chrome tanning operation. The principle product was leather for shoes. As part of the process several chemicals were used on the site. Some of these are benzidine, phenols, 1,1,1-trichloroethane, butyl acetate, ortho-dichlorobenzene, and fuel oil (used as a heating fuel).

Previous investigations at the Site revealed that low levels of chlorinated solvents were present in the groundwater at the Site in 1985. The sludge which was produced from the former plant operations and which was collected in an on-site catch basin and lagoon, was analyzed for EP toxicity, according to previous reports. All levels of chemicals detected in the EP extract were within acceptable ranges. The analytical data and 310 CMR 30.125, which lists these materials as non hazardous (provided they do not fail the EP Toxicity test), indicate the materials are classified as not hazardous. 21E Inc. is of the opinion that the waste material would, if anything, become less hazardous over time, therefore testing the material for this scope was not deemed to be necessary.

During the previous 21E Inc. investigation, the monitoring wells on the property were surveyed and depth to groundwater measurements were collected and converted to elevations to define the potentiometric surface or water table. The measurements were used to calculate the inferred groundwater flow direction, which was determined to be east. As part of this report, the inferred groundwater flow direction was calculated again using the most recent groundwater data and was determined to be east.

The results of the 1990 analysis revealed no volatile organic compounds in the groundwater collected from MW1, MW2, MW3, MW4, RR-1, RR-2 or RR-3. Groundwater samples analyzed for petroleum hydrocarbons (MW1, MW2, MW3, MW4, and RR-2) revealed no petroleum products. Semivolatile analysis of groundwater collected from MW4 and RR-3 revealed no semivolatile compounds,

including pesticides and PCBs, present in the samples. Total RCRA metals analysis of groundwater from MW1, MW3, and RR-2 revealed no levels above the Drinking Water Standards as set forth by the Massachusetts Department of Environmental Protection. Soil samples (MW1, MW3 and MW4 at about 35') analyzed for total RCRA metals do not indicate levels above the commonly expected ranges.

A site visit and inspection was completed during the course of this investigation. The site is vacant and previously existing buildings have been razed. No record of the disposal of the razed building materials was available. However, since no recently disturbed areas were noted onsite, it is assumed that the materials were removed from the property. A tar-like substance was noted during a visit to the site during heavy rains. This substance appeared to be seeping up through cracks in the asphalt in the north central portion of the lot. A close inspection of the material revealed tar-like odors and a semisolid state. This material was not observed during all visits. In fact, the material was only observed during the period of extremely high volumes of rain. It is suspected that these materials are either a nonhardened asphaltic compound or mixture or remnants of the reportedly previously landfilled, nonhazardous, sludge materials.

An update, since 1990, of municipal and state (DEP) files was completed as part of this investigation. Municipal records reveal several site investigations have been conducted in the immediate area since 1985. These properties include Whitney Barrel Company at 256 Salem Street, Murphy Waste Oil Company at 252 Salem Street, the property at 225 Wildwood Avenue, and Woburn Municipal Wells G and H. Fire Department records included documentation of the removal of three 15,000 gallon underground fuel oil storage tanks from the Riley property. Several other underground storage tanks exist in the area.

DEP records included reports on a subsurface investigation at Murphy Waste Oil Company property. This investigation found soils and groundwater contaminated with volatile organic compounds, petroleum, and PCBs. A study at 225 Wildwood Avenue revealed volatile organic contamination in both soil and groundwater on-site. An NOR was issued to Whitney Barrel at 256 Salem Street. The NOR required subsurface investigation at the property. The subsurface investigation revealed contamination of both soil and groundwater with volatile organic compounds, semivolatile organic compounds, PCBs, and metals. Further investigations are ongoing at the property.

A resampling of the seven on-site wells was conducted during

the course of this investigation. All seven wells were sampled for volatile organic compounds. No compounds were reported above the detection limit. No petroleum hydrocarbons were detected in the four wells sampled.

Four wells were analyzed for Priority Pollutant metals. The initial sampling round reported elevated levels of metals in all four samples. Field notes indicated suspended particles in the groundwater samples. Resampling of the two wells which reported the highest concentrations was undertaken and the samples were filtered of suspended particles prior to preservation and analysis. With the exception of low levels of zinc (below Safe Drinking Water Act and 310 CMR 40 DRAFT groundwater standards) no metals were reported above the detection limits in either sample. Therefore, the levels of metals reported in the other two samples analyzed without filtering are most likely due to suspended solids not from actual metal content in the groundwater.

Two phthalates were detected in each of the three groundwater samples analyzed for semivolatile organic compounds. However, both of these phthalates were also detected in the laboratory blanks. It is most probable that the phthalates are due to laboratory contamination and are not site contaminants.

Based on the data collected during the course of this investigation, it is the opinion of 21E Inc. that there is no evidence of a release of oil or hazardous materials to the groundwater on the property located at 228 Salem Street in Woburn, MA. In addition, based on data obtained from this investigation and previous investigations, it appears that previous operations at the property have not adversely affected the environmental integrity of the Site.

CERTIFICATION

8. CERTIFICATION

This report was prepared and reviewed by the following:

Heidi L. Porter
PRINCIPAL RESEARCHER

Patricia F. Foster
PROJECT GEOLOGIST

David R. Columbus
VICE PRESIDENT

RESEARCH SOURCES

8. RESEARCH SOURCES

Barbara Nowell - City Clerk's Office
City Hall
Woburn, MA
(617) 932-4400

Assessors Office
City Hall
Woburn, MA
(617) 932-4400

Building Department
City Hall
Woburn, MA
(617) 932-4400

Engineering Department
City Hall
Woburn, MA
(617) 932-4400

Jack Fralick - Health Department
City Hall
Woburn, MA
(617) 932-4400

Lieutenant John Matheson - Woburn Fire Department
Main Street
Woburn, MA
(617) 935-1636

Lynne Davis - Conservation Commission
City Hall
Woburn, MA
(617) 932-4400

DEP - Regional Office
10 Commerce Way
Woburn, MA
(617) 935-2160

Anna Mayor - DEP Boston Office
1 Winter Street
Boston, Ma
(617) 556-1112

21E INC.

EPA - Boston Office
Canal Street
Boston, MA
(617) 565-3420

Boston North, MA 7.5 X 15 Minute topographic quadrangle map (1985); published by USGS; scale 1:25000 metric.PA

FIGURE 1

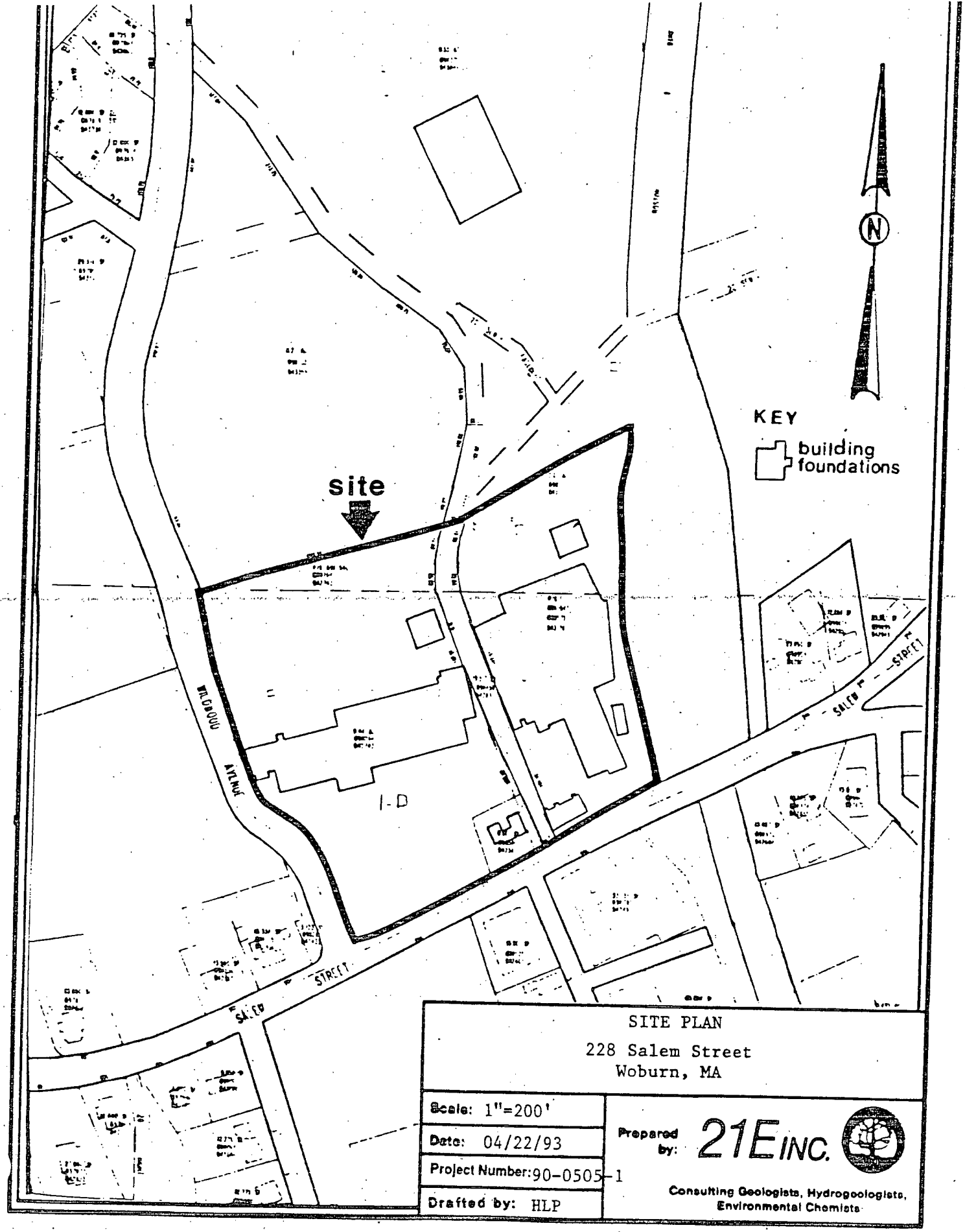
TOPOGRAPHIC MAP

228 Salem Street
Woburn, MA

21E INC.

Consulting Geologists,
Hydrogeologists,
Environmental Chemists

FIGURE 2



SITE PLAN

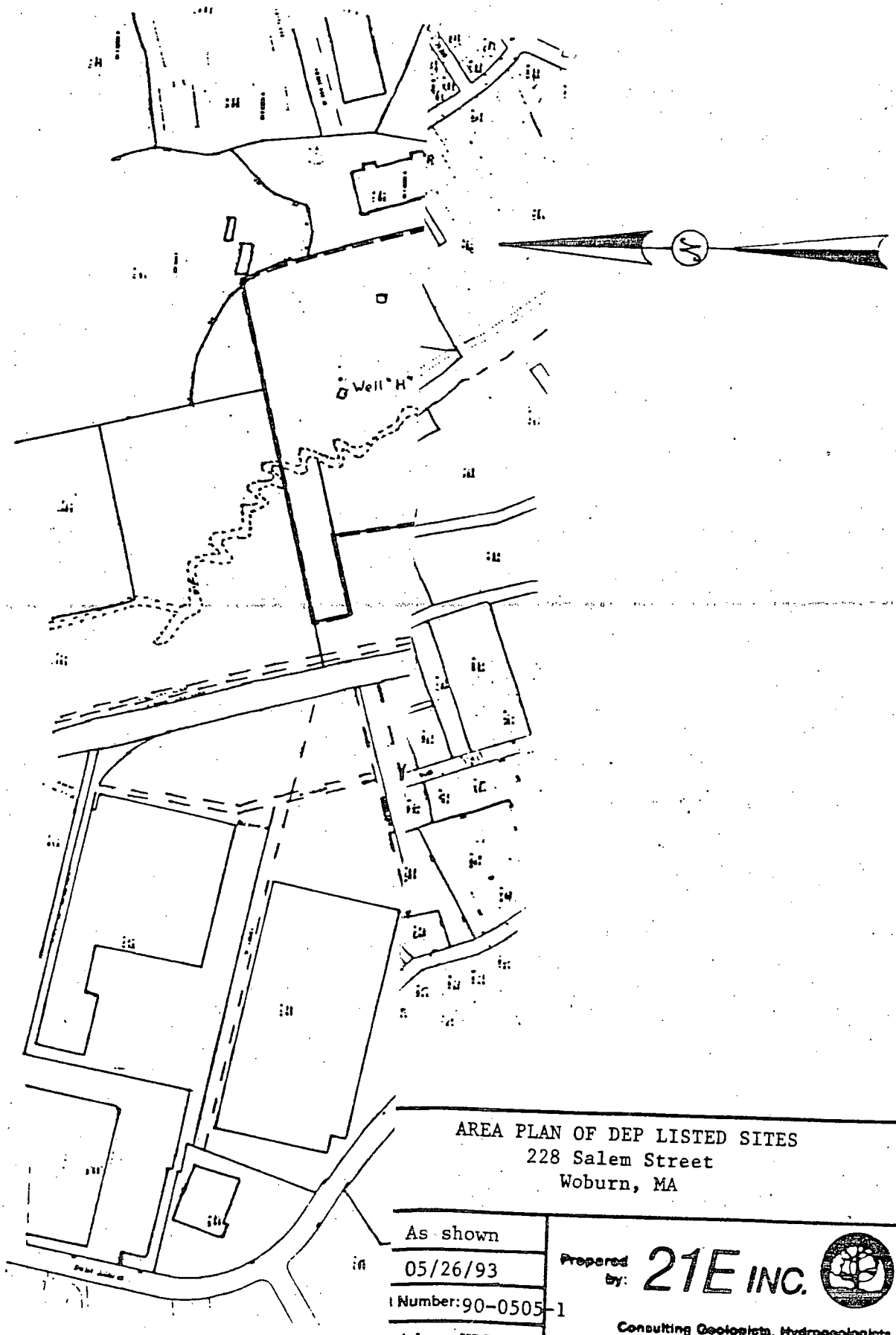
228 Salem Street
Woburn, MA

Scale:	1"=200'
Date:	04/22/93
Project Number:	90-0505-1
Drafted by:	HLP

Prepared by: 21E INC.

Consulting Geologists, Hydrogeologists, Environmental Chemists

FIGURE 3



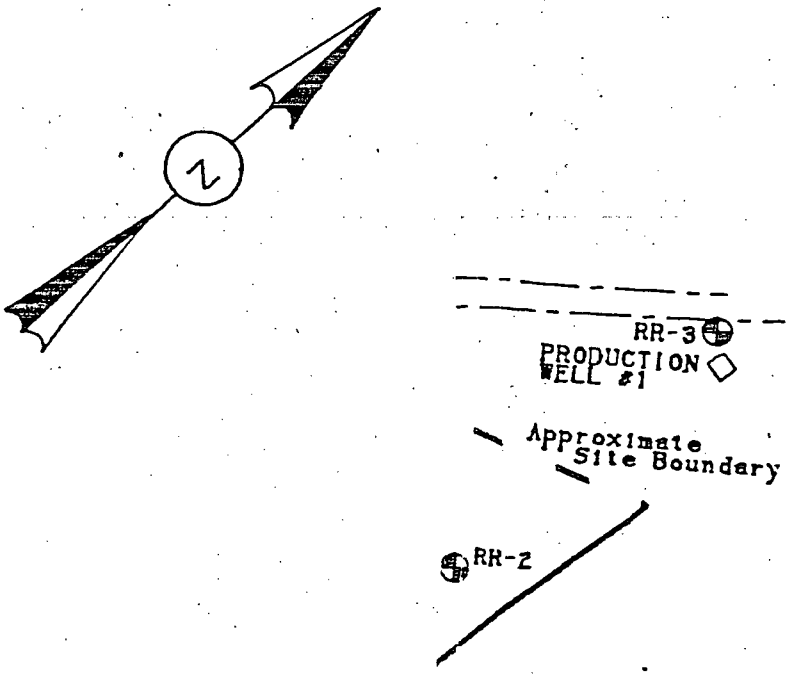
AREA PLAN OF DEP LISTED SITES
228 Salem Street
Woburn, MA

	As shown
	05/26/93
Number:	90-0505-1
ed by:	HLP

Prepared by: 21E INC.

Consulting Geologists, Hydrogeologists, Environmental Chemists

FIGURE 4



KEY

MONITORING WELL LOCATION

FORMER BUILDING LOCATION

0 50

SCALE

MONITORING WELL LOCATION PLAN
228 Salem Street
Woburn, MA

As shown

06/03/93

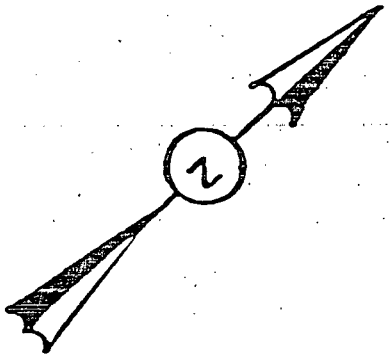
Project Number: 90-0505-2

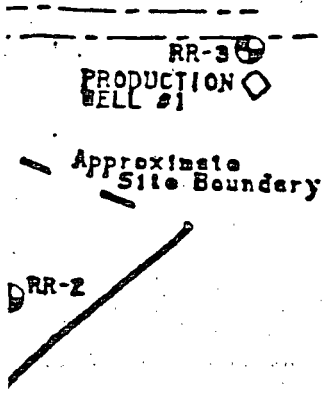
Prepared by: SMH

Prepared by: 21E INC.

Consulting Geologists, Hydrogeologists, Environmental Chemists

FIGURE 5





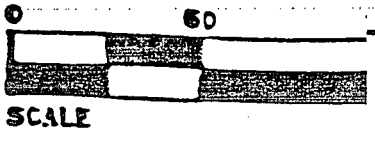
KEY

MONITORING WELL LOCATION

FORMER BUILDING LOCATION

GROUNDWATER CONTOUR INTERVAL

INFERRED GROUNDWATER FLOW DIRECTION



GROUNDWATER CONTOUR MAP

228 Salem Street
Woburn, MA

: as shown	
08/10/93	
t Number: 90-0505-2	
ed by: HLP	

Prepared by: 21E INC.

Consulting Geologists, Hydrogeologists, Environmental Chemists

APPENDIX A

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

21E INC.
330 BOSTON ROAD SUITE 4
BILLERICA, MA 01862

DATE: 04/29/93
JOB No: 930367N
PROJECT No: 90-0505-1
SAMPLE RECEIVED: 04/16/93

ATTN: PAUL MAGGIORE

SAMPLE SUMMARY

SAMPLE No	COLLECTED DATE	TIME	BY	POINT OF COLLECTION
E301355N	04/15/93	16:03	PFF	GROUND WATER - MW-1; SALEM STREET, WOBURN, MA
E301356N	04/15/93	15:40	PFF	GROUND WATER - MW-3; SALEM STREET, WOBURN, MA
E301357N	04/15/93	17:00	PFF	GROUND WATER - MW-4; SALEM STREET, WOBURN, MA
E301358N	04/15/93	11:47	PFF	GROUND WATER - RR-1; SALEM STREET, WOBURN, MA
E301359N	04/16/93	08:15	PFF	GROUND WATER - RR-2; SALEM STREET, WOBURN, MA
E301360N	04/16/93	08:45	PFF	GROUND WATER - RR-3; SALEM STREET, WOBURN, MA

REZA TAND
LAB DIRECTOR

TECHNICAL REPORT FOR

21E INC.

SAMPLES TAKEN AT:	SALEM STREET,
CLIENT PROJECT ID:	90-0505-1
ACCUTEST JOB NUMBER:	930367N
SAMPLES RECEIVED AT ACCUTEST ON:	04/16/93
NUMBER OF SAMPLES IN THIS REPORT:	6
TOTAL NUMBER OF PAGES IN REPORT:	33

REZA TAND
LAB DIRECTOR

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

		DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial :	>A8282	04/20/93
LAB SAMPLE #	: E301355N	Dilution #1 :	
MATRIX	: WATER	Dilution #2 :	
METHOD	: SW846 8240		

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACROLEIN	ND	100	
2)	ACRYLONITRILE	ND	100	
3)	BENZENE	ND	5.0	
4)	BROMOFORM	ND	5.0	
5)	BROMODICHLOROMETHANE	ND	5.0	
6)	BROMOMETHANE	ND	10	
7)	CARBON TETRACHLORIDE	ND	5.0	
8)	CHLOROBENZENE	ND	5.0	
9)	CHLOROETHANE	ND	10	
10)	2-CHLOROETHYL VINYL ETHER	ND	10	
11)	CHLOROFORM	ND	5.0	
12)	CHLOROMETHANE	ND	10	
13)	cis-1,3-DICHLOROPROPENE	ND	5.0	
14)	DIBROMOCHLOROMETHANE	ND	5.0	
15)	1,2-DICHLOROBENZENE	ND	5.0	
16)	1,3-DICHLOROBENZENE	ND	5.0	
17)	1,4-DICHLOROBENZENE	ND	5.0	
18)	1,1-DICHLOROETHANE	ND	5.0	
19)	1,2-DICHLOROETHANE	ND	5.0	
20)	1,1-DICHLOROETHYLENE	ND	5.0	
21)	trans-1,2-DICHLOROETHYLENE	ND	5.0	
22)	trans-1,3-DICHLOROPROPENE	ND	5.0	
23)	1,2-DICHLOROPROPANE	ND	5.0	
24)	ETHYLBENZENE	ND	5.0	
25)	METHYLENE CHLORIDE	ND	5.0	
26)	1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27)	TETRACHLOROETHYLENE	ND	5.0	
28)	TOLUENE	ND	5.0	
29)	1,1,1-TRICHLOROETHANE	ND	5.0	
30)	1,1,2-TRICHLOROETHANE	ND	5.0	
31)	TRICHLOROETHYLENE	ND	5.0	
32)	TRICHLOROFLUOROMETHANE	ND	5.0	
33)	VINYL CHLORIDE	ND	10	
34)	XYLENES, TOTAL	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT

SAMPLE No	COLLECTED DATE	TIME	BY	POINT OF COLLECTION
E301355N	04/15/93	16:03	PFF	GROUND WATER - MW-1; SALEM STREET, WOBURN, MA

TEST DESCRIPTION	RESULT	MDL	UNITS	DATE	INIT
ANTIMONY	<0.005	0.005	MG/L	04/27/93	HBM
ARSENIC	0.010	0.001	MG/L	04/27/93	HBM
BERYLLIUM	<0.005	0.005	MG/L	04/23/93	HBM
CADMIUM	<0.010	0.010	MG/L	04/23/93	HBM
CHROMIUM	0.039	0.025	MG/L	04/23/93	HBM
COPPER	0.040	0.020	MG/L	04/23/93	HBM
LEAD	0.017	0.005	MG/L	04/23/93	HBM
MERCURY	<0.001	0.001	MG/L	04/26/93	HBM
NICKEL	0.040	0.040	MG/L	04/23/93	HBM
SELENIUM[1]	<0.010	0.010	MG/L	04/26/93	HBM
SILVER	<0.030	0.030	MG/L	04/28/93	HBM
THALLIUM	<0.001	0.001	MG/L	04/28/93	HBM
ZINC	0.15	0.050	MG/L	04/27/93	HBM

[1] DIL'N REQUIRED DUE TO INTERFERENCE RESULTING IN ELEVATED MDL.

ND = NOT DETECTED
UG/L = PPB MG/L = PPM
MDL = METHOD DETECTION LIMIT

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

		DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial :	>A8285 04/20/93
LAB SAMPLE #	: E301356N	Dilution #1 :	
MATRIX	: WATER	Dilution #2 :	
METHOD	: SW846 8240		

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACROLEIN	ND	100	
2)	ACRYLONITRILE	ND	100	
3)	BENZENE	ND	5.0	
4)	BROMOFORM	ND	5.0	
5)	BROMODICHLOROMETHANE	ND	5.0	
6)	BROMOMETHANE	ND	10	
7)	CARBON TETRACHLORIDE	ND	5.0	
8)	CHLOROBENZENE	ND	5.0	
9)	CHLOROETHANE	ND	10	
10)	2-CHLOROETHYL VINYL ETHER	ND	10	
11)	CHLOROFORM	ND	5.0	
12)	CHLOROMETHANE	ND	10	
13)	cis-1,3-DICHLOROPROPENE	ND	5.0	
14)	DIBROMOCHLOROMETHANE	ND	5.0	
15)	1,2-DICHLOROBENZENE	ND	5.0	
16)	1,3-DICHLOROBENZENE	ND	5.0	
17)	1,4-DICHLOROBENZENE	ND	5.0	
18)	1,1-DICHLOROETHANE	ND	5.0	
19)	1,2-DICHLOROETHANE	ND	5.0	
20)	1,1-DICHLOROETHYLENE	ND	5.0	
21)	trans-1,2-DICHLOROETHYLENE	ND	5.0	
22)	trans-1,3-DICHLOROPROPENE	ND	5.0	
23)	1,2-DICHLOROPROPANE	ND	5.0	
24)	ETHYLBENZENE	ND	5.0	
25)	METHYLENE CHLORIDE	ND	5.0	
26)	1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27)	TETRACHLOROETHYLENE	ND	5.0	
28)	TOLUENE	ND	5.0	
29)	1,1,1-TRICHLOROETHANE	ND	5.0	
30)	1,1,2-TRICHLOROETHANE	ND	5.0	
31)	TRICHLOROETHYLENE	ND	5.0	
32)	TRICHLOROFLUOROMETHANE	ND	5.0	
33)	VINYL CHLORIDE	ND	10	
34)	XYLENES, TOTAL	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

			DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial	: >B3315	04/20/93
LAB SAMPLE #	: E301356N	Dilution #1	:	
MATRIX	: WATER	Dilution #2	:	
METHOD	: EPA 625			

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACENAPHTHENE	ND	10	
2)	ACENAPHTHYLENE	ND	10	
3)	ANTHRACENE	ND	10	
4)	BENZIDENE	ND	52	
5)	BENZO(A)ANTHRACENE	ND	10	
6)	BENZO(A)PYRENE	ND	10	
7)	BENZO(B)FLUORANTHENE	ND	10	
8)	BENZO(K)FLUORANTHENE	ND	10	
9)	BENZO(G,H,I)PERYLENE	ND	10	
10)	BIS(2-CHLOROETHOXY)METHANE	ND	10	
11)	BIS(2-CHLOROETHYL)ETHER	ND	10	
12)	BIS(2-CHLOROISOPROPYL)ETHER	ND	10	
13)	BIS(2-ETHYLHEXYL)PHTHALATE	ND	10	
14)	4-BROMOPHENYL PHENYL ETHER	ND	10	
15)	BUTYL BENZYL PHTHALATE	23	10	B
16)	2-CHLORONAPHTHALENE	ND	10	
17)	4-CHLOROPHENYL PHENYL ETHER	ND	10	
18)	CHRYSENE	ND	10	
19)	DIBENZO(A,H)ANTHRACENE	ND	10	
20)	1,2-DICHLOROBENZENE	ND	10	
21)	1,3-DICHLOROBENZENE	ND	10	
22)	1,4-DICHLOROBENZENE	ND	10	
23)	3,3'-DICHLOROBENZIDENE	ND	21	
24)	DIETHYL PHTHALATE	ND	10	
25)	DIMETHYL PHTHALATE	ND	10	
26)	DI-N-BUTYL PHTHALATE	28	10	B
27)	2,4-DINITROTOLUENE	ND	10	
28)	2,6-DINITROTOLUENE	ND	10	
29)	DI-N-OCTYL PHTHALATE	ND	10	
30)	1,2-DIPHENYLHYDRAZINE	ND	10	
31)	FLUORANTHENE	ND	10	
32)	FLUORENE	ND	10	
33)	HEXACHLOROBENZENE	ND	10	
34)	HEXACHLOROBUTADIENE	ND	10	
35)	HEXACHLOROCYCLOPENTADIENE	ND	10	
36)	HEXACHLOROETHANE	ND	10	
37)	INDENO(1,2,3-CD)PYRENE	ND	10	
38)	ISOPHORONE	ND	10	
39)	NAPHTHALENE	ND	10	
40)	NITROBENZENE	ND	10	
41)	N-NITROSODIMETHYLAMINE	ND	10	
42)	N-NITROSODI-N-PROPYLAMINE	ND	10	
43)	N-NITROSODIPHENYLAMINE	ND	10	
44)	PHENANTHRENE	ND	10	
45)	PYRENE	ND	10	
46)	1,2,4-TRICHLOROBENZENE	ND	10	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR ACID EXTRACTABLES BY GC/MS

		DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial :	>B3315 04/20/93
LAB SAMPLE #	: E301356N	Dilution #1 :	
MATRIX	: WATER	Dilution #2 :	
METHOD	: EPA 625		

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	4-CHLORO-3-METHYL PHENOL	ND	21	
2)	2-CHLOROPHENOL	ND	10	
3)	2,4-DICHLOROPHENOL	ND	10	
4)	2,4-DIMETHYLPHENOL	ND	52	
5)	2,4-DINITROPHENOL	ND	52	
6)	2-METHYL-4,6-DINITROPHENOL	ND	10	
7)	2-NITROPHENOL	ND	10	
8)	4-NITROPHENOL	ND	52	
9)	PENTACHLOROPHENOL	ND	52	
10)	PHENOL	ND	10	
11)	2,4,6-TRICHLOROPHENOL	ND	10	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

		DATA FILES	ANALYSIS DATE
CLIENT	: 21E		
LAB SAMPLE #	: E301357N	Initial :	>A8286 04/20/93
MATRIX	: WATER	Dilution #1 :	
METHOD	: SW846 8240	Dilution #2 :	

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACROLEIN	ND	100	
2)	ACRYLONITRILE	ND	100	
3)	BENZENE	ND	5.0	
4)	BROMOFORM	ND	5.0	
5)	BROMODICHLOROMETHANE	ND	5.0	
6)	BROMOMETHANE	ND	10	
7)	CARBON TETRACHLORIDE	ND	5.0	
8)	CHLOROBENZENE	ND	5.0	
9)	CHLOROETHANE	ND	10	
10)	2-CHLOROETHYL VINYL ETHER	ND	10	
11)	CHLOROFORM	ND	5.0	
12)	CHLOROMETHANE	ND	10	
13)	cis-1,3-DICHLOROPROPENE	ND	5.0	
14)	DIBROMOCHLOROMETHANE	ND	5.0	
15)	1,2-DICHLOROBENZENE	ND	5.0	
16)	1,3-DICHLOROBENZENE	ND	5.0	
17)	1,4-DICHLOROBENZENE	ND	5.0	
18)	1,1-DICHLOROETHANE	ND	5.0	
19)	1,2-DICHLOROETHANE	ND	5.0	
20)	1,1-DICHLOROETHYLENE	ND	5.0	
21)	trans-1,2-DICHLOROETHYLENE	ND	5.0	
22)	trans-1,3-DICHLOROPROPENE	ND	5.0	
23)	1,2-DICHLOROPROPANE	ND	5.0	
24)	ETHYLBENZENE	ND	5.0	
25)	METHYLENE CHLORIDE	ND	5.0	
26)	1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27)	TETRACHLOROETHYLENE	ND	5.0	
28)	TOLUENE	ND	5.0	
29)	1,1,1-TRICHLOROETHANE	ND	5.0	
30)	1,1,2-TRICHLOROETHANE	ND	5.0	
31)	TRICHLOROETHYLENE	ND	5.0	
32)	TRICHLOROFLUOROMETHANE	ND	5.0	
33)	VINYL CHLORIDE	ND	10	
34)	XYLENES, TOTAL	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

			DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial	: >B3316	04/20/93
LAB SAMPLE #	: E301357N	Dilution #1	:	
MATRIX	: WATER	Dilution #2	:	
METHOD	: EPA 625			

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACENAPHTHENE	ND	10	
2)	ACENAPHTHYLENE	ND	10	
3)	ANTHRACENE	ND	10	
4)	BENZIDENE	ND	52	
5)	BENZO(A)ANTHRACENE	ND	10	
6)	BENZO(A)PYRENE	ND	10	
7)	BENZO(B)FLUORANTHENE	ND	10	
8)	BENZO(K)FLUORANTHENE	ND	10	
9)	BENZO(G,H,I)PERYLENE	ND	10	
10)	BIS(2-CHLOROETHOXY)METHANE	ND	10	
11)	BIS(2-CHLOROETHYL)ETHER	ND	10	
12)	BIS(2-CHLOROISOPROPYL)ETHER	ND	10	
13)	BIS(2-ETHYLHEXYL)PHTHALATE	ND	10	
14)	4-BROMOPHENYL PHENYL ETHER	ND	10	
15)	BUTYL BENZYL PHTHALATE	20	10	B
16)	2-CHLORONAPHTHALENE	ND	10	
17)	4-CHLOROPHENYL PHENYL ETHER	ND	10	
18)	CHRYSENE	ND	10	
19)	DIBENZO(A,H)ANTHRACENE	ND	10	
20)	1,2-DICHLOROBENZENE	ND	10	
21)	1,3-DICHLOROBENZENE	ND	10	
22)	1,4-DICHLOROBENZENE	ND	10	
23)	3,3'-DICHLOROBENZIDENE	ND	21	
24)	DIETHYL PHTHALATE	ND	10	
25)	DIMETHYL PHTHALATE	ND	10	
26)	DI-N-BUTYL PHTHALATE	28	10	B
27)	2,4-DINITROTOLUENE	ND	10	
28)	2,6-DINITROTOLUENE	ND	10	
29)	DI-N-OCTYL PHTHALATE	ND	10	
30)	1,2-DIPHENYLHYDRAZINE	ND	10	
31)	FLUORANTHENE	ND	10	
32)	FLUORENE	ND	10	
33)	HEXACHLOROBENZENE	ND	10	
34)	HEXACHLOROBUTADIENE	ND	10	
35)	HEXACHLOROCYCLOPENTADIENE	ND	10	
36)	HEXACHLOROETHANE	ND	10	
37)	INDENO(1,2,3-CD)PYRENE	ND	10	
38)	ISOPHORONE	ND	10	
39)	NAPHTHALENE	ND	10	
40)	NITROBENZENE	ND	10	
41)	N-NITROSODIMETHYLAMINE	ND	10	
42)	N-NITROSODI-N-PROPYLAMINE	ND	10	
43)	N-NITROSODIPHENYLAMINE	ND	10	
44)	PHENANTHRENE	ND	10	
45)	PYRENE	ND	10	
46)	1,2,4-TRICHLOROBENZENE	ND	10	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR ACID EXTRACTABLES BY GC/MS

		DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial :	>B3316 04/20/93
LAB SAMPLE #	: E301357N	Dilution #1 :	
MATRIX	: WATER	Dilution #2 :	
METHOD	: EPA 625		

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	4-CHLORO-3-METHYL PHENOL	ND	21	
2)	2-CHLOROPHENOL	ND	10	
3)	2,4-DICHLOROPHENOL	ND	10	
4)	2,4-DIMETHYLPHENOL	ND	52	
5)	2,4-DINITROPHENOL	ND	52	
6)	2-METHYL-4,6-DINITROPHENOL	ND	10	
7)	2-NITROPHENOL	ND	10	
8)	4-NITROPHENOL	ND	52	
9)	PENTACHLOROPHENOL	ND	52	
10)	PHENOL	ND	10	
11)	2,4,6-TRICHLOROPHENOL	ND	10	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT

SAMPLE No	COLLECTED DATE	TIME	BY	POINT OF COLLECTION
E301357N	04/15/93	17:00	PFF	GROUND WATER - MW-4; SALEM STREET, WOBURN, MA

TEST DESCRIPTION		RESULT	MDL	UNITS	DATE	INIT
ANTIMONY	GW-1	<0.005	0.005	MG/L	04/27/93	HBM
ARSENIC	50	0.16	0.001	MG/L	04/27/93	HBM
BERYLLIUM		0.009	0.005	MG/L	04/23/93	HBM
CADMIUM		0.019	0.010	MG/L	04/23/93	HBM
CHROMIUM	100	0.57	0.025	MG/L	04/23/93	HBM
COPPER		0.56	0.020	MG/L	04/23/93	HBM
LEAD	15	0.11	0.005	MG/L	04/23/93	HBM
MERCURY	2	<0.001	0.001	MG/L	04/26/93	HBM
NICKEL	100	0.30	0.040	MG/L	04/23/93	HBM
SELENIUM[1]	50	<0.010	0.010	MG/L	04/26/93	HBM
SILVER	50	<0.030	0.030	MG/L	04/28/93	HBM
THALLIUM	2	0.002	0.001	MG/L	04/28/93	HBM
ZINC	2000	0.85	0.050	MG/L	04/27/93	HBM

[1] DIL'N REQUIRED DUE TO INTERFERENCE RESULTING IN ELEVATED MDL.

ND = NOT DETECTED
UG/L = PPB MG/L = PPM
MDL = METHOD DETECTION LIMIT

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

			DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial	: >A8287	04/20/93
LAB SAMPLE #	: E301358N	Dilution #1	:	
MATRIX	: WATER	Dilution #2	:	
METHOD	: SW846 8240			

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACROLEIN	ND	100	
2)	ACRYLONITRILE	ND	100	
3)	BENZENE	ND	5.0	
4)	BROMOFORM	ND	5.0	
5)	BROMODICHLOROMETHANE	ND	5.0	
6)	BROMOMETHANE	ND	10	
7)	CARBON TETRACHLORIDE	ND	5.0	
8)	CHLOROBENZENE	ND	5.0	
9)	CHLOROETHANE	ND	10	
10)	2-CHLOROETHYL VINYL ETHER	ND	10	
11)	CHLOROFORM	ND	5.0	
12)	CHLOROMETHANE	ND	10	
13)	cis-1,3-DICHLOROPROPENE	ND	5.0	
14)	DIBROMOCHLOROMETHANE	ND	5.0	
15)	1,2-DICHLOROBENZENE	ND	5.0	
16)	1,3-DICHLOROBENZENE	ND	5.0	
17)	1,4-DICHLOROBENZENE	ND	5.0	
18)	1,1-DICHLOROETHANE	ND	5.0	
19)	1,2-DICHLOROETHANE	ND	5.0	
20)	1,1-DICHLOROETHYLENE	ND	5.0	
21)	trans-1,2-DICHLOROETHYLENE	ND	5.0	
22)	trans-1,3-DICHLOROPROPENE	ND	5.0	
23)	1,2-DICHLOROPROPANE	ND	5.0	
24)	ETHYLBENZENE	ND	5.0	
25)	METHYLENE CHLORIDE	ND	5.0	
26)	1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27)	TETRACHLOROETHYLENE	ND	5.0	
28)	TOLUENE	ND	5.0	
29)	1,1,1-TRICHLOROETHANE	ND	5.0	
30)	1,1,2-TRICHLOROETHANE	ND	5.0	
31)	TRICHLOROETHYLENE	ND	5.0	
32)	TRICHLOROFLUOROMETHANE	ND	5.0	
33)	VINYL CHLORIDE	ND	10	
34)	XYLENES, TOTAL	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT

SAMPLE No	COLLECTED DATE	TIME	BY	POINT OF COLLECTION
E301358N	04/15/93	11:47	PFF	GROUND WATER - RR-1; SALEM STREET, WOBURN, MA

TEST DESCRIPTION	RESULT	MDL	UNITS	DATE	INIT
ANTIMONY	<0.005	0.005	MG/L	04/27/93	HBM
ARSENIC	0.021	0.001	MG/L	04/27/93	HBM
BERYLLIUM	<0.005	0.005	MG/L	04/23/93	HBM
CADMIUM	<0.010	0.010	MG/L	04/23/93	HBM
CHROMIUM	0.11	0.025	MG/L	04/23/93	HBM
COPPER	0.078	0.020	MG/L	04/23/93	HBM
LEAD	0.020	0.005	MG/L	04/23/93	HBM
MERCURY	<0.001	0.001	MG/L	04/26/93	HBM
NICKEL	0.080	0.040	MG/L	04/23/93	HBM
SELENIUM[1]	<0.010	0.010	MG/L	04/26/93	HBM
SILVER	<0.030	0.030	MG/L	04/28/93	HBM
THALLIUM	0.001	0.001	MG/L	04/28/93	HBM
ZINC	0.22	0.050	MG/L	04/27/93	HBM

[1] DIL'N REQUIRED DUE TO INTERFERENCE RESULTING IN ELEVATED MDL.

ND = NOT DETECTED
UG/L = PPB MG/L = PPM
MDL = METHOD DETECTION LIMIT

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

		DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial :	>A8288 04/20/93
LAB SAMPLE #	: E301359N	Dilution #1 :	
MATRIX	: WATER	Dilution #2 :	
METHOD	: SW846 8240		

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACROLEIN	ND	100	
2)	ACRYLONITRILE	ND	100	
3)	BENZENE	ND	5.0	
4)	BROMOFORM	ND	5.0	
5)	BROMODICHLOROMETHANE	ND	5.0	
6)	BROMOMETHANE	ND	10	
7)	CARBON TETRACHLORIDE	ND	5.0	
8)	CHLOROBENZENE	ND	5.0	
9)	CHLOROETHANE	ND	10	
10)	2-CHLOROETHYL VINYL ETHER	ND	10	
11)	CHLOROFORM	ND	5.0	
12)	CHLOROMETHANE	ND	10	
13)	cis-1,3-DICHLOROPROPENE	ND	5.0	
14)	DIBROMOCHLOROMETHANE	ND	5.0	
15)	1,2-DICHLOROBENZENE	ND	5.0	
16)	1,3-DICHLOROBENZENE	ND	5.0	
17)	1,4-DICHLOROBENZENE	ND	5.0	
18)	1,1-DICHLOROETHANE	ND	5.0	
19)	1,2-DICHLOROETHANE	ND	5.0	
20)	1,1-DICHLOROETHYLENE	ND	5.0	
21)	trans-1,2-DICHLOROETHYLENE	ND	5.0	
22)	trans-1,3-DICHLOROPROPENE	ND	5.0	
23)	1,2-DICHLOROPROPANE	ND	5.0	
24)	ETHYLBENZENE	ND	5.0	
25)	METHYLENE CHLORIDE	ND	5.0	
26)	1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27)	TETRACHLOROETHYLENE	ND	5.0	
28)	TOLUENE	ND	5.0	
29)	1,1,1-TRICHLOROETHANE	ND	5.0	
30)	1,1,2-TRICHLOROETHANE	ND	5.0	
31)	TRICHLOROETHYLENE	ND	5.0	
32)	TRICHLOROFLUOROMETHANE	ND	5.0	
33)	VINYL CHLORIDE	ND	10	
34)	XYLENES, TOTAL	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

			DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial	: >B3317	04/21/93
LAB SAMPLE #	: E301359N	Dilution #1	:	
MATRIX	: WATER	Dilution #2	:	
METHOD	: EPA 625			

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACENAPHTHENE	ND	10	
2)	ACENAPHTHYLENE	ND	10	
3)	ANTHRACENE	ND	10	
4)	BENZIDENE	ND	52	
5)	BENZO(A)ANTHRACENE	ND	10	
6)	BENZO(A)PYRENE	ND	10	
7)	BENZO(B)FLUORANTHENE	ND	10	
8)	BENZO(K)FLUORANTHENE	ND	10	
9)	BENZO(G,H,I)PERYLENE	ND	10	
10)	BIS(2-CHLOROETHOXY)METHANE	ND	10	
11)	BIS(2-CHLOROETHYL)ETHER	ND	10	
12)	BIS(2-CHLOROISOPROPYL)ETHER	ND	10	
13)	BIS(2-ETHYLHEXYL)PHTHALATE	ND	10	
14)	4-BROMOPHENYL PHENYL ETHER	ND	10	
15)	BUTYL BENZYL PHTHALATE	15	10	B
16)	2-CHLORONAPHTHALENE	ND	10	
17)	4-CHLOROPHENYL PHENYL ETHER	ND	10	
18)	CHRYSENE	ND	10	
19)	DIBENZO(A,H)ANTHRACENE	ND	10	
20)	1,2-DICHLOROBENZENE	ND	10	
21)	1,3-DICHLOROBENZENE	ND	10	
22)	1,4-DICHLOROBENZENE	ND	10	
23)	3,3'-DICHLOROBENZIDENE	ND	21	
24)	DIETHYL PHTHALATE	ND	10	
25)	DIMETHYL PHTHALATE	ND	10	
26)	DI-N-BUTYL PHTHALATE	30	10	B
27)	2,4-DINITROTOLUENE	ND	10	
28)	2,6-DINITROTOLUENE	ND	10	
29)	DI-N-OCTYL PHTHALATE	ND	10	
30)	1,2-DIPHENYLHYDRAZINE	ND	10	
31)	FLUORANTHENE	ND	10	
32)	FLUORENE	ND	10	
33)	HEXACHLOROBENZENE	ND	10	
34)	HEXACHLOROBUTADIENE	ND	10	
35)	HEXACHLOROCYCLOPENTADIENE	ND	10	
36)	HEXACHLOROETHANE	ND	10	
37)	INDENO(1,2,3-CD)PYRENE	ND	10	
38)	ISOPHORONE	ND	10	
39)	NAPHTHALENE	ND	10	
40)	NITROBENZENE	ND	10	
41)	N-NITROSODIMETHYLAMINE	ND	10	
42)	N-NITROSODI-N-PROPYLAMINE	ND	10	
43)	N-NITROSODIPHENYLAMINE	ND	10	
44)	PHENANTHRENE	ND	10	
45)	PYRENE	ND	10	
46)	1,2,4-TRICHLOROBENZENE	ND	10	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR ACID EXTRACTABLES BY GC/MS

			DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial	: >B3317	04/21/93
LAB SAMPLE #	: E301359N	Dilution #1	:	
MATRIX	: WATER	Dilution #2	:	
METHOD	: EPA 625			

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	4-CHLORO-3-METHYL PHENOL	ND	21	
2)	2-CHLOROPHENOL	ND	10	
3)	2,4-DICHLOROPHENOL	ND	10	
4)	2,4-DIMETHYLPHENOL	ND	52	
5)	2,4-DINITROPHENOL	ND	52	
6)	2-METHYL-4,6-DINITROPHENOL	ND	10	
7)	2-NITROPHENOL	ND	10	
8)	4-NITROPHENOL	ND	52	
9)	PENTACHLOROPHENOL	ND	52	
10)	PHENOL	ND	10	
11)	2,4,6-TRICHLOROPHENOL	ND	10	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST®
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT

SAMPLE No	COLLECTED DATE	TIME	BY	POINT OF COLLECTION
E301359N	04/16/93	08:15	PFF	GROUND WATER - RR-2; SALEM STREET, WOBURN, MA

TEST DESCRIPTION	RESULT	MDL	UNITS	DATE	INIT
ANTIMONY	<0.005	0.005	MG/L	04/27/93	HBM
ARSENIC	0.066	0.001	MG/L	04/27/93	HBM
BERYLLIUM	<0.005	0.005	MG/L	04/23/93	HBM
CADMIUM	<0.010	0.010	MG/L	04/23/93	HBM
CHROMIUM	0.20	0.025	MG/L	04/23/93	HBM
COPPER	0.30	0.020	MG/L	04/23/93	HBM
LEAD	0.055	0.005	MG/L	04/23/93	HBM
MERCURY	<0.001	0.001	MG/L	04/26/93	HBM
NICKEL	0.10	0.040	MG/L	04/23/93	HBM
SELENIUM[1]	<0.010	0.010	MG/L	04/26/93	HBM
SILVER	<0.030	0.030	MG/L	04/28/93	HBM
THALLIUM	0.002	0.001	MG/L	04/28/93	HBM
ZINC	0.68	0.050	MG/L	04/27/93	HBM

[1] DIL'N REQUIRED DUE TO INTERFERENCE RESULTING IN ELEVATED MDL.

ND = NOT DETECTED
UG/L = PPB MG/L = PPM
MDL = METHOD DETECTION LIMIT

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

			DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial	: >A8289	04/20/93
LAB SAMPLE #	: E301360N	Dilution #1	:	
MATRIX	: WATER	Dilution #2	:	
METHOD	: SW846 8240			

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACROLEIN	ND	100	
2)	ACRYLONITRILE	ND	100	
3)	BENZENE	ND	5.0	
4)	BROMOFORM	ND	5.0	
5)	BROMODICHLOROMETHANE	ND	5.0	
6)	BROMOMETHANE	ND	10	
7)	CARBON TETRACHLORIDE	ND	5.0	
8)	CHLOROBENZENE	ND	5.0	
9)	CHLOROETHANE	ND	10	
10)	2-CHLOROETHYL VINYL ETHER	ND	10	
11)	CHLOROFORM	ND	5.0	
12)	CHLOROMETHANE	ND	10	
13)	cis-1,3-DICHLOROPROPENE	ND	5.0	
14)	DIBROMOCHLOROMETHANE	ND	5.0	
15)	1,2-DICHLOROBENZENE	ND	5.0	
16)	1,3-DICHLOROBENZENE	ND	5.0	
17)	1,4-DICHLOROBENZENE	ND	5.0	
18)	1,1-DICHLOROETHANE	ND	5.0	
19)	1,2-DICHLOROETHANE	ND	5.0	
20)	1,1-DICHLOROETHYLENE	ND	5.0	
21)	trans-1,2-DICHLOROETHYLENE	ND	5.0	
22)	trans-1,3-DICHLOROPROPENE	ND	5.0	
23)	1,2-DICHLOROPROPANE	ND	5.0	
24)	ETHYLBENZENE	ND	5.0	
25)	METHYLENE CHLORIDE	ND	5.0	
26)	1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27)	TETRACHLOROETHYLENE	ND	5.0	
28)	TOLUENE	ND	5.0	
29)	1,1,1-TRICHLOROETHANE	ND	5.0	
30)	1,1,2-TRICHLOROETHANE	ND	5.0	
31)	TRICHLOROETHYLENE	ND	5.0	
32)	TRICHLOROFLUOROMETHANE	ND	5.0	
33)	VINYL CHLORIDE	ND	10	
34)	XYLENES, TOTAL	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

VOLATILE SURROGATE RECOVERY SUMMARY

LAB NAME : ACCUTEST LABORATORIES

BATCH ID : VA0490 BATCH DATE : 04/20/93

	LAB SAMPLE NO	DATA FILE	MATRIX	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	TOT OUT	Q
01	100PPBSTD	^A8280	W	108	106	94	0	
02	METHODBLANK	^A8281	W	102	101	90	0	
03	E301355N	^A8282	W	105	101	87	0	
04	E301355NMS	^A8283	W	106	104	90	0	
05	E301355NMSD	^A8284	W	106	103	92	0	
06	E301356N	^A8285	W	105	102	95	0	
07	E301357N	^A8286	W	102	101	94	0	
08	E301358N	^A8287	W	107	102	98	0	
09	E301359N	^A8288	W	105	104	92	0	
10	E301360N	^A8289	W	107	103	92	0	
11	E301361N	^A8290	W	102	101	94	0	
12								
13								
14								
15								
16								
17								
18								
19								
20								

	WATER QC LIMITS	SOIL QC LIMITS
S1 (TOL) = TOLUENE-D8	(88 -110)	(81 -117)
S2 (BFB) = 4-BROMOFLUORDBENZENE	(86 -115)	(74 -121)
S3 (DCE) = 1,2-DICHLOROETHANE-D4	(76 -114)	(70 -121)

MATRIX = Soil(S), Water(W)

Column to be used to flag recovery values
* Values outside of contract required QC limits

QUALIFIERS (Q)

a - SURROGATE RECOVERY(S) OUT DUE TO MATRIX INTERFERENCE VERIFIED BY REANALYSIS
b - SURROGATE DILUTED OUT
c - SAMPLE RE-ANALYZED

COMMENTS : _____

SEMIVOLATILE SURROGATE RECOVERY SUMMARY

LAB NAME : ACCUTEST LABORATORIES

BATCH ID : EB-208 BATCH DATE : 04/20/93

	LAB SAMPLE NO	DATA FILE	BATCH ID	MATRIX	S1 NBZ#	S2 FBP#	S3 TPH#	S4 PHL#	S5 2FP#	S6 TBP#	TOT OUT	Q
1	E301356N	^B3315	MSW-971	W	47	65	64	31	66	53	0	
2	E301357N	^B3316	MSW-971	W	58	75	76	33	71	59	0	
03	E301359N	^B3317	MSW-971	W	58	73	73	36	74	56	0	
4	E301364NMS	^B3318	MSW-971	W	59	82	83	42	86	60	0	
5	E301364NMSD	^B3319	MSW-971	W	60	81	82	41	87	60	0	
06	METHODBLANK	^B3320	MSW-971	W	51	70	72	31	68	55	0	
7												
8												
09												
10												
11												
12												
13												
14												
15												
16												
17												
19												
20												

		WATER QC LIMITS	SOIL QC LIMITS
S1 (NBZ)	= NITROBENZENE-D5	(35 -114)	(23 -120)
S2 (FBP)	= 2-FLUOROBIPHENYL	(43 -116)	(30 -115)
S3 (TPH)	= P-TERPHENYL-D14	(33 -141)	(18 -137)
S4 (PHL)	= PHENOL-D6	(10 - 94)	(24 -113)
S5 (2FP)	= 2-FLUOROPHENOL	(21 -100)	(25 -121)
S6 (TBP)	= 2,4,6-TRIBROMOPHENOL	(10 -123)	(19 -122)

MATRIX = Soil(S), Water(W)

Column to be used to flag recovery values
* Values outside of contract required QC limits

QUALIFIERS (Q)

a - SURROGATE RECOVERY(S) OUT DUE TO MATRIX INTERFERENCE VERIFIED BY RE-EXTRACTION
b - SURROGATE DILUTED OUT
c - SCHEDULED TO BE RE-EXTRACTED FOR BASE and/or ACID

COMMENTS : _____

VOLATILE BATCH QC SUMMARY

		DATA FILE	ANALYSIS DATE
QC BATCH ID: VA0490	METHOD BLANK (BLK) :	>A8281	04/20/93
	QC CHECK STD (QCCS) :	>A8291	04/20/93
MATRIX : WATER	MATRIX SPIKE (MS) :	>A8283	04/20/93
	MATRIX SPIKE DUP(MSD):	>A8284	04/20/93

The following QC data pertains to LAB Sample numbers : E301355N through E301360N,

COMPOUND	BLK CONC ppb	MDL ppb	QCCS REC %	#	MS CONC ppb	MSD CONC ppb	MS REC %	#	% RPD #	QC LIMITS RPD/% REC
ACROLEIN	ND	100	86		370	150	148		82	Ind/nd-nd
ACRYLONITRILE	ND	100	94		240	240	97		1	Ind/nd-nd
BENZENE	ND	5.0	96		51	49	101		4	Ind/37-151
BROMODICHLOROMETHANE	ND	5.0	97		48	49	97		0	Ind/35-155
BROMOFORM	ND	5.0	106		53	52	106		1	Ind/45-169
BROMOMETHANE	ND	10	86		41	41	82		1	Ind/D -242
CARBON TETRACHLORIDE	ND	5.0	86		43	44	86		2	Ind/70-140
CHLOROBENZENE	ND	5.0	96		52	48	103		8	Ind/37-160
CHLOROETHANE	ND	10	79		37	41	75		10	Ind/14-230
2-CHLOROETHYL VINYL ETHER	ND	10	96		17	15	34		9	Ind/D -305
CHLOROFORM	ND	5.0	89		46	46	92		1	Ind/51-138
CHLOROMETHANE	ND	10	74		38	35	76		7	Ind/D -273
DIBROMOCHLOROMETHANE	ND	5.0	112		54	53	109		2	Ind/53-149
1,2-DICHLOROBENZENE	ND	5.0	96		49	50	98		3	Ind/18-190
1,3-DICHLOROBENZENE	ND	5.0	104		50	49	100		2	Ind/59-156
1,4-DICHLOROBENZENE	ND	5.0	114		61	58	122		5	Ind/18-190
1,1-DICHLOROETHANE	ND	5.0	91		46	47	92		1	Ind/D -254
1,2-DICHLOROETHANE	ND	5.0	90		44	45	89		0	Ind/49-155
1,1-DICHLOROETHYLENE	ND	5.0	83		45	44	90		1	Ind/D -234
trans-1,2-DICHLOROETHYLENE	ND	5.0	88		89	92	89		3	Ind/54-156
1,2-DICHLOROPROPANE	ND	5.0	98		49	47	98		4	Ind/D -210
cis-1,3-DICHLOROPROPENE	ND	5.0	94		49	47	98		4	Ind/D -270
trans-1,3-DICHLOROPROPENE	ND	5.0	94		49	47	98		4	Ind/17-183
ETHYLBENZENE	ND	5.0	101		49	49	98		0	Ind/37-162
METHYLENE CHLORIDE	ND	5.0	90		49	54	98		11	Ind/D -221
1,1,2,2-TETRACHLOROETHANE	ND	5.0	98		50	50	101		0	Ind/46-157
TETRACHLOROETHYLENE	ND	5.0	99		51	51	101		0	Ind/64-148
TOLUENE	ND	5.0	97		48	48	97		2	Ind/47-162
1,1,1-TRICHLOROETHANE	ND	5.0	84		43	44	86		2	Ind/52-162
1,1,2-TRICHLOROETHANE	ND	5.0	91		47	44	93		4	Ind/52-150
TRICHLOROETHYLENE	ND	5.0	94		50	48	101		5	Ind/71-157
TRICHLOROFLUOROMETHANE	ND	5.0	79		43	43	86		1	Ind/17-181
VINYL CHLORIDE	ND	10	76		39	43	78		9	Ind/D -251
XYLENE (TOTAL)	ND	5.0	101		150	150	100		1	Ind/nd-nd

ND = NOT DETECTED

= COLUMN TO BE USED TO FLAG RECOVERY AND RPD VALUES WITH AN ASTERISK

COMMENTS : _____

BASE/NEUTRAL EXTRACTABLES BATCH QC SUMMARY

		DATA FILE	ANALYSIS DATE
QC BATCH ID: MSW-97	METHOD BLANK (BLK) :	>B3320	04/21/93
	QC CHECK STD (QCCS) :	>B3352	04/27/93
MATRIX : WATER	MATRIX SPIKE (MS) :	>B3318	04/21/93
	MATRIX SPIKE DUP(MSD):	>B3319	04/21/93

The following QC data pertains to LAB Sample numbers : E301356N, E301357N, E301359N,

COMPOUND	BLK CONC ppb	QCCS MDL ppb	QCCS REC %	#	MS CONC ppb	MSD CONC ppb	MS REC %	#	% RPD	#	QC LIMITS RPD/% REC
ACENAPHTHENE	ND	10	100		51	49	102		3		Ind/47-145
ACENAPHTHYLENE	ND	10	89		45	45	90		1		Ind/33-145
ANTHRACENE	ND	10	94		51	51	102		1		Ind/27-133
BENZIDENE	ND	50	4		1.2	1.4	2		40		Ind/nd-nd
BENZO(A)ANTHRACENE	ND	10	91		50	52	101		3		Ind/33-143
BENZO(B)FLUORANTHENE	ND	10	136		75	81	149		8		Ind/24-159
BENZO(K)FLUORANTHENE	ND	10	94		81	85	161		6		Ind/11-162
BENZO(A)PYRENE	ND	10	102		78	79	155		1		Ind/17-163
BENZO(G,H,I)PERYLENE	ND	10	89		71	72	142		1		Ind/D -219
BIS(2-CHLOROETHOXY)METHANE	ND	10	94		38	39	77		0		Ind/33-184
BIS(2-CHLOROETHYL)ETHER	ND	10	107		39	40	78		3		Ind/12-158
BIS(2-CHLOROISOPROPYL)ETHER	ND	10	100		38	38	75		3		Ind/36-166
BIS(2-ETHYLHEXYL)PHTHALATE	ND	10	104		61	58	123		5		Ind/ 8-158
4-BROMOPHENYL PHENYL ETHER	ND	10	100		45	44	90		3		Ind/53-127
BUTYL BENZYL PHTHALATE	18	10	149		60	56	71		12		Ind/D -152
2-CHLORONAPHTHALENE	ND	10	77		40	38	81		8		Ind/60-118
4-CHLOROPHENYL PHENYL ETHER	ND	10	84		45	44	90		1		Ind/25-158
CHRYSENE	ND	10	126		68	65	136		5		Ind/17-168
DIBENZO(A,H)ANTHRACENE	ND	10	64		71	69	142		3		Ind/D -227
1,2-DICHLOROBENZENE	ND	10	72		34	29	67		14		Ind/32-129
1,3-DICHLOROBENZENE	ND	10	64		31	27	62		16		Ind/D -172
1,4-DICHLOROBENZENE	ND	10	72		34	28	67		16		Ind/20-124
3,3'-DICHLOROBENZIDENE	ND	20	60		43	42	86		2		Ind/D -262
DIETHYL PHTHALATE	ND	10	81		37	39	74		7		Ind/D -114
DIMETHYL PHTHALATE	ND	10	63		28	29	56		4		Ind/D -112
DI-N-BUTYL PHTHALATE	9.7	10	109		69	68	110		3		Ind/ 1-118
2,4-DINITROTOLUENE	ND	10	75		48	48	96		0		Ind/39-139
2,6-DINITROTOLUENE	ND	10	82		46	46	92		0		Ind/50-158
DI-N-OCTYL PHTHALATE	ND	10	123		89	86	178	*	4		Ind/4 -146
1,2-DIPHENYLHYDRAZINE	ND	10	92		40	39	80		1		Ind/nd-nd
FLUORANTHENE	ND	10	83		49	48	98		1		Ind/26-137
FLUORENE	ND	10	88		50	50	100		0		Ind/59-121
HEXACHLOROBENZENE	ND	10	101		42	40	84		5		Ind/D -152
HEXACHLOROBUTADIENE	ND	10	80		28	22	56		24		Ind/24-116

ND = NOT DETECTED

= COLUMN TO BE USED TO FLAG RECOVERY AND RPD VALUES WITH AN ASTERISK

COMMENTS : _____

BASE/NEUTRAL EXTRACTABLES BATCH QC SUMMARY

QC BATCH ID: MSW-97

MATRIX : WATER

	DATA FILE	ANALYSIS DATE
METHOD BLANK (BLK) :	>B3320	04/21/93
QC CHECK STD (QCCS) :	>B3352	04/27/93
MATRIX SPIKE (MS) :	>B3318	04/21/93
MATRIX SPIKE DUP(MSD):	>B3319	04/21/93

The following QC data pertains to LAB Sample numbers : E301356N, E301357N, E301359N

COMPOUND	BLK CONC ppb	MDL ppb	QCCS REC % #	MS CONC ppb	MSD CONC ppb	MS REC % #	% RPD #	QC LIMITS RPD/% REC
HEXACHLOROCYCLOPENTADIENE	ND	10	108	38	31	77	23	Ind/nd-nd
HEXACHLOROETHANE	ND	10	77	28	22	56	24	Ind/40-113
INDENO(1,2,3-CD)PYRENE	ND	10	78	70	70	141	1	Ind/D -171
ISOPHORONE	ND	10	101	38	37	75	1	Ind/21-196
NAPHTHALENE	ND	10	86	42	39	84	9	Ind/21-133
NITROBENZENE	ND	10	88	33	33	66	0	Ind/35-180
N-NITROSODIMETHYLAMINE	ND	10	42	15	15	30	0	Ind/nd-nd
N-NITROSO-DI-N-PROPYLAMINE	ND	10	96	35	35	70	0	Ind/D -230
N-NITROSODIPHENYLAMINE	ND	10	98	48	48	96	0	Ind/nd-nd
NANTHRENE	ND	10	96	51	49	101	2	Ind/54-120
ENE	ND	10	193*	52	52	105	0	Ind/52-115
1,2,4-TRICHLOROBENZENE	ND	10	70	30	26	61	14	Ind/44-142

N = NOT DETECTED

= COLUMN TO BE USED TO FLAG RECOVERY AND RPD VALUES WITH AN ASTERISK

COMMENTS :

ACID EXTRACTABLES BATCH QC SUMMARY

QC BATCH ID: MSW-97

MATRIX : WATER

	DATA FILE	ANALYSIS DATE
METHOD BLANK (BLK) :	>B3320	04/21/93
QC CHECK STD (QCCS) :	>B3352	04/27/93
MATRIX SPIKE (MS) :	>B3318	04/21/93
MATRIX SPIKE DUP(MSD):	>B3319	04/21/93

The following QC data pertains to LAB Sample numbers : E301356N, E301357N, E301359N

COMPOUND	BLK CONC ppb	MDL ppb	QCCS REC %	#	MS CONC ppb	MSD CONC ppb	MS REC %	#	% RPD #	QC LIMITS RPD/% REC
4-CHLORO-3-METHYL PHENOL	ND	20	63		65	66	65		2	Ind/22-147
2-CHLOROPHENOL	ND	10	92		85	85	85		0	Ind/23-134
2,4-DICHLOROPHENOL	ND	10	68		73	73	73		0	Ind/39-135
2,4-DIMETHYLPHENOL	ND	10	108		90	87	90		3	Ind/32-119
2,4-DINITROPHENOL	ND	50	42		65	61	65		6	Ind/D -191
2-METHYL-4,6-DINITROPHENOL	ND	50	83		84	83	84		1	Ind/D -181
2-NITROPHENOL	ND	10	96		100	100	101		0	Ind/29-182
4-NITROPHENOL	ND	50	15		33	32	33		3	Ind/D -132
PENTACHLOROPHENOL	ND	50	68		67	66	67		2	Ind/14-176
PHENOL	ND	10	49		40	39	40		3	Ind/ 5-112
2,4,6-TRICHLOROPHENOL	ND	10	77		81	80	81		1	Ind/37-144

N : NOT DETECTED

* : COLUMN TO BE USED TO FLAG RECOVERY AND RPD VALUES WITH AN ASTERISK

COMMENTS : _____

QUALITY CONTROL REPORT FOR JOB : 930367N

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : ANTIMONY

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	ANT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0185	0.0163	MG/L	13	<0.0050	0.0200	0.0185	MG/L	93	0.0050	MG/L	<0.0050

COMMENTS :

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : ARSENIC

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	ANT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0198	0.0196	MG/L	1	0.00950	0.0100	0.0198	MG/L	103	0.0010	MG/L	<0.0010

COMMENTS :

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : BERYLLIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	ANT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0460	0.0470	MG/L	2	0.00900	0.0400	0.0460	MG/L	93	0.0050	MG/L	<0.0050

COMMENTS :

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : CADMIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	ANT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0560	0.0590	MG/L	5	0.0190	0.0400	0.0560	MG/L	93	0.0100	MG/L	<0.0100

COMMENTS :

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : CHROMIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	ANT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.669	0.665	MG/L	1	0.568	0.100	0.669	MG/L	101	0.0250	MG/L	<0.0250

COMMENTS :

QUALITY CONTROL REPORT FOR JOB : 930367N

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : COPPER

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.675	0.712	MG/L	5	0.561	0.100	0.675	MG/L	114	0.0200	MG/L	<0.0200

COMMENTS :

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : LEAD

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0373	0.0360	MG/L	4	0.0166	0.0200	0.0373	MG/L	104	0.001	MG/L	<0.0010

COMMENTS :

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : MERCURY

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.00461	0.00440	MG/L	5	<0.0010	0.00600	0.00461	MG/L	77	0.0010	MG/L	<0.0010

COMMENTS :

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : NICKEL

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.492	0.504	MG/L	2	0.297	0.200	0.492	MG/L	98	0.0400	MG/L	<0.0400

COMMENTS :

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : SELENIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.208	0.203	MG/L	2	<0.0100	0.200	0.208	MG/L	104	0.0010	MG/L	<0.0010

COMMENTS :

QUALITY CONTROL REPORT FOR JOB : 930367N

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : SILVER

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	ANT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.234	0.232	MG/L	1	(0.0300	0.250	0.234	MG/L	94	0.0300	MG/L	(0.0300

COMMENTS :

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : THALLIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	ANT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0119	0.0108	MG/L	10	(0.0010	0.0100	0.0119	MG/L	119	0.00100	MG/L	(0.0010

COMMENTS :

SAMPLE(S) : E301355N ,E301357N ,E301358N ,E301359N

TEST : ZINC

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	ANT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
1.390	1.450	MG/L	4	0.851	0.500	1.390	MG/L	108	0.050	MG/L	(0.0500

COMMENTS :

LABORATORY CHRONICLE

ACCUTEST JOB #.....930367N

DATE SAMPLES RECEIVED.....04/16/93

ACCUTEST SAMPLE #	SAMPLE DATE	ANALYTE	METHOD	INITIAL PREP.	FINAL PREP.	PREP. INITIALS	INITIAL ANALYSIS	REPORTED ANALYSIS	ANALYST INITIALS
E301355N	04/15/93	VOLATILE ORGANICS	SW846 8240				04/20/93	04/20/93	MRT
E301355N	04/15/93	ANTIMONY	EPA 205.2	04/19/93	04/19/93	HBM	04/27/93	04/27/93	HBM
E301355N	04/15/93	ARSENIC	EPA 206.2	04/19/93	04/19/93	HBM	04/27/93	04/27/93	HBM
E301355N	04/15/93	BERYLLIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301355N	04/15/93	CADMIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301355N	04/15/93	CHROMIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301355N	04/15/93	SELENIUM	EPA 270.2	04/19/93	04/19/93	HBM	04/26/93	04/26/93	HBM
E301355N	04/15/93	COPPER	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301355N	04/15/93	SILVER	EPA 272.1	04/19/93	04/19/93	HBM	04/28/93	04/28/93	HBM
E301355N	04/15/93	LEAD	EPA 239.2	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301355N	04/15/93	THALLIUM	EPA 279.2	04/19/93	04/19/93	HBM	04/28/93	04/28/93	HBM
E301355N	04/15/93	MERCURY	EPA 245.1	04/26/93	04/26/93	HBM	04/26/93	04/26/93	HBM
E301355N	04/15/93	NICKEL	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301355N	04/15/93	ZINC	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/27/93	HBM
E301356N	04/15/93	VOLATILE ORGANICS	SW846 8240				04/20/93	04/20/93	MRT

MANAGER MF DATE 4 / 29 / 93

LABORATORY CHRONICLE

ACCUTEST JOB #.....930367N

DATE SAMPLES RECEIVED.....04/16/93

ACCUTEST SAMPLE #	SAMPLE DATE	ANALYTE	METHOD	INITIAL PREP.	FINAL PREP.	PREP. INITIALS	INITIAL ANALYSIS	REPORTED ANALYSIS	ANALYST INITIALS
E301356N	04/15/93	ACID EXTRACTABLES	EPA 625	04/19/93	04/19/93	CAD	04/20/93	04/20/93	MRT
E301356N	04/15/93	BASE NEUTRAL EXTRACTABLES	EPA 625	04/19/93	04/19/93	CAD	04/20/93	04/20/93	MRT
E301357N	04/15/93	VOLATILE ORGANICS	SW846 8240				04/20/93	04/20/93	MRT
E301357N	04/15/93	ANTIMONY	EPA 205.2	04/19/93	04/19/93	HBM	04/27/93	04/27/93	HBM
E301357N	04/15/93	ARSENIC	EPA 206.2	04/19/93	04/19/93	HBM	04/27/93	04/27/93	HBM
E301357N	04/15/93	BERYLLIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301357N	04/15/93	CADMIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301357N	04/15/93	CHROMIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301357N	04/15/93	SELENIUM	EPA 270.2	04/19/93	04/19/93	HBM	04/26/93	04/26/93	HBM
E301357N	04/15/93	COPPER	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301357N	04/15/93	SILVER	EPA 272.1	04/19/93	04/19/93	HBM	04/28/93	04/28/93	HBM
E301357N	04/15/93	LEAD	EPA 239.2	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301357N	04/15/93	THALLIUM	EPA 279.2	04/19/93	04/19/93	HBM	04/28/93	04/28/93	HBM
E301357N	04/15/93	MERCURY	EPA 245.1	04/26/93	04/26/93	HBM	04/26/93	04/26/93	HBM
E301357N	04/15/93	NICKEL	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM

MANAGER _____ DATE 4 / 29 / 93

LABORATORY CHRONICLE

ACCUTEST JOB #.....930367N

DATE SAMPLES RECEIVED.....04/16/93

ACCUTEST SAMPLE #	SAMPLE DATE	ANALYTE	METHOD	INITIAL PREP.	FINAL PREP.	PREP. INITIALS	INITIAL ANALYSIS	REPORTED ANALYSIS	ANALYST INITIALS
E301357N	04/15/93	ZINC	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/27/93	HBM
E301357N	04/15/93	ACID EXTRACTABLES	EPA 625	04/19/93	04/19/93	CAD	04/20/93	04/20/93	MRT
E301357N	04/15/93	BASE NEUTRAL EXTRACTABLES	EPA 625	04/19/93	04/19/93	CAD	04/20/93	04/20/93	MRT
E301358N	04/15/93	VOLATILE ORGANICS	SW846 8240				04/20/93	04/20/93	MRT
E301358N	04/15/93	ANTIMONY	EPA 205.2	04/19/93	04/19/93	HBM	04/27/93	04/27/93	HBM
E301358N	04/15/93	ARSENIC	EPA 206.2	04/19/93	04/19/93	HBM	04/27/93	04/27/93	HBM
E301358N	04/15/93	BERYLLIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301358N	04/15/93	CADMIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301358N	04/15/93	CHROMIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301358N	04/15/93	SELENIUM	EPA 270.2	04/19/93	04/19/93	HBM	04/26/93	04/26/93	HBM
E301358N	04/15/93	COPPER	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301358N	04/15/93	SILVER	EPA 272.1	04/19/93	04/19/93	HBM	04/28/93	04/28/93	HBM
E301358N	04/15/93	LEAD	EPA 239.2	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301358N	04/15/93	THALLIUM	EPA 279.2	04/19/93	04/19/93	HBM	04/28/93	04/28/93	HBM
E301358N	04/15/93	MERCURY	EPA 245.1	04/26/93	04/26/93	HBM	04/26/93	04/26/93	HBM

MANAGER MT DATE 4/29/93

LABORATORY CHRONICLE

ACCUTEST JOB #.....930367N

DATE SAMPLES RECEIVED.....04/16/93

ACCUTEST SAMPLE #	SAMPLE DATE	ANALYTE	METHOD	INITIAL PREP.	FINAL PREP.	PREP. INITIALS	INITIAL ANALYSIS	REPORTED ANALYSIS	ANALYST INITIALS
E301358N	04/15/93	NICKEL	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301358N	04/15/93	ZINC	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/27/93	HBM
E301359N	04/16/93	VOLATILE ORGANICS	SW846 8240				04/20/93	04/20/93	MRT
E301359N	04/16/93	ANTIMONY	EPA 205.2	04/19/93	04/19/93	HBM	04/27/93	04/27/93	HBM
E301359N	04/16/93	ARSENIC	EPA 206.2	04/19/93	04/19/93	HBM	04/27/93	04/27/93	HBM
E301359N	04/16/93	BERYLLIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301359N	04/16/93	CADMIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301359N	04/16/93	CHROMIUM	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301359N	04/16/93	SELENIUM	EPA 270.2	04/19/93	04/19/93	HBM	04/26/93	04/26/93	HBM
E301359N	04/16/93	COPPER	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301359N	04/16/93	SILVER	EPA 272.1	04/19/93	04/19/93	HBM	04/28/93	04/28/93	HBM
E301359N	04/16/93	LEAD	EPA 239.2	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM
E301359N	04/16/93	THALLIUM	EPA 279.2	04/19/93	04/19/93	HBM	04/28/93	04/28/93	HBM
E301359N	04/16/93	MERCURY	EPA 245.1	04/26/93	04/26/93	HBM	04/26/93	04/26/93	HBM
E301359N	04/16/93	NICKEL	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/23/93	HBM

MANAGER MT DATE 4 / 29 / 93

LABORATORY CHRONICLE

ACCUTEST JOB #.....930367N

DATE SAMPLES RECEIVED.....04/16/93

ACCUTEST SAMPLE #	SAMPLE DATE	ANALYTE	METHOD	INITIAL PREP.	FINAL PREP.	PREP. INITIALS	INITIAL ANALYSIS	REPORTED ANALYSIS	ANALYST INITIALS
E301359N	04/16/93	ZINC	EPA 200.7	04/19/93	04/19/93	HBM	04/23/93	04/27/93	HBM
E301359N	04/16/93	ACID EXTRACTABLES	EPA 625	04/19/93	04/19/93	CAD	04/20/93	04/21/93	MRT
E301359N	04/16/93	BASE NEUTRAL EXTRACTABLES	EPA 625	04/19/93	04/19/93	CAD	04/20/93	04/21/93	MRT
E301360N	04/16/93	VOLATILE ORGANICS	SW846 8240				04/20/93	04/20/93	MRT

MANAGER mf DATE 4/29/93

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

TECHNICAL REPORT FOR

21E INC.

SAMPLES TAKEN AT:	RILEYS
CLIENT PROJECT ID:	91-0503-1
ACCUTEST JOB NUMBER:	930414N
SAMPLES RECEIVED AT ACCUTEST ON:	05/05/93
NUMBER OF SAMPLES IN THIS REPORT:	2
TOTAL NUMBER OF PAGES IN REPORT:	10

REZA TAND
LAB DIRECTOR

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

21E INC.
330 BOSTON ROAD SUITE 4
BILLERICA, MA 01862

DATE: 05/14/93
JOB No: 930414N
PROJECT No: 91-0503-1
SAMPLE RECEIVED: 05/05/93

ATTN: PAUL MAGGIORE

SAMPLE SUMMARY

SAMPLE No	COLLECTED DATE	TIME	BY	POINT OF COLLECTION
E301495N	05/05/93	09:35	PFF	GROUND WATER - MW-4; RILEYS
E301496N	05/05/93	10:43	PFF	GROUND WATER - RR-2; RILEYS

REZA TAND
LAB DIRECTOR

ACCUTEST®
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT

SAMPLE No	COLLECTED DATE	TIME	BY	POINT OF COLLECTION
E301495N	05/05/93	09:35	PFF	GROUND WATER - MW-4; RILEYS

TEST DESCRIPTION	RESULT	MDL	UNITS	DATE	INIT
ANTIMONY[1]	<0.005	0.005	MG/L	05/11/93	HBM
ARSENIC[1]	<0.001	0.001	MG/L	05/11/93	HBM
BERYLLIUM[1]	<0.005	0.005	MG/L	05/10/93	HBM
CADMIUM[1]	<0.010	0.010	MG/L	05/10/93	HBM
CHROMIUM[1]	<0.025	0.025	MG/L	05/10/93	HBM
COPPER[1]	<0.020	0.020	MG/L	05/10/93	HBM
LEAD[1]	<0.005	0.005	MG/L	05/10/93	HBM
MERCURY[1]	<0.001	0.001	MG/L	05/12/93	HBM
NICKEL[1]	<0.040	0.040	MG/L	05/10/93	HBM
SELENIUM[1]	<0.001	0.001	MG/L	05/10/93	HBM
SILVER[1]	<0.030	0.030	MG/L	05/13/93	HBM
THALLIUM[1]	<0.001	0.001	MG/L	05/12/93	HBM
ZINC[1]	<0.050	0.050	MG/L	05/10/93	HBM

[1] ALL METALS ANALYSIS REPORTED AS DISSOLVED

UG/L = PPB MG/L = PPM
MDL = METHOD DETECTION LIMIT

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT

SAMPLE No	COLLECTED DATE	TIME	BY	POINT OF COLLECTION
E301496N	05/05/93	10:43	PFF	GROUND WATER - RR-2; RILEYS

TEST DESCRIPTION	RESULT	MDL	UNITS	DATE	INIT
ANTIMONY[1]	<0.005	0.005	MG/L	05/11/93	HBM
ARSENIC[1]	<0.001	0.001	MG/L	05/11/93	HBM
BERYLLIUM[1]	<0.005	0.005	MG/L	05/10/93	HBM
CADMIUM[1]	<0.010	0.010	MG/L	05/10/93	HBM
CHROMIUM[1]	<0.025	0.025	MG/L	05/10/93	HBM
COPPER[1]	<0.020	0.020	MG/L	05/10/93	HBM
LEAD[1]	<0.005	0.005	MG/L	05/10/93	HBM
MERCURY[1]	<0.001	0.001	MG/L	05/12/93	HBM
NICKEL[1]	<0.040	0.040	MG/L	05/10/93	HBM
SELENIUM[1]	<0.001	0.001	MG/L	05/10/93	HBM
SILVER[1]	<0.030	0.030	MG/L	05/13/93	HBM
THALLIUM[1]	<0.001	0.001	MG/L	05/12/93	HBM
ZINC[1]	0.053	0.050	MG/L	05/10/93	HBM

[1] ALL METALS ANALYSIS REPORTED AS DISSOLVED

UG/L = PPB MG/L = PPM
MDL = METHOD DETECTION LIMIT

495 Technology Center West • Building One • Marlborough, MA 01752-1861 • (508) 481-6200

QUALITY CONTROL REPORT FOR JOB : 930414N

SAMPLE(S) : E301495N ,E301496N

TEST : ANTIMONY

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0180	0.0169	MG/L	6	<0.0050	0.0200	0.0180	MG/L	90	0.00500	MG/L	<0.0050

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : ARSENIC

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.00990	0.0101	MG/L	2	<0.0010	0.0100	0.00990	MG/L	99	0.00100	MG/L	<0.0010

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : BERYLLIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0380	0.0380	MG/L	0	<0.0050	0.0400	0.0380	MG/L	95	0.00500	MG/L	<0.0050

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : CADMIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0350	0.0370	MG/L	6	<0.0100	0.0400	0.0350	MG/L	88	0.0100	MG/L	<0.0100

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : CHROMIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.107	0.100	MG/L	7	<0.0250	0.100	0.107	MG/L	107	0.0250	MG/L	<0.0250

COMMENTS :

QUALITY CONTROL REPORT FOR JOB : 930414N

SAMPLE(S) : E301495N ,E301496N

TEST : COPPER

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.100	0.100	MG/L	0	(0.0200	0.100	0.100	MG/L	100	0.0200	MG/L	(0.0200

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : LEAD

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0219	0.0222	MG/L	1	(0.0050	0.0200	0.0219	MG/L	110	0.00500	MG/L	(0.0050

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : MERCURY

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.00325	0.00325	MG/L	0	(0.0010	0.00300	0.00325	MG/L	108	0.00100	MG/L	(0.0010

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : NICKEL

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.190	0.198	MG/L	4	(0.0400	0.200	0.190	MG/L	95	0.0400	MG/L	(0.0400

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : SELENIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.00840	0.00850	MG/L	1	(0.0010	0.0100	0.00840	MG/L	84	0.00100	MG/L	(0.0010

COMMENTS :

QUALITY CONTROL REPORT FOR JOB : 930414N

SAMPLE(S) : E301495N ,E301496N

TEST : ANTIMONY

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0180	0.0169	MG/L	6	<0.0050	0.0200	0.0180	MG/L	90	0.00500	MG/L	<0.0050

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : ARSENIC

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.00990	0.0101	MG/L	2	<0.0010	0.0100	0.00990	MG/L	99	0.00100	MG/L	<0.0010

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : BERYLLIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0380	0.0380	MG/L	0	<0.0050	0.0400	0.0380	MG/L	95	0.00500	MG/L	<0.0050

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : CADMIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.0350	0.0370	MG/L	6	<0.0100	0.0400	0.0350	MG/L	88	0.0100	MG/L	<0.0100

COMMENTS :

SAMPLE(S) : E301495N ,E301496N

TEST : CHROMIUM

DUPLICATE				MATRIX SPIKE					METHOD BLANK		
ORIGINAL	DUPLICATE	UNITS	RPD	ORIGINAL	AMT.SPK	SPK.RES	UNITS	%REC	DET.LIM	UNITS	METH.BLANK
0.107	0.100	MG/L	7	<0.0250	0.100	0.107	MG/L	107	0.0250	MG/L	<0.0250

COMMENTS :

LABORATORY CHRONICLE

ACCUTEST JOB #.....930414N

DATE SAMPLES RECEIVED.....05/05/93

ACCUTEST SAMPLE #	SAMPLE DATE	ANALYTE	METHOD	INITIAL PREP.	FINAL PREP.	PREP. INITIALS	INITIAL ANALYSIS	REPORTED ANALYSIS	ANALYST INITIALS
E301495N	05/05/93	ANTIMONY	EPA 205.2	05/07/93	05/07/93	HBM	05/11/93	05/11/93	HBM
E301495N	05/05/93	ARSENIC	EPA 206.2	05/07/93	05/07/93	HBM	05/11/93	05/11/93	HBM
E301495N	05/05/93	BERYLLIUM	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301495N	05/05/93	CADMIUM	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301495N	05/05/93	CHROMIUM	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301495N	05/05/93	SELENIUM	EPA 270.2	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301495N	05/05/93	COPPER	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301495N	05/05/93	SILVER	EPA 272.1	05/07/93	05/07/93	HBM	05/13/93	05/13/93	HBM
E301495N	05/05/93	LEAD	EPA 239.2	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301495N	05/05/93	THALLIUM	EPA 279.2	05/07/93	05/07/93	HBM	05/12/93	05/12/93	HBM
E301495N	05/05/93	MERCURY	EPA 245.1	05/12/93	05/12/93	HBM	05/12/93	05/12/93	HBM
E301495N	05/05/93	NICKEL	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301495N	05/05/93	ZINC	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301495N	05/05/93	SAMPLE FILTRATION	0.45U				05/05/93	05/05/93	SAP
E301496N	05/05/93	ANTIMONY	EPA 205.2	05/07/93	05/07/93	HBM	05/11/93	05/11/93	HBM

MANAGER _____ DATE 5 / 14 / 93

LABORATORY CHRONICLE

ACCUTEST JOB #.....930414N

DATE SAMPLES RECEIVED.....05/05/93

ACCUTEST SAMPLE #	SAMPLE DATE	ANALYTE	METHOD	INITIAL PREP.	FINAL PREP.	PREP. INITIALS	INITIAL ANALYSIS	REPORTED ANALYSIS	ANALYST INITIALS
E301496N	05/05/93	ARSENIC	EPA 206.2	05/07/93	05/07/93	HBM	05/11/93	05/11/93	HBM
E301496N	05/05/93	BERYLLIUM	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301496N	05/05/93	CADMIUM	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301496N	05/05/93	CHROMIUM	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301496N	05/05/93	SELENIUM	EPA 270.2	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301496N	05/05/93	COPPER	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301496N	05/05/93	SILVER	EPA 272.1	05/07/93	05/07/93	HBM	05/13/93	05/13/93	HBM
E301496N	05/05/93	LEAD	EPA 239.2	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301496N	05/05/93	THALLIUM	EPA 279.2	05/07/93	05/07/93	HBM	05/12/93	05/12/93	HBM
E301496N	05/05/93	MERCURY	EPA 245.1	05/12/93	05/12/93	HBM	05/12/93	05/12/93	HBM
E301496N	05/05/93	NICKEL	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301496N	05/05/93	ZINC	EPA 200.7	05/07/93	05/07/93	HBM	05/10/93	05/10/93	HBM
E301496N	05/05/93	SAMPLE FILTRATION	0.45U				05/05/93	05/05/93	SAP

MANAGER _____ DATE 5 / 14 / 93

REPORT

Analysis: Petroleum Hydrocarbons by GC/FID

Client: 21E Inc.
Project ID: Salem St. Woburn Maggiore
ECL Proj #: 93-0021
ECL ID: 04006
Matrix: Aqueous

Sampled: 04/15/93
Received: 04/16/93
Extracted: 04/20/93
Analyzed: 04/20/93
Reported: 04/21/93

SAMPLE ID	CLIENT ID	CONCENTRATION(ug/L)	SOURCE
04006	MW-3	ND	

Detection Limit: 100 ug/L (ppb)
NOTE: Detection Limit is 10 times higher for heavy oils.
ND: Not Detected

Comments:

These results have been checked and approved by: Sandra M. Hebert

Sandra M. Hebert
Laboratory Director

ECL 330 Boston Road • Suite 4
Billerica, MA 01862 • 508-663-5997

REPORT

Analysis: Petroleum Hydrocarbons by GC/FID

Client: 21E Inc.
Project ID: Salem St. Woburn Maggiore
ECL Proj #: 93-0021
ECL ID: 04007
Matrix: Aqueous

Sampled: 04/15/93
Received: 04/16/93
Extracted: 04/20/93
Analyzed: 04/20/93
Reported: 04/21/93

SAMPLE ID	CLIENT ID	CONCENTRATION(ug/L)	SOURCE
04007	MW-4	ND	

Detection Limit: 100 ug/L (ppb)
NOTE: Detection Limit is 10 times higher for heavy oils.
ND: Not Detected

Comments:

These results have been checked and approved by: Sandra M. Hebert

Sandra M. Hebert
Laboratory Director

ECL 330 Boston Road • Suite 4
Billerica, MA 01862 • 508-663-5997

REPORT

Analysis: Petroleum Hydrocarbons by GC/FID

Client: 21E Inc.
Project ID: Salem St. Woburn Maggiore
ECL Proj #: 93-0021
ECL ID: 04008
Matrix: Aqueous

Sampled: 04/15/93
Received: 04/16/93
Extracted: 04/20/93
Analyzed: 04/20/93
Reported: 04/21/93

SAMPLE ID	CLIENT ID	CONCENTRATION(ug/L)	SOURCE
04008	RR-1	ND	

Detection Limit: 100 ug/L (ppb)
NOTE: Detection Limit is 10 times higher for heavy oils.
ND: Not Detected

Comments:

These results have been checked and approved by: Sandra M. Hebert

Sandra M. Hebert
Laboratory Director

ECL 330 Boston Road • Suite 4
Billerica, MA 01862 • 508-663-5997

REPORT

Analysis: Petroleum Hydrocarbons by GC/FID

Client: 21E Inc.
Project ID: Salem St. Woburn Maggiore
ECL Proj #: 93-0021
ECL ID: 04009
Matrix: Aqueous

Sampled: 04/16/93
Received: 04/16/93
Extracted: 04/20/93
Analyzed: 04/20/93
Reported: 04/21/93

SAMPLE ID	CLIENT ID	CONCENTRATION(ug/L)	SOURCE
04009	RR-2	ND	

Detection Limit: 100 ug/L (ppb)
NOTE: Detection Limit is 10 times higher for heavy oils.
ND: Not Detected

Comments:

These results have been checked and approved by:

Sandra M. Hebert
Laboratory Director

ECL 330 Boston Road • Suite 4
Billerica, MA 01862 • 508-663-5997

APPENDIX B

ACCUTE JOB# 93041

CHAIN OF CUSTODY RECORD

PROJECT NAME Maggorie
PROJECT NUMBER 91-0503-1

Consulting Geologists, Hydrogeologists
Environmental Chemists

21E INC.
330 Boston Road, Suite 4
Billerica, MA 01862
(508) 671-9501

SAMPLE NUMBER	DATE	TIME	SAMPLE LOCATION	SAMPLE TYPE	ANALYSES: Extr Org	VOA	Pest/PCB	Trace Metals	Par HC	FILTER	NUMBER OF CONTAINERS	REMARKS
E3014954 MW-4	5/5/93	0935	Rileys	Aq				X	X		1	Please filter then preserve and analyse
E3014964 RR-2	5/5/93	1043	↓	Aq				X	X		1	
								↓	Dissolved			

NOTE: SAMPLES RECD UNPRES. IN 950 mL AMBER GLASS BOTTLES. FILTERED, PRESERVED (TRANSFERRED W/ACIDS TO 950ml PLASTIC BOTTLES).

5/5/93

SAMPLED BY (SIGN) Patricia F Foster / / / Loc. 5C

RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)
1 Patricia Foster	2	3	4	5
DATE/TIME (5/5/93 13:10)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)
RECEIVED BY (SIGN)	**RECEIVED BY (SIGN)**	**RECEIVED BY (SIGN)**	**RECEIVED BY (SIGN)**	**RECEIVED BY (SIGN)**
1	2	3	4	5
DATE/TIME (5/5/93 13:10)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)

METHOD OF SHIPMENT	RECEIVED BY	RECEIVED FOR LABORATORY BY (SIGN)	DATE/TIME
Hand Delivered			(/)

No 1135

ECL

CHAIN OF CUSTODY RECORD

PROJECT NAME Salem St Woburn (Maggiore)
PROJECT NUMBER 90-0505-1

Consulting Geologists, Hydrogeologists
Environmental Chemists

21E INC.
330 Boston Road, Suite 4
Billerica, MA 01862
(508) 671-9501

SAMPLE NUMBER	DATE	TIME	SAMPLE LOCATION	SAMPLE TYPE	ANALYSES: Extr Org	VOA	Pest/PCB	Trace Metals	Pet HC	NUMBER OF CONTAINERS	REMARKS
93-0491 MW-3	4/15/93	1540	MW-3	Ag					1	1	4°C
0492 MW-4	4/15/93	1700	MW-4	Ag					1	1	↓
0493 RR-1	4/15/93	1147	RR-1	Ag					1	1	
0494 RR-2	4/16/93	0815	RR-2	Ag					1	1	

SAMPLED BY (SIGN) Patricia J Foster

RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)
1 Patricia J Foster	2	3	4	5
DATE/TIME (4/16/93 1045)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)
RECEIVED BY (SIGN)	**RECEIVED BY (SIGN)**	**RECEIVED BY (SIGN)**	**RECEIVED BY (SIGN)**	**RECEIVED BY (SIGN)**
1	2	3	4	5
DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)

METHOD OF SHIPMENT	RECEIVED BY	RECEIVED FOR LABORATORY BY (SIGN)	DATE/TIME
HAND DELIVERED		Sandra M. Hebert	(04/16/93 / 1045)

No 1429

Cu Test — ACCUTES — B#93036

CHAIN OF CUSTODY RECORD

PROJECT NAME Salem Street Woburn (Maggione)
PROJECT NUMBER 90-0505-1

Consulting Geologists, Hydrogeologists
Environmental Chemists

21E INC.
330 Boston Road, Suite 4
Billerica, MA 01862
(508) 671-9501

SAMPLE NUMBER	DATE	TIME	SAMPLE LOCATION	SAMPLE TYPE	ANALYSES: Extr Org	VOA	Pest/PCB	Trace Metals	Par HC				NUMBER OF CONTAINERS	REMARKS
MW-1 E301355N	4/15/93	1605	MW-1	W				1					1	HNO3 4°C
MW-1	4/15/93	1603	MW-1	W		1							2	HCL
MW-3 E301356N	4/15/93	1540	MW-3	W						1			1	—
MW-3	4/15/93	1540	MW-3	W		1							2	HCL
MW-4	4/15/93	1700	MW-4	W				1					1	HNO3
MW-4 E301357N	4/15/93	1700	MW-4	W		1				1			1	—
MW-4	4/15/93	1700	MW-4	W		1							2	HCL
RR-1 E301358N	4/15/93	1147	RR-1	W				1					1	HNO3
RR-1	4/15/93	1147	RR-1	W		1							2	HCL
RR-2 E301359N	4/16/93	0915	RR-2	W						1			1	—
RR-2	4/16/93	0815	RR-2	W				1					1	HNO3
RR-2	4/16/93	0815	RR-2	W		1							2	HCL
RR-3 E301360N	4/16/93	0845	RR-3	W		1							2	HCL
EQ-1 E301361N	4/16/93	1100	Equipment Blank	W									2	HOLD

NOTE; ONLY 1 LITER (950ml) AVAILABLE FOR 625 ANAL. ON E301356N, E301357N, E301359N. 4/16/93

SAMPLED BY (SIGN) Patricia J Foster

RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)	RELINQUISHED BY (SIGN)
1 Patricia J Foster	2	3	4	5
DATE/TIME (4/16/93 1210)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)
RECEIVED BY (SIGN)	RECEIVED BY (SIGN)	RECEIVED BY (SIGN)	RECEIVED BY (SIGN)	RECEIVED BY (SIGN)
1 12:10	2	3	4	5
DATE/TIME (4/16/93)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)	DATE/TIME (/)

METHOD OF SHIPMENT	RECEIVED BY	RECEIVED FOR LABORATORY BY (SIGN)	DATE/TIME
			(/)

Loc. 3D, 3B, 1A2 No 143

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

07/30/93

TECHNICAL REPORT FOR

21E INC.

SAMPLES TAKEN AT:	RILEYS
CLIENT PROJECT ID:	90-0505-2
ACCUTEST JOB NUMBER:	930660N
SAMPLES RECEIVED AT ACCUTEST ON:	07/20/93
NUMBER OF SAMPLES IN THIS REPORT:	3
TOTAL NUMBER OF PAGES IN REPORT:	9

REZA TAND
LAB DIRECTOR

495 Technology Center West • Building One • Marlborough, MA 01752-1861 • (508) 481-6200

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

21E INC.
330 BOSTON ROAD SUITE 4
BILLERICA, MA 01862

DATE: 07/30/93
JOB No: 930660N
PROJECT No: 90-0505-2
SAMPLE RECEIVED: 07/20/93

ATTN: PAUL MAGGIORE

SAMPLE SUMMARY

SAMPLE No	COLLECTED DATE	TIME	BY	POINT OF COLLECTION
E302359N	07/16/93	18:12	NMP	GROUND WATER - MW-2; RILEYS
E302360N	07/16/93	18:30	NMP	GROUND WATER - EQUIP. BLANK; RILEYS
E302361N	07/16/93	10:00	NMP	WATER - TRIP BLANK; RILEYS

REZA TAND
LAB DIRECTOR

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

			DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial	: >A8996	07/24/93
LAB SAMPLE #	: E302359N	Dilution #1	:	
MATRIX	: WATER	Dilution #2	:	
METHOD	: SW846 8240			

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACROLEIN	ND	100	
2)	ACRYLONITRILE	ND	100	
3)	BENZENE	ND	5.0	
4)	BROMOFORM	ND	5.0	
5)	BROMODICHLOROMETHANE	ND	5.0	
6)	BROMOMETHANE	ND	10	
7)	CARBON TETRACHLORIDE	ND	5.0	
8)	CHLOROBENZENE	ND	5.0	
9)	CHLOROETHANE	ND	10	
10)	2-CHLOROETHYL VINYL ETHER	ND	10	
11)	CHLOROFORM	ND	5.0	
12)	CHLOROMETHANE	ND	10	
13)	cis-1,3-DICHLOROPROPENE	ND	5.0	
14)	DIBROMOCHLOROMETHANE	ND	5.0	
15)	1,2-DICHLOROBENZENE	ND	5.0	
16)	1,3-DICHLOROBENZENE	ND	5.0	
17)	1,4-DICHLOROBENZENE	ND	5.0	
18)	1,1-DICHLOROETHANE	ND	5.0	
19)	1,2-DICHLOROETHANE	ND	5.0	
20)	1,1-DICHLOROETHYLENE	ND	5.0	
21)	trans-1,2-DICHLOROETHYLENE	ND	5.0	
22)	trans-1,3-DICHLOROPROPENE	ND	5.0	
23)	1,2-DICHLOROPROPANE	ND	5.0	
24)	ETHYLBENZENE	ND	5.0	
25)	METHYLENE CHLORIDE	ND	5.0	
26)	1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27)	TETRACHLOROETHYLENE	ND	5.0	
28)	TOLUENE	ND	5.0	
29)	1,1,1-TRICHLOROETHANE	ND	5.0	
30)	1,1,2-TRICHLOROETHANE	ND	5.0	
31)	TRICHLOROETHYLENE	ND	5.0	
32)	TRICHLOROFLUOROMETHANE	ND	5.0	
33)	VINYL CHLORIDE	ND	10	
34)	XYLENES, TOTAL	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) = RESULTS REPORTED FROM DILUTION #1
(2) = RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

			DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial	: >A8995	07/24/93
LAB SAMPLE #	: E302360N	Dilution #1	:	
MATRIX	: WATER	Dilution #2	:	
METHOD	: SW846 8240			

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACROLEIN	ND	100	
2)	ACRYLONITRILE	ND	100	
3)	BENZENE	ND	5.0	
4)	BROMOFORM	ND	5.0	
5)	BROMODICHLOROMETHANE	ND	5.0	
6)	BROMOMETHANE	ND	10	
7)	CARBON TETRACHLORIDE	ND	5.0	
8)	CHLOROBENZENE	ND	5.0	
9)	CHLOROETHANE	ND	10	
10)	2-CHLOROETHYL VINYL ETHER	ND	10	
11)	CHLOROFORM	ND	5.0	
12)	CHLOROMETHANE	ND	10	
13)	cis-1,3-DICHLOROPROPENE	ND	5.0	
14)	DIBROMOCHLOROMETHANE	ND	5.0	
15)	1,2-DICHLOROBENZENE	ND	5.0	
16)	1,3-DICHLOROBENZENE	ND	5.0	
17)	1,4-DICHLOROBENZENE	ND	5.0	
18)	1,1-DICHLOROETHANE	ND	5.0	
19)	1,2-DICHLOROETHANE	ND	5.0	
20)	1,1-DICHLOROETHYLENE	ND	5.0	
21)	trans-1,2-DICHLOROETHYLENE	ND	5.0	
22)	trans-1,3-DICHLOROPROPENE	ND	5.0	
23)	1,2-DICHLOROPROPANE	ND	5.0	
24)	ETHYLBENZENE	ND	5.0	
25)	METHYLENE CHLORIDE	ND	5.0	
26)	1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27)	TETRACHLOROETHYLENE	ND	5.0	
28)	TOLUENE	ND	5.0	
29)	1,1,1-TRICHLOROETHANE	ND	5.0	
30)	1,1,2-TRICHLOROETHANE	ND	5.0	
31)	TRICHLOROETHYLENE	ND	5.0	
32)	TRICHLOROFLUOROMETHANE	ND	5.0	
33)	VINYL CHLORIDE	ND	10	
34)	XYLENES, TOTAL	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

ACCUTEST
LABORATORIES OF NEW ENGLAND, INC.

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

		DATA FILES	ANALYSIS DATE
CLIENT	: 21E	Initial :	>A8994	07/24/93
LAB SAMPLE #	: E302361N	Dilution #1 :		
MATRIX	: WATER	Dilution #2 :		
METHOD	: SW846 8240			

	COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1)	ACROLEIN	ND	100	
2)	ACRYLONITRILE	ND	100	
3)	BENZENE	ND	5.0	
4)	BROMOFORM	ND	5.0	
5)	BROMODICHLOROMETHANE	ND	5.0	
6)	BROMOMETHANE	ND	10	
7)	CARBON TETRACHLORIDE	ND	5.0	
8)	CHLOROBENZENE	ND	5.0	
9)	CHLOROETHANE	ND	10	
10)	2-CHLOROETHYL VINYL ETHER	ND	10	
11)	CHLOROFORM	ND	5.0	
12)	CHLOROMETHANE	ND	10	
13)	cis-1,3-DICHLOROPROPENE	ND	5.0	
14)	DIBROMOCHLOROMETHANE	ND	5.0	
15)	1,2-DICHLOROBENZENE	ND	5.0	
16)	1,3-DICHLOROBENZENE	ND	5.0	
17)	1,4-DICHLOROBENZENE	ND	5.0	
18)	1,1-DICHLOROETHANE	ND	5.0	
19)	1,2-DICHLOROETHANE	ND	5.0	
20)	1,1-DICHLOROETHYLENE	ND	5.0	
21)	trans-1,2-DICHLOROETHYLENE	ND	5.0	
22)	trans-1,3-DICHLOROPROPENE	ND	5.0	
23)	1,2-DICHLOROPROPANE	ND	5.0	
24)	ETHYLBENZENE	ND	5.0	
25)	METHYLENE CHLORIDE	18	5.0	
26)	1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27)	TETRACHLOROETHYLENE	ND	5.0	
28)	TOLUENE	ND	5.0	
29)	1,1,1-TRICHLOROETHANE	ND	5.0	
30)	1,1,2-TRICHLOROETHANE	ND	5.0	
31)	TRICHLOROETHYLENE	ND	5.0	
32)	TRICHLOROFLUOROMETHANE	ND	5.0	
33)	VINYL CHLORIDE	ND	10	
34)	XYLENES, TOTAL	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

(1) - RESULTS REPORTED FROM DILUTION #1
(2) - RESULTS REPORTED FROM DILUTION #2

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
E =ESTIMATED VALUE; EXCEEDS INSTRUMENT CALIBRATION RANGE

VOLATILE SURROGATE RECOVERY SUMMARY

LAB NAME : ACCUTEST LABORATORIES

BATCH ID : VA0539 BATCH DATE : 07/24/93

	LAB SAMPLE NO	DATA FILE	MATRIX	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	TOT OUT	Q
01	METHODBLANK	^A8993	W	107	96	90	0	
02	E302361N	^A8994	W	101	96	96	0	
03	E302360N	^A8995	W	105	92	94	0	
04	E302359N	^A8996	W	101	93	91	0	
05	E302406N	^A8997	W	106	91	97	0	
06	E302407N	^A8998	W	99	94	95	0	
07	E302401N	^A8999	W	105	92	92	0	
08	E302402N	^A9000	W	100	92	98	0	
09	E302403N	^A9001	W	108	92	93	0	
10	E302404N	^A9002	W	102	90	100	0	
11	E302405N	^A9003	W	101	89	91	0	
12	E302405NMS	^A9004	W	102	94	96	0	
13	E302405NMSD	^A9005	W	104	93	91	0	
14	E302361N	^A9006	W	99	92	93	0	
15								
16								
17								
18								
19								
20								

	WATER QC LIMITS	SOIL QC LIMITS
S1 (TOL) = TOLUENE-D8	(88 -110)	(81 -117)
S2 (BFB) = 4-BROMOFLUOROBENZENE	(86 -115)	(74 -121)
S3 (DCE) = 1,2-DICHLOROETHANE-D4	(76 -114)	(70 -121)

MATRIX = Soil(S), Water(W)

Column to be used to flag recovery values
* Values outside of contract required QC limits

QUALIFIERS (Q)

a - SURROGATE RECOVERY(S) OUT DUE TO MATRIX INTERFERENCE VERIFIED BY REANALYSIS
b - SURROGATE DILUTED OUT
c - SAMPLE RE-ANALYZED

COMMENTS : _____

		DATA FILE	ANALYSIS DATE
QC BATCH ID:	METHOD BLANK (BLK) :	>A8993	07/24/93
	QC CHECK STD (QCCS) :	>A9007	07/25/93
MATRIX : WATER	MATRIX SPIKE (MS) :	>A9004	07/24/93
	MATRIX SPIKE DUP(MSD):	>A9005	07/25/93

The following QC data pertains to LAB Sample numbers : E302359N, E302360N, E302361N, E302401N — E302407N,

COMPOUND	BLK CONC ppb	BLK MDL ppb	QCCS REC %	#	MS CONC ppb	MSD CONC ppb	MS REC %	#	% RPD	#	QC LIMITS RPD/% REC
ACROLEIN	ND	100	0		ND	ND	0		***		Ind/nd-nd
ACRYLONITRILE	ND	100	16		140	74	54		57		Ind/nd-nd
BENZENE	ND	5.0	92		45	46	91		2		Ind/37-151
BROMODICHLOROMETHANE	ND	5.0	98		46	47	91		4		Ind/35-155
BROMOFORM	ND	5.0	97		32	32	64		2		Ind/45-169
BROMOMETHANE	ND	10	78		42	41	85		4		Ind/D -242
CARBON TETRACHLORIDE	ND	5.0	86		48	49	96		1		Ind/70-140
CHLOROBENZENE	ND	5.0	96		50	49	99		2		Ind/37-160
CHLOROETHANE	ND	10	68		36	40	72		9		Ind/14-230
2-CHLOROETHYL VINYL ETHER	ND	10	111		ND	ND	0	*	***		Ind/D -305
CHLOROFORM	ND	5.0	95		53	51	106		4		Ind/51-138
CHLOROMETHANE	ND	10	71		41	39	81		5		Ind/D -273
DIBROMOCHLOROMETHANE	ND	5.0	100		37	41	73		12		Ind/53-149
1,2-DICHLOROBENZENE	ND	5.0	109		55	55	111		1		Ind/18-190
1,3-DICHLOROBENZENE	ND	5.0	112		53	55	106		3		Ind/59-156
1,4-DICHLOROBENZENE	ND	5.0	109		47	46	94		3		Ind/18-190
1,1-DICHLOROETHANE	ND	5.0	89		50	48	100		4		Ind/D -234
1,2-DICHLOROETHANE	ND	5.0	102		53	49	105		7		Ind/49-155
1,1-DICHLOROETHYLENE	ND	5.0	80		51	47	102		7		Ind/D -234
trans-1,2-DICHLOROETHYLENE	ND	5.0	91		100	100	102		2		Ind/54-156
1,2-DICHLOROPROPANE	ND	5.0	97		47	46	94		3		Ind/D -210
cis-1,3-DICHLOROPROPENE	ND	5.0	92		40	41	80		2		Ind/D -270
trans-1,3-DICHLOROPROPENE	ND	5.0	91		37	39	74		5		Ind/17-183
ETHYLBENZENE	ND	5.0	94		47	50	95		6		Ind/37-162
METHYLENE CHLORIDE	ND	5.0	94		51	50	102		1		Ind/D -221
1,1,2,2-TETRACHLOROETHANE	ND	5.0	112		46	48	92		4		Ind/46-157
TETRACHLOROETHYLENE	ND	5.0	91		49	50	98		3		Ind/64-148
TOLUENE	ND	5.0	97		50	50	101		0		Ind/47-162
1,1,1-TRICHLOROETHANE	ND	5.0	84		50	49	100		3		Ind/52-162
1,1,2-TRICHLOROETHANE	ND	5.0	108		47	47	94		1		Ind/52-150
TRICHLOROETHYLENE	ND	5.0	95		48	45	96		5		Ind/71-157
TRICHLOROFLUOROMETHANE	ND	5.0	83		53	49	106		9		Ind/17-181
VINYL CHLORIDE	ND	10	75		47	42	94		12		Ind/D -251
XYLENE (TOTAL)	ND	5.0	98		150	150	98		3		Ind/nd-nd

ND = NOT DETECTED
# = COLUMN TO BE USED TO FLAG RECOVERY AND RPD VALUES WITH AN ASTERISK

COMMENTS :

LABORATORY CHRONICLE

ACCUTEST JOB #.....930660N

DATE SAMPLES RECEIVED.....07/20/93

ACCUTEST SAMPLE #	SAMPLE DATE	ANALYTE	METHOD	INITIAL PREP.	FINAL PREP.	PREP. INITIALS	INITIAL ANALYSIS	REPORTED ANALYSIS	ANALYST INITIALS
E302359N	07/16/93	VOLATILE ORGANICS	SW846 8240				07/24/93	07/24/93	MRT
E302360N	07/16/93	VOLATILE ORGANICS	SW846 8240				07/24/93	07/24/93	MRT
E302361N	07/16/93	VOLATILE ORGANICS	SW846 8240				07/24/93	07/24/93	MRT

MANAGER _____ DATE 7/30/93