

release 3091  
Mobil 99-NWA former  
Seattle.



**KLEINFELDER**

An employee owned company

March 1, 2001  
Kleinfelder Project No: 60-5071-05

Mr. Joe Hickey  
Washington Department of Ecology  
Voluntary Cleanup Program  
3190 – 160<sup>th</sup> Avenue SE  
Bellevue, WA 98008

**Subject: Fourth Quarter 2000 Groundwater Monitoring Report  
Former Mobil Oil Service Station #99-NWA  
14357 Lake City Way, N.E.  
Seattle, Washington**

FIS 45329571

Dear Mr. Hickey:

This report presents the results of fourth quarter 2000 groundwater monitoring at former Mobil service station #99-NWA, located in Seattle, Washington (Figure 1). Kleinfelder conducts quarterly groundwater monitoring on behalf of Mobil Oil Corporation (Mobil).

The contents of this report include the following:

- Progress Report Summary Sheet
- Table 1 Well Data Summary and Groundwater Sample Results
- Figure 1 Site Location Map
- Figure 2 Site Plan
- Figure 3 Groundwater Elevation Contours—November 13, 2000
- Figure 4 BTEX Concentrations in Groundwater—November 13, 2000
- Figure 5 Benzene versus Groundwater Elevation Graphs
- Appendix A Site Exploration Methods
- Appendix B Laboratory Reports

### Limitations

Kleinfelder has performed the services for this project in accordance with the current practices in this geographic area for site assessment sampling. No guarantees are either expressed or implied.

RECEIVED

MAR 05 2001

DEPT. OF ECOLOGY

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cm  
4/5/04

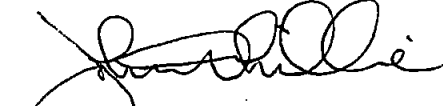
There is no investigation that is thorough enough to preclude the presence of materials at the site that presently, or in the future, may be considered hazardous. Because regulatory criteria may change, acceptable concentrations of contaminants present at the time of investigation may in the future become subject to different regulatory standards.

Respectfully submitted,

**KLEINFELDER, INC.**



Chad R. Lukkarila  
Environmental Engineering Staff



John Lilje  
Senior Project Manager

cc: Mr. Brad Ledesma, Mobil Oil Corporation  
Mr. Bart Bretherton, Kleinfelder, Inc.

# KLEINFELDER, INC.

## Quarterly Monitoring Report 4th QUARTER 2000

## Summary Sheet

Former Mobil Service Station #99-NWA  
14357 Lake City Way N.E.  
Seattle, WA

Case # N/A  
PSAPCA# N/A  
DOE PERMIT# N/A

Number of water zones:		1	This Page		1
<b>FIELD ACTIVITY:</b>			Date Sampled: November 13, 2000		
Number of groundwater wells on-site:		6	Groundwater wells monitored:		6
Number of groundwater wells off-site:		1	Groundwater wells sampled:		6
Phase of investigation:		Monitoring	Groundwater wells with free product:		0
			Groundwater phase:		Monitoring
<b>2000 QUARTERLY MONITORING SCHEDULE: (1)</b>					
	<u>Well ID</u>	<u>1st Qtr</u>	<u>2nd Qtr</u>	<u>3rd Qtr</u>	<u>4th Qtr</u>
onsite:	MW-1	---	---	M/S	M/S
	MW-2	---	---	M/S	M/S
	MW-3	---	---	M/S	M/S
	MW-4	Well Abandoned 6/18/00			
	MW-5	---	---	M/S	M/S
	MW-7	---	---	M/S	M/S
	MW-8	---	---	M/S	M/S
	offsite:	MW-6 (2)	---	---	---
<p>M/S = Monitored and Sampled M = Monitored only (no sample) --- = Not sampled</p> <p>(1) Mobil Site #99-NWA was scheduled for annual sampling, no samples taken in 1st and 2nd quarters. Schedule changed to quarterly sampling in 9/00. (2) MW-6 located in 145th Street NE has been paved over, no street use permit in place.</p>					
<b>SITE HYDROGEOLOGY:</b>					
Approximate depth to groundwater below ground surface:					7.16 feet
Approximate elevation of potentiometric surface above Mean Sea Level:					219.27 feet
Average increase/decrease in groundwater elevations since last sampling episode:					+1.47 feet
Approximate flow direction and hydraulic gradient:					Southwest at 0.06 ft/ft
<b>GROUNDWATER CONTAMINATION (BENZENE WA MTCA = 5.0 ppb):</b>					
Wells containing free product:		0	Range in thickness of free product:		No FP detected
Number of wells with concentrations below MTCA:		2	Volume of free product recovered this period:		0
Number of wells with concentrations at or above MTCA:		4	Volume of free product recovered to date:		0
			Range in concentrations of benzene:		Non-detect to 1500 ppb
Nature of contamination:		Gasoline			
<b>GROUNDWATER REMEDIATION PERFORMANCE</b>			Date started: December 16, 1996		
			Date removed: 1998		
			Number of wells containing ORC: 0		

Prepared by:

*Chad R. Lukkarila*

Chad R. Lukkarila

Kleinfelder Project No.

60-5071-05

Approved by:

*John Lillie*

John Lillie

Submittal Date:

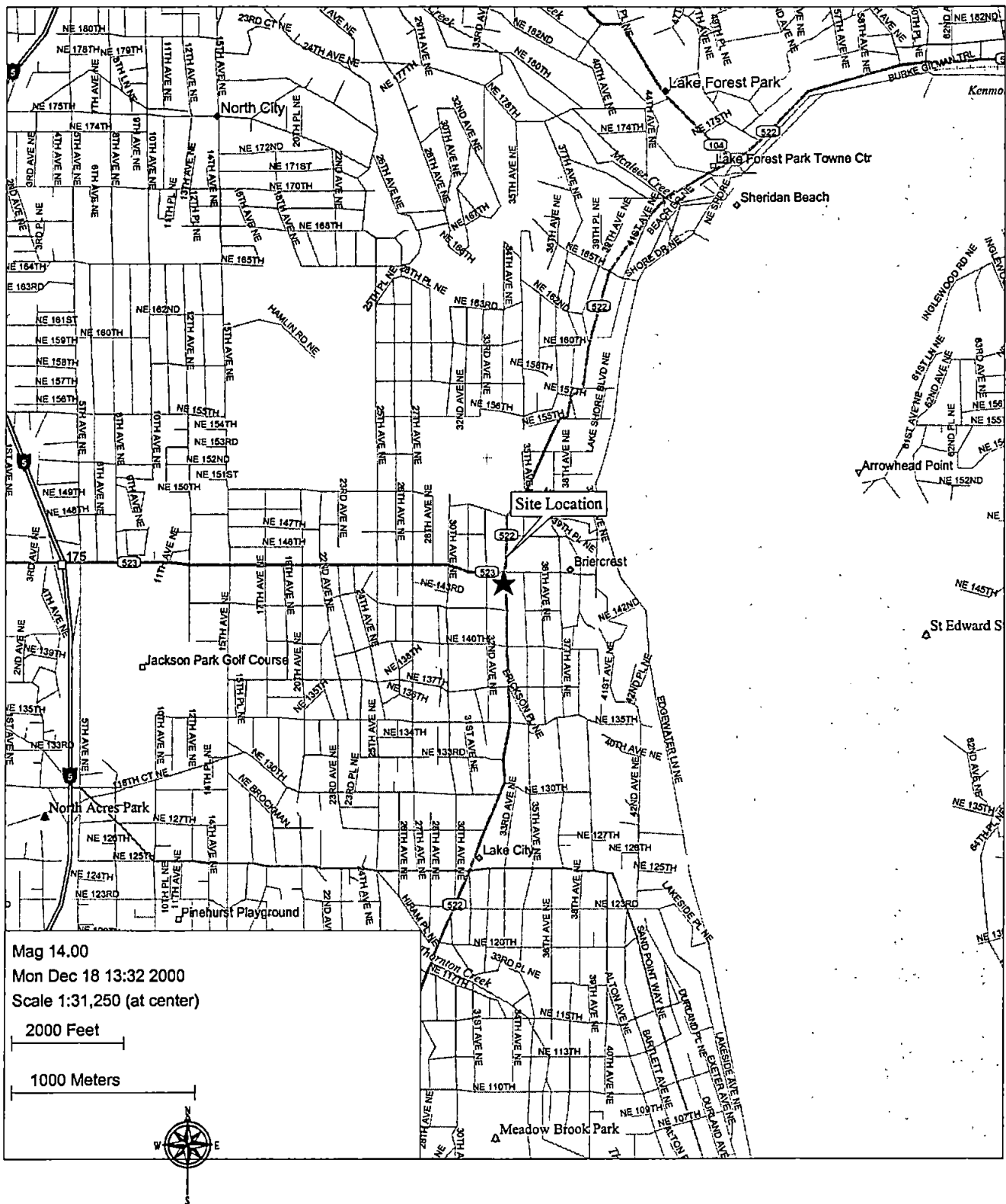
December 14, 2000

**TABLE 1**  
**WELL DATA SUMMARY AND GROUNDWATER SAMPLE RESULTS**  
**VOCs AND DISSOLVED LEAD**  
**FORMER MOBIL STATION 99-NWA**  
**14357 LAKE CITY WAY NE**  
**SEATTLE, WASHINGTON**

Well Number Elevation [1] Screen Interval [2] Diameter [3] Well Depth [2]	Sample Date	Sample Identification Number	Depth to Ground Water [2]	Ground Water Elevation [4]	Product Thickness [5]	NWTPH-Gx [6] (ug/l)	NWTPH-Dx Diesel Range [7] (mg/l)	NWTPH-Dx Heavy Oil Range [7] (mg/l)	BENZENE [9] (ug/L)	TOLUENE [9] (ug/L)	ETHYL BENZENE [9] (ug/L)	TOTAL XYLENES [9] (ug/L)	TOTAL LEAD [9] (ug/L)
MW1 226.55 (8.5-16.5) 4 16.5	9/26/92 11/18/94 12/16/96 12/13/97 12/17/98 8/16/00 11/13/00	MW0109282 MW0111184 MW01-12166 MW01-12137 MW-1 MW-1-81600 MW-1	- 7.30 8.53 8.90 8.56 10.50 10.61	- 219.25 218.02 217.65 217.99 218.05 215.94	- - - - - - -	3,190 1,900 2,680 5,000 860 630 720	- 0.38 0.518 0.25 - 0.56 0.49	- - - 0.5 0.45J 0.40J	840 4.5 59.9 14.8 2 4.7 14	7 4.3 10 2.86 3 2 1.4	210 88 290 21.2 37 3.3 6.2	90 90 54 2.0 4 7 4	30 150 - 1.1 - 38.5 13.5
MW2 226.01 (4-13) 4 13	9/26/92 11/18/94 12/16/96 12/13/97 12/17/98 8/16/00 11/13/00	MW0209282 MW0211184 MW02-12166 MW02-12137 (Not Sampled) MW-2-81600 MW-2	- 5.92 5.51 8.49 8.34 9.50 6.65	- 220.09 220.50 217.52 217.67 216.51 219.36	- - - - - - -	140,000 76,000 65,100 480 - 13,000 15,000	- 4.30 2.45 0.25 0.5 1.8J 2.2J	- - - 0.5 0.4 0.4 0.2	710.0 780.0 387.0 40.5 - 170.0 190	3,500 720 215 0.5 - 37.0 42	3,800 2,100 1,310 0.5 - 350.0 420	23,000 12,000 6,500 1.0 - 1,700 1,700	19 410 - 1.0 - 226.0 216
MW3 226.35 (4-13) 4 13	9/26/92 11/18/94 12/17/96 12/13/97 12/17/98 8/16/00 11/13/00	MW0309282 MW0311184 MW03-12176 MW03-12137 MW-3 MW-3-81600 MW-3	- 6.28 5.89 7.88 7.98 8.70 4.00	- 220.07 220.46 218.47 218.37 217.65 222.35	- - - - - - -	16,000 4,500 3,350 153 680 770 1,590	- 4.3 0.972 0.25 - 0.22J 0.47	- - - 0.5 0.26J 0.43J	42 38 20.2 1.14 2 3.4 5.1	10 17 1.3 0.5 2 1.2 2	980 50 15.9 0.869 11 5.7 11	430 200 4.12 1.0 1.4 1.9J 11	10 60 - 1.0 - 2.4J 30.1
MW4 226.34 (5-15) 4 15	9/26/92 9/26/92 11/18/94 12/17/96 12/13/97 12/17/98	MW0409282 MW0409282-DUP* MW0411184 MW04-12176 (Damaged) (Damaged)	- - 6.78 6.31 - -	- - 219.56 220.03 - -	- - - - - -	31,000 27,000 9,600 5,350 - -	- - 2 1.95 - -	- - - - - -	490 420 840 732 - -	670 720 290 359 - -	2,100 2,300 1,900 494 - -	3,280 3,300 590 700 - -	11 7.9 11 - - -
Abandoned 8/19/00, Drilled MW8 as Replacement													
MW5 225.16 (5-15) 4 15	9/26/92 11/18/94 12/16/96 12/13/97 12/17/98 8/16/00 11/13/00	MW0509282 MW0511184 MW05-12166 MW05-12137 MW-5 MW-5-81600 MW-5	- 5.38 6.83 7.46 8.17 8.82 9.05	- 219.78 218.33 217.70 216.99 216.34 216.11	- - - - - - -	<50 450 128 18,800 448 448 448	- 0.05 0.25 0.25 - 0.096J 0.08	- - - 0.922 - 0.20 0.2	<0.5 0.5 0.5 0.5 0.2 0.20 0.54J	<0.5 0.5 0.5 0.5 0.2 0.20 0.44J	<0.5 0.5 1.53 26.4 0.2 0.20 0.47J	<1.0 0.5 14.7 2,110 0.6 0.60 0.94J	<2.0 74 - 7.6 - 17.8 33.3
MW6 224.71 (5-15) 4 15	9/26/92 11/18/94 12/17/96 12/13/97 12/17/98 8/16/00	MW0609282 MW0611184 MW06-12176 (Not Sampled) MW-6 Not Sampled	- 6.02 5.8 - 5.78 -	- 218.69 218.91 - 218.93 -	- - - - - -	830 450 85 - 83 -	- 0.3 0.757 - - -	- - - - - -	<0.5 0.5 0.5 - 0.2 -	2.8 0.5 0.5 - 0.3 -	9.3 0.5 0.5 - 0.2 -	62 0.5 1.0 - 0.6 -	17 9.6 - - - -
Covered by new asphalt on 145th Street													
MW7 225.58 (3-14.5) 4 14.5	9/26/92 11/18/94 12/17/96 12/13/97 12/17/98 8/16/00 11/13/00	MW0709282 MW0711184 MW07-12176 MW07-12137 MW-7 MW-7-81600 MW-7	- 4.58 4.49 5.2 5.15 6.7 5.15	- 221.02 221.09 220.38 220.43 218.88 220.43	- - - - - - -	15,000 9,800 1,230 238 780 1,500 2,400	- 0.92 0.933 0.25 - 0.19J 1.1	- - - 0.5 0.21J 1.2	<0.5 12 0.662 5.05 0.2 0.82J 10	2.8 55 1.54 0.835 4 3 3.4	23 49 9.32 5.36 4 1.4 8.4	12 61 1.0 2.6 0.6 0.60 10	8.7 2.0 - 1.0 - 31.4 32.6
MW8 226.34 (5-17.5) 2 17.5	Drilled 8/19/00 to replace MW4 8/16/00 11/13/00	MW-8-81600 MW-8	7.54 7.5	218.8 218.84	- -	51,000 49,000	2.2 2.5	2 2.0	1,300 1,500	1,500 830	2,900 2,600	10,000 8,900	68.6 24.8
CLEANUP LEVEL (10)						1,000	1	1	6	40	30	20	5

- Mean Sea Level elevation in feet, surveyed to top of PVC well casing.
- Depth in feet, measured from top of PVC well casing.
- Diameter in inches.
- Mean Sea Level elevation in feet corrected for floating product, if applicable.
- Non-aqueous phase floating product thickness in feet.
- NWTPH-Gx Method- Gasoline range.
- NWTPH-Dx Method - Diesel and Heavy Oil range.
- EPA Method 8020.
- EPA 200 Series Methods.
- Method "A" Groundwater Cleanup Levels, MTCA, February 28, 1991.

ug/L. Micrograms per liter, parts per billion.  
 mg/L. Milligrams per liter, parts per million.  
 < Concentration less than laboratory detection limit listed (non-detected).  
 - Not Analyzed  
 — Not Encountered  
 \* Duplicate sample collected for QA/QC purposes.  
 VOCs Volatile Organic Compounds  
 NCA #P712258  
 Note: Prior to 1997, gasoline and diesel analyzed using Washington methods (WTPH-G, WTPH-D)  
 J = Estimated value  
 Bold = Greater than MTCA Cleanup Levels



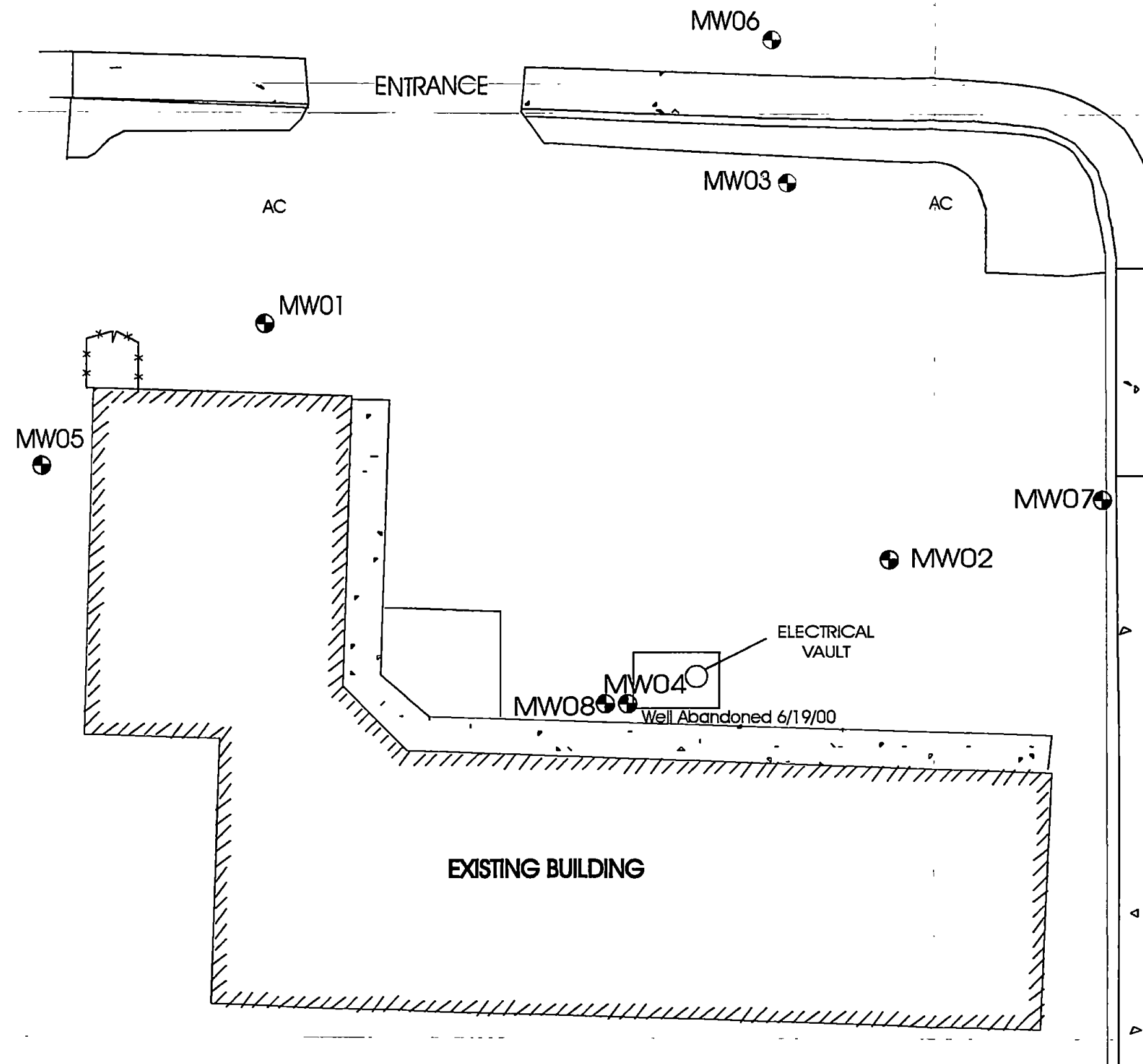
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**SITE LOCATION MAP**  
**FORMER MOBIL STATION #99-NWA**  
**14357 LAKE CITY WAY NE.**  
**SEATTLE, WASHINGTON**

**Project # 60-5071-05**

**FIGURE 1**



**LEGEND**

MW-03  MONITORING WELL LOCATION



0 10 20 40

SCALE: 1 INCH = 20 FEET



**KLEINFELDER**

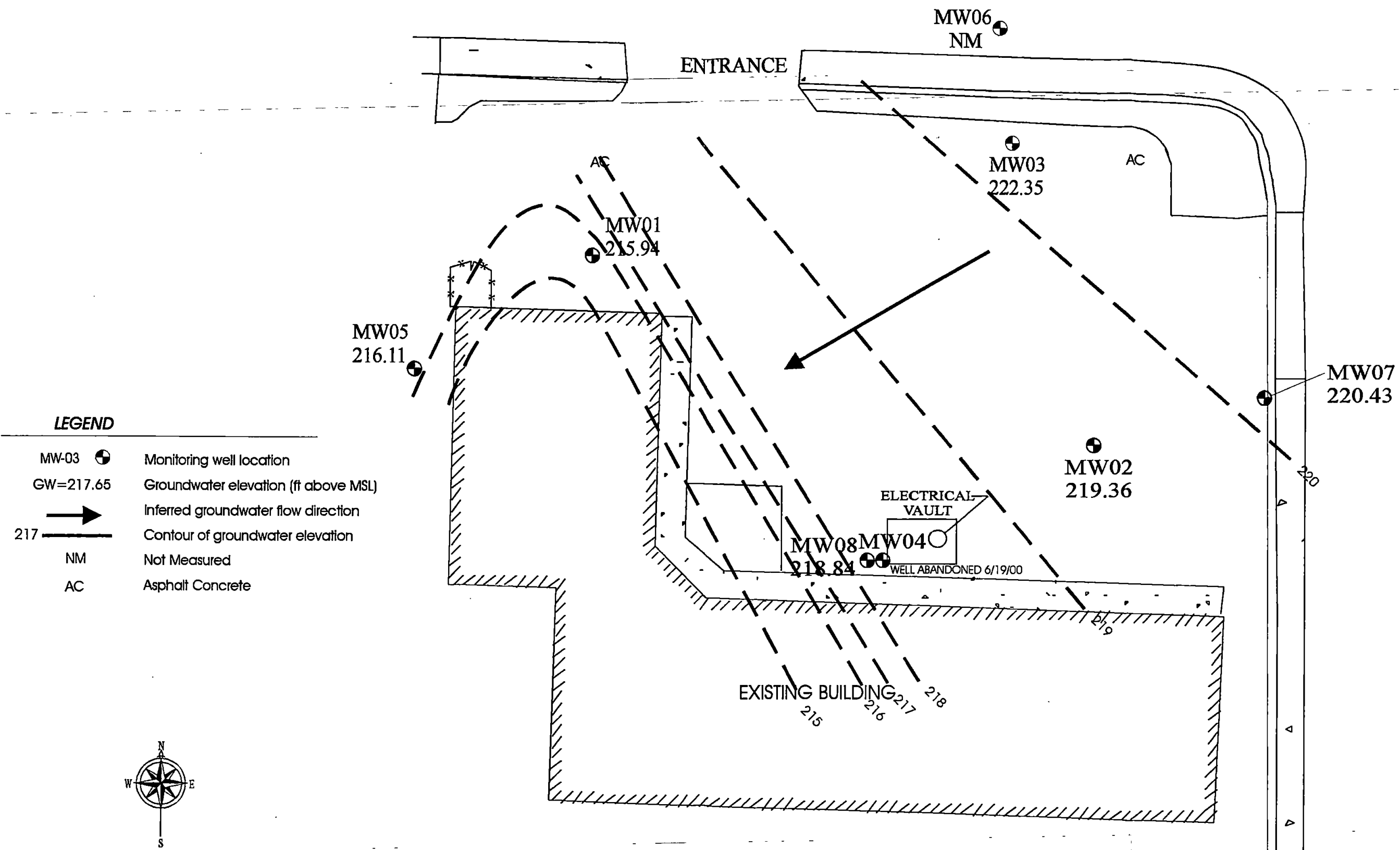
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SITE PLAN  
FORMER MOBIL STATION #99-NWA  
14357 LAKE CITY WAY NE  
SEATTLE, WASHINGTON

Project # 60-5071-05

FIGURE 2



**KLEINFELDER**

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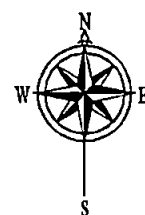
GROUNDWATER ELEVATION CONTOURS - November 13, 2000  
 FORMER MOBIL STATION #99-NWA  
 14357 LAKE CITY WAY NE  
 SEATTLE, WASHINGTON

Project # 60-5071-05

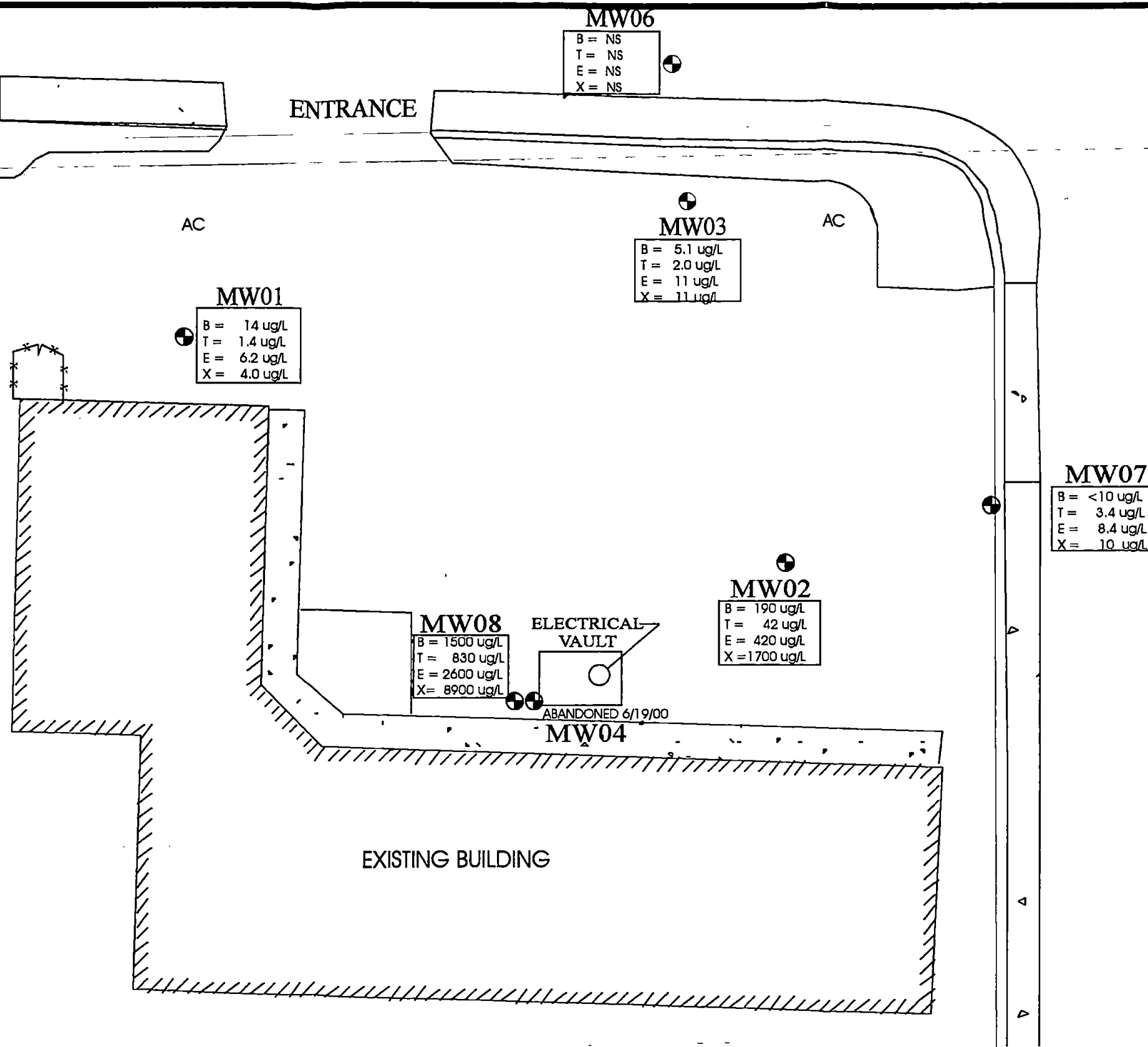
FIGURE 3

# LEGEND

- MW-03  Monitoring well location
- B = 5.1 ug/l Benzene concentration in ug/L or ppb
- T = 2.0 ug/l Toluene concentration in ug/L or ppb
- E = 11 ug/l Ethylbenzene concentration in ug/L or ppb
- X = 11 ug/l Xylene (Total) concentration in ug/L or ppb
- NS Not sampled
- AC Asphalt Concrete
- J Estimated Value



0 10 20 40  
SCALE: 1 INCH = 20 FEET



**KLEINFELDER**

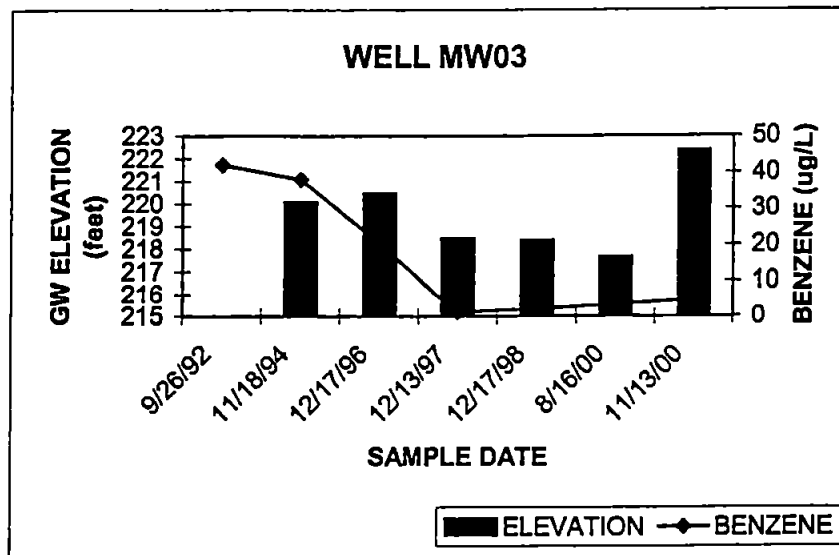
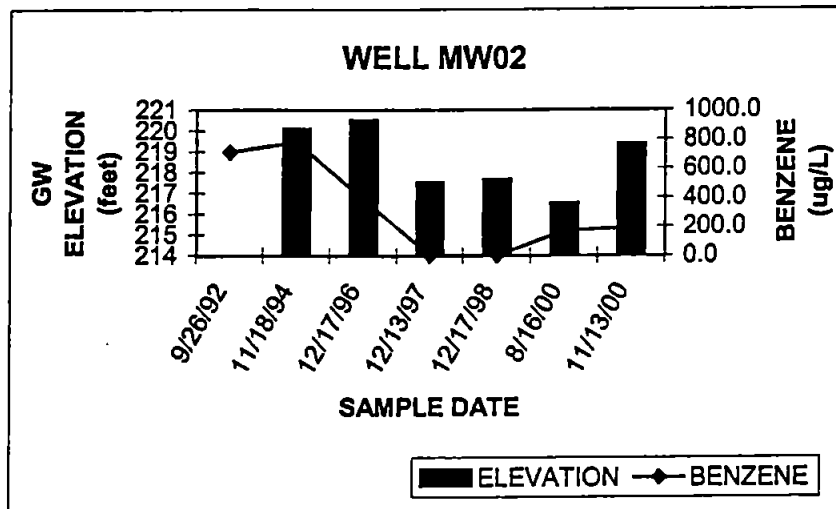
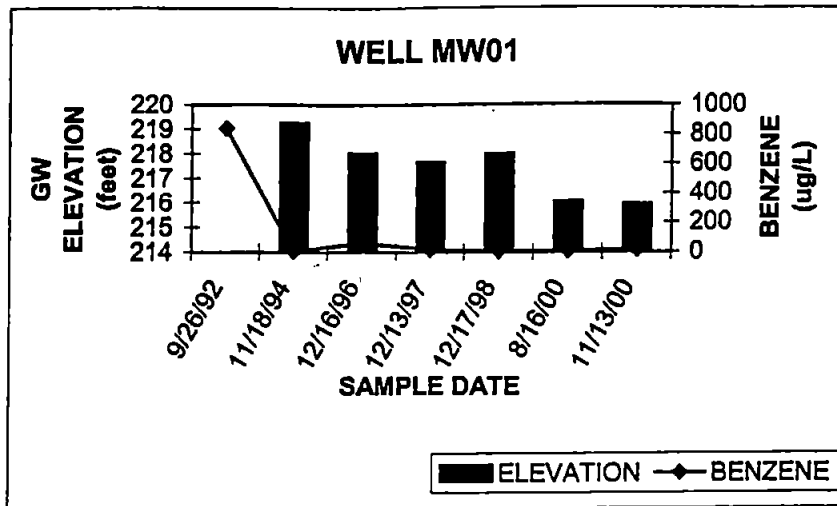
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BTEX CONCENTRATIONS IN GROUNDWATER-November 13, 2000  
FORMER MOBIL STATION #99-NWA  
14357 LAKE CITY WAY NE  
SEATTLE, WASHINGTON

Project # 60-5071-05

FIGURE 4



**KLEINFELDER**

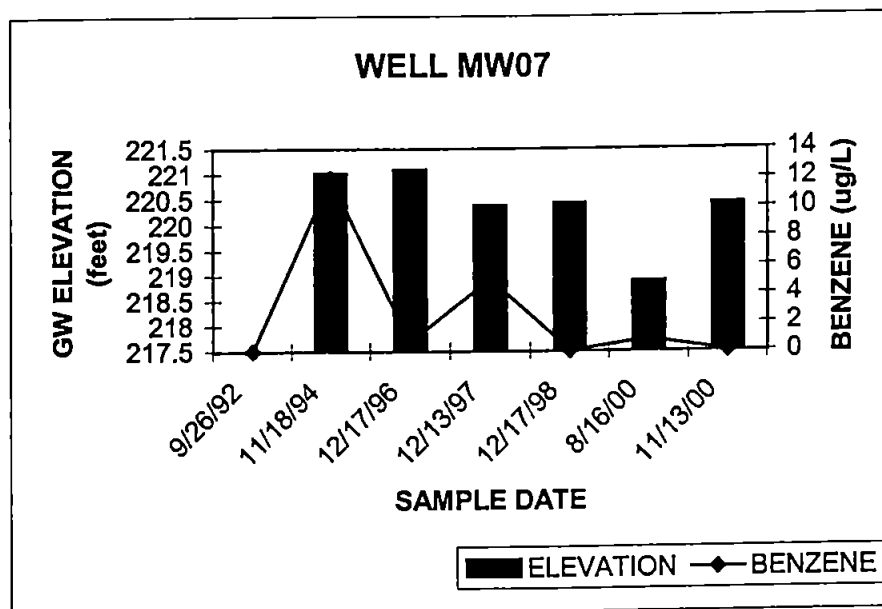
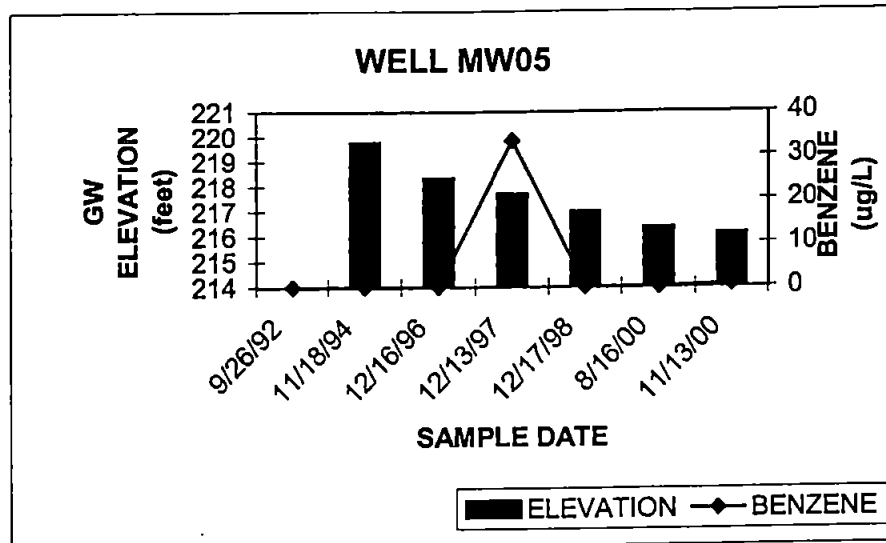
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BENZENE vs. GROUNDWATER ELEVATION GRAPHS  
 FORMER MOBIL STATION #99-NWA  
 14357 LAKE CITY WAY NE.  
 SEATTLE, WASHINGTON

Project # 60-5071-05

**FIGURE 5**



## APPENDIX A SITE EXPLORATION METHODS

### Water Level Measurements

Water level measurements were referenced to the surveyed elevation at the top of the well casing. The static water level and product thickness (when present) were measured in each monitoring well using a Solinst oil/water interface tape. The instrument emitted a steady tone when the probe encountered oil and an intermittent beep when it encountered water.

The probe on the oil/water interface tape was lowered into the well until the instrument detected floating product (if present). The tape connected to the probe was used to obtain a depth to product measurement, from the reference point, to within 0.01 feet. The probe was lowered further into the well until the instrument detected water. The depth-to-water, relative to the same reference point, was recorded. Subtracting the first measurement from the second yields thickness of free product floating on top of the water column in the well.

Water elevations were corrected for floating product by the following equation:

$$h_c = h + (d_H/d_W)b$$

Where  $h_c$  = Corrected Water Elevation

$h$  = Depth to Water

$d_H$  = Density of Hydrocarbon

gasoline  $d_H$  = 0.73 grams/cubic centimeter

diesel  $d_H$  = 0.83 grams/cubic centimeter

$d_W$  = Density of Water (1 gram/cubic centimeter)

$b$  = Hydrocarbon Thickness

### Monitor Well Sampling

Kleinfelder personnel sampled groundwater monitoring wells in accordance with the following protocol:

- The height of the water column within the well was calculated by subtracting the depth to water from the total depth of the well. The volume of this water column was calculated using the relationship  $V = 3.142r^2h$ . Where  $V$  is the volume of

water in cubic feet,  $r$  is the radius of the well in feet and  $h$  is the height of the water column in feet.

- A minimum of three casing volumes of water was removed from the well using a submersible electric pump (Purger-ES40) or disposable bailer. Temperature, pH, and specific conductivity were monitored during the well purge. Standards of known pH and specific conductivity were used to calibrate the field meter prior to use.
- The contract laboratory prepared sample containers to conform with EPA-recommended preservation techniques for the analytes of concern.
- The groundwater sample was collected with a disposable bailer. Sample containers were open only as long as necessary to collect the samples.
- Sample containers were labeled with a sample number, date, time, and sampler's name and stored in an ice chest containing ice. Chain-of-custody procedures documented sample handling.
- To reduce the potential for cross-contamination, developing and sampling equipment were washed in a trisodium phosphate solution, rinsed with tap water, and given a final rinse with distilled water. Clean latex gloves were worn when handling sample bottles.



## ANALYTICAL RESULTS

Prepared for:

ExxonMobil  
Remediation Engineering Dept.  
3700 West 190th St., TPT-2  
Torrance, CA 90509-2929

Prepared by:

Lancaster Laboratories  
2425 New Holland Pike  
Lancaster, PA 17605-2425

## SAMPLE GROUP

The sample group for this submittal is 739619. Samples arrived at the laboratory on Wednesday, November 15, 2000. The PO# for this group is 4500446506-0509 and the release number is 00380.

<u>Client Description</u>	<u>Lancaster Labs Number</u>
MW-1 Grab Water Sample	3501549
MW-5 Grab Water Sample	3501550
MW-3 Grab Water Sample	3501551
MW-7 Grab Water Sample	3501552
MW-2 Grab Water Sample	3501553
MW-8 Grab Water Sample	3501554
Trip Blank Water Sample	3501555

## METHODOLOGY

The specific methodologies used in obtaining the enclosed analytical results are indicated on the laboratory chronicles.

1 COPY TO Kleinfelder

Attn: Mr. John Lillie

Questions? Contact your Client Services Representative  
Teresa M. Lis at (717) 656-2300.

Respectfully Submitted,



Lancaster Laboratories, Inc.  
2425 New Holland Pike  
PO Box 12425  
Lancaster, PA 17605-2425  
717-656-2300 Fax: 717-656-2681

## Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>N.D.</b>	none detected	<b>BMQL</b>	Below Minimum Quantitation Level
<b>TNTC</b>	Too Numerous To Count	<b>MPN</b>	Most Probable Number
<b>IU</b>	International Units	<b>CP Units</b>	cobalt-chloroplatinate units
<b>umhos/cm</b>	micromhos/cm	<b>NTU</b>	nephelometric turbidity units
<b>C</b>	degrees Celsius	<b>F</b>	degrees Fahrenheit
<b>Cal</b>	(diet) calories	<b>lb.</b>	pound(s)
<b>meq</b>	milliequivalents	<b>kg</b>	kilogram(s)
<b>g</b>	gram(s)	<b>mg</b>	milligram(s)
<b>ug</b>	microgram(s)	<b>l</b>	liter(s)
<b>ml</b>	milliliter(s)	<b>ul</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>fib &gt;5 um/ml</b>	fibers greater than 5 microns in length per ml
<b>&lt;</b>	less than - The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture.		

### U.S. EPA data qualifiers:

#### Organic Qualifiers

<b>A</b>	TIC is a possible aldol-condensation product
<b>B</b>	Analyte was also detected in the blank
<b>C</b>	Pesticide result confirmed by GC/MS
<b>D</b>	Compound quantitated on a diluted sample
<b>E</b>	Concentration exceeds the calibration range of the instrument
<b>J</b>	Estimated value
<b>N</b>	Presumptive evidence of a compound (TICs only)
<b>P</b>	Concentration difference between primary and confirmation columns >25%
<b>U</b>	Compound was not detected
<b>X,Y,Z</b>	Defined in case narrative

#### Inorganic Qualifiers

<b>B</b>	Value is <CRDL, but ≥IDL
<b>E</b>	Estimated due to interference
<b>M</b>	Duplicate injection precision not met
<b>N</b>	Spike sample not within control limits
<b>S</b>	Method of standard additions (MSA) used for calculation
<b>U</b>	Compound was not detected
<b>W</b>	Post digestion spike out of control limits
<b>*</b>	Duplicate analysis not within control limits
<b>+</b>	Correlation coefficient for MSA <0.995

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report and data may be reproduced except in full, without the written approval of the laboratory.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions of Lancaster Laboratories and we hereby object to any conflicting terms contained in any acceptance or order submitted by client.



Lancaster Laboratories Sample No. WW 3501549

Collected: 11/13/2000 12:00 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

Reported: 12/11/00 at 05:24 AM

Discard: 1/11/01

MW-1 Grab Water Sample

ExxonMobil

Remediation Engineering Dept.

3700 West 190th St., TPT-2

Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

NWA1-

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
01055	Lead (furnace method)	7439-92-1	0.0135	0.0019	mg/l	1
08208	BTEX (8020)					
00776	Benzene	71-43-2	14.	0.20	ug/l	1
00777	Toluene	108-88-3	1.4	0.20	ug/l	1
00778	Ethylbenzene	100-41-4	6.2	0.20	ug/l	1
00779	Total Xylenes	1330-20-7	4.2	0.60	ug/l	1
08271	TPH by NWTPH-Dx (waters)					
02095	Diesel Range Organics	n.a.	0.49	0.080	mg/l	1
02096	Heavy Range Organics	n.a.	0.40 J	0.20	mg/l	1
08274	Gx by 8015B Modified - water					
01648	Gx by 8015B Modified - water	n.a.	0.72	0.048	mg/l	1

State of Washington Lab Certification No. C259

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
01055	Lead (furnace method)	SW-846 7421	1	11/24/2000 15:28	Jolene M. Schields	1
08208	BTEX (8020)	SW-846 8020A/5030A	1	11/17/2000 12:34	Darvin L. Martin	1
08271	TPH by NWTPH-Dx (waters)	NWTPH-Dx, ECY 97-602(modified)	1	11/29/2000 15:34	Robert G. Brown	1
08274	Gx by 8015B Modified - water	Gx by SW-846 8015B Modified	1	11/17/2000 12:34	Darvin L. Martin	1
05704	WW/TL SW 846 GFAA Digest tot	SW-846 3020A	1	11/20/2000 17:15	Liana C. Jones	1
07003	Extraction - DRO (Waters)	NWTPH-Dx, ECY 97-602, 6/97	1	11/17/2000 08:00	Maria A. Davenport	1



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Lancaster Laboratories Sample No. WW 3501549

Collected: 11/13/2000 12:00 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

Reported: 12/11/00 at 05:24 AM

Discard: 1/11/01

MW-1 Grab Water Sample

ExxonMobil

Remediation Engineering Dept.

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Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

NWA1-



Lancaster Laboratories Sample No. WW 3501550

Collected: 11/13/2000 12:30 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

Reported: 12/11/00 at 05:24 AM

Discard: 1/11/01

MW-5 Grab Water Sample

ExxonMobil

Remediation Engineering Dept.

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Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

NWA5-

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
01055	Lead (furnace method)	7439-92-1	0.0333	0.0019	mg/l	1
08208	BTEX (8020)					
00776	Benzene	71-43-2	0.54 J	0.20	ug/l	1
00777	Toluene	108-88-3	0.44 J	0.20	ug/l	1
00778	Ethylbenzene	100-41-4	0.47 J	0.20	ug/l	1
00779	Total Xylenes	1330-20-7	0.94 J	0.60	ug/l	1
08271	TPH by NWTTPH-Dx (waters)					
02095	Diesel Range Organics	n.a.	N.D.	0.080	mg/l	1
02096	Heavy Range Organics	n.a.	N.D.	0.20	mg/l	1
o-Terphenyl surrogate recovery is out of specification (low) for the original extraction of this sample (trial 1). The sample was reextracted past the method hold time (trial 2). Surrogate recovery is within specification for trial 2 and comparable TPH results were observed for the two trials. Trial 1 data is reported.						
08274	Gx by 8015B Modified - water					
01648	Gx by 8015B Modified - water	n.a.	N.D.	0.048	mg/l	1

State of Washington Lab Certification No. C259

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
01055	Lead (furnace method)	SW-846 7421	1	11/24/2000 15:34	Jolene M. Schields	1
08208	BTEX (8020)	SW-846 8020A/5030A	1	11/17/2000 13:10	Darvin L. Martin	1
08271	TPH by NWTTPH-Dx (waters)	NWTTPH-Dx, ECY 97-602(modified)	1	11/29/2000 15:54	Robert G. Brown	1



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Lancaster Laboratories Sample No. WW 3501550

Collected: 11/13/2000 12:30 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

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Reported: 12/11/00 at 05:24 AM

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Discard: 1/11/01

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MW-5 Grab Water Sample

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LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

#### NWA5-

08274	Gx by 8015B Modified - water	Gx by SW-846 8015B Modified	1	11/17/2000 13:10	Darvin L. Martin	1
05704	WW/TL SW 846 GFAA Digest tot	SW-846 3020A	1	11/20/2000 17:15	Liana C. Jones	1
07003	Extraction - DRO (Waters)	NWTPH-Dx, ECY 97-602, 6/97	1	11/17/2000 08:00	Maria A. Davenport	1



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Lancaster Laboratories Sample No. WW 3501551

Collected: 11/13/2000 13:00 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

Reported: 12/11/00 at 05:25 AM

Discard: 1/11/01

MW-3 Grab Water Sample

ExxonMobil

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Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

NWA3-

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method		Units	Dilution Factor
				Detection Limit			
01055	Lead (furnace method)	7439-92-1	0.0301	0.0019		mg/l	1
08208	BTEX (8020)						
00776	Benzene	71-43-2	5.1	0.20		ug/l	1
00777	Toluene	108-88-3	2.0	0.20		ug/l	1
00778	Ethylbenzene	100-41-4	11.	0.20		ug/l	1
00779	Total Xylenes	1330-20-7	11.	0.60		ug/l	1
08271	TPH by NWTTPH-Dx (waters)						
02095	Diesel Range Organics	n.a.	0.47	0.080		mg/l	1
02096	Heavy Range Organics	n.a.	0.43 J	0.20		mg/l	1
08274	Gx by 8015B Modified - water						
01648	Gx by 8015B Modified - water	n.a.	1.5	0.048		mg/l	1

State of Washington Lab Certification No. C259

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis		Analyst	Dilution Factor
				Date and Time			
01055	Lead (furnace method)	SW-846 7421	1	11/24/2000 15:39		Jolene M. Schields	1
08208	BTEX (8020)	SW-846 8020A/5030A	1	11/17/2000 16:14		Darvin L. Martin	1
08271	TPH by NWTTPH-Dx (waters)	NWTTPH-Dx, ECY 97-602 (modified)	1	11/29/2000 16:14		Robert G. Brown	1
08274	Gx by 8015B Modified - water	Gx by SW-846 8015B Modified	1	11/17/2000 16:14		Darvin L. Martin	1
05704	WW/TL SW 846 GFAA Digest tot	SW-846 3020A	1	11/20/2000 17:15		Liana C. Jones	1
07003	Extraction - DRO (Waters)	NWTTPH-Dx, ECY 97-602, 6/97	1	11/17/2000 08:00		Maria A. Davenport	1



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Lancaster Laboratories Sample No. WW 3501551

Collected: 11/13/2000 13:00 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

Reported: 12/11/00 at 05:25 AM

Discard: 1/11/01

MW-3 Grab Water Sample

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LOC# 99-NWA WBS# 56

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NWA3-



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Lancaster Laboratories Sample No. WW 3501552

Collected: 11/13/2000 14:00 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

Reported: 12/11/00 at 05:25 AM

Discard: 1/11/01

MW-7 Grab Water Sample

ExxonMobil

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Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

NWA7-

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
01055	Lead (furnace method)	7439-92-1	0.0326	0.0019	mg/l	1
08208	BTEX (8020)					
00776	Benzene	71-43-2	N.D.	10.	ug/l	1
00777	Toluene	108-88-3	3.4	0.20	ug/l	1
00778	Ethylbenzene	100-41-4	8.4	0.20	ug/l	1
00779	Total Xylenes	1330-20-7	10.	0.60	ug/l	1
Due to the presence of an interferent near its retention time, the normal reporting limit was not attained for benzene.						
The presence or concentration of benzene cannot be determined below the reporting limit due to the presence of this interferent.						
08271	TPH by NWTPH-Dx (waters)					
02095	Diesel Range Organics	n.a.	1.1	0.16	mg/l	1
02096	Heavy Range Organics	n.a.	1.2	0.40	mg/l	1
Due to interferences from the sample matrix (high sediment content), the limits of quantitation for the TPH-Dx determinations were increased.						
08274	Gx by 8015B Modified - water					
01648	Gx by 8015B Modified - water	n.a.	2.4	0.048	mg/l	1
Due to the nature of the sample matrix, the surrogate standard recovery is above the range of specifications.						

State of Washington Lab Certification No. C259

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
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Lancaster Laboratories Sample No. WW 3501552

Collected: 11/13/2000 14:00 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

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Reported: 12/11/00 at 05:25 AM

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Discard: 1/11/01

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MW-7 Grab Water Sample

Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

NWA7-

01055	Lead (furnace method)	SW-846 7421	1	11/24/2000 15:44	Jolene M. Schields	1
08208	BTEX (8020)	SW-846 8020A/5030A	1	11/17/2000 16:52	Darvin L. Martin	1
08271	TPH by NWTPH-Dx (waters)	NWTPH-Dx, ECY 97-602 (modified)	1	11/29/2000 16:34	Robert G. Brown	1
08274	Gx by 8015B Modified - water	Gx by SW-846 8015B Modified	1	11/17/2000 16:52	Darvin L. Martin	1
05704	WW/TL SW 846 GFAA Digest tot	SW-846 3020A	1	11/20/2000 17:15	Liana C. Jones	1
07003	Extraction - DRO (Waters)	NWTPH-Dx, ECY 97-602, 6/97	1	11/17/2000 08:00	Maria A. Davenport	1



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Lancaster Laboratories Sample No. WW 3501553

Collected: 11/13/2000 14:30 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

Reported: 12/11/00 at 05:25 AM

Discard: 1/11/01

MW-2 Grab Water Sample

ExxonMobil

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Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

NWA2 -

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
01055	Lead (furnace method)	7439-92-1	0.216	0.0190	mg/l	10
08208	BTEX (8020)					
00776	Benzene	71-43-2	190.	1.0	ug/l	5
00777	Toluene	108-88-3	42.	1.0	ug/l	5
00778	Ethylbenzene	100-41-4	420.	1.0	ug/l	5
00779	Total Xylenes	1330-20-7	1,700.	3.0	ug/l	5
The vial submitted for volatile analysis did not have a pH < 2 at the time of analysis. Due to the volatile nature of the analytes, it is not appropriate for the laboratory to adjust the pH at the time of sample receipt.						
08271	TPH by NWTPH-Dx (waters)					
02095	Diesel Range Organics	n.a.	2.2 J	0.80	mg/l	10
02096	Heavy Range Organics	n.a.	N.D.	2.0	mg/l	10
The quantitation limits were raised because sample dilution was necessary to bring target compounds into the calibration range of the system.						
08274	Gx by 8015B Modified - water					
01648	Gx by 8015B Modified - water	n.a.	15.	0.24	mg/l	5

State of Washington Lab Certification No. C259

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
01055	Lead (furnace method)	SW-846 7421	1	11/27/2000 08:28	Jessica L. Boyd	10
08208	BTEX (8020)	SW-846 8020A/5030A	1	11/17/2000 17:29	Darvin L. Martin	5



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Lancaster Laboratories Sample No. WW 3501553

Collected: 11/13/2000 14:30 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

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Reported: 12/11/00 at 05:25 AM

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Discard: 1/11/01

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MW-2 Grab Water Sample

Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

## NWA2-

08271	TPH by NWTTPH-Dx (waters)	NWTTPH-Dx, ECY 97-602(modified)	1	11/29/2000 02:05	Robert G. Brown	10
08274	Gx by 8015B Modified - water	Gx by SW-846 8015B Modified	1	11/17/2000 17:29	Darvin L. Martin	5
05704	WW/TL SW 846 GFAA Digest tot	SW-846 3020A	1	11/20/2000 17:15	Liana C. Jones	1
07003	Extraction - DRO (Waters)	NWTTPH-Dx, ECY 97-602, 6/97	1	11/17/2000 08:00	Maria A. Davenport	1



Lancaster Laboratories Sample No. WW 3501554

Collected: 11/13/2000 15:00 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

Reported: 12/11/00 at 05:25 AM

Discard: 1/11/01

MW-8 Grab Water Sample

ExxonMobil

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3700 West 190th St., TPT-2

Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

NWA8-

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
01055	Lead (furnace method)	7439-92-1	0.0248	0.0019	mg/l	1
08208	BTEX (8020)					
00776	Benzene	71-43-2	1,500.	4.0	ug/l	20
00777	Toluene	108-88-3	830.	4.0	ug/l	20
00778	Ethylbenzene	100-41-4	2,600.	4.0	ug/l	20
00779	Total Xylenes	1330-20-7	8,900.	12.	ug/l	20
08271	TPH by NWTPH-Dx (waters)					
02095	Diesel Range Organics	n.a.	2.5	0.80	mg/l	10
02096	Heavy Range Organics	n.a.	N.D.	2.0	mg/l	10
	Accurate surrogate recoveries could not be determined due to the dilution required for analysis of the sample.					
08274	Gx by 8015B Modified - water					
01648	Gx by 8015B Modified - water	n.a.	49.	1.0	mg/l	20

State of Washington Lab Certification No. C259

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
01055	Lead (furnace method)	SW-846 7421	1	11/24/2000 19:57	Jolene M. Schields	1
08208	BTEX (8020)	SW-846 8020A/5030A	1	11/17/2000 18:06	Darvin L. Martin	20
08271	TPH by NWTPH-Dx (waters)	NWTPH-Dx, ECY 97-602(modified)	1	11/29/2000 02:25	Robert G. Brown	10
08274	Gx by 8015B Modified - water	Gx by SW-846 8015B Modified	1	11/17/2000 18:06	Darvin L. Martin	20
05704	WW/TL SW 846 GFAA Digest tot	SW-846 3020A	1	11/20/2000 17:15	Liana C. Jones	1



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Lancaster Laboratories Sample No. WW 3501554

Collected: 11/13/2000 15:00 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

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Reported: 12/11/00 at 05:25 AM

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Discard: 1/11/01

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MW-8 Grab Water Sample

Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

NWA8-

07003 Extraction - DRO (Waters)

NWTPH-Dx, ECY 97-602,  
6/97

1

11/17/2000 08:00

Maria A. Davenport

1



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Lancaster Laboratories Sample No. WW 3501555

Collected: 11/13/2000 12:00 by CL

Account Number: 09728

Submitted: 11/15/2000 09:20

ExxonMobil

Reported: 12/11/00 at 05:25 AM

Remediation Engineering Dept.

Discard: 1/11/01

3700 West 190th St., TPT-2

Trip Blank Water Sample

Torrance, CA 90509-2929

LOC# 99-NWA WBS# 56

MOBIL: 14357 Lake City Way - Seattle, WA

NWTB-

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
08208	BTEX (8020)					
00776	Benzene	71-43-2	N.D.	0.20	ug/l	1
00777	Toluene	108-88-3	N.D.	0.20	ug/l	1
00778	Ethylbenzene	100-41-4	N.D.	0.20	ug/l	1
00779	Total Xylenes	1330-20-7	N.D.	0.60	ug/l	1
08274	Gx by 8015B Modified - water					
01648	Gx by 8015B Modified - water	n.a.	N.D.	0.048	mg/l	1

State of Washington Lab Certification No. C259

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
08208	BTEX (8020)	SW-846 8020A/5030A	1	11/17/2000 06:07	Darvin L. Martin	1
08274	Gx by 8015B Modified - water	Gx by SW-846 8015B Modified	1	11/17/2000 06:07	Darvin L. Martin	1



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## Quality Control Summary

Page 1 of 2

Client Name: ExxonMobil

Group Number: 739619

Reported: 12/11/00 at 05:25 AM

## Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 003210009A D333	Sample number(s): 3501549-3501554							
Diesel Range Organics	N.D.	.08	mg/l	88		60-120		
Heavy Range Organics	N.D.	.2	mg/l					
Batch number: 00321A02	Sample number(s): 3501549-3501555							
Benzene	N.D.	.2	ug/l	107		79-119		
Toluene	N.D.	.2	ug/l	105		81-118		
Ethylbenzene	N.D.	.2	ug/l	103		80-118		
Total Xylenes	N.D.	.6	ug/l	103		81-118		
Gx by 8015B Modified - water	N.D.	.048	mg/l	96	95	63-130	1	30
Batch number: 003255704001	Sample number(s): 3501549-3501554							
Lead (furnace method)	N.D.	.0019	mg/l	109		80-117		

## Sample Matrix Quality Control

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 003210009A D333	Sample number(s): 3501549-3501554								
Diesel Range Organics						1.1	N.D.	200* (1)	20
Heavy Range Organics						1.2	0.72 J	47* (1)	20
Batch number: 00321A02	Sample number(s): 3501549-3501555								
Benzene	112	112	77-129	1	30				
Toluene	109	106	77-131	2	30				
Ethylbenzene	102	100	80-130	3	30				
Total Xylenes	103	101	75-133	2	30				
Gx by 8015B Modified - water	103	102	70-130	1	30				
Batch number: 003255704001	Sample number(s): 3501549-3501554								
Lead (furnace method)	92	95	80-120	2	20	0.0057	0.0061	7 (1)	20

## Surrogate Quality Control

Analysis Name: TPH by NWTPH-Dx (waters)

Batch number: 003210009A D333

Orthoterphenyl

3501549	93
3501550	40*
3501551	94
3501552	99
3501553	92
3501554	199*

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The background result was more than four times the spike added.



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## Quality Control Summary

Client Name: ExxonMobil  
Reported: 12/11/00 at 05:25 AM

Group Number: 739619

### Surrogate Quality Control

Blank 80  
LCS 69  
PD 89

Limits: 50-150

Analysis Name: BTEX (8020)

Batch number: 00321A02

	Trifluorotoluene-P	Trifluorotoluene-F
3501549	107	103
3501550	108	101
3501551	103	111
3501552	124	139*
3501553	106	101
3501554	96	123
3501555	109	99
Blank	107	97
LCS	108	98
LCSD		110
MS	112	98
MSD	110	103

Limits: 69-132

65-131

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The background result was more than four times the spike added.



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**Sample #:**

SCR#: 114553

**Please print.**

Mobil Consultant/Office: <b>KLEINFELDER</b>				Matrix		Analyses Requested <small>List total number of containers in the box under each analysis.</small>										Preservative Codes											
Consultant Prj. Mgr: <b>JOAN LILLIE</b> Prj. #: <b>60-5071-04</b>				Total Number of Containers		Preservative Codes										H = HCl T = Thiosulfate N = HNO <sub>3</sub> B = NaOH S = H <sub>2</sub> SO <sub>4</sub> O = Other											
Consultant Phone #: <b>425-562-4200</b> Fax #: <b>425-562-4201</b>																											
Location Code #: <b>99-NWA</b> WBS #: <b>.56</b>				Soil		Potable Water		Air		Oil		BTX 8020		TPH 8015 MOD		GRO		DRO		H		H		N		H	
Site Address: <b>14357 LAKE CITY WAY, SEATTLE</b> State: <b>WA</b>				Grab		Composite		Air		Oil		BTX 8020		TPH 8015 MOD		GRO		DRO		H		H		N		H	
Sampler: <b>CHAD LUKKARILA, JOE WOOD</b>				Grab		Composite		Air		Oil		BTX 8020		TPH 8015 MOD		GRO		DRO		H		H		N		H	
Mobil Engineer: <b>BRAD LEDESMA</b>				Grab		Composite		Air		Oil		BTX 8020		TPH 8015 MOD		GRO		DRO		H		H		N		H	
Sample Identification				Date Collected		Time Collected		Grab		Composite		Soil		Water		Air		Oil		BTX 8020		TPH 8015 MOD		GRO		DRO	
MW-1				11/13/00		1200		X		X		8		X		X		8		2		2		2		2	
MW-5				11/13/00		1230		X		X		8		X		X		8		2		2		2		2	
MW-3				11/13/00		1300		X		X		8		X		X		8		2		2		2		2	
MW-7				11/13/00		1400		X		X		8		X		X		8		2		2		2		2	
MW-2				11/13/00		1430		X		X		8		X		X		8		2		2		2		2	
MW-8				11/13/00		1500		X		X		8		X		X		8		2		2		2		2	
TRIP BLANKS				11/13/00		1200		X		X		2		X		X		2									
TEMP BLANK										X		1															



KLEINFELDER

2405 140<sup>th</sup> Avenue NE  
Suite A101  
Bellevue, WA 98005  
Tel. 206-562-4200

Fax. 206-562-4201



KLEINFELDER

## *Transmittal*

Date: March 1, 2001  
Kleinfelder Project No.: 60-5071-05

**TO:**

Mr. Joe Hickey  
Washington Department of Ecology  
Voluntary Cleanup Program  
3190 - 160<sup>th</sup> Avenue SE  
Bellevue, WA 98008

**Subject:**

**FOURTH QUARTER 2000 GROUNDWATER MONITORING REPORT  
FORMER MOBIL OIL SERVICE STATION #99-NWA  
14357 LAKE CITY WAY, N.E.  
SEATTLE, WASHINGTON**

**We are sending the following:**

One copy of the above referenced report.

**Remarks:**

If you have any questions, please contact me at (425)-562-4200.

Thank you.

**By:**

Chad R. Lukkarila  
Environmental Engineering Staff

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MAR 05 2001  
DEPT. OF ECOLOGY