SITE ASSESSMENT SUMMARY

FORMER MOBIL HANGAR
WESTCHESTER COUNTY AIRPORT

INTRODUCTION

In the summer of 1990, Mobil Corporation entered into discussions with Texaco, Inc. relative to a transfer of Mobil's long-term hangar lease at the Westchester County Airport, White Plains, NY. Subsequent environmental investigations at the hangar have identified and characterized subsurface contamination.

This Site Assessment Summary presents a chronology of activities at the site, and a summary of findings to date.

BACKGROUND

In response to the possible lease transfer, Texaco hired an environmental consultant, Pilko & Associates, Inc. to perform a subsurface investigation in and around the hangar. This investigation is documented in their 1/91 report, previously submitted to NYSDEC (Enclosure 1). Of particular note was a finding of up to 54 ppm of volatile chlorinated hydrocarbon (CHC) concentrations in the soil below the hangar floor in an area where solvents had been stored ("the source area".) Based on this finding, Mobil agreed to perform additional investigations to characterize subsurface contamination at the hangar.

Mobil hired Target Environmental Services, Inc., (Target), a firm that specializes in soil gas analysis. They performed a soil gas survey that shows elevated concentrations of CHC vapors in the soil under the hangar floor in the vicinity of the source area. These findings are documented in their 1/91 report, previously submitted to NYSDEC (Enclosure 2).

Based on further discussions with Texaco, Mobil hired Leggette, Brashears and Graham (LBG) to perform soils analysis on a regular grid in the hangar and under the apron in front of the hangar. This study confirmed the presence of CHCs at the source area, and indicated the presence of low levels of CHCs in soils under other parts of the hangar. These results are reported in their 5/91 report, previously submitted to NYSDEC (Enclosure 3).

In response to an unexpected detection in the deepest sample for one boring, Mobil directed LBG to perform deeper soils analysis at this location. The results of this effort are reported in their 8/91 report, previously submitted to NYSDEC (Enclosure 4).

RESULTS

The purpose of this section is to summarize and integrate the various assessments which have been carried out at the former Mobil Hangar. For additional detail, the reader is referred to the individual assessment reports.

To broadly summarize the findings:

- Concentrations of CHCs in soil are as high as 54 ppm in the source area.
- Concentrations fall off rapidly with depth (typically to non-detect or less than 1 ppm below 24".)
- Concentrations fall off rapidly with distance to typically 1 ppm or less at 40' from the source area.
- Nearly all of the CHCs are probably attributable to the solvent or solvents used at the hangar, and include primarily 1,1,1-trichloroethane (111-TCA) and tetrachloroethylene (also known as perchloroethylene, or PCE). Minor concentrations of trichloroethylene (TCE) and 1,1-dichloroethane (11-DCA) are also probably associated with solvent.
- Benzene, toluene, ethylbenzene and total xylenes (BTEX) were not detected, with the exception of a detection of xylenes at a single location (TB-2), at a shallow depth (0"-6") and at a low concentration (0.096 ppm).
- Concentrations of Total Petroleum Hydrocarbons (TPH) are typically low (below 50 ppm) for soil samples inside and outside of the hangar.
- Elevated levels of CHCs in soil vapors are in the immediate vicinity of the source area, at concentrations as high as 73 ppm. Soil gas concentrations fall off rapidly with distance, to approximately 1 ppm at 60' from the source area.

More detailed discussions of the data are presented in the following two sections.

CHCs in Soils

The CHC data is presented on a series of figures attached to this report. Figure 1 shows the soil boring locations in relationship to the source area, and Figures 2 through 5 present CHC concentrations for each boring at the various sampling depths: 0"-6"; 18"-24"; 36"-42" and 54"-60". Figure 6 is a concentration contour map of CHC concentrations at the 0"-6" depth, which showed the highest concentrations.

Areal distribution of CHCs in soil - As shown on Figure 2, relatively high CHC concentrations (54, 50 and 14.7 ppm) are present at shallow depths in the immediate vicinity of the source area. Concentrations fall off rapidly with distance from the source area as is clearly shown on Figure 6. The area within the 10 ppm contour is approximately 170 sq. ft. (~13'x13'); the area within the 5 ppm contour is approximately 400 sq. ft. (~20'x20').

Concentrations above 1 ppm (as high as 3.1 ppm) are found in a broad area in the central part of the hangar (Figure 6).

Concentration changes with depth - Examination of Figures 2 - 5 shows that CHC concentrations decrease rapidly with depth. For most borings (including the Pilko borings near the source area), concentrations decrease to non-detect below 24". At four locations, CHC concentrations were detected at the 54"-60" sampling interval. Of these, three show concentrations of less than 1 ppm, while one (TB-5) showed a concentration of 2.28 ppm.

The concentration at TB-5 (2.28 ppm) is anomalously high, considering that the concentration of the 36"-42" sample was only 0.07 ppm. However, to determine if CHC concentrations extended below 60", additional soil sampling was conducted at the TB-5 location. Samples were collected at depths of 72"-78", 90"-96", 108"-114" and 126"-132". No concentrations of CHCs were detected. (Note that the watertable was encountered at 108" and bedrock at 144".)

Anomalous constituents - As stated above, nearly all of the CHCs are probably attributable to the solvent or solvents used at the hangar. However, two compounds reported by the lab are considered anomalous: bromodichrloromethane (BDCM) and chloromethane (CM).

BDCM was detected in shallow (0"-6") soils at two locations away from the source area (TB-6 and TB-8), at low concentrations: 0.14 and 0.15 ppm, respectively. BDCM is a component in some fire extinguishers, which could explain its presence in the soils.

CM was detected in deeper (36"-42") soils at two locations away from the source area (TB-2 and TB-3), at concentrations of 0.79 and 1.8 ppm, respectively. The occurrence of CM is more problematic: it is isolated at a particular depth, it was not detected above or below in the same borings; and CM is a gas above -24 C. It appears likely that this chemical was not actually present in the soils, but is a laboratory artifact.

TPH in Soil

All soil samples inside and outside of the hangar were analyzed for Total Petroleum Hydrocarbons (TPH). For reasons discussed below, the TPH detected at the hangar is not considered environmentally significant and is not considered further in this Site Assessment Summary.

TPH concentrations presented in the Pilko report were as high as 1100 ppm inside the hangar, and 270 ppm outside the hangar for shallow (0"-6") soils. Concentrations dropped off quickly with depth, with most below 100 ppm at 18"-24", and all below 100 ppm at 36"-40".

TPH concentrations presented in the LBG report (reported as Total Chromatographable Organics) were consistently lower: a high of 46 ppm inside the hangar and 30 ppm outside the hangar. As with the Pilko data, concentrations decreased rapidly with depth, with a maximum concentration of 20 ppm below 6".

The probable reason for the disparity in TPH results is analytical: Pilko's lab utilized method 418.1, an infrared spectroscopy (IR) method, while LBG's lab (at Mobil's direction) utilized a gas chromatography (GC) method. For reasons discussed below, the data derived by GC is given more credence.

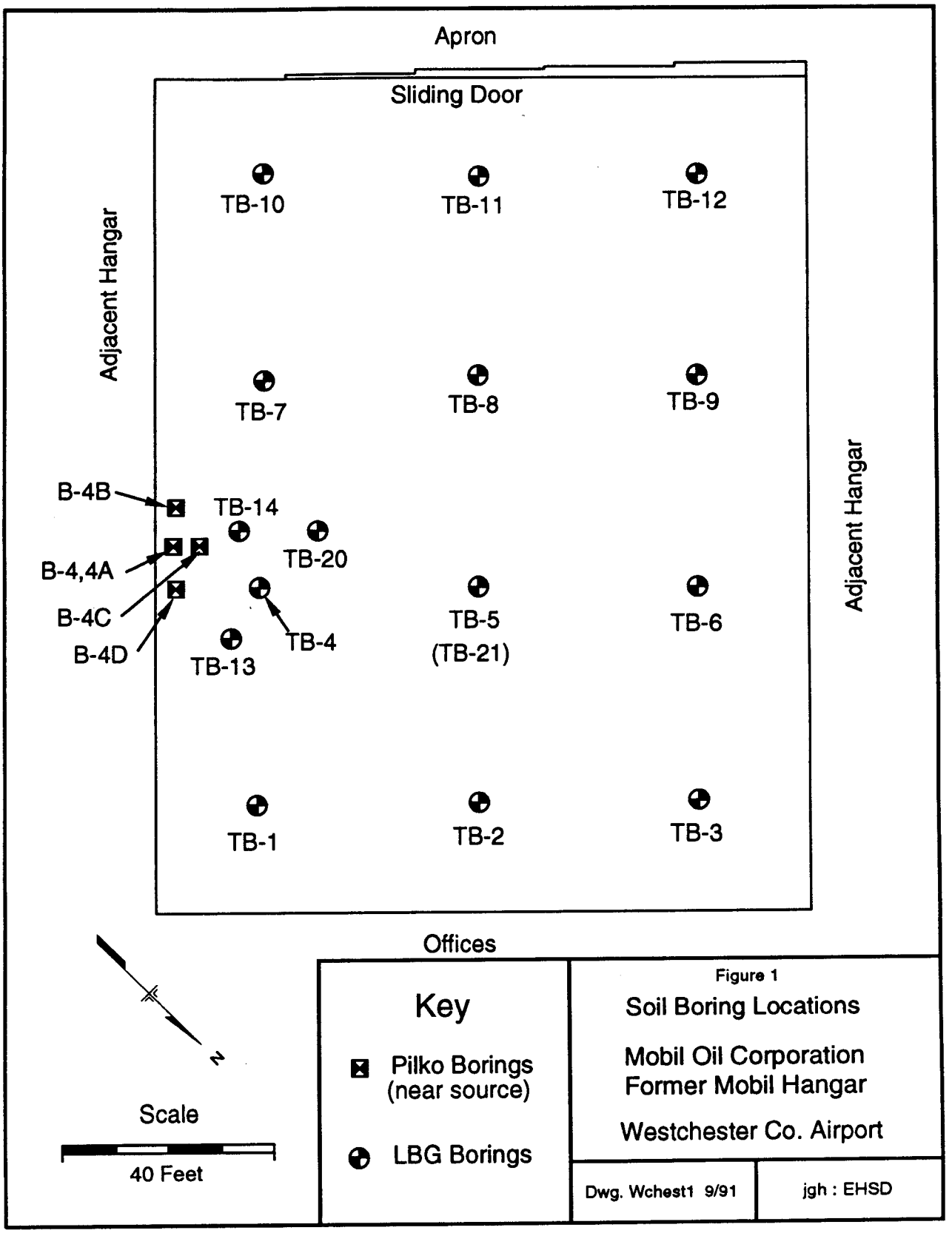
Several studies have been undertaken to evaluate TPH by IR versus GC:

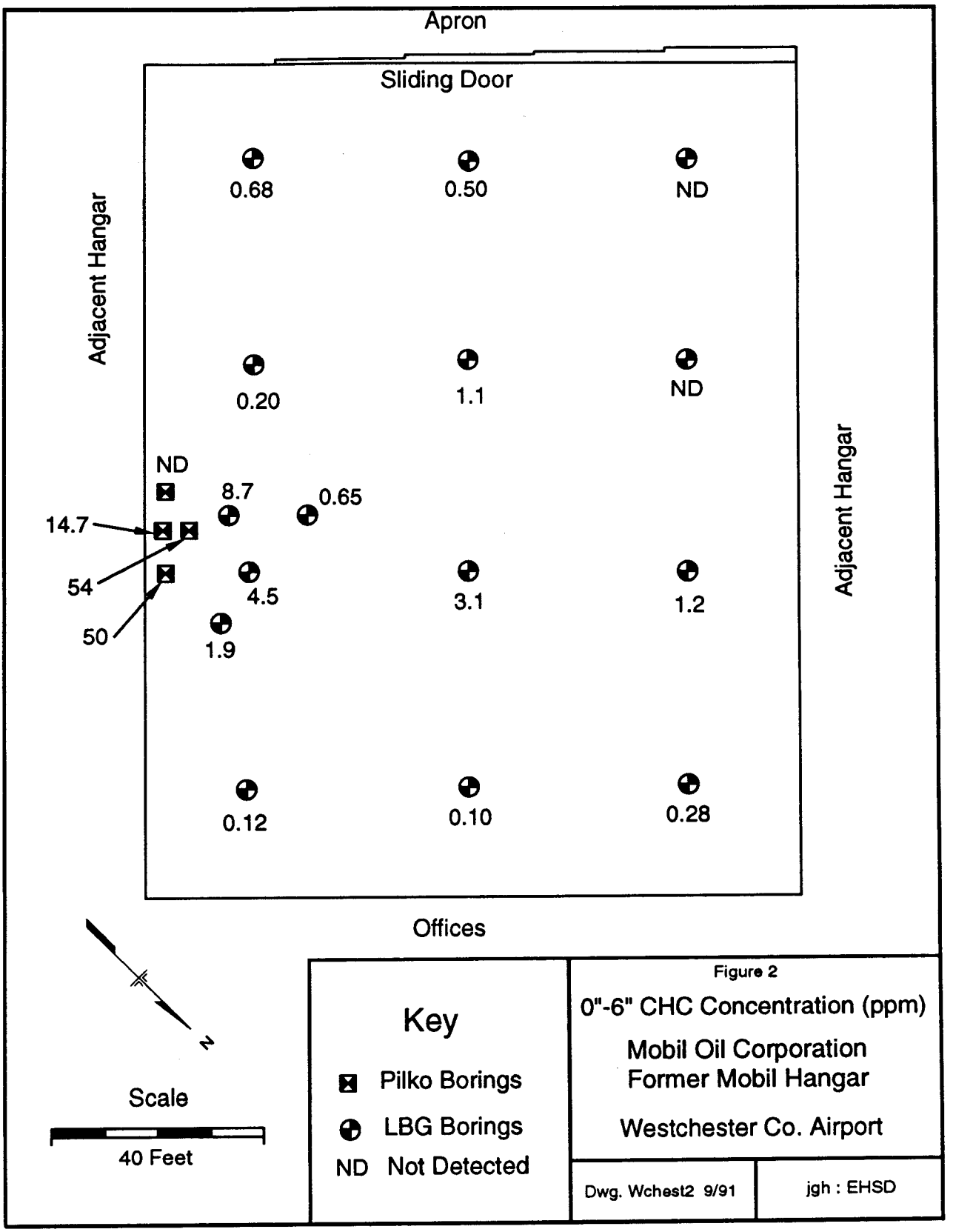
- Thomey, et. al., 1989 (attached) - reports significant false positives for TPH values in fine-grained soils when using the IR method.
- Walters, et. al., 1990 (attached) - recommends GC-based method.
- EPA, API, Midwest Research Institute UST Work group, (Interim progress Report, 1990) - Work group is developing a manual based on GC-based methods for TPH.

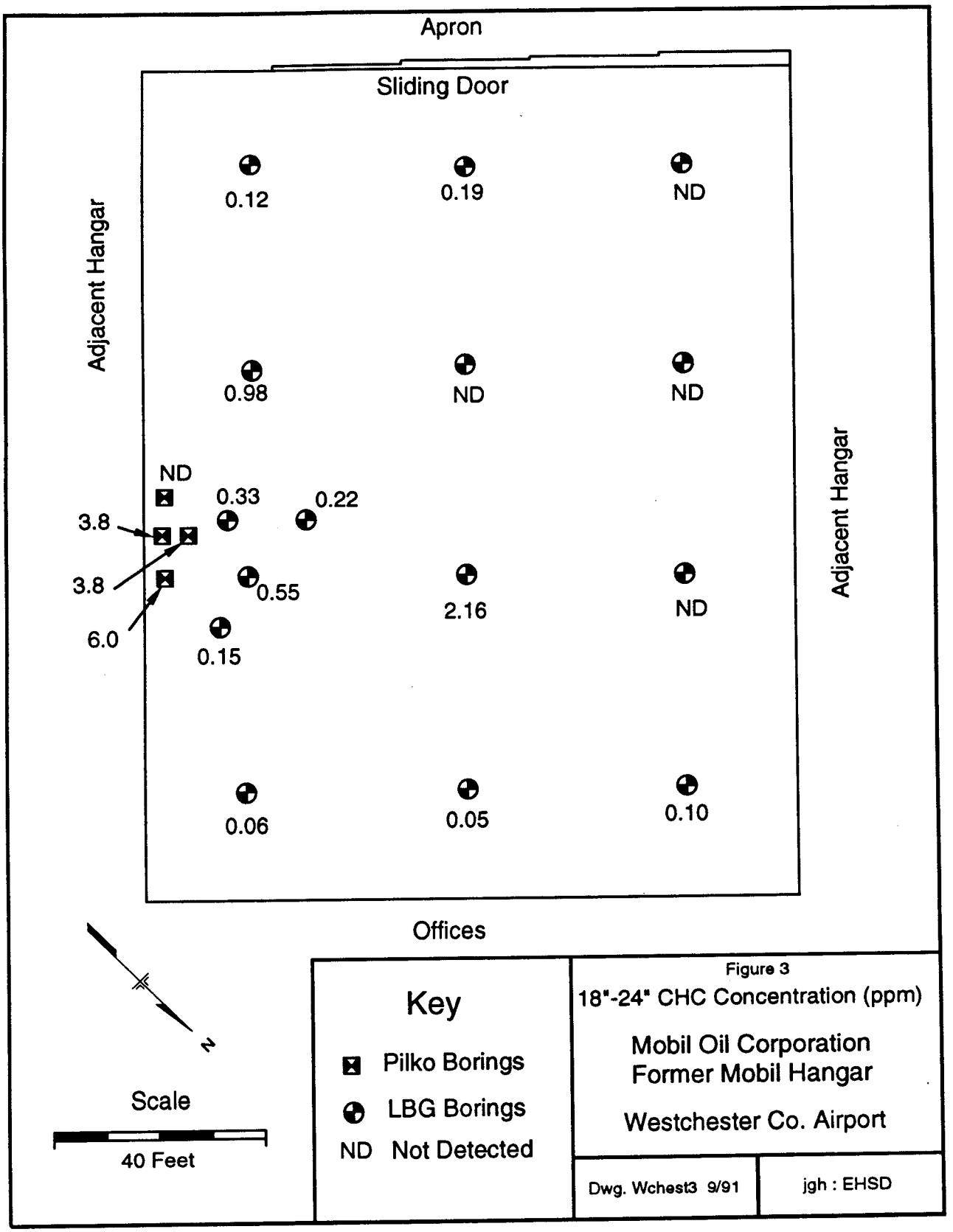
Of particular significance for the former Mobil hangar is the article by Thomey, et. al. In clay-bearing soils (as are present at the hangar), the IR-based method showed false positives up to several hundred ppm. Based on this finding, the recommendation by Walters, and the fact that the EPA and API are developing a GC-based manual, the GC method is preferred as more reliable and realistic.

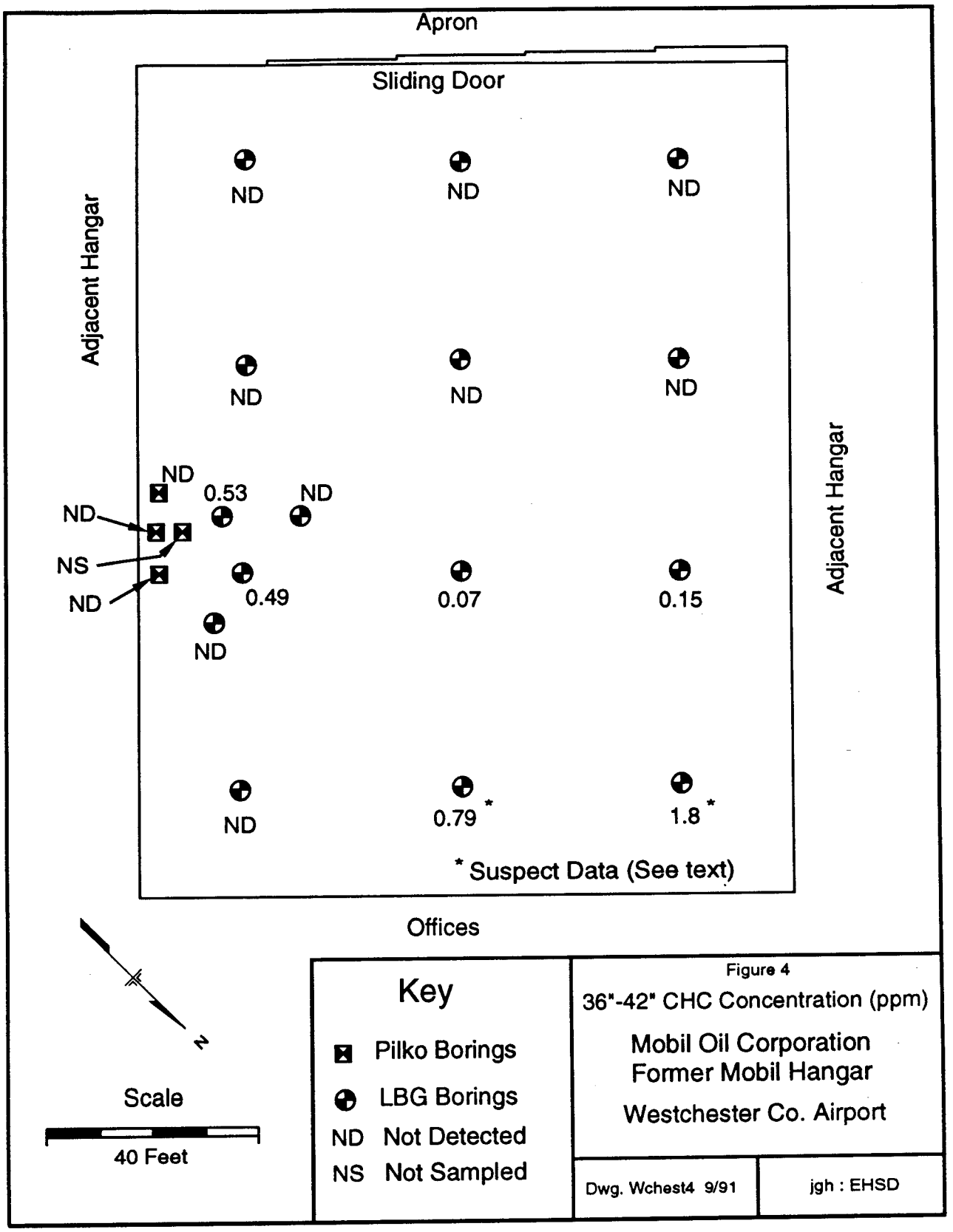
Soil Gas

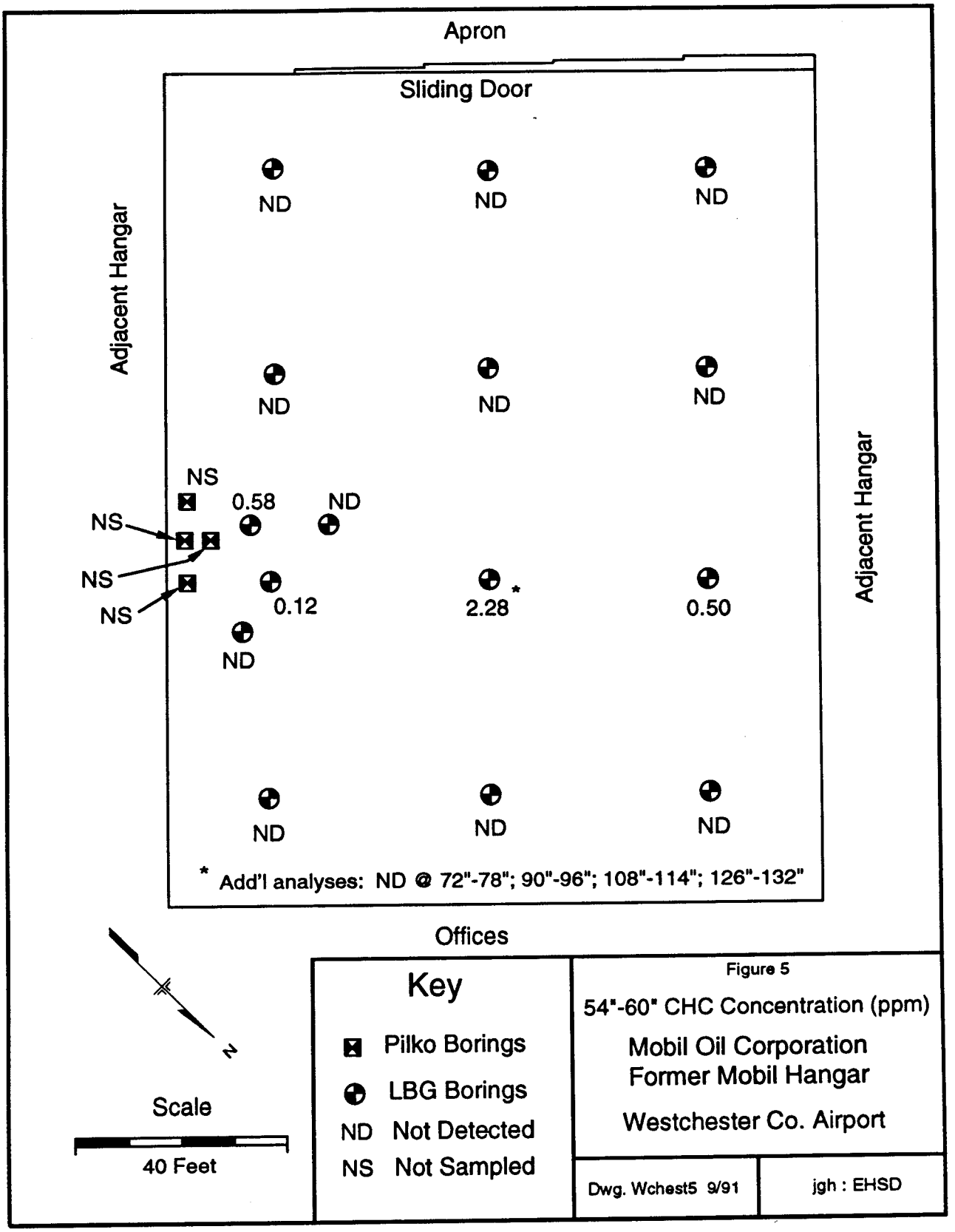
The compound which is present at highest concentrations in the soil gas is 111-TCA (which accounts for nearly 90% of the total soil gas concentrations detected). Minor concentrations of other chlorinated organics are present, most notably PCE, 11-DCA and 12-DCE. Figure 7 is the soil gas contour map for 111-TCA. As can be seen, concentrations fall quickly below 10 ppm away from the source area.

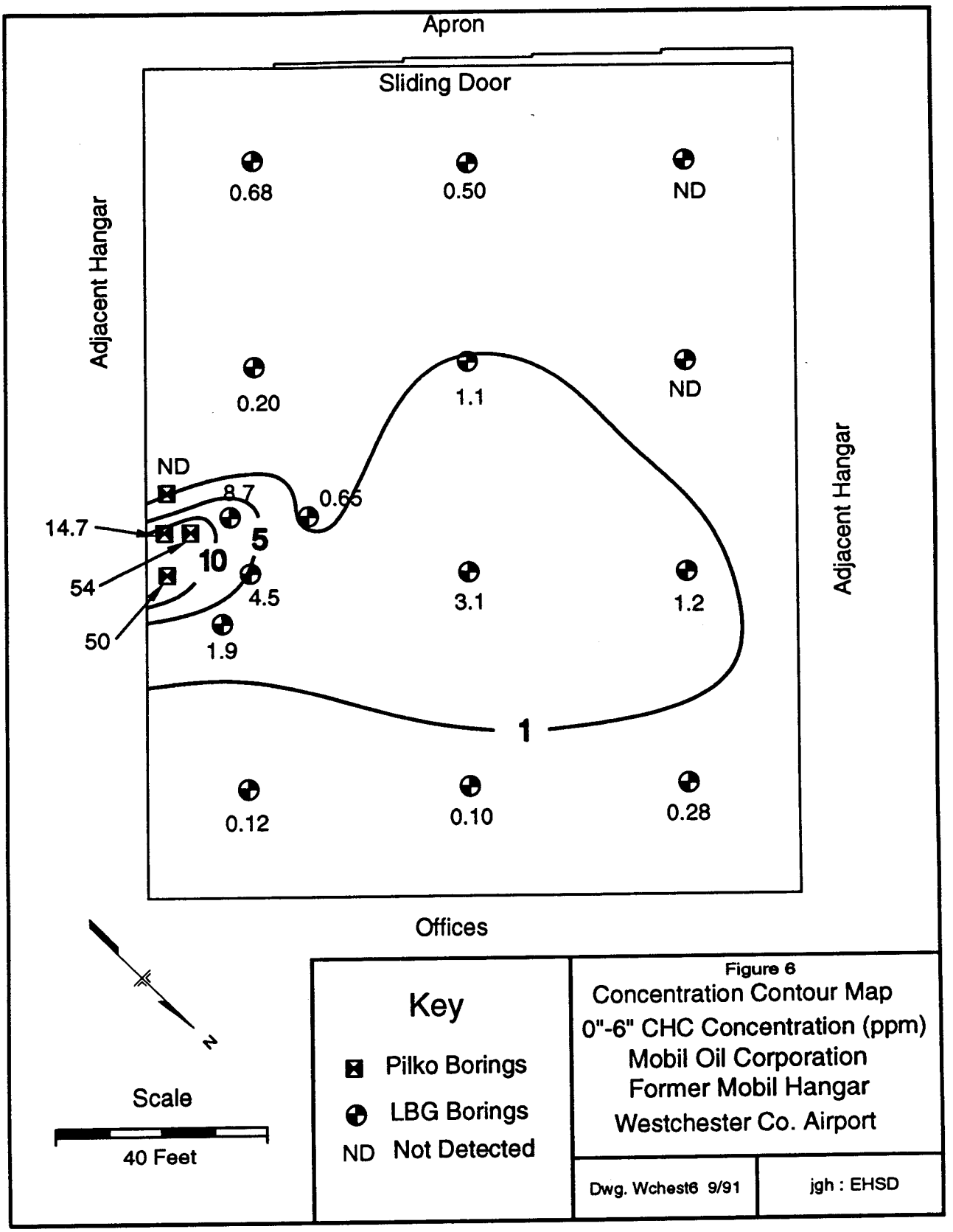

Apron
Sliding Door
Adjacent Hangar
Adjacent Hangar
TB-10
TB-11
TB-12
TB-7
TB-8
TB-9
B-4B
TB-14
TB-20
B-4,4A
B-4C
B-4D
TB-13
TB-4
TB-5
(TB-21)
TB-6
TB-1
TB-2
TB-3
Offices
N
Scale
40 Feet
Key
Pilko Borings
(near source)
LBG Borings
Figure 1
Soil Boring Locations
Mobil Oil Corporation
Former Mobil Hangar
Westchester Co. Airport
Dwg. Wchest1 9/91
jgh : EHSD

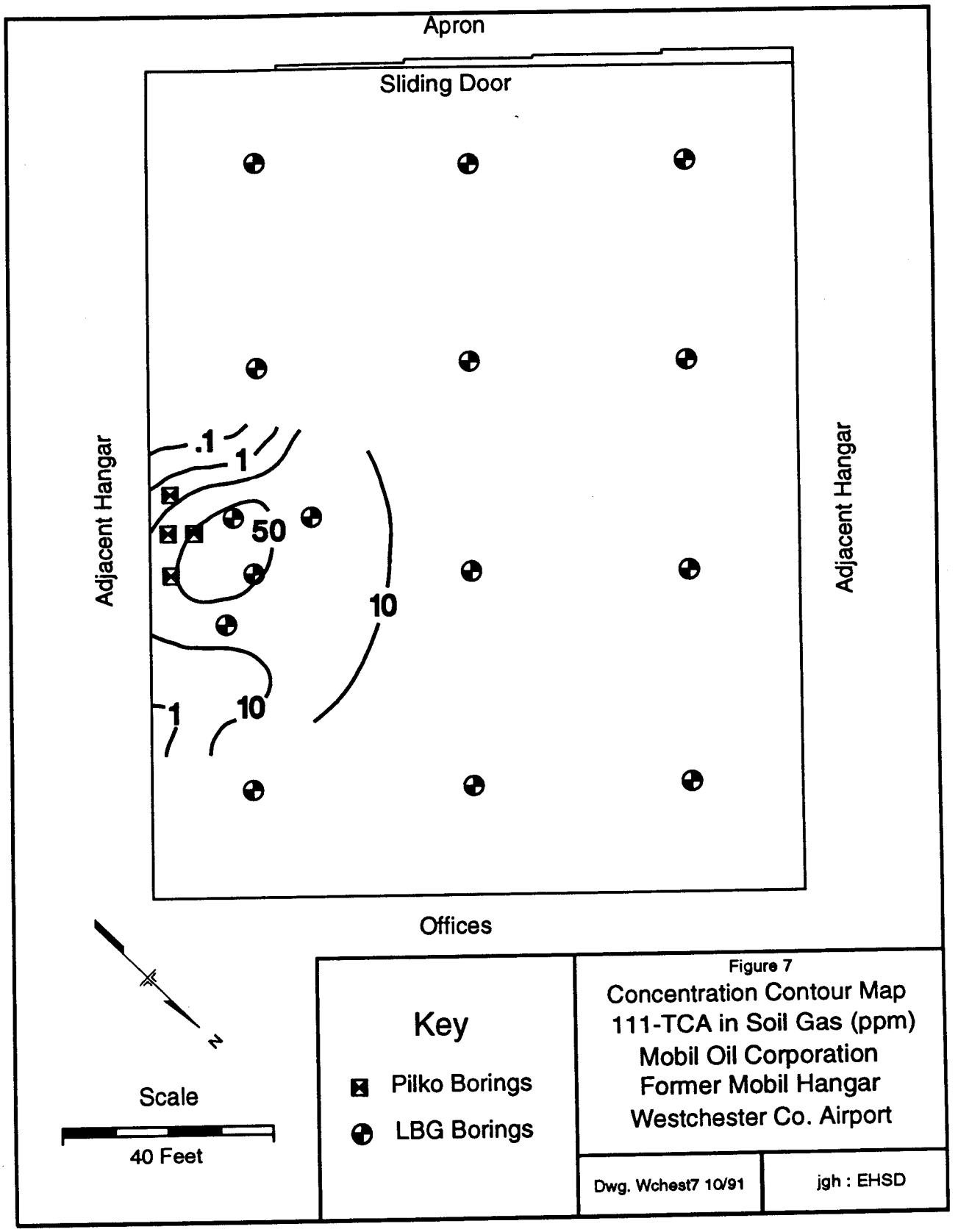

Apron
Sliding Door
Adjacent Hangar
Adjacent Hangar
0.68
0.50
ND
0.20
1.1
ND
ND
8.7
0.65
14.7
54
50
4.5
1.9
3.1
1.2
0.12
0.10
0.28
Offices
N
Scale
40 Feet
Key
Pilko Borings
LBG Borings
ND Not Detected
Figure 2
0"-6" CHC Concentration (ppm)
Mobil Oil Corporation
Former Mobil Hangar
Westchester Co. Airport
Dwg. Wchest2 9/91
jgh : EHSD


Apron
Sliding Door
Adjacent Hangar
Adjacent Hangar
0.12
0.19
ND
0.98
ND
ND
ND
0.33
0.22
3.8
3.8
6.0
0.55
0.15
2.16
ND
0.06
0.05
0.10
Offices
N
Scale
40 Feet
Key
Pilko Borings
LBG Borings
ND Not Detected
Figure 3
18"-24" CHC Concentration (ppm)
Mobil Oil Corporation
Former Mobil Hangar
Westchester Co. Airport
Dwg. Wchest3 9/91
jgh : EHSD


Apron
Sliding Door
Adjacent Hangar
Adjacent Hangar
ND
ND
ND
ND
ND
ND
ND
0.53
ND
ND
NS
ND
0.49
0.07
0.15
ND
ND
0.79 *
1.8 *
* Suspect Data (See text)
Offices
N
Scale
40 Feet
Key
Pilko Borings
LBG Borings
ND Not Detected
NS Not Sampled
Figure 4
36"-42" CHC Concentration (ppm)
Mobil Oil Corporation
Former Mobil Hangar
Westchester Co. Airport
Dwg. Wchest4 9/91
jgh : EHSD


Apron
Sliding Door
Adjacent Hangar
Adjacent Hangar
ND
ND
ND
ND
ND
ND
NS
0.58
ND
NS
NS
NS
0.12
2.28 *
0.50
ND
ND
ND
ND
* Add'l analyses: ND @ 72"-78"; 90"-96"; 108"-114"; 126"-132"
Offices
N
Scale
40 Feet
Key
Pilko Borings
LBG Borings
ND Not Detected
NS Not Sampled
Figure 5
54"-60" CHC Concentration (ppm)
Mobil Oil Corporation
Former Mobil Hangar
Westchester Co. Airport
Dwg. Wchest5 9/91
jgh : EHSD


Apron
Sliding Door
Adjacent Hangar
Adjacent Hangar
Offices
0.68
0.50
ND
0.20
1.1
ND
ND
8.7
0.65
14.7
5
10
54
4.5
3.1
1.2
50
1.9
1
0.12
0.10
0.28
N
Scale
40 Feet
Key
Pilko Borings
LBG Borings
ND Not Detected
Figure 6
Concentration Contour Map
0"-6" CHC Concentration (ppm)
Mobil Oil Corporation
Former Mobil Hangar
Westchester Co. Airport
Dwg. Wchest6 9/91
jgh : EHSD


Apron
Sliding Door
Adjacent Hangar
Adjacent Hangar
.1
1
50
10
1
10
Offices
N
Scale
40 Feet
Key
Pilko Borings
LBG Borings
Figure 7
Concentration Contour Map
111-TCA in Soil Gas (ppm)
Mobil Oil Corporation
Former Mobil Hangar
Westchester Co. Airport
Dwg. Wchest7 10/91
jgh : EHSD

A COMPARISON OF METHODS

FOR MEASURING TOTAL PETROLEUM HYDROCARBONS IN SOIL

BY

NAN THOMEY, DAVID BRATBERG AND CATHE KALISZ

PRESENTED AT THE

NATIONAL WATER WELL ASSOCIATION
CONFERENCE ON PETROLEUM HYDROCARBONS
AND ORGANIC CHEMICALS IN GROUND WATER

November 1989 - Houston, Texas

A COMPARISON OF METHODS

FOR MEASURING TOTAL PETROLEUM HYDROCARBONS IN SOIL

by
Nan Thomey, David Bratberg
Applied Earth Sciences, Inc.
Houston, Texas
and
Cathe Kalisz
Star Enterprise
Irving, Texas

ABSTRACT

Two analytical methods are used to measure total petroleum hydrocarbon concentration in soil samples. One method is a modification of EPA Method 418.1 which utilizes a freon extraction followed by infrared spectroscopy. The second method uses the same extraction method, but is followed by gas chromatography/flame ionization detector analysis.

Soil samples collected during investigations of petroleum product releases from underground storage tanks were submitted to the laboratory and analyzed by both methods. Specific controls were specified for the analyses to eliminate sampling bias from the results.

The data obtained by the two methods were compared and different results were observed. In certain soil matrices, a positive interference was documented in the results from Method 418.1. This positive interference could lead to unwarranted remediation activities if the results are used as cleanup guidelines. The results of the study and potential explanation for the differences are presented.

INTRODUCTION

During the course of subsurface investigations of petroleum product releases from underground storage tanks, soil samples may be collected in order to document the vertical and horizontal extent of subsurface contamination. In addition, soil samples are collected during remediation activities to measure the effectiveness of the technique utilized and to determine the proper disposal location for excavated material.

Current regulations and technical guidelines in many states require that these soil samples be analyzed for the common gasoline constituents benzene, toluene, ethylbenzene and total xylenes (BTEX). These analyses are performed using EPA Method 8020 as described in SW-846, Test Methods for Evaluating Solid Waste-Physical/Chemical Methods. This is a gas chromatography technique utilizing a photo-ionization detector. In addition, many states require measurement of total petroleum hydrocarbons (TPH) to determine the presence of non-gasoline hydrocarbons such as diesel or kerosene, and extremely weathered gasoline products. Currently, there is not an EPA approved method for TPH analysis in soil. The method which has been commonly used and referenced is EPA Method 418.1, described in Methods for Chemical Analysis of Water and Wastes. This method is for measurement of TPH by infrared spectroscopy (IR) in water and wastewater. The extraction procedure must be modified for soil analysis. The state of California, among others, specified a gas chromatography (GC) with flame ionization detection (FID) to determine TPH concentrations in both soil and water. This method is designed to provide product identification as well as quantification. The so called "California Method" is not approved by the state of Texas. This is because a headspace injection technique is used for gasoline analysis. The state of Texas does not accept this injection method because the EPA considers this technique suitable for screening purposes only.

During environmental assessments, anomolies were noticed in the 418.1 TPH data. The data obtained were inconsistent with known site information. One type of situation involved soil samples which were collected from service station sites which had never dispensed any products except gasoline. Analytical results indicated that the samples contained no measurable BTEX constituents and the soils exhibited no hydrocarbon odors. However, TPH results indicated the presence of 100-200 mg/kg of petroleum hydrocarbons. These results were inconsistent with the composition of gasoline. A second type of situation involved samples which were collected in conjunction with remodeling activities at sites with no suspected or known

product releases. Soil borings were performed and several intervals were sampled and analyzed for each boring. BTEX concentrations were below the analytical detection limits. The TPH results ranged from 100-250 mg/kg for all of the samples which were collected.

Based upon this information, a potential problem was suspected with the 418.1 TPH analyses. The BTEX chromatograms were examined and in most cases, there was no evidence of the presence of petroleum hydrocarbons. A positive interference in the IR method was suspected. The IR methodology was focused upon because the method used for soil analyses is actually a technique developed for water analyses. The method did not appear to be directly applicable to the analysis of soils. Through discussions with the Texas Water Commission and other states, a method for TPH analysis by Gas Chromatograph (GC) utilizing a flame ionization detector (FID) was proposed and was approved by the State for use in the underground storage tank program.

To satisfy our own curiosity, we decided to conduct a method comparison study. We submitted a number of soil samples for TPH analysis. The samples were analyzed by IR and GC/FID. The data obtained by the two methods are presented and compared below.

The state of Texas has approved the use of a GC/FID analysis for TPH. The method approved specifies the extraction solvent, type of column, and injection technique to be used.

DESCRIPTION OF METHODS

Approximately 60 samples were submitted for analysis during the course of the study. All soils were classified by the same hydrogeologist to assure consistency.

Two methods were used for the analysis of the samples. One method was the EPA modified 418.1 procedure for infrared spectroscopy. The second method was a GC/FID capillary column analysis, based upon ASTM 3328. This is the GC method which is approved by the State of Texas. ATSM 3328 is a procedure for the comparison of waterborne oils. There is no mechanism in this method for quantification.

Both methods utilize the same extraction procedure. A known portion of the sample was dried with anhydrous sodium sulfate, and ground to form a free-flowing powder. The dried samples were then extracted by sonication. The solvent which was used was fluorocarbon-113. The extract was treated with 60-200 mesh silica gel. The silica gel treatment is to remove polar hydrocarbons which include

animal fats and other non-petroleum hydrocarbons.

The treated extract was then analyzed by Infrared spectroscopy and GC/FID. Both analyses were performed on the same extract. This eliminated any bias from the sampling and extraction processes. The IR analysis measures carbon-hydrogen bonds. The GC/FID analysis utilizes flame ionization to measure hydrocarbons. The IR analysis cannot identify specific hydrocarbons. GC/FID is a common analytical technique which is frequently used to identify and quantify specific hydrocarbons.

In the IR method, TPH is calculated by comparing the IR absorbance of the samples at about 2950 cm^{-1}, to the response of a reference oil standard. The reference oil standard utilized in 418.1 is composed of n-hexadecane (C16), isoctane (C8), and chlorobenzene (C6). In the GC/FID method, the total area response of the sample is compared to the total area response of a specific fuel or mixture of fuels such as gasoline or diesel. These standards are in the range of approximately C-5 to C-22. Copies of standard chromatograms for gasoline and diesel are shown in Figure 1. A known 418.1 reference oil standard was analyzed by GC and the result calculated based upon the GC standard. A known GC gasoline standard was analyzed by IR and the result calculated from the 418.1 reference oil. This was done to determine the potential effects of utilizing different standards.

RESULTS

The analytical results are presented by soil type in Table 1. Significantly different results by the two methods were observed. The IR results were higher than the GC/FID results for certain types of soil. The predominant samples exhibiting this effect were the soils whose major constituents were weathered limestone, silt, or clay.

All of the samples composed predominantly of weathered limestone had IR results which were higher than the GC/FID results. Some of these differences were quite significant. For example, on one sample which was submitted, the results were 760 and 67 mg/kg by IR and GC/FID, respectively. In a second case, the results were 3,100 and 1,000 mg/kg by IR and GC/FID, respectively.

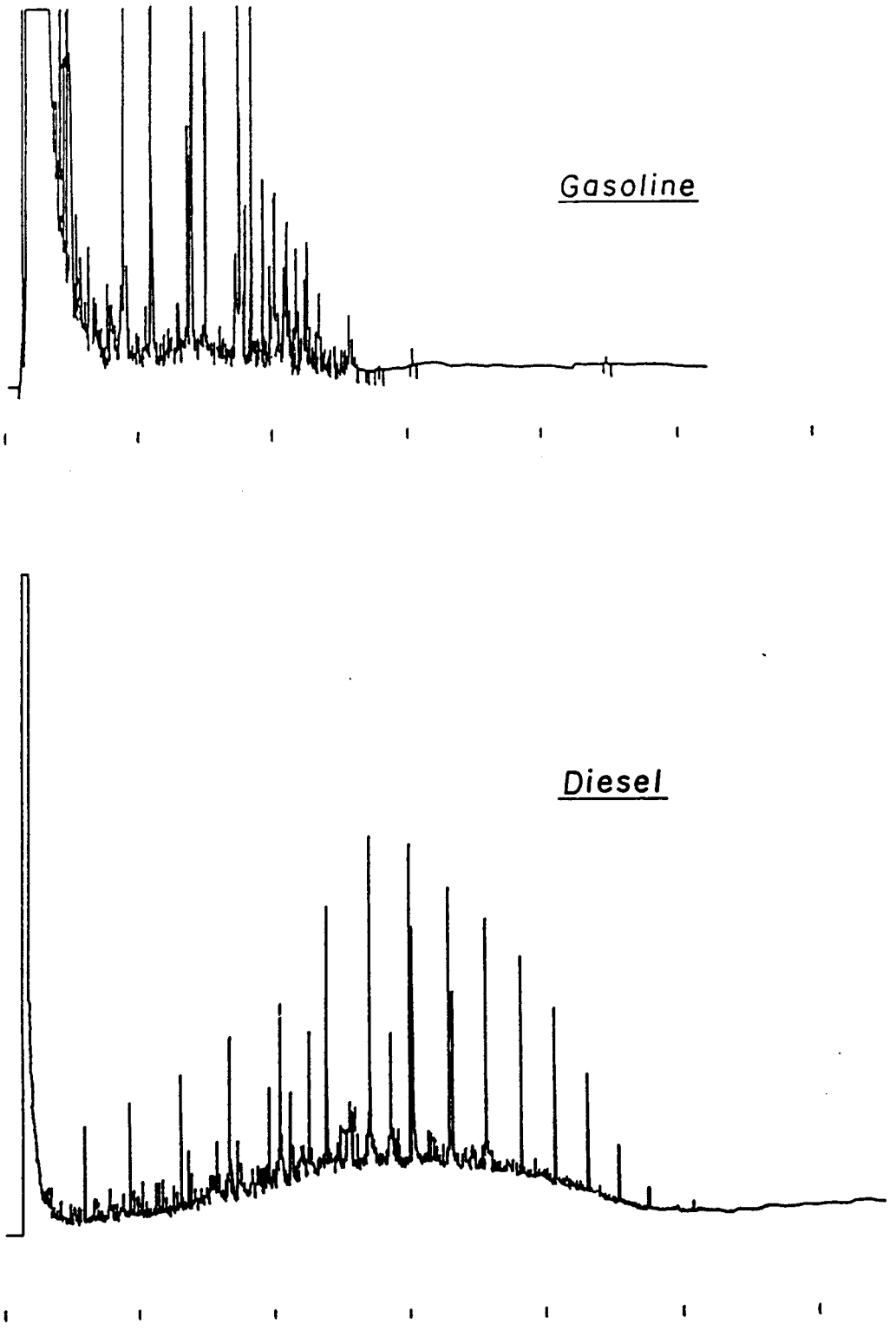


Figure 1.- STANDARD CHROMATOGRAMS

TABLE 1

Summary of Results
TPH Method Comparison

(all units in mg/kg)

SOIL TYPE	TPH/IR	TPH/GC
Weathered limestone, sandy clay	760	67
Weathered limestone, sandy clay	31	ND
Weathered limestone, sandy clay	3,100	1,000
Sand	130	230
Sand	120	170
Sand	150	150
Sand	100	130
Sand, medium	ND	ND
Sand, medium	ND	ND
Sand, medium	ND	ND
Sand, some clay	ND	ND
Sand, medium	ND	ND
Sand, medium	ND	ND
Sand, clay mixture	ND	ND
Silty sand	30	ND
Silty sand	ND	ND
Silty sand	ND	ND
Clayey sand	ND	ND
Silty clay	16	ND
Silty clay	ND	ND
Silty clay	ND	ND
Silty clay	ND	ND
Silty clay, weathered limestone	ND	ND
Silty clay,	366	ND
Sandy clay, dry	ND	ND
Clay, brown, dry	ND	ND
Clay, yellow brown, dry	ND	ND
Clay, weathered limestone	ND	ND
Clay, yellow brown, dense, dry	250	ND
Clay, dark gray, dense, stiff	ND	ND
Clay, dark gray, stiff	120	ND
Clay, dark gray, stiff	ND	ND
Clay, gray, stiff	160	ND
Clay, some silt, dense	ND	ND

TABLE 1 (Continued)

Summary of Results
TPH Method Comparison

(all units in mg/kg)

SOIL TYPE	TPH/IR	TPH/GC
Clay, light brown, manganese concretions	ND	ND
Clay, dark gray	30	ND
Clay, light brown	ND	ND
Clay, black	ND	ND
Clay, dark gray, some grass roots	323	87
Clay, dark gray	ND	63
Clay, light brown	ND	ND
Clay, dark brown, stiff	ND	ND
Clayey silt	796	70
Clayey silt	ND	ND
Clayey silt	ND	ND
Clayey silt	ND	ND
Clayey silt, silty clay	ND	ND
Silt, weathered limestone, wet	ND	ND
Silt, gray, loose	90	ND
Silt, medium sand	ND	ND
Sandy, silt, wet	106	ND
Clayey gravel	9,700	350

For the clay soils, nearly one-third of the samples submitted had IR results which were higher than GC/FID results. All but one of these samples had TPH results by IR greater than 100 mg/kg. The TPH by GC/FID results on these samples were all <25 mg/kg. Similar problems were observed in the silty clay, clayey silt, and silt samples.

For sandy soils, the IR and GC data agreed very well. In some cases the GC/FID results were slightly higher than the IR results. However, in these cases, both values were greater than 100 mg/kg.

The standard analysis comparison demonstrated that the type of standard used had little or no affect on the analytical results. A 100 ppm 418.1 Reference Oil Standard was analyzed by GC/FID and calculated based on a gasoline standard. The result obtained was 97 ppm. A 53 ppm gasoline standard was analyzed in duplicate by IR and the result calculated based upon the 418.1 reference oil standard. The results obtained were 49 and 44 ppm, respectively.

INTERPRETATION

It was originally theorized that the positive interference in the IR method was due to the presence of natural organics in the soils which were not removed by the silica gel extraction. However, the results obtained for the weathered limestone, which should not contain organic material, does not support that theory.

A second theory is that the positive interference is caused by suspended particles in the extract. It is possible that the clay-sized inorganic particles absorb infrared light and cause a positive reading in the absence of petroleum hydrocarbons.

The colloidal and clay-sized particles would require a much longer time than 60-200 mesh silica gel to settle out of the extract. Additionally, the settling time and velocity are governed by the density differences of the particles and fluid, and the viscosity of the fluid (Stokes Law). Freon 113 has a density of 1.565 grams/cc and a visosity of 0.68 centipoise, meaning that light-weight particles are going to require much longer settling times in Freon 113 than water.

CONCLUSION

Based upon the results of this study, it is apparent that EPA Method 418.1 is not an appropriate technique for measuring TPH concentration in certain types of soils. These types of soils can be categorized as weathered limestone, clays, and silts. One of the more frequent arguments for using this method is that it is a relatively inexpensive test. We believe this study demonstrates how thousands of dollars can be spent on unnecessary remediation and disposal costs because of actions taken on the basis of a laboratory analysis costing less than fifty dollars. It is our opinion that the GC/FID technique provides a more adequate representation of the degree of hydrocarbon contamination in soil.

If EPA modified Method 418.1 is used for TPH analysis in soils, positive results should be confirmed through GC/FID analysis. Otherwise, the parameter of TPH should not be used to establish cleanup guidelines or to assign waste classfications.

ANALYTICAL METHODS

FOR PETROLEUM HYDROCARBONS

BY

GARY WALTERS, MIKE HOFFMAN, ELIZABETH WESSLING, AND KIMBERLY ZILLIS

PRESENTED AT THE

NATIONAL WATER WELL ASSOCIATION
CONFERENCE ON PETROLEUM HYDROCARBONS
AND ORGANIC CHEMICALS IN GROUND WATER

October 1989 - Houston, Texas

ANALYTICAL METHODS FOR

PETROLEUM HYDROCARBONS

Gary Walters, Kimberly Zilis, Elizabeth A. Wessling, Michael Hoffman

Enseco - Rocky Mountain Analytical Laboratory (Enseco-RMAL)
Arvada, Colorado

Abstract

There are currently a wide variety of methods available for the analysis of petroleum products in environmental samples. An indicator test like Total Petroleum Hydrocarbons by Infrared Spectroscopy (EPA Method 418.1) and analyte specific tests like Methods 8020, 8240, 8100, or 8270 can only be indirectly related to petroleum products. The goal of our efforts has been to develop alternative techniques to provide reliable measurement of a full range of petroleum products at environmental levels at reasonable cost.

The suggested methods are all based on gas chromatography with flame ionization detection (GC/FID). The methods include a purge and trap "Volatile" method termed "Gasoline Range Organics" which includes measurement of gasoline and BTEX. The "Semivolatile" method is termed "Total Chromatographable Organics" and is designed to measure other products (diesel, kerosene, and motor oil) and provide carbon range information. An "Oil Spill" method is designed specifically for crude oil and is termed "Petroleum Hydrocarbons".

INTRODUCTION

From gasoline storage tanks to crude oil spills, contamination of the environment by various petroleum products has resulted in a variety of laboratory techniques to determine the extent of contamination. An indicator test such as Total Petroleum Hydrocarbons by Infrared Spectroscopy (EPA Method 418.1) is known to have a low recovery for gasoline (6,7) and is susceptible to a significant positive bias when applied to some soil types (9). Analyte specific tests (EPA Method 8020 and 8040) only measure selected components of gasoline (e.g. BTEX). The limitations of these tests have been well documented (6,7). A variety of Gas Chromatography/Flame Ionization Detection (GC/FID) methods have been developed including ASTM Method D3328-78 (2) for "waterborne oil" and the California Department of Health Services "modified Method 8015" (8).

The wide array of methods available for petroleum hydrocarbon analysis provide data of varying and questionable quality. The approach of our work was to evaluate the existing methods and establish "improved" methods based on GC/FID (including documented performance). As discussed below, an analytical protocol which provides a reliable measurement of a full range of petroleum products at environmental levels at a reasonable cost was developed.

I. SUMMARY OF PETROLEUM PRODUCTS

Petroleum products are comprised of a range of individual hydrocarbons. Figure 1 is condensed from the ASTM Manual on Hydrocarbon Analysis (3) and shows the carbon range and boiling point range of several common products. The distribution of these individual hydrocarbons is shown in Figure 1.

Petroleum product specifications are based on criteria such as distillation start/end points, octane ratings for gasoline, and cetane ratings for diesel. Thus, the concentration of individual hydrocarbons (and groups like Paraffins, Olefins, Napthenes, and Aromatics) may vary significantly from one vendor to the next for a given product. Various products may contain many of the same compounds in different relative amounts. To reliably measure petroleum products, methods must adjust for these variations.

II. EXISTING METHODS

Total Petroleum Hydrocarbons (TPH)

Several versions of the TPH or oil and grease methods are available. Standard Methods 5520A (2) (formerly 503) includes three methods for liquids: the partition-gravimetric method (B), the partition-infrared method (C), and the filtration-soxhlet method (D), plus a soxhlet method for sludges (E). Calibration of the infrared spectrophotometer (Method C) requires a "known oil" or a reference oil (by volume - 37.5% iso-octane, 37.5% hexadecane, and 25% benzene). Method F is silica gel cleanup which removes polar fats from animal and vegetable sources, and makes the test more specific for non-polar petroleum hydrocarbons.

FIGURE 1.

SUMMARY OF PETROLEUM PRODUCTS

No. of Carbon Atoms	C_2	C_4	C_6	C_8	C_{10}	C_{12}	C_{14}	C_{16}	C_{18}	C_{20}	$>C_{20}$
Boiling Pt., °C	-89	-0.5	69	126	174	216	253	287	316	343	

Butanes ——

Gasoline ——————————

Diesel ——————————

Fuel Oil ——————————

Wax ——————————

Method 413.1 is Total Recoverable Oil and Grease using a separatory funnel extraction and gravimetric determination (11). Method 413.2 replaces the gravimetric determination with an infrared measurement. Calibration uses a reference oil (by volume 37.5% n-hexadecane, 37.5% iso-octane, and 25% chlorobenzene). Method 418.1 (Total Recoverable Petroleum Hydrocarbons) is similar to 413.2 except 418.1 adds a silica gel cleanup. These are water methods, but 418.1 is frequently modified using a soxhlet or sonication extraction for the analysis of soils. The EPA has also published two methods, 9070 and 9071, in SW 846 (12) for oil and grease with gravimetric determination in water and sludge, respectively.

A modification of the TPH method has been developed by the Chevron Research Company (4). This Modified Oven Drying Technique (MODT) determines the oil, water and solids concentration of wastes and soils. The three phases are recovered separately, allowing for a weight closure check and further characterization of each phase if necessary.

Except for the MODT method, the TPH methods are EPA approved, well established, and most commercial laboratories are very familiar with the technique. These methods are relatively quick and inexpensive. However, there are some definite disadvantages to the TPH tests. All these tests use freon as an extraction solvent, and freon will become increasingly difficult to obtain. In addition, many "heavy distillates" are poorly soluble in freon and not effectively extracted. TPH tests have low recovery for volatile hydrocarbons, like gasoline. Volatile components are lost during the concentration step of the gravimetric method. Infrared calibration with the required "reference oil" assumes the unknown sample is 25% aromatic. This can lead to significant bias if a sample is 100% (or 0%) aromatic. One study (9) has indicated potential false positive TPH IR results when the test is performed on clay or limestone soils. Without the silica gel cleanup, TPH tests will measure vegetable or animal hydrocarbons (organic acids, fats) which can bias results high. Use of the silica gel cleanup may remove complex aromatic compounds and other hydrocarbons which contain chlorine, sulfur, and nitrogen which can bias results low.

Method 8020/602

Similar to the TPH / oil and grease techniques, Method 8020 is EPA approved, well established, and in wide spread use. Method 8020 is a Gas Chromatography/Photoionization Detection (GC/PID) method which can measure the individual "toxic" components of gasoline directly (BTEX - Benzene, Toluene, Ethyl benzene, Xylenes). Method 602 is a similar technique designed for wastewater applications. The method has good sensitivity for these compounds - nominal reporting limits are 0.5 ug/L in water and 50 ug/kg in soil.

The primary disadvantage for Method 8020 is the difficulty in correlating BTEX values to gasoline. While BTEX is a good indicator for gasoline, particularly in groundwater, the volatile aromatics can originate from sources other than gasoline. Of course, Method 8020 does not address any of the heavier products like diesel or kerosene.

Method 8240/8270 and 624/625

Methods 8240 and 8270 (12) are also target compound methods but use Gas Chromatography/Mass Spectrometry (GC/MS). Method 624 and 625 are used for waste water applications. These are EPA approved methods with good sensitivity (5 to 10 ug/L in water, 5 to 330 ug/kg in soil). In addition, through the use of library searches/Tentatively Identified Compounds, additional non-target compounds can be measured.

The disadvantages of Methods 8240/8270 are similar to Method 8020. It can be difficult to correlate individual compound data to particular products. In addition, the GC/MS methods are generally too expensive for routine screening applications.

California LUFT: DHS TPH - Gasoline and Diesel

The DHS TPH methods are GC/FID techniques designed to measure gasoline and diesel. Unlike the target compound methods, these methods provide values for specific products. Calibration uses commercial gasoline or diesel, and samples are analyzed on a packed GC column. "Standard laboratory quality practices" including blanks, duplicates, and spikes are required.

However, the California methods do have some limitations. The methods lack key method performance data such as recovery and minimal quality assurance criteria. Key details such as start/stop of integration, use of baseline projection, and interpretation of weathered samples are not addressed. In addition, the analysis of gasoline is permitted by either Headspace or Purge and Trap (EPA 5030). Apparently, gasoline may also be analyzed by the same extraction/concentration method used for diesel. There is no indication of the equivalence or applicability of these method variations.

ASTM D3328-78

ASTM D3328-78 (2) is a GC/FID method for the analysis of waterborne oils. It is oriented toward qualitative identification and the determination of product matches, primarily distillate fuel, lubricating oil, and crude oil. Sample of known oils must be submitted with the analysis; there are no provisions for identification of the source of unknown oils. No quantification information is provided.

III. IMPROVED METHODS

The "improved" methods all have similar characteristics. They provide a "Total Hydrocarbon" value for a particular carbon range which is based on a GC/FID response relative to a synthetic standard. The use of a synthetic standard requires careful attention to the analytical details of the method, but provides a more universally consistent quantification. Each method has the capability to fingerprint particular products. However, the primary goal of the method is to provide reliable, consistent quantification. The basic method can be enhanced for specific applications. The methods are listed below:

- "Volatile" Method - Gasoline Range Organics (GRO)
  - for the gasoline range, BTEX included

- "Semivolatile" Method - Extractable Petroleum Hydrocarbons reported as Total Chromatographable Organics (EPH-TCO)
  - for diesel, kerosene, and other products

- "Oil Spill" Method - Petroleum Hydrocarbons (PHC)
  - for crude oil

Gasoline Range Organics

The Gasoline Range Organic Method was developed through a laboratory study sponsored by the American Petroleum Institute designed to establish a reliable method for sampling and analyzing gasoline range organics in soil. A number of professionals in the petroleum industry recognized that the current analyses for gasoline were inadequate due to the following concerns:

- loss of volatile organics during sampling and sample handling leading to significant bias;

- the wide variety of laboratory techniques for "gasoline" produced data of variable quality; and

- the generally poor documentation of the performance of "gasoline" methods.

The results of this study have been previously described (5).

The GRO method is a modified Method 8015 (Purge and Trap - GC/FID) for the measurement of gasoline which adds Method 8020 (Purge and Trap - GC/PID) for BTEX. (The BTEX values are based on a single column.) The method complies with the minimum criteria in the California LUFT purge and trap method for gasoline. Calibration uses a synthetic gasoline comprised of ten common components of gasoline. The synthetic gasoline eliminates potential problems from variable commercial gasoline. In addition the first and last peaks define the gasoline "window" and correspond to the range of C_6 to C_{10}.

Various commercial gasolines had similar recoveries (53%, 58%, 62%) compared to API PS-6 reference gasoline (70%). Using PS-6 gasoline and the methanol extraction - purge and trap GRO, recoveries were similar in Ottawa Sand (70%), Houston Black Clay (67%), and Norwood Loam (58%). Relative percent differences on the clay and loam were less than 5%.

The soil method used field preservation with methanol which stabilizes the organic components via solubilization and minimizes microbial degradation. This field sample control allows the sampler greater freedom in the actual selection of the sample. Reporting limits for gasoline are 2 to 5 mg/kg for soil and 50 to 100 ug/L for water. Reporting limits for individual components like benzene are lower (0.05 mg/kg for soil and 0.5 ug/L for water).

Extractable Petroleum Hydrocarbons Total Chromatographable Organics (EPH-TCO)

The EPH-TCO is a modified Method 8100 (GC/FID) designed to measure diesel, fuel oil, kerosene, and other products in the range of C_7 to C_{32}. It is also possible to identify gasoline and motor oil, though these products are not recovered as well as diesel. The method complies with the minimum criteria in the California LUFT extraction method for diesel. Key points of this method have been described in more detail (13).

Organic compounds are extracted from their matrix into methylene chloride, and the extract is then analyzed by capillary column GC with a flame ionization detector. The term "Total Chromatographable Organics" (TCO) is defined at the total chromatographic area responding to a FID with boiling points between 100°C and 470°C as compared to the response of ortho-terphenyl. This definition is very similar to the definition of TCO set forth by the EPA in 1978 (10). The boiling range of 100°C to 470°C corresponds to the hydrocarbon range of nC_7 to nC_{32}. Quantification is performed using a baseline projection to integrate area for both resolved and unresolved components. Additional information is generated by comparing the chromatogram against standards of known petroleum products for identification and a series of alkanes for a carbon distribution range. In addition, non-petroleum products such as vegetable oil and vegetative hydrocarbons can be identified in some cases.

The average recovery of fuel oil #2 from reagent water spiked at 250 ug/L was 66% with a relative standard deviation (RSD) of 25% (12 replicates). The average recovery of fuel oil #2 from Ottawa sand spiked at 10 mg/kg was 67% with a RSD of 18% (4 replicates). The average surrogate (ortho-terphenyl) recovery was 82% in water (15% RSD) and 84% in Ottawa sand (8% RSD). The surrogate was spiked at 20 ug/L in water and 0.80 mg/kg in Ottawa sand. Note that ortho-terphenyl functions as the surrogate standard and the calibration standard.

Petroleum Hydrocarbons

The Petroleum Hydrocarbons (PHC) method has been used extensively for oil spills and is similar to the EPH-TCO Method. The results provide information on fate, transport, and weathering of crude oil. These results include a "Total Petroleum Hydrocarbon" value (C_{10} to C_{36}), n-alkanes (C_{10} to C_{32}), pristane, and phytane. This test can be linked with a GC/MS-Selected Ion Monitoring technique to measure trace levels of Polynuclear Aromatic Hydrocarbons.

IV. COMPARISONS OF PETROLEUM HYDROCARBON METHODS

The following tables compare the performance of petroleum hydrocarbon methods on various soils. Following each table is a discussion of the results.

TABLE 1. COMPARISON OF "TPH" METHODS FOR GASOLINE (5)

Method	Field Sample mg/kg	Lab Spike mg/kg
API-GRO	130	8.3
CALIF-LUFT	64	0.96
8020-BTEX (Total)	5.9	1.8
8240-(RIC total)	51	0.82
TPH-IR	ND (50)	ND (50)

The field sample contained weathered gasoline. The lab spike was artificially weathered (spiked at 50 mg/kg; however, some of the lighter components were lost during the mixing process). Method 8020 results are lower than GRO because only selected components (BTEX) are measured. TPH-IR is known to have a low recovery for the volatile and aromatic components of gasoline.

TABLE 2. COMPARISON OF EPH EXTRACTION SOLVENTS FOR DIESEL

Method	D-S-1, mg/kg	D-S-2, mg/kg	D-S-5, mg/kg	D-S-4, mg/kg
EPH-TCO (CH_2Cl_2)	78	150	10	12
EPH-TCO (Freon 113)	29	24	2.2	6.0

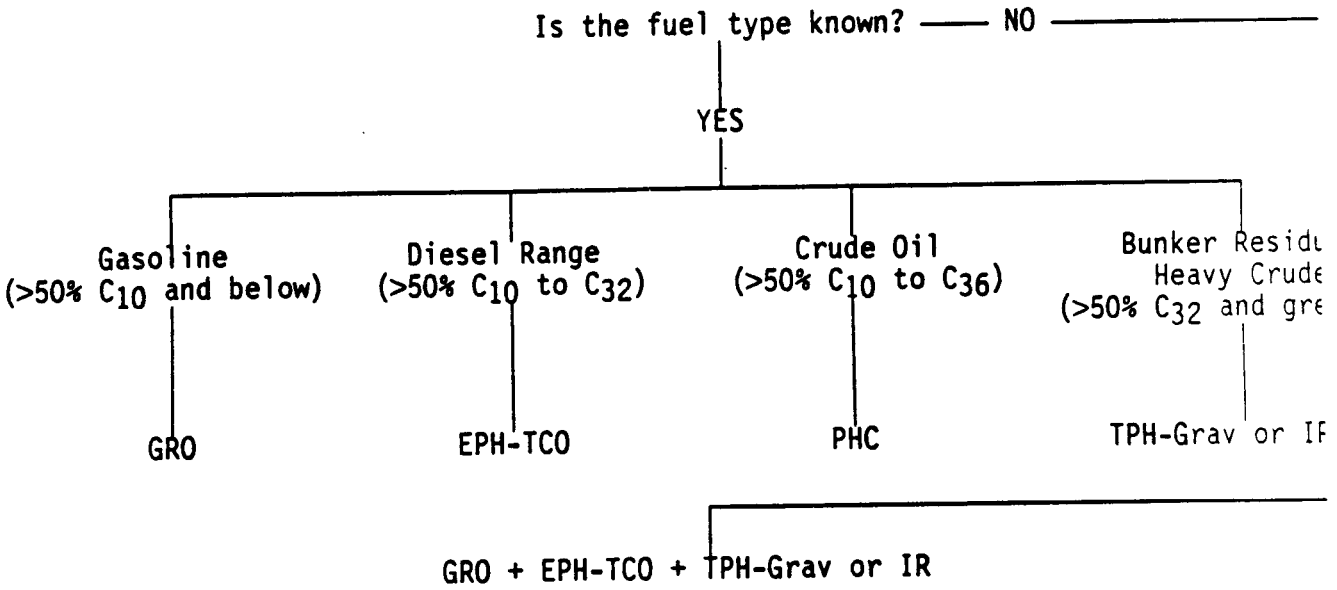
These samples were field samples contaminated with diesel. The tests were done to evaluate extraction solvents and the number of extraction steps for a round robin study. The CH_2Cl_2 samples were extracted three times with methylene chloride, while the freon samples were extracted one time with freon 113. The average surrogate (1-chlorooctadecane) recovery was 103% for CH_2Cl_2 extraction and 67% for freon extraction. Though not conclusive, the data indicates that CH_2Cl_2 is more effective for the extraction of diesel from these soils.

A limited study was performed to evaluate the recovery of the standard gravimetric procedure (SW-846 Method 9071) for diesel #2, creosote, and motor oil. This method has a higher detection limit than the EPH-TCO method, but is useful for heavier products like motor oil. Average recoveries (3 replicates spiked at 2500 mg/kg) were 95% for motor oil, 78% for diesel, and 63% for creosote. These results indicate that EPH-TCO and TPH gravimetric results for diesel should be equivalent in high-level samples.

V. METHOD SELECTION

If the source of the petroleum product contamination is known, the appropriate method can be selected. The Gasoline Range Organic (GRO) test is the recommended technique for gasoline. For other refined products, like diesel, kerosene, and jet fuels, the Extractable Petroleum Hydrocarbons (EPH-TCO) should be used. For crude oil spills, the Petroleum Hydrocarbon (PHC) test is recommended.

FIGURE 2


Is the fuel type known?
NO
YES
Gasoline
(>50% C_{10} and below)
Diesel Range
(>50% C_{10} to C_{32})
Crude Oil
(>50% C_{10} to C_{36})
Bunker Residu
Heavy Crude
(>50% C_{32} and gre
GRO
EPH-TCO
PHC
TPH-Grav or IF
GRO + EPH-TCO + TPH-Grav or IR

For unknown situations or site characterizations, the GRO and EPH-TCO should be run to provide comprehensive information. In addition, TPH-IR or a TPH-gravimetric procedure should be considered if heavy products (motor oil, bunker oil) may be present. Refer to Figure 2.

While it would be desirable to propose an additive value from the methods in Figure 2, that may not be practical in all cases. Particularly in unknown samples, interpretation of the GRO, EPH-TCO, and TPH results yield useful information. For example, a high GRO value relative to EPH-TCO and TPH confirms that gasoline is the primary product present. Also, if GRO is low and EPH-TCO and TPH are equivalent, the sample is primarily in the kerosene-diesel range (the EPH-TCO should indicate the product). Finally, if TPH is high, motor oil and heavy products can be present. If interferences are suspected, the EPH-TCO results should qualitatively confirm the presence of heavier products.

Acknowledgement: The "Gasoline Range Organics" method development was sponsored by the American Petroleum Institute.

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Biographical Sketches

Gary Walters is a principal scientist in Technical Services with Enseco-Rocky Mountain Analytical Laboratories (RMAL). He has thirteen years of experience in the analysis of trace organics using GC/MS and GC. He has previously been employed with Jordan Laboratories and Shell Development Company. He received B.S. degrees in Biology from Stephen F. Austin State University in 1977 and in Chemistry from Corpus Christi State University in 1984.

Kimberly Zilis is the GC Data Review Supervisor with Enseco-RMAL with over nine years of experience in organic analytical chemistry. She has been an Analyst and Organic Coordinator for RMAL in the EPA Contract Laboratory Program. She previously worked with TOSCO, a research refinery laboratory, where she developed procedures to determine the efficiency of various catalysts in cracking crude oils. Ms. Zilis received a B.A. from the University of Colorado in Molecular, Cellular, and Developmental Biology in 1978.

Elizabeth A. Wessling is the Supervisor of Semivolatile Chromatography at Enseco-RMAL with five years of analytical chemistry experience. She has performed GC and HPLC analyses, and was previously employed with Central Pharmaceuticals where she developed testing methods and tested new pharmaceutical formulations. Ms. Wessling received a B.S. in Biochemistry from Indiana University in 1985.

Michael Hoffman is the Supervisor of Volatile Chromatography at Enseco-RMAL and has over nine years of experience in analytical chemistry. He has performed GC, HPLC, and various analytical techniques, and has previously been employed with toxicology laboratories. He has been a high school science teacher, and has B.S. and B.S.E degrees in Chemistry and Science Education from Oklahoma Christian College.

MOBIL OIL CORPORATION
SUBSURFACE INVESTIGATION
OF THE MOBIL HANGAR
WESTCHESTER COUNTY AIRPORT

VOLUME I OF II

Prepared for

Mobil Oil Corporation

May 1991

Encl 3

LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Ground-Water Consultants
72 Danbury Road
Wilton, CT 06897

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MOBIL OIL CORPORATION
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WESTCHESTER COUNTY AIRPORT

INTRODUCTION

Leggette, Brashears & Graham, Inc. (LBG) was retained by Mobil Oil Corporation (Mobil) to conduct a subsurface investigation at the Mobil Hangar, at the Westchester County Airport in Harrison, New York. The purpose of the investigation was to collect data necessary to determine if use of the hangar had caused environmental impacts, and if so to define the extent of the impact. The scope of work included the drilling of 20 test borings to a maximum depth of 5 feet below the base of the concrete floor and the collection of soil samples for laboratory analysis. The original scope of work is included in Appendix A.

SITE LOCATION AND DESCRIPTION

The Mobil Hangar is part of Building D, located at the Westchester County Airport in Harrison, New York (figure 1). The hangar is approximately 145 feet long and approximately 120 feet wide. Outside of the hangar doors is a large concrete pad approximately 10 inches thick with a width of 120 feet and a length of 100 feet. The site is flat, situated approximately 415 feet above sea level. The hangar is currently used on a limited basis for aircraft maintenance and storage.

DRILLING PROGRAM

Twenty test borings were completed during the drilling program conducted on March 8, 11 and 12, 1991. Test boring locations were selected based upon a 35- by 40-foot grid system in which one boring was located in the center of each

square. Twelve borings, TB-1 through TB-12 were drilled inside of the Mobil Hangar. Three additional borings were completed inside the hangar, TB-13, TB-14 and TB-20, adjacent to the former soil-vapor survey sampling locations 15 and 16. These soil-vapor locations were areas where Vapex Environmental Technologies had detected elevated vapor concentrations of hydrocarbon components. Outside of the hangar on the concrete pad, five test borings were completed. Four of these, TB-15, TB-16, TB-17 and TB-19, were located based upon the 35- by 40-foot grid system. Test Boring TB-18 was located 10 feet from the southern property boundary. Figure 2 shows the location of all the test borings.

Before the drilling of each test boring, a section of concrete floor, approximately 1 foot by 1 foot, was removed using a concrete saw and/or a jackhammer. Thickness of the floor ranged from 6 to 10 inches.

The test borings were completed using a Mobile B-57 drilling rig and 4.25 inch i.d. (inside diameter) hollow-stem auger. Split-spoon sampling was conducted in advance of the borehole using clean 2-inch and 3-inch diameter steel split spoons. Split-spoon sampling was continuous from the base of the concrete to a depth of 5 feet. Deviations occurred when large boulders or bedrock were encountered.

Upon completion of sampling, the borehole was backfilled to the base of the concrete with the drill cuttings and packed. The floor was then repaired with concrete to grade. Any excess soils and all broken concrete shards were piled on plastic sheeting adjacent to an inside wall of the hangar.

SAMPLING PROCEDURE

Decontamination

All drilling equipment that came into contact with the soil, including the auger and drilling bit, were cleaned between borings with Alconox (a low phosphate detergent) and

tap water. The equipment was then rinsed with analyte-free deionized water. All sampling equipment was cleaned between samples with Alconox and tap water and thoroughly rinsed with analyte-free deionized water. The sampling equipment was then placed on polyethylene sheeting to dry.

Soil Sampling

During the drilling of the test borings, split spoon samples were collected for laboratory analysis as well as for geological characterization. Geologic logs for the boreholes are presented in Appendix B.

At each borehole location, samples were collected from 0 to 6, 18 to 24, 36 to 42, and 54 to 60 inches below the base of the concrete. Of the 20 test borings completed only four, TB-8, TB-15, TB-18 and TB-19, could not be sampled at each of the predetermined locations because of either boulders or bedrock. The test boring data is summarized in table 1.

Upon recovery of the split spoon, it was opened and the contents were described and recorded in a log book. The soil from the predetermined sampling depths was collected using a stainless-steel sampling spoon and placed into laboratory containers. The samples were then labeled and packed into a chilled sample cooler. Before the end of each day, a field blank was collected by pouring analyte-free deionized water through a split spoon and sampling the runoff. In addition to the field blank, a trip blank, prepared by the laboratory, was present with the samples throughout the day. After the sampling for the day was completed, the sample containers were packed into a cooler along with ice packs and a chain of custody form (Appendix C). The samples were then shipped overnight by Federal Express to Enseco Rocky Mountain Analytical Laboratory located in Arvada, Colorado for analysis (EPA Method 8010/8020 and Modified 8015).

EVALUATION OF SOIL-QUALITY RESULTS

The results from the soil-quality analysis indicate that eight compounds were detected in the soils collected from inside of the Mobil Hangar. These compounds are identified as tetrachloroethene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), xylene, bromodichloromethane and chloromethane.

The two predominant compounds found in most of the borings completed inside of the Mobil Hangar were PCE and 1,1,1-TCA. In addition, TCE, 1,1-DCE and 1,1-DCA were detected in several test borings completed inside of the hangar. Table 2 presents the results of the soil sample analyses. Actual laboratory reports are attached in Appendix C.

Figure 3 is a map of the locations and concentrations of detected volatile organic compounds (VOCs) collected from 0 to 6 inches below grade. The highest concentrations of PCE and 1,1,1-TCA were detected near the southeast wall of the hangar in samples collected from Test Boring TB-14. PCE and 1,1,1-TCA were detected at concentrations of 3,100 and 5,600 ug/kg (micrograms per kilogram), respectively. Samples collected from TB-4, TB-5 and TB-13 had concentrations of PCE above 1,000 ug/kg, ranging from 1,300 to 2,600 ug/kg. Samples collected from TB-1, TB-3, TB-6, TB-7, TB-8, TB-10, TB-11 and TB-20 had concentrations of PCE below 1,000 ug/kg, ranging from 120 to 790 ug/kg.

1,1,1-TCA was also detected in samples collected from TB-4, TB-5, TB-6, TB-10, TB-11, TB-13 and TB-20, ranging from 76 to 1,300 ug/kg.

Xylenes were detected in the north corner of the building in Test Borings TB-2 and TB-3 at concentrations of 98 and 78 ug/kg, respectively. Bromodichloromethane was detected only at Test Borings TB-6 and TB-8 at concentrations of

140 and 150 ug/kg, respectively. TCE was detected in the shallow samples collected from TB-4, TB-5, TB-6 and TB-8. 1,1-DCA was found in samples collected from TB-4 and TB-5 at concentrations of 390 and 230 ug/kg respectively. 1,1-DCE was also found in TB-4 at 120 ug/kg. The only test boring outside of the hangar that contained any detectable organic compounds was TB-15. 1,1,1-TCA was detected in the shallow zone at a concentration of 120 ug/kg.

Figure 4 is a map of the locations and concentrations of detected VOCs collected from 18 to 24 inches below grade. The highest concentration of PCE detected at this depth was at a concentration of 1,600 ug/kg at TB-5. PCE was detected at concentrations ranging from 54 to 790 ug/kg at Test Borings TB-1, TB-2, TB-3, TB-4, TB-7 TB-10, TB-11, TB-13, TB-14 and TB-20.

1,1,1-TCA was detected at concentrations ranging between 91 to 320 ug/kg at Test Borings TB-4, TB-5, TB-14 and TB-20. TCE was detected at TB-5 and TB-7 at concentrations of 55 and 210 ug/kg, respectively. 1,1-DCA was detected in TB-5 and TB-7 at a concentration of 180 and 240 ug/kg, respectively. Bromodichloromethane was detected in TB-7 at a concentration of 210 ug/kg.

Figure 5 is a map of the locations and concentrations of detected VOCs collected from 36 to 42 inches below grade. PCE was detected at a concentration of 340 ug/kg at TB-14. PCE was also detected in TB-4, TB-5, and TB-6 at concentrations ranging from 69 to 290 ug/kg. 1,1,1-TCA was detected at soils collected from TB-4 and TB-14 at concentrations of 200 and 190 ug/kg, respectively.

Chloromethane was detected in two test borings in the Mobil Hangar. Both locations were concentrated in the north corner of the hangar. The compound was found in TB-2 and TB-3 with concentrations of 790 and 1,800 ug/kg, respectively.

Figure 6 is a map of the locations and concentrations of detected VOCs collected from 54 to 60 inches below grade. The

highest concentration of PCE was detected in TB-5 at 1,700 ug/kg. PCE and 1,1,1-TCA were detected in TB-4, TB-6 and TB-14. PCE concentrations ranged between 73 and 430 ug/kg. 1,1,1-TCA concentrations ranged between 50 and 300 ug/kg. 1,1,1-TCA was also found in TB-5. In addition, 210 ug/kg of 1,1-DCA and 72 ug/kg of TCE were detected in TB-5.

Low levels of extractable petroleum hydrocarbons were detected at varying depths in every test boring. Results of the laboratory analysis are reported as total chromatographable organics (TCO). The highest TCO concentration was detected in the shallow, 0 to 6 inches, soil on TB-14 at 46 mg/kg. Three other Test Borings, TB-13, TB-018 and TB-19, contained TCO levels above 20 mg/kg. These also were found 0 to 6 inches below grade. TCO laboratory results are presented on table 2.

CONCLUSIONS

1. Seventy-one soil samples were collected during the drilling of 20 test borings. Samples were collected from 0 to 6, 18 to 24, 36 to 42 and 54 to 60 inches below the base of the concrete.

2. Eight compounds were detected in the soils collected from inside of the hangar. These include PCE, 1,1,1-TCA, TCE, 1,1-DCE, 1,1-DCA, xylene, bromodichloromethane and chloromethane.

3. PCE and 1,1,1-TCA are the predominant compounds present onsite, with the highest concentrations found in the shallow soil located in the central portion of the hangar near the southeastern wall.

4. A small area near the northeast wall of the hanger contains low levels of xylenes in the shallow soil from 0 to 6 inches below the base of the concrete.

5. Low levels of bromodichloromethane were detected in the central part of the hanger at a maximum depth of 24 inches.

6. Chloromethane was found at two locations in the north corner of the hanger at a depth of 36 to 42 inches below the base of the concrete.

7. Low levels of extractable petroleum hydrocarbons were found in varying depths at each test boring location.

8. In general, the concentration of VOCs with depth and the number of samples containing organics decreased with depth.

LEGGETTE, BRASHEARS & GRAHAM, INC.

Keith Yocis

Keith Yocis (CB)
Hydrogeologist

Reviewed by:

Dan C. Buzea

Dan C. Buzea, CPG
Senior Associate

Robert Lamonica

Robert Lamonica, CPG
Vice President

kaf
May 21, 1991
mocwap.rpt/91-17

TABLES

TABLE 1

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Data

Test boring	Date	Total depth (feet)	Sample Depths				Comments
			0 to 6 inches	18 to 24 inches	36 to 42 inches	54 to 60 inches	
TB-1	03/08/91	5	X	X	X	X	
TB-2	03/08/91	5	X	X	X	X	
TB-3	03/08/91	5	X	X	X	X	
TB-4	03/08/91	5	X	X	X	X	
TB-5	03/08/91	5	X	X	X	X	
TB-6	03/08/91	5	X	X	X	X	
TB-7	03/11/91	5	X	X	X	X	
TB-8	03/11/91	2	X	X			Auger refusal.
TB-9	03/11/91	5	X	X	X	X	
TB-10	03/11/91	5	X	X	X	X	
TB-11	03/11/91	5	X	X		X	Boulder encountered at 2 feet.
TB-12	03/11/91	5	X	X	X	X	
TB-13	03/11/91	5	X	X	X	X	
TB-14	03/11/91	5	X	X	X	X	
TB-15	03/12/91	3	X	X			Auger refusal.
TB-16	03/12/91	5	X	X	X	X	
TB-17	03/12/91	5	X	X	X	X	
TB-18	03/12/91	3	X	X			Auger refusal.
TB-19	03/12/91	3.4	X	X			Auger refusal.
TB-20	03/12/91	5	X	X	X	X	

TABLE 2

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Soil Analysis Results (ug/kg)[1/]
(Test Borings TB-1 through TB-4)

Parameter	TB-1 depth (inches)				TB-2 depth (inches)				TB-3 depth (inches)				TB-4 depth (inches)			
	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60
Chloromethane	ND	ND	ND	ND	ND	ND	790	ND	ND	ND	1,800	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	390	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,300	290	200	50
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 2
(continued)

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Soil Analysis Results (ug/kg)[1/]
(Test Borings TB-1 through TB-4)

Parameter	TB-1 depth (inches)				TB-2 depth (inches)				TB-3 depth (inches)				TB-4 depth (inches)			
	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	130	ND	ND	ND
Dibromochloro-methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-ethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EDB (1,2-Dibromoethane)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloro-ethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloro-ethene	120	56	ND	ND	ND	54	ND	ND	200	96	ND	ND	2,600	260	290	73
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	98	ND	ND	ND	78	ND	ND	ND	ND	ND	ND	ND
Total Chromato-graphable Organics[2/]	12	7.5	ND	7.4	ND	ND	6.9	4.9	6.3	5.7	ND	ND	12	4.6	ND	ND

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TABLE 2

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Soil Analysis Results (ug/kg)[1/]
(Test Borings TB-5 through TB-8)

Parameter	TB-5 depth (inches)				TB-6 depth (inches)				TB-7 depth (inches)				TB-8 depth (inches)			
	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
1,1-Dichloro-ethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
1,1-Dichloro-ethane	230	180	ND	210	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
1,1,2-Trichloro-1,2,2-triflouro-ethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
1,2-Dichloro-ethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
1,1,1-Trichloro-ethane	460	320	ND	300	100	ND	ND	66	ND	240	ND	ND	ND	ND	NA	NA
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Bromodichloro-methane	ND	ND	ND	ND	140	ND	ND	ND	ND	210	ND	ND	150	ND	NA	NA
1,2-Dichloro-propane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA

TABLE 2
(continued)

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Soil Analysis Results (ug/kg)[1/]
(Testing Borings TB-5 through TB-8)

Parameter	TB-5 depth (inches)				TB-6 depth (inches)				TB-7 depth (inches)				TB-8 depth (inches)			
	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60
Trichloroethene	78	55	ND	72	140	ND	ND	ND	ND	210	ND	ND	150	ND	NA	NA
Dibromochloro-methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
1,1,2-Trichloro-ethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
EDB (1,2-Di-bromoethane)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
1,1,2,2-Tetra-chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Tetrachloro-ethene	2,300	1,600	69	1,700	790	ND	150	430	200	320	ND	ND	790	ND	NA	NA
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Total Chromato-graphable Organics	8.3	4.4	7.8	10	7.4	ND	ND	5.7	13	12	5.3	20	8.7	5.3	NA	NA

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TABLE 2

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Soil Analysis Results (ug/kg)[1/]
(Test Borings TB-9 through TB-12)

Parameter	TB-9 depth (inches)				TB-10 depth (inches)				TB-11 depth (inches)				TB-12 depth (inches)			
	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
1,1-Dichloro-ethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
1,1,-Dichloro-ethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
trans-1,2-Di-chloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoro-ethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
1,2-Dichloro-ethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
1,1,1-Trichloro-ethane	ND	ND	ND	ND	76	ND	ND	ND	86	ND	NA	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
Bromodichloro-methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
1,2-Dichloro-propane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
trans-1,3-Di-chloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND

TABLE 2
(continued)

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Soil Analysis Results (ug/kg)[1/]
(Testing Borings TB-9 through TB-12)
(continued)

Parameter	TB-9 depth (inches)				TB-10 depth (inches)				TB-11 depth (inches)				TB-12 depth (inches)			
	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60
richloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
ibromochloro-ethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
is-1,3-Di-hloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
,1,2-Trichloro-thane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
DB (1,2-ibromoethane)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
romoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
,1,2,2-Tetra-hloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
etrachloro-thene	ND	ND	ND	ND	600	120	ND	ND	410	190	NA	ND	ND	ND	ND	ND
hlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
enzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
oluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
thylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
ylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
otal Chromato-raphable rganics	4.2	ND	ND	8.6	11	10	4.6	ND	14	13	NA	6.6	ND	9.8	5.2	5.1

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TABLE 2

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Soil Analysis Results (ug/kg)[1/]
(Test Borings TB-13 through TB-16)

Parameter	TB-13 depth (inches)				TB-14 depth (inches)				TB-15 depth (inches)				TB-16 depth (inches)			
	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
1,1,1-Trichloroethane	630	ND	ND	ND	5,600	180	190	280	120	ND	NA	NA	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Trans-1,3-Dichloro-propene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND

TABLE 2
(continued)

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Soil Analysis Results (ug/kg)[1/]
(Test Borings TB-13 through TB-16)

Parameter	TB-13 depth (inches)				TB-14 depth (inches)				TB-15 depth (inches)				TB-16 depth (inches)			
	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60
EDB (1,2-Dibromoethane)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
1,1,2,2-Tetrachloro-ethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Tetrachloroethene	1,300	150	ND	ND	3,100	150	340	300	ND	ND	NA	NA	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND
Total Chromatographable Organics	27	12	4.4	ND	46	27	5	ND	13	5.7	NA	NA	17	12	4.2	ND

TABLE 2

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Soil Analysis Results (ug/kg)[1/]
(Test Borings TB-17 through TB-20)

Parameter	TB-17 depth (inches)				TB-18 depth (inches)				TB-19 depth (inches)				TB-20 depth (inches)			
	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60
Chloromethane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
rans-1,2-Dichloro-thene	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
hloroform	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
,1,2-Trichloro-1,2,2-rifluoroethane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
,2-Dichloroethane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
arbon Tetrachloride	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	250	91	ND	ND
romodichloroemthane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
,2-Dichloropropane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
rans-1,3-Dichloro-ropene	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
richloroethene	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
ibromochloromethane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
is-1,2-Dichloropropene	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND

TABLE 2
(continued)

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT

Summary of Test Boring Soil Analysis Results (ug/kg)1/
(Test Borings TB-17 through TB-20)

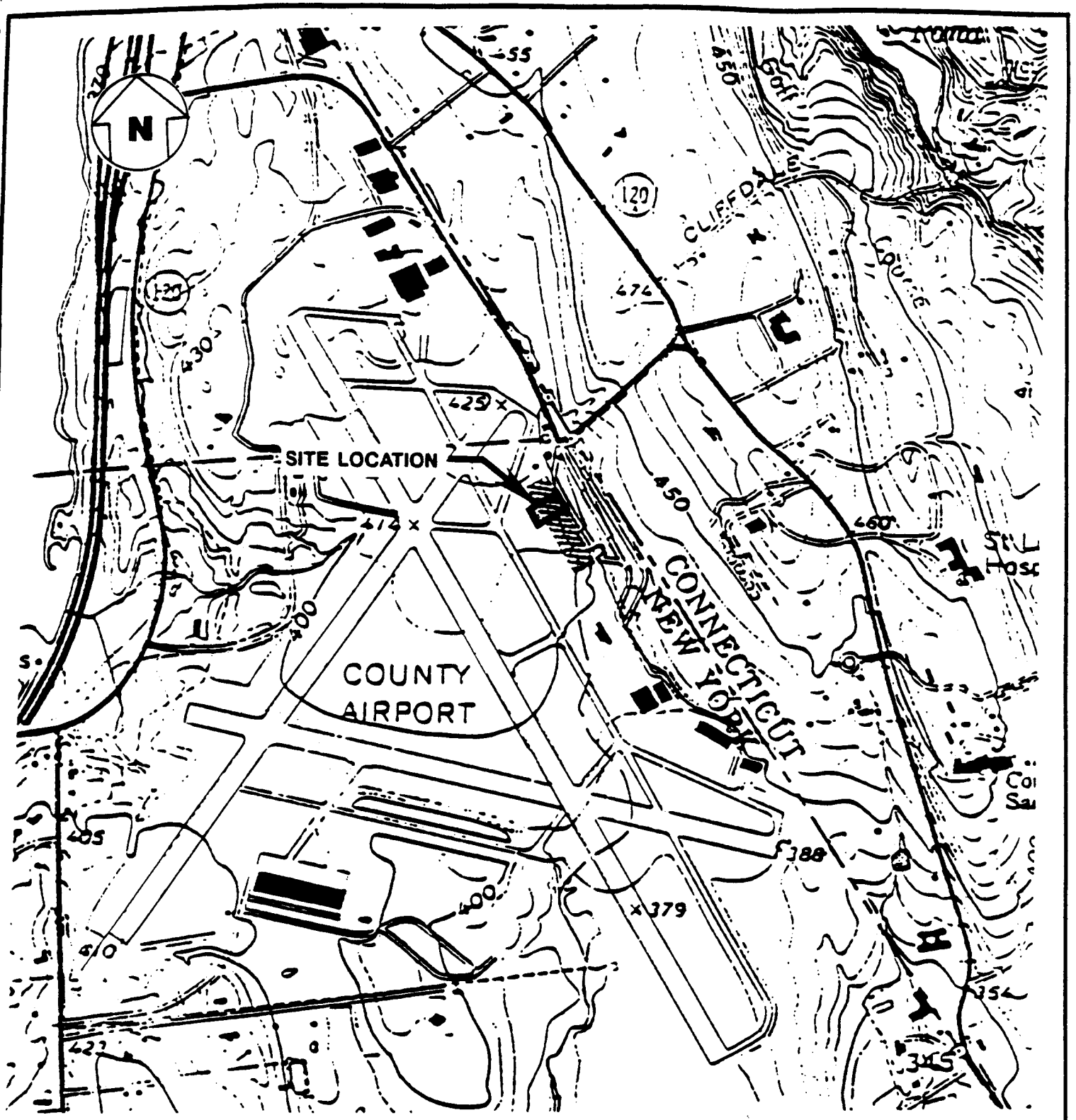
Parameter	TB-17 depth (inches)				TB-18 depth (inches)				TB-19 depth (inches)				TB-20 depth (inches)			
	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60	0-6	18-24	36-42	54-60
EDB (1,2-Dibromoethane)	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
1,1,2,2-Tetrachloro-ethane	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	400	130	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND	ND	ND
Total Chromatographable Organics	6.6	5.2	ND	ND	27	6.6	NA	NA	30	4.3	NA	NA	ND	ND	4.6	ND

/ All results in micrograms per kilogram.
/ Extractable petroleum hydrocarbons.

D - Not detectable.
A - Not applicable.

ocwest.tbl/91-19

FIGURES



MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT
MOBIL HANGAR

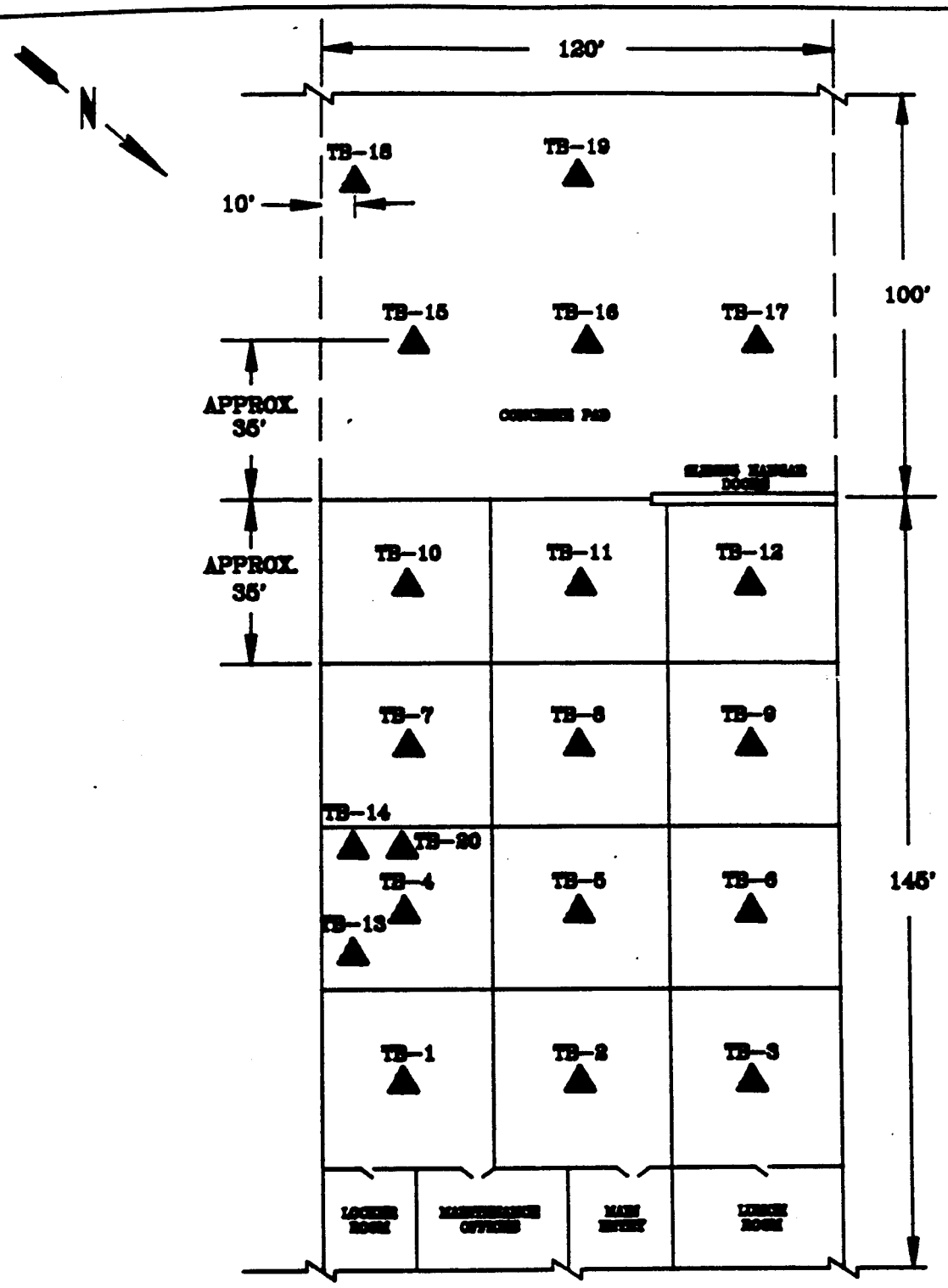
SITE LOCATION MAP

DATE	REVISED

PREPARED BY:

LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Ground-Water Consultants
72 Danbury Road
Wilton, CT 06897
(203) 762-1207

DATE 3/28/91



LEGEND

TB-1 ▲ APPROXIMATE TEST BORING LOCATION

0 40

SCALE IN FEET

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT
MOBIL HANGAR
HARRISON, NEW YORK

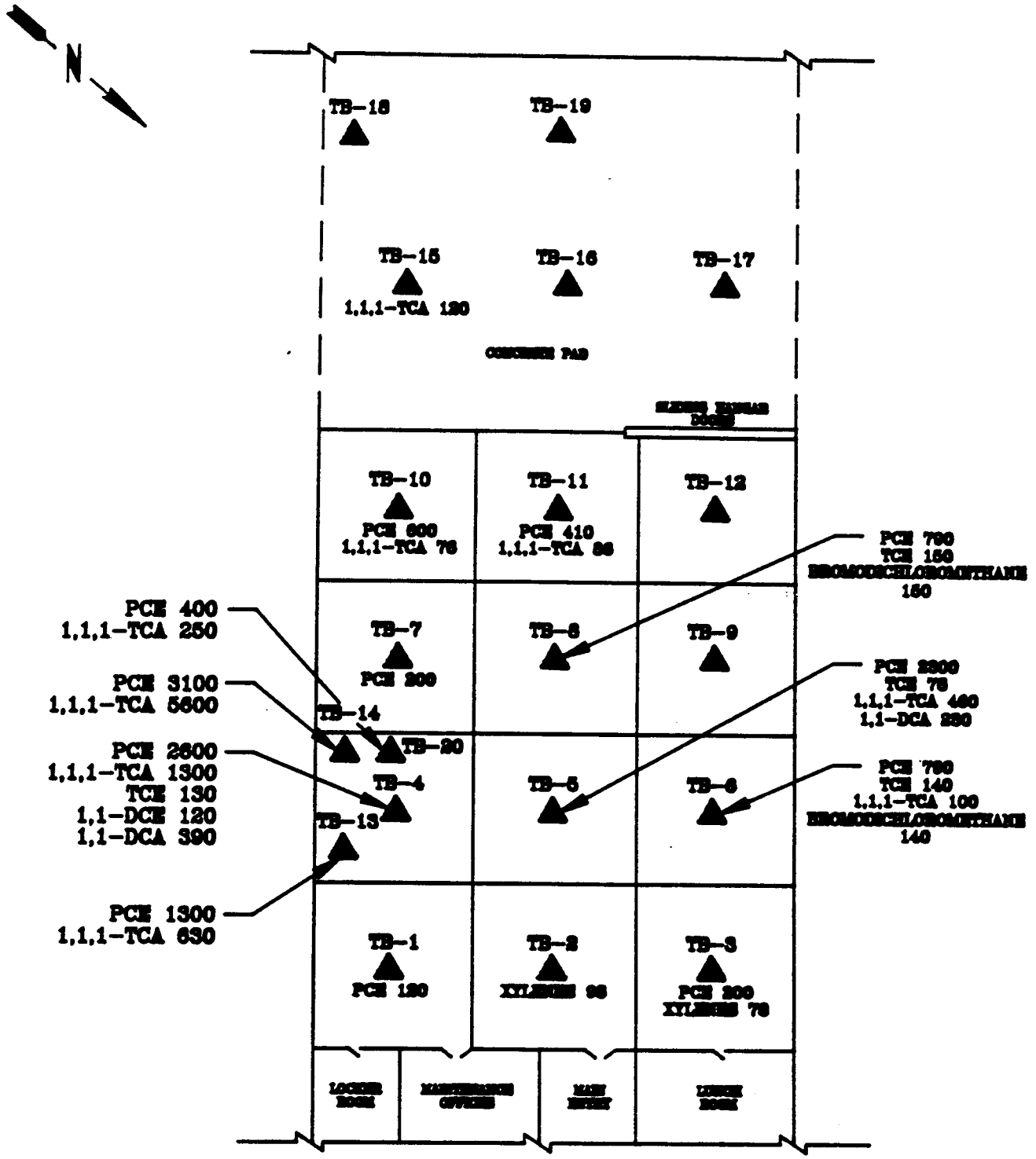
LOCATION OF TEST BORINGS

DATE	REVISED

PREPARED BY:

LANGAN, ENGINEERING & ENVIRONMENTAL SERVICES, INC.
Professional Ground-Water Specialists
72 Danbury Road
Wilton, CT 06897
(203) 762-1297

DATE 4/12/91 FIGURE 2



LEGEND

TB-1 ▲ APPROXIMATE TEST BORING LOCATION

1300 SAMPLE RESULTS ARE IN MICROGRAMS PER KILOGRAM (ug/kg)

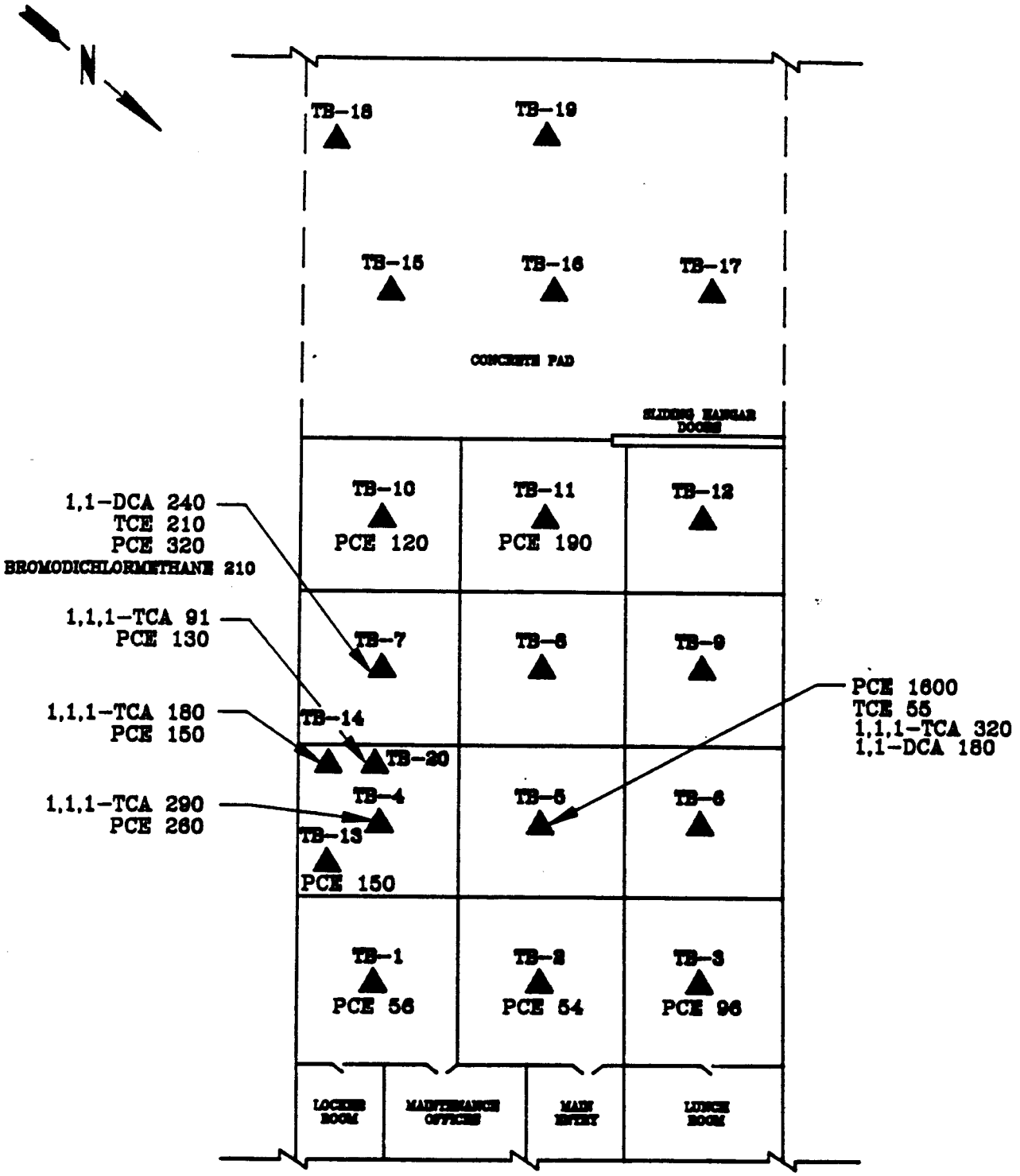
0 40

SCALE IN FEET

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT
MOBIL HANGAR
HARRISON, NEW YORK

LOCATION AND CONCENTRATION OF DETECTED VOLATILE ORGANIC COMPOUNDS FROM 0 TO 6-INCHES BELOW GRADE

DATE	REVISED	PREPARED BY:
		LOCKETT, BRAKEMAN & GRAHAM, INC. Professional Ground-Water Consultants 72 Newbury Road Whitney, CT 06297 (203) 799-1397
		DATE 4/19/91 FIGURE 8



LEGEND

TB-1 ▲ APPROXIMATE TEST BORING LOCATION

260 SAMPLE RESULTS ARE IN MICROGRAMS PER KILOGRAM (ug/kg)

0 40

SCALE IN FEET

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT
MOBIL HANGAR
HARRISON, NEW YORK

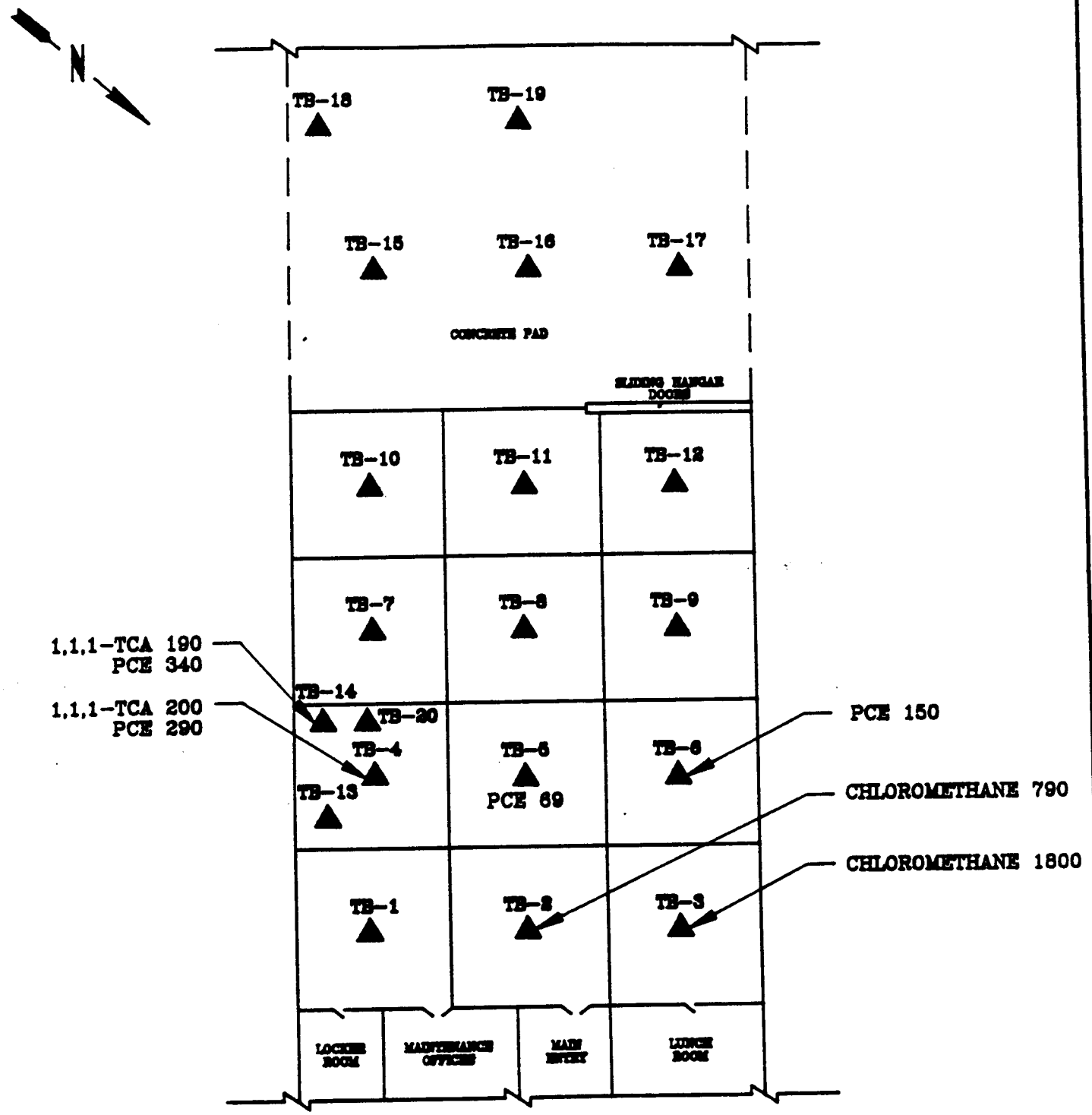
LOCATION AND CONCENTRATION OF DETECTED VOLATILE ORGANIC COMPOUNDS FROM 18 TO 24-INCHES BELOW GRADE

DATE	REVISED

PREPARED BY:

LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Ground-Water Consultants
72 Duxbury Road
Wilton, CT 06897
(203) 762-1207

DATE: 4/19/91 FIGURE 4



LEGEND

TB-1 ▲ APPROXIMATE TEST BORING LOCATION

290 SAMPLE RESULTS ARE IN MICROGRAMS PER KILOGRAM (ug/kg)

0 40

SCALE IN FEET

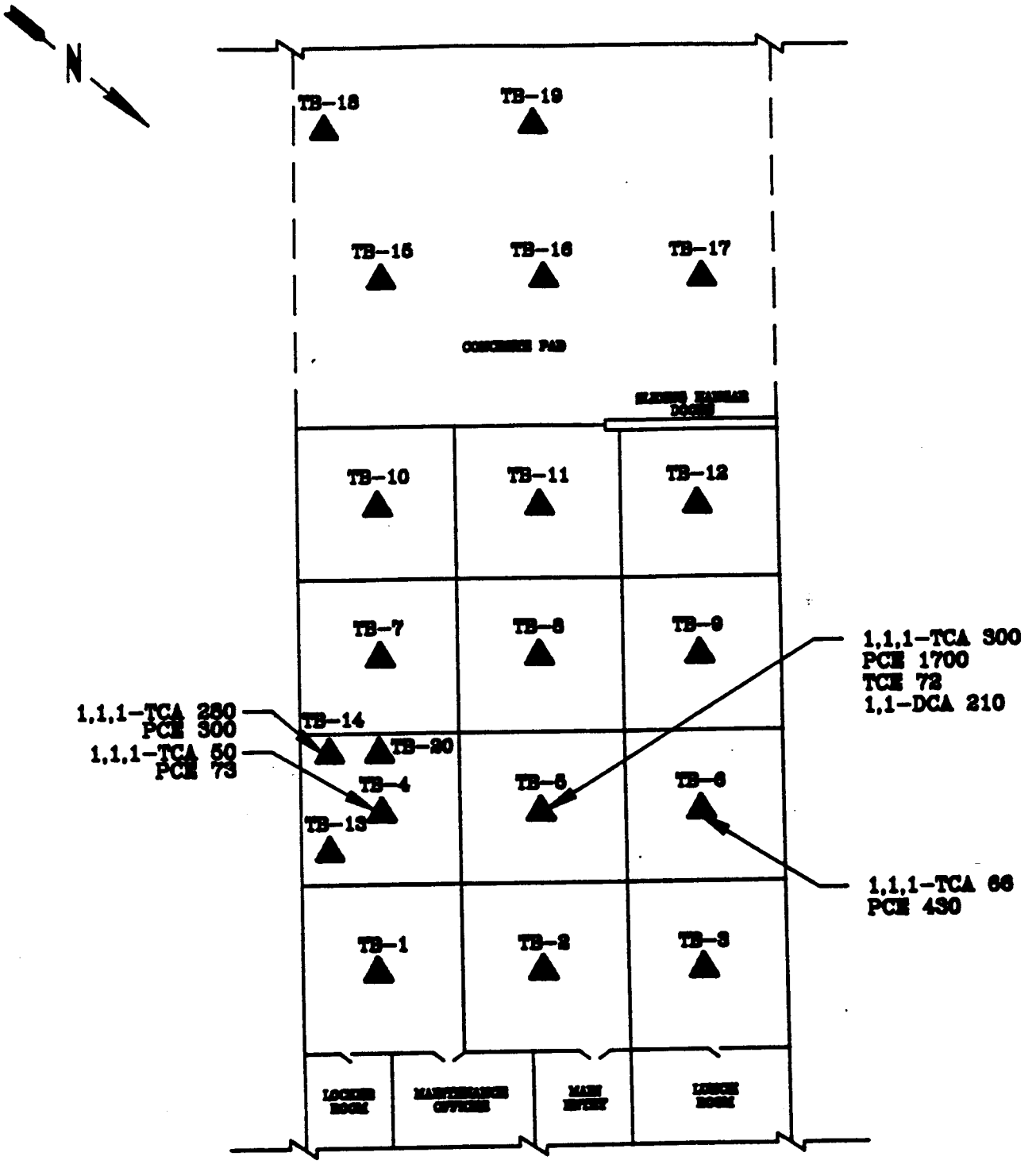
MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT
MOBIL HANGAR
HARRISON, NEW YORK

LOCATION AND CONCENTRATION OF DETECTED VOLITILE ORGANIC COMPOUNDS FROM 36 TO 42-INCHES BELOW GRADE

DATE	REVISED

PREPARED BY:
LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Ground-Water Consultants
72 Danbury Road
Wilton, CT 06897
(203) 762-1207

DATE: 4/19/91 FIGURE 6



LEGEND

TB-1 ▲ APPROXIMATE TEST BORING LOCATION

300 SAMPLE RESULTS ARE IN MICROGRAMS PER KILOGRAM (ug/kg)

0 40

SCALE IN FEET

MOBIL OIL CORPORATION
WESTCHESTER COUNTY AIRPORT
MOBIL HANGAR
HARRISON, NEW YORK

LOCATION AND CONCENTRATION OF DETECTED VOLATILE ORGANIC COMPOUNDS FROM 54 TO 60-INCHES BELOW GRADE

DATE	REVISED

PREPARED BY:
LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Ground-Water Consultants
72 Danbury Road
Wilton, CT 06897
(203) 762-1297

DATE: 4/10/91 FIGURE: 6

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-7A
Lab ID: 013942-0001-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	200	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	98	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-7B
Lab ID: 013942-0002-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Chloromethane	ND	ug/kg	500	
Bromomethane	ND	ug/kg	500	
Vinyl chloride	ND	ug/kg	100	
Chloroethane	ND	ug/kg	500	
Methylene chloride	ND	ug/kg	500	
1,1-Dichloroethene	ND	ug/kg	50	
1,1-Dichloroethane	240	ug/kg	50	
trans-1,2-Dichloroethene	ND	ug/kg	50	
Chloroform	ND	ug/kg	50	
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100	
1,2-Dichloroethane	ND	ug/kg	100	
1,1,1-Trichloroethane	ND	ug/kg	50	
Carbon tetrachloride	ND	ug/kg	50	
Bromodichloromethane	210	ug/kg	100	L
1,2-Dichloropropane	ND	ug/kg	100	
trans-1,3-Dichloropropene	ND	ug/kg	100	
Trichloroethene	210	ug/kg	50	L
Dibromochloromethane	ND	ug/kg	100	
cis-1,3-Dichloropropene	ND	ug/kg	200	
1,1,2-Trichloroethane	ND	ug/kg	100	
EDB (1,2-Dibromoethane)	ND	ug/kg	200	
Bromoform	ND	ug/kg	500	
1,1,2,2-Tetrachloroethane	ND	ug/kg	100	
Tetrachloroethene	320	ug/kg	50	
Chlorobenzene	ND	ug/kg	200	

Surrogate	Recovery	
Bromochloromethane	112	%

Note L : These components are not separable using this method and are therefore quantified together.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-7C
Lab ID: 013942-0003-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	84	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-7D
Lab ID: 013942-0004-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	77	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-8A
Lab ID: 013942-0005-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Chloromethane	ND	ug/kg	500	
Bromomethane	ND	ug/kg	500	
Vinyl chloride	ND	ug/kg	100	
Chloroethane	ND	ug/kg	500	
Methylene chloride	ND	ug/kg	500	
1,1-Dichloroethene	ND	ug/kg	50	
1,1-Dichloroethane	ND	ug/kg	50	
trans-1,2-Dichloroethene	ND	ug/kg	50	
Chloroform	ND	ug/kg	50	
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100	
1,2-Dichloroethane	ND	ug/kg	100	
1,1,1-Trichloroethane	ND	ug/kg	50	
Carbon tetrachloride	ND	ug/kg	50	
Bromodichloromethane	150	ug/kg	100	L
1,2-Dichloropropane	ND	ug/kg	100	
trans-1,3-Dichloropropene	ND	ug/kg	100	
Trichloroethene	150	ug/kg	50	L
Dibromochloromethane	ND	ug/kg	100	
cis-1,3-Dichloropropene	ND	ug/kg	200	
1,1,2-Trichloroethane	ND	ug/kg	100	
EDB (1,2-Dibromoethane)	ND	ug/kg	200	
Bromoform	ND	ug/kg	500	
1,1,2,2-Tetrachloroethane	ND	ug/kg	100	
Tetrachloroethene	790	ug/kg	50	
Chlorobenzene	ND	ug/kg	200	
Surrogate	**Recovery**			
Bromochloromethane	114	%		

Note L : These components are not separable using this method and are therefore quantified together.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-8B
Lab ID: 013942-0006-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	110	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-9A
Lab ID: 013942-0007-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	106	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-9B
Lab ID: 013942-0008-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	102	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-9C
Lab ID: 013942-0009-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	92	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-9D
Lab ID: 013942-0010-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	99	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-10A
Lab ID: 013942-0011-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	76	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	600	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	82	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-10B
Lab ID: 013942-0012-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	120	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	86	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-10C
Lab ID: 013942-0013-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	91	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-10D
Lab ID: 013942-0014-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 21 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	89	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: FB
Lab ID: 013942-0015-FB
Matrix: AQUEOUS Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	0.90	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	75	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-7A
Lab ID: 013942-0001-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 13 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	102	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-7B
Lab ID: 013942-0002-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 13 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	104	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-7C
Lab ID: 013942-0003-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 13 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	103	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-7D
Lab ID: 013942-0004-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 13 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-8A
Lab ID: 013942-0005-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 13 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-8B
Lab ID: 013942-0006-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 13 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	104	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-9A
Lab ID: 013942-0007-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 13 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	103	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-9B
Lab ID: 013942-0008-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 13 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	104	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-9C
Lab ID: 013942-0009-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 13 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	103	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-9D
Lab ID: 013942-0010-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 14 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-10A
Lab ID: 013942-0011-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 14 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-10B
Lab ID: 013942-0012-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 14 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-10C
Lab ID: 013942-0013-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 14 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-10D
Lab ID: 013942-0014-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: NA

Received: 12 MAR 91
Analyzed: 14 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: FB
Lab ID: 013942-0015-FB
Matrix: AQUEOUS Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 15 MAR 91

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethylbenzene	ND	ug/L	0.50
Xylenes (total)	ND	ug/L	0.50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	111	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-7A
Lab ID: 013942-0001-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 14 MAR 91 Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	13	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	94	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C9-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-7B
Lab ID: 013942-0002-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 14 MAR 91 Analyzed: 26 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	12	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	92	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C9-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-7C
Lab ID: 013942-0003-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 14 MAR 91 Analyzed: 26 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	5.3	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	88	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C16-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-7D
Lab ID: 013942-0004-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: 14 MAR 91

Received: 12 MAR 91
Analyzed: 26 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	20	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	92	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C16-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-8A
Lab ID: 013942-0005-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: 14 MAR 91

Received: 12 MAR 91
Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	8.7	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	85	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C18-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-8B
Lab ID: 013942-0006-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 14 MAR 91 Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	5.3	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	86	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C22-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-9A
Lab ID: 013942-0007-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: 14 MAR 91

Received: 12 MAR 91
Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	4.2	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	91	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C22-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-98
Lab ID: 013942-0008-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 14 MAR 91 Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	Recovery		
o-Terphenyl	91	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-9C
Lab ID: 013942-0009-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 14 MAR 91 Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	**Recovery**		
o-Terphenyl	79	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-9D
Lab ID: 013942-0010-SA
Matrix: SOIL — Sampled: 11 MAR 91 — Received: 12 MAR 91
Authorized: 12 MAR 91 — Prepared: 14 MAR 91 — Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	8.6	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	91	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C13-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns — Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-10A
Lab ID: 013942-0011-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 14 MAR 91 Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	11	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	86	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C14-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-10B
Lab ID: 013942-0012-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 14 MAR 91 Analyzed: 26 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	10	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	95	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C18-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-10C
Lab ID: 013942-0013-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: 14 MAR 91

Received: 12 MAR 91
Analyzed: 26 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	4.6	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	96	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C18-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-10D
Lab ID: 013942-0014-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: 14 MAR 91

Received: 12 MAR 91
Analyzed: 26 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	**Recovery**		
o-Terphenyl	78	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: FB
Lab ID: 013942-0015-FB
Matrix: AQUEOUS Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 18 MAR 91 Analyzed: 22 MAR 91

Parameter	Result	Units	Reporting Limit
Total Chromatographable Organics	ND	mg/L	0.10
Surrogate	**Recovery**		
o-Terphenyl	95	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

IV. QUALITY CONTROL REPORT

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{\left| \text{Measured Concentration DCS1} - \text{Measured Concentration DCS2} \right|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
013942-0001-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0001-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0001-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0002-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0002-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0002-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0003-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0003-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0003-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0004-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0004-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0004-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0005-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0005-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0005-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0006-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0006-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0006-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0007-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0007-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0007-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0008-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0008-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0008-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0009-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0009-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0009-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0010-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0010-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0010-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0011-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0011-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0011-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0012-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0012-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0012-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0013-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0013-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0013-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0014-SA	SOIL	TCO-S	14 MAR 91-A	14 MAR 91-A
013942-0014-SA	SOIL	8010-S	21 MAR 91-H	21 MAR 91-H
013942-0014-SA	SOIL	8020-S	13 MAR 91-Q	13 MAR 91-Q
013942-0015-FB	AQUEOUS	602-A	14 MAR 91-P	14 MAR 91-P
013942-0015-FB	AQUEOUS	601-A	29 MAR 91-F9	29 MAR 91-F9
013942-0015-FB	AQUEOUS	TCO-A	15 FEB 91-A	18 MAR 91-A

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: TCO-S Matrix: SOIL QC Lot: 14 MAR 91-A Concentration Units: mg/kg								
Total Chromatographable Organics	16.7	11.5	16.5	14.0	84	40-120	36	20
Category: 8010-S Matrix: SOIL QC Lot: 21 MAR 91-H Concentration Units: ug/kg								
1,1-Dichloroethane	500	579	584	582	116	60-140	0.9	20
Chloroform	500	667	685	676	135	60-140	2.7	20
Bromodichloromethane	1000	1030	1050	1040	104	60-140	1.9	20
Trichloroethene	500	517	523	520	104	60-140	1.2	20
Chlorobenzene	500	583	593	588	118	60-140	1.7	20
Category: 8020-S Matrix: SOIL QC Lot: 13 MAR 91-Q Concentration Units: ug/kg								
Benzene	500	497	478	488	98	75-125	3.9	15
Toluene	500	476	460	468	94	75-125	3.4	15
Ethylbenzene	500	455	434	444	89	75-125	4.7	15
Xylenes (total)	500	526	468	497	99	75-125	12	15
1,3-Dichlorobenzene	500	546	461	504	101	75-125	17	15
Category: 602-A Matrix: AQUEOUS QC Lot: 14 MAR 91-P Concentration Units: ug/L								
Benzene	5.0	4.76	4.50	4.63	93	80-120	5.6	15
Toluene	5.0	4.44	4.24	4.34	87	80-120	4.6	15
Ethylbenzene	5.0	4.42	4.13	4.28	86	80-120	6.8	15
Xylenes (total)	5.0	4.61	4.27	4.44	89	80-120	7.7	15
1,3-Dichlorobenzene	5.0	5.24	4.59	4.92	98	80-120	13	15

Calculations are performed before rounding to avoid round-off errors in calculated results.

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 601-A Matrix: AQUEOUS QC Lot: 29 MAR 91-F9 Concentration Units: ug/L								
1,1-Dichloroethane	5.0	4.77	4.89	4.83	97	80-130	2.5	20
Chloroform	5.0	5.10	5.23	5.16	103	80-120	2.5	20
Bromodichloromethane	10	8.07	8.19	8.13	81	80-120	1.5	20
Trichloroethene	5.0	4.94	4.82	4.88	98	70-120	2.5	20
Chlorobenzene	5.0	4.24	4.13	4.18	84	80-120	2.6	20
Category: TCO-A Matrix: AQUEOUS QC Lot: 15 FEB 91-A Concentration Units: mg/L								
Total Chromatographable Organics	0.50	0.332	0.267	0.300	60	40-120	22	20

Calculations are performed before rounding to avoid round-off errors in calculated results.

SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: TCO-S Matrix: SOIL QC Lot: 14 MAR 91-A QC Run: 14 MAR 91-A Concentration Units: mg/kg				
o-Terphenyl	0.666	0.657	99	40-120
Category: 8010-S Matrix: SOIL QC Lot: 21 MAR 91-H QC Run: 21 MAR 91-H Concentration Units: ug/kg				
Bromochloromethane	500	404	81	20-160
Category: 8020-S Matrix: SOIL QC Lot: 13 MAR 91-Q QC Run: 13 MAR 91-Q Concentration Units: ug/kg				
a,a,a-Trifluorotoluene	3000	3170	106	20-160
Category: 602-A Matrix: AQUEOUS QC Lot: 14 MAR 91-P QC Run: 14 MAR 91-P Concentration Units: ug/L				
a,a,a-Trifluorotoluene	30.0	33.3	111	20-160
Category: 601-A Matrix: AQUEOUS QC Lot: 29 MAR 91-F9 QC Run: 29 MAR 91-F9 Concentration Units: ug/L				
Bromochloromethane	5.00	4.22	84	20-160

Calculations are performed before rounding to avoid round-off errors in calculated results.

SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC (cont.)

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: TCO-A Matrix: AQUEOUS QC Lot: 15 FEB 91-A QC Run: 18 MAR 91-A Concentration Units: mg/L				
o-Terphenyl	0.0200	0.0166	83	40-120

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Volatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: TCO-FID-S Matrix: SOIL QC Lot: 14 MAR 91-A QC Run: 14 MAR 91-A			
Total Chromatographable Organics	ND	mg/kg	4.0
Test: 8010-S Matrix: SOIL QC Lot: 21 MAR 91-H QC Run: 21 MAR 91-H			
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8020-BTEX-S			
Matrix: SOIL			
QC Lot: 13 MAR 91-Q QC Run: 13 MAR 91-Q			
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Test: 602-BTEX-AP			
Matrix: AQUEOUS			
QC Lot: 14 MAR 91-P QC Run: 14 MAR 91-P			
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethylbenzene	ND	ug/L	0.50
Xylenes (total)	ND	ug/L	0.50
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 29 MAR 91-F9 QC Run: 29 MAR 91-F9			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0

METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A Matrix: AQUEOUS QC Lot: 29 MAR 91-F9 QC Run: 29 MAR 91-F9			
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Test: TCO-FID-A Matrix: AQUEOUS QC Lot: 15 FEB 91-A QC Run: 18 MAR 91-A			
Total Chromatographable Organics	ND	mg/L	0.10

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS

FOR

MOBIL OIL CORPORATION

ENSECO-RMAL NO. 013950

APRIL 4, 1991

Reviewed by:

Joel E. Holtz

Roger A. Fruge for
Sue Dalla

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

I. OVERVIEW

On March 12, 1991, Enseco-Rocky Mountain Analytical Laboratory received 15 soil samples from Mobil Oil Corporation.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

I. Overview
II. Sample Description Information/Analytical Test Requests
III. Analytical Results
IV. Quality Control Report

Each sample was analyzed to achieve the lowest possible reporting limits within the constraints of the method. Sample 013950-0012 was diluted for Method 8010 due to the concentration of target compounds and the reporting limits were raised accordingly.


Two

II. SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

Enseco
A Corning Company

SAMPLE DESCRIPTION INFORMATION
for
Mobil Oil Corporation

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
013950-0001-SA	TB-12A	SOIL	11 MAR 91	13:35	12 MAR 91
013950-0002-SA	TB-12B	SOIL	11 MAR 91	13:35	12 MAR 91
013950-0003-SA	TB-12C	SOIL	11 MAR 91	13:40	12 MAR 91
013950-0004-SA	TB-12D	SOIL	11 MAR 91	13:45	12 MAR 91
013950-0005-SA	TB-11A	SOIL	11 MAR 91	12:45	12 MAR 91
013950-0006-SA	TB-11B	SOIL	11 MAR 91	12:45	12 MAR 91
013950-0007-SA	TB-11D	SOIL	11 MAR 91	12:55	12 MAR 91
013950-0008-SA	TB-13A	SOIL	11 MAR 91	12:15	12 MAR 91
013950-0009-SA	TB-13B	SOIL	11 MAR 91	12:15	12 MAR 91
013950-0010-SA	TB-13C	SOIL	11 MAR 91	12:20	12 MAR 91
013950-0011-SA	TB-13D	SOIL	11 MAR 91	12:25	12 MAR 91
013950-0012-SA	TB-14A	SOIL	11 MAR 91	11:40	12 MAR 91
013950-0013-SA	TB-14B	SOIL	11 MAR 91	11:40	12 MAR 91
013950-0014-SA	TB-14C	SOIL	11 MAR 91	11:50	12 MAR 91
013950-0015-SA	TB-14D	SOIL	11 MAR 91	11:55	12 MAR 91

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
Mobil Oil Corporation

Lab ID: 013950	Group Code	Analysis Description	Custom Test?
0001 - 0015	A	Extractable Petroleum Hydrocarbons	N
		Prep - Hydrocarbons by GC	N
		Halogenated Volatile Organics	N
		Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)	N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III. ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Enseco-RMAL is no longer routinely blank-correcting analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.3, May, 1989.

In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method. The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is given in Section IV.

The analytical data reported are subject to the following limitations of the analytical methodology:

Extractable Petroleum Hydrocarbons by GC/FID

This method is based on a methylene chloride extraction of a sample followed by capillary column gas chromatography with flame ionization detection. Extractable Petroleum Hydrocarbons are reported as Total Chromatographable Organics (TCO). The TCO result was based on the entire area under the chromatogram as compared to a synthetic standard, ortho-terphenyl. The detection limit is based on the response of diesel #2/fuel oil #2. Reporting limits for other products may vary and can be determined. In particular, reporting limits for motor oils and lubricating oils will be higher.

In addition to functioning as the calibration standard, ortho-terphenyl is used as the surrogate standard. It is spiked into each sample to provide an evaluation of recovery for each sample. This recovery may be affected by matrix interference or sample dilution.

The composition of various petroleum products may vary depending on refinery operation, seasonal additives, and crude oil sources. If, on the judgement of the analyst, the fingerprint of the sample matched the fingerprint of one of the petroleum products listed below, the product is reported in the report footnote. In addition, the footnote contains the carbon range and any other pertinent information on the sample. The target petroleum products include:

Gasoline
Aviation Gasoline
Kerosene
Paint Thinner
Turpentine
Fuel Oil #2 and Diesel #2
Fuel Oil #4
Fuel Oil #6
Coal Tar
Creosote
Lubricating Oils
Motor Oils
Vegetation Hydrocarbons
Asphalt

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-12A
Lab ID: 013950-0001-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	106	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

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Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-12B
Lab ID: 013950-0002-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	119	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
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Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-12C
Lab ID: 013950-0003-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	121	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-12D
Lab ID: 013950-0004-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: NA

Received: 12 MAR 91
Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	132	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Jeff Lowry

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Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-11A
Lab ID: 013950-0005-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	86	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	410	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	119	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-11B
Lab ID: 013950-0006-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	190	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	116	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-11D
Lab ID: 013950-0007-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	103	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
A Coming Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-13A
Lab ID: 013950-0008-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	630	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	1300	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	124	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-13B
Lab ID: 013950-0009-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	150	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	114	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
A Coming Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-13C
Lab ID: 013950-0010-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	117	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-13D
Lab ID: 013950-0011-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	111	%	

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-14A
Lab ID: 013950-0012-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	1000
Bromomethane	ND	ug/kg	1000
Vinyl chloride	ND	ug/kg	200
Chloroethane	ND	ug/kg	1000
Methylene chloride	ND	ug/kg	1000
1,1-Dichloroethene	ND	ug/kg	100
1,1-Dichloroethane	ND	ug/kg	100
trans-1,2-Dichloroethene	ND	ug/kg	100
Chloroform	ND	ug/kg	100
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	200
1,2-Dichloroethane	ND	ug/kg	200
1,1,1-Trichloroethane	5600	ug/kg	100
Carbon tetrachloride	ND	ug/kg	100
Bromodichloromethane	ND	ug/kg	200
1,2-Dichloropropane	ND	ug/kg	200
trans-1,3-Dichloropropene	ND	ug/kg	200
Trichloroethene	ND	ug/kg	100
Dibromochloromethane	ND	ug/kg	200
cis-1,3-Dichloropropene	ND	ug/kg	400
1,1,2-Trichloroethane	ND	ug/kg	200
EDB (1,2-Dibromoethane)	ND	ug/kg	400
Bromoform	ND	ug/kg	1000
1,1,2,2-Tetrachloroethane	ND	ug/kg	200
Tetrachloroethene	3100	ug/kg	100
Chlorobenzene	ND	ug/kg	400

Surrogate	Recovery	
Bromochloromethane	112	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-14B
Lab ID: 013950-0013-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	180	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	150	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	110	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-14C
Lab ID: 013950-0014-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	190	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	10[illegible]
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	340	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	99	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-14D
Lab ID: 013950-0015-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	280	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	300	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	100	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-12A
Lab ID: 013950-0001-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 14 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-12B
Lab ID: 013950-0002-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 14 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-12C
Lab ID: 013950-0003-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 14 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	99	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-12D
Lab ID: 013950-0004-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 15 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	99	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Coming Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-11A
Lab ID: 013950-0005-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 14 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	103	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-11B
Lab ID: 013950-0006-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: NA

Received: 12 MAR 91
Analyzed: 14 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	102	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-11D
Lab ID: 013950-0007-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 15 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-13A
Lab ID: 013950-0008-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 15 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	98	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Coming Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-13B
Lab ID: 013950-0009-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 15 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	98	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-13C
Lab ID: 013950-0010-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 15 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-13D
Lab ID: 013950-0011-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 15 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	99	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-14A
Lab ID: 013950-0012-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 15 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-14B
Lab ID: 013950-0013-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: NA Analyzed: 15 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Enseco
A Coming Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-14C
Lab ID: 013950-0014-SA
Matrix: SOIL
Authorized: 12 MAR 91
Sampled: 11 MAR 91
Prepared: NA
Received: 12 MAR 91
Analyzed: 15 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Enseco
A Corning Company

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-14D
Lab ID: 013950-0015-SA
Matrix: SOIL
Authorized: 12 MAR 91
Sampled: 11 MAR 91
Prepared: NA
Received: 12 MAR 91
Analyzed: 15 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	95	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins
Approved By: Jeff Lowry

Enseco
A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-12A
Lab ID: 013950-0001-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 19 MAR 91 Analyzed: 28 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	Recovery		
o-Terphenyl	97	%	

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley Approved By: Jeff Lowry

Enseco
A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-12B
Lab ID: 013950-0002-SA
Matrix: SOIL
Authorized: 12 MAR 91
Sampled: 11 MAR 91
Prepared: 19 MAR 91
Received: 12 MAR 91
Analyzed: 28 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	9.8	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	98	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C14-C32.

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley
Approved By: Jeff Lowry

Enseco
A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-12C
Lab ID: 013950-0003-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 19 MAR 91 Analyzed: 28 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	5.2	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	110	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C23-C32.

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley Approved By: Jeff Lowry

Enseco
A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-12D
Lab ID: 013950-0004-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 19 MAR 91 Analyzed: 28 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	5.1	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	92	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C23-C32.

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley Approved By: Jeff Lowry

Enseco
A Coming Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-11A
Lab ID: 013950-0005-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 19 MAR 91 Analyzed: 29 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	14	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	109	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C19-C32.

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley Approved By: Jeff Lowry

METHOD BLANK REPORT
Volatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: TCO-FID-S Matrix: SOIL QC Lot: 19 MAR 91-A QC Run: 19 MAR 91-A			
Total Chromatographable Organics	ND	mg/kg	4.0
Test: 8010-S Matrix: SOIL QC Lot: 22 MAR 91-F QC Run: 22 MAR 91-F			
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8020-BTEX-S			
Matrix: SOIL			
QC Lot: 16 MAR 91-Q QC Run: 16 MAR 91-Q			
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Test: 8020-BTEX-S			
Matrix: SOIL			
QC Lot: 20 MAR 91-G QC Run: 20 MAR 91-G			
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Test: 8020-BTEX-S			
Matrix: SOIL			
QC Lot: 18 MAR 91-G QC Run: 18 MAR 91-G			
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Test: 8010-S			
Matrix: SOIL			
QC Lot: 24 MAR 91-F9 QC Run: 24 MAR 91-F9			
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100

METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8010-S			
Matrix: SOIL			
QC Lot: 24 MAR 91-F9 QC Run: 24 MAR 91-F9			
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Test: TCO-FID-A			
Matrix: AQUEOUS			
QC Lot: 15 FEB 91-A QC Run: 18 MAR 91-A			
Total Chromatographable Organics	ND	mg/L	0.10
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 19 MAR 91-F10 QC Run: 19 MAR 91-F10			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0

METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A Matrix: AQUEOUS QC Lot: 19 MAR 91-F10 QC Run: 19 MAR 91-F10			
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Test: 602-BTEX-AP Matrix: AQUEOUS QC Lot: 19 MAR 91-P QC Run: 18 MAR 91-P			
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethylbenzene	ND	ug/L	0.50
Xylenes (total)	ND	ug/L	0.50
Test: 601-A Matrix: AQUEOUS QC Lot: 19 MAR 91-F10 QC Run: 19 MAR 91-F10			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0

METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 19 MAR 91-F10 QC Run: 19 MAR 91-F10			
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Test: 602-BTEX-AP			
Matrix: AQUEOUS			
QC Lot: 19 MAR 91-P QC Run: 18 MAR 91-P			
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethylbenzene	ND	ug/L	0.50
Xylenes (total)	ND	ug/L	0.50

Enseco
A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-11B
Lab ID: 013950-0006-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 19 MAR 91 Analyzed: 29 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	13	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	106	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C20-C32.

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley Approved By: Jeff Lowry

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A Coming Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-11D
Lab ID: 013950-0007-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 19 MAR 91 Analyzed: 29 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	6.6	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	98	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C21-C32.

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley Approved By: Jeff Lowry

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Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-13A
Lab ID: 013950-0008-SA
Matrix: SOIL
Authorized: 12 MAR 91
Sampled: 11 MAR 91
Prepared: 19 MAR 91
Received: 12 MAR 91
Analyzed: 28 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	27	mg/kg	20	1
Surrogate	Recovery			
o-Terphenyl	88	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C18-C32.

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley
Approved By: Jeff Lowry

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A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-13B
Lab ID: 013950-0009-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 19 MAR 91 Analyzed: 28 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	12	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	91	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C17-C32.

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley Approved By: Jeff Lowry

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A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-13C
Lab ID: 013950-0010-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: 19 MAR 91

Received: 12 MAR 91
Analyzed: 28 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	4.4	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	106	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C20-C32.

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley

Approved By: Jeff Lowry

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A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-13D
Lab ID: 013950-0011-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 19 MAR 91 Analyzed: 28 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	Recovery		
o-Terphenyl	90	%	

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley

Approved By: Jeff Lowry

Enseco
A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-14A
Lab ID: 013950-0012-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: 19 MAR 91

Received: 12 MAR 91
Analyzed: 01 APR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	46	mg/kg	40	1
Surrogate	Recovery			
o-Terphenyl	112	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C14-C17.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Enseco
A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-14B
Lab ID: 013950-0013-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: 19 MAR 91

Received: 12 MAR 91
Analyzed: 27 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	27	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	100	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C15-C32.

ND = Not detected
NA = Not applicable

Reported By: Kathy Ridley

Approved By: Jeff Lowry

Enseco
A Corning Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-14C
Lab ID: 013950-0014-SA
Matrix: SOIL Sampled: 11 MAR 91 Received: 12 MAR 91
Authorized: 12 MAR 91 Prepared: 19 MAR 91 Analyzed: 27 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	5.0	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	106	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C16-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Enseco
A Coming Company

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-14D
Lab ID: 013950-0015-SA
Matrix: SOIL
Authorized: 12 MAR 91

Sampled: 11 MAR 91
Prepared: 19 MAR 91

Received: 12 MAR 91
Analyzed: 27 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	Recovery		
o-Terphenyl	99	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry


Four

IV. QUALITY CONTROL REPORT

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{\left| \text{Measured Concentration DCS1} - \text{Measured Concentration DCS2} \right|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

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QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
013950-0001-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0001-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0001-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0002-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0002-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0002-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0003-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0003-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0003-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0004-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0004-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0004-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0005-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0005-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0005-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0006-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0006-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0006-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0007-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0007-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0007-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0008-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0008-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0008-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0009-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0009-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0009-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0010-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0010-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0010-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0011-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0011-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0011-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0012-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0012-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0012-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0013-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0013-SA	SOIL	8010-S	24 MAR 91-F10	24 MAR 91-F10
013950-0013-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0014-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0014-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0014-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q
013950-0015-SA	SOIL	TCO-S	19 MAR 91-B	19 MAR 91-B
013950-0015-SA	SOIL	8010-S	22 MAR 91-H4	22 MAR 91-H4
013950-0015-SA	SOIL	8020-S	14 MAR 91-Q	14 MAR 91-Q

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Limits	Precisic (RPD) DCS Limi
Category: TCO-S Matrix: SOIL QC Lot: 19 MAR 91-B Concentration Units: mg/kg							
Total Chromatographable Organics	20	23.5	21.9	22.7	114	40-120	7.0
Category: 8010-S Matrix: SOIL QC Lot: 22 MAR 91-H4 Concentration Units: ug/kg							
1,1-Dichloroethane	500	501	512	506	101	60-140	2.2
Chloroform	500	663	655	659	132	60-140	1.2
Bromodichloromethane	1000	951	972	962	96	60-140	2.2
Trichloroethene	500	475	436	456	91	60-140	8.6
Chlorobenzene	500	490	556	523	105	60-140	13
Category: 8020-S Matrix: SOIL QC Lot: 14 MAR 91-Q Concentration Units: ug/kg							
Benzene	500	476	458	467	93	75-125	3.9
Toluene	500	463	457	460	92	75-125	1.3
Ethylbenzene	500	459	445	452	90	75-125	3.1
Xylenes (total)	500	473	458	466	93	75-125	3.2
1,3-Dichlorobenzene	500	490	458	474	95	75-125	6.8
Category: 8010-S Matrix: SOIL QC Lot: 24 MAR 91-F10 Concentration Units: ug/kg							
1,1-Dichloroethane	500	428	444	436	87	60-140	3.7
Chloroform	500	581	634	608	122	60-140	8.7
Bromodichloromethane	1000	940	976	958	96	60-140	3.8
Trichloroethene	500	470	488	479	96	60-140	3.8
Chlorobenzene	500	483	425	454	91	60-140	13

Calculations are performed before rounding to avoid round-off errors in calculated results

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SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured	Accuracy(%) SCS	Limits
Category: TCO-S				
Matrix: SOIL				
QC Lot: 19 MAR 91-B QC Run: 19 MAR 91-B				
Concentration Units: mg/kg				
o-Terphenyl	0.800	0.860	108	40-120
Category: 8010-S				
Matrix: SOIL				
QC Lot: 22 MAR 91-H4 QC Run: 22 MAR 91-H4				
Concentration Units: ug/kg				
Bromochloromethane	500	601	120	20-160
Category: 8020-S				
Matrix: SOIL				
QC Lot: 14 MAR 91-Q QC Run: 14 MAR 91-Q				
Concentration Units: ug/kg				
a,a,a-Trifluorotoluene	3000	3010	100	20-160
Category: 8010-S				
Matrix: SOIL				
QC Lot: 24 MAR 91-F10 QC Run: 24 MAR 91-F10				
Concentration Units: ug/kg				
Bromochloromethane	500	459	92	20-160

Calculations are performed before rounding to avoid round-off errors in calculated results

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METHOD BLANK REPORT
Volatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: TCO-FID-S			
Matrix: SOIL			
QC Lot: 19 MAR 91-B QC Run: 19 MAR 91-B			
Total Chromatographable Organics	ND	mg/kg	4.0
Test: 8010-S			
Matrix: SOIL			
QC Lot: 22 MAR 91-H4 QC Run: 22 MAR 91-H4			
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8020-BTEX-S			
Matrix: SOIL			
QC Lot: 14 MAR 91-Q QC Run: 14 MAR 91-Q			
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Test: 8010-S			
Matrix: SOIL			
QC Lot: 24 MAR 91-F10 QC Run: 24 MAR 91-F10			
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Rocky Mountain
Analytical Laboratory

Enseco
A CORNING Company

April 2, 1991

Mr. Greg Hill
Mobil Oil Corporation
Environmental Health & Safety
Pennington Rocky Hill Road
Pennington, NJ 08540

Dear Mr. Hill:

Enclosed is the report for 18 soil and two aqueous samples received at Enseco-Rocky Mountain Analytical Laboratory on March 13, 1991.

Included with the report is a quality control summary.

Please call if you have any questions.

Sincerely,

Joel E. Holtz
Program Administrator

Reviewed by:

Sue Dalla
Manager
Program Administration

JEH/SD/lw
Enclosures

RMAL #013979

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS
FOR
MOBIL OIL CORPORATION
ENSECO-RMAL NO. 013979

APRIL 2, 1991

Reviewed by:

Joel E. Holtz

Sue Dalla

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

I. OVERVIEW

On March 13, 1991, Enseco-Rocky Mountain Analytical Laboratory received 18 soil and 2 aqueous samples from Mobil Oil Corporation.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

I. Overview
II. Sample Description Information/Analytical Test Requests
III. Analytical Results
IV. Quality Control Report

Standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory QC samples analyzed in conjunction with the samples in this project were within established control limits.

II. SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

SAMPLE DESCRIPTION INFORMATION
for
Mobil Oil Corporation

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
013979-0001-SA	TB-15A	SOIL	12 MAR 91	11:30	13 MAR 91
013979-0002-SA	TB-15B	SOIL	12 MAR 91	11:35	13 MAR 91
013979-0003-SA	TB-16A	SOIL	12 MAR 91	10:45	13 MAR 91
013979-0004-SA	TB-16B	SOIL	12 MAR 91	11:00	13 MAR 91
013979-0005-SA	TB-16C	SOIL	12 MAR 91	11:05	13 MAR 91
013979-0006-SA	TB-16D	SOIL	12 MAR 91	11:10	13 MAR 91
013979-0007-SA	TB-17A	SOIL	12 MAR 91	10:15	13 MAR 91
013979-0008-SA	TB-17B	SOIL	12 MAR 91	10:25	13 MAR 91
013979-0009-SA	TB-17C	SOIL	12 MAR 91	10:30	13 MAR 91
013979-0010-SA	TB-17D	SOIL	12 MAR 91	10:35	13 MAR 91
013979-0011-SA	TB-18A	SOIL	12 MAR 91	13:20	13 MAR 91
013979-0012-SA	TB-18B	SOIL	12 MAR 91	13:25	13 MAR 91
013979-0013-SA	TB-19A	SOIL	12 MAR 91	12:00	13 MAR 91
013979-0014-SA	TB-19B	SOIL	12 MAR 91	12:20	13 MAR 91
013979-0015-SA	TB-20A	SOIL	12 MAR 91	14:20	13 MAR 91
013979-0016-SA	TB-20B	SOIL	12 MAR 91	14:25	13 MAR 91
013979-0017-SA	TB-20C	SOIL	12 MAR 91	14:30	13 MAR 91
013979-0018-SA	TB-20D	SOIL	12 MAR 91	14:45	13 MAR 91
013979-0019-SA	FB	AQUEOUS	12 MAR 91	13:40	13 MAR 91
013979-0020-SA	TB	AQUEOUS			13 MAR 91

ANALYTICAL TEST REQUESTS
for
Mobil Oil Corporation

Lab ID: 013979	Group Code	Analysis Description	Custom Test?
0001 - 0018	A	Extractable Petroleum Hydrocarbons	N
		Prep - Hydrocarbons by GC	N
		Halogenated Volatile Organics	N
		Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)	N
0019	B	Extractable Petroleum Hydrocarbons	N
		Prep - Hydrocarbons by GC	N
		Halogenated Volatile Organics	N
		Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)	N
0020	C	Halogenated Volatile Organics	N
		Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)	N

III. ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Enseco-RMAL is no longer routinely blank-correcting analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.3, May, 1989.

In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method. The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is given in Section IV.

The analytical data reported are subject to the following limitations of the analytical methodology:

Extractable Petroleum Hydrocarbons by GC/FID

This method is based on a methylene chloride extraction of a sample followed by capillary column gas chromatography with flame ionization

detection. Extractable Petroleum Hydrocarbons are reported as Total Chromatographable Organics (TCO). The TCO result was based on the entire area under the chromatogram as compared to a synthetic standard, ortho-terphenyl. The detection limit is based on the response of diesel #2/fuel oil #2. Reporting limits for other products may vary and can be determined. In particular, reporting limits for motor oils and lubricating oils will be higher.

In addition to functioning as the calibration standard, ortho-terphenyl is used as the surrogate standard. It is spiked into each sample to provide an evaluation of recovery for each sample. This recovery may be affected by matrix interference or sample dilution.

The composition of various petroleum products may vary depending on refinery operation, seasonal additives, and crude oil sources. If, on the judgement of the analyst, the fingerprint of the sample matched the fingerprint of one of the petroleum products listed below, the product is reported in the report footnote. In addition, the footnote contains the carbon range and any other pertinent information on the sample. The target petroleum products include:

Gasoline
Aviation Gasoline
Kerosene
Paint Thinner
Turpentine
Fuel Oil #2 and Diesel #2
Fuel Oil #4
Fuel Oil #6
Coal Tar
Creosote
Lubricating Oils
Motor Oils
Vegetation Hydrocarbons
Asphalt

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-15A
Lab ID: 013979-0001-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: NA

Received: 13 MAR 91
Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	120	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	74	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-15B
Lab ID: 013979-0002-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	78	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-16A
Lab ID: 013979-0003-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: NA

Received: 13 MAR 91
Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	85	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-16B
Lab ID: 013979-0004-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: NA

Received: 13 MAR 91
Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	77	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-16C
Lab ID: 013979-0005-SA
Matrix: SOIL — Sampled: 12 MAR 91 — Received: 13 MAR 91
Authorized: 13 MAR 91 — Prepared: NA — Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	77	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-16D
Lab ID: 013979-0006-SA
Matrix: SOIL — Sampled: 12 MAR 91 — Received: 13 MAR 91
Authorized: 13 MAR 91 — Prepared: NA — Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	77	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-17A
Lab ID: 013979-0007-SA
Matrix: SOIL — Sampled: 12 MAR 91 — Received: 13 MAR 91
Authorized: 13 MAR 91 — Prepared: NA — Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	78	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-17B
Lab ID: 013979-0008-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	75	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-17C
Lab ID: 013979-0009-SA
Matrix: SOIL — Sampled: 12 MAR 91 — Received: 13 MAR 91
Authorized: 13 MAR 91 — Prepared: NA — Analyzed: 24 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	78	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-17D
Lab ID: 013979-0010-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 24 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	76	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-18A
Lab ID: 013979-0011-SA
Matrix: SOIL — Sampled: 12 MAR 91 — Received: 13 MAR 91
Authorized: 13 MAR 91 — Prepared: NA — Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	74	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins — Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-18B
Lab ID: 013979-0012-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	73	%

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-19A
Lab ID: 013979-0013-SA
Matrix: SOIL — Sampled: 12 MAR 91 — Received: 13 MAR 91
Authorized: 13 MAR 91 — Prepared: NA — Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	72	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-19B
Lab ID: 013979-0014-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	82	%

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-20A
Lab ID: 013979-0015-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	250	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	400	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	72	%

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-20B
Lab ID: 013979-0016-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	91	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	130	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	74	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-20C
Lab ID: 013979-0017-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200

Surrogate	Recovery	
Bromochloromethane	76	%

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB-20D
Lab ID: 013979-0018-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 25 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Chloromethane	ND	ug/kg	500
Bromomethane	ND	ug/kg	500
Vinyl chloride	ND	ug/kg	100
Chloroethane	ND	ug/kg	500
Methylene chloride	ND	ug/kg	500
1,1-Dichloroethene	ND	ug/kg	50
1,1-Dichloroethane	ND	ug/kg	50
trans-1,2-Dichloroethene	ND	ug/kg	50
Chloroform	ND	ug/kg	50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Surrogate	**Recovery**		
Bromochloromethane	77	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: FB
Lab ID: 013979-0019-SA
Matrix: AQUEOUS Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 20 MAR 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	92	%

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: Mobil Oil Corporation
Client ID: TB
Lab ID: 013979-0020-SA
Matrix: AQUEOUS Sampled: Unknown Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 20 MAR 91

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Surrogate	**Recovery**		
Bromochloromethane	103	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-15A
Lab ID: 013979-0001-SA
Matrix: SOIL — Sampled: 12 MAR 91 — Received: 13 MAR 91
Authorized: 13 MAR 91 — Prepared: NA — Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-15B
Lab ID: 013979-0002-SA
Matrix: SOIL
Authorized: 13 MAR 91
Sampled: 12 MAR 91
Prepared: NA
Received: 13 MAR 91
Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-16A
Lab ID: 013979-0003-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-16B
Lab ID: 013979-0004-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 20 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	97	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-16C
Lab ID: 013979-0005-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 19 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	94	%	

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-16D
Lab ID: 013979-0006-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-17A
Lab ID: 013979-0007-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-17B
Lab ID: 013979-0008-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-17C
Lab ID: 013979-0009-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	102	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-17D
Lab ID: 013979-0010-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-18A
Lab ID: 013979-0011-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-18B
Lab ID: 013979-0012-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-19A
Lab ID: 013979-0013-SA
Matrix: SOIL — Sampled: 12 MAR 91 — Received: 13 MAR 91
Authorized: 13 MAR 91 — Prepared: NA — Analyzed: 19 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	96	%	

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper

Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-19B
Lab ID: 013979-0014-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 19 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	95	%	

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-20A
Lab ID: 013979-0015-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 19 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	98	%	

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-20B
Lab ID: 013979-0016-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: NA

Received: 13 MAR 91
Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	99	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-20C
Lab ID: 013979-0017-SA
Matrix: SOIL — Sampled: 12 MAR 91 — Received: 13 MAR 91
Authorized: 13 MAR 91 — Prepared: NA — Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins

Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB-20D
Lab ID: 013979-0018-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 16 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Benzene	ND	ug/kg	50
Toluene	ND	ug/kg	50
Ethylbenzene	ND	ug/kg	50
Xylenes (total)	ND	ug/kg	50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: FB
Lab ID: 013979-0019-SA
Matrix: AQUEOUS Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 19 MAR 91

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethylbenzene	ND	ug/L	0.50
Xylenes (total)	ND	ug/L	0.50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	119	%	

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Jeff Lowry

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Mobil Oil Corporation
Client ID: TB
Lab ID: 013979-0020-SA
Matrix: AQUEOUS Sampled: Unknown Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: NA Analyzed: 19 MAR 91

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethylbenzene	ND	ug/L	0.50
Xylenes (total)	ND	ug/L	0.50
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	111	%	

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-15A
Lab ID: 013979-0001-SA
Matrix: SOIL — Sampled: 12 MAR 91 — Received: 13 MAR 91
Authorized: 13 MAR 91 — Prepared: 19 MAR 91 — Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	13	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	85	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C11-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-15B
Lab ID: 013979-0002-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: 19 MAR 91

Received: 13 MAR 91
Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	5.7	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	78	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C24-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-16A
Lab ID: 013979-0003-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: 19 MAR 91

Received: 13 MAR 91
Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	17	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	85	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C14-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-16B
Lab ID: 013979-0004-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: 19 MAR 91

Received: 13 MAR 91
Analyzed: 22 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	12	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	108	%		

Note 1 :
Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C21-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-16C
Lab ID: 013979-0005-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: 19 MAR 91

Received: 13 MAR 91
Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	4.2	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	88	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C24-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-16D
Lab ID: 013979-0006-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: 19 MAR 91

Received: 13 MAR 91
Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	Recovery		
o-Terphenyl	80	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-17A
Lab ID: 013979-0007-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: 19 MAR 91

Received: 13 MAR 91
Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	6.6	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	92	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C20-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-17B
Lab ID: 013979-0008-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 19 MAR 91 Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	5.2	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	83	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C23-C29.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-17C
Lab ID: 013979-0009-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 19 MAR 91 Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	**Recovery**		
o-Terphenyl	85	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-17D
Lab ID: 013979-0010-SA
Matrix: SOIL
Authorized: 13 MAR 91

Sampled: 12 MAR 91
Prepared: 19 MAR 91

Received: 13 MAR 91
Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	Recovery		
o-Terphenyl	82	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-18A
Lab ID: 013979-0011-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 19 MAR 91 Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	27	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	89	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C14-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-18B
Lab ID: 013979-0012-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 19 MAR 91 Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	6.6	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	91	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C21-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-19A
Lab ID: 013979-0013-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 19 MAR 91 Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	30	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	77	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C14-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-19B
Lab ID: 013979-0014-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 19 MAR 91 Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	4.3	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	73	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range of C13-C32.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-20A
Lab ID: 013979-0015-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 19 MAR 91 Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	**Recovery**		
o-Terphenyl	86	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-208
Lab ID: 013979-0016-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 19 MAR 91 Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	Recovery		
o-Terphenyl	90	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns

Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-20C
Lab ID: 013979-0017-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 19 MAR 91 Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit	
Total Chromatographable Organics	4.6	mg/kg	4.0	1
Surrogate	Recovery			
o-Terphenyl	82	%		

Note 1 : Qualitative ID : This sample has GC/FID characteristics for which reliable identification of a product could not be achieved. Sample resembles a hydrocarbon product occurring within the n-alkane range ofC24-C30.

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: TB-20D
Lab ID: 013979-0018-SA
Matrix: SOIL Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 19 MAR 91 Analyzed: 23 MAR 91

Parameter	Result	Wet wt. Units	Reporting Limit
Total Chromatographable Organics	ND	mg/kg	4.0
Surrogate	**Recovery**		
o-Terphenyl	79	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

Extractable Petroleum Hydrocarbons

Method GC/FID

Client Name: Mobil Oil Corporation
Client ID: FB
Lab ID: 013979-0019-SA
Matrix: AQUEOUS Sampled: 12 MAR 91 Received: 13 MAR 91
Authorized: 13 MAR 91 Prepared: 18 MAR 91 Analyzed: 22 MAR 91

Parameter	Result	Units	Reporting Limit
Total Chromatographable Organics	ND	mg/L	0.10
Surrogate	Recovery		
o-Terphenyl	84	%	

ND = Not detected
NA = Not applicable

Reported By: Janet Binns Approved By: Jeff Lowry

IV. QUALITY CONTROL REPORT

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\ \text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}\ |}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
013979-0001-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0001-SA	SOIL	8010-S	22 MAR 91-F	22 MAR 91-F
013979-0001-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0002-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0002-SA	SOIL	8010-S	22 MAR 91-F	22 MAR 91-F
013979-0002-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0003-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0003-SA	SOIL	8010-S	22 MAR 91-F	22 MAR 91-F
013979-0003-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0004-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0004-SA	SOIL	8010-S	22 MAR 91-F	22 MAR 91-F
013979-0004-SA	SOIL	8020-S	20 MAR 91-G	20 MAR 91-G
013979-0005-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0005-SA	SOIL	8010-S	22 MAR 91-F	22 MAR 91-F
013979-0005-SA	SOIL	8020-S	18 MAR 91-G	18 MAR 91-G
013979-0006-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0006-SA	SOIL	8010-S	22 MAR 91-F	22 MAR 91-F
013979-0006-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0007-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0007-SA	SOIL	8010-S	22 MAR 91-F	22 MAR 91-F
013979-0007-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0008-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0008-SA	SOIL	8010-S	22 MAR 91-F	22 MAR 91-F
013979-0008-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0009-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0009-SA	SOIL	8010-S	24 MAR 91-F9	24 MAR 91-F9
013979-0009-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0010-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0010-SA	SOIL	8010-S	24 MAR 91-F9	24 MAR 91-F9
013979-0010-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0011-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0011-SA	SOIL	8010-S	24 MAR 91-F9	24 MAR 91-F9
013979-0011-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0012-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0012-SA	SOIL	8010-S	24 MAR 91-F9	24 MAR 91-F9
013979-0012-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0013-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0013-SA	SOIL	8010-S	24 MAR 91-F9	24 MAR 91-F9
013979-0013-SA	SOIL	8020-S	18 MAR 91-G	18 MAR 91-G
013979-0014-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0014-SA	SOIL	8010-S	24 MAR 91-F9	24 MAR 91-F9
013979-0014-SA	SOIL	8020-S	18 MAR 91-G	18 MAR 91-G
013979-0015-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0015-SA	SOIL	8010-S	24 MAR 91-F9	24 MAR 91-F9
013979-0015-SA	SOIL	8020-S	18 MAR 91-G	18 MAR 91-G
013979-0016-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0016-SA	SOIL	8010-S	24 MAR 91-F9	24 MAR 91-F9

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC (cont.)

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
013979-0016-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0017-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0017-SA	SOIL	8010-S	24 MAR 91-F9	24 MAR 91-F9
013979-0017-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0018-SA	SOIL	TCO-S	19 MAR 91-A	19 MAR 91-A
013979-0018-SA	SOIL	8010-S	24 MAR 91-F9	24 MAR 91-F9
013979-0018-SA	SOIL	8020-S	16 MAR 91-Q	16 MAR 91-Q
013979-0019-SA	AQUEOUS	TCO-A	15 FEB 91-A	18 MAR 91-A
013979-0019-SA	AQUEOUS	601-A	19 MAR 91-F10	19 MAR 91-F10
013979-0019-SA	AQUEOUS	602-A	19 MAR 91-P	18 MAR 91-P
013979-0020-SA	AQUEOUS	601-A	19 MAR 91-F10	19 MAR 91-F10
013979-0020-SA	AQUEOUS	602-A	19 MAR 91-P	18 MAR 91-P

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TCO-S Matrix: SOIL QC Lot: 19 MAR 91-A Concentration Units: mg/kg								
Total Chromatographable Organics	20	18.7	15.9	17.3	87	40-120	16	20
Category: 8010-S Matrix: SOIL QC Lot: 22 MAR 91-F Concentration Units: ug/kg								
1,1-Dichloroethane	500	458	487	472	95	60-140	6.1	20
Chloroform	500	479	517	498	100	60-140	7.6	20
Bromodichloromethane	1000	800	802	801	80	60-140	0.3	20
Trichloroethene	500	513	508	510	102	60-140	1.0	20
Chlorobenzene	500	418	398	408	82	60-140	4.9	20
Category: 8020-S Matrix: SOIL QC Lot: 16 MAR 91-Q Concentration Units: ug/kg								
Benzene	500	452	433	442	89	75-125	4.3	15
Toluene	500	458	441	450	90	75-125	3.8	15
Ethylbenzene	500	473	448	460	92	75-125	5.4	15
Xylenes (total)	500	464	461	462	93	75-125	0.6	15
1,3-Dichlorobenzene	500	514	484	499	100	75-125	6.0	15
Category: 8020-S Matrix: SOIL QC Lot: 20 MAR 91-G Concentration Units: ug/kg								
Benzene	500	493	491	492	98	75-125	0.4	15
Toluene	500	459	476	468	94	75-125	3.6	15
Ethylbenzene	500	478	477	478	96	75-125	0.2	15
Xylenes (total)	500	457	452	454	91	75-125	1.1	15
1,3-Dichlorobenzene	500	518	510	514	103	75-125	1.6	15

Calculations are performed before rounding to avoid round-off errors in calculated results.

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 8020-S Matrix: SOIL QC Lot: 18 MAR 91-G Concentration Units: ug/kg								
Benzene	500	423	407	415	83	75-125	3.9	15
Toluene	500	406	398	402	80	75-125	2.0	15
Ethylbenzene	500	431	421	426	85	75-125	2.3	15
Xylenes (total)	500	447	409	428	86	75-125	8.9	15
1,3-Dichlorobenzene	500	489	468	478	96	75-125	4.4	15
Category: 8010-S Matrix: SOIL QC Lot: 24 MAR 91-F9 Concentration Units: ug/kg								
1,1-Dichloroethane	500	475	476	476	95	60-140	0.2	20
Chloroform	500	499	513	506	101	60-140	2.8	20
Bromodichloromethane	1000	805	918	862	86	60-140	13	20
Trichloroethene	500	520	532	526	105	60-140	2.3	20
Chlorobenzene	500	382	389	386	77	60-140	1.8	20
Category: TCO-A Matrix: AQUEOUS QC Lot: 15 FEB 91-A Concentration Units: mg/L								
Total Chromatographable Organics	0.50	0.332	0.267	0.300	60	40-120	22	20
Category: 601-A Matrix: AQUEOUS QC Lot: 19 MAR 91-F10 Concentration Units: ug/L								
1,1-Dichloroethane	5.0	5.38	5.49	5.44	109	80-130	2.0	20
Chloroform	5.0	6.45	6.86	6.66	133	80-120	6.2	20
Bromodichloromethane	10	10.8	11.4	11.1	111	80-120	5.4	20
Trichloroethene	5.0	5.41	5.70	5.56	111	70-120	5.2	20
Chlorobenzene	5.0	4.84	5.02	4.93	99	80-120	3.7	20

Calculations are performed before rounding to avoid round-off errors in calculated results.

BLANK REPORT
le Organics by GC

	Result	Units	Reporting Limit
e			
TCO-FID-S			
x: SOIL			
t: 19 MAR 91-A QC Run: 19 MAR 91-A			
Chromatographable	ND	mg/kg	4.0
janics			
: 8010-S			
ix: SOIL			
.ot: 22 MAR 91-F QC Run: 22 MAR 91-F			
)romethane	ND	ug/kg	500
nomethane	ND	ug/kg	500
yl chloride	ND	ug/kg	100
oroethane	ND	ug/kg	500
hylene chloride	ND	ug/kg	500
-Dichloroethene	ND	ug/kg	50
l-Dichloroethane	ND	ug/kg	50
ans-1,2-Dichloroethene	ND	ug/kg	50
loroform	ND	ug/kg	100
1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/kg	100
2-Dichloroethane	ND	ug/kg	50
,1,1-Trichloroethane	ND	ug/kg	50
arbon tetrachloride	ND	ug/kg	100
romodichloromethane	ND	ug/kg	100
,2-Dichloropropane	ND	ug/kg	100
rans-1,3-Dichloropropene	ND	ug/kg	50
richloroethene	ND	ug/kg	100
ibromochloromethane	ND	ug/kg	200
is-1,3-Dichloropropene	ND	ug/kg	100
,1,2-Trichloroethane	ND	ug/kg	200
DB (1,2-Dibromoethane)	ND	ug/kg	500
Bromoform	ND	ug/kg	100
1,1,2,2-Tetrachloroethane	ND	ug/kg	50
Tetrachloroethene	ND	ug/kg	200
Chlorobenzene			

METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8010-S			
Matrix: SOIL			
QC Lot: 24 MAR 91-F9 QC Run: 24 MAR 91-F9			
1,2-Dichloroethane	ND	ug/kg	100
1,1,1-Trichloroethane	ND	ug/kg	50
Carbon tetrachloride	ND	ug/kg	50
Bromodichloromethane	ND	ug/kg	100
1,2-Dichloropropane	ND	ug/kg	100
trans-1,3-Dichloropropene	ND	ug/kg	100
Trichloroethene	ND	ug/kg	50
Dibromochloromethane	ND	ug/kg	100
cis-1,3-Dichloropropene	ND	ug/kg	200
1,1,2-Trichloroethane	ND	ug/kg	100
EDB (1,2-Dibromoethane)	ND	ug/kg	200
Bromoform	ND	ug/kg	500
1,1,2,2-Tetrachloroethane	ND	ug/kg	100
Tetrachloroethene	ND	ug/kg	50
Chlorobenzene	ND	ug/kg	200
Test: TCO-FID-A			
Matrix: AQUEOUS			
QC Lot: 15 FEB 91-A QC Run: 18 MAR 91-A			
Total Chromatographable Organics	ND	mg/L	0.10
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 19 MAR 91-F10 QC Run: 19 MAR 91-F10			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0

METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A Matrix: AQUEOUS QC Lot: 19 MAR 91-F10 QC Run: 19 MAR 91-F10			
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Test: 602-BTEX-AP Matrix: AQUEOUS QC Lot: 19 MAR 91-P QC Run: 18 MAR 91-P			
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethylbenzene	ND	ug/L	0.50
Xylenes (total)	ND	ug/L	0.50
Test: 601-A Matrix: AQUEOUS QC Lot: 19 MAR 91-F10 QC Run: 19 MAR 91-F10			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0