

Limited Site Characterization Report

For the Smith-Kem, Inc. Facility
200 Railroad Avenue,
Ellensburg, WA

Prepared For:

Belsaas & Smith Construction
103 E. 4th Ave., #209
Ellensburg, WA 98926

Prepared By:



DAVID L. GREEN



1705 S. 24th Ave.
Yakima, WA 98926

July 26, 2007

Executive Summary

The Smith-Kem, Inc. facility is located at 200 Railroad Ave., Ellensburg, WA. The facility utilized an Aboveground Storage Tank (AST) system to support retail sale of petroleum products. Belsaas & Smith Construction (BSC) retained Sage earth Sciences, Inc. (Sage) to perform subsurface exploration activities to investigate for the presence of petroleum hydrocarbons in soil and/or groundwater adjacent to the AST system at the facility. The scope of work for this project did not include investigation of the AST system currently located on the site.

BSC provided backhoe services to excavate two (2) exploratory test pits on June 11, 2007 and twelve (12) additional exploratory test pits on July 02, 2007. Petroleum stained soils were observed in the vicinity of the existing AST system. Sage submitted selected soil and groundwater samples, collected from within the exploratory test pits, and to Friedman & Bruya, Inc. (FBI), Seattle, WA for NWTPH-HCID (hydrocarbon identification) and/or NWTPH-Dx (diesel range petroleum hydrocarbons) analyses.

Based upon our field observations and FBI independent laboratory analysis of soil and groundwater samples (Appendix C), Sage found that site soil and groundwater is impacted by diesel range petroleum hydrocarbons at concentrations exceeding the *Method A Groundwater & Soil Cleanup Levels* of WAC 173-340-720 & 740 (Appendix D). Remedial action is required to reduce diesel concentrations in site soil and groundwater to acceptable levels.

Petroleum impacted soil appears to be limited to the vicinity of the AST's. Petroleum impacted groundwater appears to extend from the area of the AST's toward the east and northeast. The extent of diesel impacted soil has not been determined in the east and northeast directions.

TABLE OF CONTENTS

| | |
|--|-----------|
| 1.0 INTRODUCTION | 1 |
| 1.1 PURPOSE | 1 |
| 1.2 SCOPE OF WORK | 1 |
| 2.0 BACKGROUND INFORMATION | 1 |
| 2.1 SITE LOCATION | 1 |
| 2.2 SITE DESCRIPTION & ADJACENT LAND USE | 1 |
| 2.3 AST INFORMATION..... | 3 |
| 2.4 SOILS DESCRIPTION | 3 |
| 2.5 HYDROGEOLOGY | 3 |
| 3.0 LIMITED SITE CHARACTERIZATION | 3 |
| 3.1 TEST PIT #1 | 4 |
| 3.2 TEST PIT #2..... | 6 |
| 3.3 TEST PIT #3..... | 8 |
| 3.4 TEST PIT #4..... | 8 |
| 3.5 TEST PIT #5..... | 9 |
| 3.6 TEST PIT #6..... | 9 |
| 3.7 TEST PIT #7..... | 10 |
| 3.8 TEST PIT #8..... | 10 |
| 3.9 TEST PIT #9..... | 11 |
| 3.10 TEST PIT #10..... | 11 |
| 3.11 TEST PIT #11 | 12 |
| 3.12 TEST PIT #12..... | 12 |
| 3.13 TEST PIT #13..... | 13 |
| 3.14 TEST PIT #14..... | 13 |
| 4.0 CONCLUSIONS & RECOMMENDATIONS | 14 |
| 4.1 CONCLUSIONS..... | 14 |
| 4.2 IMPACTED SOIL REMOVAL..... | 14 |
| 4.3 GROUNDWATER MONITORING PROGRAM | 14 |
| 5.0 LIMITATIONS | 15 |

LIST OF APPENDICES

- Appendix A: Soil & Groundwater Sampling Methods
- Appendix B: Daily Field Sampling Log
- Appendix C: FBI Analytical Data Reports
- Appendix D: *Method A Cleanup Levels* of WAC 173-340-720 & 740

1.0 Introduction

1.1 Purpose

The purpose of this Limited Site Characterization Report is to describe findings and actions taken associated subsurface exploration activities to investigate for the presence of petroleum hydrocarbons in soil and/or groundwater adjacent to an Above-ground Storage Tank (AST) System at the Smith-Kem, Inc. facility, located in Ellensburg, Washington. The limited investigation was performed to ascertain if site soil and/or groundwater conditions comply with regulatory requirements established by the Washington State Department of Ecology (WSDOE).

1.2 Scope of Work

Belsaas & Smith Construction (BSC) of Ellensburg, WA retained Sage Earth Sciences, Inc. (Sage) to provide soil and groundwater sampling services. Sage collected the samples from exploratory test pits established by BSC, adjacent to the AST system. Soil and groundwater samples were submitted to Friedman and Bruya, Inc. (FBI), Seattle, WA for independent laboratory analysis.

2.0 Background Information

2.1 Site Location

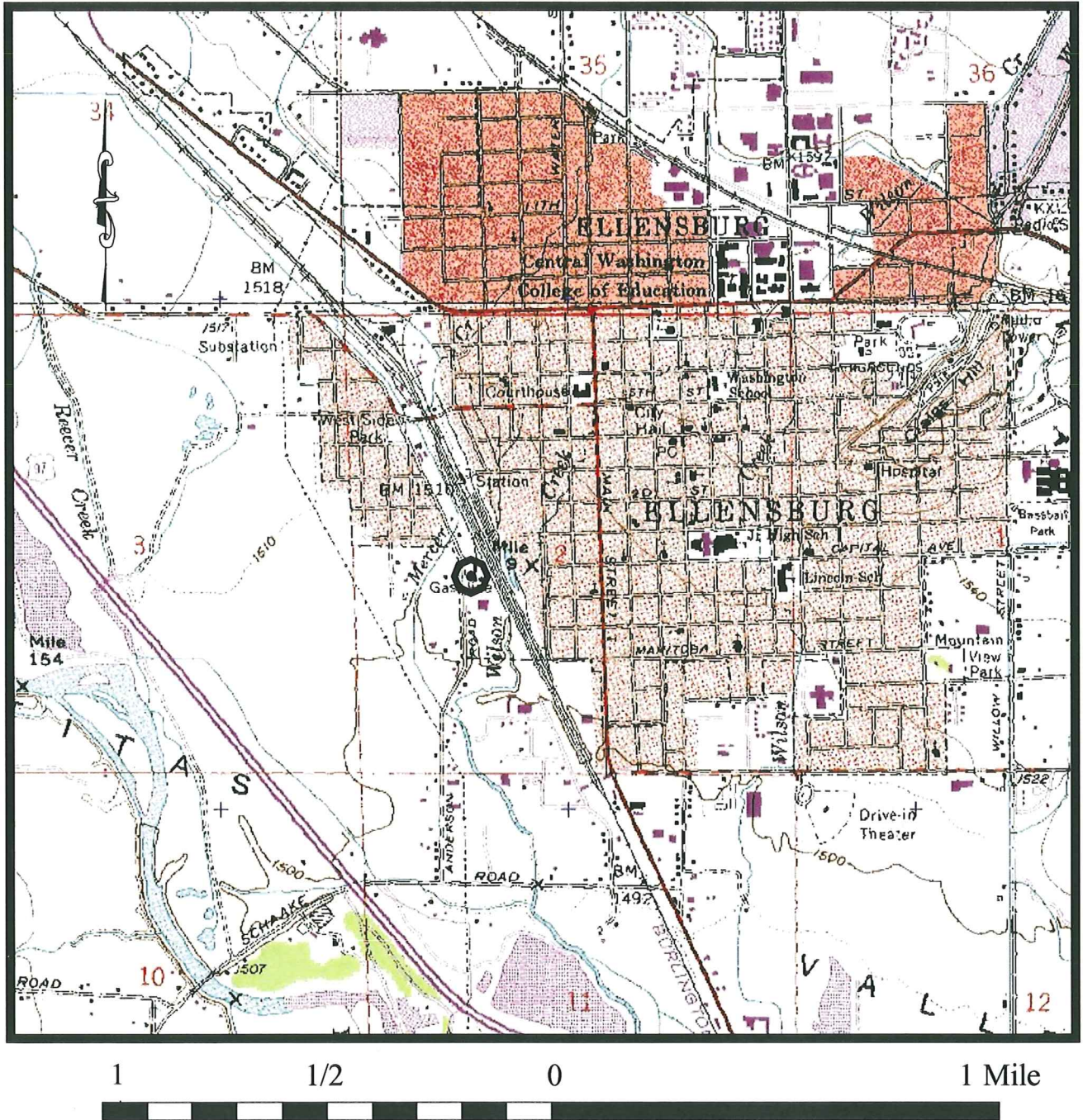
The facility is located at 200 Railroad Ave., Ellensburg, WA. It is situated within the NE 1/4 of the SW 1/4, Section 02, Township 17 North, Range 18 East, Willamette Meridian. The site latitude is approximately N 46° 59' 27.0" and the longitude is approximately W 120° 33' 16.9". Figure 1 shows the location of the site.

2.2 Site Description & Adjacent Land Use

The facility is owned and operated by:

Ad Gro LLC, dba Smith-Kem, Inc.
200 N. Railroad Ave./P.O. Box 774
Ellensburg, WA 98926
(509) 925-5977

The authorized site contact is Mr. Andrew Erickson.



Graphic Scale

Contour Interval - 40 Feet

 = Site Location

Figure 1. Site Location Map

The property is currently occupied by the Smith-Kem, Inc. facility as shown by Figure 2. The facility utilized an Aboveground Storage Tank (AST) system. South Railroad Avenue lies immediately west of the subject property. A residential dwelling is situated west of the site, across Railroad Ave. Consolidated Electrical Distribution lies immediately south of the site. Railroad tracks lies immediately east of the subject property.

The local topography slopes gently toward south. Mercer Creek lies approximately 450 feet west of the site. Wilson Creek lies approximately 200 feet southeast of the site.

2.3 AST Information

The scope of work for this project did not include investigation of the AST system currently located on the site.

2.4 Soils Description

The site is covered with ¾" minus imported gravel from ground surface to depths up to one (1) foot Below Ground Surface (BGS). This soil unit is classified as "GP" according to the Unified Soil Classification System (USCS). Clayey, silty sand (mud), with a thickness of up to one and one-half (1.5) feet underlies the imported gravel at locations adjacent to the road, near the office building. This soil unit is classified as "ML" according to the USCS. Underlying soil consists of cobbles and small boulders up to approximately one and one-half (1.5) foot in diameter with silty, coarse sand. This soil unit extends to a depth of approximately seven (7) feet BGS and is classified as "GP" according to the USCS.

2.5 Hydrogeology

Groundwater was encountered during excavation activities at depths ranging from five (5.0) feet to seven and one-half (7.5) feet BGS at the site. Determination of site hydrogeologic characteristics was not included in Sage's scope of work for this project.

3.0 Limited Site Characterization

BSC provided backhoe services to excavate two (2) exploratory test pits (TP-1 & TP-2) on June 11, 2007. BSC provided backhoe services to excavate twelve (12) additional exploratory test pits (TP-3 through TP-14) on July 02, 2007. The exploratory test pit locations are shown by Figure 2. Rodney L. Heit, an environmental assessor licensed by the International Code Council, performed limited site characterization services by collecting soil and groundwater samples from within the exploratory test pits. Sage collected twenty-one (21) soil samples and fourteen (14) samples of groundwater exposed within the exploratory test pits at the locations shown by Figure 2. Sage collected the samples using methods described by Appendix A. Sample descriptions are documented by the *Daily Field Sampling Log* (Appendix B). Selected soil samples were submitted to Friedman & Bruya, Inc., Seattle, WA for NWTPH-HCID (Hydrocarbon Identification) and/or NWTPH-Dx (Total Petroleum Hydrocarbons as diesel extended to include motor oil range compounds). A summary of soil sample analysis results is presented in Table 1. A summary of groundwater sample analysis results is presented in Table 2. A discussion of each exploratory test pit is described below.

3.1 Test Pit #1

BSC excavated an exploratory test pit (TP-1) immediately west of the ammonia storage tank on June 11, 2007 using a backhoe. Figure 2 shows the location of TP-1. Petroleum stained soil and odors were observed at depths beyond 4.9 feet BGS. Groundwater was encountered at approximately 5.0 feet BGS and the excavation was advanced to approximately 5.5 feet BGS. Inspection of the groundwater found a petroleum sheen.

Sage collected two (2) soil samples (S1 & S2) during the excavating process at a depth of 3.0 feet and 5.0 feet BGS, respectively. Sage collected one (1) groundwater sample (W3) from within this test pit.

NWTPH-HCID and NWTPH-Dx analysis of sample S1 & S2 found:

- no detectable (less than 20 ppm) gasoline range petroleum hydrocarbons,
- diesel range petroleum hydrocarbons at concentrations ranging from 1,800 parts per million (ppm) up to 7,400 ppm and
- no detectable (less than 250 ppm) heavy oil range petroleum hydrocarbons.

NWTPH-Dx analysis of sample W3 found:

- diesel range petroleum hydrocarbons at a concentration of 24,000 parts per billion (ppb).

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2.

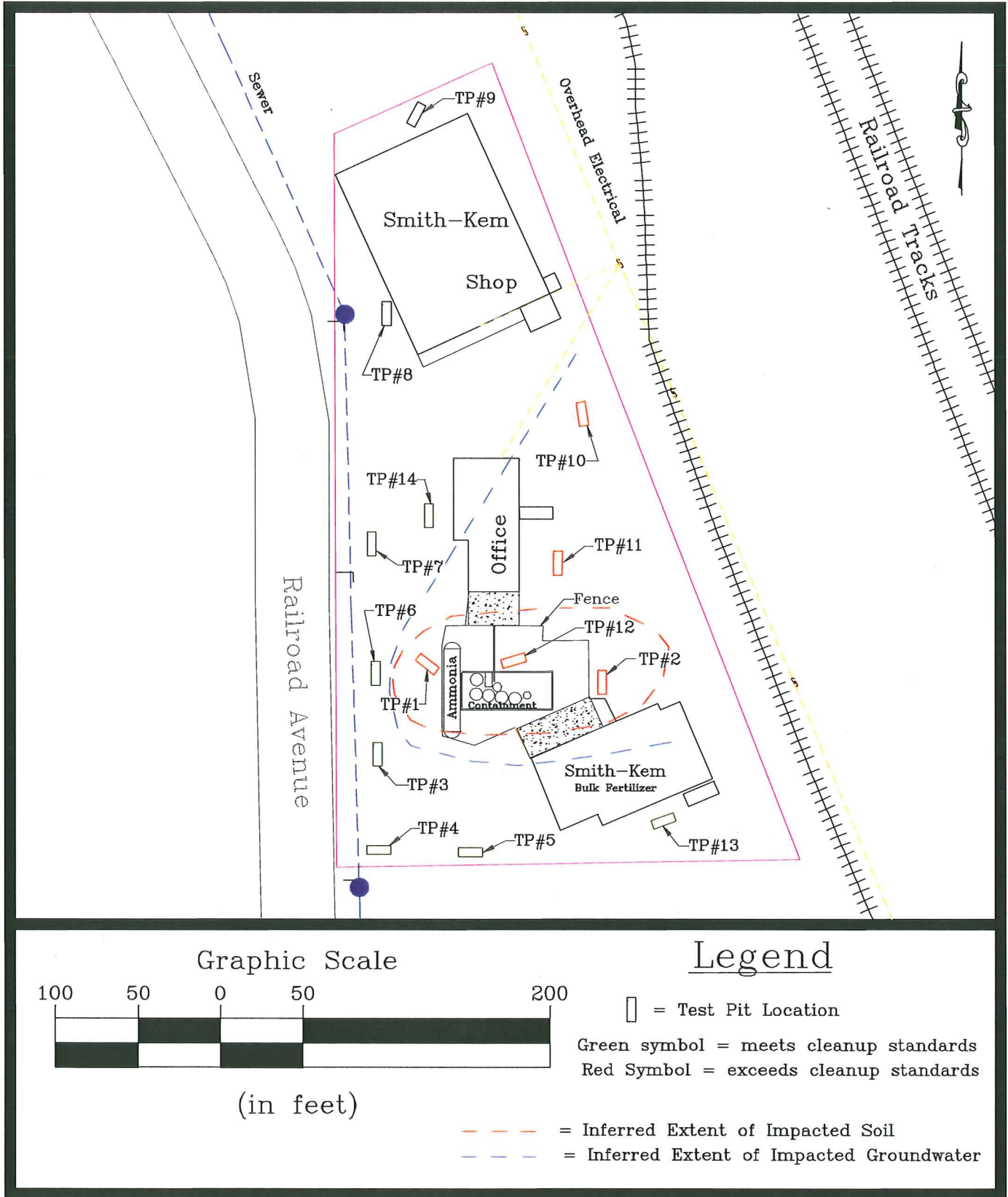


Figure 2. Exploratory Test Pit Locations

Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that soil and groundwater remediation is required at the TP-1 location.

| Table 1. FBI Analytical Results for Subsurface Soil Samples | | | | | |
|--|---------------|---------------------|--------------------------------|------------------------------|---------------------------------|
| Test Pit ID | Sample | Depth (feet) | TPH as Gasoline (mg/Kg) | TPH as Diesel (mg/Kg) | TPH as Heavy Oil (mg/Kg) |
| TP-1 | BSC-0407-S1 | 3.0 | <20 | 1,800 | <250 |
| TP-1 | BSC-0407-S2 | 5.0 | <20 | 7,400 | <250 |
| TP-2 | BSC-0407-S4 | 3.0 | <20 | <50 | <250 |
| TP-2 | BSC-0407-S5 | 5.3 | <20 | <50 | <250 |
| TP-3 | BSC-0407-S7 | 3.5 | NA | NA | NA |
| TP-3 | BSC-0407-S8 | 4.6 | NA | <50 | NA |
| TP-4 | BSC-0407-S10 | 3.0 | NA | NA | NA |
| TP-4 | BSC-0407-S11 | 4.6 | NA | <50 | NA |
| TP-5 | BSC-0407-S13 | 3.2 | NA | NA | NA |
| TP-5 | BSC-0407-S14 | 5.0 | NA | <50 | NA |
| TP-6 | BSC-0407-S16 | 3.5 | NA | NA | NA |
| TP-6 | BSC-0407-S17 | 5.0 | NA | <50 | NA |
| TP-7 | BSC-0407-S19 | 3.5 | NA | NA | NA |
| TP-7 | BSC-0407-S20 | 4.5 | NA | <50 | NA |
| TP-8 | BSC-0407-S22 | 4.5 | NA | NA | NA |
| TP-9 | BSC-0407-S24 | 7.0 | NA | NA | NA |
| TP-10 | BSC-0407-S26 | 4.6 | <20 | <50 | <250 |
| TP-11 | BSC-0407-S28 | 4.6 | NA | <50 | NA |
| TP-12 | BSC-0407-S30 | 4.5 | <20 | >50 | <250 |
| TP-13 | BSC-0407-S32 | 4.6 | NA | <50 | NA |
| TP-14 | BSC-0407-S34 | 4.6 | NA | <50 | NA |

Red Font indicates that concentration exceeds Method A Cleanup Levels of WAC 173-340-740
Green Font indicates that concentration does not exceed Method A Cleanup Levels of WAC 173-340-740
Mg/Kg = milligrams per kilogram or parts per million, NA = Sample not analyzed using the analytical method indicated

3.2 Test Pit #2

BSC excavated an exploratory test pit (TP-2) thirty feet east of the AST containment area on June 11, 2007 using a backhoe. Figure 2 shows the location of TP-2. Petroleum stained soil and odors were observed at depths beyond 5.25 feet BGS. Groundwater was encountered at approximately 6.0 feet BGS and the excavation was advanced to approximately 7.0 feet BGS. Inspection of the groundwater found a slight petroleum sheen.

Sage collected two (2) soil samples (S4 & S5) during the excavating process at a depth of 3.0 feet and 5.25 feet BGS, respectively. Sage collected one (1) groundwater sample (W6) from within this test pit.

NWTPH-HCID analysis of sample S4 & S5 found:

- no detectable (less than 20 ppm) gasoline range petroleum hydrocarbons,
- no detectable (less than 50 ppm) diesel range petroleum hydrocarbons and
- no detectable (less than 250 ppm) heavy oil range petroleum hydrocarbons.

NWTPH-Dx analysis of sample W6 found:

- diesel range petroleum hydrocarbons at a concentration of 1,000 ppb.

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2. Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that groundwater remediation is required at the TP-2 location.

| Table 2. FBI Analytical Results for Groundwater Samples | | | |
|--|---------------|---------------------|-----------------------------|
| Test Pit ID | Sample | Depth (feet) | TPH as Diesel (µg/L) |
| TP-1 | BSC-0407-W3 | 5.5 | 24,000 |
| TP-2 | BSC-0407-W6 | 6.0 | 1,000 |
| TP-3 | BSC-0407-W9 | 5.0 | <250 |
| TP-4 | BSC-0407-W12 | 5.2 | <250 |
| TP-5 | BSC-0407-W15 | 5.3 | <250 |
| TP-6 | BSC-0407-W18 | 5.3 | 340 |
| TP-7 | BSC-0407-W21 | 5.0 | <250 |
| TP-8 | BSC-0407-W23 | 6.0 | NA |
| TP-9 | BSC-0407-W25 | 7.5 | NA |
| TP-10 | BSC-0407-W27 | 5.0 | 600 |
| TP-11 | BSC-0407-W29 | 5.0 | 1,800 |
| TP-12 | BSC-0407-W31 | 6.0 | NA |
| TP-13 | BSC-0407-W33 | 5.5 | <250 |
| TP-14 | BSC-0407-W35 | 5.2 | <250 |

Red Font indicates that concentration exceeds Method A Cleanup Levels of WAC 173-340-720
Green Font indicates that concentration does not exceed Method A Cleanup Levels of WAC 173-340-720
 µg/L = micrograms per Liter or parts per billion, NA = Sample not analyzed using the analytical method indicated

3.3 Test Pit #3

BSC excavated an exploratory test pit (TP-3) forty feet southwest of the ammonia tank on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-3. No petroleum stained soil or odors were observed within TP-3. Groundwater was encountered at approximately 5.0 feet BGS and the excavation was advanced to approximately 6.0 feet BGS. Inspection of the groundwater found no petroleum sheen.

Sage collected two (2) soil samples (S7 & S8) during the excavating process at a depth of 3.5 feet and 4.7 feet BGS, respectively. Sage collected one (1) groundwater sample (W9) from within this test pit.

NWTPH-Dx analysis of sample S8 found no detectable (less than 50 ppm) diesel range petroleum hydrocarbons. NWTPH-Dx analysis of sample W9 found no detectable (less than 250 ppb) diesel range petroleum hydrocarbons.

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2. Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that no soil or groundwater remediation is required at the TP-3 location.

3.4 Test Pit #4

BSC excavated an exploratory test pit (TP-4) forty feet southwest of the ammonia tank on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-4. No petroleum stained soil or odors were observed within TP-4. Groundwater was encountered at approximately 5.1 feet BGS and the excavation was advanced to approximately 6.0 feet BGS. Inspection of the groundwater found no petroleum sheen.

Sage collected two (2) soil samples (S10 & S11) during the excavating process at a depth of 3.0 feet and 4.7 feet BGS, respectively. Sage collected one (1) groundwater sample (W12) from within this test pit.

NWTPH-Dx analysis of sample S11 found no detectable (less than 50 ppm) diesel range petroleum hydrocarbons. NWTPH-Dx analysis of sample W12 found no detectable (less than 250 ppb) diesel range petroleum hydrocarbons.

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2. Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that no soil or groundwater remediation is required at the TP-4 location.

3.5 Test Pit #5

BSC excavated an exploratory test pit (TP-5) 85 feet south of the AST containment area on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-5. No petroleum stained soil or odors were observed within TP-5. Groundwater was encountered at approximately 5.3 feet BGS and the excavation was advanced to approximately 6.0 feet BGS. Inspection of the groundwater found no petroleum sheen.

Sage collected two (2) soil samples (S13 & S14) during the excavating process at a depth of 3.1 feet and 5.0 feet BGS, respectively. Sage collected one (1) groundwater sample (W15) from within this test pit.

NWTPH-Dx analysis of sample S14 found no detectable (less than 50 ppm) diesel range petroleum hydrocarbons. NWTPH-Dx analysis of sample W15 found no detectable (less than 250 ppb) diesel range petroleum hydrocarbons.

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2. Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that no soil or groundwater remediation is required at the TP-5 location.

3.6 Test Pit #6

BSC excavated an exploratory test pit (TP-6) 40 feet west of the ammonia tank on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-6. No petroleum stained soil or odors were observed within TP-6. Groundwater was encountered at approximately 5.3 feet BGS and the excavation was advanced to approximately 6.0 feet BGS. Inspection of the groundwater found a slight petroleum sheen.

Sage collected two (2) soil samples (S16 & S17) during the excavating process at a depth of 3.5 feet and 5.0 feet BGS, respectively. Sage collected one (1) groundwater sample (W18) from within this test pit.

NWTPH-Dx analysis of sample S17 found no detectable (less than 50 ppm) diesel range petroleum hydrocarbons. NWTPH-Dx analysis of sample W18 found diesel range petroleum hydrocarbons at a concentration of 340 ppb.

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2. Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that no soil or groundwater remediation is required at the TP-6 location.

3.7 Test Pit #7

BSC excavated an exploratory test pit (TP-7) 100 feet northwest of the AST containment area on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-7. No petroleum stained soil or odors were observed within TP-7. Groundwater was encountered at approximately 5.0 feet BGS and the excavation was advanced to approximately 6.0 feet BGS. Inspection of the groundwater found no petroleum sheen.

Sage collected two (2) soil samples (S19 & S20) during the excavating process at a depth of 3.5 feet and 4.5 feet BGS, respectively. Sage collected one (1) groundwater sample (W21) from within this test pit.

NWTPH-Dx analysis of sample S20 found no detectable (less than 50 ppm) diesel range petroleum hydrocarbons. NWTPH-Dx analysis of sample W21 found no detectable (less than 250 ppb) diesel range petroleum hydrocarbons.

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2. Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that no soil or groundwater remediation is required at the TP-7 location.

3.8 Test Pit #8

BSC excavated an exploratory test pit (TP-8) 220 feet north-northwest of the AST containment area on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-8. No petroleum stained soil or odors were observed within TP-8. Groundwater was encountered at approximately 6.0 feet BGS and the excavation was advanced to approximately 7.0 feet BGS. Inspection of the groundwater found no petroleum sheen.

Sage collected one (1) soil sample (S22) during the excavating process at a depth of 4.5 feet BGS. Sage collected one (1) groundwater sample (W23) from within this test pit.

Sage did not select any samples, collected from within this test pit, for analysis. However, Sage observed no indication of petroleum impacted soil or groundwater at this location.

3.9 Test Pit #9

BSC excavated an exploratory test pit (TP-9) 335 feet north of the AST containment area on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-9. No petroleum stained soil or odors were observed within TP-9. Groundwater was encountered at approximately 7.5 feet BGS and the excavation was advanced to approximately 8.0 feet BGS. Inspection of the groundwater found no petroleum sheen.

Sage collected one (1) soil sample (S24) during the excavating process at a depth of 7.0 feet BGS. Sage collected one (1) groundwater sample (W25) from within this test pit.

Sage did not select any samples, collected from within this test pit, for analysis. However, Sage observed no indication of petroleum impacted soil or groundwater at this location.

3.10 Test Pit #10

BSC excavated an exploratory test pit (TP-10) 150 feet north-northeast of the AST containment area on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-10. No petroleum stained soil or odors were observed within TP-10. Groundwater was encountered at approximately 5.0 feet BGS and the excavation was advanced to approximately 6.0 feet BGS. Inspection of the groundwater found no petroleum sheen.

Sage collected one (1) soil sample (S26) during the excavating process at a depth of 4.7 feet BGS. Sage collected one (1) groundwater sample (W27) from within this test pit.

NWTPH-HCID analysis of sample S26 found:

- no detectable (less than 20 ppm) gasoline range petroleum hydrocarbons,
- no detectable (less than 50 ppm) diesel range petroleum hydrocarbons and
- no detectable (less than 250 ppm) heavy oil range petroleum hydrocarbons.

NWTPH-Dx analysis of sample W10 found:

- diesel range petroleum hydrocarbons at a concentration of 600 ppb.

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2. Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that groundwater remediation is required at the TP-10 location.

3.11 Test Pit #11

BSC excavated an exploratory test pit (TP-11) 60 feet north-northeast of the AST containment area on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-11. No petroleum stained soil or odors were observed within TP-11. Groundwater was encountered at approximately 5.0 feet BGS and the excavation was advanced to approximately 6.0 feet BGS. Inspection of the groundwater found no petroleum sheen.

Sage collected one (1) soil sample (S28) during the excavating process at a depth of 4.7 feet BGS. Sage collected one (1) groundwater sample (W29) from within this test pit.

NWTPH-Dx analysis of sample S28 found no detectable (less than 50 ppm) diesel range petroleum hydrocarbons. NWTPH-Dx analysis of sample W29 found diesel range petroleum hydrocarbons at a concentration of 1,800 ppm.

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2. Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that groundwater remediation is required at the TP-10 location.

3.12 Test Pit #12

BSC excavated an exploratory test pit (TP-12) immediately north of the AST containment area on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-12. Petroleum stained soil and odors were observed within TP-12 at depths beyond 3.5 feet BGS. Groundwater was encountered at approximately 6.0 feet BGS and the excavation was advanced to approximately 7.0 feet BGS. Inspection of the groundwater found a thin layer (less than 1/8 inch) of petroleum on the groundwater surface.

Sage collected one (1) soil sample (S30) during the excavating process at a depth of 4.5 feet BGS. Sage collected one (1) groundwater sample (W31) from within this test pit.

NWTPH-HCID analysis of sample S30 found:

- no detectable (less than 20 ppm) gasoline range petroleum hydrocarbons,
- detectable (greater than 50 ppm) diesel range petroleum hydrocarbons and
- no detectable (less than 250 ppm) heavy oil range petroleum hydrocarbons.

Since petroleum was observed on the groundwater surface, sample W31 was not selected for analysis.

The FBI analytical results for soil samples are summarized by Table 1. Visual inspection of soil and groundwater within TP-12 indicates that soil and groundwater remediation is required at the TP-12 location.

3.13 Test Pit #13

BSC excavated an exploratory test pit (TP-13) 95 feet southeast of the AST containment area on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-13. No petroleum stained soil or odors were observed within TP-13. Groundwater was encountered at approximately 5.5 feet BGS and the excavation was advanced to approximately 6.0 feet BGS. Inspection of the groundwater found no petroleum sheen.

Sage collected one (1) soil sample (S32) during the excavating process at a depth of 4.7 feet BGS. Sage collected one (1) groundwater sample (W33) from within this test pit.

NWTPH-Dx analysis of sample S32 found no detectable (less than 50 ppm) diesel range petroleum hydrocarbons. NWTPH-Dx analysis of sample W33 found no detectable (less than 250 ppb) diesel range petroleum hydrocarbons.

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2. Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that no soil or groundwater remediation is required at the TP-13 location.

3.14 Test Pit #14

BSC excavated an exploratory test pit (TP-14) 90 feet north-northwest of the AST containment area on July 02, 2007 using a backhoe. Figure 2 shows the location of TP-14. No petroleum stained soil or odors were observed within TP-14. Groundwater was encountered at approximately 5.1 feet BGS and the excavation was advanced to approximately 6.0 feet BGS. Inspection of the groundwater found no petroleum sheen.

Sage collected one (1) soil sample (S34) during the excavating process at a depth of 4.7 feet BGS. Sage collected one (1) groundwater sample (W35) from within this test pit.

NWTPH-Dx analysis of sample S34 found no detectable (less than 50 ppm) diesel range petroleum hydrocarbons. NWTPH-Dx analysis of sample W35 found no detectable (less than 250 ppb) diesel range petroleum hydrocarbons.

The FBI analytical results for soil samples are summarized by Table 1 while results for groundwater samples are summarized by Table 2. Comparison of the analytical results (Appendix C) with the *Method A Groundwater and Soil Cleanup Levels* (Cleanup Levels) of WAC 173-340-720 & 740 (Appendix D) indicates that no soil or groundwater remediation is required at the TP-14 location.

4.0 Conclusions & Recommendations

4.1 Conclusions

Based upon our field observations and FBI independent laboratory analysis of soil and groundwater samples (Appendix C), Sage found that site soil and groundwater is impacted by diesel range petroleum hydrocarbons at concentrations exceeding the *Method A Groundwater & Soil Cleanup Levels* of WAC 173-340-720 & 740 (Appendix D). Remedial action is required to reduce diesel concentrations in site soil and groundwater to acceptable levels.

Petroleum impacted soil appears to be limited to the vicinity of the AST's. Petroleum impacted groundwater appears to extend from the area of the AST's toward the east and northeast. The inferred extent of petroleum impacted soil and groundwater is shown by Figure 2. However, the extent of diesel impacted soil has not been determined in the east and northeast directions.

4.2 Impacted Soil Removal

Sage recommends removal and treatment/disposal of diesel impacted soil to reduce impacts to groundwater. Impacted soil removal activities should be conducted during the period when the groundwater table attains its seasonal low.

4.3 Groundwater Monitoring Program

Sage recommends additional hydrogeologic investigation and monitoring to:

- Determine the extent of groundwater contamination,
- Ensure that the plume does not migrate off-site,
- Ensure that petroleum concentrations are reduced to acceptable levels and
- Determine seasonal fluctuations of the groundwater level.

The additional hydrogeologic investigation should include determining underground utility locations and installation of at least three (3) groundwater-monitoring wells. The wells must be surveyed to allow determination of the precise groundwater flow direction. The site specific groundwater flow direction must be determined to ensure that a minimum of one (1) groundwater monitoring well is located downgradient of the release site.

Please note that additional wells may be required to determine the extent of groundwater contamination. A sufficient quantity of monitoring wells must be installed to determine groundwater flow direction, gradient, and extent of groundwater contamination. Upon determining the extent of groundwater contamination, a remedial action plan could be developed to reduce contaminant concentrations to acceptable levels.

Upon conducting the additional hydrogeologic investigation, Sage recommends implementing a groundwater-monitoring program to monitor groundwater gradients (flow direction) as well as diesel concentrations in groundwater.

Upon completion of impacted soil removal activities and monitoring well installation, Sage recommends collection and analysis of groundwater samples on a quarterly schedule while groundwater levels in the monitoring wells should be measured on a monthly basis for the first year of the monitoring program. Groundwater samples should be analyzed for diesel range petroleum hydrocarbons. Groundwater level measurements should be performed to ensure that a downgradient monitoring well is in place in the case of changing groundwater flow directions.

When petroleum hydrocarbon concentrations do not exceed risk based "Cleanup Levels" established in WAC 173-340-720 of four consecutive quarters, you may request a "no further action" determination from the Washington State Department of Ecology.

5.0 Limitations

In performance of this project, Sage Earth Sciences has conducted its activities in accordance with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. The conclusions and recommendations are based upon our field observations and independent laboratory analyses. Since the scope of work for this project is confined to limited site characterization to investigate for the presence of petroleum hydrocarbon impacted soil and/or groundwater, this document does not imply that the property is free of other environmental constraints. This report is solely for the use and information of our client. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and other parameters indicated. Sage Earth Sciences, Inc. is not responsible for the impacts of changes in environmental standards, practices, or regulations subsequent to the performance of services. Sage Earth Sciences, Inc. does not warrant the accuracy of information supplied by the client and/or others, nor use of segregated portions of this report. Sage Earth Sciences, Inc. assumes no liability for conditions we were not authorized to evaluate, or conditions not generally recognized as predictable when services were performed. This report is copyright 2007 by Sage Earth Sciences, Inc. No portion of this document may be copied or duplicated in any manner without expressed written consent by Sage Earth Sciences, Inc.

Appendix A

Excavation Soil Sampling Methodology

Soil sampling locations were chosen at locations considered representative of soil conditions. To collect representative soil samples, Sage Earth Sciences, Inc. uses the methodology outlined below.

1. Select a new sample jar whose volume is adequate for the appropriate analysis.
2. Remove a minimum of six (6) inches of soil to minimize the loss of volatile compounds.
3. Immediately transfer the soil to the sample container, using the container itself to collect the sample. Using new disposable vinyl gloves, pack the soil tightly into the container to prevent the loss of volatile compounds. Ensure that the container is filled completely to exclude any airspace in the sample.
4. Label the jar with a unique identification number, the analytical procedure to be used, the time and date of sample collection and the person who collected the sample.
5. Enter the sample on the Chain-of-Custody form and the Daily Field Sampling Log.
6. Place the sample in wet ice to cool the samples to approximately four (4) degrees Celsius.
7. Place the samples in a shipping cooler packed with absorbent material and blue ice for shipment.
8. Secure the Chain-of-Custody form to the underside of the cooler lid in a sealable plastic bag with tape.
9. Upon completion of sampling activities, secure the lid of the cooler with strapping tape and affix custody seals across the lid/cooler interface. Place appropriate shipping waybills atop the cooler.
10. Ship the samples to the laboratory via commercial courier.

Groundwater Sampling Methodology – Low Flow Purging

Prior to introducing groundwater-sampling equipment into the exploratory test pit, Sage collected a Depth to Water (DTW) measurement and visually checked for the presence of floating petroleum sheen or product on the water table. DTW measurements are recorded on the Daily Field Sampling Log.

Groundwater samples were collected using a Geotech Series II[®] Peristaltic Pump using a flow rate less than 1.0 liter per minute. New polyethylene and norprene tubing was used at each groundwater sampling location.

The peristaltic pump operates by mechanical peristalsis so the sample is only exposed to new polyethylene sampling tubing and norprene tubing. Water was pumped from depths immediately below the water table. Pumped water was discharged directly into laboratory supplied sample containers. Sample containers consisted of:

- 500 mL amber jars with no preservative for NWTPH-Dx analysis.

Upon filling each sample container, the following methodology for sample handling was used:

1. Replace the sample container cap.
2. Label sample containers with a unique identification number, the analytical procedure to be used, the time/date of sample collection, and sample preservation method.
3. Log each sample on the Chain-of-Custody form.
4. Place samples in coolers containing wet ice to cool the samples to $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$ until transferred to a refrigerator at the Sage office for temporary storage.
5. Samples were packed on the day of transport in a shipping cooler packed with absorbent material and blue ice for shipment to the fixed laboratory.
6. The signed Chain-of-Custody forms were taped on the underside of the cooler lid in a sealed plastic bag.
7. The lid of the cooler was secured with strapping tape and custody seals were affixed across the lid/cooler interface. Appropriate waybills were taped to the top of the cooler.
8. The samples were transported to the fixed analytical laboratory via commercial carrier.

Appendix B



Field Staff RODNEY Heit

Date 07-02-07

Job # BSL-0407

Page 1 of 1

Sunny warm

| Time | Sample # | Sample Location | Matrix | Staining | Odor | Depth | TOV | TLC |
|-------|----------|-----------------|--------|---------------------|--------------------|-------|-----|-----|
| 9:15 | S7 | Test Pit #3 | Soil | None | None | 3-5 | NA | NA |
| 9:25 | S8 | " " | Soil | None | None | 4-8 | | |
| 9:35 | W9 | " " | Water | None | None | 5-0 | | |
| 9:54 | S10 | Test Pit #4 | Soil | None | None | 3-0 | | |
| 10:05 | S11 | " " | Soil | Black soils? | None | 4-8 | | |
| 10:11 | W12 | " " | Water | None | None | 5-2 | | |
| 10:30 | S13 | Test Pit #5 | Soil | None | None | 3-2 | | |
| 10:38 | S14 | " " | Soil | None | None | 5-0 | | |
| 10:44 | W15 | " " | Water | None | None | 5-4 | | |
| 11:05 | S16 | Test Pit #6 | Soil | None | None | 3-5 | | |
| 11:10 | S17 | " " | Soil | None | None | 5-0 | | |
| 11:18 | W18 | " " | Water | shen & slight | None | 5-4 | | |
| 11:31 | S19 | Test Pit #7 | Soil | DARK BROWN soils | None | 3-6 | | |
| 11:42 | S20 | " " | Soil | None | None | 4-6 | | |
| 11:59 | W21 | " " | Water | None | None | 5-0 | | |
| 12:16 | S22 | Test Pit #8 | Soil | None | None | 4-6 | | |
| 12:25 | W23 | " " | Water | None | None | 6-0 | | |
| 12:45 | S24 | Test Pit #9 | Soil | Blue grey soils | organic sewer like | 7-0 | | |
| 12:56 | W25 | " " | Water | None | None | 7-6 | | |
| 1:15 | S26 | Test Pit #10 | Soil | None | None | 4-8 | | |
| 1:26 | W27 | " " | Water | None | None | 5-0 | | |
| 1:47 | S28 | Test Pit #11 | Soil | None | None | 4-8 | | |
| 2:01 | W29 | " " | Water | None | None | 5-0 | | |
| 2:25 | S30 | Test Pit #12 | Soil | yellow to 1-2 shiny | Disc heavy/cheap | 4-6 | | |
| 2:33 | W31 | " " | Water | shen film product | Disc | 6-0 | | |
| 2:39 | S32 | Test Pit #13 | Soil | None | None | 4-8 | | |
| 2:45 | W33 | " " | Water | None | None | 5-5 | | |
| 3:25 | S34 | Test Pit #14 | Soil | None | None | 4-8 | | |
| 3:45 | W35 | " " | Water | None | None | 5-2 | | |

Ambient Vapors NA Units
 TLC Standards NA

Appendix C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

June 19, 2007

Rodney Heit, Project Manager
Sage Earth Sciences, Inc.
1705 S 24th Ave
Yakima, WA 98902

Dear Mr. Heit:

Included are the results from the testing of material submitted on June 12, 2007 from the BSE-0107, F&BI 706116 project. There are 5 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
SES0619R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/19/07
Date Received: 06/12/07
Project: BSE-0107, F&BI 706116
Date Extracted: 06/12/07
Date Analyzed: 06/12/07

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID
Results Reported as Not Detected (ND) or Detected (D)**

THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT

| <u>Sample ID</u> Laboratory ID | <u>Gasoline</u> | <u>Diesel</u> | <u>Heavy Oil</u> | <u>Surrogate</u> <u>(% Recovery)</u> (Limit 50-150) |
|-----------------------------------|-----------------|---------------|------------------|---|
| BSE-0107-S1 706116-01 | ND | D | ND | 96 |
| BSE-0107-S2 706116-02 | ND | D | ND | 106 |
| BSE-0107-S4 706116-04 | ND | ND | ND | 94 |
| BSE-0107-S5 706116-05 | ND | ND | ND | 99 |
| Method Blank | ND | ND | ND | 101 |

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/19/07
Date Received: 06/12/07
Project: BSE-0107, F&BI 706116
Date Extracted: 06/13/07
Date Analyzed: 06/14/07

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD NWTPH-Dx**

Extended to Include Motor Oil Range Compounds

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

| <u>Sample ID</u> Laboratory ID | <u>Diesel Extended</u> (C ₁₀ -C ₃₆) | <u>Surrogate</u> (% Recovery) (Limit 53-144) |
|-----------------------------------|---|--|
| BSE-0107-S1 706116-01 | 1,800 | 110 |
| BSE-0107-S2 706116-02 | 7,400 | 118 |
| Method Blank | <50 | 108 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/19/07
Date Received: 06/12/07
Project: BSE-0107, F&BI 706116
Date Extracted: 06/15/07
Date Analyzed: 06/15/07

**RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD NWTPH-Dx
Extended to Include Motor Oil Range Compounds
Results Reported as ug/L (ppb)**

| <u>Sample ID</u> Laboratory ID | <u>Diesel Extended</u> (C ₁₀ -C ₃₆) | <u>Surrogate</u> (% Recovery) (Limit 52-134) |
|-----------------------------------|---|--|
| BSE-0107-W3 706116-03 | 24,000 | 126 |
| BSE-0107-W6 706116-06 | 1,000 | 103 |
| Method Blank | <250 | 98 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/19/07

Date Received: 06/12/07

Project: BSE-0107, F&BI 706116

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: 706140-11 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|-----------------|--------------------|----------------|------------------|---------------------------|----------------------------|------------------------|-------------------|
| Diesel Extended | mg/kg (ppm) | 5,000 | <50 | 94 | 93 | 71-137 | 1 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|-----------------|--------------------|----------------|----------------------------|------------------------|
| Diesel Extended | mg/kg (ppm) | 5,000 | 111 | 70-129 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/19/07

Date Received: 06/12/07

Project: BSE-0107, F&BI 706116

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|-----------------|--------------------|----------------|----------------------------|-----------------------------|------------------------|-------------------|
| Diesel Extended | ug/L (ppb) | 2,500 | 97 | 106 | 73-142 | 9 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

July 12, 2007

Rodney Heit, Project Manager
Sage Earth Sciences, Inc.
1705 S 24th Ave
Yakima, WA 98902

Dear Mr. Heit:

Included are the results from the testing of material submitted on July 6, 2007 from the BSC-0407, F&BI 707072 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
SES0712R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/12/07
Date Received: 07/06/07
Project: BSC-0407, F&BI 707072
Date Extracted: 07/10/07
Date Analyzed: 07/10/07 and 07/11/07

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID
Results Reported as Not Detected (ND) or Detected (D)**

THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT

| <u>Sample ID</u> Laboratory ID | <u>Gasoline</u> | <u>Diesel</u> | <u>Heavy Oil</u> | <u>Surrogate</u> <u>(% Recovery)</u> (Limit 50-150) |
|-----------------------------------|-----------------|---------------|------------------|---|
| BSC-0407-S26 707072-20 | ND | ND | ND | 98 |
| BSC-0407-S30 707072-24 | ND | D | ND | 111 |
| Method Blank | ND | ND | ND | 109 |

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/12/07
Date Received: 07/06/07
Project: BSC-0407, F&BI 707072
Date Extracted: 07/09/07
Date Analyzed: 07/09/07 and 07/10/07

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD NWTPH-Dx**

Extended to Include Motor Oil Range Compounds

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

| <u>Sample ID</u> Laboratory ID | <u>Diesel Extended</u> (C ₁₀ -C ₃₆) | <u>Surrogate</u> (% Recovery) (Limit 53-144) |
|-----------------------------------|---|--|
| BSC-0407-S8 707072-02 | <50 | 105 |
| BSC-0407-S11 707072-05 | <50 | 108 |
| BSC-0407-S14 707072-08 | <50 | 107 |
| BSC-0407-S17 707072-11 | <50 | 113 |
| BSC-0407-S20 707072-14 | <50 | 105 |
| BSC-0407-S28 707072-22 | <50 | 106 |
| BSC-0407-S32 707072-26 | <50 | 109 |
| BSC-0407-S34 707072-28 | <50 | 109 |
| Method Blank | <50 | 108 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/12/07
 Date Received: 07/06/07
 Project: BSC-0407, F&BI 707072
 Date Extracted: 07/09/07
 Date Analyzed: 07/09/07 and 07/10/07

**RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES
 FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
 USING METHOD NWTPH-Dx
 Extended to Include Motor Oil Range Compounds
 Results Reported as ug/L (ppb)**

| <u>Sample ID</u> Laboratory ID | <u>Diesel Extended</u> (C ₁₀ -C ₃₆) | <u>Surrogate</u> (% Recovery) (Limit 68-143) |
|-----------------------------------|---|--|
| BSC-0407-W9 707072-03 | <250 | 93 |
| BSC-0407-W12 707072-06 | <250 | 90 |
| BSC-0407-W15 707072-09 | <250 | 100 |
| BSC-0407-W18 707072-12 | 340 | 106 |
| BSC-0407-W21 707072-15 | <250 | 98 |
| BSC-0407-W27 707072-21 | 600 | 88 |
| BSC-0407-W29 707072-23 | 1,800 | 89 |
| BSC-0407-W33 707072-27 | <250 | 95 |
| BSC-0407-W35 707072-29 | <250 | 100 |
| Method Blank | <250 | 114 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/12/07

Date Received: 07/06/07

Project: BSC-0407, F&BI 707072

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: 707085-02 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|-----------------|--------------------|----------------|------------------|---------------------------|----------------------------|------------------------|-------------------|
| Diesel Extended | mg/kg (ppm) | 5,000 | <50 | 89 | 90 | 71-137 | 1 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|-----------------|--------------------|----------------|----------------------------|------------------------|
| Diesel Extended | mg/kg (ppm) | 5,000 | 111 | 70-129 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/12/07

Date Received: 07/06/07

Project: BSC-0407, F&BI 707072

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: Laboratory Control Sample

| <u>Analyte</u> | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|-----------------|--------------------|----------------|----------------------------|-----------------------------|------------------------|-------------------|
| Diesel Extended | ug/L (ppb) | 2,500 | 102 | 93 | 67-141 | 9 |

Data Qualifiers & Definitions

- a** - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- A1** - More than one compound of similar molecule structure was identified with equal probability.
- b** - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca** - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.
- c** - The presence of the analyte indicated may be due to carryover from previous sample injections.
- d** - The sample was diluted. Detection limits may be raised due to dilution.
- ds** - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.
- dv** - The sample was diluted due to insufficient sample volume. Detection limits are raised due to dilution
- fb** - The analyte indicated was found in the method blank. The result should be considered an estimate.
- fc** - The compound is a common laboratory and field contaminant.
- fp** - Compounds in the sample matrix interfered with quantitation of the analyte. The reported concentration may be a false positive.
- hr** - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.
- ht** - The sample was extracted outside of holding time. Results should be considered estimates.
- ip** - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j** - The result is below normal reporting limits. The value reported is an estimate.
- J** - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl** - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.
- jr** - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc** - The presence of the compound indicated is likely due to laboratory contamination.
- L** - The reported concentration was generated from a library search.
- nm** - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc** - The sample was received in a container not approved by the method. The value reported should be considered an estimate.
- pr** - The sample was received with incorrect preservation. The value reported should be considered an estimate.
- ve** - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.
- vo** - The value reported fell outside the control limits established for this analyte.
- x** - The pattern of peaks present is not indicative of diesel.
- y** - The pattern of peaks present is not indicative of motor oil.

TRU



SAMPLE CHAIN OF CUSTODY

1705 South 24th Avenue
Yakima, WA 98902
Phone (509) 834-2333
Fax (509) 834-2334
info@sage-earth-sciences.com

Sampler: Rodney Heit
Project ID: BSC-0407
Location: Ellensburg, WA.
Turn-around Time: STANDARD
Sampler Signature: *Rodney L Heit*
Date: 07-02-07

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | Sample Size | # of Containers | NWTPH-HCID | NWTPH-Gx | NWTPH-Dx | Method 826B | Method 8270 | Method 6010 | Methamphetamine (Methanol Solvent) | Asbestos by Bulk PLM | Lab Archive | Notes: |
|--------------|--------|--------------|--------------|-------------|-------------|-----------------|------------|----------|----------|-------------|-------------|-------------|------------------------------------|----------------------|-------------|--------|
| BSC-0407-57 | 01 | 07-02-07 | 9:15 | Soil | 4oz | 1 | | | | | | | | | X | |
| BSC-0407-58 | 02 | | 9:25 | Soil | 4oz | 1 | | X | | | | | | | | |
| BSC-0407-59 | 03 | | 9:35 | Water | 500 ml | 1 | | X | | | | | | | | |
| BSC-0407-510 | 04 | | 9:54 | Soil | 4oz | 1 | | | X | | | | | | X | |
| BSC-0407-511 | 05 | | 10:05 | Soil | 4oz | 1 | | | X | | | | | | | |
| BSC-0407-512 | 06 | | 10:11 | Water | 500 ml | 1 | | | X | | | | | | | |
| BSC-0407-513 | 07 | | 10:30 | Soil | 4oz | 1 | | | X | | | | | | X | |
| BSC-0407-514 | 08 | | 10:38 | Soil | 4oz | 1 | | | X | | | | | | | |
| BSC-0407-515 | 09 | | 10:44 | Water | 500 ml | 1 | | | X | | | | | | | |
| BSC-0407-516 | 10 | | 11:05 | Soil | 4oz | 1 | | | X | | | | | | X | |
| BSC-0407-517 | 11 | | 11:10 | Soil | 4oz | 1 | | | X | | | | | | | |
| BSC-0407-518 | 12 | | 11:18 | Water | 500 ml | 1 | | | X | | | | | | | |
| BSC-0407-519 | 13 | | 11:31 | Soil | 4oz | 1 | | | X | | | | | | X | |
| BSC-0407-520 | 14 | | 11:42 | Soil | 4oz | 1 | | | X | | | | | | | |

Laboratory Destination:

Friedman & Bruya, Inc.
3012 - 16th Avenue West
Seattle, WA 98119-2029
Phone (206) 285-8282
Fax (206) 283-5044

| Relinquished By | SIGNATURE | PRINTED NAME | COMPANY | DATE | TIME |
|-----------------|----------------------|---------------|---------------------------|----------|---------|
| Relinquished By | <i>Rodney L Heit</i> | Rodney L Heit | Sage Earth Sciences, Inc. | 07-05-07 | 9:08 Am |
| Received By | <i>J. Devo</i> | DD RD | FBI | 7-06-07 | 9:30 |
| Relinquished By | | | | | |
| Received By | | | | | |

Samples received at 21 °C

T 1 1 2 17E ut-uu-01 1104 2-3



SAMPLE CHAIN OF CUSTODY

1705 South 24th Avenue
 Yakima, WA 98902
 Phone (509) 834-2333
 Fax (509) 834-2334
 info@sage-earth-sciences.com

Sampler: Rodney L Heit
 Project ID: BSC-0407
 Location: Ellensburg, WA.
 Turn-around Time: STANDARD
 Sampler Signature: *Rodney L Heit*
 Date: 07-02-07

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | Sample Size | # of Containers | NWTPH-HCID | NWTPH-Gx | NWTPH-Dx | Method 826B | Method 8270 | Method 6010 | Methamphetamine (Methanol Solvent) | Asbestos by Bulk PLM | Lab Archive | Notes: |
|--------------|--------|--------------|--------------|-------------|-------------|-----------------|------------|----------|----------|-------------|-------------|-------------|------------------------------------|----------------------|-------------|--------|
| BSC-0407-W21 | 15 | 07-02-07 | 11:59 | Water | 500 ml | 1 | | | X | | | | | | | |
| BSC-0407-S22 | 16 | | 12:16 | Soil | 4 oz | 1 | | | | | | | | | X | |
| BSC-0407-W23 | 17 | | 12:25 | Water | 500 ml | 1 | | | | | | | | | X | |
| BSC-0407-S24 | 18 | | 12:45 | Soil | 4 oz | 1 | | | | | | | | | X | |
| BSC-0407-W25 | 19 | | 12:56 | Water | 500 ml | 1 | | | | | | | | | X | |
| BSC-0407-S26 | 20 | | 1:15 | Soil | 4 oz | 1 | X | | | | | | | | | |
| BSC-0407-W27 | 21 | | 1:26 | Water | 500 ml | 1 | | | X | | | | | | | |
| BSC-0407-S28 | 22 | | 1:47 | Soil | 4 oz | 1 | | | X | | | | | | | |
| BSC-0407-W29 | 23 | | 2:01 | Water | 500 ml | 1 | | | X | | | | | | | |
| BSC-0407-S30 | 24 | | 2:25 | Soil | 4 oz | 1 | X | | | | | | | | | |
| BSC-0407-W31 | 25 | | 2:33 | Water | 500 ml | 1 | | | | | | | | | X | |
| BSC-0407-S32 | 26 | | 2:39 | Soil | 4 oz | 1 | | | X | | | | | | | |
| BSC-0407-W33 | 27 | | 2:46 | Water | 500 ml | 1 | | | X | | | | | | | |
| BSC-0407-S34 | 28 | | 3:25 | Soil | 4 oz | 1 | | | X | | | | | | | |

Laboratory Destination:

Friedman & Bruya, Inc.
 3012 - 16th Avenue West
 Seattle, WA 98119-2029
 Phone (206) 285-8282
 Fax (206) 283-5044

| RELINQUISHED BY | SIGNATURE | PRINTED NAME | COMPANY | DATE | TIME |
|-----------------|----------------------|---------------|---------------------------|----------|---------|
| Relinquished By | <i>Rodney L Heit</i> | Rodney L Heit | Sage Earth Sciences, Inc. | 07-05-07 | 9:08 am |
| Received By | <i>DOVO</i> | DOVO | FBI | 07-06-07 | 2:30 PM |
| Relinquished By | | | | | |
| Received By | | | | | |

Samples received at 21 °C

Appendix D

Table 720-1
Method A Cleanup Levels for Ground Water.^a

| Hazardous Substance | CAS Number | Cleanup Level |
|---|-------------------|------------------------------|
| Arsenic | 7440-38-2 | 5 ug/liter ^b |
| Benzene | 71-43-2 | 5 ug/liter ^c |
| Benzo(a)pyrene | 50-32-8 | 0.1 ug/liter ^d |
| Cadmium | 7440-43-9 | 5 ug/liter ^e |
| Chromium (Total) | 7440-47-3 | 50 ug/liter ^f |
| DDT | 50-29-3 | 0.3 ug/liter ^g |
| 1,2 Dichloroethane (EDC) | 107-06-2 | 5 ug/liter ^h |
| Ethylbenzene | 100-41-4 | 700 ug/liter ⁱ |
| Ethylene dibromide (EDB) | 106-93-4 | 0.01 ug/liter ^j |
| Gross Alpha Particle Activity | | 15 pCi/liter ^k |
| Gross Beta Particle Activity | | 4 mrem/yr ^l |
| Lead | 7439-92-1 | 15 ug/liter ^m |
| Lindane | 58-89-9 | 0.2 ug/liter ⁿ |
| Methylene chloride | 75-09-2 | 5 ug/liter ^o |
| Mercury | 7439-97-6 | 2 ug/liter ^p |
| MTBE | 1634-04-4 | 20 ug/liter ^q |
| Naphthalenes | 91-20-3 | 160 ug/liter ^r |
| PCB mixtures | | 0.1 ug/liter ^s |
| Radium 226 and 228 | | 5 pCi/liter ^t |
| Radium 226 | | 3 pCi/liter ^u |
| Tetrachloroethylene | 127-18-4 | 5 ug/liter ^v |
| Toluene | 108-88-3 | 1,000 ug/liter ^w |
| Total Petroleum Hydrocarbons ^x | | |
| [Note: Must also test for and meet cleanup levels for other petroleum components--see footnotes!] | | |
| Gasoline Range Organics | | 800 ug/liter |
| Benzene present in ground water | | 1,000 ug/liter |
| No detectable benzene in ground water | | |
| Diesel Range Organics | | 500 ug/liter |
| Heavy Oils | | 500 ug/liter |
| Mineral Oil | | 1,000 ug/liter |
| 1,1,1 Trichloroethane | 71-55-6 | 200 ug/liter ^y |
| Trichloroethylene | 79-01-5 | 5 ug/liter ^z |
| Vinyl chloride | 75-01-4 | 0.2 ug/liter ^{aa} |
| Xylenes | 1330-20-7 | 1,000 ug/liter ^{bb} |

Footnotes:

- a **Caution on misusing this table.** This table has been developed for specific purposes. It is intended to provide conservative cleanup levels for drinking water beneficial uses at sites undergoing routine cleanup actions or those sites with relatively few hazardous substances. This table may not be appropriate for defining cleanup levels at other sites. For these reasons, the values in this table should not automatically be used to define cleanup levels that must be met for financial, real estate, insurance coverage or placement, or similar transactions or purposes. Exceedances of the values in this table do not necessarily mean the ground water must be restored to those levels at all sites. The level of restoration depends on the remedy selected under WAC 173-340-350 through 173-340-390.
- b **Arsenic.** Cleanup level based on background concentrations for state of Washington.
- c **Benzene.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61).
- d **Benzo(a)pyrene.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61), adjusted to a 1×10^{-5} risk. This value may also be used as the total concentration that all carcinogenic PAHs must meet using the toxicity equivalency methodology in WAC 173-340-708(8).
- e **Cadmium.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.62).
- f **Chromium (Total).** Cleanup level based on concentration derived using Equation 720-1 for hexavalent chromium. This is a total value for chromium III and chromium VI. If just chromium III is present at the site, a cleanup level of 100 ug/l may be used (based on WAC 246-290-310 and 40 C.F.R. 141.62).
- g **DDT (dichlorodiphenyltrichloroethane).** Cleanup levels based on concentration derived using Equation 720-2.
- h **1,2 Dichloroethane (ethylene dichloride or EDC).** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61).
- i **Ethylbenzene.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61).
- j **Ethylene dibromide (1,2 dibromoethane or EDB).** Cleanup level based on concentration derived using Equation 720-2, adjusted for the practical quantitation limit.
- k **Gross Alpha Particle Activity, excluding uranium.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.15).
- l **Gross Beta Particle Activity, including gamma activity.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.15).
- m **Lead.** Cleanup level based on applicable state and federal law (40 C.F.R. 141.80).
- n **Lindane.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61).
- o **Methylene chloride (dichloromethane).** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61).
- p **Mercury.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.62).
- q **Methyl tertiary-butyl ether (MTBE).** Cleanup level based on federal drinking water advisory level (EPA-822-F-97-009, December 1997).
- r **Naphthalenes.** Cleanup level based on concentration derived using Equation 720-1. This is a total value for naphthalene, 1-methyl naphthalene and 2-methyl naphthalene.
- s **PCB mixtures.** Cleanup level based on concentration derived using Equation 720-2, adjusted for the practical quantitation limit. This cleanup level is a total value for all PCBs.
- t **Radium 226 and 228.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.15).
- u **Radium 226.** Cleanup level based on applicable state law (WAC 246-290-310).
- v **Tetrachloroethylene.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61).
- w **Toluene.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61).
- x **Total Petroleum Hydrocarbons (TPH).** TPH cleanup values have been provided for the most common petroleum products encountered at contaminated sites. Where there is a mixture of products or the product composition is unknown, samples must be tested using both the NWTPH-Gx and NWTPH-Dx methods and the lowest applicable TPH cleanup level must be met.
- **Gasoline range organics** means organic compounds measured using method NWTPH-Gx. Examples are aviation and automotive gasoline. The cleanup level is based on protection of ground water for noncarcinogenic effects during drinking water use. Two cleanup levels are provided. The higher value is based on the assumption that no benzene is present in the ground water sample. If any detectable amount of benzene is present in the ground water sample, the lower TPH cleanup level must be used. No interpolation between these cleanup levels is allowed. The ground water cleanup level for any carcinogenic components of the petroleum [such as benzene, EDB and EDC] and any noncarcinogenic components [such as ethylbenzene, toluene, xylenes and MTBE], if present at the site, must also be met. See Table 830-1 for the minimum testing requirements for gasoline releases.
- **Diesel range organics** means organic compounds measured using NWTPH-Dx. Examples are diesel, kerosene, and #1 and #2 heating oil. The cleanup level is based on protection from noncarcinogenic effects during drinking water use. The ground water cleanup level for any carcinogenic components of the petroleum [such as benzene and PAHs] and any noncarcinogenic components [such as ethylbenzene, toluene, xylenes and naphthalenes], if present at the site, must also be met. See Table 830-1 for the minimum testing requirements for diesel releases.
- **Heavy oils** means organic compounds measured using NWTPH-Dx. Examples are #6 fuel oil, bunker C oil, hydraulic oil and waste oil. The cleanup level is based on protection from noncarcinogenic effects during drinking water use, assuming a product composition similar to diesel fuel. The ground water cleanup level for any carcinogenic components of the petroleum [such as benzene, PAHs and PCBs] and any noncarcinogenic components [such as ethylbenzene, toluene, xylenes and naphthalenes], if present at the site, must also be met. See Table 830-1 for the minimum testing requirements for heavy oil releases.
- **Mineral oil** means non-PCB mineral oil, typically used as an insulator and coolant in electrical devices such as transformers and capacitors measured using NWTPH-Dx. The cleanup level is based on protection from noncarcinogenic

effects during drinking water use. Sites using this cleanup level must analyze ground water samples for PCBs and meet the PCB cleanup level in this table unless it can be demonstrated that: (1) The release originated from an electrical device manufactured after July 1, 1979; or (2) oil containing PCBs was never used in the equipment suspected as the source of the release; or (3) it can be documented that the oil released was recently tested and did not contain PCBs. Method B (or Method C, if applicable) must be used for releases of oils containing greater than 50 ppm PCBs. See Table 830-1 for the minimum testing requirements for mineral oil releases.

- y **1,1,1 Trichloroethane.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61).
- z **Trichloroethylene.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61).
- aa **Vinyl chloride.** Cleanup level based on applicable state and federal law (WAC 246-290-310 and 40 C.F.R. 141.61), adjusted to a 1×10^{-5} risk.
- bb **Xylenes.** Cleanup level based on xylene not exceeding the maximum allowed cleanup level for total petroleum hydrocarbons and on prevention of adverse aesthetic characteristics. This is a total value for all xylenes.

Table 740-1
Method A Soil Cleanup Levels for Unrestricted Land Uses.^a

| Hazardous Substance | CAS Number | Cleanup Level |
|---|-------------------|---------------------------|
| Arsenic | 7440-38-2 | 20 mg/kg ^b |
| Benzene | 71-43-2 | 0.03 mg/kg ^c |
| Benzo(a)pyrene | 50-32-8 | 0.1 mg/kg ^d |
| Cadmium | 7440-43-9 | 2 mg/kg ^e |
| Chromium | | |
| Chromium VI | 18540-29-9 | 19 mg/kg ^{f1} |
| Chromium III | 16065-83-1 | 2,000 mg/kg ^{f2} |
| DDT | 50-29-3 | 3 mg/kg ^g |
| Ethylbenzene | 100-41-4 | 6 mg/kg ^h |
| Ethylene dibromide (EDB) | 106-93-4 | 0.005 mg/kg ⁱ |
| Lead | 7439-92-1 | 250 mg/kg ^j |
| Lindane | 58-89-9 | 0.01 mg/kg ^k |
| Methylene chloride | 75-09-2 | 0.02 mg/kg ^l |
| Mercury (inorganic) | 7439-97-6 | 2 mg/kg ^m |
| MTBE | 1634-04-4 | 0.1 mg/kg ⁿ |
| Naphthalenes | 91-20-3 | 5 mg/kg ^o |
| PCB Mixtures | | 1 mg/kg ^p |
| Tetrachloroethylene | 127-18-4 | 0.05 mg/kg ^q |
| Toluene | 108-88-3 | 7 mg/kg ^r |
| Total Petroleum Hydrocarbons^s | | |
| [Note: Must also test for and meet cleanup levels for other petroleum components--see footnotes!] | | |
| Gasoline Range Organics | | 100 mg/kg |
| Gasoline mixtures Without benzene and consisting of no more than 20% aromatic hydrocarbons between EC 8 and EC 16 | | 30 mg/kg |
| All other gasoline mixtures | | |
| Diesel Range Organics | | 2,000 mg/kg |
| Heavy Oils | | 2,000 mg/kg |
| Mineral Oil | | 4,000 mg/kg |
| 1,1,1 Trichloroethane | 71-55-6 | 2 mg/kg ^t |
| Trichloroethylene | 79-01-5 | 0.03 mg/kg ^u |
| Xylenes | 1330-20-7 | 9 mg/kg ^v |

Footnotes:

- a** **Caution on misusing this table.** This table has been developed for specific purposes. It is intended to provide conservative cleanup levels for sites undergoing routine cleanup actions or for sites with relatively few hazardous substances, and the site qualifies under WAC 173-340-7491 for an exclusion from conducting a simplified or site-specific terrestrial ecological evaluation, or it can be demonstrated using a terrestrial ecological evaluation under WAC 173-340-7492 or 173-340-7493 that the values in this table are ecologically protective for the site. This table may not be appropriate for defining cleanup levels at other sites. For these reasons, the values in this table should not automatically be used to define cleanup levels that must be met for financial, real estate, insurance coverage or placement, or similar transactions or purposes. Exceedances of the values in this table do not necessarily mean the soil must be restored to these levels at a site. The level of restoration depends on the remedy selected under WAC 173-340-350 through 173-340-390.
- b** **Arsenic.** Cleanup level based on direct contact using Equation 740-2 and protection of ground water for drinking water use using the procedures in WAC 173-340-747(4), adjusted for natural background for soil.
- c** **Benzene.** Cleanup level based on protection of ground water for drinking water use, using the procedures in WAC 173-340-747 (4) and (6).
- d** **Benzo(a)pyrene.** Cleanup level based on direct contact using Equation 740-2. This value may also be used as the total concentration that all carcinogenic PAHs must meet using the toxicity equivalency methodology in WAC 173-340-708(8).
- e** **Cadmium.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4), adjusted for the practical quantitation limit for soil.
- fl** **Chromium VI.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).
- f2** **Chromium III.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4). Chromium VI must also be tested for and the cleanup level met when present at a site.
- g** **DDT (dichlorodiphenyltrichloroethane).** Cleanup level based on direct contact using Equation 740-2.
- h** **Ethylbenzene.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).
- i** **Ethylene dibromide (1,2 dibromoethane or EDB).** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4), adjusted for the practical quantitation limit for soil.
- j** **Lead.** Cleanup level based on preventing unacceptable blood lead levels.
- k** **Lindane.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4), adjusted for the practical quantitation limit.
- l** **Methylene chloride (dichloromethane).** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).
- m** **Mercury.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).
- n** **Methyl tertiary-butyl ether (MTBE).** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).
- o** **Naphthalenes.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4). This is a total value for naphthalene, 1-methyl naphthalene and 2-methyl naphthalene.
- p** **PCB Mixtures.** Cleanup level based on applicable federal law (40 C.F.R. 761.61). This is a total value for all PCBs.
- q** **Tetrachloroethylene.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).
- r** **Toluene.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).
- s** **Total Petroleum Hydrocarbons (TPH).** TPH cleanup values have been provided for the most common petroleum products encountered at contaminated sites. Where there is a mixture of products or the product composition is unknown, samples must be tested using both the NWTPH-Gx and NWTPH-Dx methods and the lowest applicable TPH cleanup level must be met.
- Gasoline range organics** means organic compounds measured using method NWTPH-Gx. Examples are aviation and automotive gasoline. The cleanup level is based on protection of ground water for noncarcinogenic effects during drinking water use using the procedures described in WAC 173-340-747(6). Two cleanup levels are provided. The lower value of 30 mg/kg can be used at any site. When using this lower value, the soil must also be tested for and meet the benzene soil cleanup level. The higher value of 100 mg/kg can only be used if the soil is tested and found to contain no benzene and less than 20% of the gasoline mixture consists of aromatic petroleum hydrocarbons between EC 8 and EC 16. No interpolation between these cleanup levels is allowed. In both cases, the soil cleanup level for any other carcinogenic components of the petroleum [such as EDB and EDC], if present at the site, must also be met. Also, in both cases, soil cleanup levels for any noncarcinogenic components [such as toluene, ethylbenzene, xylenes, naphthalene, and MTBE], also must be met if these substances are found to exceed ground water cleanup levels at the site. See Table 830-1 for the minimum testing requirements for gasoline releases.
- Diesel range organics** means organic compounds measured using method NWTPH-Dx. Examples are diesel, kerosene, and #1 and #2 heating oil. The cleanup level is based on preventing the accumulation of free product on the ground water, as described in WAC 173-340-747(10). The soil cleanup level for any carcinogenic components of the petroleum [such as benzene and PAHs], if present at the site, must also be met. Soil cleanup levels for any noncarcinogenic components [such as toluene, ethylbenzene, xylenes and naphthalenes], also must be met if these substances are found to exceed the ground water cleanup levels at the site. See Table 830-1 for the minimum testing requirements for diesel releases.
- Heavy oils** means organic compounds measured using NWTPH-Dx. Examples are #6 fuel oil, bunker C oil, hydraulic oil and waste oil. The cleanup level is based on preventing the accumulation of free product on the ground water, as described in WAC 173-340-747(10) and assuming a product composition similar to diesel fuel. The soil cleanup level for any carcinogenic components of the petroleum [such as benzene, PAHs and PCBs], if present at the site, must also be met. Soil cleanup levels for any noncarcinogenic components [such as toluene, ethylbenzene, xylenes and naphthalenes], also must be met if found to exceed the ground water cleanup levels at the site. See Table 830-1 for the minimum testing requirements for heavy oil releases.
- Mineral oil** means non-PCB mineral oil, typically used as an insulator and coolant in electrical devices such as transformers

and capacitors, measured using NWTPH-Dx. The cleanup level is based on preventing the accumulation of free product on the ground water, as described in WAC 173-340-747(10). Sites using this cleanup level must also analyze soil samples and meet the soil cleanup level for PCBs, unless it can be demonstrated that: (1) The release originated from an electrical device that was manufactured after July 1, 1979; or (2) oil containing PCBs was never used in the equipment suspected as the source of the release; or (3) it can be documented that the oil released was recently tested and did not contain PCBs. Method B must be used for releases of oils containing greater than 50 ppm PCBs. See Table 830-1 for the minimum testing requirements for mineral oil releases.

- t** **1,1,1 Trichloroethane.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).
- u** **Trichloroethylene.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).
- v** **Xylenes.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4). This is a total value for all xylenes.