

PACIFIC
ENVIRONMENTAL
GROUP, INC.

July 22, 1992
Project No. 520-25.03

Mr. David Bush
Chevron U.S.A. Products Company
Site Assessment & Remediation Group
20500 Richmond Beach Drive N.W.
Seattle, Washington 98111

Re: Stage II Vapor Recovery System Installation
Chevron Service Station No. 60090129
Seattle, Washington

Dear Mr. Bush:

This letter presents the results of an environmental investigation conducted by Pacific Environmental Group, Inc. (PACIFIC) in conjunction with Gradient Construction Inc. (GRADIENT) at Chevron U.S.A. Service Station 60090129, located at 4700 Brooklyn Ave., Seattle, Washington (Figure 1). The purpose of this investigation was to assess and document soil quality with respect to petroleum hydrocarbons at the site during stage II vapor recovery equipment retrofit. Services were provided by PACIFIC under Chevron Contract No. P16CNW01819X, Release No. 71830280 dated March 26, 1992.

The scope of work for the environmental investigation consisted of the following tasks:

- o Field screening and segregation of soils stockpiled from the trenching operations using a photoionization detector (PID).
- o Collecting soil samples from trench locations where PID screening concentrations exceeded background levels.
- o Collecting one discrete soil sample from each 25 cubic yards of stockpiled soils.
- o Submitting soil samples and appropriate documentation to approved laboratory for analysis.
- o Preparation of this report.

Site Background

The Chevron site is situated on the northeast corner at the intersection of Brooklyn Ave and 47th Street in the city of Seattle (Figure 1). Three 12,000-gallon underground storage tanks (USTs) are located in the southwestern portion of the service station property and store leaded, unleaded, and supreme gasoline, respectively. A vapor extraction remediation system has been installed at the site by another consulting firm and is operational.

Stage II Vapor Recovery Retrofit

During the weeks of May 11 and 18, 1992, A.L. Sleister and Sons Construction, Inc., (Sleister) performed a stage II vapor recovery retrofit. The scope of work performed by Sleister included vapor recovery line-trenching, system installation, testing, and backfilling.

Trench Excavation

Trenches for vapor recovery lines were excavated along each dispenser island and extended to join the USTs in an excavation uncovering the west portion of the tank cluster (Figure 1). The trenching was approximately three feet wide and depths ranged from approximately 1.5 to 3 feet deep. Approximately 20 cubic yards of soil and pea-gravel were excavated from the trenches and stockpiled on-site.

Excavated soils consisted of fill, silty sand, and sand. The UST excavation was backfilled with pea-gravel.

Soil Screening

Following excavation, soil was screened for the presence of volatile organic compounds (VOCs) using a Thermo Environmental Instruments Inc. Model 580B photo-ionization detector. Soil sampling and PID field screening methodology is presented in Appendix A.

VOCs exceeding background levels were identified in one area of the trenches (Figure 1). Soils from this area, totaling approximately 3 cubic yards, were segregated, sampled, and spread out on plastic sheeting for treatment by aeration. No other VOCs were detected in the soil screened from the trenches.

Soil Sampling

Based on field PID readings, a total of two soil samples were collected. One sample (T-1) was collected from within the trenches adjacent to the northeastern pump

dispenser (Figure 2). One sample (SP-1) was collected from the three cubic yards of segregated stockpiled soil, prior to aeration.

Based on field PID readings and discussions with Chevron, PACIFIC submitted the samples for analysis by a state certified laboratory.

Following stage II vapor recovery system installation and testing, the trenches were backfilled. The backfill material consisted of pea-gravel, clean soil, and the segregated soil. The trenches were finished with asphalt or concrete. Approximately 17 cubic yards of clean soil were removed from the site by Sleister.

Analytical Parameters

Soil samples collected from the trench excavation and stockpiled soils were analyzed for the following parameters:

<u>PARAMETER</u>	<u>METHOD</u>
Total Petroleum Hydrocarbons as gasoline (TPH-G)	Washington Method WTPH-G
Benzene, toluene, ethylbenzene and xylenes (BTEX compounds)	EPA Method 8020
Total Lead	EPA Method 7420

All soil samples were analyzed by North Creek Analytical of Bothell, Washington.

Soil Analytical Results

As requested by Chevron, samples T-1 and SP-1 were analyzed for the parameters listed above. The results of these analyses are presented in Table 1. Laboratory methods, analytical reports, and chain-of-custody documentation are contained in Attachment B.

Conclusions

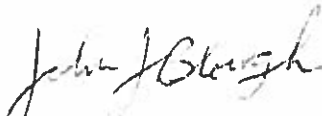
Soil sample T-1 was collected from the one area in the trenches which exceeded background VOCs detectable by the PID. Sample SP-1 was collected from the stockpiled soil associated with the area where sample T-1 was collected. Concentrations of TPH-G in both samples were above MTCA Method A cleanup levels. Analytical results for BTEX compounds and total lead were below MTCA Method A cleanup levels.

Chevron instructed that the segregated soil be backfilled in the trenches for in-place treatment with the existing vapor extraction system in operation at the site.

PACIFIC appreciates this opportunity to be of continuing service. If you have any questions regarding the contents of this report, please call.

Sincerely,

Pacific Environmental Group, Inc.



John J. Blough
Field Services Coordinator
Gradient Construction, Inc.



Ward Crell
Senior Geologist

Table 1
Figure 1
Attachments A and B

Table 1
SOIL ANALYTICAL RESULTS
CHEVRON U.S.A. STATION #60090129

TPH as Gasoline - Washington Method WTPH-G
BTEX Compounds - EPA Method 8020
Total Lead - EPA Method 7420
 Concentrations in mg/kg (ppm)

Sample I.D.	Sample Date	PARAMETER					
		Total Lead	TPH-Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
T-1	5/13/92	ND	400	ND	ND	ND	1.0
SP-1	5/13/92	34	160	ND	0.021	ND	0.60
MTCA Cleanup Levels		250	100	0.5	40	20	20
Detection Limits		7.5	1.0	0.0080	0.0080	0.0080	0.0080

NOTES: ND - Not Detected
 NA - Not analyzed for this parameter
 Analytical Reports are included in Attachment B

ATTACHMENT A
INVESTIGATIVE PROCEDURES

ATTACHMENT B

**LABORATORY ANALYTICAL METHODS AND REPORTS, AND
CHAIN-OF-CUSTODY DOCUMENTATION**

ATTACHMENT B

Laboratory Analytical Methods

Analysis for TPH-gasoline was performed according to WTPH-G. Benzene, toluene, ethylbenzene, and xylenes analysis was performed in accordance with EPA Method 8020. A methanol solvent extraction was used for the TPH analysis with final detection by gas chromatography using a flame-ionization detector. A headspace or purge and trap technique was utilized for BTEX analysis. Final detection was by gas chromatography using a photoionization detector.

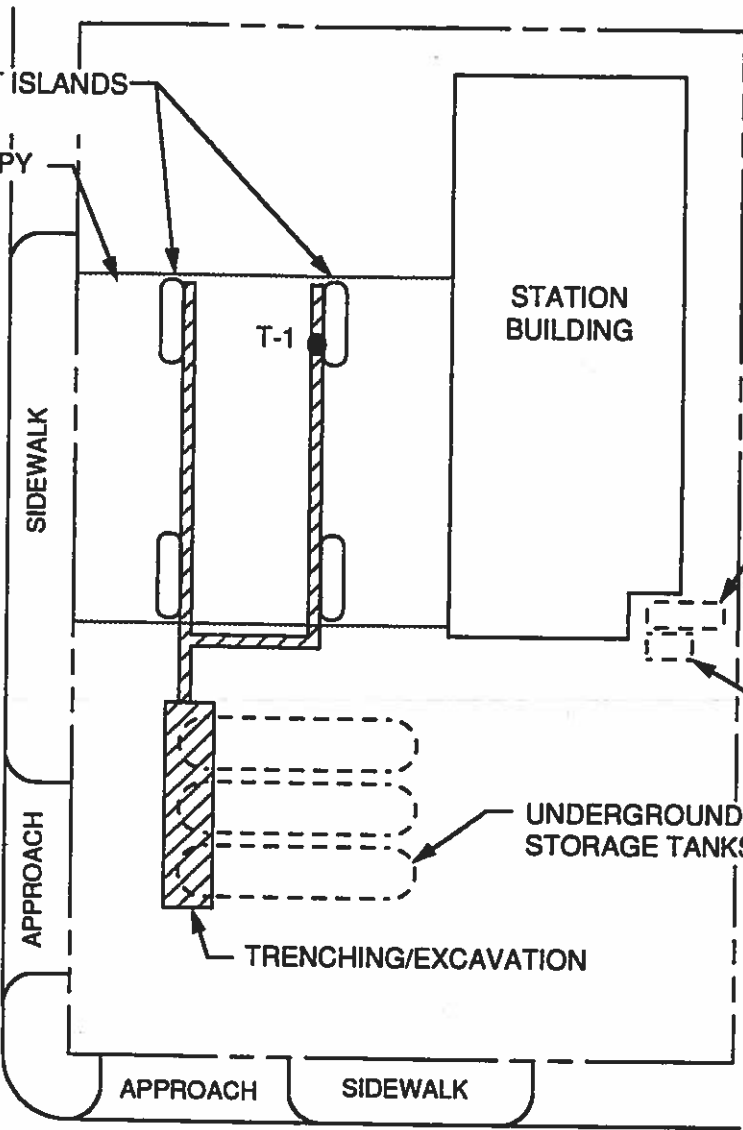
Samples were tested for Total Lead using modified EPA Methods 7420 and 7421.



PRODUCT ISLANDS (TYP)

CANOPY

BROOKLYN AVENUE



T-1

STATION BUILDING

ALLEY

HEATING OIL TANK

WASTE OIL TANK

UNDERGROUND FUEL STORAGE TANKS

TRENCHING/EXCAVATION

SIDEWALK

APPROACH

APPROACH

SIDEWALK

N.E. 47TH STREET

EXPLANATION

T-1 ● SOIL SAMPLE LOCATION AND DESIGNATION

SCALE



PACIFIC ENVIRONMENTAL GROUP, INC.

CHEVRON U.S.A. SERVICE STATION # 60090129
4700 Brooklyn Avenue
Seattle, Washington

SITE MAP

FIGURE: 1
PROJECT: 520-25.03


Pacific Environmental Group 4020 148th Avenue NE, #B Redmond, WA 98052 Attention: John Blough	Client Project ID: Chevron # 60090129 Matrix: Soil Analysis for: Total Solids First Sample #: 205-0734	Received: May 13, 1992 Reported: May 15, 1992
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LABORATORY ANALYSIS FOR: Total Solids

Sample Number	Sample Description	Sample Result %
205-0734	T-1	89
205-0735	SP-1	93

North Creek Analytical routinely provides analytical results for soils, sediments or sludges on a WET WEIGHT "as received" basis. To attain dry weight equivalents for regulatory compliance, divide the soil result by the decimal fraction of percent solids.

NORTH CREEK ANALYTICAL inc


Scot Cocanour
Laboratory Director

Pacific Environmental Group 4020 148th Avenue NE, #B Redmond, WA 98052 Attention: John Blough	Client Project ID: Chevron # 60090129 Matrix Descript: Soil Analysis Method: EPA 5030/8015/8020 First Sample #: 205-0734	Sampled: May 13, 1992 Received: May 13, 1992 Analyzed: May 19, 1992 Reported: May 28, 1992
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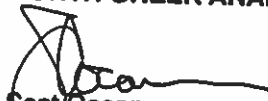
TOTAL PETROLEUM HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Volatile Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
205-0734	T-1	400 G-2	N.D.	N.D.	N.D.	1.0	104
BLK051992	Method Blank	N.D.	N.D.	N.D.	N.D.	N.D.	88

Detection Limits:	1.0	0.0080	0.0080	0.0080	0.015
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Volatile Hydrocarbons are quantitated as gasoline range organics (nC5 - nC12). Surrogate recovery reported is for Bromofluorobenzene. Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc


 Scot Cocanour
 Laboratory Director

Please Note:
 The detection limit for Benzene, Toluene and Ethyl Benzene in #205-0734 = 0.20 mg/kg.

Pacific Environmental Group 4020 148th Avenue NE, #B Redmond, WA 98052 Attention: John Blough	Client Project ID: Chevron # 60090129 Matrix Descript: Soil Analysis Method: EPA 5030/8015/8020 First Sample #: 205-0735	Sampled: May 13, 1992 Received: May 13, 1992 Analyzed: May 14, 1992 Reported: May 15, 1992
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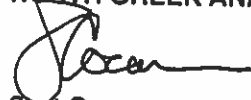
TOTAL PETROLEUM HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Volatile Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
205-0735	SP-1	160 G2	N.D.	0.021	N.D.	0.60	117
BLK051392	Method Blank	N.D.	N.D.	N.D.	N.D.	N.D.	79

Detection Limits:	1.0	0.0050	0.0050	0.0050	0.015
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Volatile Hydrocarbons are quantitated as gasoline range organics (nC5 - nC12). Surrogate recovery reported is for Bromofluorobenzene. Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc


 Scot Cocanour
 Laboratory Director

Please Note:

The detection limit for Benzene and Ethyl Benzene in # 205-0735 = 0.02 mg/kg.

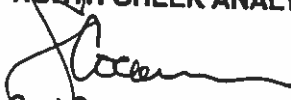
Pacific Environmental Group 4020 148th Avenue NE, #B Redmond, WA 98052 Attention: John Blough	Client Project ID: Chevron # 60090129 Analysis Method: EPA 7420 Analysis for: Lead First Sample #: 205-0734 Matrix: Soil	Sampled: May 13, 1992 Received: May 13, 1992 Digested: May 22, 1992 Analyzed: May 26, 1992 Reported: May 28, 1992
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METALS ANALYSIS FOR: Lead

Sample Number	Sample Description	Detection Limit mg/kg (ppm)	Sample Result mg/kg (ppm)
205-0734	T-1	7.5	N.D.
BLK052292	Method Blank	0.15 mg/L	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL Inc


 Scot Cocanour
 Laboratory Director

HYDROCARBON ANALYSES FOOTNOTES

(1/92)

- | <u>Code</u> | <u>Description</u> |
|--|---|
| VOLATILE HYDROCARBONS - Gasoline Range Organics | |
| G 1 | The hydrocarbons present in this sample are primarily due to extractable diesel range organics. |
| G 2 | The hydrocarbons present in this sample are a complex mixture of both gasoline range and diesel range organics. |
| G 3 | The total hydrocarbon result in this sample is primarily due to a peak(s) eluting in the purgeable hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended. |

EXTRACTABLE HYDROCARBONS - Diesel Range Organics

- | | |
|-----|--|
| D 1 | The hydrocarbons present in this sample are primarily due to volatile gasoline range organics. |
| D 2 | The hydrocarbons present in this sample are primarily due to very heavy, non-resolvable oil range organics. Quantitation by EPA 418.1 is recommended. |
| D 3 | The hydrocarbons present in this sample are a complex mixture of volatile gasoline, extractable diesel and non-resolvable oil range organics. |
| D 4 | The hydrocarbon result shown is an estimated (greater than) value due to high concentration. Reanalysis is being performed to yield a quantitative result. |

Oils & Lubricants
[-----]
T.R.P.H. (418.1)

Diesel & Fuel Oils
[-----]
Extractables (3550/8015)

Gasoline
[-----]
Volatiles (5030/8015)

LOW	LOW TO MEDIUM	MEDIUM	MEDIUM TO HIGH	VERY HIGH																				
HYDROCARBON BOILING POINT RANGE																								
CARBON RANGE:																								
5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	+29

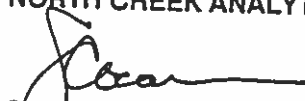
Pacific Environmental Group 4020 148th Avenue NE, #B Redmond, WA 98052 Attention: John Blough	Client Project ID: Chevron # 60090129 Analysis Method: EPA 7420 Analysis for: Lead First Sample #: 205-0735 Matrix: Soil	Sampled: May 13, 1992 Received: May 13, 1992 Digested: May 14, 1992 Analyzed: May 14, 1992 Reported: May 15, 1992
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METALS ANALYSIS FOR: Lead

Sample Number	Sample Description	Detection Limit mg/kg (ppm)	Sample Result mg/kg (ppm)
205-0735	SP-1	7.5	12
BLK051492	Method Blank	0.15	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc


Scot Cocanour
Laboratory Director

Pacific Environmental Group 4020 148th Avenue NE, #B Redmond, WA 98052 Attention: John Blough	Client Project ID: Chevron # 60090129 EPA Method: 5030/8020 Sample Matrix: Soil Units: mg/kg QC Sample #: 205-0517	Analyst: M. Essig K. Wilke Analyzed: May 13, 1992 Reported: May 13, 1992
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QUALITY CONTROL DATA REPORT

ANALYTE	Benzene			
	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.50	0.50	0.50	1.50
Conc. Matrix Spike:	0.36	0.40	0.46	1.32
Matrix Spike % Recovery:	72	80	92	88
Conc. Matrix Spike Dup.:	0.38	0.46	0.48	1.35
Matrix Spike Duplicate % Recovery:	76	92	96	90
Upper Control Limit %:	101	111	116	114
Lower Control Limit %:	62	62	74	70
Relative % Difference:	5.4	14	4.3	2.2
Maximum RPD:	18	31	21	23

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 Scot Cocanour
 Laboratory Director

% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$

Pacific Environmental Group
 4020 148th Avenue NE, #B
 Redmond, WA 98052
 Attention: John Blough

Client Project ID: Chevron # 60090129
 Method: EPA 7420
 Sample Matrix: Water
 Units: mg/L
 QC Sample #: BLK051492

Analyst: B. Oaks
 Extracted: May 14, 1992
 Analyzed: May 14, 1992
 Reported: May 15, 1992

QUALITY CONTROL DATA REPORT

ANALYTE

Lead

Sample Conc.: N.D.

Spike Conc. Added: 0.50

Conc. Matrix Spike: 0.58

Matrix Spike % Recovery: 116

Conc. Matrix Spike Dup.: 0.57

Matrix Spike Duplicate % Recovery: 114

Upper Control Limit %: 121

Lower Control Limit %: 67

Relative % Difference: 1.7

Maximum RPD: 30

NORTH CREEK ANALYTICAL inc


 Scot Cocanour
 Laboratory Director

% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$

Pacific Environmental Group
 4020 148th Avenue NE, #B
 Redmond, WA 98052
 Attention: John Blough

Client Project ID: Chevron # 60090129
 EPA Method: 5030/8020
 Sample Matrix : Soil
 Units: mg/kg
 QC Sample #: 205-0905

Analyst: M. Essig
 K. Wilke

Analyzed: May 19, 1992
 Reported: May 28, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Ethyl			
	Benzene	Toluene	Benzene	Xylenes
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.50	0.50	0.50	1.50
Conc. Matrix Spike:	0.36	0.51	0.51	1.43
Matrix Spike % Recovery:	72	102	102	95
Conc. Matrix Spike Dup.:	0.36	0.48	0.48	1.35
Matrix Spike Duplicate % Recovery:	72	96	96	90
Upper Control Limit %:	101	111	116	114
Lower Control Limit %:	62	62	74	70
Relative % Difference:	0	6.1	6.1	5.8
Maximum RPD:	18	31	21	23

NORTH CREEK ANALYTICAL Inc


 Scot Cocanour
 Laboratory Director

% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$

Pacific Environmental Group
 4020 148th Avenue NE, #B
 Redmond, WA 98052
 Attention: John Blough

Client Project ID: Chevron # 60090129
 Method: EPA 7420
 Sample Matrix: Water
 Units: mg/L
 QC Sample #: BLK052292

Analyst: B. Oaks
 Digested: May 22, 1992
 Analyzed: May 26, 1992
 Reported: May 28, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	
	Lead

Sample Conc.: N.D.

Spike Conc. Added: 0.50

Conc. Matrix Spike: 0.45

Matrix Spike % Recovery: 90

Conc. Matrix Spike Dup.: 0.42

Matrix Spike Duplicate % Recovery: 84

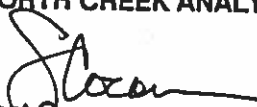
Upper Control Limit %: 121

Lower Control Limit %: 67

Relative % Difference: 6.9

Maximum RPD: 30

NORTH CREEK ANALYTICAL Inc


 Scot Ocanour
 Laboratory Director

% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$

PROJECT No. 520-25.03

Chain of Custody



4020 148th Avenue N.E., Suite B
Redmond, WA 98052
(206) 869-5099 FAX (206) 869-5639

Facility no. Chauron # 60090129

Facility Address: 4700 Bracklyn Ave NE Seattle

Billing reference number 520-25-03

CLIENT engineer: DAVID RASH

PACIFIC Project Contact: John Kleygh

Sampler: John Kleygh

Laboratory name: North Creek

Sample I.D.	Lab No.	Container no.	Container type/size	Sample Preservation	Matrix S = Soil A = Air W = Water C = Charcoal	TYPE G = Grab C = Comp. D = Discrete	Sampling date	Sampling time	WTPH-G/BTEX TPH-Gasoline/BTEX (WTPH-G/8015/8020)	TPH Diesel (WTPH-D/Mod. EPA 8015)	TPH-418.1 (EPA 418.1)	Polychlorinated Biphenyls (EPA 8080)	Hydrocarbon Identification (TPH-HCID)	Volatile Organics (EPA 624/8240)	Polynuclear Aromatics (PAHs-EPA 8100/610)	Metals Total <input type="checkbox"/> Dissolved <input type="checkbox"/>	Total Lead (EPA 7420/7421)	Turnaround
T-1	2950 734		GLASS JAR	on ice	S	D	5/13/92	11:00 AM	X								X	X
SP-1	735		11	11	S	D	5/13/92	11:00 AM	X									X

Comments:

Condition of sample: On ice

Temperature received:

Relinquished by Sampler: [Signature]

Date: 5/13/92 Time: 13:30

Received by: [Signature]

Date: 5-13-92 Time: 12:25

Relinquished by: [Signature]

Date: 5-13-92 Time: 13:30

Received by laboratory: [Signature]

Date: 05-13-92 Time: 1:30

Relinquished by:

Date:

Received by laboratory:

Date:

Turnaround time

Priority Rush 1 Business Day

Rush 2 Business Days

Expedited 5 Business Days

Standard 10 Business Days

As Contracted