

Reference # 1759
WOLFKILL
MT. VERNON
LIST # 5856



May 31, 2002
2-91M-14404-0

Wolfkill Feed and Fertilizer
P.O. Box 578
Monroe, Washington 98272

Attention: Mr. Willard Cox III

Subject: Groundwater Status Report (May 2, 2002)
Former Wolfkill Yard
205 W. Fir Street
Mt. Vernon, Washington

RECEIVED

JUN 04 2002

DEPT OF ECOLOGY

Dear Mr. Cox:

AMEC Earth & Environmental, Inc. (AMEC) formerly known as AGRA is pleased to present Wolfkill Feed and Fertilizer with the following *Groundwater Status Report*. The contents of this report include AMEC's observations of groundwater conditions, analytical results of the groundwater samples collected on May 2, 2002, and AMEC's conclusions based upon these findings.

INTRODUCTION

The site is currently a feed and fertilizer supply facility located at 205 West Fir Street in Mt. Vernon, Washington (Figure 1). In December 1990, AMEC was subcontracted to assist in the characterization and remediation of petroleum contamination identified during the removal of four underground storage tanks (USTs) at the subject site. The USTs were reported to contain gasoline and diesel fuels and had been removed prior to AMEC's involvement. AMEC visited the subject site shortly following the removal of the USTs to document their condition and direct over excavation efforts to remove residual petroleum contaminated soils. The analytical test results of soil samples collected from the final limits of excavation indicated that petroleum concentrations were below Washington's Model Toxics Control Act Method A cleanup levels.

In February 1990, following site restoration efforts, and due to the presence of shallow groundwater in the UST excavation, AMEC installed three groundwater monitoring wells (MW-1, MW-2, and MW-3) near the perimeter of the former UST excavation. Soil samples were collected during well installation and select samples were submitted for laboratory analysis. One soil sample collected from MW-2 (southwest corner of excavation), at an approximate depth of 7.5 to 9 feet below ground surface (bgs), contained concentrations of total petroleum hydrocarbons (TPH, by EPA Method 418.1) at 305 parts per million (ppm), benzene at 3.25

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ppm, and total xylenes at 42.9 ppm (BTEX by EPA Method 8020). These concentrations exceeded the MTCA method A cleanup levels of 200 ppm, 0.5 ppm, and 20 ppm respectively.

Groundwater samples were collected from the wells on 19 February 1990. The analytical results indicated that groundwater samples collected in all three wells contained one or more petroleum compounds above the Washington's Model Toxics Control Act (MTCA) Method A cleanup criteria. AMEC's *Subsurface Petroleum Hydrocarbon Investigation Report* (9 March 1990) should be referred to for more specific information regarding environmental conditions at the site.

Groundwater monitoring and sampling at the site recommenced at the site on January 28, 1999. The analytical data indicated that monitoring well MW-1 contained gasoline range petroleum hydrocarbons, benzene and xylenes and MW-2 contained lead above the MTCA Method A cleanup criteria. The levels had reduced considerably since 1990 and it was concluded that natural attenuation was occurring.

Wolfkill Feed and Fertilizer authorized AMEC to perform groundwater monitoring and sampling at the site in April 2002.

MAY 2, 2002 MONITORING AND SAMPLING RESULTS

Groundwater Monitoring Results

AMEC visited the subject site on May 2, 2002 to evaluate the condition of the three monitoring wells and undertake groundwater monitoring and sampling. Water levels ranged from 5.90 feet (MW-1) to 7.50 feet (MW-2) below the top of the well casings. The average depth to water was approximately 6.45 feet below the top of the well casings.

The calculated groundwater elevation data indicated a groundwater flow direction to the south west. The site is tidally influenced and flow directions are variable based on tide levels. The water level/elevation data is summarized in Table 1. Groundwater levels are shown on Figure 2.

| Well ID | Date | Well Casing Elevation (feet) | Depth to Water (feet) | Groundwater Elevation (feet) |
|---------|---------|------------------------------|-----------------------|------------------------------|
| MW-1 | 2/19/90 | 99.43 | 3.74 | 95.69 |
| | 1/26/99 | | 4.73 | 94.70 |
| | 5/2/02 | | 5.90 | 93.53 |
| MW-2 | 2/19/90 | 100.64 | 4.71 | 95.93 |
| | 1/26/99 | | 5.39 | 95.25 |
| | 5/2/02 | | 7.50 | 93.14 |
| MW-3 | 2/19/90 | 100.03 | 4.25 | 95.78 |
| | 1/26/99 | | 4.87 | 95.16 |
| | 5/2/02 | | 5.95 | 94.08 |

Groundwater Analytical Results

Groundwater samples were collected from the three monitoring wells (MW-1 through MW-3) on May 2, 2002, following the purging of approximately 3 to 4 well casing volumes of groundwater. Approximately 75 gallons of purge water was generated during this sampling event. All purge water was disposed to a registered disposal location.

The groundwater samples were collected in laboratory prepared containers and preserved accordingly. All samples were submitted to OnSite Laboratories, a Washington State certified laboratory facility in Redmond, Washington for analytical testing of:

- Gasoline range petroleum hydrocarbons (GRPH) by Ecology Method WTPH-G;
- Diesel range petroleum hydrocarbons (DRPH) by Ecology Method WTPH-Dx;
- Volatile aromatic hydrocarbons (benzene, toluene, ethylbenzene, and xylenes (BTEX)) by EPA Method 8021B; and
- Total lead by EPA Method 200.8 series methods.

Laboratory analytical data indicated that the sample collected from MW-1 contained detectable gasoline range petroleum hydrocarbon concentrations, toluene, ethylbenzene and xylenes below the Method A cleanup level for the respective compounds. No detectable concentrations of gasoline, BTEX or diesel were noted in MW-2 and MW-3 and no lead was detected in MW-2.

The groundwater samples collected from MW-1 contained detectable concentrations of benzene of 9.3 parts per billion (ppb) which exceeded the MTCA Method A cleanup level of 5.0 ppb.

Quality control/quality assurance (QA/QC) testing included surrogate recoveries, matrix spike/duplicates, a field duplicate and a laboratory control standard. All QA/QC data was within acceptable ranges of tolerance.

Groundwater analytical data is summarized in Table 2. Laboratory analytical certificates for this sampling event are presented as Appendix A to this report.

| TABLE 2 SUMMARY OF GROUNDWATER ANALYTICAL RESULTS | | | | | | | | | |
|--|---------|---------------|--------------------------|------------------------|-------------|-------------|-------------|-------------|-------------|
| Well | Date | TPH | Gasoline Range TPH | Diesel Range TPH | B | T | E | X | Lead |
| MW-1 | 2/19/90 | 5,100 | NT | NT | 74 | 11 | <1 | 72 | NT |
| | 1/26/99 | NT | 1,290 | <0.25 | 25.8 | 5.39 | 18.0 | 38.9 | <5.0 |
| | 5/2/02 | NT | 450 | <0.25 | 9.3 | 2.7 | 6.3 | 5.7 | NT |
| MW-2 | 2/19/90 | 23,000 | NT | NT | 49 | 150 | 177 | 648 | NT |
| | 1/26/99 | NT | 564 | 290 | <0.5 | 3.52 | 4.02 | 7.40 | 5.29 |
| | 5/2/02 | NT | <100 | <0.25 | <1.0 | <1.0 | <1.0 | <1.0 | <1.1 |
| Dup (MW-2) | 5/2/02 | NT | <100 | <0.25 | <1.0 | <1.0 | <1.0 | <1.0 | <1.1 |
| MW-3 | 2/19/90 | <5,000 | NT | NT | 7 | 3 | <1 | 38 | NT |
| | 1/26/99 | NT | <50 | 250 | <0.5 | <0.5 | <0.5 | <1.5 | NT |
| | 5/2/02 | NT | <100 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | NT |
| MTCA | | 1,000 | 1,000 | 1,000 | 5.0 | 40.0 | 20.0 | 20.0 | 5.0 |

Notes: TPH = Total petroleum hydrocarbons by EPA Method 418.1
 Gasoline range TPH by NWTPH-G
 Diesel range TPH by NWTPH-Dx
 BTEX by EPA Method 5030/8021B
 Lead Analysis by EPA 6000/200.8 Series Method
 All concentrations are presented in μL (parts per billion, (ppb))
 MTCA = Model Toxics Control Act Method A cleanup levels
BOLD indicates concentration exceeds MTCA Method A
 NT = Not Tested

Subsequent to the receipt of the analytical data an informal discussion was held between AMEC (Meg Strong) and Washington State Department of Ecology (John Bails). Mr. Bails requested that the results be sent to him for review. However, it was his opinion that MW-2 and MW-3 were unlikely to require further sampling since the values were below MTCA Method A cleanup criteria. Mr. Bails further stated that MW-1 would need one full year of quarterly monitoring with values below MTCA Method A cleanup criteria to satisfy Ecology that the groundwater was within compliance.

CONCLUSIONS

Based upon AMEC's field observations and analytical laboratory results obtained during this monitoring and sampling event, benzene continues to persist in the groundwater at the site within MW-1 at levels above the current MTCA Method A cleanup levels. BTEX compounds in the groundwater may indicate that pockets of residual soil contamination are continuing to act as sources for groundwater contamination; however, based on the relatively low petroleum hydrocarbon concentrations, the volume of residual soil contamination is likely to be negligible. AMEC expects the residual soil and groundwater contamination to continue to attenuate naturally without the need for any additional remedial actions.

AMEC appreciates the opportunity to be of service to Wolfkill Feed and Fertilizer. If there are any additional questions or comments regarding either the contents of this report, or any other aspects of this assessment, please feel free to contact our office at your earliest convenience.

Sincerely,



Meg Strong
Associate

Reviewed by



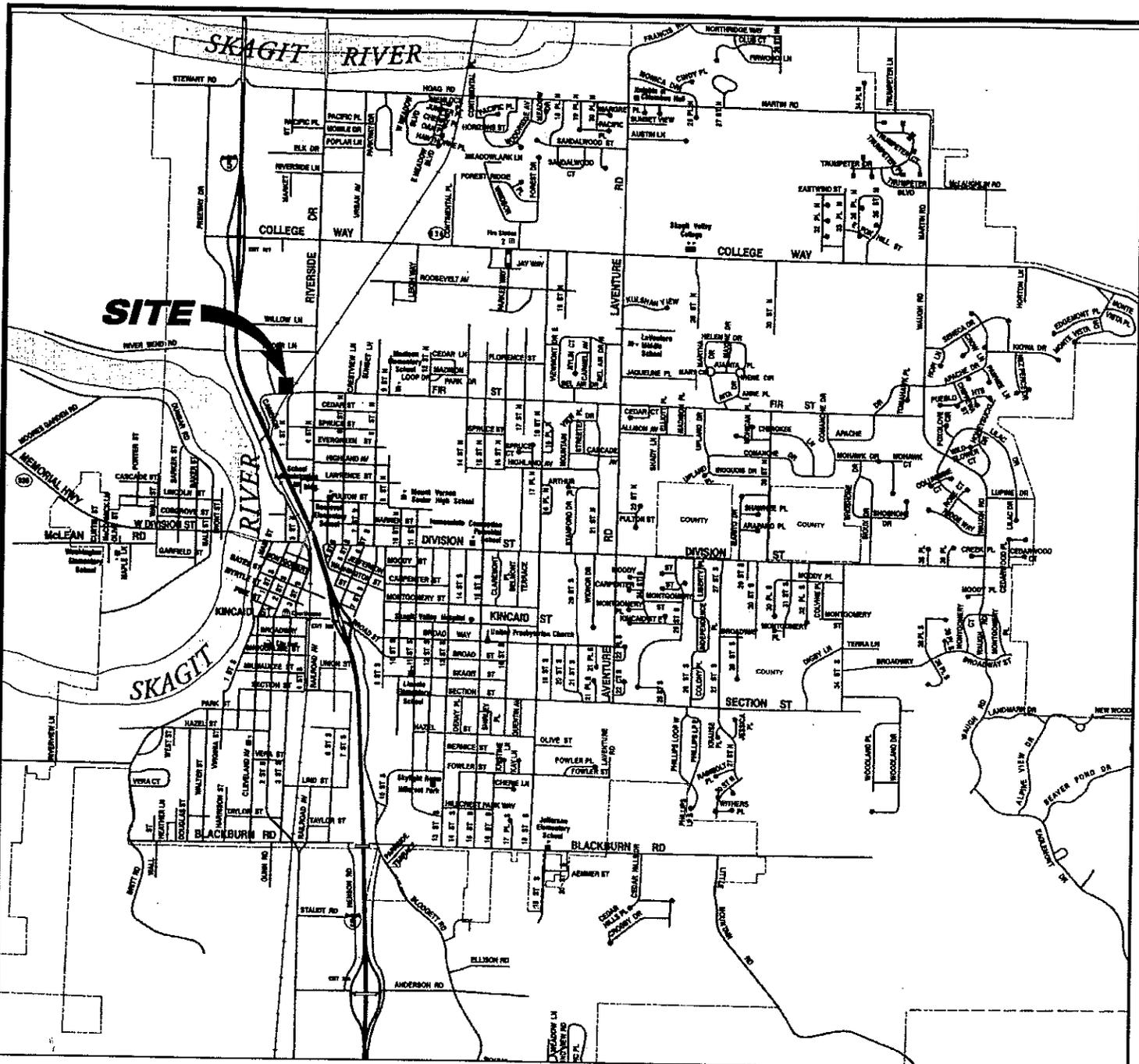
Mark Johns, Ph.D.
Principal

MJS/MWJ/lad

cc John Bails – Department of Ecology

Enclosures: Figure 1 — Location Map
Figure 2 — Groundwater Map for May 2, 2002
Laboratory Test Certificates

JOB NO.: 2-91M-14404-0 | DWG DATE: 05-29-2002 | SCALE: N.T.S. | DESIGN BY: MJS | FILE NAME: LOCATION.DWG



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Kirkland, WA, U.S.A. 98034-6918

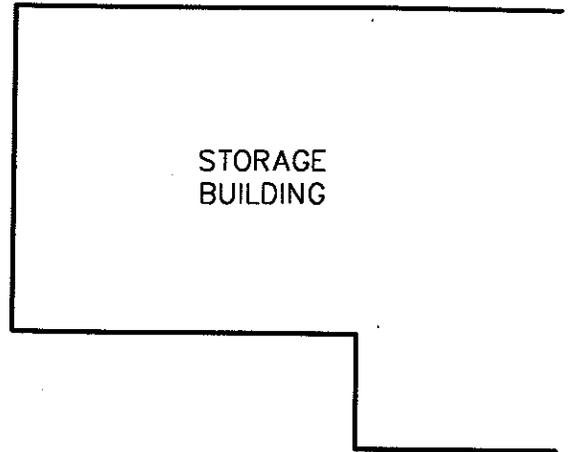
LOCATION MAP
FORMER WOLFKILL YARD
MOUNT VERNON, WASHINGTON

FIGURE
1

LEGEND

MW-3  MONITORING WELL NUMBER AND APPROXIMATE LOCATION
94.08 SPOT GROUNDWATER ELEVATION IN FEET

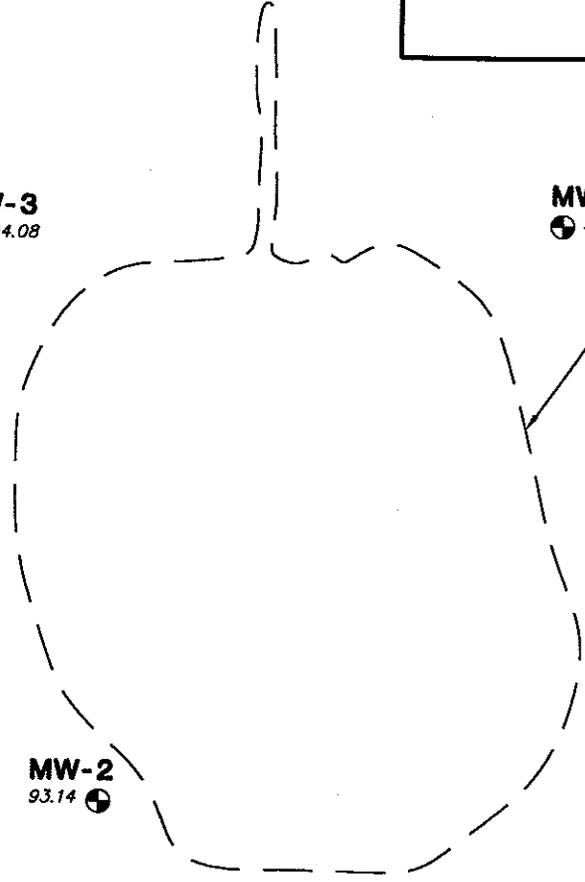
← SHOP BUILDING



STORAGE BUILDING

MW-3  94.08

MW-1  93.53

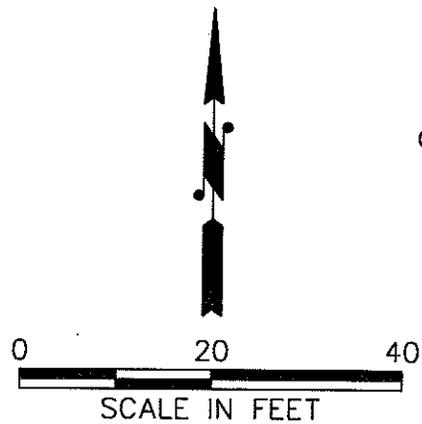


LIMITS OF FORMER EXCAVATION

MW-2  93.74

MAIN OFFICE →

FIR STREET
↓



SCALE IN FEET

GROUNDWATER MAP FOR 05/02/2002

FORMER WOLFKILL YARD

MOUNT VERNON, WASHINGTON

FIGURE

2



AMEC EARTH AND ENVIRONMENTAL, INC.
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JOB NO.: 2-91M-14404-0 | DWG DATE: 05-29-2002 | SCALE: 1"=20' | DESIGN BY: MJS | FILE NAME: SITE-2.DWG



LABORATORY ANALYTICAL TEST CERTIFICATES



**OnSite
Environmental Inc.**

Analytical Testing and Mobile Laboratory Services

May 13, 2002

Meg Strong
AMEC Earth & Environmental, Inc.
11335 NE 122nd Way, Suite 100
Kirkland, WA 98034

Re: Analytical Data for Project 2-91M-14404-0
Laboratory Reference No. 0205-024

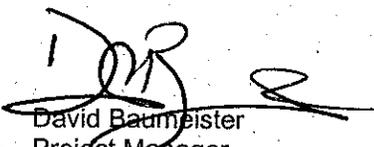
Dear Meg:

Enclosed are the analytical results and associated quality control data for samples submitted on May 2, 2002.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,


David Baumeister
Project Manager

Enclosures

Date of Report: May 13, 2002
Samples Submitted: May 2, 2002
Lab Traveler: 05-024
Project: 2-91M-14404-0

Case Narrative

Samples were collected on May 2, 2002. Samples were maintained at the laboratory at 4°C and followed SW846 analysis and extraction methods.

NWTPH Gx/BTEX Analysis

Any QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

NWTPH Dx Analysis

Any QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Total Lead by EPA 200.8 Analysis

Any QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: May 13, 2002
 Samples Submitted: May 2, 2002
 Lab Traveler: 05-024
 Project: 2-91M-14404-0

NWTPH-Gx/BTEX

Date Extracted: 5-6-02
 Date Analyzed: 5-6-02

Matrix: Water
 Units: ug/L (ppb)

Client ID: **MW-1**
 Lab ID: 05-024-01

MW-2
 05-024-02

| | Result | Flags | PQL | Result | Flags | PQL |
|--------------------------------------|---------------|--------------|------------|---------------|--------------|------------|
| Benzene | 9.3 | | 1.0 | ND | | 1.0 |
| Toluene | 2.7 | | 1.0 | ND | | 1.0 |
| Ethyl Benzene | 6.3 | | 1.0 | ND | | 1.0 |
| m,p-Xylene | 3.6 | | 1.0 | ND | | 1.0 |
| o-Xylene | 2.1 | | 1.0 | ND | | 1.0 |
| TPH-Gas | 450 | | 100 | ND | | 100 |
| Surrogate Recovery: Fluorobenzene | 89% | | | 89% | | |

Date of Report: May 13, 2002
 Samples Submitted: May 2, 2002
 Lab Traveler: 05-024
 Project: 2-91M-14404-0

NWTPH-Gx/BTEX

Date Extracted: 5-6-02
 Date Analyzed: 5-6-02

Matrix: Water
 Units: ug/L (ppb)

Client ID: **MW3**
 Lab ID: 05-024-03

MW4
 05-024-04

| | Result | Flags | PQL | Result | Flags | PQL |
|--------------------------------------|--------|-------|-----|--------|-------|-----|
| Benzene | ND | | 1.0 | ND | | 1.0 |
| Toluene | ND | | 1.0 | ND | | 1.0 |
| Ethyl Benzene | ND | | 1.0 | ND | | 1.0 |
| m,p-Xylene | ND | | 1.0 | ND | | 1.0 |
| o-Xylene | ND | | 1.0 | ND | | 1.0 |
| TPH-Gas | ND | | 100 | ND | | 100 |
| Surrogate Recovery: Fluorobenzene | 88% | | | 86% | | |

Date of Report: May 13, 2002
Samples Submitted: May 2, 2002
Lab Traveler: 05-024
Project: 2-91M-14404-0

**NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL**

Date Extracted: 5-6-02
Date Analyzed: 5-6-02

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0506W2

| | Result | Flags | PQL |
|--------------------------------------|---------------|--------------|------------|
| Benzene | ND | | 1.0 |
| Toluene | ND | | 1.0 |
| Ethyl Benzene | ND | | 1.0 |
| m,p-Xylene | ND | | 1.0 |
| o-Xylene | ND | | 1.0 |
| TPH-Gas | ND | | 100 |
| Surrogate Recovery: Fluorobenzene | 87% | | |

Date of Report: May 13, 2002
Samples Submitted: May 2, 2002
Lab Traveler: 05-024
Project: 2-91M-14404-0

**NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL**

Date Extracted: 5-6-02
Date Analyzed: 5-6-02

Matrix: Water
Units: ug/L (ppb)

| Lab ID: | 05-024-02 Original | 05-024-02 Duplicate | RPD | Flags |
|---------------------|-----------------------|------------------------|-----|-------|
| Benzene | ND | ND | NA | |
| Toluene | ND | ND | NA | |
| Ethyl Benzene | ND | ND | NA | |
| m,p-Xylene | ND | ND | NA | |
| o-Xylene | ND | ND | NA | |
| TPH-Gas | ND | ND | NA | |
| Surrogate Recovery: | | | | |
| Fluorobenzene | 89% | 88% | | |

Date of Report: May 13, 2002
 Samples Submitted: May 2, 2002
 Lab Traveler: 05-024
 Project: 2-91M-14404-0

**NWTPH-Gx/BTEX
 MS/MSD QUALITY CONTROL**

Date Extracted: 5-6-02
 Date Analyzed: 5-6-02

Matrix: Water
 Units: ug/L (ppb)

Spike Level: 50.0 ppb

| Lab ID: | 05-033-04 MS | Percent Recovery | 05-033-04 MSD | Percent Recovery | RPD | Flags |
|---------------|-----------------|---------------------|------------------|---------------------|-----|-------|
| Benzene | 42.7 | 85 | 45.5 | 91 | 6.3 | |
| Toluene | 45.3 | 91 | 48.1 | 96 | 6.1 | |
| Ethyl Benzene | 46.1 | 92 | 49.1 | 98 | 6.3 | |
| m,p-Xylene | 45.4 | 91 | 48.1 | 96 | 5.7 | |
| o-Xylene | 46.0 | 92 | 48.9 | 98 | 6.2 | |

Surrogate Recovery:

Fluorobenzene 85% 88%

Date of Report: May 13, 2002
 Samples Submitted: May 2, 2002
 Lab Traveler: 05-024
 Project: 2-91M-14404-0

NWTPH-Dx

Date Extracted: 5-7-02
 Date Analyzed: 5-8-02

Matrix: Water
 Units: mg/L (ppm)

| | MW-1 | MW-2 | MW-3 |
|--------------------|-----------|-----------|-----------|
| Client ID: | MW-1 | MW-2 | MW-3 |
| Lab ID: | 05-024-01 | 05-024-02 | 05-024-03 |
| Diesel Range: | ND | ND | ND |
| PQL: | 0.25 | 0.25 | 0.25 |
| Identification: | --- | --- | --- |
| Lube Oil Range: | ND | ND | ND |
| PQL: | 0.40 | 0.40 | 0.40 |
| Identification: | --- | --- | --- |
| Surrogate Recovery | | | |
| o-Terphenyl: | 100% | 101% | 100% |
| Flags: | Y | Y | Y |

Date of Report: May 13, 2002
Samples Submitted: May 2, 2002
Lab Traveler: 05-024
Project: 2-91M-14404-0

NWTPH-Dx

Date Extracted: 5-7-02
Date Analyzed: 5-8-02

Matrix: Water
Units: mg/L (ppm)

Client ID: MW-4
Lab ID: 05-024-04

Diesel Range: ND
PQL: 0.25
Identification: ---

Lube Oil Range: ND
PQL: 0.40
Identification: ---

Surrogate Recovery
o-Terphenyl: 86%

Flags: Y

Date of Report: May 13, 2002
Samples Submitted: May 2, 2002
Lab Traveler: 05-024
Project: 2-91M-14404-0

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted: 5-7-02
Date Analyzed: 5-8-02

Matrix: Water
Units: mg/L (ppm)

Lab ID: MB0507W1

Diesel Range: ND
PQL: 0.25
Identification: ---

Lube Oil Range: ND
PQL: 0.40
Identification: ---

Surrogate Recovery
o-Terphenyl: 108%

Flags: Y

Date of Report: May 13, 2002
Samples Submitted: May 2, 2002
Lab Traveler: 05-024
Project: 2-91M-14404-0

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted: 5-7-02
Date Analyzed: 5-8-02

Matrix: Water
Units: mg/L (ppm)

Lab ID: 05-021-01 05-021-01 DUP

Diesel Range: ND ND
PQL: 0.25 0.25

RPD: N/A

Surrogate Recovery
o-Terphenyl: 84% 80%

Flags: Y Y

Date of Report: May 13, 2002
Samples Submitted: May 2, 2002
Lab Traveler: 05-024
Project: 2-91M-14404-0

**TOTAL LEAD
EPA 200.8**

Date Extracted: 5-8-02
Date Analyzed: 5-9-02

Matrix: Water
Units: ug/L (ppb)

| Client ID | Lab ID | Result | PQL |
|-----------|-----------|--------|-----|
| MW-2 | 05-024-02 | ND | 1.1 |
| MW-4 | 05-024-04 | ND | 1.1 |

Date of Report: May 13, 2002
Samples Submitted: May 2, 2002
Lab Traveler: 05-024
Project: 2-91M-14404-0

TOTAL LEAD
EPA 200.8
METHOD BLANK QUALITY CONTROL

Date Extracted: 5-8-02
Date Analyzed: 5-9-02

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0508W2

| Analyte | Method | Result | PQL |
|---------|--------|--------|-----|
| Lead | 200.8 | ND | 1.1 |

Date of Report: May 13, 2002
Samples Submitted: May 2, 2002
Lab Traveler: 05-024
Project: 2-91M-14404-0

**TOTAL LEAD
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Extracted: 5-8-02
Date Analyzed: 5-9-02

Matrix: Water
Units: ug/L (ppb)

Lab ID: 05-016-01

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|------------------|---------------------|-----|-----|-------|
| Lead | ND | ND | NA | 1.1 | |

Date of Report: May 13, 2002
Samples Submitted: May 2, 2002
Lab Traveler: 05-024
Project: 2-91M-14404-0

**TOTAL LEAD
EPA 200.8
MS/MSD QUALITY CONTROL**

Date Extracted: 5-8-02
Date Analyzed: 5-9-02

Matrix: Water
Units: ug/L (ppb)

Lab ID: 05-016-01

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|-----|------------------|-----|------------------|-----|-------|
| Lead | 110 | 116 | 105 | 116 | 105 | 0 | |



DATA QUALIFIERS AND ABBREVIATIONS

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
- B - The analyte indicated was also found in the blank sample.
- C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
- D - Data from 1: ___ dilution.
- E - The value reported exceeds the quantitation range, and is an estimate.
- F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
- G - Insufficient sample quantity for duplicate analysis.
- H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
- I - Compound recovery is outside of the control limits.
- J - The value reported was below the practical quantitation limit. The value is an estimate.
- K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
- L - The RPD is outside of the control limits.
- M - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
- O - Hydrocarbons outside the defined gasoline range are present in the sample.
- P - The RPD of the detected concentrations between the two columns is greater than 40.
- Q - Surrogate recovery is outside of the control limits.
- S - Surrogate recovery data is not available due to the necessary dilution of the sample.
- T - The sample chromatogram is not similar to a typical _____.
- U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
- W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
- X - Sample extract treated with a silica gel cleanup procedure.
- Y - Sample extract treated with an acid cleanup procedure.
- Z -
- ND - Not Detected at PQL
- MRL - Method Reporting Limit
- PQL - Practical Quantitation Limit
- RPD - Relative Percent Difference

