

Prepared for:
The BNSF Railway Company
Seattle, Washington

2007-2008 Annual Site-Wide Groundwater Monitoring Report

BNSF Former Fueling and Maintenance Facility –
Skykomish, Washington

AECOM, Inc.
July 2009
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Contents

1.0	Introduction	1-1
1.1	Groundwater Monitoring Objectives	1-1
1.2	Background.....	1-1
1.3	Report Organization	1-2
2.0	Monitoring Well Network.....	2-1
3.0	Gauging and Sampling Procedures	3-1
3.1	Fluid Level Measurements	3-1
3.1.1	Groundwater Levels and Product Thickness Measurements.....	3-1
3.1.2	Surface Water Level Measurements	3-1
3.2	Sampling Methods	3-2
3.2.1	Well Purging and Field Parameter Collection	3-2
3.2.2	Sample Preservation and Handling.....	3-2
3.2.3	Investigation-Derived Waste.....	3-2
4.0	Laboratory Analysis and Reporting	4-1
4.1	Analytical Methods.....	4-1
4.2	Data Packages	4-1
4.3	Data Management and Validation.....	4-1
4.4	Groundwater Cleanup Levels and Remediation Levels.....	4-2
5.0	Results	5-1
5.1	Fluid Levels	5-1
5.2	Field Parameters	5-1
5.2.1	pH.....	5-1
5.2.2	Conductivity.....	5-2
5.2.3	Temperature	5-2
5.2.4	Oxidation-Reduction Potential.....	5-2
5.2.5	Turbidity.....	5-2
5.3	Total Petroleum Hydrocarbons	5-2
5.3.1	Site-Wide Wells.....	5-3
5.3.2	Levee Zone Wells	5-3
5.3.3	Former Maloney Creek Wells.....	5-3
6.0	Summary and Recommendations	6-1
7.0	References	7-1

List of Appendices

Appendix A Field Forms

Appendix B Data Reports

Appendix C Data Validation Reports

List of Tables

Table 5-1 Potentiometric Surface Elevations and Product Thicknesses – August 2007 – September 2008

Table 5-2 Stabilized Field Parameter Measurements

Table 5-3 Total Petroleum Hydrocarbons (TPH-Dx)

List of Figures

- Figure 1-1 Regional Location Map
- Figure 1-2 Site Map Showing Site Zones and other Notable Features
- Figure 2-1 Site Layout showing Fluid Level Gauging Network August 2007 – April 2008
- Figure 2-2 Site Layout showing Fluid Level Gauging Network May – September 2008
- Figure 5-1 Hydrograph Source Data Locations Plotted on Hydrographs
- Figure 5-2 Groundwater Elevations – Selected Wells January 2003 – September 2007
- Figure 5-3 Groundwater Elevations – Selected Wells August 2007 – September 2008
- Figure 5-4 Skykomish River and Select Wells Groundwater Elevations August 2007 – September 2008
- Figure 5-5 Product Thickness vs. Groundwater Elevation in Well 5-W-2 (2002-2008)
- Figure 5-6 Product Thickness vs. Groundwater Elevation in Well 5-W-3 (2002-2008)
- Figure 5-7 Product Thickness vs. Groundwater Elevation in Well MW-8 (2002-2008)
- Figure 5-8 Product Thickness vs. Groundwater Elevation in Well MW-20 (2002-2008)
- Figure 5-9 Product Thickness vs. Groundwater Elevation in Well MW-21 (2002-2008)
- Figure 5-10 Product Thickness vs. Groundwater Elevation in Well MW-36 (2002-2008)
- Figure 5-11 October 2007 Potentiometric Map
- Figure 5-12 November 2, 2007 Potentiometric Map
- Figure 5-13 November 15, 2007 Potentiometric Map
- Figure 5-14 December 2007 Potentiometric Map
- Figure 5-15 January 2008 Potentiometric Map
- Figure 5-16 March 2008 Potentiometric Map
- Figure 5-17 April 2008 Potentiometric Map
- Figure 5-18 May 2008 Potentiometric Map
- Figure 5-19 June 2008 Potentiometric Map
- Figure 5-20 July 2008 Potentiometric Map
- Figure 5-21 August 2008 Potentiometric Map
- Figure 5-22 September 2008 Potentiometric Map
- Figure 5-23 Total Petroleum Hydrocarbons (TPH-Dx) in Groundwater – October 2007
- Figure 5-24 Total Petroleum Hydrocarbons (TPH-Dx) in Groundwater – November 2007
- Figure 5-25 Total Petroleum Hydrocarbons (TPH-Dx) in Groundwater – December 2007
- Figure 5-26 Total Petroleum Hydrocarbons (TPH-Dx) in Groundwater – March 2008
- Figure 5-27 Total Petroleum Hydrocarbons (TPH-Dx) in Groundwater – June 2008
- Figure 5-28 Total Petroleum Hydrocarbons (TPH-Dx) in Groundwater – September 2008
- Figure 5-29 TPH Concentrations in Select Wells versus Time August 2007 – September 2008
- Figure 5-30 TPH Concentrations in Select Wells versus Time (2003-2008)

1.0 Introduction

This Site-Wide Groundwater Monitoring Report (report) was prepared for the Burlington Northern Santa Fe (BNSF) Former Fueling and Maintenance Facility, Skykomish, Washington (Site) on behalf of the BNSF Railway Company, in accordance with Section VI.A.6. of Consent Decree No. 07-2-33672-9SEA and the *Groundwater Monitoring Plan* (Plan; RETEC, 2005a, 2007 and ENSR, 2008a) and describes the details and results of the site-wide groundwater monitoring activities performed from August 2007 to September 2008. This includes 1) semi-annual site-wide monitoring events completed in March and September 2008; 2) bi-monthly Levee Zone monitoring completed in October, November and December 2007; and 3) quarterly Levee Zone monitoring in March and June 2008.

1.1 Groundwater Monitoring Objectives

The *Groundwater Monitoring Plan* (Plan; RETEC, 2005a, 2007 and ENSR, 2008a) describes a program that is intended to accomplish the following objectives:

- Evaluate potential changes in total petroleum hydrocarbons (TPH) distribution that may affect implementation of cleanup actions throughout the Site.
- Provide monitoring data for the groundwater in the Levee Zone to assess how Levee Zone interim cleanup actions affect groundwater quality.
- Provide water level data to assess the groundwater flow direction in the vicinity of the Former Maloney Creek east wetland.

1.2 Background

The Site includes BNSF property and adjacent public and private properties within the Town of Skykomish, and encompasses an area of about 40 acres (Figure 1-1). The Site is approximately bounded by: the South Fork Skykomish River to the north, Skykomish city limits to the east, Old Cascade Highway to the south, and Maloney Creek to the west. Railroad Avenue separates BNSF property from the main commercial district of the town (Figure 1-2).

The Former Railway Maintenance and Fueling Facility in Skykomish is owned and operated by BNSF. Historical activities since the facility opened in the late 1890s included refueling and maintaining locomotives and operating an electrical substation for electric engines. BNSF stored Bunker C and diesel fuel at the Site in aboveground storage tanks (ASTs) and underground storage tanks (USTs) until 1974, when BNSF discontinued most fuel handling activities at the Site.

Some of the historic Site activities resulted in the release of petroleum products and other compounds to the surrounding environment. In early 1991, Washington State Department of Ecology (Ecology) designated the Site as a high priority cleanup site. Later that year, BNSF initiated plans to conduct a Remedial Investigation/Feasibility Study (RI/FS) in accordance with the Ecology Model Toxics Control Act (MTCA). At that time, formal negotiations for Agreed Order No. DE 91TC-N213 began. Negotiations were completed in mid-1993. Following a public comment period, the Agreed Order, which included detailed work plans for the RI/FS process and early interim action for cleanup work, was signed by Ecology and BNSF. Ecology and BNSF signed a separate agreed order (No. DE 01TCPNR-2800) in 2001 for additional interim action cleanup work near the South Fork Skykomish River and the levee west of 5th Street. BNSF has been routinely monitoring groundwater at the Site pursuant to the 2001 Agreed Order and *Interim Action Basis of Design Report for the*

LNAPL Barrier System (RETEC, 2001). BNSF also conducted groundwater monitoring pursuant to the 1993 Order (after the RI and supplemental RI) in conjunction with the 1995 interim action (passive skimming wells).

In 2006, Ecology and BNSF signed an additional agreed order (No. DE-2379) that outlined the interim action for cleanup work in the Levee Zone and part of the Northwest Developed Zone (NWDZ). This interim action consisted of:

- Temporary relocation of five residences,
- Excavation of the levee, underlying soils and sediments along the south bank of the South Fork Skykomish River,
- Reconstruction of the levee, and restoration of natural resources, private property and public infrastructure that were disturbed by the remediation activities.

Under the 2006 Agreed Order, BNSF was required to continue groundwater monitoring as described in the *Groundwater Monitoring Plan* (RETEC, 2005a). In October 2007, BNSF and Ecology signed a Consent Decree (CD, No. 07-2-33672-9 SEA). Any remaining work required by the 2006 order was incorporated into and required by the CD. The CD requires BNSF to conduct a final cleanup of the Site by implementing the 2006 *Action Plan for Cleanup* (CAP) (ENSR, 2007b) in accordance with the schedule identified in the CD.

Section VI.A.6 of the CD requires BNSF to conduct groundwater monitoring consistent with the *Groundwater Monitoring Plan* (RETEC, 2005a) as amended. Upon the approval of Ecology, the *Groundwater Monitoring Plan* was amended in 2007 to the *Groundwater Monitoring Plan, Revision 1* (RETEC, 2007), which went into effect in July 2007. This plan is revised annually. The most recent revision, *Groundwater Monitoring Plan* (ENSR, 2008a), was approved by Ecology and went into effect in July 2008.

Since 1993, investigations performed by BNSF, in cooperation with Ecology, have revealed petroleum residuals in soil, groundwater, sediments, and surface water. Detailed information about the scope of prior investigations and the results appear in the 1996 *Remedial Investigation Report* (RETEC, 1996), the 2002 *Supplemental Remedial Investigation Report* (RETEC, 2002), the 2005 *Feasibility Study* (RETEC 2005b) and the 2007 *Remedial Design Investigation Report* (RDI Report, ENSR, 2008b).

1.3 Report Organization

Section 1 of this report provides an introduction, background information and the objectives of the site-wide groundwater monitoring. Section 2 describes the monitoring well network, changes made to the network during the monitoring period, and forthcoming changes related to cleanup activities. Section 3 describes the methods used to perform the monitoring activities. Section 4 describes the laboratory analyses and reporting and the subsequent data management and validation activities performed by AECOM Environment (AECOM). The section also describes the groundwater cleanup levels and remediation levels that have been established for the Site. Section 5 describes the results of the monitoring activities, specifically the fluid level gauging and analytical results from the groundwater sampling. Section 6 provides a summary of the data and recommendations for future sampling events. Finally, Section 7 provides cited references.

2.0 Monitoring Well Network

This section describes the piezometers and wells that were included in the groundwater monitoring network for fluid level gauging and groundwater analytical sampling during the monitoring period. Piezometer and well locations are shown in Figures 2-1 and 2-2.

Since the 2007 monitoring event, 11 piezometers were added to the FMCZ and 18 monitoring wells were decommissioned along Railroad Avenue. In agreement with Ecology (ENSR, 2007a), the 11 piezometers were installed in the FMCZ East Wetland, RYZ, and SDZ during August and September 2007 to evaluate groundwater flow direction in the vicinity of the east wetland and to compare groundwater to surface water levels within the east wetland. Monthly gauging took place immediately following installation. These piezometers were officially added to the monitoring well gauging network in the *2008 Groundwater Monitoring Plan (ENSR, 2008a)*.

The monitoring well gauging and sampling network was further modified after the March 2008 semi-annual groundwater sampling and gauging event. In April 2008, 18 monitoring wells were decommissioned along Railroad Avenue in preparation for the 2008 excavation and construction of the Hydraulic Contaminant Control (HCC) wall. Eight of these wells were part of the fluid level gauging network. Decommissioning details will be included in the *2008 Skykomish Remediation – As Built Completion Report*, which was submitted in March 2009 (AECOM 2009).

The monitoring well network utilized from June 2007 to June 2008, as described in the *Groundwater Monitoring Plan, Revision 1 (RETEC, 2007)*, consisted of the following, as categorized by the monitoring frequency.

- Monthly Monitoring - 11 piezometers and 27 monitoring wells for fluid level gauging in the vicinity of Former Maloney Creek starting in November 2007
- Bi-Monthly Monitoring - 13 monitoring wells for fluid level gauging in the vicinity of the Levee Zone; 7 of these wells were sampled for TPH analysis by NWTPH-Dx
- Semi-Annual Monitoring –
 - 41 monitoring wells for Site-wide fluid level gauging; 28 of these wells were sampled for TPH analysis by NWTPH-Dx
 - 9 locations for surface water level gauging

The current monitoring well network, which was utilized from July 2008 to September 2008 and is as defined in the July 2008 version of the *Groundwater Monitoring Plan (ENSR, 2008a)* consists of the following, as categorized by the monitoring frequency.

- Monthly Monitoring - 11 piezometers and 27 monitoring wells for fluid level gauging in the vicinity of Former Maloney Creek
- Quarterly Monitoring - 13 monitoring wells for fluid level gauging in the vicinity of the Levee Zone; 7 of these wells were sampled for TPH analysis by NWTPH-Dx

- Semi-Annual Monitoring –
 - 33 monitoring wells for Site-wide fluid level gauging; 21 of these wells were sampled for TPH analysis by NWTPH-Dx
 - 9 locations for surface water level gauging

In the remainder of this document, the “Plan” refers to the 2008 revision of the Groundwater Monitoring Plan (ENSR, 2008a), as approved by Ecology, and described in Section 1.

In addition to the monitoring scope defined in the Plan, a seep, along the bank of the South Fork Skykomish River, located near the 6th Street fallout, was sampled in September 2008 per Ecology’s request.

During site-wide gauging events during this reporting period there were two wells (2A-W-7 and 2A-W-4) with suspect groundwater elevations. The groundwater elevations in these wells were consistently higher than the surrounding areas. This is believed to be due to errors in well elevation survey data. This has been noted on the respective potentiometric map figures and these wells will be re-surveyed in the near future.

The conditional points of compliance for groundwater are generally described in Section 3.4 and Figure 6 of the CAP. The monitoring network described above was established, in part, before the CAP was issued by Ecology in October 2007; however, all of the wells in the network are well inside the groundwater compliance boundary. Compliance boundary wells will be identified in the Long-Term Compliance Monitoring Plan to be developed at the conclusion of active remediation.

3.0 Gauging and Sampling Procedures

This section describes the field methods that were used for the fluid level gauging and sample collection activities described in the Plan.

3.1 Fluid Level Measurements

3.1.1 Groundwater Levels and Product Thickness Measurements

Fluid level measurements were made to provide groundwater elevation and free product thickness data. The fluid levels were measured and recorded at each well location prior to purging or sample collection activities. Two methods were used to measure fluid levels at monitoring well locations depending on whether a well contained Light Non-aqueous Phase Liquid (LNAPL).

If LNAPL was observed as a light trace (0.01 feet thick) then the depth to the top and the thickness of the LNAPL was measured using tape and paste. In this method, a measuring tape was coated with a water-reactive paste. The tape was then lowered into the well until it was below the water level. The paste reacts to the water by changing color and the LNAPL thickness can be estimated by the tape interval that was coated with the petroleum product. The groundwater elevation was then derived from the length of measuring tape that has not changed color. The LNAPL thickness was added to the groundwater elevation to derive the LNAPL top elevation.

If the LNAPL was observed at a greater thickness (0.02 feet or more thick), then, in addition to the tape and paste method, the thickness was verified using a site-specific method that employs a peristaltic pump. First the top of fluid was measured. Then, polyethylene tubing was lowered into the well to a depth below the water table. Water was pumped while the tubing was gradually raised. Once the pump began to pump LNAPL instead of water, the remaining tubing was pulled from the well and its length was measured to derive elevation.

If LNAPL was not observed, then a water level meter was used to gauge depth to water. The method used for gauging each well was noted on the gauging field forms, which are provided in Appendix A.

All measurements were collected in accordance with the Plan (ENSR, 2008a). Measurement equipment was decontaminated between wells in accordance with Standard Operating Procedure (SOP) 7600 and fluid level data were recorded on appropriate field forms (provided in Appendix A of the Plan). The field form includes fields for date and time of the measurement, depth to water (in feet), depth to LNAPL (in feet), LNAPL thickness (in feet) and measurement method. In addition, the well condition (including the condition of the lock, monument integrity, and legibility of well labels) was recorded for each location.

Upon completion of a measurement event, the field manager inspected the field forms and collected data. After assuring that the information was complete, the field manager signed the quarterly gauging sheets before the field staff left the Site.

3.1.2 Surface Water Level Measurements

River stage measurements were collected at five locations along the South Fork Skykomish River during the site-wide fluid level measuring events. Two of the locations are at known permanent landmarks (a storm outfall and a bridge abutment). The other three locations are set equidistant from the two landmarks.

The river stage elevations at each location were measured using a surveying level and rod. The elevations were measured from permanent surveying monuments in the street, parallel to the river bank.

Surface water level measurements were also collected from four piezometer locations within the FMCZ -east wetland. The piezometers, which are also used to measure groundwater elevations beneath the wetlands, were constructed with blank casing tops well above the surface water and the top-of-casing elevations have been surveyed. Therefore, the piezometer casings were used to measure the surface water elevations by placing a water level meter along the outside of the piezometers and measuring from the top of the casing to the surface of the water.

3.2 Sampling Methods

Standard EPA-approved low-flow sampling techniques, described in the Plan (SOP 235), were used for monitoring wells that have historically been free of LNAPL.

A different sampling methodology was used for wells containing LNAPL. Due to the nature and physical properties (high viscosity and specific gravity of 0.97) of Bunker C, there is a risk that LNAPL could mix with the underlying groundwater and be entrained in groundwater samples using standard sampling procedures. Therefore, as described in the Plan, air was blown out through the polyethylene tubing as it was lowered into the well. This was done in an attempt to prevent any free product from entering the tubing. These wells were then purged for 10 minutes at a low flow rate before sample collection. The low-flow purging was intended to minimize disturbance and the potential for LNAPL/water mixing. No field parameters were collected.

The fluid level measurements (described in Section 3.1) were used at each product-containing well to position the polyethylene tubing such that the tubing inlet was approximately one foot below LNAPL/water interface. Samples were then collected using low-flow sampling techniques. After sampling was complete at each location, the polyethylene sampling tube was discarded.

3.2.1 Well Purging and Field Parameter Collection

Each well was purged prior to sampling using a peristaltic pump with new disposable tubing at a flow rate of 0.1 to 0.5 L/min. During purging, the flow rates, water levels, and water quality parameters (pH, conductivity, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity) were recorded. Purging continued until the parameters stabilized (i.e., the measured values showed little variation). Water quality parameter measurements are discussed in Section 5.2 of this report.

As previously stated, field parameters were not measured at wells that contain measurable LNAPL because the petroleum product could damage the water quality meters.

3.2.2 Sample Preservation and Handling

Appropriate packaging and shipping methods were used to minimize the potential for sample breakage, leakage or cross contamination (the Plan, SOP 7600). In addition, the documentation accompanying the samples provided a record of sample custody from collection to analysis. All sample containers were pre-preserved in laboratory-cleaned containers. All sample preservation, handling, and analysis were conducted in accordance with the Plan.

3.2.3 Investigation-Derived Waste

All decontamination water and purge water was drummed, labeled and disposed of at a licensed disposal facility in accordance with applicable regulations and the Plan.

4.0 Laboratory Analysis and Reporting

This section summarizes the laboratory analysis and reporting procedures, and the subsequent data management and validation. Groundwater samples were analyzed by Test America Analytical Laboratories (TestAmerica), located in Bothell, Washington. TestAmerica is a Washington-certified laboratory.

4.1 Analytical Methods

Groundwater samples were analyzed for TPH using method NWTPH-Dx both with and without the acid-silica gel cleanup method.

The laboratory was instructed to report sample concentrations to the method detection limit (MDL) rather than the higher method reporting limit (MRL). It was recognized that reported concentrations above the MDL but below the MRL have a greater degree of uncertainty. Accordingly, these results were qualified as estimated (J-flagged). Reporting of results to the MDL has the advantage of reporting detected concentrations at a lower level. This also minimizes the chances that a non-detected result will be reported with a detection limit greater than the cleanup level (CUL).

4.2 Data Packages

TestAmerica provided both electronic data deliverables that could be directly imported into the environmental data management system and text data reports. The text data reports were provided as hard copies (Appendix B) and in electronic (.pdf) files.

Each data report included copies of the chain-of-custody forms and a case narrative with the following information: description of case, comments on sample condition upon receipt, and description of sample preparation and analysis. The following data were included in the data report: MDL, MRL, units of measure, dilution factor, batch number, date received, date prepared, date analyzed, analytical method, and any notes or qualifiers.

The report also contained the details and results of laboratory QA/QC procedures that were performed on the samples.

4.3 Data Management and Validation

Upon receipt of the data from TestAmerica, the electronic data deliverables and case narratives were checked for completeness, and then validated by staff chemists. Once validated, the data were imported into the environmental data management system. Finally, a quality control check was performed on the imported data to ensure that it was accurately uploaded and that transfer errors did not occur.

AECOM chemists evaluated the groundwater data to assess whether the analytical results met the quality control/validation standards described in the Plan. These metrics included precision, accuracy, method compliance and completeness of the data set. The validation results were then used to evaluate whether the data were suitable for their intended use. The validation was performed based on the criteria provided in:

- *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review*, document number EPA540/R-99/008 of October 1999
- *USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review*, document number USEPA-540-R-07-003, July 2007.

- *Analytical Methods for Petroleum Hydrocarbons*, ECY 97-602. June 1997.

Field duplicate relative percent difference review and applicable control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, December 1996.

Data validation reports are presented in Appendix C.

4.4 Groundwater Cleanup Levels and Remediation Levels

The groundwater TPH CUL (208 µg/L) and RL (477 µg/L) are specified in Section 3.4 and Table 1 of the CAP in accordance with WAC 173-340-720. The CAP anticipates that cleanup levels will be attained at points of compliance following implementation of all cleanup actions specified in the CAP and final compliance monitoring begins in 2012. (CAP, Sections 4 and 6.2.)

5.0 Results

This section presents a summary and evaluation of the results from the fluid level gauging and TPH analytical sampling conducted during the reporting period.

5.1 Fluid Levels

This section provides data and conclusions drawn from the quarterly fluid level gauging that occurred from August 2007 through September 2008. Table 5-1 presents gauging results from this reporting period. Seasonal variations in groundwater elevations and product thickness, and changes in groundwater gradients are discussed below.

There were two notable variations from the planned fluid level measurement activities. During the January 2008 monthly gauging event only a subset of locations were inaccessible due to unusually heavy snowfall. The snowfall continued through February 2008 making access to monitoring wells unsafe. Between June 30 and August 25, 2008 potentiometric surface gradients and flow directions were affected by construction dewatering and the installation of the sheetpile HCC wall.

Groundwater levels show seasonal variations in response to river levels and seasonal changes in precipitation. Figure 5-1 shows the locations of the wells and South Fork Skykomish River gauges used in the hydrographs. Figures 5-2 and 5-3 show seasonal groundwater variation for the past five years (January 2003 to September 2008) and for the period from August 2007 to September 2008, respectively. Figure 5-4 shows river levels and groundwater well data from August 2007 to September 2008.

Six wells from around the Site were selected to evaluate the relationship between free product thicknesses and groundwater elevations. Figures 5-5 through 5-10 are scatter plots of water level vs. product thickness from gauging events from 2002 through 2008. These data suggest there may be a slight trend showing a decrease in product thickness as the groundwater elevation increases.

Monthly potentiometric surface maps for the reporting period starting in October 2007 are shown in Figures 5-11 through 5-22. As shown in these figures, the groundwater flow direction is consistently towards the river, to the north or northwest, regardless of the season. These figures also show the groundwater elevations are lower in the levee remediation area due, at least in part, to the impermeable liner, which is shown on the figures and is described in the *Levee Zone Interim Action for Cleanup 2006- As Built Completion Report* (ENSR, 2007b).

5.2 Field Parameters

Table 5-2 presents stabilized field parameter measurements collected during the quarterly and semi-annual groundwater sampling events of the reporting period from all wells except those containing free product. Each field parameter is discussed separately below.

5.2.1 pH

The median pH of groundwater across the site during the reporting period was 6.02. The minimum pH was 4.83 at 2A-W-6 in December 2007 and the maximum pH was 7.45 at 5-W-16 in March 2008. The median, minimum and maximum pH measurements were consistent with past measurements at the Site.

5.2.2 Conductivity

The median conductivity (in $\mu\text{mhos/cm}$) of groundwater across the Site during the reporting period was 69. The minimum was 32 at MW-37 in March 2008 and the maximum was 307 at 5-W-15 in March 2008. These measurements were consistent with historical values.

5.2.3 Temperature

The median temperature (C) in groundwater during the reporting period was 7.18. The minimum temperature was 0.90 at MW-4 in March 2008, and a maximum temperature was 16.0 at 5-W-4 in September 2008. The temperature varied seasonally.

5.2.4 Dissolved Oxygen

The median dissolved oxygen (DO) concentration (mg/L) in groundwater across the Site during the reporting period was 2.34. The minimum DO was 0.00 mg/L (suspected meter error) and the maximum was 10.70 at 5-W-16. In general, the wells within the 2006 interim action area and outside the areas of known contamination had higher concentrations of DO than the wells within the dissolved plume area. The lowest concentrations of DO were typically measured in areas within and downgradient from the areas of known contamination and in areas having higher concentrations of groundwater contamination. These measurements are consistent with historical values.

5.2.4 Oxidation-Reduction Potential

The median oxidation reduction potential (ORP) in groundwater across the site during the reporting period was 101.2. The minimum ORP value was -112 mV at MW-35 in March 2008 and a maximum was 536 mV at 5-W-17 in March 2008. ORP in groundwater at the site is most commonly positive. These measurements were consistent with historical values.

5.2.5 Turbidity

The median turbidity in groundwater across the Site during the reporting period was 1.90 NTU. The minimum turbidity was 0 at 5-W-17 in September 2008, and the maximum was 48.2 NTU at MW-3 in September 2008. Turbidity measurements were generally less than 10 during the reporting period and are consistent with historic measurements.

5.3 Total Petroleum Hydrocarbons

TPH in groundwater was analyzed using method NWTPH-Dx, which measures diesel range (TPH-D, C12–C25) and oil range (TPH-O, C25–C36) hydrocarbons. Figures 5-23 through 5-28 show the extent of TPH (measured as method NWTPH-Dx without acid/silica gel cleanup) in groundwater. Concentrations provided on the figures are the sums of oil-range (oil) and diesel-range (diesel) TPH concentrations (no silica gel cleanup). Table 5-3 presents the TPH data for the reporting period.

TPH concentrations were compared to the CUL (208 $\mu\text{g/L}$) and RL (477 $\mu\text{g/L}$). As described in the Cleanup Action Plan, the CUL should be applied in areas where TPH concentrations in groundwater should be protective of sediments (e.g., near the South Fork Skykomish River and Former Maloney Creek) and the RL should be applied where TPH concentrations in groundwater should be protective of drinking water. The conditional point of compliance (CPOC) boundary shown on figures 2-26 through 5-28 is adapted from CAP Figure 6.

The CPOC is still considered tentative and may be adjusted after cleanup activities are completed. However, for the purposes of discussion, the CPOC is included on the figures and individual results are compared with both the CUL and RL.

5.3.1 Site-Wide Wells

TPH results for site-wide monitoring are illustrated on Figures 5-23 through 5-28. Oil concentrations ranged from non-detect to 2,490 µg/L. Diesel concentrations ranged from non-detect to 7,750 µg/L. TPH (oil plus diesel) concentrations ranged from 61 to 10,240 µg/L. TPH (oil plus diesel range) concentrations in wells located within or adjacent to the plume typically exceeded the RL.

Analytical results from groundwater samples collected from the semi-annual sampling events were reviewed to evaluate whether TPH concentrations vary seasonally. Figure 5-29 presents time-concentration plots of TPH in selected wells. As this figure shows, TPH concentrations were generally greatest during the fall/winter months. Figure 5-30 shows historical TPH data (when available); no long-term trends are evident within the Site, indicating that the plume location is relatively stable. These figures show that the groundwater concentrations generally increase with higher groundwater elevations.

5.3.2 Levee Zone Wells

TPH results in the Levee Zone are illustrated on Figures 5-23 through 5-28. Oil concentrations ranged from non-detect to 855 µg/L. Diesel concentrations ranged from non-detect to 1,540 µg/L. TPH (oil plus diesel) concentrations ranged from 61 µg/L to 1,965 µg/L. The average concentration was 454 µg/L. Concentrations (oil plus diesel) in wells 5-W-15, 5-W-18, and 5-W-20 typically exceeded the RL. Oil and diesel results using acid-silica gel cleanup were mostly non-detect and TPH concentrations (oil plus diesel) did not exceed the RL or CUL, suggesting potential biogenic interferences. However, since significant remaining TPH has been observed in soil south of the Levee Zone excavated area and in confirmational soil samples along the western excavation side-wall, there is other evidence that TPH-affected groundwater may be present in the Levee Zone. The oil and diesel concentrations at the seep were 111 µg/L and 261 µg/L. The TPH concentration (oil plus diesel) at the seep was 372 µg/L, which exceeds the CUL.

5.3.3 Former Maloney Creek Wells

TPH results in the wells in the vicinity of Former Maloney Creek are illustrated on Figures 5-23 through 5-28. Oil concentrations ranged from non-detect to a 1,050 µg/L. Diesel concentrations ranged from non-detect to 1,030 µg/L. TPH (oil plus diesel) concentrations ranged from 61 µg/L to 1,910 µg/L. The average concentration was 609 µg/L. TPH (oil plus diesel) concentrations in wells 2A-W-9 and 2A-W-10 typically exceeded the CUL. TPH (oil plus diesel) concentrations in wells 2A-W-11 and MW-39 typically exceeded the RL. Analysis using acid-silica gel cleanup was not completed for these wells.

6.0 Summary and Recommendations

This report presents the results of groundwater monitoring performed in the third and fourth quarters of 2007 and the first three quarters of 2008. Approximately 103 groundwater samples were collected during the reporting period.

The fluid level and monitoring data collected throughout the reporting period were compared to previous monitoring data. These data indicate groundwater flow gradients are relatively consistent throughout the year and similar to historic gradients; however, the installation of the HCC wall during the 2008 remediation effort has modified the groundwater flow by cutting off the flow from the railyard to the downgradient properties. This wall has not affected the direction of the groundwater flow but has caused a slight mounding on the upgradient side of the wall and caused the groundwater downgradient of the wall to be at a lower elevation than the pre-wall construction elevations. This mounding is being corrected by pumping the groundwater from recovery wells into the on site treatment system. These data also indicate that the LNAPL and dissolved plume extents have remained relatively stable throughout the monitoring period and do not appear to have migrated or changed size, although there are some seasonal fluctuations in TPH concentrations.

TPH concentrations during the monitoring events exceeded the CUL (208 µg/L) and RL (477 µg/L) at locations downgradient and immediately adjacent to areas containing free and residual product.

The TPH CUL (208 µg/L) was exceeded in a sample collected from a seep observed on the bank of the South Fork Skykomish River. The TPH concentration (oil plus diesel range) was 372 µg/L. The seep is located in an area where in-place soil exceeds the soil RL of 3,400 mg/kg NWTPH-Dx. This area west of the levee cleanup zone will be investigated further in 2009 to assess the extent of soil concentrations exceeding the RL and/or the CUL (22.0 mg/kg NWTPH-Dx). During seasons of lower river levels, samples will be collected from the seep and analyzed to more completely understand the potential TPH effects on the South Fork Skykomish River.

7.0 References

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Tables

**Table 5-1 Potentiometric Surface Elevations and Product Thicknesses
August 2007 through September 2008**

Well Number	10/3/2007			11/15/2007			12/13/2007		
	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)
1A--W--1	NM	--	--	NM	--	--	NM	--	--
1A--W--2	NM	--	--	NM	--	--	NM	--	--
1A--W--3	NM	--	--	NM	--	--	NM	--	--
1A--W--4	NM	--	--	NM	--	--	NM	--	--
1A--W--5	919.64	--	--	NM	--	--	919.25	--	--
1B--W--1	NM	--	--	925.83	--	--	925.43	--	Trace
1B--W--2	NM	--	--	NM	--	--	NM	--	--
1B--W--3	NM	--	--	NM	--	--	921.21	--	--
1C--W--1	NM	--	--	NM	--	--	NM	--	--
1C--W--2	NM	--	--	NM	--	--	NM	--	--
1C--W--3	NM	--	--	NM	--	--	NM	--	--
1C--W--4	NM	--	--	NM	--	--	NM	--	--
2A--W--1	NM	--	--	NM	--	--	NM	--	--
2A--W--2	NM	--	--	925.80	--	--	925.26	--	--
2A--W--3	NM	--	--	925.39	--	--	924.48	--	Trace
2A--W--4	NM	--	--	928.79	--	--	928.17	--	Trace
2A--W--5	NM	--	--	927.67	--	--	928.84	--	--
2A--W--6	NM	--	--	NM	--	--	NM	--	--
2A--W--7	NM	--	--	930.82	--	--	929.70	--	--
2A--W--8	NM	--	--	NM	--	--	NM	--	--
2A--W--9	NM	--	--	928.65	--	--	927.89	--	--
2A--W--10	NM	--	--	929.65	--	--	929.1	--	--
2A--W--11	NM	--	--	928.06	--	--	925.73	--	Trace
2A--W--22	NM	--	--	NM	--	--	925.51	--	--
2B--B--211	NM	--	--	NM -- due to damage			NM -- due to damage		
2B--W--4	NM	--	--	929.33	--	--	929.12	--	--
2B--W--11	NM	--	--	929.72	929.91	--	929.47	NM	--
2B--W--122	NM	--	--	929.67	929.73	--	929.27	NM	--
2B--W--13	NM	--	--	929.11	929.34	--	928.71	NM	--
2B--W--14	NM	--	--	927.90	928.00	--	928.47	NM	--
2B--W--153	NM	--	--	928.20	928.97	--	NM	NM	--
2B--W--19	NM	--	--	929.89	--	--	929.76	--	--
2B--W--21	NM	--	--	928.50	--	--	927.94	--	--
2B--W--30	NM	--	--	926.79	--	--	926.41	--	--
2B--W--32	NM	--	--	929.33	--	--	929.16	--	--
2B--W--33	NM	--	--	930.27	--	--	930.04	--	--
5--W--1	920.63	--	--	NM	--	--	921.95	--	--
5--W--2	NM	--	--	NM	--	--	NM	--	--
5-W-3	919.03	--	--	NM	--	--	919.01	--	--
5-W-4	NM	--	--	NM	--	--	NM	--	--
5-W-14	918.58	--	--	917.45	--	--	917.96	--	--
5-W-15	918.4	--	--	917.36	--	--	917.86	--	--
5-W-16	918.2	--	--	917.26	--	--	917.73	--	--
5-W-17	918.37	--	--	917.36	--	--	917.91	--	--
5-W-18	918.11	--	--	917.20	--	--	917.67	--	--
5-W-19	914.73	--	--	916.87	--	--	917.43	--	--
5-W-20	917.6	--	--	916.78	--	--	917.36	--	--
MW-1	NM	--	--	927.29	--	--	927.53	--	--
MW-2	NM	--	--	928.14	--	--	928.06	--	--
MW-3	NM	--	--	929.80	--	--	929.30	--	--
MW-4	NM	--	--	929.84	--	--	929.37	--	--
MW-5	NM	--	--	928.39	--	--	927.62	--	--
MW-7	NM	--	--	925.81	--	--	924.79	--	--
MW-9	NM	--	--	926.26	--	--	925.76	--	--
MW-10	NM	--	--	926.77	--	--	926.52	--	--
MW-11	NM	--	--	926.53	--	--	926.46	--	--
MW-12	NM	--	--	928.15	--	--	926.50	--	--
MW-13	NM	--	--	927.07	--	--	925.74	--	--
MW-14	NM	--	--	926.48	--	--	925.37	--	--
MW-15	NM	--	--	925.35	--	--	924.46	--	--
MW-16	NM	--	--	NM	--	--	NM	--	--
MW-17	NM	--	--	928.48	--	--	928.32	--	Heavy Trace
MW-18	NM	--	--	927.23	--	--	927.01	--	--
MW-19	NM	--	--	922.44	--	--	921.83	--	--
MW-21	NM	--	--	NM	--	--	NM	--	--
MW-22	918.18	--	--	NM	--	--	917.99	--	Heavy Trace
MW-26	NM	--	--	NM	--	--	NM	--	--
MW-27	NM	--	--	NM	--	--	NM	--	--
MW-28	NM	--	--	NM	--	--	NM	--	--
MW-32	NM	--	--	NM	--	--	NM	--	--
MW-34	NM	--	--	NM	--	--	NM	--	--
MW-35	NM	--	--	NM	--	--	NM	--	--
MW-36	920.84	--	--	NM	--	--	921.47	--	Trace
MW-37	NM	--	--	NM	--	--	NM	--	--
MW-38	NM	--	--	NM	--	--	NM	--	--
MW-39	NM	--	--	928.83	--	--	928.23	--	--
MW-40	NM	--	--	925.63	--	--	924.73	--	--

**Table 5-1 Potentiometric Surface Elevations and Product Thicknesses
August 2007 through September 2008**

Well Number	1/1/2008			3/24/2008			4/30/2008		
	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)
1A--W--1	NM	--	--	922.82	--	--	NM	--	--
1A--W--2	NM	--	--	925.43	--	Very Heavy Trace	NM	--	--
1A--W--3	NM	--	--	920.46	--	--	NM	--	--
1A--W--4	NM	--	--	920.98	--	--	NM	--	--
1A--W--5	NM	--	--	919.25	--	--	NM	--	--
1B--W--1	925.82	--	--	926.16	--	Trace	925.43	--	Trace
1B--W--2	NM	--	--	924.26	--	--	NM	--	--
1B--W--3	NM	--	--	923.45	--	--	NM	--	--
1C--W--1	NM	--	--	924.62	--	--	NM	--	--
1C--W--2	NM	--	--	926.27	--	--	NM	--	--
1C--W--3	NM	--	--	912.62	--	--	NM	--	--
1C--W--4	NM	--	--	923.55	--	--	NM	--	--
2A--W--1	NM	--	--	925.27	--	--	NM	--	--
2A--W--2	925.84	--	--	926.06	--	--	NM	--	--
2A--W--3	925.28	--	--	925.57	--	Trace	924.93	--	Trace
2A--W--4	NM	--	--	929.08	--	Heavy Trace	928.31	--	Heavy Trace
2A--W--5	927.60	--	--	927.97	--	--	927.34	--	--
2A--W--6	NM	--	--	925.18	--	--	NM	--	--
2A--W--7	NM	--	--	929.80	--	--	929.79	--	--
2A--W--8	NM	--	--	928.88	--	--	NM	--	--
2A--W--9	928.38	--	--	928.56	--	--	928.11	--	--
2A--W--10	929.45	--	--	929.74	--	--	929.51	--	--
2A--W--11	927.65	--	--	927.84	--	Trace	927.36	--	Trace
2A--W--22	NM	--	--	925.65	--	--	925.53	--	--
2B--B--211	NM -- due to damage			NM -- due to damage			926.45	--	--
2B--W--4	929.18	--	--	929.41	--	--	929.35	--	--
2B--W--11	929.69	930.63	--	929.91	929.96	--	929.80	929.96	--
2B--W--122	929.58	NM	--	929.77	929.88	--	929.62	929.73	--
2B--W--13	928.93	NM	--	929.10	929.38	--	928.88	929.33	--
2B--W--14	928.87	NM	--	929.11	929.11	--	928.92	929.25	--
2B--W--153	927.72	NM	--	927.79	929.23	--	927.24	929.14	--
2B--W--19	929.65	--	--	929.89	--	--	929.94	--	--
2B--W--21	NM	--	--	928.54	--	--	928.33	--	--
2B--W--30	926.73	--	--	927.04	--	--	926.37	--	--
2B--W--32	929.15	--	--	929.40	--	--	929.35	--	--
2B--W--33	930.70	--	--	930.87	--	--	930.57	--	--
5--W--1	NM	--	--	922.44	--	Trace	NM	--	--
5--W--2	NM	--	--	920.75	--	Very Heavy Trace	NM	--	--
5--W--3	NM	--	--	919.52	--	Heavy Trace	NM	--	--
5--W--4	NM	--	--	921.03	--	--	NM	--	--
5--W--14	NM	--	--	918.06	--	--	NM	--	--
5--W--15	NM	--	--	917.99	--	--	NM	--	--
5--W--16	NM	--	--	917.71	--	--	NM	--	--
5--W--17	NM	--	--	917.87	--	--	NM	--	--
5--W--18	NM	--	--	917.63	--	--	NM	--	--
5--W--19	NM	--	--	917.22	--	--	NM	--	--
5--W--20	NM	--	--	917.12	--	--	NM	--	--
MW-1	927.29	--	--	927.61	--	--	927.58	--	--
MW-2	927.76	--	--	928.14	--	--	928.17	--	--
MW-3	929.57	--	--	930.58	--	--	930.01	--	--
MW-4	929.69	--	--	930.15	--	--	929.83	--	--
MW-5	928.12	--	--	928.32	--	--	927.84	--	--
MW-7	925.67	--	--	926.02	--	Trace	925.41	--	--
MW-9	926.23	--	--	926.52	--	--	925.80	--	--
MW-10	NM	--	--	926.99	--	--	926.39	--	--
MW-11	NM	--	--	926.41	--	--	926.33	--	--
MW-12	927.74	--	--	927.80	--	--	927.27	--	--
MW-13	926.91	--	--	926.91	--	--	926.48	--	--
MW-14	926.33	--	--	926.43	--	--	925.97	--	--
MW-15	925.32	--	--	925.53	--	--	925.00	--	--
MW-16	NM	--	--	921.03	--	--	NM	--	--
MW-17	928.32	--	--	928.83	--	--	928.26	--	--
MW-18	927.06	--	--	927.41	--	--	926.94	--	--
MW-19	NM	--	--	922.61	--	--	NM	--	--
MW-21	NM	--	--	925.74	--	Very Heavy Trace	NM	--	--
MW-22	NM	--	--	918.32	--	Heavy Trace	NM	--	--
MW-26	NM	--	--	923.86	--	--	NM	--	--
MW-27	NM	--	--	925.86	--	--	NM	--	--
MW-28	NM	--	--	928.82	--	--	NM	--	--
MW-32	NM	--	--	917.33	--	--	NM	--	--
MW-34	NM	--	--	925.08	--	--	NM	--	--
MW-35	NM	--	--	925.24	--	--	NM	--	--
MW-36	NM	--	--	922.03	--	0.82	NM	--	--
MW-37	NM	--	--	924.69	--	--	NM	--	--
MW-38	NM	--	--	918.22	--	--	NM	--	--
MW-39	928.66	--	--	928.89	--	Trace	928.68	--	Trace
MW-40	925.57	--	--	925.77	--	--	925.23	--	--

**Table 5-1 Potentiometric Surface Elevations and Product Thicknesses
August 2007 through September 2008**

Well Number	5/29/2008			6/23/2008			7/24/2008		
	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)
1A--W--1	NM	--	--	NM	--	--	NM	--	--
1A--W--2	NM	--	--	NM	--	--	NM	--	--
1A--W--3	NM	--	--	NM	--	--	NM	--	--
1A--W--4	NM	--	--	NM	--	--	NM	--	--
1A--W--5	NM	--	--	920.61	--	--	NM	--	--
1B--W--1	NM	--	--	NM	--	--	NM	--	--
1B--W--2	NM	--	--	NM	--	--	NM	--	--
1B--W--3	NM	--	--	NM	--	--	NM	--	--
1C--W--1	NM	--	--	NM	--	--	NM	--	--
1C--W--2	NM	--	--	NM	--	--	NM	--	--
1C--W--3	NM	--	--	NM	--	--	NM	--	--
1C--W--4	NM	--	--	NM	--	--	NM	--	--
2A--W--1	NM	--	--	NM	--	--	NM	--	--
2A--W--2	NM	--	--	NM	--	--	NM	--	--
2A--W--3	925.10	--	Trace	924.38	--	Trace	924.24	--	Trace
2A--W--4	NM	--	--	NM	--	--	927.27	--	0.29
2A--W--5	928.15	--	--	927.53	--	--	926.12	--	--
2A--W--6	NM	--	--	NM	--	--	NM	--	--
2A--W--7	931.40	--	--	NM	--	--	929.01	--	--
2A--W--8	NM	--	--	NM	--	--	NM	--	--
2A--W--9	927.98	--	--	927.49	--	--	926.24	--	--
2A--W--10	929.45	--	--	929.10	--	--	927.21	--	--
2A--W--11	927.26	--	Heavy Trace	926.59	--	Heavy Trace	925.56	--	Heavy Trace
2A--W--22	NM	--	--	NM	--	--	NM	--	--
2B--B--211	926.05	--	--	925.37	--	--	924.61	--	--
2B--W--4	929.81	--	--	929.36	--	--	927.74	--	--
2B--W--11	929.83	929.54	--	929.59	929.59	--	927.68	Dry	--
2B--W--122	929.60	929.37	--	929.26	929.17	0.04	927.38	Dry	--
2B--W--13	928.70	929.22	--	929.07	929.09	0.81	926.62	Dry	--
2B--W--14	928.78	Dry	--	928.25	Dry	--	926.54	Dry	--
2B--W--153	NM	Dry	--	NM	Dry	--	NM	Dry	--
2B--W--19	930.78	--	--	930.15	--	--	928.11	--	--
2B--W--21	928.60	--	--	928.10	--	--	926.82	--	--
2B--W--30	926.88	--	--	926.17	--	--	NM	--	--
2B--W--32	929.94	--	--	929.44	--	--	927.80	--	--
2B--W--33	930.71	--	--	930.09	--	--	927.72	--	--
5--W--1	NM	--	--	921.89	--	Trace	NM	--	--
5--W--2	NM	--	--	NM	--	--	NM	--	--
5--W--3	NM	--	--	919.95	--	Trace	NM	--	--
5--W--4	NM	--	--	NM	--	--	NM	--	--
5--W--14	NM	--	--	919.25	--	--	NM	--	--
5--W--15	NM	--	--	919.17	--	--	NM	--	--
5--W--16	NM	--	--	919.02	--	--	NM	--	--
5--W--17	NM	--	--	919.16	--	--	NM	--	--
5--W--18	NM	--	--	918.99	--	--	NM	--	--
5--W--19	NM	--	--	918.73	--	--	NM	--	--
5--W--20	NM	--	--	918.62	--	--	NM	--	--
MW-1	929.10	--	--	928.26	--	--	926.57	--	--
MW-2	929.88	--	--	928.97	--	--	927.00	--	--
MW-3	930.52	--	--	929.72	--	--	927.61	--	--
MW-4	929.70	--	--	929.43	--	--	927.46	--	--
MW-5	927.78	--	--	927.28	--	--	926.10	--	--
MW-7	925.37	--	Trace	924.62	--	--	924.26	--	Trace
MW-9	926.36	--	--	925.68	--	--	924.55	--	--
MW-10	927.39	--	--	926.66	--	--	925.39	--	--
MW-11	927.62	--	--	926.79	--	--	925.40	--	--
MW-12	926.86	--	--	926.18	--	--	925.29	--	--
MW-13	926.12	--	--	925.51	--	--	924.79	--	--
MW-14	925.75	--	--	925.14	--	--	924.54	--	--
MW-15	924.96	--	--	924.28	--	--	923.96	--	--
MW-16	NM	--	--	NM	--	--	NM	--	--
MW-17	929.39	--	Trace	927.60	--	Trace	926.25	--	Heavy Trace
MW-18	928.07	--	--	927.32	--	--	925.87	--	--
MW-19	NM	--	--	NM	--	--	NM	--	--
MW-21	NM	--	--	NM	--	--	NM	--	--
MW-22	NM	--	--	918.76	--	Heavy Trace	NM	--	--
MW-26	NM	--	--	NM	--	--	NM	--	--
MW-27	NM	--	--	NM	--	--	NM	--	--
MW-28	NM	--	--	NM	--	--	NM	--	--
MW-32	NM	--	--	NM	--	--	NM	--	--
MW-34	NM	--	--	NM	--	--	NM	--	--
MW-35	NM	--	--	NM	--	--	NM	--	--
MW-36	NM	--	--	921.94	--	Heavy Trace	NM	--	--
MW-37	NM	--	--	NM	--	--	NM	--	--
MW-38	NM	--	--	NM	--	--	NM	--	--
MW-39	928.73	--	Trace	928.23	--	Trace	926.76	--	Trace
MW-40	925.18	--	--	924.52	--	--	924.11	--	--

**Table 5-1 Potentiometric Surface Elevations and Product Thicknesses
August 2007 through September 2008**

Well Number	8/27/2008			9/22/2008		
	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)	Potentiometric Elevation (NAVD88)	Wetland Water Elevation (NAVD88)	Product Thickness (feet)
1A-W-1	NM	—	—	921.71	—	—
1A-W-2	NM	—	—	NM	—	—
1A-W-3	NM	—	—	918.95	—	—
1A-W-4	NM	—	—	919.80	—	—
1A-W-5	NM	—	—	918.37	—	—
1B-W-1	NM	—	—	NM	—	—
1B-W-2	NM	—	—	921.37	—	—
1B-W-3	NM	—	—	921.21	—	—
1C-W-1	NM	—	—	922.64	—	—
1C-W-2	NM	—	—	924.70	—	—
1C-W-3	NM	—	—	NM	—	—
1C-W-4	NM	—	—	921.89	—	—
2A-W-1	NM	—	—	NM	—	—
2A-W-2	NM	—	—	NM	—	—
2A-W-3	923.88	—	Trace	922.75	—	Trace
2A-W-4	927.36	—	Heavy Trace	926.66	—	Heavy Trace
2A-W-5	925.92	—	—	925.17	—	—
2A-W-6	NM	—	—	NM	—	—
2A-W-7	928.72	—	—	928.20	—	—
2A-W-8	NM	—	—	926.46	—	—
2A-W-9	926.06	—	—	925.19	—	—
2A-W-10	929.1	—	—	925.97	—	—
2A-W-11	925.52	—	Heavy Trace	924.80	—	Heavy Trace
2A-W-22	NM	—	—	NM	—	—
2B-B-211	924.38	—	—	93.70	—	—
2B-W-4	927.51	—	—	926.54	—	—
2B-W-11	927.88	927.88	—	926.32	926.32	—
2B-W-122	927.84	927.84	—	926.00	926.00	—
2B-W-13	926.55	926.55	—	925.48	925.48	—
2B-W-14	926.45	926.45	—	925.55	925.55	—
2B-W-153	927.44	927.44	—	924.53	924.53	—
2B-W-19	927.90	—	—	926.93	—	—
2B-W-21	926.59	—	—	925.81	—	—
2B-W-30	925.09	—	—	924.34	—	—
2B-W-32	927.52	—	—	926.63	—	—
2B-W-33	928.16	—	—	926.47	—	—
5-W-1	NM	—	—	918.74	—	—
5-W-2	NM	—	—	917.39	—	-926.85
5-W-3	NM	—	—	917.26	—	Trace
5-W-4	NM	—	—	917.99	—	—
5-W-14	NM	—	—	917.19	—	—
5-W-15	NM	—	—	917.21	—	—
5-W-16	NM	—	—	917.04	—	—
5-W-17	NM	—	—	917.14	—	—
5-W-18	NM	—	—	917.00	—	—
5-W-19	NM	—	—	916.73	—	—
5-W-20	NM	—	—	916.65	—	—
MW-1	926.18	—	—	925.61	—	—
MW-2	926.55	—	—	925.92	—	—
MW-3	929.76	—	—	926.84	—	—
MW-4	927.47	—	—	926.23	—	—
MW-5	925.89	—	—	925.11	—	—
MW-7	924.02	—	—	923.01	—	None
MW-9	925.04	—	—	924.04	—	—
MW-10	925.44	—	—	924.69	—	—
MW-11	925.36	—	—	924.74	—	—
MW-12	925.19	—	—	924.50	—	—
MW-13	924.63	—	—	923.94	—	—
MW-14	924.22	—	—	923.54	—	—
MW-15	923.46	—	—	922.61	—	—
MW-16	NM	—	—	918.42	—	—
MW-17	NM	—	—	NM	—	—
MW-18	925.77	—	—	925.05	—	—
MW-19	NM	—	—	NM	—	—
MW-21	NM	—	—	NM	—	Very Heavy Trace
MW-22	NM	—	—	917.02	—	Heavy Trace
MW-26	NM	—	—	919.34	—	—
MW-27	NM	—	—	NM	—	—
MW-28	NM	—	—	925.26	—	—
MW-32	NM	—	—	916.46	—	—
MW-34	NM	—	—	NM	—	—
MW-35	NM	—	—	921.30	—	—
MW-36	NM	—	—	919.87	—	Heavy Trace
MW-37	NM	—	—	NM	—	—
MW-38	NM	—	—	916.90	—	—
MW-39	926.58	—	Trace	925.88	—	Trace
MW-40	923.62	—	—	922.81	—	—

Notes
PT Product Thickness
NM Not Measured
HT Heavy Trace
T Trace

¹2B-B-21 was observed to be damaged during the May 2008 gauging event. This piezometer is irreparable.

²2B-W-12 was installed at an angle of 14 degrees from vertical. All potentiometric elevations have been corrected to vertical.

³2B-W-15 was observed to be damaged during the May 2008 gauging event. This piezometer has been unable to be repaired. February 2008 groundwater was not recorded due to inaccessibility to site or wells.

Table 5-2 Stabilized Field Parameter Measurements

Well	Sample Date	Field Parameters						
		Time	pH	Conductivity (µmhos/cm)	Temperature (°C)	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)
1A-W-1	25-Mar-08	0932	6.22	80	6.47	-25.7	2.94	1.91
	23-Sep-08	0853	6.12	137	11.5	92.6	0.49	2.33
1A-W-3	25-Mar-08	No parameters collected, product in discharge line.						
	23-Sep-08	0944	6.10	83	10.13	92.5	2.53	5.39
1A-W-4	25-Mar-08	1047	6.62	62	7.0	-28.2	5.30	1.18
	23-Sep-08	1050	6.21	56	8.02	101.2	4.68	0.01
1A-W-5	25-Mar-08	1456	6.38	104	6.84	113.1	7.28	2.20
	23-Sep-08	1129	6.29	59	9.39	103.5	4.02	0.66
1B-W-1	25-Mar-08	No parameters collected, product in discharge line.						
	23-Sep-08	Abandoned						
1B-W-2	25-Mar-08	1217	6.00	58	7.01	-19.0	3.51	2.61
	23-Sep-08	1652	6.22	172	11.72	80.8	0.26	3.00
1B-W-3	25-Mar-08	1745	6.06	69	5.75	0.1	4.21	0.95
	23-Sep-08	1541	5.96	85	10.72	71.9	0.54	1.00
1C-W-1	13-Dec-07	1237	4.87	107	7.78	173.2	0.50	0.95
	25-Mar-08	1006	5.53	76	5.61	125.2	3.84	2.40
	23-Sep-08	1312	5.53	51	11.45	112.6	2.34	0.25
1C-W-2	25-Mar-08	0843	6.11	75	5.11	159.1	8.01	2.40
	23-Sep-08	1150	6.12	84	12.2	174.0	2.79	1.01
1C-W-3	24-Mar-08	1542	6.00	45	5.08	13.3	10.3	27.3
	23-Sep-08	No data (inaccessible, large bolders on top).						
1C-W-4	24-Mar-08	1514	5.22	47	5.89	125.1	1.95	2.20
	23-Sep-08	1429	5.52	59	10.18	94.0	0.35	0.64
2A-W-1	26-Mar-08	No parameters collected, product in discharge line.						
	23-Sep-08	Abandoned						
2A-W-6*	13-Dec-07	1408	4.83	79	6.17	187.6	0.50	2.11
	26-Mar-08	1038	5.42	50	4.55	173.0	0.83	1.77
2A-W-9	25-Mar-08	1534	5.47	78	3.41	90.1	1.52	2.50
	23-Sep-08	1405	5.99	84	14.4	-4.0	0.00	1.61
2A-W-10	25-Mar-08	1616	5.69	59	1.69	125.5	8.43	2.00
	22-Sep-08	1653	5.25	43	9.44	86.1	0.14	4.51
2A-W-11	24-Mar-08	No parameters collected, product in discharge line.						
	23-Sep-08	No parameters collected, product in discharge line.						
2B-W-4	25-Mar-08	1440	5.82	33	4.09	-77.9	0.63	1.58
	23-Sep-08	Field form missing						
5-W-4	25-Mar-08	1053	5.76	65	4.8	148.6	3.46	2.20
	23-Sep-08	1313	5.91	109	16.0	-16.0	1.81	9.06

Table 5-2 Stabilized Field Parameter Measurements

Well	Sample Date	Field Parameters						
		Time	pH	Conductivity (µmhos/cm)	Temperature (°C)	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)
5-W-14	3-Oct-07	1004	5.60	62	7.5	21.0	5.64	0.75
	21-Nov-07	0842	6.64	57	6.65	100.3	5.91	0.65
	12-Dec-07	1853	6.09	63	5.8	279.8	4.93	0.51
	25-Mar-08	0905	6.64	163	6.0	135.0	6.50	0.48
	23-Jun-08	1508	6.53	93	9.9	109.0	5.73	0.19
	23-Sep-08	1032	6.27	57	8.2	144.0	4.10	0.00
5-W-15	3-Oct-07	1041	5.92	190	10.4	76.8	2.25	16.0
	21-Nov-07	1017	6.53	86	8.85	3.60	0.87	4.00
	13-Dec-07	0921	5.87	47	7.4	124.8	0.83	10.74
	25-Mar-08	0950	6.65	307	3.7	15.5	0.98	18.7
	23-Jun-08	1230	6.59	135	11.1	40.9	1.28	2.36
	23-Sep-08	1635	6.55	88	11.04	-73.9	0.19	4.90
5-W-16	3-Oct-07	1138	6.09	40	9.3	-53.9	10.7	4.90
	21-Nov-07	1113	6.75	59	6.22	112.3	5.86	3.63
	12-Dec-07	2006	5.81	125	3.4	121.0	0.00	2.95
	25-Mar-08	1047	7.45	62	4.2	99.0	0.00	2.99
	23-Jun-08	1547	7.36	41	9.4	126.0	0.01	3.56
	23-Sep-08	1756	6.64	41	10.8	77.7	6.90	0.45
5-W-17	3-Oct-07	1225	5.65	38	8.1	-42.9	6.03	0.90
	21-Nov-07	1115	6.19	49	8.17	91.6	5.47	0.80
	13-Dec-07	0814	5.78	48	5.94	248.2	5.01	0.74
	25-Mar-08	1132	6.40	84	6.4	536.0	6.70	6.41
	23-Jun-08	1327	6.39	77	8.3	144.0	5.82	0.43
	23-Sep-08	1133	6.15	52	8.91	152.9	4.43	0.00
5-W-18	3-Oct-07	1307	5.57	88	9.8	109.0	1.70	0.66
	21-Nov-07	1034	5.98	95	9.62	31.5	0.18	2.80
	13-Dec-07	1046	5.51	87	6.89	135.6	0.32	10.34
	25-Mar-08	1417	6.35	178	4.6	110.0	0.72	9.56
	23-Jun-08	1420	6.40	131	10.5	61.9	1.07	1.00
	23-Sep-08	1245	6.30	101	11.24	98.3	0.20	0.38
5-W-19	3-Oct-07	1347	5.60	36	8.5	-33.9	7.00	0.20
	21-Nov-07	0935	6.10	42	7.09	168.0	3.99	0.99
	12-Dec-07	2113	6.04	48	5.52	201.1	5.20	1.85
	25-Mar-08	1459	6.48	76	6.2	356.0	8.44	0.86
	23-Jun-08	1629	6.46	73	8.8	169.0	5.90	0.41
	23-Sep-08	1429	6.30	47	9.76	146.8	4.75	0.03

Table 5-2 Stabilized Field Parameter Measurements

Well	Sample Date	Field Parameters						
		Time	pH	Conductivity (µmhos/cm)	Temperature (°C)	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)
5-W-20	3-Oct-07	1437	5.50	165	9.6	-14.2	0.41	0.71
	21-Nov-07	0836	6.07	114	9.03	81.8	0.14	3.30
	12-Dec-07	2214	5.62	78	7.18	95.7	0.33	3.58
	25-Mar-08	1608	6.43	125	4.4	170.0	0.61	2.18
	23-Jun-08	1713	6.38	131	9.5	103.0	0.43	1.34
	23-Sep-08	0919	6.27	99	9.87	76.8	0.17	1.06
MW-3	26-Mar-08	0945	6.02	85	1.5	175.0	8.30	10.1
	23-Sep-08	1544	6.15	172	13.9	87.0	7.90	48.2
MW-4	26-Mar-08	1033	6.22	88	0.9	5.99	4.01	2.98
	23-Sep-08	1456	6.07	60	12.7	22.0	0.00	1.49
MW-16	25-Mar-08	1439	5.45	64	5.14	126.9	7.42	1.90
	23-Sep-08	1853	5.20	43	10.49	207.6	1.64	0.05
MW-19	26-Mar-08	1115	5.63	39	4.03	181.0	6.79	2.40
	23-Sep-08	Abandoned						
MW-34	25-Mar-08	0919	5.48	46	4.22	191.4	6.75	2.30
	23-Sep-08	Abandoned						
MW-35	25-Mar-08	1602	6.10	101	6.85	-112.3	0.56	1.47
	23-Sep-08	1755	5.95	87	11.42	37.3	0.20	0.48
MW-37	26-Mar-08	0924	5.81	32	3.71	-83.8	0.79	0.92
	23-Sep-08	Abandoned						
MW-38	25-Mar-08	1307	6.19	98	7.45	120.4	0.53	1.90
	23-Sep-08	1231	6.12	54	12.6	167.0	1.12	0.74
MW-39	26-Mar-08	No parameters collected, product in discharge line.						
	23-Sep-08							

Notes

*2A-W-6 was removed from the sampling network in May 2008 as approved by the Department of Ecology and explained in the 2008 GW Monitoring Plan

Table 5-3 Total Petroleum Hydrocarbons Reported as NWTPH-Dx

Chemical Name Unit		Oil Range µg/L			Oil Range w/SG µg/L			Diesel Range µg/L			Diesel Range w/ Silica Gel Cleanup µg/L			NTPH-Dx (calc) ^{a, b} µg/L	NTPH-Dx w/SG (calc) ^{a, b} µg/L			
Well	Sample Date	Result & Qualifier	Method Detection Limit	Reporting Detection Limit	Result & Qualifier	Method Detection Limit	Reporting Detection Limit	Result & Qualifier	Method Detection Limit	Reporting Detection Limit	Result & Qualifier	Method Detection Limit	Reporting Detection Limit					
1A-W-1	25-Mar-08	ND		84.9	472	NA		183	J	37.7	236	NA		225	NA			
1A-W-1	23-Sep-08	152	J	85.7	476	NA		347	J	38.1	238	NA		499	NA			
1A-W-3	25-Mar-08	1410		84.9	472	NA		836		37.7	236	NA		2246	NA			
1A-W-3	23-Sep-08	420	J	85.7	476	NA		191	J	38.1	238	NA		611	NA			
1A-W-3 FD	23-Sep-08	180	J	84.9	472	NA		79.1	J	37.7	236	NA		259	NA			
1A-W-4	25-Mar-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA			
1A-W-4	23-Sep-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA			
1A-W-5	25-Mar-08	ND		86.5	481	NA		ND		38.5	240	NA		63	NA			
1A-W-5	23-Sep-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA			
1B-W-1	25-Mar-08	859		84.9	472	NA		3180		37.7	236	NA		4039	NA			
1B-W-2	25-Mar-08	118	J	84.9	472	NA		175	J	37.7	236	NA		293	NA			
1B-W-2	23-Sep-08	170	J	87.4	485	NA		507	J	38.8	243	NA		677	NA			
1B-W-3	25-Mar-08	96	J	84.9	472	NA		116	J	37.7	236	NA		212	NA			
1B-W-3	23-Sep-08	ND		85.7	476	NA		117	J	38.1	238	NA		160	NA			
1C-W-1	13-Dec-07	357	J	84.9	472	ND	151	472	1280	J	37.7	236	43.3	J	37.7	236	1637	118.8
1C-W-1	25-Mar-08	170	J	84.9	472	NA		613		37.7	236	NA		783	NA			
1C-W-1	23-Sep-08	ND		84.9	472	NA		55	J	37.7	236	NA		97	NA			
1C-W-2	25-Mar-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA			
1C-W-2	23-Sep-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA			
1C-W-3	24-Mar-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA			
1C-W-4	24-Mar-08	111	J	84.9	472	NA		174	J	37.7	236	NA		285	NA			
1C-W-4	23-Sep-08	105	J	84.9	472	NA		373	J	37.7	236	NA		478	NA			
2A-W-1	26-Mar-08	583		86.5	481	NA		1530		38.5	240	NA		2113	NA			
2A-W-1 FD	26-Mar-08	561		86.5	481	NA		1490		38.5	240	NA		2051	NA			
2A-W-6	13-Dec-07	831		84.9	472	ND	151	472	4980	J	37.7	236	243	JN	37.7	236	5811	318.5
2A-W-6	26-Mar-08	497		86.5	481	NA		2540		38.5	240	NA		3037	NA			
2A-W-6 FD	26-Mar-08	481		84.9	472	NA		2520		37.7	236	NA		3001	NA			
5-W-4	25-Mar-08	175	J	86.5	481	NA		188	J	38.5	240	NA		363	NA			
5-W-4	23-Sep-08	2490	J	84.9	472	NA	82	7750	J	37.7	236	NA		10240	NA			
5-W-4 FD	25-Mar-08	188	J	85.7	476	NA		211	J	38.1	238	NA		399	NA			
MW-16	25-Mar-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA			
MW-16	23-Sep-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA			
MW-19	26-Mar-08	ND		84.9	472	NA		38	J	37.7	236	NA		80	NA			
MW-34	25-Mar-08	ND		84.9	472	NA		80.8	J	37.7	236	NA		123	NA			
MW-35	25-Mar-08	357	J	84.9	472	NA		1300		37.7	236	NA		1657	NA			
MW-35	23-Sep-08	187	J	85.7	476	NA		305	J	38.1	238	NA		492	NA			
MW-37	26-Mar-08	284	J	84.9	472	NA		842		37.7	236	NA		1126	NA			
MW-38	25-Mar-08	ND		84.9	472	NA		84	J	37.7	236	NA		126	NA			
MW-38	23-Sep-08	ND		85.7	476	NA		ND		38.1	238	NA		62	NA			
Maximum		2490						7750				243		10240	**	319	**	
Minimum		ND						ND				43		61	**	119	**	
Average														1121	**	219	**	

Table 5-3 Total Petroleum Hydrocarbons Reported as NWTPH-Dx

Chemical Name		Oil Range			Oil Range w/SG			Diesel Range			Diesel Range w/ Silica Gel Cleanup			NTPH-Dx (calc) ^{a, b}		NTPH-Dx w/SG (calc) ^{a, b}	
Unit		µg/L			µg/L			µg/L			µg/L			µg/L		µg/L	
Well	Sample Date	Result & Qualifier	Method	Reporting	Result & Qualifier	Method	Reporting	Result & Qualifier	Method	Reporting	Result & Qualifier	Method	Reporting				
			Detection Limit	Detection Limit		Detection Limit	Detection Limit		Detection Limit	Detection Limit		Detection Limit	Detection Limit				
Levee Zone wells																	
5-W-14	3-Oct-07	ND		476	NA			ND		238	NA			62		NA	
5-W-14	2-Nov-07	87	J	472	ND		472	ND		236	ND		236	106		94.35	
5-W-14	12-Dec-07	ND		472	ND		472	49.9	J	236	51.6	J	236	92		127.1	
5-W-14	25-Mar-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-14	23-Jun-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-14	23-Sep-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-14 FD	2-Nov-07	164	J	472	ND		472	73.6	J	236	ND		236	238		94.35	
5-W-15	3-Oct-07	425	J	476	NA			1540	JN	238	NA			1965		NA	
5-W-15	2-Nov-07	177	J	472	ND		472	85.8	J	236	ND		236	263		94.35	
5-W-15	13-Dec-07	ND		472	ND		472	121	J	236	ND		236	163		94.35	
5-W-15	25-Mar-08	153	J	472	ND		472	305		236	ND		236	458		94.35	
5-W-15	23-Jun-08	145	J	472	ND		472	204	J	236	ND		236	349		94.35	
5-W-15	23-Sep-08	ND		472	ND		472	272	J	236	ND		236	314		94.35	
5-W-15 FD	23-Jun-08	152	J	472	ND		472	207	J	236	ND		236	359		94.35	
5-W-15 FD	3-Oct-07	397	J	472	NA			1470	JN	236	NA			1867		NA	
5-W-15 FD	23-Sep-08	ND		476	ND		476	193		238	ND		238	236		95.05	
5-W-16	3-Oct-07	ND		472	NA			56.2	J	236	NA			99		NA	
5-W-16	2-Nov-07	118	J	476	ND		476	67.6	J	238	ND		238	186		95.05	
5-W-16	12-Dec-07	ND		472	ND		472	47.6	J	236	47.9	J	236	90		123.4	
5-W-16	25-Mar-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-16	23-Jun-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-16	23-Sep-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-16 FD	25-Mar-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-17	3-Oct-07	ND		472	NA			ND		236	NA			61		NA	
5-W-17	2-Nov-07	521		472	ND		472	141	J	236	ND		236	662		94.35	
5-W-17	13-Dec-07	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-17	25-Mar-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-17	23-Jun-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-17	23-Sep-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-17 FD	13-Dec-07	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-18	3-Oct-07	256	J	472	NA			623	JN	236	NA			879		NA	
5-W-18	2-Nov-07	855		472	ND		472	1100		236	78.4	J	236	1955		153.9	
5-W-18	13-Dec-07	406	J	472	ND		472	858	J	236	56.7	J	236	1264		132.2	
5-W-18	25-Mar-08	362	J	472	ND		472	844		236	44.6	J	236	1206		120.1	
5-W-18	23-Jun-08	272	J	472	ND		472	511	J	236	41.9	J	236	783		117.4	
5-W-18	23-Sep-08	ND		472	ND		472	342	J	236	ND		236	384		94.35	
5-W-19	3-Oct-07	ND		472	NA			ND		236	NA			61		NA	
5-W-19	2-Nov-07	134	J	476	ND		476	ND		238	ND		238	153		95.05	
5-W-19	12-Dec-07	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-19	25-Mar-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-19	23-Jun-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-19	23-Sep-08	ND		472	ND		472	ND		236	ND		236	61		94.35	
5-W-20	3-Oct-07	393	J	472	NA			756	JN	236	NA			1149		NA	
5-W-20	2-Nov-07	820		476	ND		476	1010		238	53.4	J	238	1830		129.4	
5-W-20	12-Dec-07	403	J	472	ND		472	912	J	236	45	J	236	1315		120.5	
5-W-20	25-Mar-08	326	J	472	ND		472	762		236	39.6	J	236	1088		115.1	
5-W-20	23-Jun-08	292	J	472	ND		472	551	J	236	ND		236	843		94.35	
5-W-20	23-Sep-08	ND		472	ND		472	305	J	236	ND		236	347		94.35	
Seep	27-Aug-08	111	J	472	ND		472	261	J	236	42	J	236	372		117.5	
Maximum		855						1540			78			1965	**	154	**
Minimum		ND						ND			ND			61	**	94	**
Average														453	**	102	**

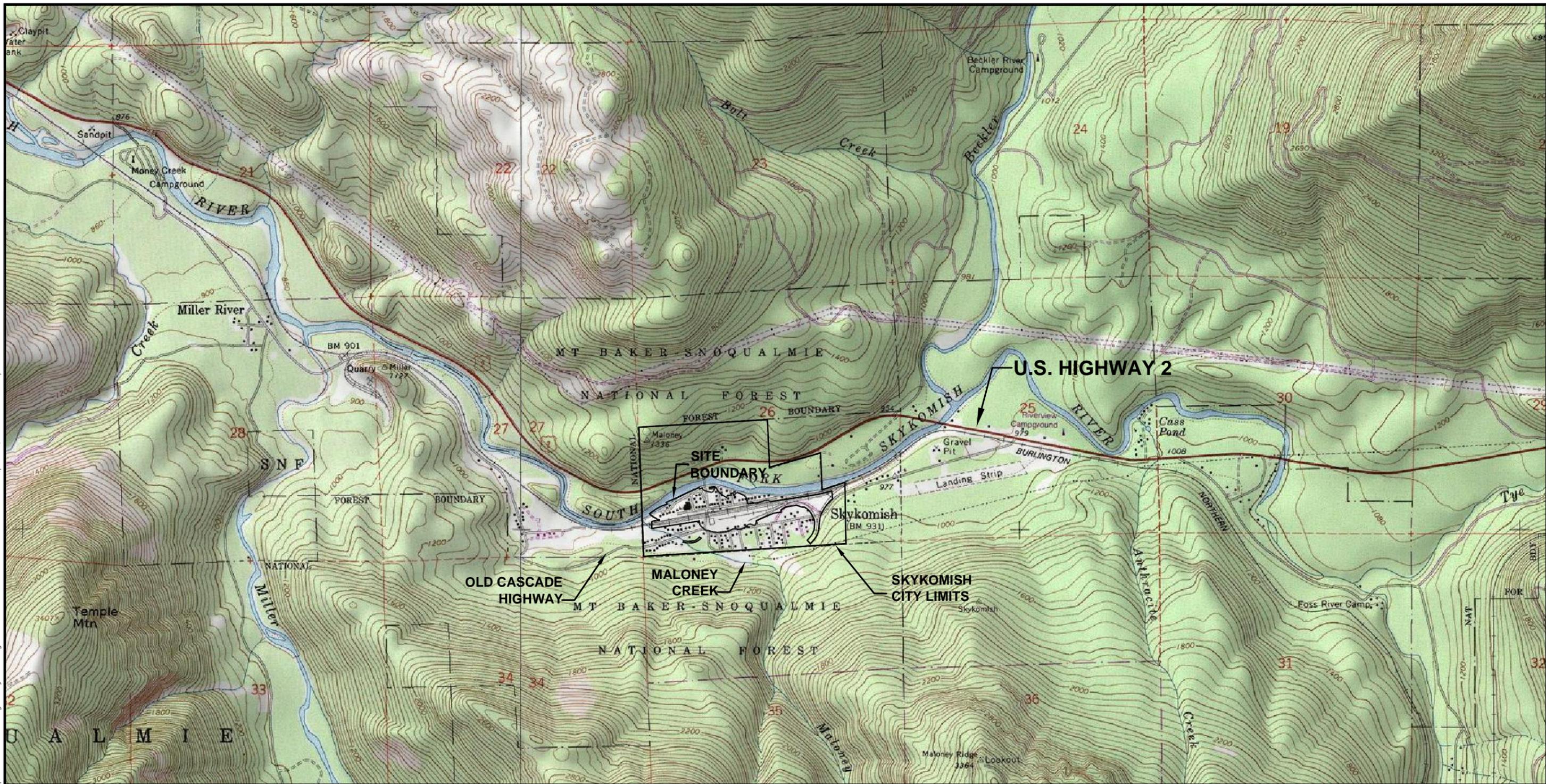
Table 5-3 Total Petroleum Hydrocarbons Reported as NWTPH-Dx

Chemical Name		Oil Range			Oil Range w/SG			Diesel Range			Diesel Range w/ Silica Gel Cleanup			NTPH-Dx (calc) ^{a, b}	NTPH-Dx w/SG (calc) ^{a, b}	
Unit		µg/L			µg/L			µg/L			µg/L			µg/L	µg/L	
Well	Sample Date	Result & Qualifier	Method Detection Limit	Reporting Detection Limit	Result & Qualifier	Method Detection Limit	Reporting Detection Limit	Result & Qualifier	Method Detection Limit	Reporting Detection Limit	Result & Qualifier	Method Detection Limit	Reporting Detection Limit			
Fomer Maloney Creek Wetland																
2A-W-9	25-Mar-08	598		84.9	472	NA		1030		37.7	236	NA		1628	NA	
2A-W-9	23-Sep-08	147	J	85.7	476	NA		323	J	38.1	238	NA		470	NA	
2A-W-9 FD	23-Sep-08	171	J	85.7	476	NA		294	J	38.1	238	NA		465	NA	
2A-W-10	25-Mar-08	245	J	84.9	472	NA		136	J	37.7	236	NA		381	NA	
2A-W-10	22-Sep-08	153	J	85.7	476	NA		227	J	38.1	238	NA		380	NA	
2A-W-11	24-Mar-08	473		84.9	472	NA		675		37.7	236	NA		1148	NA	
2A-W-11	23-Sep-08	1050		85.7	476	NA		860	J	38.1	238	NA		1910	NA	
2B-W-4	25-Mar-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA	
2B-W-4	23-Sep-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA	
MW-3	26-Mar-08	ND		84.9	472	NA		ND		37.7	236	NA		61	NA	
MW-3	23-Sep-08	143	J	85.7	476	NA		102	J	38.1	238	NA		245	NA	
MW-4	26-Mar-08	119	J	86.5	481	NA		81.2	J	38.5	240	NA		200	NA	
MW-4	23-Sep-08	ND		85.7	476	NA		ND		38.1	238	NA		62	NA	
MW-39	26-Mar-08	222	J	86.5	481	NA		639		38.5	240	NA		861	NA	
MW-39	23-Sep-08	559		84.9	472	NA		642	J	37.7	236	NA		1201	NA	
Maximum		1050						1030						1910	**	
Minimum		ND						ND						61	**	
Average														609	**	
Field Equipment QC																
FIELDQC	3-Oct-07	ND		84.9	472	NA		ND		37.7	236	NA		61	NA	
FIELDQC EB	13-Dec-07	ND		84.9	472	ND	151	472	ND	37.7	236	ND	37.7	236	61	94.35
FIELDQC EB	25-Mar-08	ND		84.9	472	NA			ND	37.7	236	NA		61	NA	
FIELDQC EB	23-Jun-08	ND		84.9	472	ND	151	472	ND	37.7	236	ND	37.7	236	61	94.35
FIELDQC EB	23-Sep-08	ND		85.7	476	NA			ND	38.1	238	NA		62	NA	

- Notes**
- ** Determined based on calculated concentrations
 - EB Equipment Blank
 - FB Field Blank
 - FD Field Duplicate
 - J Estimated concentration
 - JN Analyte must be considered presumptively present at an estimated concentration
 - NA Not Analyzed
 - ND Not Detected
 - Light Green Trace LNAPL
 - Tan Heavy Trace LNAPL
 - a Sum of detected concentrations of Oil and Diesel Range TPH
 - b TPH Calculation uses 1/2 the MDL for Non Detects
 - Bold** Exceeds remediation or cleanup level

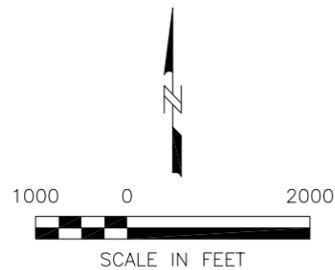
Figures

File: L:\BNSF-Skykomish\2008 Annual GW Report site-location.dwg Layout: Figure 1-1 User: MarshallE Plotted: Apr 16, 2009 - 3:37pm Xref's:



SOURCE: TOPOI, National Geographic Holdings, Inc.

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THE BNSF RAILWAY COMPANY
SKYKOMISH, WASHINGTON

01140-204-0340

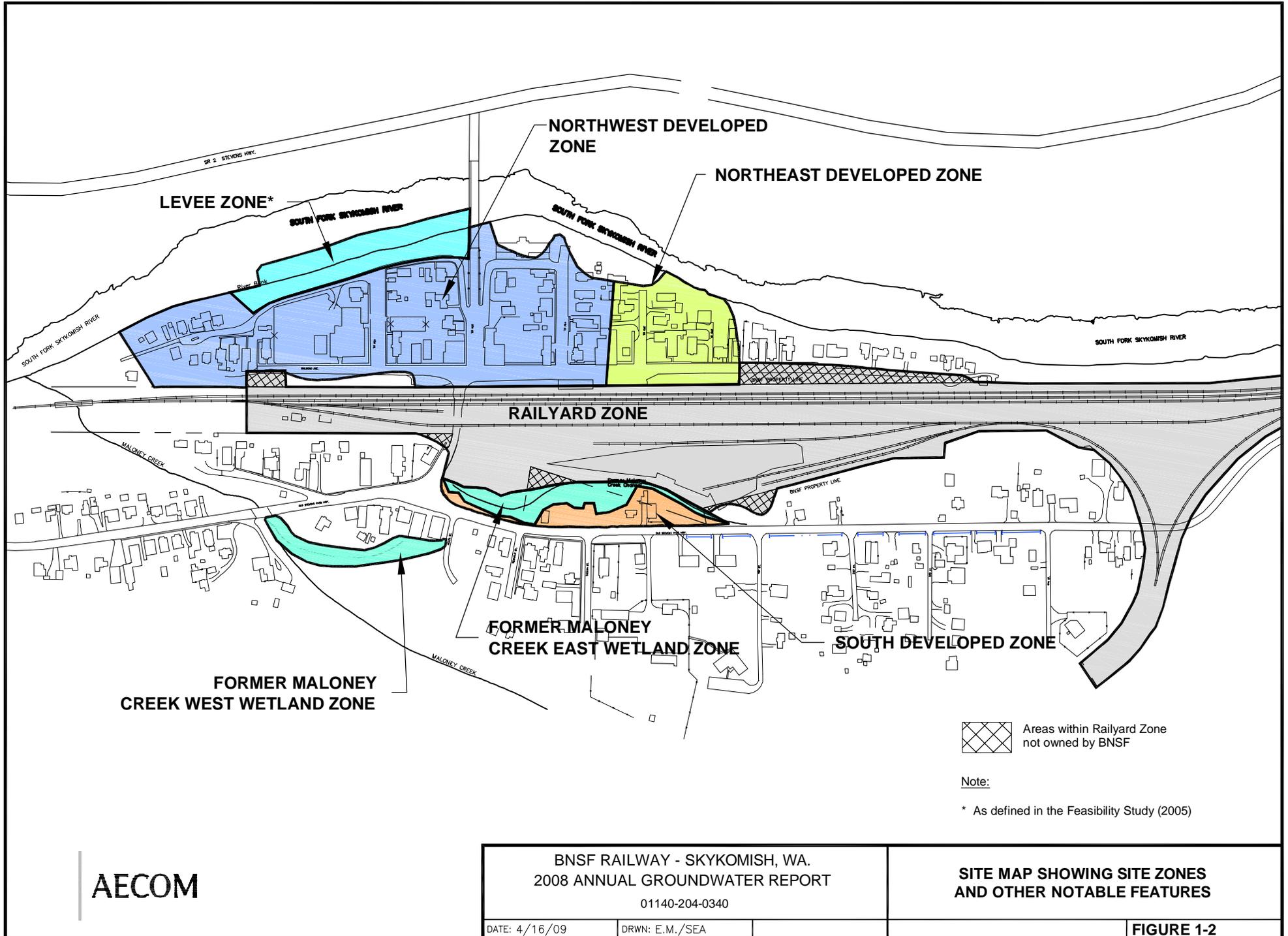
DATE: 04/16/09

DRWN: E.M./SEA

REGIONAL LOCATION MAP



FIGURE 1-1



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BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

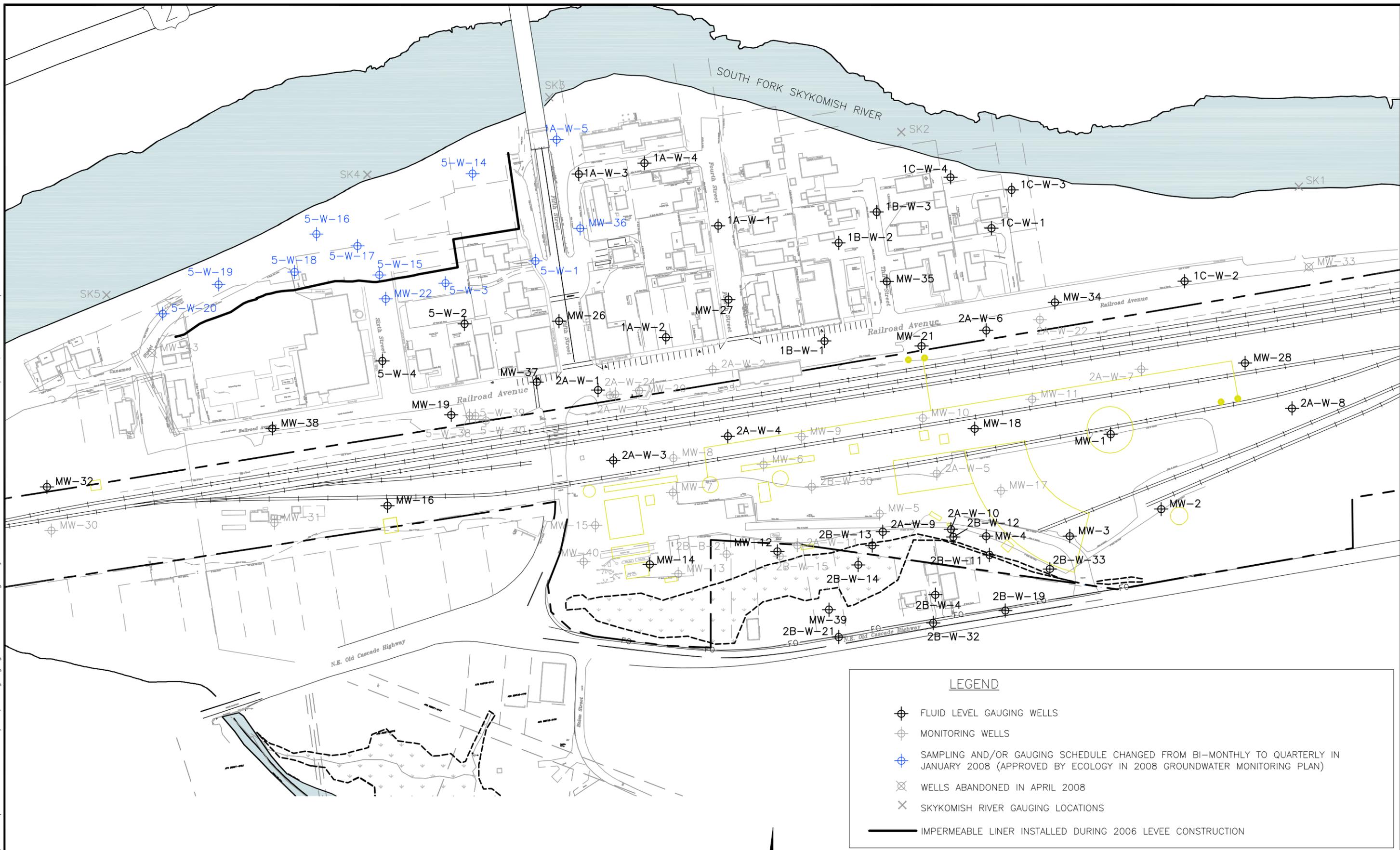
**SITE MAP SHOWING SITE ZONES
 AND OTHER NOTABLE FEATURES**

DATE: 4/16/09

DRWN: E.M./SEA

FIGURE 1-2

File: L:\BNSF-Skykomish\2008 Annual GW Report\fluid gauging 8-07_4-08.dwg Layout: FIG 2-1 User: MarstallE Plotted: Apr 16, 2009 - 1:48pm Xref's:



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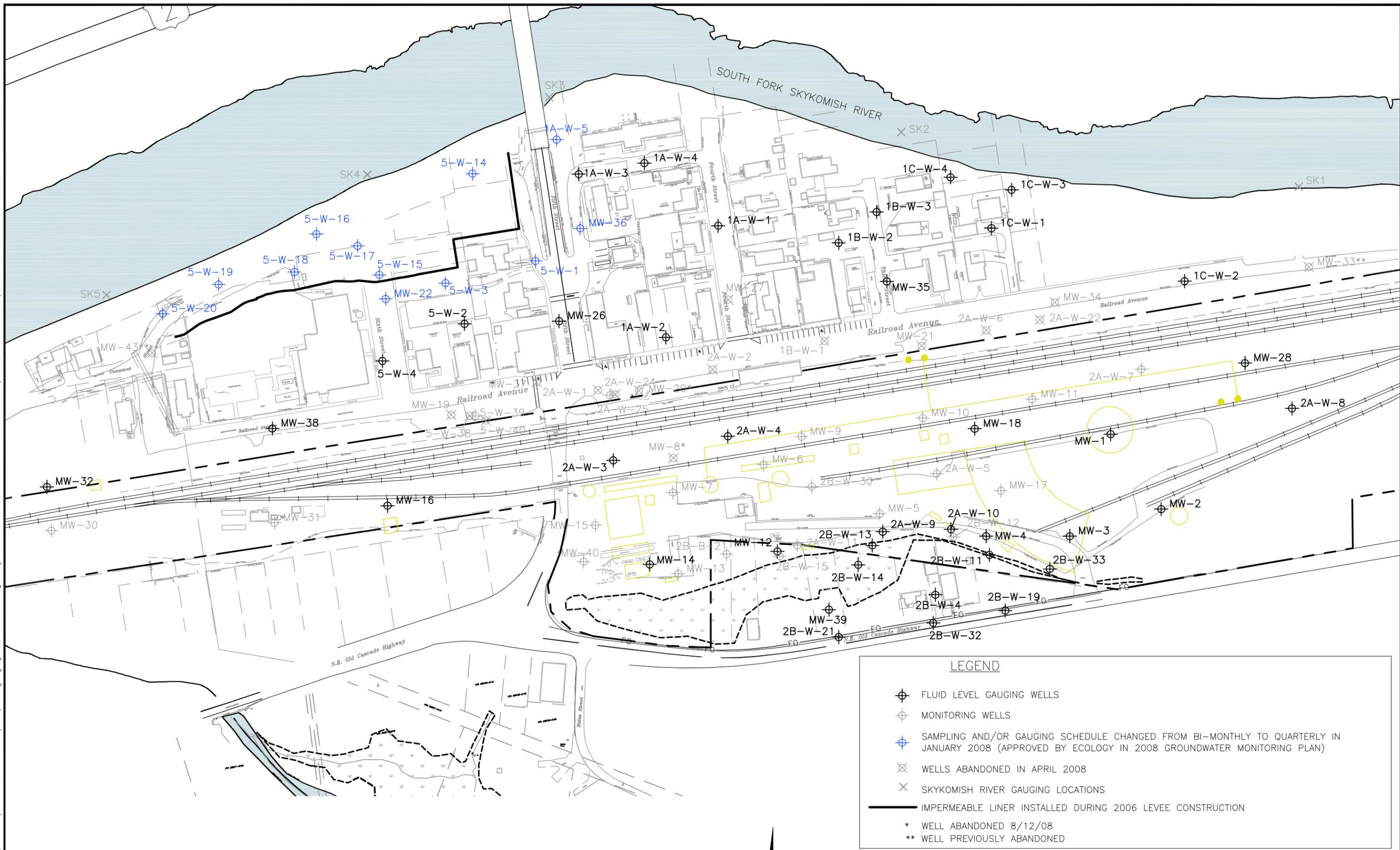


LEGEND

- ⊕ FLUID LEVEL GAUGING WELLS
- ⊕ MONITORING WELLS
- ⊕ SAMPLING AND/OR GAUGING SCHEDULE CHANGED FROM BI-MONTHLY TO QUARTERLY IN JANUARY 2008 (APPROVED BY ECOLOGY IN 2008 GROUNDWATER MONITORING PLAN)
- ⊗ WELLS ABANDONED IN APRIL 2008
- ⊗ SKYKOMISH RIVER GAUGING LOCATIONS
- IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION

BNSF RAILWAY - SKYKOMISH, WA. 2008 ANNUAL GROUNDWATER REPORT 01140-204-0340		SITE LAYOUT SHOWING FLUID LEVEL GAUGING NETWORK AUGUST 2007 - APRIL 2008
DATE: 4/16/09	DRWN: E.M./SEA	FIGURE 2-1

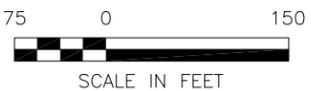
File: L:\BNSF-Skykomish\2008 Annual GW Report\fluid gauging 5-08_9-08.dwg Layout: FIG 2-2 User: MarstallE Plotted: Apr 16, 2009 - 1:49pm Xref's:



LEGEND

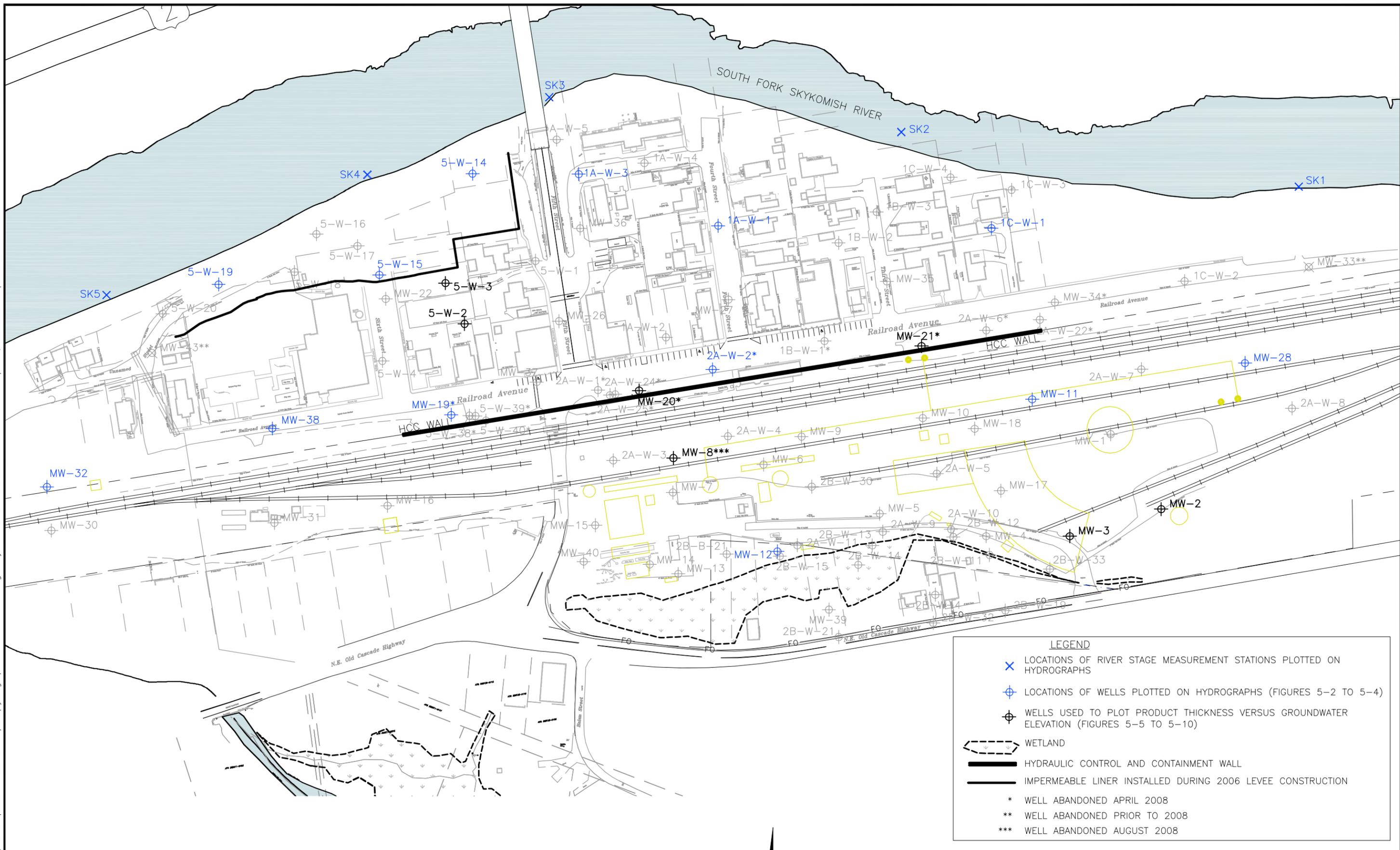
- ⊕ FLUID LEVEL GAUGING WELLS
- ⊙ MONITORING WELLS
- ⊕ (blue) SAMPLING AND/OR GAUGING SCHEDULE CHANGED FROM BI-MONTHLY TO QUARTERLY IN JANUARY 2008 (APPROVED BY ECOLOGY IN 2008 GROUNDWATER MONITORING PLAN)
- ⊗ WELLS ABANDONED IN APRIL 2008
- X SKYKOMISH RIVER GAUGING LOCATIONS
- IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION
- * WELL ABANDONED 8/12/08
- ** WELL PREVIOUSLY ABANDONED

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BNSF RAILWAY - SKYKOMISH, WA. 2008 ANNUAL GROUNDWATER REPORT 01140-204-0340		SITE LAYOUT SHOWING FLUID LEVEL GAUGING NETWORK MAY - SEPTEMBER 2008
DATE: 4/16/09	DRWN: E.M./SEA	FIGURE 2-2

File: L:\BNSF-Skykomish\2008 Annual GW Report\hydrograph source locations.dwg Layout: FIG 5-1 User: MarshallE Plotted: Apr 16, 2009 - 1:55pm Xref's:

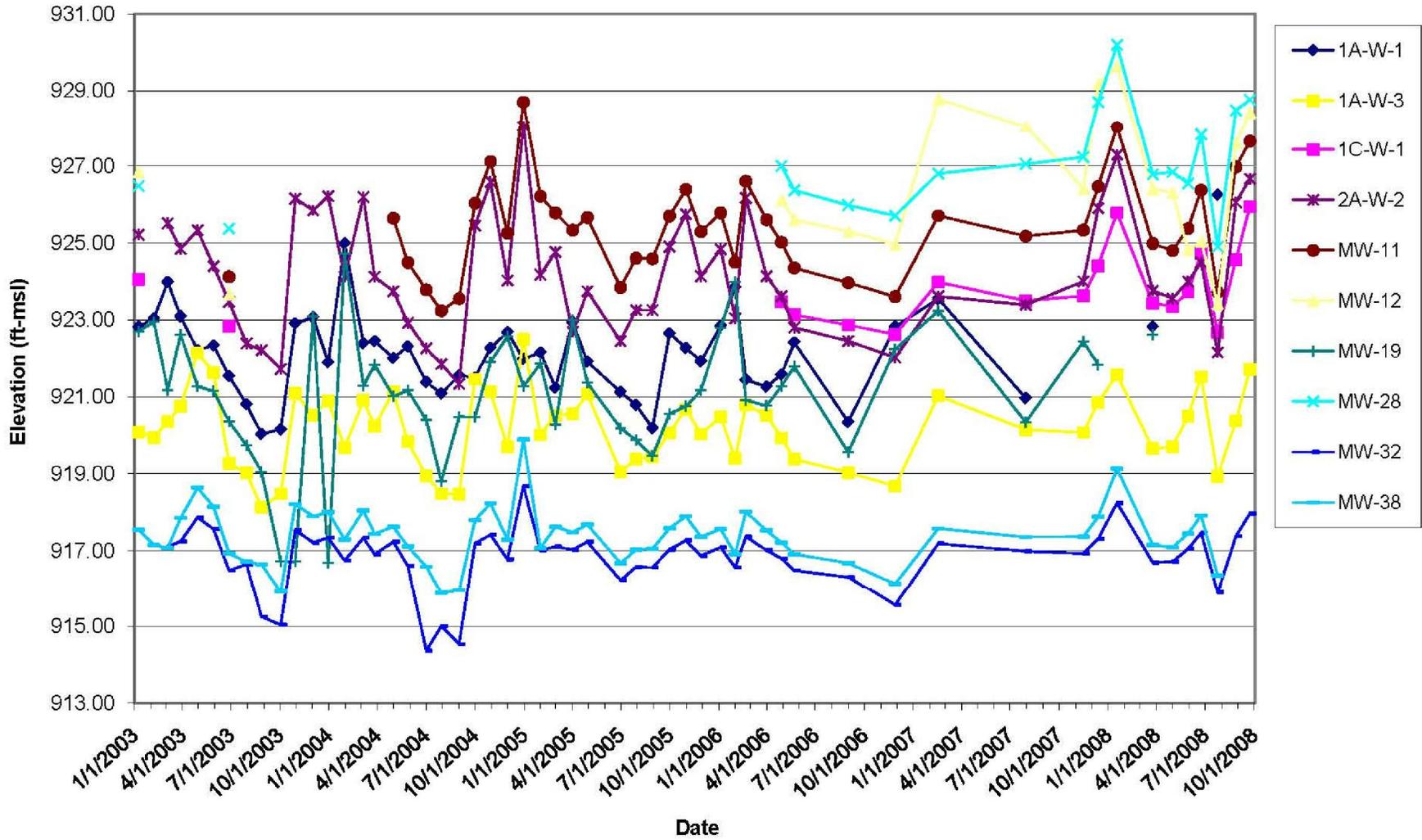


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BNSF RAILWAY - SKYKOMISH, WA. 2008 ANNUAL GROUNDWATER REPORT 01140-204-0340		HYDROGRAPH SOURCE DATA LOCATIONS PLOTTED ON HYDROGRAPHS
DATE: 4/16/09	DRWN: E.M./SEA	FIGURE 5-1

- LEGEND**
- ✕ LOCATIONS OF RIVER STAGE MEASUREMENT STATIONS PLOTTED ON HYDROGRAPHS
 - ⊕ LOCATIONS OF WELLS PLOTTED ON HYDROGRAPHS (FIGURES 5-2 TO 5-4)
 - ⊕ WELLS USED TO PLOT PRODUCT THICKNESS VERSUS GROUNDWATER ELEVATION (FIGURES 5-5 TO 5-10)
 - WETLAND
 - HYDRAULIC CONTROL AND CONTAINMENT WALL
 - IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION
 - * WELL ABANDONED APRIL 2008
 - ** WELL ABANDONED PRIOR TO 2008
 - *** WELL ABANDONED AUGUST 2008



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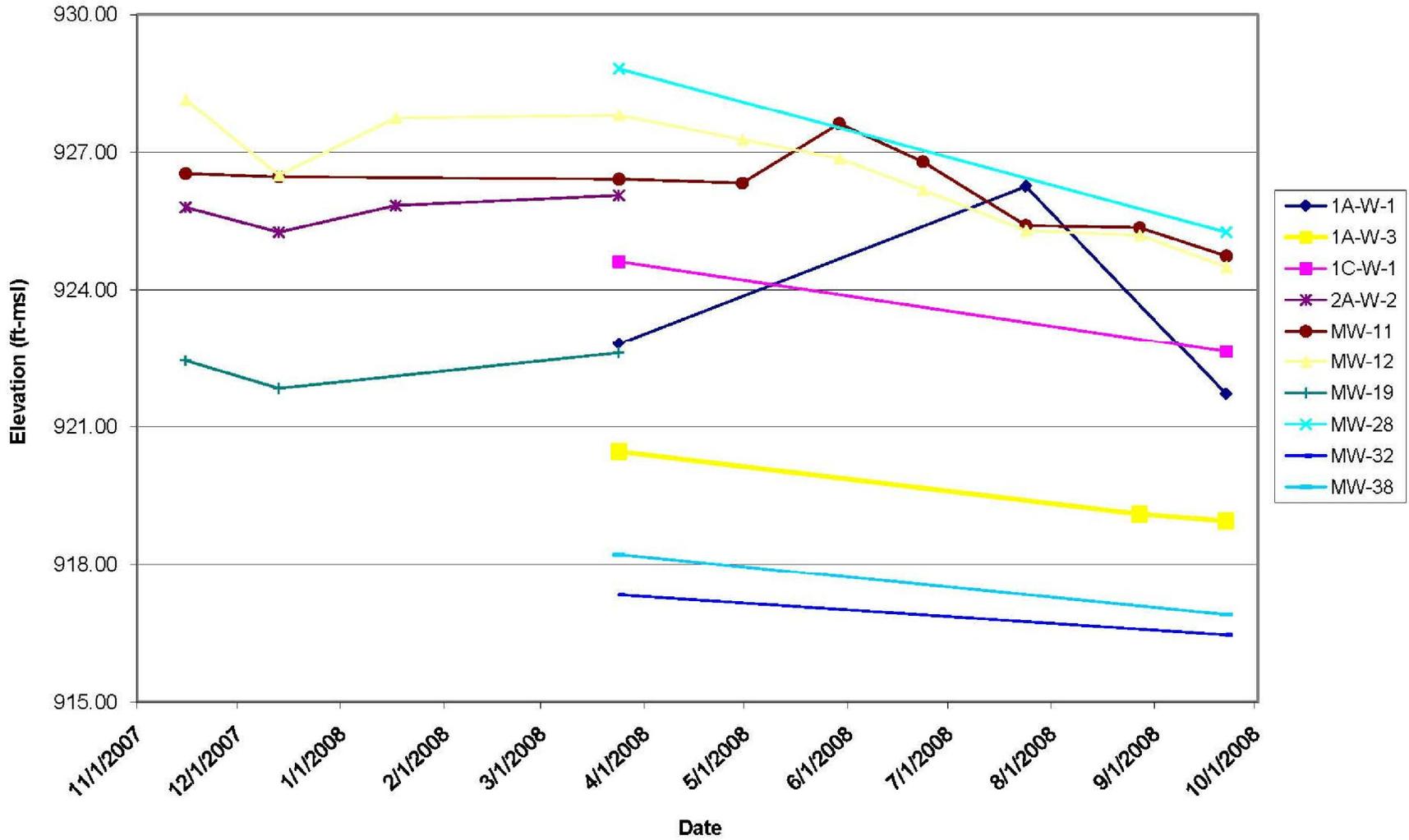
BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

**GROUNDWATER ELEVATIONS - SELECTED WELLS
 JANUARY 2003 - SEPTEMBER 2008**

DATE: 04/17/09

DRWN: E.M./SEA

FIGURE 5-2



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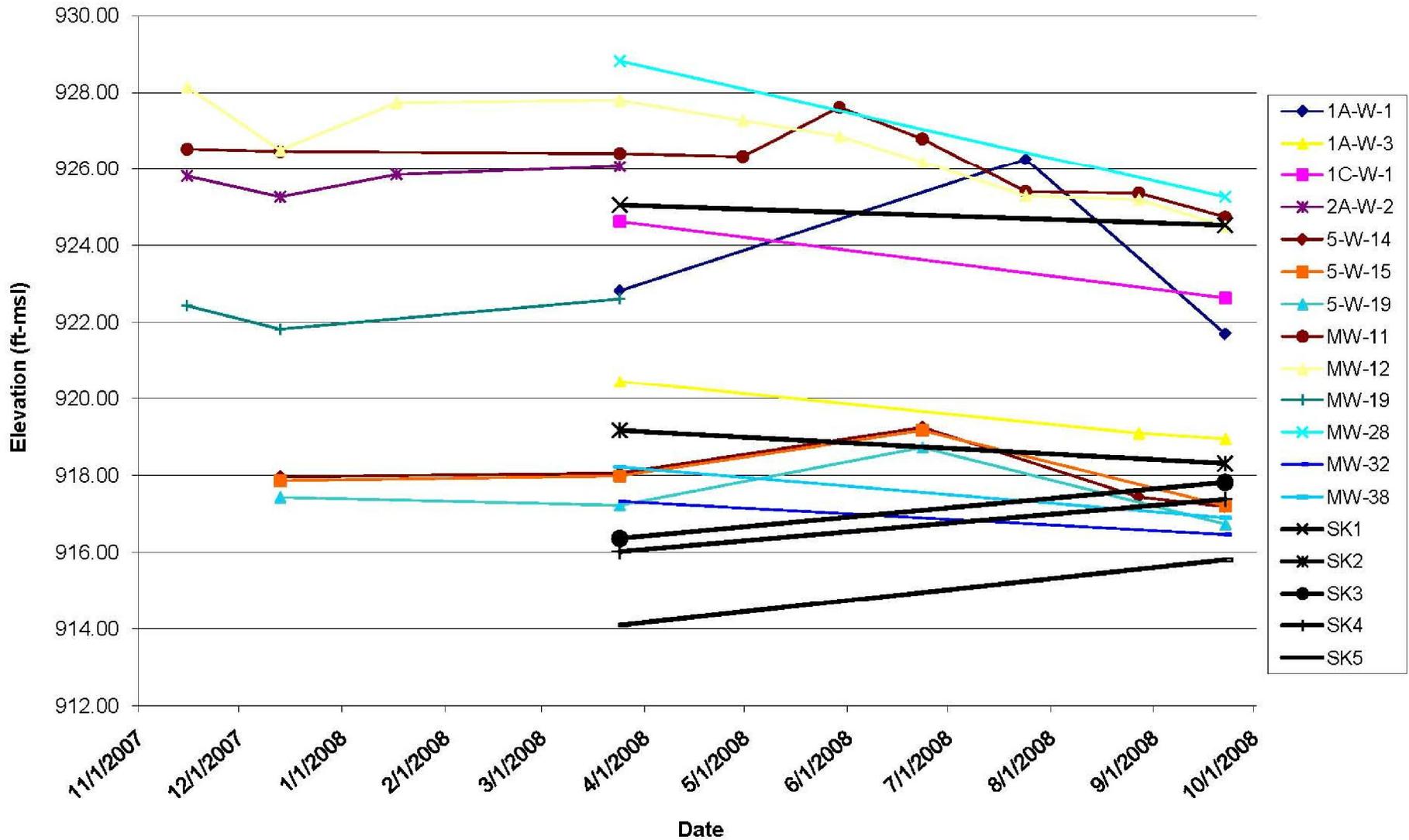
BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

GROUNDWATER ELEVATIONS - SELECTED WELLS
 AUGUST 2007 - SEPTEMBER 2008

DATE: 04/17/09

DRWN: E.M./SEA

FIGURE 5-3



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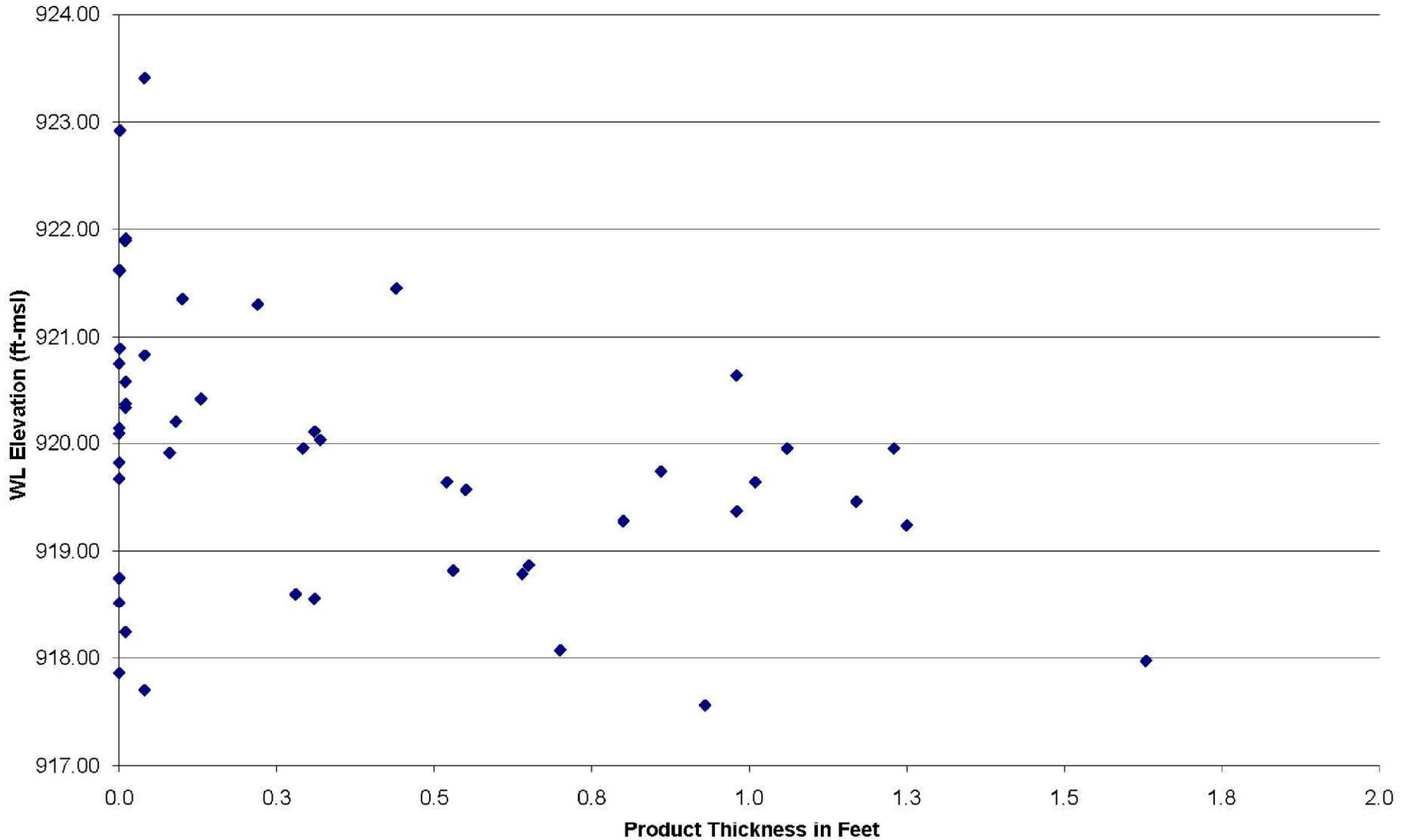
BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

SKYKOMISH RIVER AND SELECT WELLS
 GROUNDWATER ELEVATIONS
 AUGUST 2007 - SEPTEMBER 2008

DATE: 04/17/09

DRWN: E.M./SEA

FIGURE 5-4



AECOM

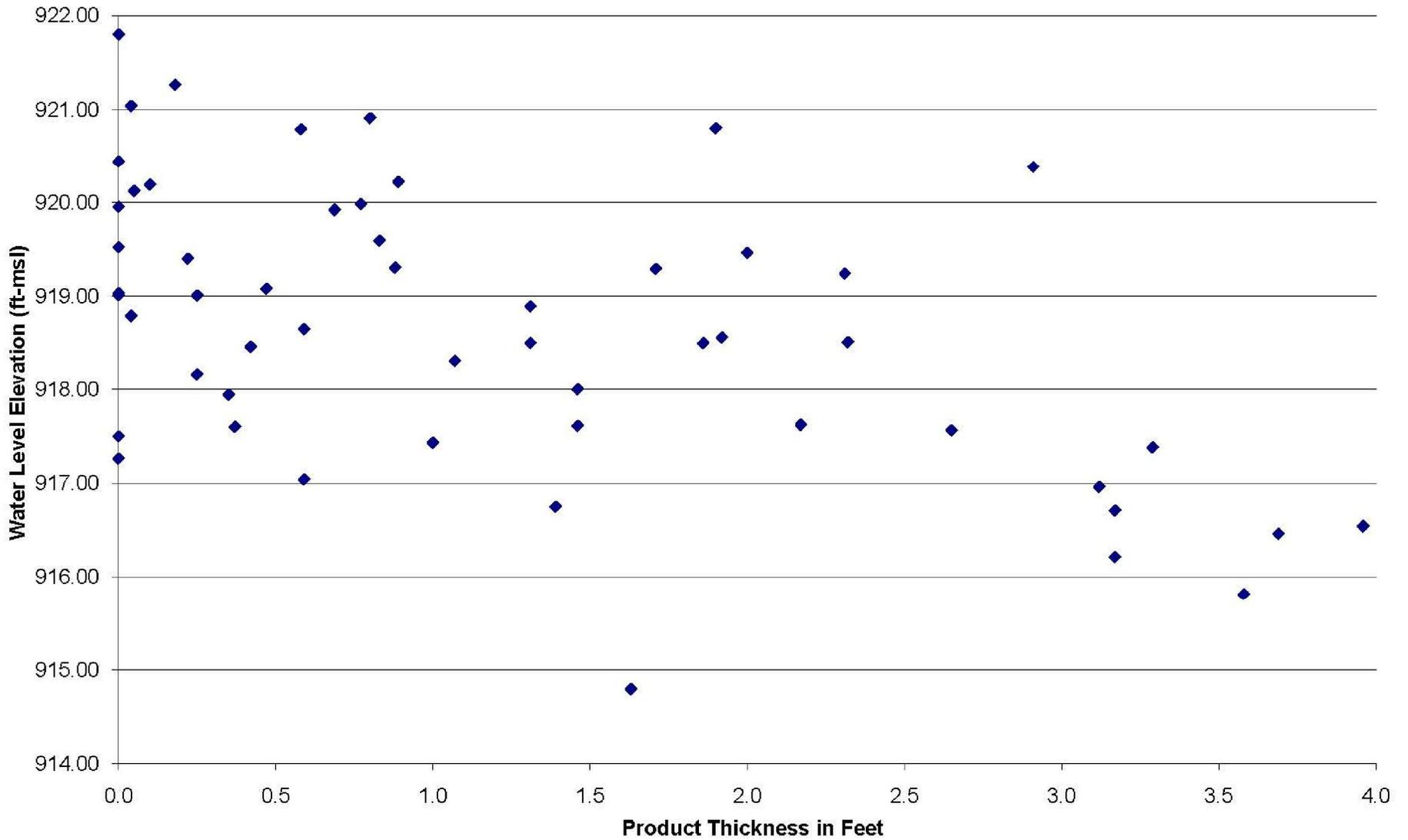
BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

**PRODUCT THICKNESS vs. GROUNDWATER
 ELEVATION IN WELL 5-W-2
 (2002-2008)**

DATE: 04/17/09

DRWN: E.M./SEA

FIGURE 5-5



AECOM

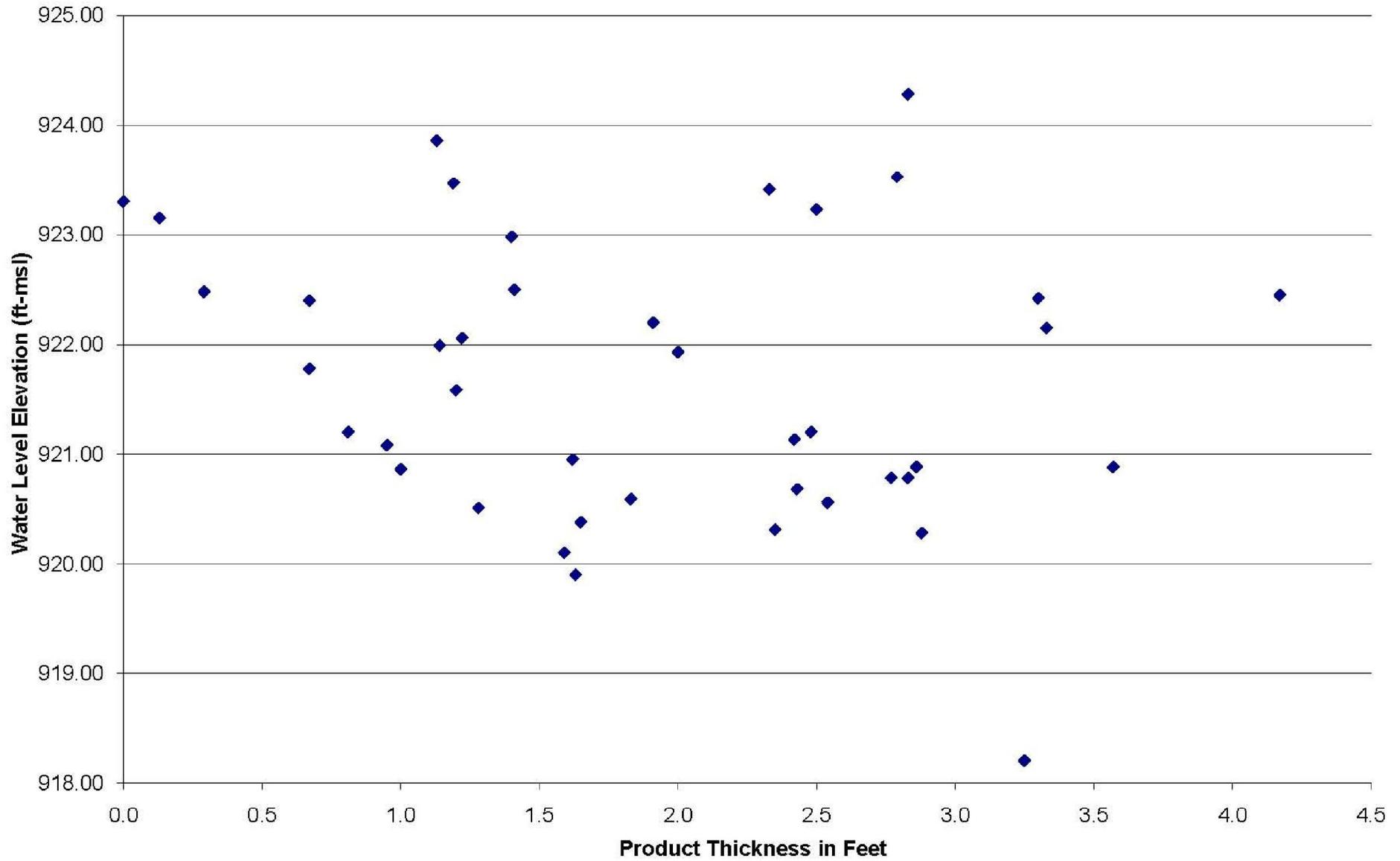
BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

**PRODUCT THICKNESS vs. GROUNDWATER
 ELEVATION IN WELL 5-W-3
 (2002-2008)**

DATE: 04/17/09

DRWN: E.M./SEA

FIGURE 5-6



AECOM

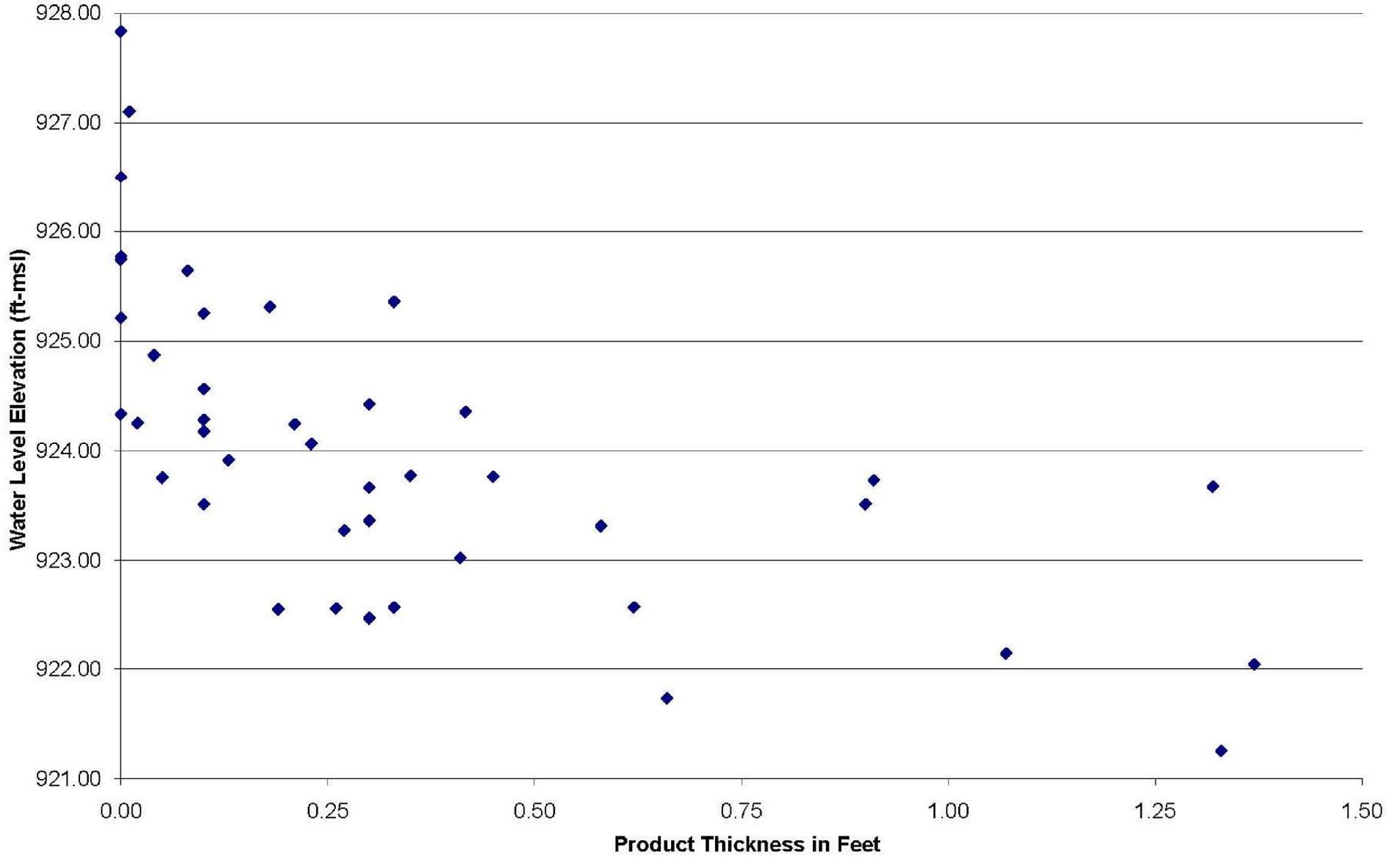
BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

**PRODUCT THICKNESS vs. GROUNDWATER
 ELEVATION IN WELL MW-8
 (2002-2008)**

DATE: 04/17/09

DRWN: E.M./SEA

FIGURE 5-7



AECOM

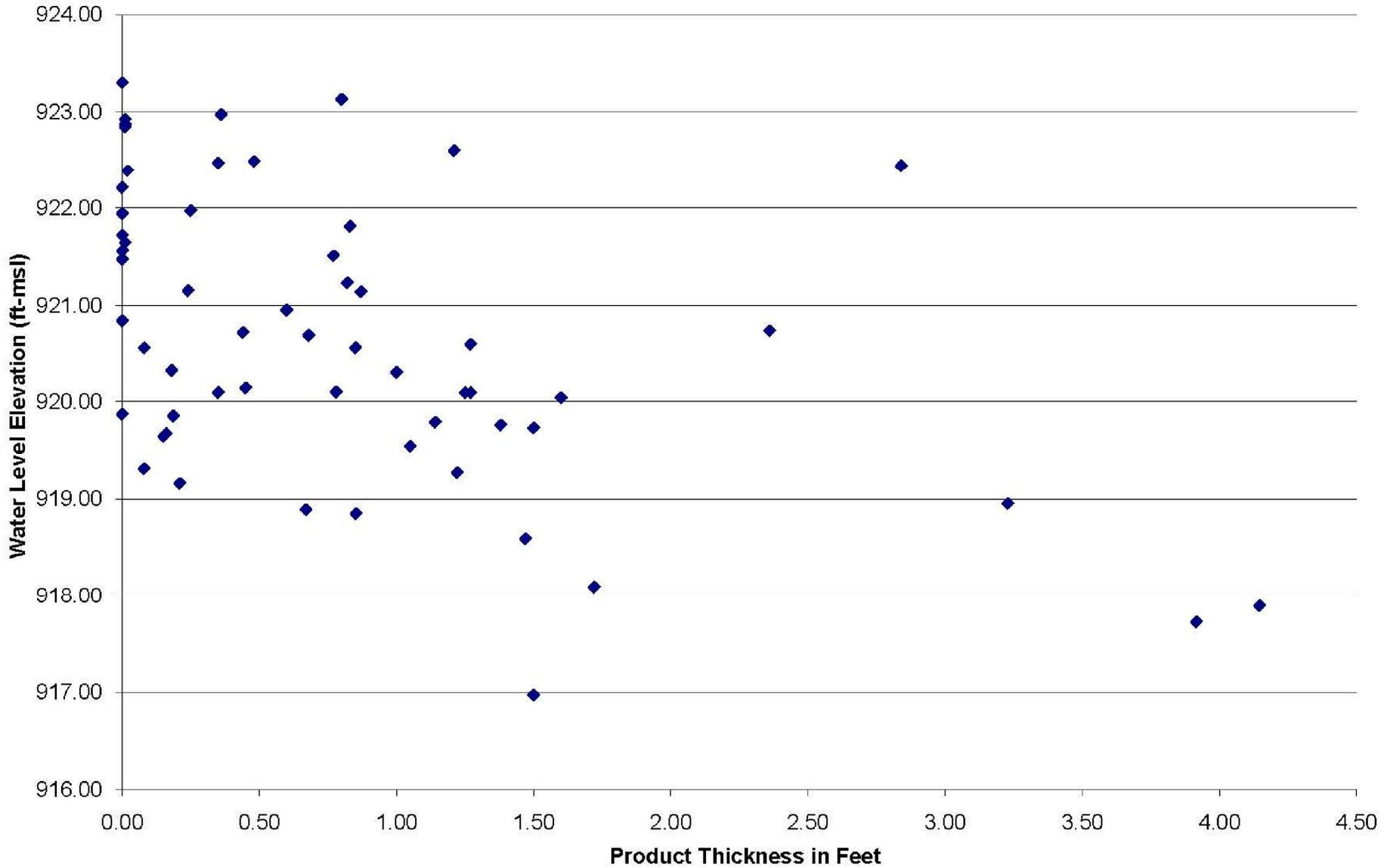
BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

**PRODUCT THICKNESS vs. GROUNDWATER
 ELEVATION IN WELL MW-21
 (2002-2008)**

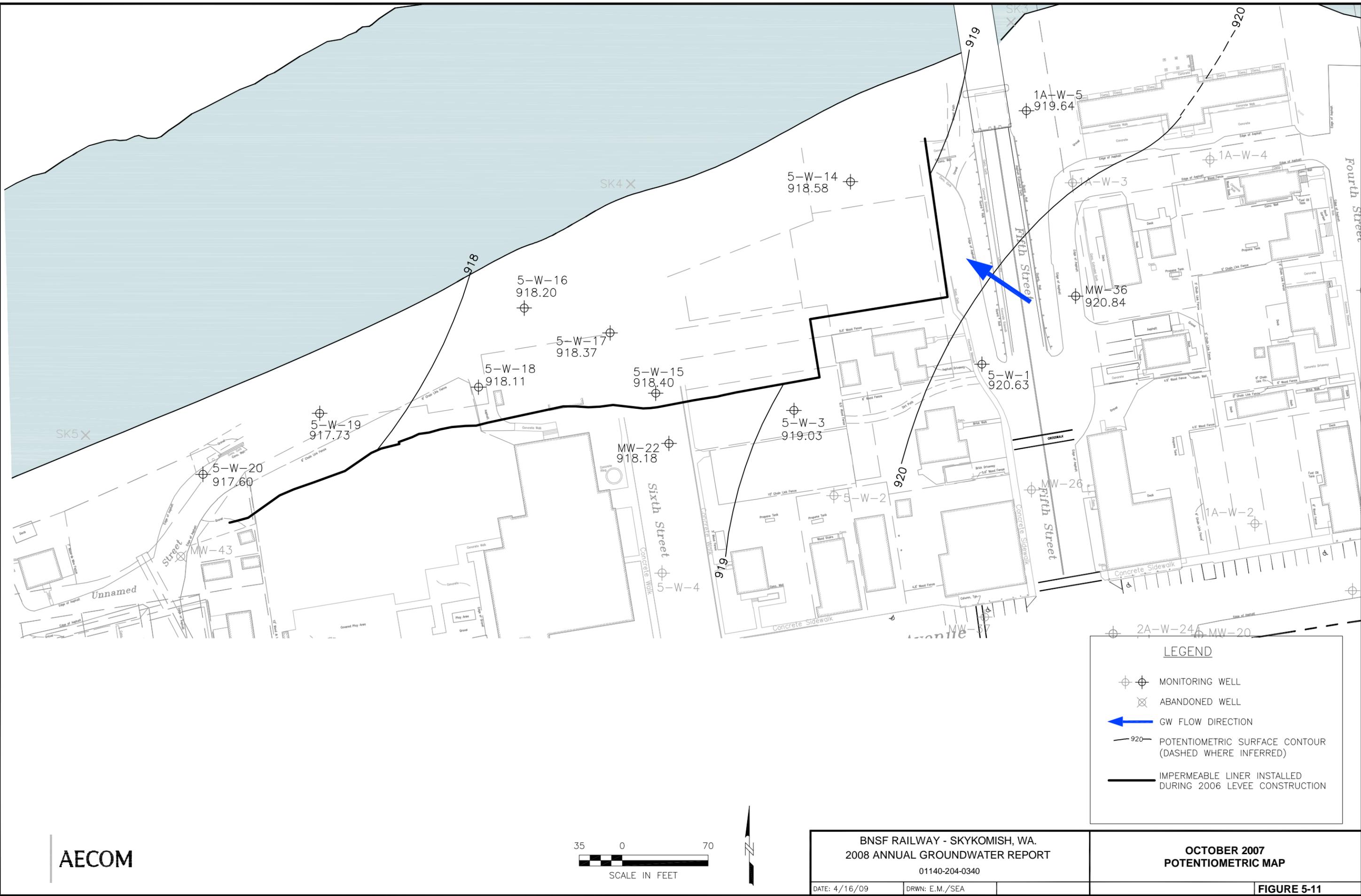
DATE: 04/17/09

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FIGURE 5-9



File: L:\BNSF-Skykomish\2008 Annual GW Report\October 2007.dwg Layout: FIGURE 5-11 User: MarstallE Plotted: Apr 16, 2009 - 2:00pm Xref's:



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 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340
 DATE: 4/16/09 DRWN: E.M./SEA

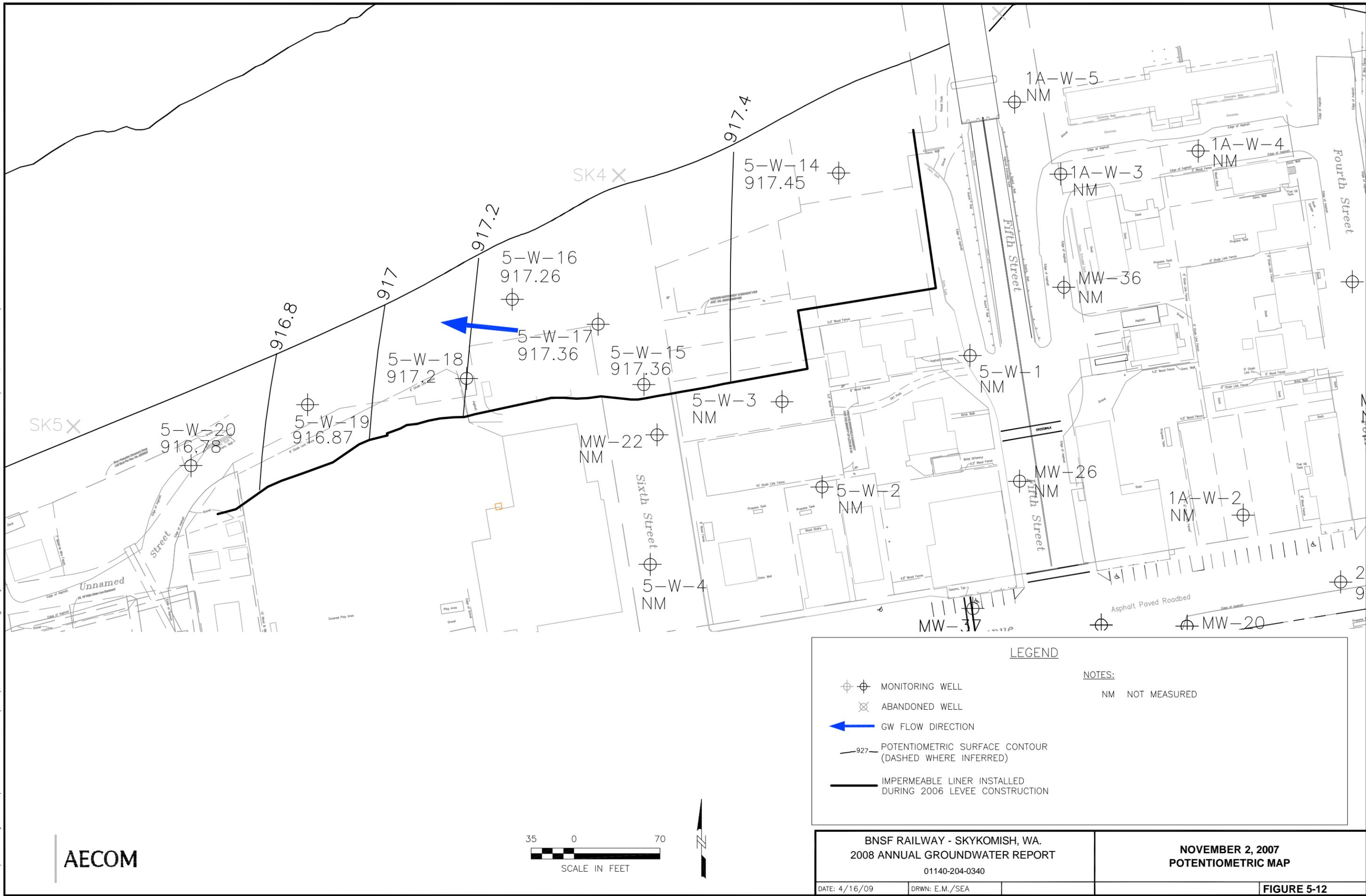
LEGEND

- MONITORING WELL
- ABANDONED WELL
- GW FLOW DIRECTION
- POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION

OCTOBER 2007
POTENTIOMETRIC MAP

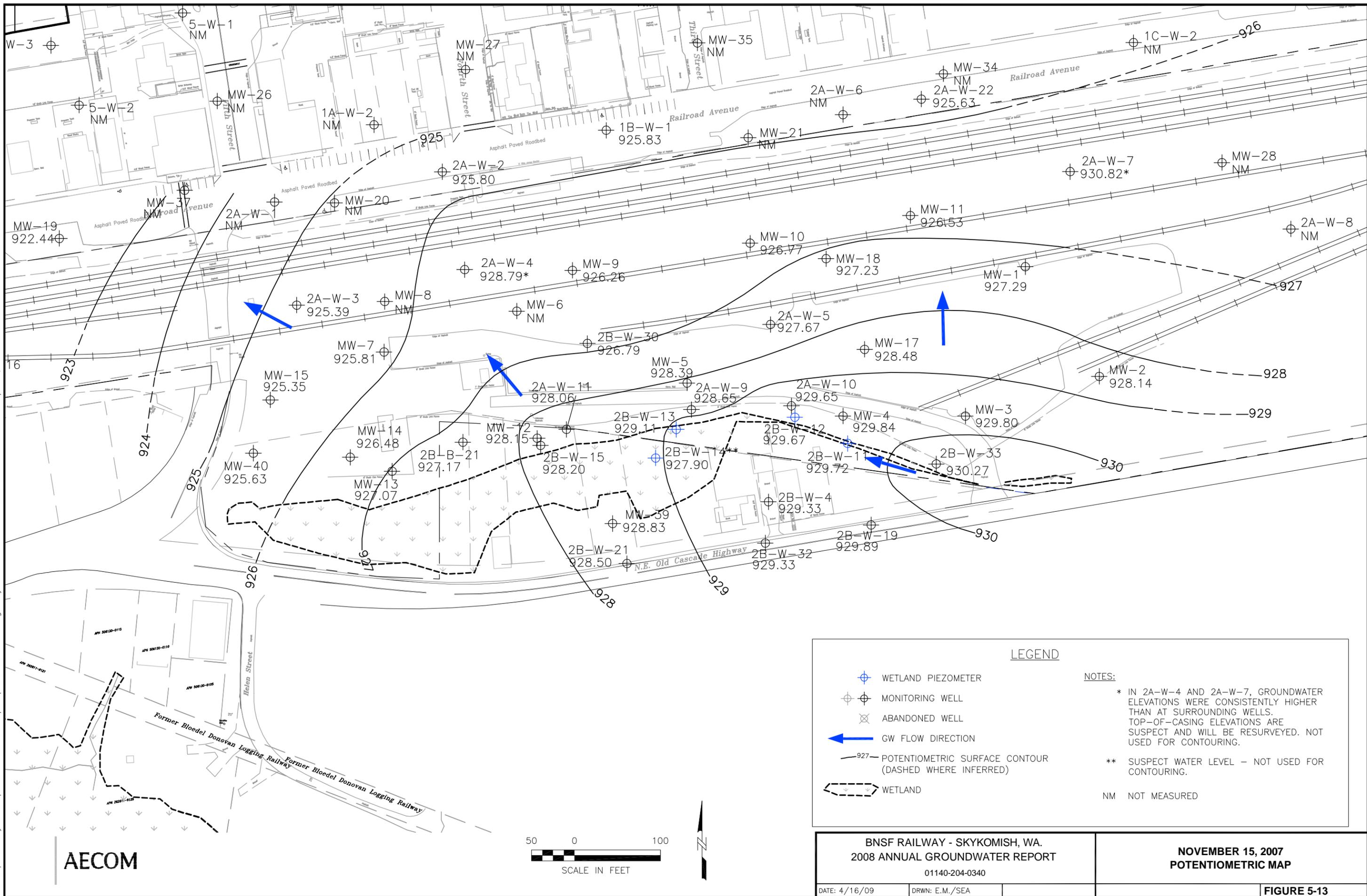
FIGURE 5-11

File: L:\BNSF-Skykomish\2008 Annual GW Report\November 2007.dwg Layout: FIGURE 5-12 User: MarshallE Plotted: Apr 16, 2009 - 2:16pm Xref's:



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File: L:\BNSF-Skykomish\2008 Annual GW Report\November 2007.dwg Layout: FIGURE 5-13 User: MarshallE Plotted: Apr 20, 2009 - 8:53am Xref's:



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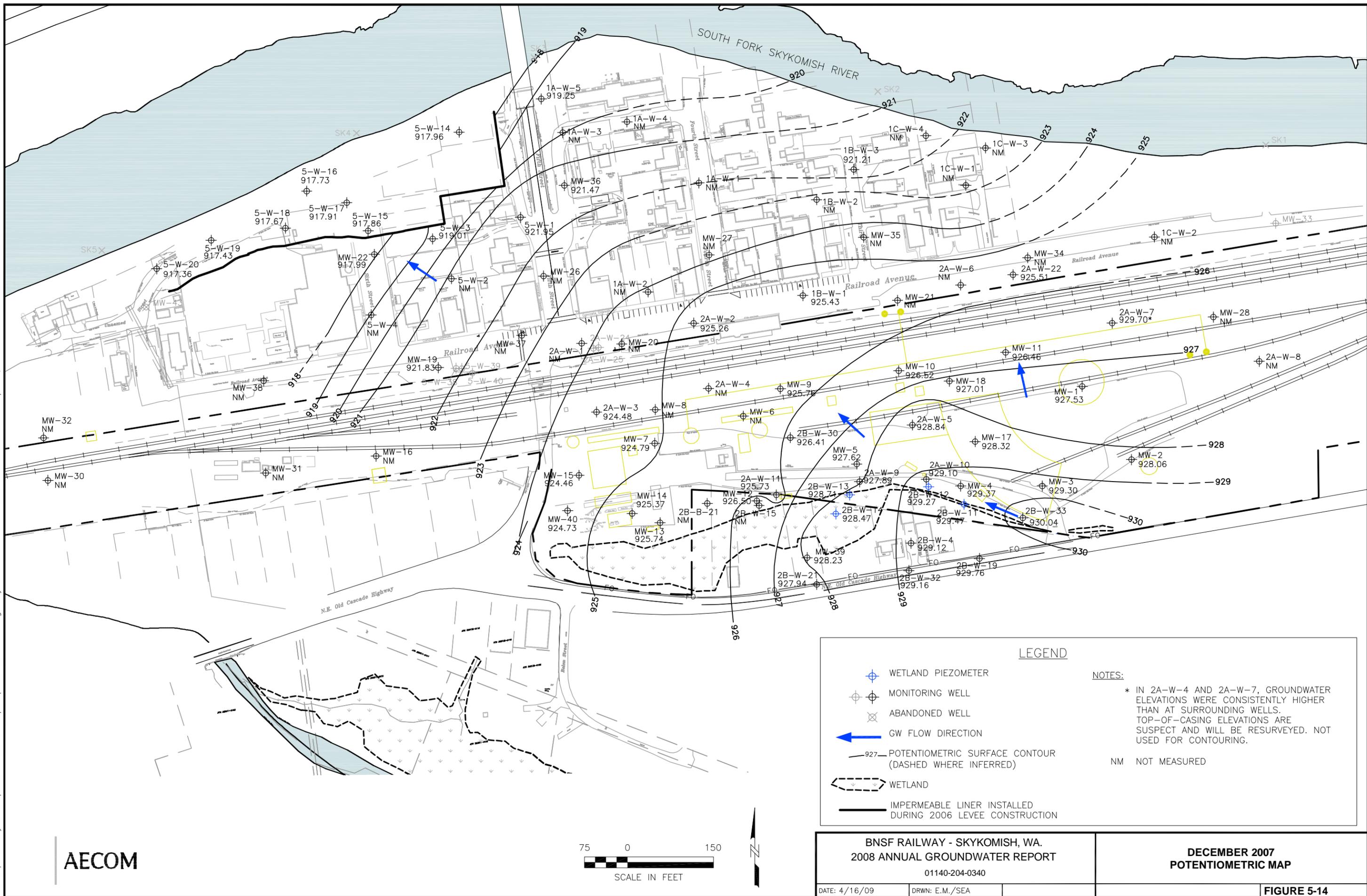
- WETLAND PIEZOMETER
- MONITORING WELL
- ABANDONED WELL
- GW FLOW DIRECTION
- POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- WETLAND

NOTES:

- * IN 2A-W-4 AND 2A-W-7, GROUNDWATER ELEVATIONS WERE CONSISTENTLY HIGHER THAN AT SURROUNDING WELLS. TOP-OF-CASING ELEVATIONS ARE SUSPECT AND WILL BE RESURVEYED. NOT USED FOR CONTOURING.
- ** SUSPECT WATER LEVEL - NOT USED FOR CONTOURING.
- NM NOT MEASURED

BNSF RAILWAY - SKYKOMISH, WA. 2008 ANNUAL GROUNDWATER REPORT 01140-204-0340		NOVEMBER 15, 2007 POTENTIOMETRIC MAP
DATE: 4/16/09	DRWN: E.M./SEA	FIGURE 5-13

File: L:\BNSF-Skykomish\2008 Annual GW Report\December 2007.dwg Layout: FIGURE 5-14 User: MarshallE Plotted: Apr 20, 2009 - 8:52am Xref's:



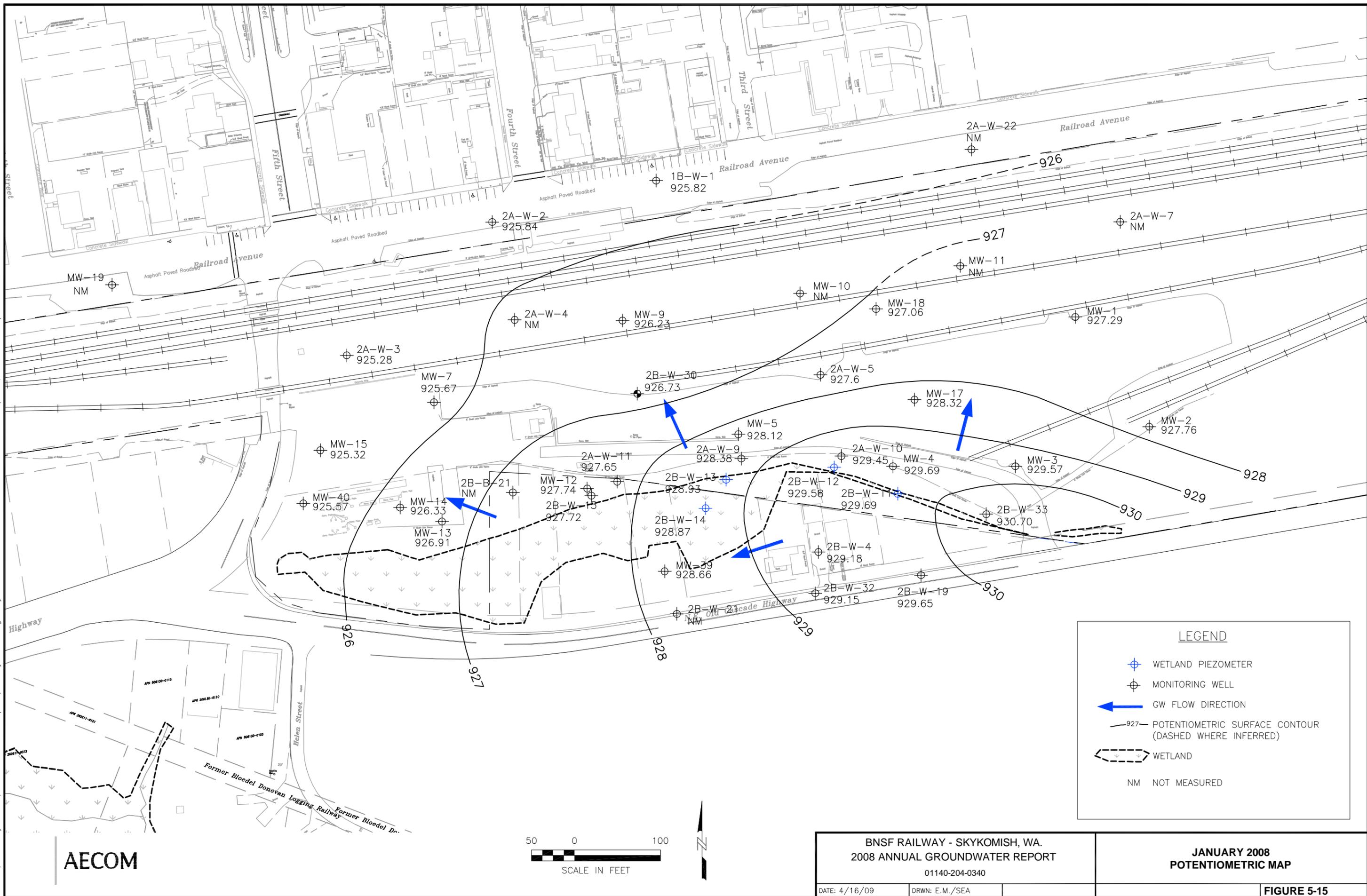
LEGEND		NOTES:
	WETLAND PIEZOMETER	* IN 2A-W-4 AND 2A-W-7, GROUNDWATER ELEVATIONS WERE CONSISTENTLY HIGHER THAN AT SURROUNDING WELLS. TOP-OF-CASING ELEVATIONS ARE SUSPECT AND WILL BE RESURVEYED. NOT USED FOR CONTOURING.
	MONITORING WELL	
	ABANDONED WELL	NM NOT MEASURED
	GW FLOW DIRECTION	
	POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)	
	WETLAND	
	IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION	

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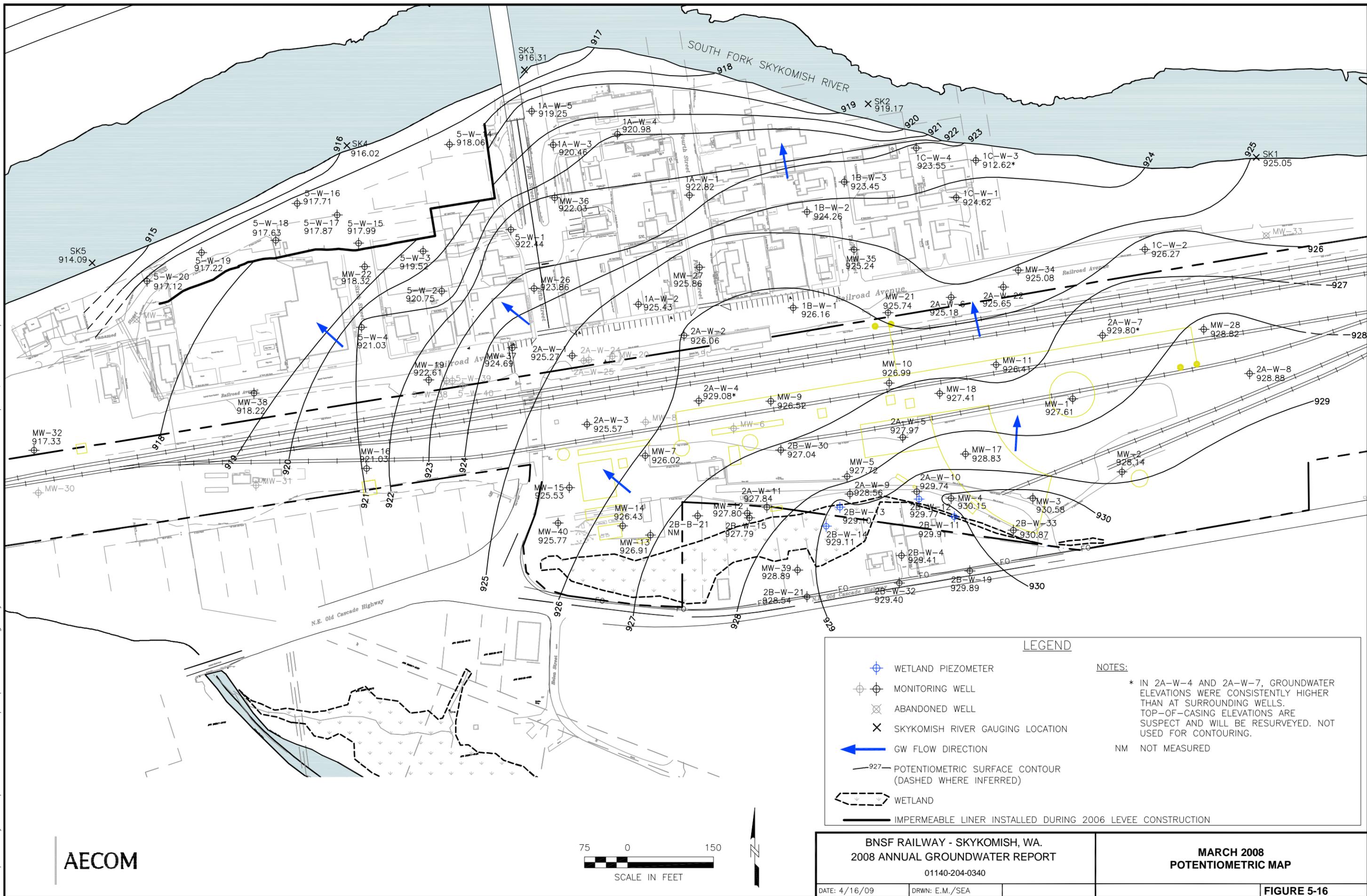
BNSF RAILWAY - SKYKOMISH, WA. 2008 ANNUAL GROUNDWATER REPORT 01140-204-0340		DECEMBER 2007 POTENTIOMETRIC MAP
DATE: 4/16/09	DRWN: E.M./SEA	FIGURE 5-14

File: L:\BNSF-Skykomish\2008 Annual GW Report\January 2008.dwg Layout: FIGURE 5-15 User: MarstallE Plotted: Apr 16, 2009 - 2:24pm Xref's:



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File: L:\BNSF-Skykomish\2008 Annual GW Report\March 2008.dwg Layout: FIGURE 5-16 User: MarshallE Plotted: Apr 20, 2009 - 3:05pm Xref's:



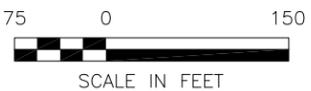
LEGEND

- WETLAND PIEZOMETER
- MONITORING WELL
- ABANDONED WELL
- SKYKOMISH RIVER GAUGING LOCATION
- GW FLOW DIRECTION
- POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- WETLAND
- IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION

NOTES:

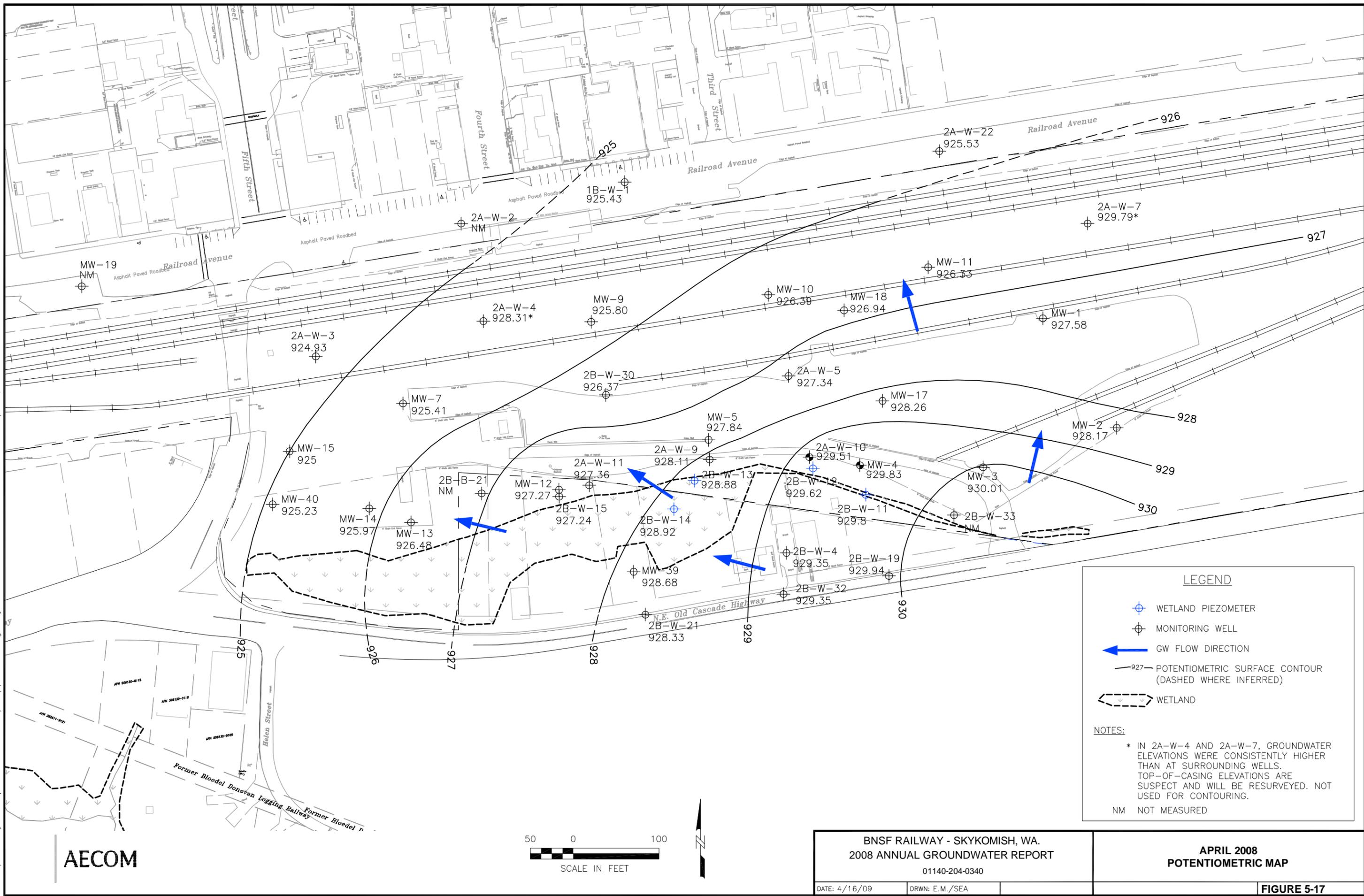
- * IN 2A-W-4 AND 2A-W-7, GROUNDWATER ELEVATIONS WERE CONSISTENTLY HIGHER THAN AT SURROUNDING WELLS. TOP-OF-CASING ELEVATIONS ARE SUSPECT AND WILL BE RESURVEYED. NOT USED FOR CONTOURING.
- NM NOT MEASURED

AECOM



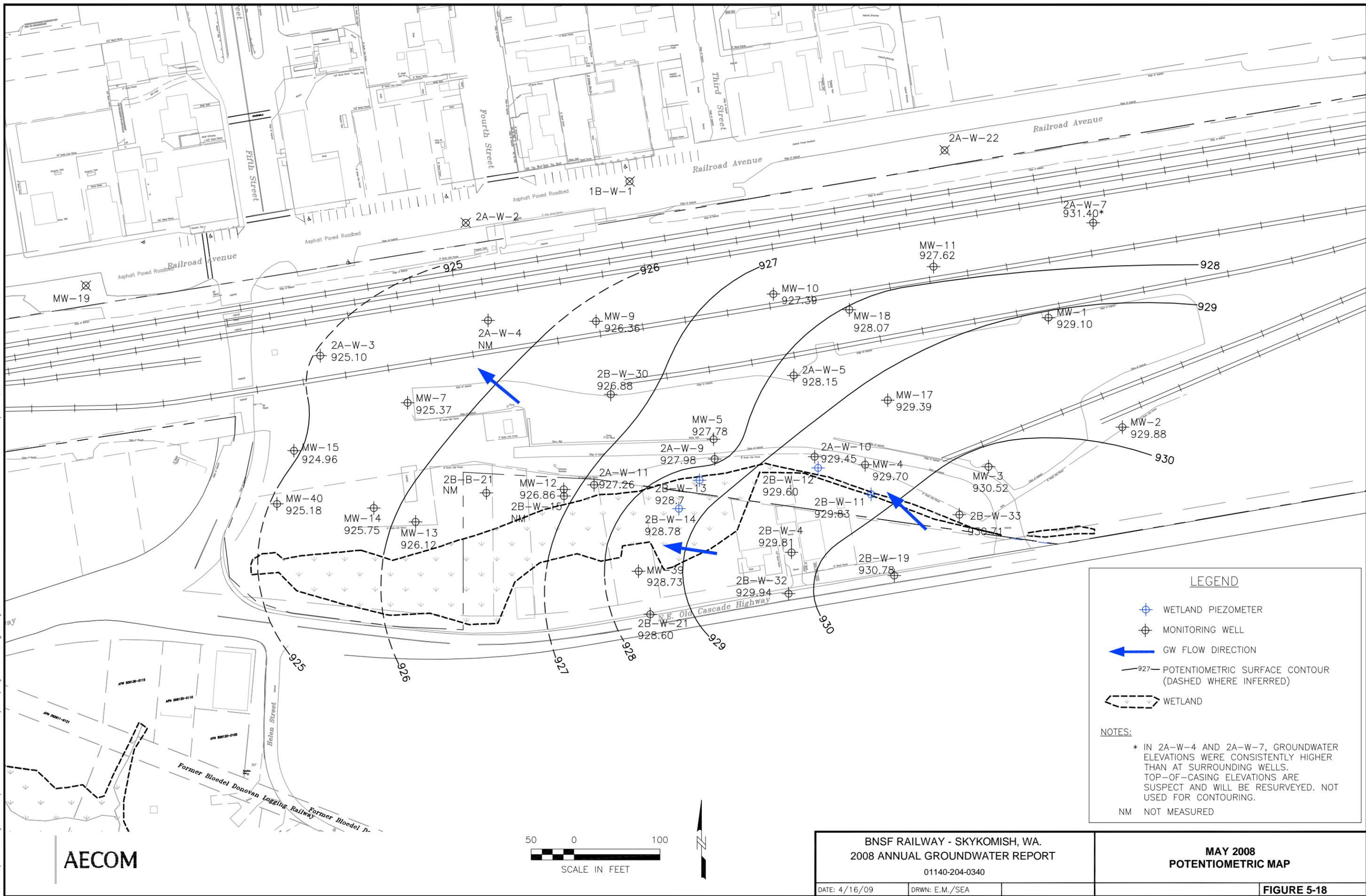
BNSF RAILWAY - SKYKOMISH, WA. 2008 ANNUAL GROUNDWATER REPORT 01140-204-0340		MARCH 2008 POTENTIOMETRIC MAP
DATE: 4/16/09	DRWN: E.M./SEA	FIGURE 5-16

File: L:\BNSF-Skykomish\2008 Annual GW Report\April 2008.dwg Layout: FIGURE 5-17 User: MarshallE Plotted: Apr 20, 2009 - 8:50am Xref's:



AECOM

File: L:\BNSF-Skykomish\2008 Annual GW Report\May 2008.dwg Layout: FIGURE 5-18 User: MarshallE Plotted: Apr 20, 2009 - 8:49am Xref's:



AECOM



LEGEND

- WETLAND PIEZOMETER
- MONITORING WELL
- GW FLOW DIRECTION
- POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- WETLAND

NOTES:

- * IN 2A-W-4 AND 2A-W-7, GROUNDWATER ELEVATIONS WERE CONSISTENTLY HIGHER THAN AT SURROUNDING WELLS. TOP-OF-CASING ELEVATIONS ARE SUSPECT AND WILL BE RESURVEYED. NOT USED FOR CONTOURING.
- NM NOT MEASURED

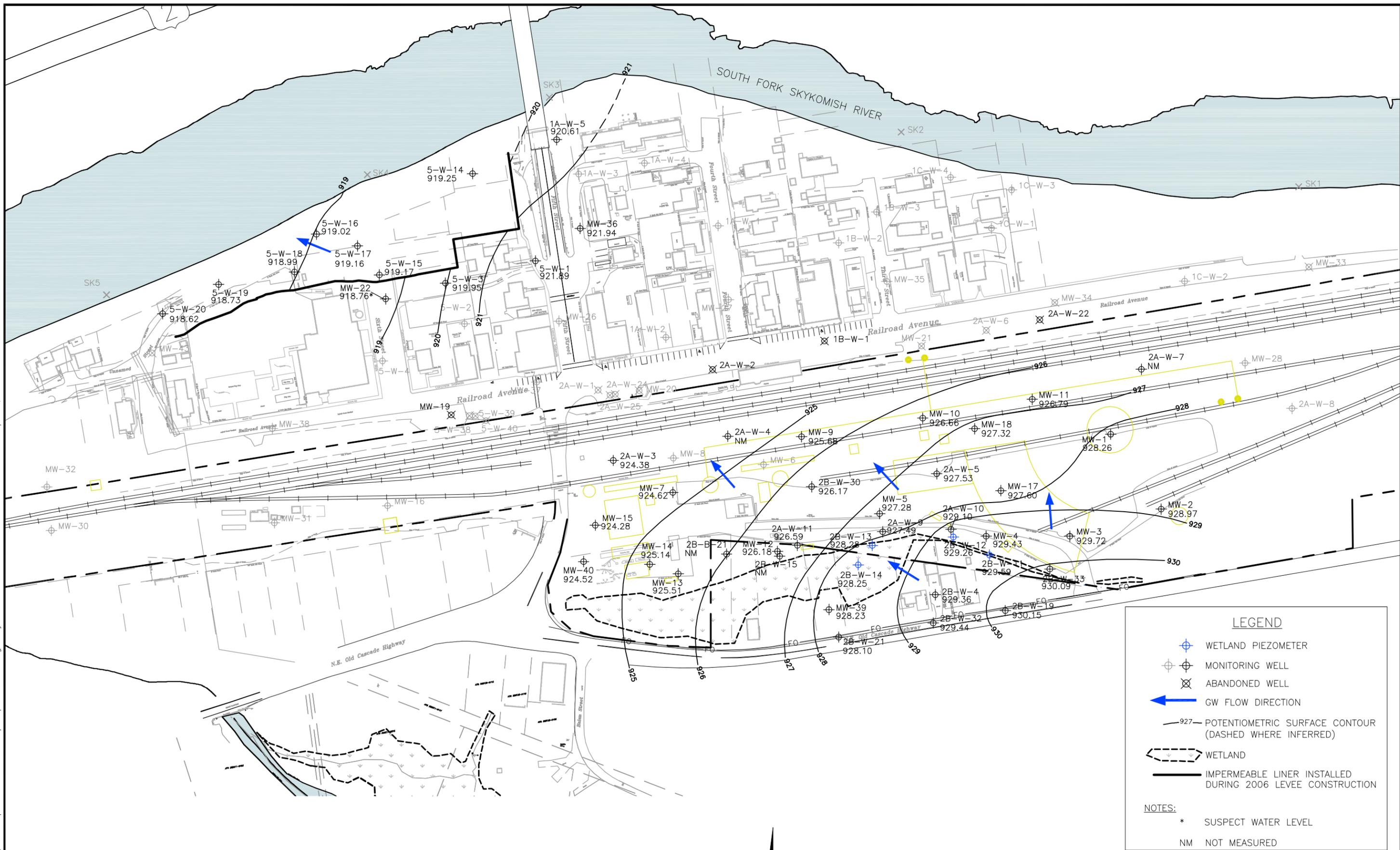
BNSF RAILWAY - SKYKOMISH, WA.
2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

DATE: 4/16/09 DRWN: E.M./SEA

MAY 2008
POTENTIOMETRIC MAP

FIGURE 5-18

File: L:\BNSF-Skykomish\2008 Annual GW Report\June 2008.dwg Layout: FIGURE 5-19 User: MarshallE Plotted: Apr 20, 2009 - 8:48am Xref's:



BNSF RAILWAY - SKYKOMISH, WA.
2008 ANNUAL GROUNDWATER REPORT
01140-204-0340
DATE: 4/16/09 DRWN: E.M./SEA

LEGEND

- WETLAND PIEZOMETER
- MONITORING WELL
- ABANDONED WELL
- GW FLOW DIRECTION
- POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- WETLAND
- IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION

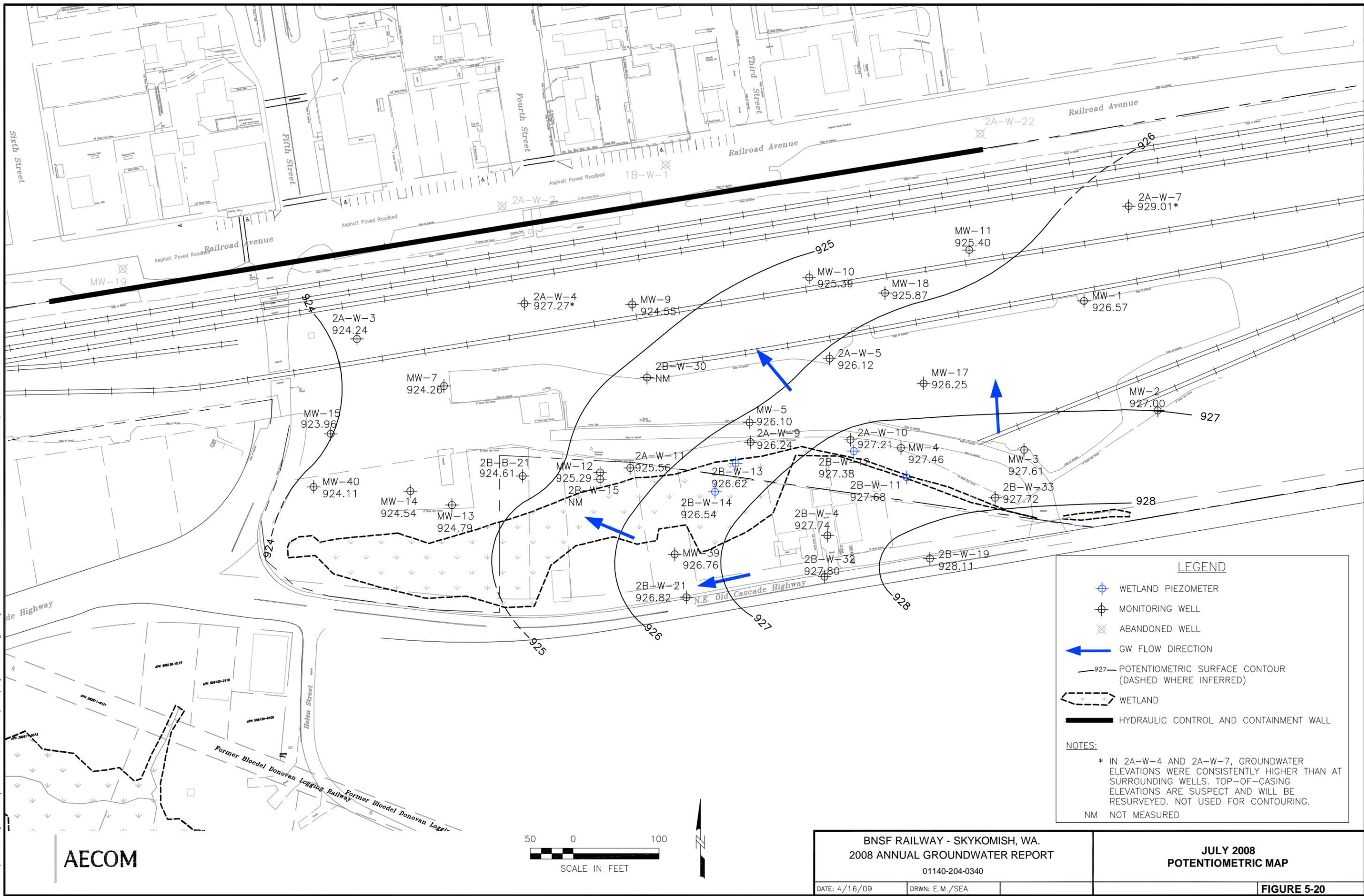
NOTES:

- * SUSPECT WATER LEVEL
- NM NOT MEASURED

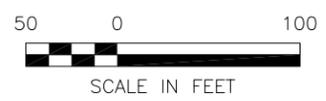
JUNE 2008
POTENTIOMETRIC MAP

FIGURE 5-19

File: L:\BNSF-Skykomish\2008 Annual GW Report\July 2008.dwg Layout: FIGURE 5-20 User: MarshallE Plotted: Apr 20, 2009 - 8:47am Xref's:



AECOM



BNSF RAILWAY - SKYKOMISH, WA.
2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

DATE: 4/16/09 DRWN: E.M./SEA

LEGEND

- WETLAND PIEZOMETER
- MONITORING WELL
- ABANDONED WELL
- GW FLOW DIRECTION
- POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- WETLAND
- HYDRAULIC CONTROL AND CONTAINMENT WALL

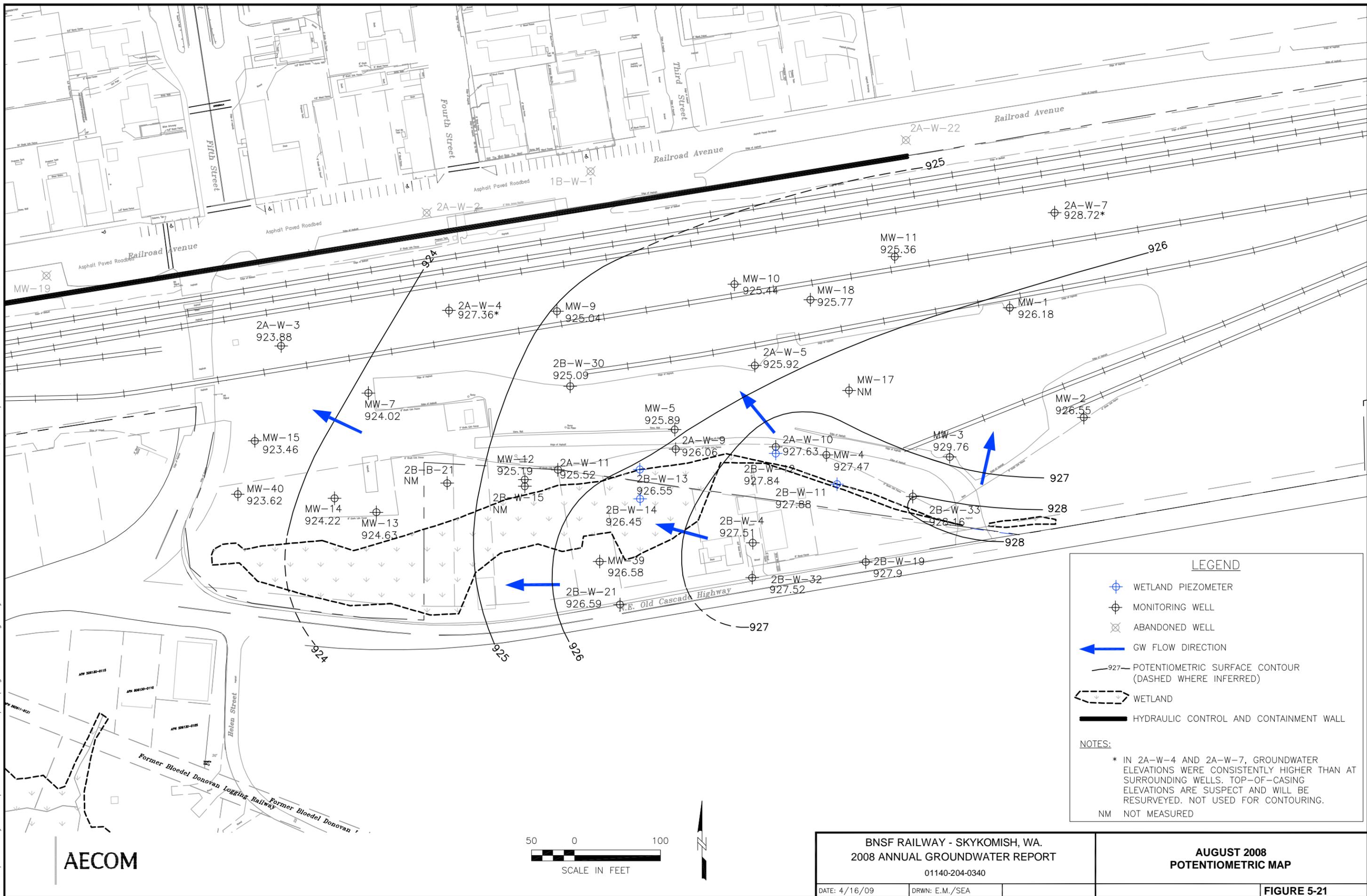
NOTES:

- * IN 2A-W-4 AND 2A-W-7, GROUNDWATER ELEVATIONS WERE CONSISTENTLY HIGHER THAN AT SURROUNDING WELLS. TOP-OF-CASING ELEVATIONS ARE SUSPECT AND WILL BE RESURVEYED. NOT USED FOR CONTOURING.
- NM NOT MEASURED

JULY 2008
POTENTIOMETRIC MAP

FIGURE 5-20

File: L:\BNSF-Skykomish\2008 Annual GW Report\August 2008.dwg Layout: FIGURE 5-21 User: MarshallE Plotted: Apr 20, 2009 - 8:47am Xref's:



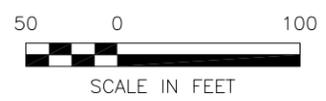
LEGEND

- WETLAND PIEZOMETER
- MONITORING WELL
- ABANDONED WELL
- GW FLOW DIRECTION
- POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- WETLAND
- HYDRAULIC CONTROL AND CONTAINMENT WALL

NOTES:

- * IN 2A-W-4 AND 2A-W-7, GROUNDWATER ELEVATIONS WERE CONSISTENTLY HIGHER THAN AT SURROUNDING WELLS. TOP-OF-CASING ELEVATIONS ARE SUSPECT AND WILL BE RESURVEYED. NOT USED FOR CONTOURING.
- NM NOT MEASURED

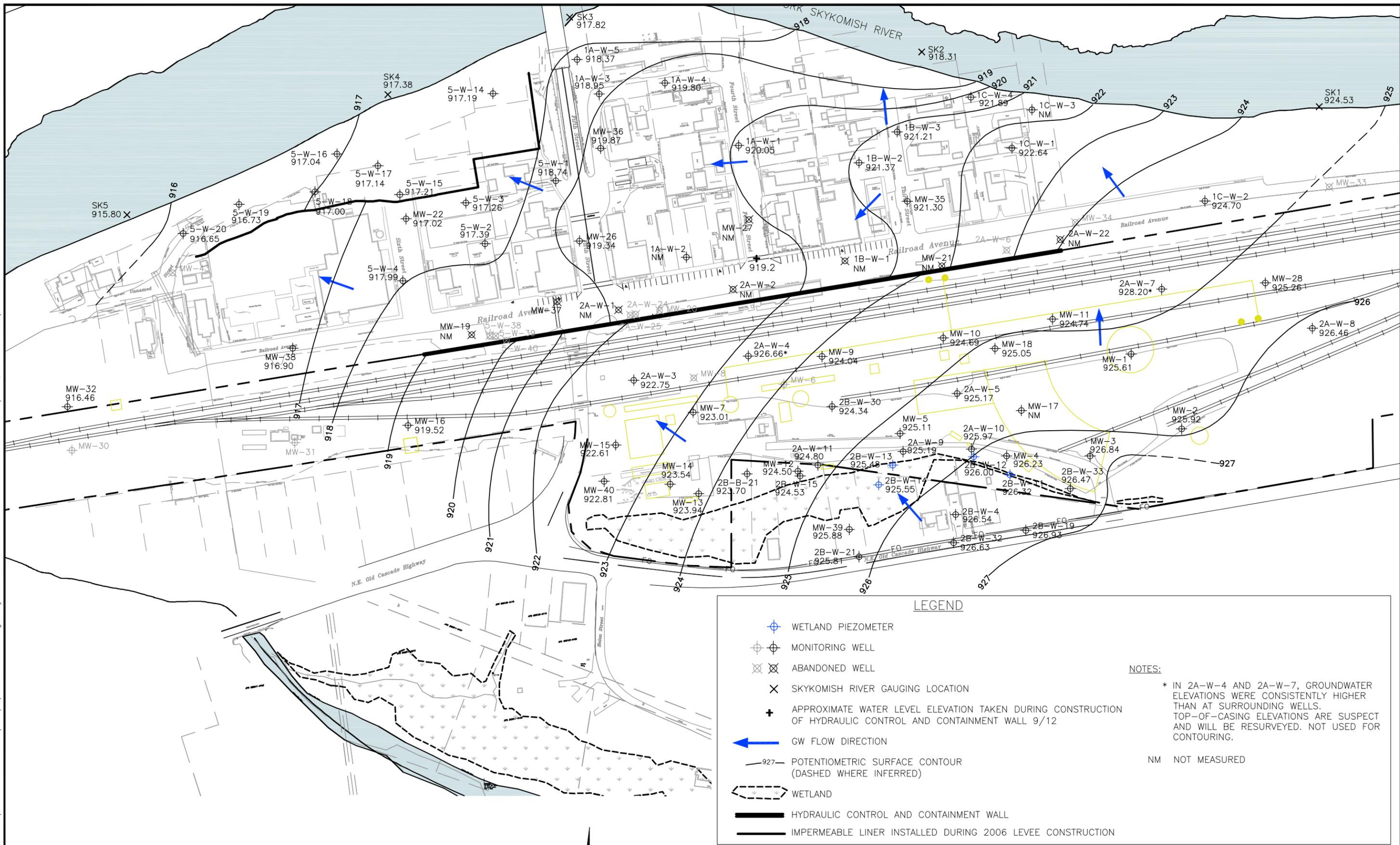
AECOM



BNSF RAILWAY - SKYKOMISH, WA.
2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340
 DATE: 4/16/09 DRWN: E.M./SEA

AUGUST 2008
POTENTIOMETRIC MAP
FIGURE 5-21

File: L:\BNSF-Skykomish\2008 Annual GW Report\September 2008.dwg Layout: FIGURE 5-22 User: MarshallE Plotted: Apr 20, 2009 - 3:06pm Xref's:



AECOM

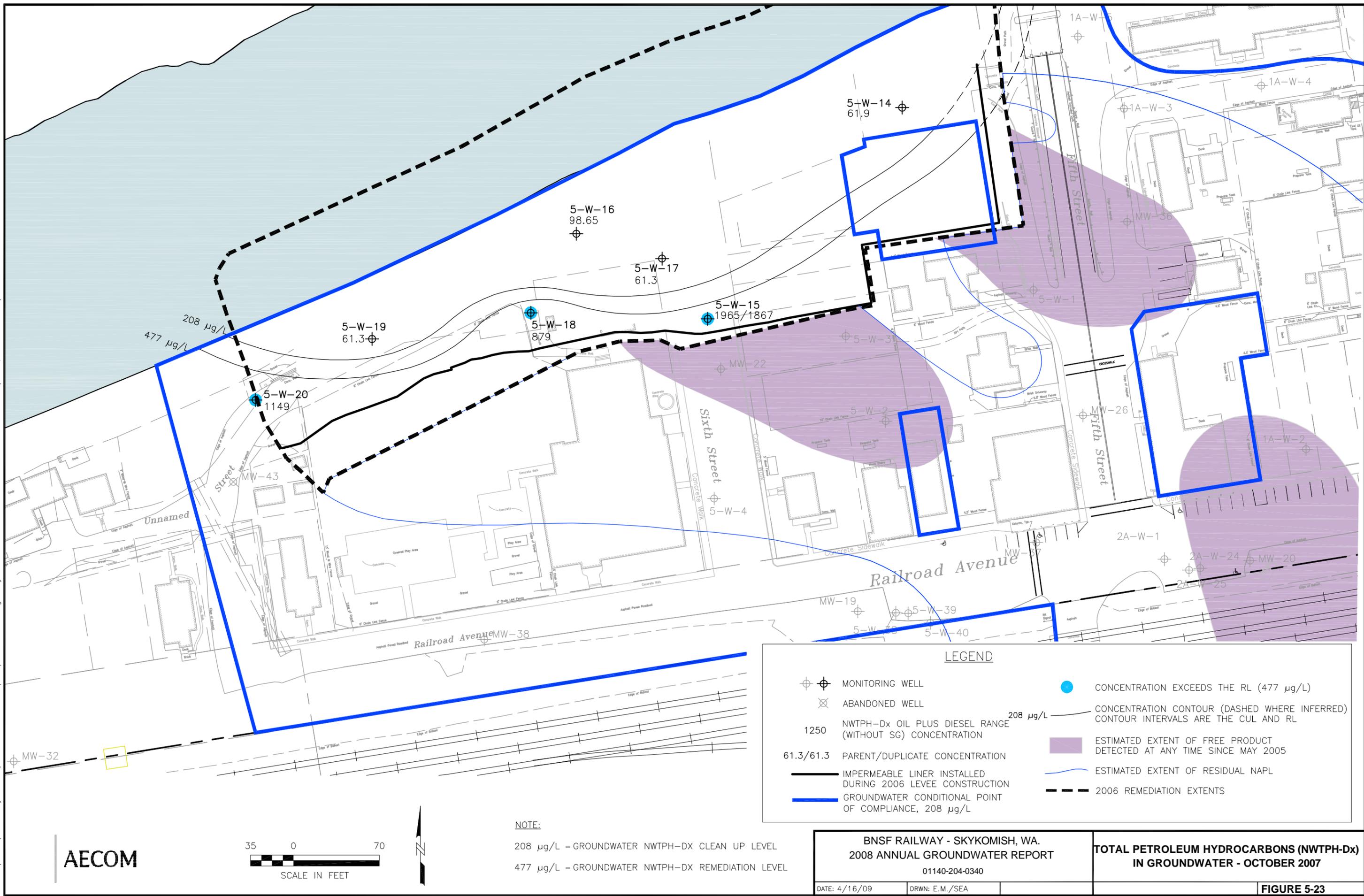


LEGEND	
	WETLAND PIEZOMETER
	MONITORING WELL
	ABANDONED WELL
	SKYKOMISH RIVER GAUGING LOCATION
	APPROXIMATE WATER LEVEL ELEVATION TAKEN DURING CONSTRUCTION OF HYDRAULIC CONTROL AND CONTAINMENT WALL 9/12
	GW FLOW DIRECTION
	POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
	WETLAND
	HYDRAULIC CONTROL AND CONTAINMENT WALL
	IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION

NOTES:	
* IN 2A-W-4 AND 2A-W-7, GROUNDWATER ELEVATIONS WERE CONSISTENTLY HIGHER THAN AT SURROUNDING WELLS. TOP-OF-CASING ELEVATIONS ARE SUSPECT AND WILL BE RESURVEYED. NOT USED FOR CONTOURING.	
NM	NOT MEASURED

BNSF RAILWAY - SKYKOMISH, WA. 2008 ANNUAL GROUNDWATER REPORT 01140-204-0340		SEPTEMBER 2008 POTENTIOMETRIC MAP
DATE: 4/16/09	DRWN: E.M./SEA	FIGURE 5-22

File: P:\CADD\BNSF-Skykomish\2008 Annual GW Report\TPH_10-07.dwg Layout: FIGURE 5-23 User: MarshallE Plotted: Apr 27, 2009 - 3:39pm Xref's:

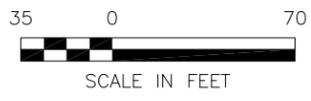


LEGEND

- MONITORING WELL
- ABANDONED WELL
- 1250 NWTPH-Dx OIL PLUS DIESEL RANGE (WITHOUT SG) CONCENTRATION
- 61.3/61.3 PARENT/DUPLICATE CONCENTRATION
- IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION
- GROUNDWATER CONDITIONAL POINT OF COMPLIANCE, 208 µg/L
- CONCENTRATION EXCEEDS THE RL (477 µg/L)
- CONCENTRATION CONTOUR (DASHED WHERE INFERRED) CONTOUR INTERVALS ARE THE CUL AND RL
- ESTIMATED EXTENT OF FREE PRODUCT DETECTED AT ANY TIME SINCE MAY 2005
- ESTIMATED EXTENT OF RESIDUAL NAPL
- 2006 REMEDIATION EXTENTS

NOTE:
 208 µg/L - GROUNDWATER NWTPH-DX CLEAN UP LEVEL
 477 µg/L - GROUNDWATER NWTPH-DX REMEDIATION LEVEL

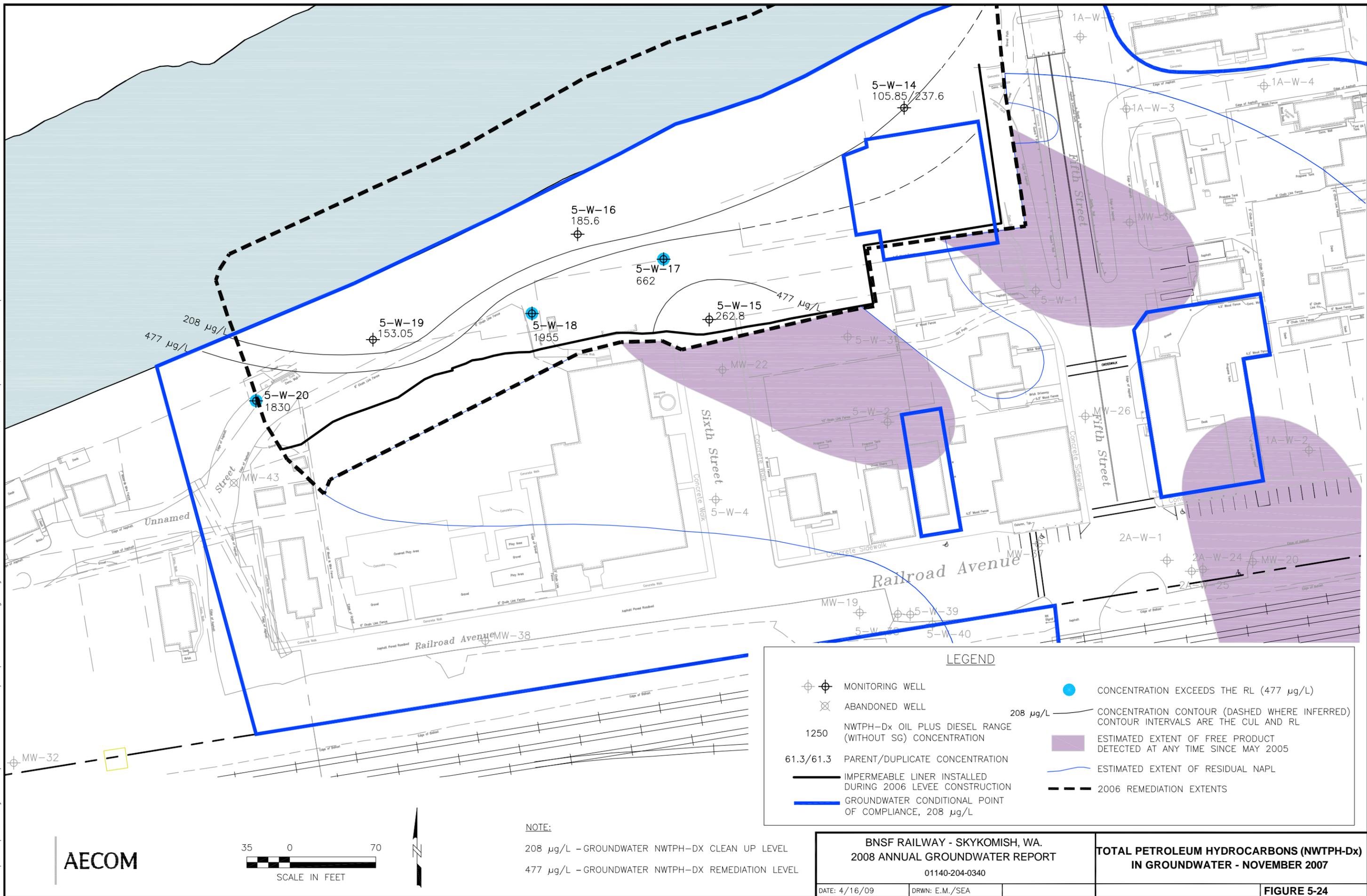
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BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340
 DATE: 4/16/09 DRWN: E.M./SEA

TOTAL PETROLEUM HYDROCARBONS (NWTPH-Dx)
IN GROUNDWATER - OCTOBER 2007
FIGURE 5-23

File: P:\CADD\BNSF-Skykomish\2008 Annual GW Report\TPH_11-07.dwg Layout: FIGURE 5-24 User: MarshallE Plotted: Apr 27, 2009 - 3:40pm Xref's:



LEGEND

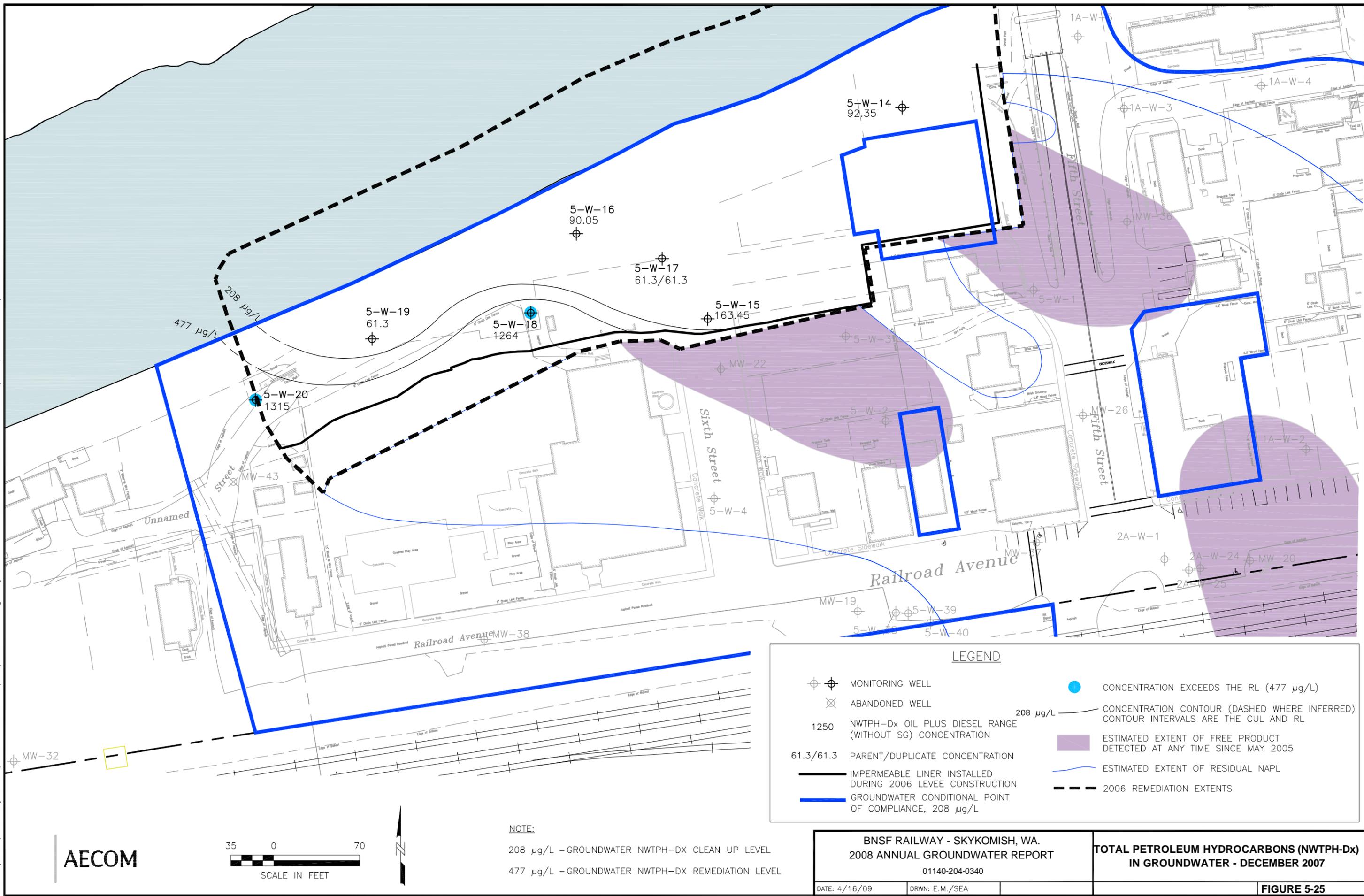
- MONITORING WELL
- ABANDONED WELL
- 1250 NWTPH-Dx OIL PLUS DIESEL RANGE (WITHOUT SG) CONCENTRATION
- 61.3/61.3 PARENT/DUPLICATE CONCENTRATION
- IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION
- GROUNDWATER CONDITIONAL POINT OF COMPLIANCE, 208 µg/L
- CONCENTRATION EXCEEDS THE RL (477 µg/L)
- CONCENTRATION CONTOUR (DASHED WHERE INFERRED) CONTOUR INTERVALS ARE THE CUL AND RL
- ESTIMATED EXTENT OF FREE PRODUCT DETECTED AT ANY TIME SINCE MAY 2005
- ESTIMATED EXTENT OF RESIDUAL NAPL
- 2006 REMEDIATION EXTENTS

NOTE:
 208 µg/L - GROUNDWATER NWTPH-DX CLEAN UP LEVEL
 477 µg/L - GROUNDWATER NWTPH-DX REMEDIATION LEVEL

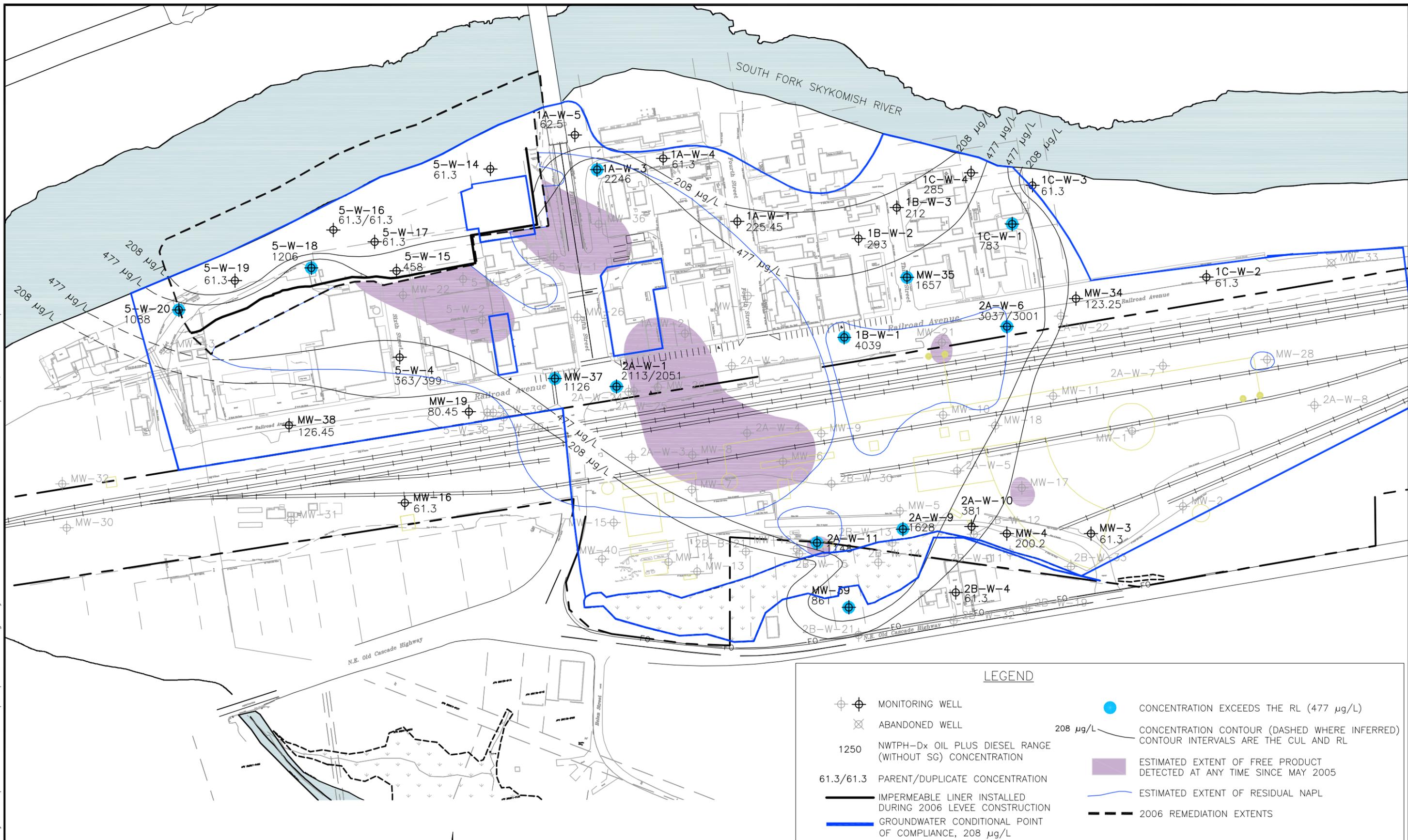


BNSF RAILWAY - SKYKOMISH, WA. 2008 ANNUAL GROUNDWATER REPORT 01140-204-0340		TOTAL PETROLEUM HYDROCARBONS (NWTPH-Dx) IN GROUNDWATER - NOVEMBER 2007
DATE: 4/16/09	DRWN: E.M./SEA	FIGURE 5-24

File: P:\CADD\BNSF-Skykomish\2008 Annual GW Report\TPH_12-07.dwg Layout: FIGURE 5-25 User: MarshallE Plotted: Apr 27, 2009 - 3:41pm Xref's:



File: P:\CADD\BNSF-Skykomish\2008 Annual GW Report\TPH_3-08.dwg Layout: FIGURE 5-26 User: MarshallE Plotted: Apr 27, 2009 - 3:42pm Xref's:



NOTE:
 208 µg/L - GROUNDWATER NWTPH-DX CLEAN UP LEVEL
 477 µg/L - GROUNDWATER NWTPH-DX REMEDIATION LEVEL

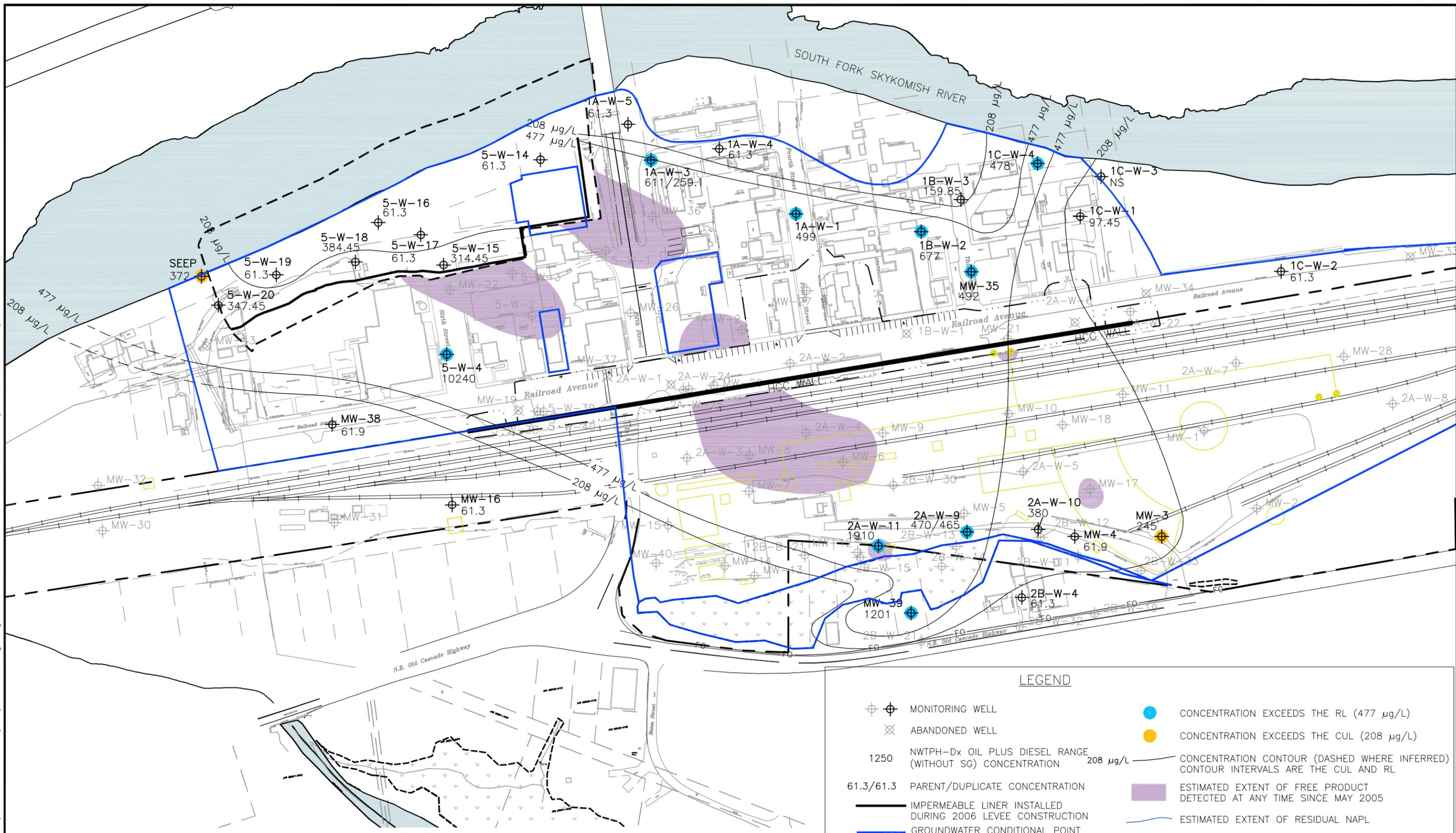
LEGEND	
	MONITORING WELL
	ABANDONED WELL
1250	NWTPH-Dx OIL PLUS DIESEL RANGE (WITHOUT SG) CONCENTRATION
61.3/61.3	PARENT/DUPLICATE CONCENTRATION
	IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION
	GROUNDWATER CONDITIONAL POINT OF COMPLIANCE, 208 µg/L
	CONCENTRATION EXCEEDS THE RL (477 µg/L)
	CONCENTRATION CONTOUR (DASHED WHERE INFERRED) CONTOUR INTERVALS ARE THE CUL AND RL
	ESTIMATED EXTENT OF FREE PRODUCT DETECTED AT ANY TIME SINCE MAY 2005
	ESTIMATED EXTENT OF RESIDUAL NAPL
	2006 REMEDIATION EXTENTS

AECOM



BNSF RAILWAY - SKYKOMISH, WA. 2008 ANNUAL GROUNDWATER REPORT 01140-204-0340		TOTAL PETROLEUM HYDROCARBONS (NWTPH-Dx) IN GROUNDWATER - MARCH 2008
DATE: 4/16/09	DRWN: E.M./SEA	FIGURE 5-26

File: P:\CADD\BNSF-Skykomish\2008 Annual GW Report\TPH_9-08.dwg Layout: FIGURE 5-28 User: MarshallE Plotted: Apr 27, 2009 - 3:44pm Xref's:



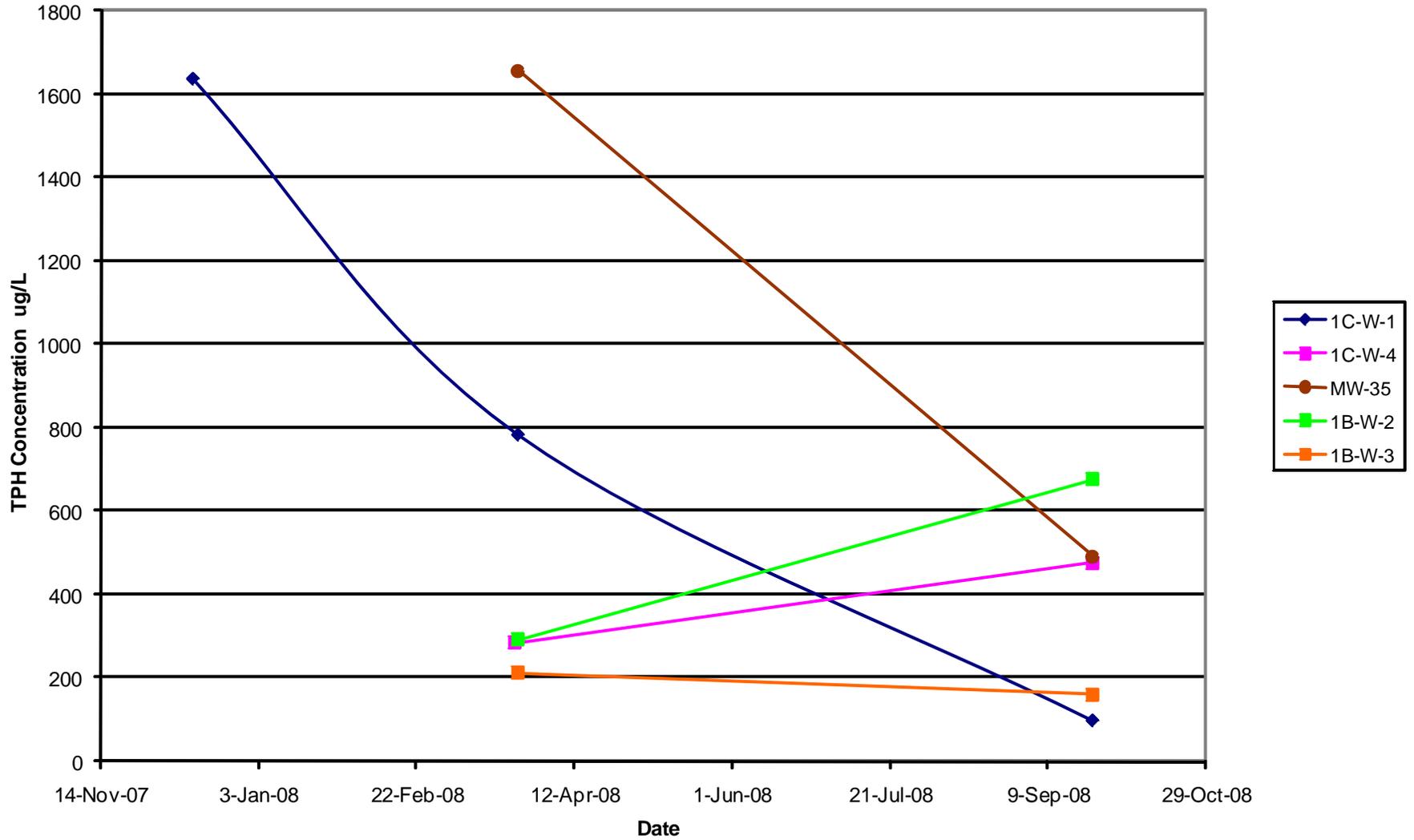
NOTE:
 208 µg/L - GROUNDWATER NWTPH-DX CLEAN UP LEVEL
 477 µg/L - GROUNDWATER NWTPH-DX REMEDIATION LEVEL
 SEEP LOCATION SAMPLED 8/27/08

LEGEND	
⊕	MONITORING WELL
⊗	ABANDONED WELL
1250	NWTPH-Dx OIL PLUS DIESEL RANGE (WITHOUT SG) CONCENTRATION
61.3/61.3	PARENT/DUPLICATE CONCENTRATION
—	IMPERMEABLE LINER INSTALLED DURING 2006 LEVEE CONSTRUCTION
—	GROUNDWATER CONDITIONAL POINT OF COMPLIANCE, 208 µg/L
●	CONCENTRATION EXCEEDS THE RL (477 µg/L)
●	CONCENTRATION EXCEEDS THE CUL (208 µg/L)
---	CONCENTRATION CONTOUR (DASHED WHERE INFERRED) CONTOUR INTERVALS ARE THE CUL AND RL
■	ESTIMATED EXTENT OF FREE PRODUCT DETECTED AT ANY TIME SINCE MAY 2005
—	ESTIMATED EXTENT OF RESIDUAL NAPL
---	2006 REMEDIATION EXTENTS
---	2008 REMEDIATION EXTENTS

AECOM



BNSF RAILWAY - SKYKOMISH, WA. 2008 ANNUAL GROUNDWATER REPORT 01140-204-0340		TOTAL PETROLEUM HYDROCARBONS (NWTPH-Dx) IN GROUNDWATER - SEPTEMBER 2008
DATE: 4/16/09	DRWN: E.M./SEA	FIGURE 5-28



AECOM

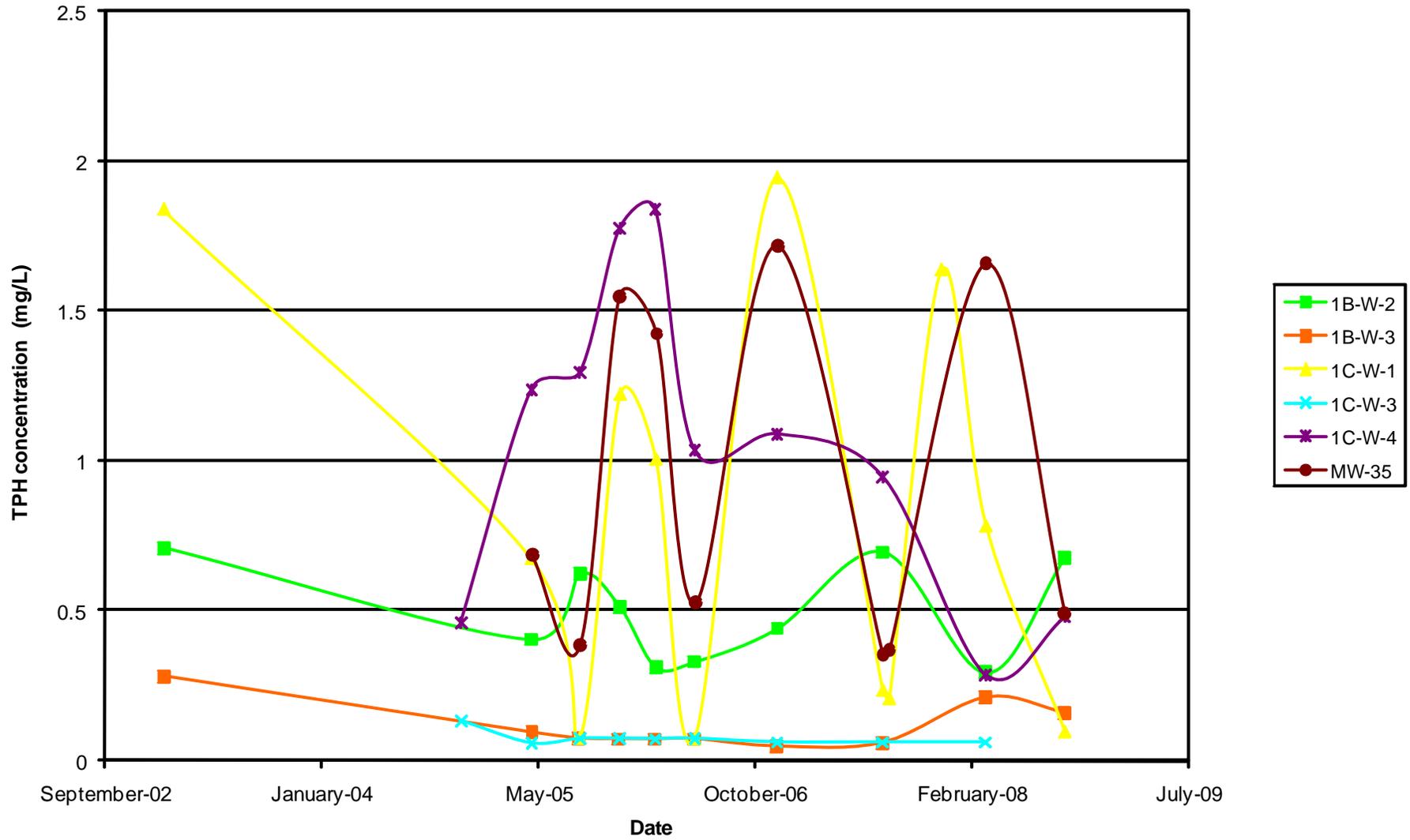
BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

NWTPH-Dx CONCENTRATIONS IN SELECT WELLS
 VERSUS TIME
 AUGUST 2007 - SEPTEMBER 2008

DATE: 04/17/09

DRWN: E.M./SEA

FIGURE 5-29



AECOM

BNSF RAILWAY - SKYKOMISH, WA.
 2008 ANNUAL GROUNDWATER REPORT
 01140-204-0340

NWTPH-Dx CONCENTRATIONS IN SELECT WELLS
 VERSUS TIME
 (2003-2008)

DATE: 04/17/09

DRWN: E.M./SEA

FIGURE 5-30

Appendix A

Field Forms

Fluid Level Gauging Form

Project Name: BNSF Skykomish Project Number: 01140-204-0340 Collected by: D. Kinney / A. Jambrosic

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	7/30/07		DTW (ft)	Prod. Thick. (ft)	Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)				
1A-W-5	10/3/07	0817		8.95	NP	-	WL	10.07	NP				
5-W-13		-	-	-	-	-	-	-	-	-	-	-	Well not installed
5-W-14		0920		8.27	NP	-	WL	9.44	NP				
5-W-15		0926		6.96	NP	-	WL	6.02	NP				
5-W-16		0938		7.27	NP	-	WL	8.27	NP				
5-W-17		0939		6.56	NP	-	WL	7.60	NP				
5-W-18		0940		6.80	NP	-	WL	7.78	NP				
5-W-19		0945		6.82	NP	-	WL	7.72	NP				
5-W-20		0950		6.46	NP	-	WL	7.32	NP				
5-W-1		0951		7.74	Trace	-	T&P	8.40	Trace				8' - 3 1/8"
5-W-3		0932		6.18	Trace	-	T&P	7.49	NP				7' - 9 7/8"
MW-22		935		7.04	Very Trace	-	T&P	8.60	0.4				8' - 11 1/2"
MW-36	N	0948		7.55	Trace	-	T&P	8.30	Very Tr				8' - 5 3/8"

Other Notes:

dirty casing, possible trace product
 dirty well

use tape and paste (TP)
 use tape & paste (TP) + peristaltic pump (PP)

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method			DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)	Sign Off	Comments
<input checked="" type="checkbox"/> MW-7	11/15/07	1120		11.08		None	TP								12.0' - 11.0"
<input checked="" type="checkbox"/> 1B-W-1		1043		9.69		None	TP (PP)								10.0' - 3.7"
<input checked="" type="checkbox"/> 2A-W-3		1100		9.04		None	TP								10.0' - 11.5"
<input checked="" type="checkbox"/> 2A-W-11		1130		5.53		None	TP								6.0' - 5.6"
<input checked="" type="checkbox"/> MW-39		1143		7.38		None	TP								8.0' - 7.4"
<input checked="" type="checkbox"/> 2A-W-4	↓	1210		9.44		Trace	TP								10.0' - 7.0"

Other Notes:

- clean well - north ('town') half use water level meter (WL)
- clean well - south ('railyard') half use water level meter (WL)
- dirty casing, possible trace product use tape and paste (TP)
- dirty well use tape & paste (TP) + peristaltic pump (PP)

Fluid Level Gauging Form

Project Name: BNSF Skykomish

Project Number: 01140-204-0340

Collected by: Aaron Jambasiu / Fred Merrell

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Outside PVC Depth to LNAPL (ft) Water	LNAPL Thickness	Method	11/15/2007				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-2	12/13/07	1044		10.29			WL	9.75					
2A-W-5	12/13/07	1126		10.63			WL	11.80					
2A-W-7	12/13/07	1425		10.89			WL	9.77					
2A-W-9	12/13	1408		8.69			WL	7.93					
2A-W-10	12/13/07	1415		8.83			WL	8.28					
2A-W-22	12/13/07	1835		9.81			WL	9.69					
2B-W-4	12/13/07	1725		1.91			WL	1.70					
2B-W-11	12/13	1607		1.24			WL	0.99					Surface 1.05
2B-W-12	12/13/07	1742		4.34			WL	3.93					outside surface water 4.29ft
2B-W-13	12/13	1401		3.81			WL	3.41					Surface 3.41
2B-W-14	12/13	1356		2.78			WL	3.35					Surface 2.61 - outside
2B-W-15							WL	3.54					No H ₂ O level @ 4.25 -
2B-W-19	12/13	1534		5.49			WL	5.36					
2B-W-21	12/13	1633		7.87			WL	7.31					
2B-W-30	12/13	1627		10.19			WL	9.81					
2B-W-32	12/13/07	1527		6.29			WL	6.12					
2B-W-33	12/13/07	1542		8.24			WL	8.01					
2B-B-21								3.33					

not located

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	11/15/2007				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	12/3/07	1509		11.67			WL	11.91					11.67
MW-2	12/3/07	1505		11.14			WL	11.06					Rusty lock - went loose
MW-3	12/3/07	1455		8.73			WL	8.23					
MW-4	12/13/07	1445		7.58			WL	7.11					
MW-5	12/13/07	1438		5.74			WL	4.97					
MW-9	12/13/07	1201		11.77			WL	11.27					
MW-10	12/13/07	1159		11.82			WL	11.57					
MW-11	12/13/07	1154		12.74			WL	12.67					
MW-12	12/13	1326		4.95			WL	3.30					
MW-13	12/13	1336		9.19			WL	7.86					
MW-14	12/13	1332	13.5	11.12			WL	10.01					
MW-15	12/13/07	1302		12.34			WL	11.45					
X MW-17	12/13/07	1815		10.79	10.79	Heavy Trace	TP	10.63					HAS PRODUCT 11.0-0.21
MW-18	12/13/07	1517		13.67			WL	13.45					
MW-19	12/13/07	1217		10.72			WL	10.11					
MW-40	12/13/07	1311		11.79			WL	10.89					

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	11/15/2007				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
✕ MW-7	12/13/07	1534		12.10	—	NONE	TP	11.08	None				DTW = 13.0 - 0.90
✕ 1B-W-1	12/13/07	1458		10.09	10.09	TRACE	TP	9.69	None				DTW = 11.0 - 0.91
✕ 2A-W-3	12/13/07	1605		9.95	9.95	TRACE	TP	9.04	None				DTW = 11.0 - 1.05
✕ 2A-W-11	12/13/07	1520		7.86	7.86	TRACE	TP	5.53	None				7.5 - 0.64
✕ MW-39	12/13/07	1508		7.98	—	NONE	TP	7.38	None				9.0 - 2.02 = DTW
■ 2A-W-4	12/13/07	1550		10.04	10.04	TRACE	TP	9.42	None				11.0 - 0.96

Other Notes:

- clean well - north ('town') half use water level meter (WL)
- clean well - south ('railyard') half use water level meter (WL)
- dirty casing, possible trace product use tape and paste (TP)
- dirty well use tape & paste (TP) + peristaltic pump (PP)

MW-22 @ 16:45 DTW+DTP 9.0 - 1.77 heavy trace
 S-W-3 @ 17:15 DTW+DTP 7.0 - 0.80 heavy trace
 11W-36 @ 17:00 DTW-DTP 7.5 - 0.50 trace

Fluid Level Gauging Form

Project Name: **BNSF Skykomish**

Project Number: **01140-204-0340**

Collected by: *Acron Jambasic / Fred Merrell*

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	10/3/2007		7/30/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
1A-W-5	12/13/07	1658		9.84			WL	8.95		10.07			
5-W-13				NI			WL	NI		NI			
5-W-14	12/13/07	1015	1015	8.89 ft			WL	8.27		9.44			
5-W-15	12/13/07	0848		7.56			WL	6.96		6.02			
5-W-16	12/13/07	7:75 PM		7.74 ft			WL	7.27		8.27			Time 10:22
5-W-17	12/13/07	1027		7.02 ft			WL	6.56		7.60			
5-W-18	12/13/07	1004		7.24			WL	6.80		7.78			
5-W-19	12/12/07	2057		7.12			WL	6.82		7.72			
5-W-20	12/12/07	2146		6.70			WL	6.46		7.32			
5-W-1	12/13/07	1635		6.42		NONE	TP	7.74	Trace	8.40	Trace		7.0 - 0.38
5-W-3	12/13/07	1715		6.20	6.20	Heavy Trace	TP	6.18	Trace	7.49	None		7.0 - 0.80
MW-22	12/13/07	1645	46	7.23	7.23	Heavy Trace	TP	7.04	Hvy Tr	8.60	0.4		9.0 - 1.77
MW-36	12/13/07	1700	700	6.92	6.92	Trace	TP	7.55	Trace	8.30	hvy Tr		7.5 - 0.58

Other Notes:

dirty casing, possible trace product
 dirty well

use tape and paste (TP)
 use tape & paste (TP) + peristaltic pump (PP)

2A-W-7 = DTW = 10.89 ft @ 14:25

Fluid Level Gauging Form

Project Name: BNSF SkykomishProject Number: 01140-204-0340Collected by: C. Smith & F. Merrill

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	12/13/2007		11/15/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-2	11/17/08	1330		9.71				10.29		9.75			
2A-W-5		1600		11.87				10.63		11.80			
2A-W-7								10.89		9.77			
2A-W-9		1355		8.20				8.69		7.93			Buried, Not Found
2A-W-10		1030		8.48				8.83		8.28			
2A-W-22								9.81		9.69			
2B-W-4		1205		1.85				1.91		1.70			Buried, Not Found
2B-W-11		1000		1.02				1.24		0.99			
2B-W-12	11/17/08	1045		4.02				4.34		3.93			outside casing 0.80
2B-W-13		1115		3.59				3.81		3.41			
2B-W-14		1118		2.38				2.78		3.35			
2B-W-15		1125		4.02				Dry		3.54			
2B-W-19		1215		5.60				5.49		5.36			
2B-W-21								7.87		7.31			
2B-W-30		1545		9.87				10.19		9.81			Not Found
2B-W-32	11/17/08	1200		6.30				6.29		6.12			
2B-W-33		1010		7.58				8.24		8.01			
2B-B-21								NM		3.33			Not Found

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	12/13/2007		11/15/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	11/7/08	11014		11.91				11.67		11.91			
MW-2		11018		11.44				11.14		11.06			
MW-3		11020		8.40				8.73		8.23			
MW-4		11025		7.26				7.58		7.11			
MW-5		11555		5.24				5.74		4.97			
MW-9		11530		11.30				11.77		11.27			
MW-10	11/7/08							11.82		11.57			Buried / Not Found
MW-11								12.74		12.67			Buried / Not Found
MW-12		1127		3.71				4.95		3.30			
MW-13		1130		8.02				9.19		7.86			
MW-14		1136	13.5	10.16				11.12		10.01			
MW-15		1144		11.48				12.34		11.45			
MW-17		11005		10.70			TP	10.79	Hvy Tr	10.63			
MW-18	11/7/08	11008		13.62				13.67		13.45			
MW-19								10.72		10.11			
MW-40		1140		10.95				11.79		10.89			Buried / Not Found

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	12/13/2007		11/15/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
<input checked="" type="checkbox"/> MW-7	11/7/08	1540		11.20			T&P	12.10	None	11:08	None		
<input checked="" type="checkbox"/> 1B-W-1	1	1750		9.70			T&P	10.09	Tr	9.69	None		
<input checked="" type="checkbox"/> 2A-W-3	1	1742		9.15			TP	9.75	Tr	9.04	None		
<input checked="" type="checkbox"/> 2A-W-11	1	1635		5.94			TP	7.86	Tr	5.53	None		
<input checked="" type="checkbox"/> MW-39	11/7/08	1650		7.55			TP	7.98	None	7.38	None		
<input checked="" type="checkbox"/> 2A-W-4								10.04	None	9.42	None		Buried, Not Found

Other Notes:

<input type="checkbox"/>	clean well - north ('town') half	use water level meter (WL)
<input type="checkbox"/>	clean well - south ('railyard') half	use water level meter (WL)
<input checked="" type="checkbox"/>	dirty casing, possible trace product	use tape and paste (TP)
<input checked="" type="checkbox"/>	dirty well	use tape & paste (TP) + peristaltic pump (PP)

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	7/30/2007		2/16/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
S-W-17								7.60		NI			
S-W-18								7.78		NI			
S-W-19								7.72		NI			
S-W-20								7.32		NI			
s MW-1	3/24/08	1031		11.59				13.25		10.29			
s MW-2	3/24/08	1036		11.06				12.93		9.38			
s MW-3	3/24/08	1042		7.45				11.32		6.80			
s MW-4	3/24/08	1048		6.80				10.28		6.62			
s MW-12	3/24/08	1131		3.65				6.90		3.03			
s MW-14			13.5					12.87		9.59			
s MW-16								15.62		12.75			
s MW-18	3/24/08	1100		13.27				15.49		12.55			
s MW-19	3/24/08	1233		9.94				12.22		9.32			
s MW-26	3/24/08	1256		6.79				9.58		6.12			
s MW-32	3/24/08	1207		8.73				9.48		8.10			
MW-34								11.60		9.37			
MW-35								12.94		10.30			
s MW-37	3/24/08	1209		7.63				10.31		7.05			
s MW-38	3/24/08	1216		4.34				5.25		NM			Well Damaged
2A-W-22								10.60		NI			

Newel MW-17 ✓ AS
 MW-13
 MW-14
 MW-19
 MW-26
 MW-32
 MW-37
 MW-38
 2B-W-4
 MW-4
 MW-5
 MW-17

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	7/30/2007		2/16/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
1A-W-3	3/24/08	10:30		7.52		none	TP	8.84	none	6.27	none	AJ	9.0 - 1.48
1B-W-1	3/24/08	10:42		9.36		trace	TP	11.89	hvy. trace	8.70	none	AJ	10.0 - 0.64
2A-W-1	3/24/08	10:54		8.60		none	TP	11.51	trace	8.10	none	AJ	9.0 - 0.40
2A-W-3 -								11.84	hvy. trace	8.38	none		
2A-W-11	3/24/08	13:20		5.75				9.69	hvy. trace	5.14	trace		(6.5 - 0.75)
MW-27	3/24/08	12:42		10.37		none	TP	13.19	none	9.64	none	AJ	(1.0 - 0.63)
MW-28 -								15.00	none	11.86	none		
MW-39 -								10.12	none	6.80	none		
1A-W-2	3/24/08	13:00		9.88		very heavy trace	TP	13.24	0.37	9.11	0.01	AJ	(11.0 - 1.12)
2A-W-4 -	3/24/08	13:43		9.13		heavy trace	TP	12.28	0.28	8.82	0.11	AJ	(10.0 - 0.87)
5-W-1	3/24/08	12:26		5.93		trace	TP	8.40	trace	5.12	none	AJ	(7.0 - 1.07)
5-W-2	3/24/08	12:15		5.62		very heavy trace	TP + PUMP	7.59	hvy. trace	4.75	trace	AJ	6.0 - 0.38
5-W-3	3/24/08	11:30		5.69		heavy trace	TP	7.49	none	4.77	trace	AJ	(6.0 - 0.31)
MW-21	3/24/08	13:07		12.82		very heavy trace	TP	15.52	0.62	12.06	hvy. trace	AJ	(14.0 - 1.18)
MW-22	3/24/08	11:05		6.90		heavy trace	TP	8.60	0.4	5.85	hvy. trace	AJ	(7.5 - 0.60)
MW-36	3/24/08	10:20		7.16	6.34		TP + PUMP	8.30	hvy. trace	5.09	hvy. trace	AJ	(7.0 - 0.66)
- MW-17													

NOTES:

5-W-2 - Attempted gauging by pump method but was not a measurable amount of product to measure by this method, but tube was covered with product and a lot of product was entrained with the tubing during pumping.

MW-27 - Need new cap, screws on cap correctly, entire cap and threads came off well could not remove any other way so measuring point will be slightly lower than survey elevation.

Fluid Level Gauging Form

Project Name: BNSF SkykomishProject Number: 01140-204-0340

Collected by: _____

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	7/30/2007		2/16/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
n 1A-W-1								14.53		11.94			
n 1A-W-4								9.16		6.86			
n 1A-W-5								10.07		7.66			
n 1B-W-2								13.55		10.46			
n 1B-W-3								14.91		12.16			
n 1C-W-1								13.20		10.49			
n 1C-W-2								10.27		7.49			
n 1C-W-3								10.93		8.72			
n 1C-W-4								10.28		8.42			
n 2A-W-6								11.90		9.30			
s 2A-W-8	3/24/08	1023		13.74				15.82		12.18			
s 2A-W-9	3/24/08	1011B		8.02				10.99		7.38			
s 2A-W-10	3/24/08	1112		8.19				11.51		7.79			
s 2B-W-4								4.02		0.80			
s 5-W-4	3/24/08	1250		5.63	4.83			6.75		4.03			
n 5-W-13								NI		NI			
n 5-W-14								9.44		NI			
n 5-W-15								8.02		NI			
n 5-W-16								8.27		NI			

Fluid Level Gauging Form

Project Name: BNSF Skykomish

Project Number: 01140-204-0340

Collected by: C. Smith

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	7/30/2007		2/16/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
n 1A-W-1	2/23	1035		12.67				14.53		11.94		(Well Cap Not on Casing - Put cap on when finished)	
n 1A-W-4	2/23	1041		8.21				9.16		6.86			
n 1A-W-5	2/23	1050		7.31				10.07		7.66			
n 1B-W-2	3/23	1020		11.55				13.55		10.46			
n 1B-W-3	3/23	1030		13.21				14.91		12.16			
n 1C-W-1	3/23/08	0905		11.82				13.20		10.49			
n 1C-W-2	3/23/08	0950		9.02				10.27		7.49			
n 1C-W-3								10.93		8.72			
n 1C-W-4								10.28		8.42			
n 2A-W-6	3/23	0910		6.14				11.90		9.30			
s 2A-W-8								15.82		12.18			
s 2A-W-9								10.99		7.38			
s 2A-W-10								11.51		7.79			
s 2B-W-4	3/23	1255		1.02				4.02		0.80			
s 5-W-4								6.75		4.03			
n 5-W-13								NI		NI		NOT EXISTANT	
n 5-W-14	3/23	1140		8.79				9.44		NI			
n 5-W-15	3/23	1105		7.37				8.02		NI			
n 5-W-16	3/23	1120		7.76				8.27		NI			

Fluid Level Gauging Form

Project Name: BNSF Skykomish Project Number: 01140-204-0340 Collected by: _____

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to Water (ft) N/A	LNAPL Thickness	Method	12/13/2007		11/15/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-2	3/24/08	1242		9.49	(V. ALK.)			10.29		9.75		DWK	
2A-W-5		1144		11.50				10.63		11.80			
2A-W-7		1036		10.79				10.89		9.77			
2A-W-9		—	—	Other list				8.69		7.93			
2A-W-10		—	—	↓	↓			8.83		8.28			
2A-W-22		—	—	↓	↓			9.81		9.69			
2B-W-4		—	—	↓	↓			1.91		1.70			
2B-W-11		1124		0.80	0.75			1.24		0.99			
2B-W-12		1126		3.82	3.60			4.34		3.93			
2B-W-13		1215		3.42	3.14			3.81		3.41			
2B-W-14		1212		2.14	1.96			2.78		3.35			
2B-W-15		1155		3.95	2.51			Dry		3.54			
2B-W-19		1104		5.36				5.49		5.36			
2B-W-21		1132		7.27				7.87		7.31			
2B-W-30		1138		9.56				10.19		9.81			
2B-W-32		1108		6.05				6.29		6.12			
2B-W-33		1059		7.41				8.24		8.01			
2B-B-21		—		NM				NM		3.33			Not able to locate too much snow & ice

MW-39 1254 7.32 Trace T&P
 2A-W-3 1259 8.89 Trace T&P
~~MW-28~~
~~2A-W-4~~ 1307 11.81 None T&P
 MW-17 1316 10.28 Trace T&P
 MW-7 1330 10.87 Trace T&P

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	12/13/2007		11/15/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1								11.67		11.91			
MW-2								11.14		11.06			
MW-3								8.73		8.23			
MW-4								7.58		7.11			
MW-5	03/24/08	1203		5.24				5.74		4.97			
MW-9	03/24/08	0955		11.01				11.77		11.27			
MW-10	03/27/08	1001		11.35				11.82		11.57			
MW-11	03/24/08	1005		12.79				12.74		12.67			HC product on pipe - 211/1/08
MW-12								4.95		3.30			
MW-13								9.19		7.86			
MW-14			13.5					11.12		10.01			
MW-15	3/24/08	1140		11.27				12.34		11.45			
MW-17								10.79	Hvy Tr	10.63			TARE & PASTE
MW-18								13.67		13.45			
MW-19								10.72		10.11			
MW-40	3/24/08	1146		10.75				11.79		10.89			

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	12/13/2007		11/15/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
<input checked="" type="checkbox"/> MW-7	3/29/08	1330		10.87		Trace	TPP	12.10	None	11.08	None	DIC	
<input checked="" type="checkbox"/> TB-W-1								10.09	Tr	9.69	None		
<input checked="" type="checkbox"/> 2A-W-3								9.75	Tr	9.04	None		
<input checked="" type="checkbox"/> 2A-W-11								7.86	Tr	5.53	None		
<input checked="" type="checkbox"/> MW-80								7.98	None	7.38	None		
<input checked="" type="checkbox"/> 2A-W-4								10.04	None	9.42	None		

Other Notes:

- clean well - north ('town') half use water level meter (WL)
- clean well - south ('railyard') half use water level meter (WL)
- dirty casing, possible trace product use tape and paste (TP)
- dirty well use tape & paste (TP) + peristaltic pump (PP)



River Gauging Form

Project
Name: BNSF Skykomish

Project
Number: 01140-204

Measured
by: Aaron Jambros / Fred Merrill / Cassie Smith

stake ID	date	time	backsight	foresight	water level	comments
SK-1	3/24/05	1717	4.24 46.13	14.48		
SK-2	↓	1657	3.10	20.55		
SK-3	↓	1635	6.56	15.13		
SK-4	↓	1620	6.56	15.47		
SK-5	↓	1640	6.56	17.40		
ML-1			NM	NM	NM	
ML-2			↓	↓	↓	
ML-3						
ML-4			↓	↓	↓	

stake ID: SK# = Skykomish River gauging locations, ML# = Former Maloney Creek channel gauging locations

all measurements in feet

backsight: height of level above surveyed point (staff placed at PK nail)

foresight: height of level above gauging point (staff placed in stream bed at SKx, MLx)

water level: depth of water at gauging point

Fluid Level Gauging Form

Project Name: BNSF Skykomish Project Number: 01140-204-0340 Collected by: _____

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	DTW (ft) - Depth to LNAPL (ft) (Creek)	LNAPL Thickness	Method	3/24/2008		12/13/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-2	4/30/2008	1024		NM				9.49		10.29			Well Abandoned
2A-W-5		1150		12.13				11.5		10.63			
2A-W-7		1124		10.80				10.79		10.89			
2A-W-9		1135		8.47				8.02		8.69			
2A-W-10		1155		8.42				8.19		8.83			
2A-W-22		1018		9.79				9.67		9.81			
2B-W-4		1036		1.68				1.62		1.91			
2B-W-11		1135		0.91	0.75			0.8		1.24			
2B-W-12		1140		3.98	3.75			3.82		4.34			
2B-W-13		1150		3.64	3.19			3.42		3.81			
2B-W-14		1152		2.33	2.00			2.14		2.78			
2B-W-15		1012		4.50	2.60			3.95		Dry			
2B-W-19		1029		5.31				5.36		5.49			
2B-W-21		1040		7.48				7.27		7.87			
2B-W-30		1008		10.23				9.56		10.19			
2B-W-32		1033		6.10				6.05		6.29			
2B-W-33		1004		7.71				7.41		8.24			
2B-B-21	↓	1010		4.05				NM		NM			

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/24/2008		12/13/2007		Sign Off	Comments	
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)			
MW-1	4/30/2008	1027		11.62				11.59		11.67				
MW-2		1020		11.03				11.06		11.14				
MW-3		1040		8.02				7.45		8.73				
MW-4		1049		7.12				6.8		7.58				
MW-5		1145		5.57				5.04		5.74				
MW-9		1212		11.73				11.01		11.77				
MW-10		1105		11.95				11.35		11.82				
MW-11		1115		12.87				12.79		12.74				
MW-12		1157		4.18				3.65		4.95				
MW-13		1200		8.45				NM		9.19				
MW-14		1203	13.5	10.52				10.06		11.12				
MW-15		1200		11.80				11.27		12.34				
MW-17		-	Gauged w/ T&P (see pg 3)						10.28		10.79	Hvy Tr		
MW-18		1110		13.74				13.27		13.67				
MW-19		-		NM				9.94		10.72				
MW-40		1205		11.29				10.75		11.79			Well Abandoned	

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/24/2008		12/13/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
<input checked="" type="checkbox"/> MW-7	4/30/2008	1054	11.48			None	T+P	10.87	Tr	12.10	None		12' - 158 mm
<input checked="" type="checkbox"/> MW-17		1059	10.85			None		10.28		10.79	Hvy Tr		11' - 45 mm
<input checked="" type="checkbox"/> 1B-W-1		1105	10.09			TR		9.36	Tr	10.09	Tr		11' - 278 mm
<input checked="" type="checkbox"/> 2A-W-3		1116	9.50			TR		8.86	Tr	9.75	Tr		10' - 152 mm
<input checked="" type="checkbox"/> 2A-W-11		1111	6.23			TR		5.75	Tr	7.86	Tr		7 - 235 mm
<input checked="" type="checkbox"/> MW-39		1047	7.53			TR		7.32	Tr	7.98	None		8' - 143 mm
<input checked="" type="checkbox"/> 2A-W-4		1122	9.90			Hvy TR		9.13	Hvy Tr	10.04	None		10' - 32 mm

Other Notes:

<input type="checkbox"/>	clean well - north ('town') half	use water level meter (WL)
<input type="checkbox"/>	clean well - south ('railyard') half	use water level meter (WL)
<input checked="" type="checkbox"/>	dirty casing, possible trace product	use tape and paste (TP)
<input type="checkbox"/>	dirty well	use tape & paste (TP) + peristaltic pump (PP)

Fluid Level Gauging Form

Project Name: BNSF Skykomish Project Number: 01140-204-0340 Collected by: D. Kinney / G. Sebbane

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Creek Depth to LNAPL (ft) Water	LNAPL Thickness	Method	4/30/2008		3/24/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-2	5/29/2008	-	-	NM	-	-	-	NM		9.49			Well Abandoned
2A-W-5		0914		11.32				12.13		11.5			
2A-W-7		1000		9.19				10.8		10.79			
2A-W-9		0905		8.60				8.47		8.02			
2A-W-10		0920		8.48				8.42		8.19			
2A-W-22		-	-	NM	-	-	-	9.79		9.67			Well Abandoned
2B-W-4		0900		1.22				1.68		1.62			
2B-W-11		0903		0.88	1.17			0.91		0.8			
2B-W-12		0906		4.00	4.11			3.98		3.82			
2B-W-13		0959		3.82	3.30			3.64		3.42			
2B-W-14		0957		2.47	Dry			2.33		2.14			
2B-W-15		0919		Dry	Dry			4.50		3.95			
2B-W-19		0851		4.47				5.31		5.36			
2B-W-21		0910		7.21				7.48		7.27			
2B-W-30		0923		9.72				10.23		9.56			
2B-W-32		0856		5.51				6.10		6.05			
2B-W-33		0847		7.57				7.71		7.41			
2B-B-21	↓	0916		4.95				4.05		NM			

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	4/30/2008		3/24/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	5/29/2008	0951		10.10				11.62		11.59			
MW-2		0942		9.32				11.03		11.06			
MW-3		0936		7.51				8.02		7.45			
MW-4		0930		7.25				7.12		6.80			
MW-5		0900		5.58				5.22		5.04			
MW-9		1020		11.17				11.73		11.01			
MW-10		1013		10.95				11.95		11.35			
MW-11		1006		11.58				12.87		12.79			
MW-12		1028		4.59				4.18		3.65			
MW-13		1035		8.81				8.45		NM			
MW-14		1040	13.5	10.74				10.52		10.06			
MW-15		1048		11.84				11.80		11.27			
MW-18		1010		12.61				13.74		13.27			
MW-19		-	-	NM	-	-	-	NM		9.94			Well Abandoned
MW-40		1045		11.34				11.29		10.75			

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	4/30/2008		3/24/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
<input checked="" type="checkbox"/> MW-7	5/29/2008	0941		11.52	TR	-	T&P	11.48		10.87	Tr		12' - 0.48'
<input checked="" type="checkbox"/> MW-17		1007		9.72	TR	-	T&P	10.85		10.28			11' - 1.78'
<input checked="" type="checkbox"/> 1B-W-1		-	-	NM	-	-	-	10.09	Tr	9.36	Tr		Well Abandoned
<input checked="" type="checkbox"/> 2A-W-3		1031		9.33	TR	-	T&P	9.50	Tr	8.86	Tr		10' - 0.67'
<input checked="" type="checkbox"/> 2A-W-11		0948		6.33	Hvy TR	-	T&P	6.23	Tr	5.75	Tr		7' - 0.67'
<input checked="" type="checkbox"/> MW-39		0955		7.48	TR	-	T&P	7.53	Tr	7.32	Tr		8 - 0.52'
<input checked="" type="checkbox"/> 2A-W-4		1020		NM	-	-	-	9.90	Hvy Tr	9.13	Hvy Tr		New gravel pad & Trailer over well - could not locate

Other Notes:

<input type="checkbox"/> clean well - north ('town') half	use water level meter (WL)
<input type="checkbox"/> clean well - south ('railyard') half	use water level meter (WL)
<input checked="" type="checkbox"/> dirty casing, possible trace product	use tape and paste (TP)
<input checked="" type="checkbox"/> dirty well	use tape & paste (TP) + peristaltic pump (PP)

Fluid Level Gauging Form

Project Name: BNSF SkykomishProject Number: 01140-204-0340Collected by: D. Kinney / G. Sebbano

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	5/29/2008		4/30/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-2	6/23/2008	-	-	NM	-	-	-	NM		NM			Well Abandoned
2A-W-5		0935		11.94				11.32		12.13			Well not located
2A-W-7		-	-	NM	-	-	-	9.19		10.8			
2A-W-9		0915		9.09				8.6		8.47			
2A-W-10		0920		8.83				8.48		8.42			
2A-W-22		-	-	NM	-	-	-	NM		9.79			Well Abandoned
2B-W-4		0952		1.67				1.22		1.68			
2B-W-11		0945		1.12	1.12			0.88		0.91			
2B-W-12		0942		4.35	4.31			4		3.98			
2B-W-13		0907		4.24	3.43			3.82		3.64			
2B-W-14		0906		3.00	dry			2.47		2.33			
2B-W-15		0901		dry @ 4.3	dry			Dry		4.50			
2B-W-19		0940		5.10				4.47		5.31			
2B-W-21		0955		7.71				7.21		7.48			
2B-W-30		1036		10.43				9.72		10.23			
2B-W-32		0948		6.01				5.51		6.10			
2B-W-33		0931		8.19				7.57		7.71			
2B-B-21		0903		5.13				4.45		4.05			

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	5/29/2008		4/30/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	6/23/2008	0958		10.94				10.1		11.62			
MW-2		0954		10.23				9.32		11.03			
MW-3		0945		8.31				7.51		8.02			
MW-4		0950		7.52				7.25		7.12			
MW-5		0928		6.08				5.58		5.22			
MW-9		1013		11.85				11.17		11.73			
MW-10		1007		11.68				10.95		11.95			
MW-11		1003		12.41				11.58		12.87			
MW-12		0900		5.27				4.59		4.18			
MW-13		0918		9.42				8.81		8.45			
MW-14		0912	13.5	11.35				10.74		10.52			
MW-15		0903		12.52				11.84		11.80			
MW-18		1018		13.36				12.61		13.74			
MW-19		-	-	NM	-	-	-	NM		NM			Well Abandoned
MW-40		0908		12.00				11.34		11.29			

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	5/29/2008		4/30/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
<input checked="" type="checkbox"/> MW-7	6/27/2008	1012		12.27	-	None	T&P	11.52	Tr	11.48			13.0-0.73'
<input checked="" type="checkbox"/> MW-17		1021		9.55	-	TR	T&P	9.72	Tr	10.85			11.0-1.45' *
<input checked="" type="checkbox"/> 1B-W-1		-	-	NM	-	-	-	NM		10.09	Tr		Well Abandoned
<input checked="" type="checkbox"/> 2A-W-3		1031		10.05	-	TR	T&P	9.33	Tr	9.50	Tr		11.0-0.95'
<input checked="" type="checkbox"/> 2A-W-11		1003		7.00	-	Hvy TR	T&P	6.33	Hvy Tr	6.23	Tr		8.0-1.00'
<input checked="" type="checkbox"/> MW-39		0958		7.98	-	TR	T&P	7.53	Tr	7.53	Tr		9.0-1.02'
<input checked="" type="checkbox"/> 2A-W-4		-	-	NM	-	-	-	NM		9.90	Hvy Tr		Not located

Other Notes:

- clean well - north ('town') half
- clean well - south ('railyard') half
- dirty casing, possible trace product
- dirty well

- use water level meter (WL)
- use water level meter (WL)
- use tape and paste (TP)
- use tape & paste (TP) + peristaltic pump (PP)

* MW-17: casing has been adjusted, now a flush-mount well

Fluid Level Gauging Form

Project Name: BNSF Skykomish

Project Number: 01140-204-0340

Collected by: D. Kinney / G. Sebbane

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/24/2008		10/3/2007		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
1A-W-5	6/27/08	11:25		7.98			WL	9.34		8.95			
5-W-13													Not installed
5-W-14		12:35		7.60				8.79		8.27			
5-W-15		11:53		6.19				7.37		6.96			
5-W-16		12:26		6.45				7.76		7.27			
5-W-17		12:20		5.77				7.06		6.56			
5-W-18		13:00		5.92				7.28		6.80			
5-W-19		12:46		5.82				7.33		6.82			
5-W-20		12:51		5.44				6.94		6.46			
5-W-1		11:33		6.48	Trace		T&P	5.93	Tr	7.74	Trace		7.0 - 0.52'
5-W-3		11:47		5.76	Trace		T&P	5.69	Hvy Tr	6.18	Trace		6.0 - 0.74'
MW-22		11:38		6.46	Hvy Tr		T&P	6.90	Hvy Tr	7.04	Hvy Tr		8.0 - 1.54'
MW-36		11:20		6.45	Hvy Tr		T&P	7.16	0.82	7.55	Trace		7.0 - 0.55'

Other Notes:

dirty casing, possible trace product
dirty well

use tape and paste (TP)
use tape & paste (TP) + peristaltic pump (PP)

Product 8 S./Creek Wells & PZOs

PAGE 1

Fluid Level Gauging Form

Project Name: BNSF Skykomish

Project Number: 01140-204-0340

Collected by: _____

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	6/23/2008		5/29/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-2	7/24/2008			NM				NM		NM			Well Abandoned
2A-W-5		1012		13.35				11.94		11.32			
2A-W-7		1346		11.58				NM		9.19			
2A-W-9		0959		10.34				9.09		8.60			
2A-W-10		1430		10.72				8.83		8.48			
2A-W-22				NM				NM		NM			Well Abandoned
2B-W-4		0929		3.29				1.67		1.22			↑ Creek Dry ↓
2B-W-11		0939		3.03				1.12		0.88			
2B-W-12		0948		6.29				4.35		4.00			
2B-W-13		0954		5.90				4.24		3.82			
2B-W-14		1005		4.71				3.00		2.47			
2B-W-15		—		N.M.				Dry		Dry			- Broken or Clogged
2B-W-19		0924		7.14				5.10		4.47			
2B-W-21		1143		8.99				7.71		7.21			
2B-W-30		0924		7.45				10.43		9.72			
2B-W-32		0920		7.15				6.01		5.51			
2B-W-33		0935		10.56				8.19		7.57			
2B-B-21		1030		5.89				5.13		4.45			

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	6/23/2008		5/29/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	7/24/2008	9:35		12.63				10.94		10.10			
MW-2		9:30		12.20				10.23		9.32			
MW-3		9:22		10.42				8.31		7.51			
MW-4								7.52		7.25			
MW-5		9:15		7.26				6.08		5.58			
MW-9		9:56		12.89				11.85		11.17			
MW-10		9:52		12.95				11.68		10.95			
MW-11		9:44		13.80				12.41		11.58			Some green & odor
MW-12								5.27		4.59			inter probe
MW-13		11:02		10.14				9.42		8.81			
MW-14		10:50	13.5	11.95				11.35		10.74			
MW-15		10:42		12.24				12.52		11.84			
MW-18		10:05		14.81				13.36		12.61			
MW-19				NM				NM		NM			Well Abandoned
MW-40		10:46		12:41				12.00		11.34			

Fluid Level Gauging Form

Project Name: BNSF Skykomish Project Number: 01140-204-0340 Collected by: C. Smith & G. Sebbane

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	6/23/2008		5/29/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-2	7/24/2008			NM				NM		NM			Well Abandoned
2A-W-5		1012		13.35				11.94		11.32			
2A-W-7		1340		11.58				NM		9.19			
2A-W-9		0959		1034				9.09		8.60			
2A-W-10		1430		1072				8.83		8.48			
2A-W-22				NM				NM		NM			Well Abandoned
2B-W-4		0929		3.29				1.67		1.22			
2B-W-11		0939		3.03				1.12		0.88			
2B-W-12		0948		6.29				4.35		4.00			
2B-W-13		0957		5.90				4.24		3.82			
2B-W-14		1005		4.71				3.00		2.47			
2B-W-15				N.M.				Dry		Dry			Meter was stuck (Broken?)
2B-W-19		0924		7.14				5.10		4.47			
2B-W-21		1143		8.99				7.71		7.21			
2B-W-30				N.M.				10.43		9.72			
2B-W-32		0920		7.65				6.01		5.51			
2B-W-33		0935		10.56				8.19		7.57			
2B-B-21		1036		5.89				5.13		4.45			

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	6/23/2008		5/29/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	7/24/2008	0935		12.63				10.94		10.10			
MW-2		0930		12.20				10.23		9.32			
MW-3		0922		10.42				8.31		7.51			
MW-4		1406		9.49				7.52		7.25			
MW-5		0915		7.26				6.08		5.58			
MW-9		0956		12.98				11.85		11.17			
MW-10		0952		12.95				11.68		10.95			
MW-11		0944		13.80				12.41		11.58			
MW-12		1014		6.16				5.27		4.59			
MW-13		1102		10.14				9.42		8.81			
MW-14		1055	13.5	11.95				11.35		10.74			
MW-15		1042		12.84				12.52		11.84			
MW-18		1005		14.81				13.36		12.61			
MW-19				NM				NM		NM			
MW-40		1040		12.41				12.00		11.34			Well Abandoned

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	6/23/2008		5/29/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
<input checked="" type="checkbox"/> MW-7	7/24/2008	1110		12.63	—	Trace	T&P	12.27	None	11.52	Tr		T&P - Trace
<input checked="" type="checkbox"/> MW-17				10.9	—	Hvy Trace	T&P	9.55	Tr	9.72	Tr		
<input checked="" type="checkbox"/> 1B-W-1				NM				NM		NM			Well Abandoned
<input checked="" type="checkbox"/> 2A-W-3		1101		10.19	—	Trace	T&P	10.05	Tr	9.33	Tr		
<input checked="" type="checkbox"/> 2A-W-11		1134		8.03	—	Hvy Trace	T&P	7.00	Hvy Tr	6.33	Hvy Tr		
<input checked="" type="checkbox"/> MW-39		1148		9.45	—	Trace	T&P	7.98	Tr	7.53	Tr		
<input checked="" type="checkbox"/> 2A-W-4		1535		11.22	10.93	0.29	Pump	NM		NM			Peristaltic Pump & Tubing

Other Notes:

- clean well - north ('town') half
- clean well - south ('railyard') half
- dirty casing, possible trace product
- dirty well

- use water level meter (WL)
- use water level meter (WL)
- use tape and paste (TP)
- use tape & paste (TP) + peristaltic pump (PP)

Fluid Level Gauging Form

Project Name: BNSF SkykomishProject Number: 01140-204-0340Collected by: D. Kinney, G. Sabbane

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft) <i>WSD / ToC P.V.C. spot</i>	LNAPL Thickness	Method	7/24/2008		6/23/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-5	08/27/08	0844		13.55				13.35		11.94			
2A-W-7		1045		11.87				11.58		NM			
2A-W-9		0757		10.52				10.34		9.09			
2A-W-10		0905		10.30				10.72		8.83			
2B-W-4		0826		3.52				3.29		1.67			
2B-W-11		0836		2.83	1.15			3.03		1.12			
2B-W-12		0832		5.80	4.46			6.29		4.35			
2B-W-13		0754		5.97	dry			5.9		4.24			
2B-W-14		0757		4.80	dry			4.71		3.00			
2B-W-15		0802		dry @ 4.3'	dry			NM		Dry			
2B-W-19		0829		7.35				7.14		5.10			
2B-W-21		0748		9.22				8.99		7.71			
2B-W-30		0845		11.51				NM		10.43			
2B-W-32		0823		7.93				7.65		6.01			
2B-W-33		0840		10.12				10.56		8.19			
2B-B-21	↓	0806		6.12				5.89		5.13			

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	DTW (TOC-PVC) Creek	LNAPL Thickness	Method	7/24/2008		6/23/2008		Sign Off
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)	
MW-1	08/27/08	0810		13.02				12.63		10.94		
MW-2	08/27/08	0806		17.65				12.2		10.23		
MW-3	08/27/08	0754		8.27				10.42		8.31		
MW-4	08/27/08	0758		9.48				9.49		7.52		
MW-5	08/27/08	0746		7.77				7.26		6.08		
MW-9	08/27/08	0831		17.49				12.98		11.85		
MW-10	08/27/08	0821		12.90				12.95		11.68		
MW-11	08/27/08	0817		13.84				13.8		12.41		
MW-12	08/27/08	0803		6.26				6.16		5.27		
MW-13	08/27/08	0902		10.30				10.14		9.42		
MW-14	08/27/08	0858	13.5	12.27				11.95		11.35		
MW-15	08/27/08	0855		13.34				12.84		12.52		
MW-18	08/27/08	0839		14.91				14.81		13.36		
MW-40	08/27/08	0851		12.90				12.41		12		

	Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	7/24/2008		6/23/2008		Sign Off	Comments
									DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
☒	MW-7	08/27/08	0850		12.87	-	None	T&P	12.63	Trace	12.27	None		13' - 0.13'
☒	MW-17	08/27/08	-	-	NM	-	-	T&P	10.9	Heavy Trace	9.55	Trace		Well buried under soil stockpile Casing adjusted to Flush-mount
☒	2A-W-3	08/27/08	0920		10.55		Trace	T&P	10.19	Trace	10.05	Trace		11' - 0.45'
☒	2A-W-11	08/27/08	0817		8.07		Hvy Tr	T&P	8.03	Heavy Trace	7	Heavy Trace		9' - 0.93'
☒	MW-39	08/27/08	12819		9.63		Trace	T&P	9.45	Trace	7.98	Trace		10' - 0.37'
■	2A-W-4	08/27/08	0934		10.85		Hvy Tr	Pump	11.22	10.93	NM			P. Pump & tubing 12' - 0.15'

Other Notes:

☐	clean well - north ('town') half	use water level meter (WL)
☐	clean well - south ('railyard') half	use water level meter (WL)
☒	dirty casing, possible trace product	use tape and paste (TP)
■	dirty well	use tape & paste (TP) + peristaltic pump (PP)

Fluid Level Gauging Form

Project Name: BNSF Skykomish

Project Number: 01140-204-0340

Collected by: D. Kinney, Fred Merrill, Ghani Sebbane

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	8/27/2008		7/24/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-2	9/22/2008	—		NM				NM		NM		DWK	Well Abandoned
2A-W-5		1331		14.30				13:55		13:35		Fm	
2A-W-7		1315		12.39				11:87		11:58		DWK	
2A-W-9		0832		11.39				10:52		10:34		DWK	
2A-W-10		1010		11.96				10:3		10:72		DWK	
2A-W-22		—		NM				NM		NM		DWK	Well Abandoned
2B-W-4		0937		4.49				3:52		3:29		DWK	
2B-W-11		0942		4.39	dry			2:83		3:03		DWK	
2B-W-12		0940		7.70	dry			5:8		6:29		DWK	
2B-W-13		1004		7.04	dry			5:97		5:9		DWK	
2B-W-14		1006		5.70	dry			4:80		4:71		DWK	
2B-W-15		0906		7.21	dry			Dry		Dry		DWK	
2B-W-19		0946		8.32				7:35		7:14		DWK	
2B-W-21		0926		10.00				9:22		8:99		DWK	
2B-W-30		0835		12.26				11:51		NM		DWK	
2B-W-32		0930		8.82				7:93		7:65		DWK	
2B-W-33		0952		11.81				10:12		10:56		DWK	
2B-B-21		0903		6.80				6:12		5:89		DWK	

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	8/27/2008		7/24/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	9/22/2008	0855		13.59				13.02		12.63		DWK	
MW-2		0846		13.28				12.65		12.2		DWK	
MW-3		0842		11.19				8.27		10.42		DWK	
MW-4		0840		10.72				9.48		9.49		DWK	
MW-5		0827		8.25				7.47		7.26		DWK	
MW-9		1223		13.49				12.49		12.89		FM	
MW-10		1230		13.65				12.9		12.95		FM	
MW-11		1239		14.46				13.84		13.8		FM	
MW-12		0901		6.95				6.26		6.16		DWK	
MW-13		1215		10.99				10.38		10.14		DWK	
MW-14		1218	13.5	12.95				12.27		11.95		DWK	
MW-15		1221		14.19				13.34		12.84		DWK	
MW-18		1145		15.63				14.91		14.81		DWK	
MW-19		-		NM				NM		NM		DWK	Well Abandoned
MW-40		1224		13.71				12.90		12.41		DWK	

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	8/27/2008		7/24/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
<input checked="" type="checkbox"/> MW-7	9/22/2008	0915		13.88		None	TOP	12.87	None	12.63	Tr.		14' - 0.12'
<input checked="" type="checkbox"/> MW-17		-		NM		-	-	NM		10.9	Hvy. Tr.		Covered by soil stockpile
<input checked="" type="checkbox"/> 1B-W-1		-		NM		-	-	NM		NM			Well Abandoned
<input checked="" type="checkbox"/> 2A-W-3		0855		11.68		Trace	TOP	10.55	Tr.	10.19	Tr.		12' - 0.32'
<input checked="" type="checkbox"/> 2A-W-11		0930		8.79		8.79	TOP	8.07	Hvy. Tr.	8.03	Hvy. Tr.		9' - 0.21'
<input checked="" type="checkbox"/> MW-39		0945		10.33		None	TOP	9.63	Tr.	9.45	Tr.		11' - 0.67'
<input checked="" type="checkbox"/> 2A-W-4	✓	1230		11.55		Hvy. TR	TOP	10.85	Hvy. Tr.	11.22	0.29		12' - 0.45'

Other Notes:

- clean well - north (town) half use water level meter (WL)
- clean well - south ('railyard') half use water level meter (WL)
- dirty casing, possible trace product use tape and paste (TP)
- dirty well use tape & paste (TP) + peristaltic pump (PP)

Fluid Level Gauging Form

Project Name: BNSF Skykomish

Project Number: 01140-204-0340

Collected by: D. Kinney, Fred Merrill, G. Sabbane

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/24/2008				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
n 1A-W-1	9/27/08	1140		15.44				12.67				FM	
n 1A-W-4		0931		9.39				8.21				FM	
n 1A-W-5		0941		10.22				9.34				FM	
n 1B-W-2		0850		14.44				11.55				FM	
n 1B-W-3		0900		15.45				13.21				FM	
n 1C-W-1		1105		13.80				11.82				FM	
n 1C-W-2		0821		10.59				9.02				FM	
n 1C-W-3		0830		NM				9.84				FM	Boulders are covering well
n 1C-W-4		0838		10.85				9.19				FM	
s 2A-W-8		0850		16.16				13.74				DWK	
s 2A-W-9		0834		11.39				8.02				DWK	
s 2A-W-10		1010		11.96				8.19				DWK	
s 2B-W-4		0937		4.49				1.62				DWK	
s 5-W-4		1039		7.67				4.63				FM	
n 5-W-14		0957		9.66				8.79				FM	
n 5-W-15		1048		8.15				7.37				FM	
n 5-W-16		1011		8.43				7.76				FM	
n 5-W-17		1004		7.79				7.06				FM	
n 5-W-18		1017		7.91				7.28				FM	
n 5-W-19		1022		7.82				7.33				FM	
n 5-W-20		1028		7.91				6.94				FM	

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/24/2008				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
\ MW-1	9/22/08	0855		13.59				11.59				DWK	
s MW-2		0846		13.28				11.06				DWK	
s MW-3		0842		11.19				7.45				DWK	
s MW-4		0840		10.72				6.80				DWK	
s MW-12		0901		6.95				3.65				DWK	
s MW-14		1218	13.5	12.95				10.06				DWK	
s MW-16		0919		14.92 13.80				13.54				DWK	
s MW-18		1145		15.63				13.27				DWK	
s MW-26		1056		11.31				6.79				FM	
s MW-32		1158		9.60				8.73				FM	
m MW-35		0845		14.56				10.91				FM	
s MW-38		1118		5.66				4.34				DWK	

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/24/2008		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)		
X 1A-W-3	9/27/08	1020		9.03		None	T&P	7.52			10' - 0.97'
X 1B-W-1		—		NM		—	—	9.36			Well Abandoned
X 2A-W-1		—		NM		—	—	8.60			" "
X 2A-W-3		0845		11.68		Trace	T&P	8.86			12' - 0.32'
X 2A-W-11		0930		8.79		Trace	T&P	5.75			9' - 0.21'
X MW-28		0900		15.37		Lt. Trace	T&P	11.81			16' - 0.73'
X MW-39		0945		10.33		None	T&P	7.32			11' - 0.67'
1A-W-2		1030		NM		—	—	9.88			Not Located
2A-W-4		1230		11.55		Hvy Tr	T&P	9.13			12' - 0.45'
5-W-1		1037		9.63		Trace	T&P	5.93			10' - 0.37'
5-W-2		1150		8.30	9.0	0.70	Pump	5.62			9' - 0.7'
5-W-3		1100		7.95		Trace	T&P	5.69			9' - 1.05'
MW-22		1050		8.20		Hvy Trace	T&P	6.90			9' - 0.8'
MW-36	✓	1010		8.52		Hvy Trace	T&P	7.16	0.82		9' - 0.48'

Other Notes:

- clean wells north (town) half use water level meter (WL)
- clean well - south ('railyard') half use water level meter (WL)
- dirty casing, possible trace product use tape and paste (TP)
- dirty well use tape & paste (TP) + peristaltic pump (PP)

total wells:



River Gauging Form

Project Name: BNSF Skykomish

Project Number: 01140-204

Measured by: Ghani Sabbane / Jesse Waknitz

stake ID	date	time	backsight	foresight	water level	comments
SK-1	9/22/08	1443	3.86'	14.62'		
SK-2		1512	4.81'	23.12'		
SK-3		1414	11.27'	18.38'		
SK-4		1340	11.27'	18.82'		
SK-5		1400	11.27'	20.39'		
ML-1		-			dry	
ML-2		-				
ML-3		-				
ML-4		-				

stake ID: SK# = Skykomish River gauging locations, ML# = Former Maloney Creek channel gauging locations
 all measurements in feet

backsight: height of level above surveyed point (staff placed at PK nail)

foresight: height of level above gauging point (staff placed in stream bed at SKx, MLx)

water level: depth of water at gauging point

used 5-W-17 for SK-3 → SK-5 (backsight → 11.27')

used 1C-W-2 for SK-1 → 3.86' backsight

used PK-Nail for SK-2

TOC (PVC) used for
 5-W-17 & 1C-W-1



River Gauging Form

Project Name: BNSF Skykomish

Project Number: 01146-204-0340
 Number: BN050-16423-711

Measured by: _____

stake ID	date	time	backsight	foresight	water level	comments
SK-1	11/27/2006	9:16 14:43	3.86	14.62'		
SK-2	11/27/2006	15:12	4.81	23.12'		
SK-3	11/27/2006	14:06	11.27	18.38'		
SK-4	11/27/2006	13:40	11.27	18.82'		
SK-5	11/27/2006	14:00	11.27	20.39'		
ML-1	11/27/2006	-			dry	
ML-2	11/27/2006	-			dry	
ML-3	11/27/2006	-			dry	
ML-4	11/27/2006	-				

stake ID: SK# = Skykomish River gauging locations, ML# = Former Maloney Creek channel gauging locations
 all measurements in feet

backsight: height of level above surveyed point (staff placed at PK nail)

foresight: height of level above gauging point (staff placed in stream bed at SKx, MLx)

water level: depth of water at gauging point

50-17 = 11.27' 9/22/08 SK3-4-5-
 1c-w-2 - 1c-w-4 = 3.86' 9/22/08 SK-1
 PK-NAVL = 9/22/08 SK-2.

Appendix B

Data Reports

April 08, 2008

Sarah Albano
ENSR International-Seattle
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

RE: BNSF-Skykomish

Enclosed are the results of analyses for samples received by the laboratory on 03/26/08 13:40.
The following list is a summary of the Work Orders contained in this report, generated on 04/08/08
17:02.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
BRC0418	BNSF-Skykomish	01140-204-0340

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International-Seattle

1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-0340

Project Manager: Sarah Albano

Report Created:

04/08/08 17:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2A-W-11-0308	BRC0418-01	Water	03/24/08 15:10	03/26/08 13:40
1C-W-4-0308	BRC0418-02	Water	03/24/08 15:30	03/26/08 13:40
1C-W-3-0308	BRC0418-03	Water	03/24/08 15:45	03/26/08 13:40
5-W-14-0308	BRC0418-04	Water	03/25/08 09:10	03/26/08 13:40
5-W-15-0308	BRC0418-05	Water	03/25/08 09:55	03/26/08 13:40
5-W-16-0308	BRC0418-06	Water	03/25/08 10:50	03/26/08 13:40
5-W-160-0308	BRC0418-07	Water	03/25/08 11:00	03/26/08 13:40
5-W-17-0308	BRC0418-08	Water	03/25/08 11:35	03/26/08 13:40
1B-W-1-0308	BRC0418-09	Water	03/25/08 13:05	03/26/08 13:40
1A-W-3-0308	BRC0418-10	Water	03/25/08 13:35	03/26/08 13:40
5-W-18-0308	BRC0418-11	Water	03/25/08 14:20	03/26/08 13:40
5-W-19-0308	BRC0418-12	Water	03/25/08 15:05	03/26/08 13:40
5-W-20-0308	BRC0418-13	Water	03/25/08 16:10	03/26/08 13:40
MW-500-0308	BRC0418-14	Water	03/25/08 16:25	03/26/08 13:40
1A-W-1-0308	BRC0418-15	Water	03/25/08 09:40	03/26/08 13:40
1A-W-4-0308	BRC0418-16	Water	03/25/08 10:50	03/26/08 13:40
1B-W-2-0308	BRC0418-17	Water	03/25/08 12:20	03/26/08 13:40
2B-W-4-0308	BRC0418-18	Water	03/25/08 14:45	03/26/08 13:40
MW-35-0308	BRC0418-19	Water	03/25/08 16:05	03/26/08 13:40
1B-W-3-0308	BRC0418-20	Water	03/25/08 17:50	03/26/08 13:40
1C-W-2-0308	BRC0418-21	Water	03/25/08 08:50	03/26/08 13:40
MW-34-0308	BRC0418-22	Water	03/25/08 09:25	03/26/08 13:40
1C-W-1-0308	BRC0418-23	Water	03/25/08 10:10	03/26/08 13:40
5-W-4-0308	BRC0418-24	Water	03/25/08 11:00	03/26/08 13:40
5-W-40-0308	BRC0418-25	Water	03/25/08 08:00	03/26/08 13:40
MW-38-0308	BRC0418-26	Water	03/25/08 13:10	03/26/08 13:40
1A-W-5-0308	BRC0418-27	Water	03/25/08 14:00	03/26/08 13:40
MW-16-0308	BRC0418-28	Water	03/25/08 14:45	03/26/08 13:40
2A-W-9-0308	BRC0418-29	Water	03/25/08 15:45	03/26/08 13:40
2A-W-10-0308	BRC0418-30	Water	03/25/08 16:20	03/26/08 13:40
2A-W-1-0308	BRC0418-31	Water	03/26/08 09:00	03/26/08 13:40
2A-W-100-0308	BRC0418-32	Water	03/26/08 09:10	03/26/08 13:40
MW-3-0308	BRC0418-33	Water	03/26/08 09:50	03/26/08 13:40
MW-4-0308	BRC0418-34	Water	03/26/08 10:35	03/26/08 13:40
MW-39-0308	BRC0418-35	Water	03/26/08 11:05	03/26/08 13:40

TestAmerica Seattle



Kate Haney, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.



ENSR International-Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name:	BNSF-Skykomish	Report Created:
	Project Number:	01140-204-0340	04/08/08 17:02
	Project Manager:	Sarah Albano	

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-37-0308	BRC0418-36	Water	03/26/08 09:30	03/26/08 13:40
2A-W-6-0308	BRC0418-37	Water	03/26/08 10:45	03/26/08 13:40
2A-W-60-0308	BRC0418-38	Water	03/26/08 10:30	03/26/08 13:40
MW-19-0308	BRC0418-39	Water	03/26/08 11:20	03/26/08 13:40

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International-Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-0340

Project Manager: Sarah Albano

Report Created:

04/08/08 17:02

Analytical Case Narrative

TestAmerica - Seattle, WA

BRC0418

SAMPLE RECEIPT

The samples were received March 26th, 2008 by TestAmerica - Seattle. The temperature of the samples at the time of receipt was 5.9 degrees Celsius.

PREPARATIONS AND ANALYSIS

No additional anomalies, discrepancies, or issues were associated with sample preparation, analysis and quality control other than those already qualified in the data and described in the Notes and Definitions page at the end of the report.

TestAmerica Seattle



Kate Haney, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.



ENSR International-Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Sarah Albano	Report Created: 04/08/08 17:02
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRC0418-01 (2A-W-11-0308)		Water			Sampled: 03/24/08 15:10					
Diesel Range Hydrocarbons	NWTPH-Dx	0.675	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 00:27	
Lube Oil Range Hydrocarbons	"	0.473	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			96.5%		53 - 125 %	"				"
Octacosane			105%		68 - 125 %	"				"
BRC0418-02 (1C-W-4-0308)		Water			Sampled: 03/24/08 15:30					
Diesel Range Hydrocarbons	NWTPH-Dx	0.174	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 00:52	J
Lube Oil Range Hydrocarbons	"	0.111	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			101%		53 - 125 %	"				"
Octacosane			118%		68 - 125 %	"				"
BRC0418-03 (1C-W-3-0308)		Water			Sampled: 03/24/08 15:45					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 01:18	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			90.9%		53 - 125 %	"				"
Octacosane			110%		68 - 125 %	"				"
BRC0418-04 (5-W-14-0308)		Water			Sampled: 03/25/08 09:10					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 01:44	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			101%		53 - 125 %	"				"
Octacosane			110%		68 - 125 %	"				"
BRC0418-05 (5-W-15-0308)		Water			Sampled: 03/25/08 09:55					
Diesel Range Hydrocarbons	NWTPH-Dx	0.305	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 02:10	
Lube Oil Range Hydrocarbons	"	0.153	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			96.8%		53 - 125 %	"				"
Octacosane			112%		68 - 125 %	"				"
BRC0418-06 (5-W-16-0308)		Water			Sampled: 03/25/08 10:50					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 02:35	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			93.8%		53 - 125 %	"				"
Octacosane			111%		68 - 125 %	"				"

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

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ENSR International-Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Sarah Albano	Report Created: 04/08/08 17:02
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
 TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRC0418-07 (5-W-160-0308)		Water			Sampled: 03/25/08 11:00					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 04:19	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			102%		53 - 125 %	"				"
Octacosane			113%		68 - 125 %	"				"
BRC0418-08 (5-W-17-0308)		Water			Sampled: 03/25/08 11:35					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 06:50	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			101%		53 - 125 %	"				"
Octacosane			121%		68 - 125 %	"				"
BRC0418-09 (1B-W-1-0308)		Water			Sampled: 03/25/08 13:05					
Diesel Range Hydrocarbons	NWTPH-Dx	3.18	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 07:15	
Lube Oil Range Hydrocarbons	"	0.859	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			110%		53 - 125 %	"				"
Octacosane			118%		68 - 125 %	"				"
BRC0418-10 (1A-W-3-0308)		Water			Sampled: 03/25/08 13:35					
Diesel Range Hydrocarbons	NWTPH-Dx	0.836	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 07:41	
Lube Oil Range Hydrocarbons	"	1.41	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			106%		53 - 125 %	"				"
Octacosane			114%		68 - 125 %	"				"
BRC0418-11 (5-W-18-0308)		Water			Sampled: 03/25/08 14:20					
Diesel Range Hydrocarbons	NWTPH-Dx	0.844	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 09:23	
Lube Oil Range Hydrocarbons	"	0.362	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			109%		53 - 125 %	"				"
Octacosane			123%		68 - 125 %	"				"
BRC0418-12 (5-W-19-0308)		Water			Sampled: 03/25/08 15:05					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 09:48	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			92.6%		53 - 125 %	"				"
Octacosane			113%		68 - 125 %	"				"

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Kate Haney

Kate Haney, Project Manager

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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
 TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRC0418-13 (5-W-20-0308)		Water			Sampled: 03/25/08 16:10					
Diesel Range Hydrocarbons	NWTPH-Dx	0.762	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 10:14	
Lube Oil Range Hydrocarbons	"	0.326	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			108%		53 - 125 %	"			"	
Octacosane			122%		68 - 125 %	"			"	
BRC0418-14 (MW-500-0308)		Water			Sampled: 03/25/08 16:25					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 10:39	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			87.1%		53 - 125 %	"			"	
Octacosane			92.4%		68 - 125 %	"			"	
BRC0418-15 (1A-W-1-0308)		Water			Sampled: 03/25/08 09:40					
Diesel Range Hydrocarbons	NWTPH-Dx	0.183	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 11:05	J
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			92.6%		53 - 125 %	"			"	
Octacosane			113%		68 - 125 %	"			"	
BRC0418-16 (1A-W-4-0308)		Water			Sampled: 03/25/08 10:50					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 11:31	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			89.4%		53 - 125 %	"			"	
Octacosane			108%		68 - 125 %	"			"	
BRC0418-17 (1B-W-2-0308)		Water			Sampled: 03/25/08 12:20					
Diesel Range Hydrocarbons	NWTPH-Dx	0.175	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 11:57	J
Lube Oil Range Hydrocarbons	"	0.118	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			94.2%		53 - 125 %	"			"	
Octacosane			111%		68 - 125 %	"			"	
BRC0418-18 (2B-W-4-0308)		Water			Sampled: 03/25/08 14:45					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 12:22	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			100%		53 - 125 %	"			"	
Octacosane			116%		68 - 125 %	"			"	

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Kate Haney, Project Manager

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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRC0418-19 (MW-35-0308)		Water			Sampled: 03/25/08 16:05					
Diesel Range Hydrocarbons	NWTPH-Dx	1.30	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 00:27	Q9
Lube Oil Range Hydrocarbons	"	0.357	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			95.1%		53 - 125 %	"			"	
Octacosane			102%		68 - 125 %	"			"	
BRC0418-20 (1B-W-3-0308)		Water			Sampled: 03/25/08 17:50					
Diesel Range Hydrocarbons	NWTPH-Dx	0.116	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 12:48	J
Lube Oil Range Hydrocarbons	"	0.0960	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			98.5%		53 - 125 %	"			"	
Octacosane			115%		68 - 125 %	"			"	
BRC0418-21 (1C-W-2-0308)		Water			Sampled: 03/25/08 08:50					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 00:52	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			101%		53 - 125 %	"			"	
Octacosane			107%		68 - 125 %	"			"	
BRC0418-22 (MW-34-0308)		Water			Sampled: 03/25/08 09:25					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0808	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 01:18	J
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			97.3%		53 - 125 %	"			"	
Octacosane			106%		68 - 125 %	"			"	
BRC0418-23 (1C-W-1-0308)		Water			Sampled: 03/25/08 10:10					
Diesel Range Hydrocarbons	NWTPH-Dx	0.613	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 01:44	Q9
Lube Oil Range Hydrocarbons	"	0.170	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			96.3%		53 - 125 %	"			"	
Octacosane			102%		68 - 125 %	"			"	
BRC0418-24 (5-W-4-0308)		Water			Sampled: 03/25/08 11:00					
Diesel Range Hydrocarbons	NWTPH-Dx	0.188	0.0385	0.240	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 02:10	J
Lube Oil Range Hydrocarbons	"	0.175	0.0865	0.481	"	"	"	"	"	J
Surrogate(s): 2-FBP			94.9%		53 - 125 %	"			"	
Octacosane			105%		68 - 125 %	"			"	

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Kate Haney, Project Manager

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ENSR International-Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Sarah Albano	Report Created: 04/08/08 17:02
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRC0418-25 (5-W-40-0308)		Water			Sampled: 03/25/08 08:00					
Diesel Range Hydrocarbons	NWTPH-Dx	0.211	0.0381	0.238	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 02:35	J
Lube Oil Range Hydrocarbons	"	0.188	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			99.2%		53 - 125 %	"			"	
Octacosane			108%		68 - 125 %	"			"	
BRC0418-26 (MW-38-0308)		Water			Sampled: 03/25/08 13:10					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0840	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 04:19	J
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			105%		53 - 125 %	"			"	
Octacosane			111%		68 - 125 %	"			"	
BRC0418-27 (1A-W-5-0308)		Water			Sampled: 03/25/08 14:00					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0385	0.240	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 06:50	
Lube Oil Range Hydrocarbons	"	ND	0.0865	0.481	"	"	"	"	"	
Surrogate(s): 2-FBP			89.8%		53 - 125 %	"			"	
Octacosane			95.8%		68 - 125 %	"			"	
BRC0418-28 (MW-16-0308)		Water			Sampled: 03/25/08 14:45					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 07:15	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			95.6%		53 - 125 %	"			"	
Octacosane			103%		68 - 125 %	"			"	
BRC0418-29 (2A-W-9-0308)		Water			Sampled: 03/25/08 15:45					
Diesel Range Hydrocarbons	NWTPH-Dx	1.03	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 07:41	Q9
Lube Oil Range Hydrocarbons	"	0.598	0.0849	0.472	"	"	"	"	"	Q9
Surrogate(s): 2-FBP			96.7%		53 - 125 %	"			"	
Octacosane			98.5%		68 - 125 %	"			"	
BRC0418-30 (2A-W-10-0308)		Water			Sampled: 03/25/08 16:20					
Diesel Range Hydrocarbons	NWTPH-Dx	0.136	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 09:23	J
Lube Oil Range Hydrocarbons	"	0.245	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			98.8%		53 - 125 %	"			"	
Octacosane			104%		68 - 125 %	"			"	

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Kate Haney

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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRC0418-31 (2A-W-1-0308)		Water			Sampled: 03/26/08 09:00					
Diesel Range Hydrocarbons	NWTPH-Dx	1.53	0.0385	0.240	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 09:48	Q9
Lube Oil Range Hydrocarbons	"	0.583	0.0865	0.481	"	"	"	"	"	Q9
<i>Surrogate(s): 2-FBP</i>			98.0%		53 - 125 %	"				"
<i>Octacosane</i>			104%		68 - 125 %	"				"
BRC0418-32 (2A-W-100-0308)		Water			Sampled: 03/26/08 09:10					
Diesel Range Hydrocarbons	NWTPH-Dx	1.49	0.0385	0.240	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 10:14	Q9
Lube Oil Range Hydrocarbons	"	0.561	0.0865	0.481	"	"	"	"	"	Q9
<i>Surrogate(s): 2-FBP</i>			98.3%		53 - 125 %	"				"
<i>Octacosane</i>			107%		68 - 125 %	"				"
BRC0418-33 (MW-3-0308)		Water			Sampled: 03/26/08 09:50					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 10:39	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP</i>			94.3%		53 - 125 %	"				"
<i>Octacosane</i>			104%		68 - 125 %	"				"
BRC0418-34 (MW-4-0308)		Water			Sampled: 03/26/08 10:35					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0812	0.0385	0.240	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 11:05	J
Lube Oil Range Hydrocarbons	"	0.119	0.0865	0.481	"	"	"	"	"	J
<i>Surrogate(s): 2-FBP</i>			98.0%		53 - 125 %	"				"
<i>Octacosane</i>			105%		68 - 125 %	"				"
BRC0418-35 (MW-39-0308)		Water			Sampled: 03/26/08 11:05					
Diesel Range Hydrocarbons	NWTPH-Dx	0.639	0.0385	0.240	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 11:31	Q9
Lube Oil Range Hydrocarbons	"	0.222	0.0865	0.481	"	"	"	"	"	J
<i>Surrogate(s): 2-FBP</i>			100%		53 - 125 %	"				"
<i>Octacosane</i>			106%		68 - 125 %	"				"
BRC0418-36 (MW-37-0308)		Water			Sampled: 03/26/08 09:30					
Diesel Range Hydrocarbons	NWTPH-Dx	0.842	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 11:57	Q9
Lube Oil Range Hydrocarbons	"	0.284	0.0849	0.472	"	"	"	"	"	J
<i>Surrogate(s): 2-FBP</i>			94.1%		53 - 125 %	"				"
<i>Octacosane</i>			103%		68 - 125 %	"				"

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Kate Haney

Kate Haney, Project Manager

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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRC0418-37 (2A-W-6-0308)		Water			Sampled: 03/26/08 10:45					
Diesel Range Hydrocarbons	NWTPH-Dx	2.54	0.0385	0.240	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 12:22	Q9
Lube Oil Range Hydrocarbons	"	0.497	0.0865	0.481	"	"	"	"	"	Q9
<i>Surrogate(s): 2-FBP</i>			96.2%		53 - 125 %	"				"
<i>Octacosane</i>			104%		68 - 125 %	"				"
BRC0418-38 (2A-W-60-0308)		Water			Sampled: 03/26/08 10:30					
Diesel Range Hydrocarbons	NWTPH-Dx	2.52	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 12:48	Q9
Lube Oil Range Hydrocarbons	"	0.481	0.0849	0.472	"	"	"	"	"	Q9
<i>Surrogate(s): 2-FBP</i>			97.8%		53 - 125 %	"				"
<i>Octacosane</i>			106%		68 - 125 %	"				"
BRC0418-39 (MW-19-0308)		Water			Sampled: 03/26/08 11:20					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0380	0.0377	0.236	mg/l	1x	8C28015	03/28/08 09:35	04/01/08 13:14	J
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP</i>			97.5%		53 - 125 %	"				"
<i>Octacosane</i>			106%		68 - 125 %	"				"

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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
 TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRC0418-04 (5-W-14-0308)		Water			Sampled: 03/25/08 09:10					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 15:50	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			96.9%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			110%		68 - 125 %	"				"
BRC0418-05 (5-W-15-0308)		Water			Sampled: 03/25/08 09:55					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 16:16	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			90.8%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			102%		68 - 125 %	"				"
BRC0418-06 (5-W-16-0308)		Water			Sampled: 03/25/08 10:50					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 16:42	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			94.7%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			110%		68 - 125 %	"				"
BRC0418-07 (5-W-160-0308)		Water			Sampled: 03/25/08 11:00					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 17:08	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			103%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			112%		68 - 125 %	"				"
BRC0418-08 (5-W-17-0308)		Water			Sampled: 03/25/08 11:35					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 17:35	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			104%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			121%		68 - 125 %	"				"
BRC0418-11 (5-W-18-0308)		Water			Sampled: 03/25/08 14:20					
Diesel Range (SGCU)	NWTPH-Dx	0.0446	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 18:01	J
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			96.0%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			108%		68 - 125 %	"				"

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

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ENSR International-Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Sarah Albano	Report Created: 04/08/08 17:02
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
 TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRC0418-12 (5-W-19-0308)		Water			Sampled: 03/25/08 15:05					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 18:27	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			90.6%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			108%		68 - 125 %	"				"
BRC0418-13 (5-W-20-0308)		Water			Sampled: 03/25/08 16:10					
Diesel Range (SGCU)	NWTPH-Dx	0.0396	0.0377	0.236	mg/l	1x	8C28014	03/28/08 09:32	04/01/08 18:53	J
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			94.6%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			108%		68 - 125 %	"				"

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International-Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Sarah Albano	Report Created: 04/08/08 17:02
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8C28014 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes		
Blank (8C28014-BLK1)													Extracted: 03/28/08 09:32			
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	03/31/08 22:44			
Lube Oil Range Hydrocarbons	"	ND	0.0900	0.500	"	"	--	--	--	--	--	--	"			
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>92.7%</i>	<i>Limits: 53-125%</i>		<i>"</i>							<i>03/31/08 22:44</i>			
<i>Octacosane</i>			<i>106%</i>	<i>68-125%</i>		<i>"</i>							<i>"</i>			
LCS (8C28014-BS1)													Extracted: 03/28/08 09:32			
Diesel Range Hydrocarbons	NWTPH-Dx	1.97	0.0400	0.250	mg/l	1x	--	2.00	98.7%	(61-132)	--	--	03/31/08 23:09			
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>96.9%</i>	<i>Limits: 53-125%</i>		<i>"</i>							<i>03/31/08 23:09</i>			
<i>Octacosane</i>			<i>107%</i>	<i>68-125%</i>		<i>"</i>							<i>"</i>			
Matrix Spike (8C28014-MS1)													QC Source: BRC0418-04		Extracted: 03/28/08 09:32	
Diesel Range Hydrocarbons	NWTPH-Dx	2.06	0.0377	0.236	mg/l	1x	ND	1.89	109%	(32-143)	--	--	03/31/08 23:35			
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>101%</i>	<i>Limits: 53-125%</i>		<i>"</i>							<i>03/31/08 23:35</i>			
<i>Octacosane</i>			<i>117%</i>	<i>68-125%</i>		<i>"</i>							<i>"</i>			
Matrix Spike Dup (8C28014-MSD1)													QC Source: BRC0418-04		Extracted: 03/28/08 09:32	
Diesel Range Hydrocarbons	NWTPH-Dx	2.09	0.0377	0.236	mg/l	1x	ND	1.89	111%	(32-143)	1.50% (40)		04/01/08 00:01			
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>99.6%</i>	<i>Limits: 53-125%</i>		<i>"</i>							<i>04/01/08 00:01</i>			
<i>Octacosane</i>			<i>117%</i>	<i>68-125%</i>		<i>"</i>							<i>"</i>			

QC Batch: 8C28015 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8C28015-BLK1)													Extracted: 03/28/08 09:35	
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	03/31/08 22:44	
Lube Oil Range Hydrocarbons	"	ND	0.0900	0.500	"	"	--	--	--	--	--	--	"	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>93.5%</i>	<i>Limits: 53-125%</i>		<i>"</i>							<i>03/31/08 22:44</i>	
<i>Octacosane</i>			<i>99.0%</i>	<i>68-125%</i>		<i>"</i>							<i>"</i>	
LCS (8C28015-BS1)													Extracted: 03/28/08 09:35	
Diesel Range Hydrocarbons	NWTPH-Dx	2.11	0.0400	0.250	mg/l	1x	--	2.00	105%	(61-132)	--	--	03/31/08 23:09	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>91.8%</i>	<i>Limits: 53-125%</i>		<i>"</i>							<i>03/31/08 23:09</i>	
<i>Octacosane</i>			<i>99.5%</i>	<i>68-125%</i>		<i>"</i>							<i>"</i>	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International-Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Sarah Albano	Report Created: 04/08/08 17:02
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8C28015 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (8C28015-MS1)			QC Source: BRC0418-19				Extracted: 03/28/08 09:35							
Diesel Range Hydrocarbons	NWTPH-Dx	3.26	0.0377	0.236	mg/l	1x	1.30	1.89	104%	(32-143)	--	--	03/31/08 23:35	
Surrogate(s): 2-FBP		Recovery: 95.2%		Limits: 53-125%		"						03/31/08 23:35		
Octacosane		101%		68-125%		"						"		
Matrix Spike Dup (8C28015-MSD1)			QC Source: BRC0418-19				Extracted: 03/28/08 09:35							
Diesel Range Hydrocarbons	NWTPH-Dx	3.23	0.0377	0.236	mg/l	1x	1.30	1.89	102%	(32-143)	1.07% (40)		04/01/08 00:01	
Surrogate(s): 2-FBP		Recovery: 101%		Limits: 53-125%		"						04/01/08 00:01		
Octacosane		102%		68-125%		"						"		

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International-Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Sarah Albano	Report Created: 04/08/08 17:02
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8C28014 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8C28014-BLK2)							Extracted: 03/28/08 09:32							
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	04/01/08 03:53	
Lube Oil Range (SGCU)	"	ND	0.160	0.500	"	"	--	--	--	--	--	--	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>94.7%</i>							<i>Limits: 53-125%</i>			<i>04/01/08 03:53</i>	
<i>Octacosane (SGCU)</i>			<i>109%</i>							<i>68-125%</i>			<i>"</i>	
LCS (8C28014-BS1)							Extracted: 03/28/08 09:32							
Diesel Range (SGCU)	NWTPH-Dx	2.00	0.0400	0.250	mg/l	1x	--	2.00	100%	(61-132)	--	--	04/01/08 13:14	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>99.4%</i>							<i>Limits: 53-125%</i>			<i>04/01/08 13:14</i>	
<i>Octacosane (SGCU)</i>			<i>111%</i>							<i>68-125%</i>			<i>"</i>	
Matrix Spike (8C28014-MS1)							QC Source: BRC0418-04		Extracted: 03/28/08 09:32					
Diesel Range (SGCU)	NWTPH-Dx	2.01	0.0377	0.236	mg/l	1x	ND	1.89	106%	(32-143)	--	--	04/01/08 14:58	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>97.5%</i>							<i>Limits: 53-125%</i>			<i>04/01/08 14:58</i>	
<i>Octacosane (SGCU)</i>			<i>116%</i>							<i>68-125%</i>			<i>"</i>	
Matrix Spike Dup (8C28014-MSD1)							QC Source: BRC0418-04		Extracted: 03/28/08 09:32					
Diesel Range (SGCU)	NWTPH-Dx	1.91	0.0377	0.236	mg/l	1x	ND	1.89	101%	(32-143)	5.24% (40)		04/01/08 15:24	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>92.4%</i>							<i>Limits: 53-125%</i>			<i>04/01/08 15:24</i>	
<i>Octacosane (SGCU)</i>			<i>110%</i>							<i>68-125%</i>			<i>"</i>	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International-Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-0340

Project Manager: Sarah Albano

Report Created:

04/08/08 17:02

Notes and Definitions

Report Specific Notes:

- J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
- Q9 - Hydrocarbon pattern most closely resembles transformer oil.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Seattle



Kate Haney, Project Manager

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LABORATORY INFORMATION

LAB WORK ORDER: BRC0418

Laboratory: Test America Project Manager:
 Address: 11720 North Cck Plkwy Ste 400 Phone: (425) 470-9200
 City/State/Zip: Bothell, WA 98011 Fax:

SHIPMENT INFORMATION
 Shipment Method: Hand delivered
 Tracking Number:

CHAIN OF CUSTODY
 BNSF PROJECT INFORMATION
 BNSF Project Number: Skukomish
 BNSF Project Name:
 BNSF Contact: Bruce Shappard

Project State of Origin: WA
 Project City: Skukomish
 BNSF Work Order No.: TT 0100-408

CONSULTANT INFORMATION
 Company: ENSR
 Address: 1011 SW Klickitat Way Ste 207
 City/State/Zip: Seattle, WA 98134

Project Number: 01140-204-0340
 Project Manager: Halah Voges
 Email:
 Phone: (206) 624-9349 Fax: (206) 624-2859

TURNAROUND TIME
 1-day Rush
 2-day Rush
 3-day Rush
 5- to 8-day Rush
 Standard 10-Day
 Other _____

DELIVERABLES
 Other Deliverables?
 BNSF Standard (Level II)
 Level III
 Level IV
 EDD Req, Format?
RETEC-EQWIS

METHODS FOR ANALYSIS

NWTFH-DX																			
W/S GCU																			
NWTFH-DX																			
W/S GCU																			

SAMPLE INFORMATION

Sample Identification	Containers	Sample Collection			Filtered Y/N	Type (Comp/Grab)	Matrix	METHODS FOR ANALYSIS										COMMENTS	LAB USE							
		Date	Time	Sampler																						
1 2A-W-11 - 0308	2	3/24/08	1510	DWK	N		W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-01
2 1C-W-4 -	2		1530	CS				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-02
3 1C-W-3 -	2		1545	GS				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-03
4 5-W-14 -	2	3/25/08	0910	DWK				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-04
5 5-W-15 -	4		0955					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-05
6 5-W-16 -	4		1050					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-06
7 5-W-160 -	4		1120					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-07
8 5-W-17 -	4		1135					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-08
9 1B-W-1 -	2		1305					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-09
10 1A-W-3 -	2		1335					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-10
11 5-W-18 -	4		1420					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-11
12 5-W-19 -	4		1505					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-12
13 5-W-20	4		1610					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-13
14 MW-500 -	2		1625					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-14
15 1A-W-1	2		0940	GS				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				-15

Relinquished By: [Signature] Date/Time: 3/26/08/1340 Received By: [Signature] Date/Time: 3/26/08/1340
 Relinquished By: Date/Time: Received By: Date/Time:
 Relinquished By: Date/Time: Received By: Date/Time:
 Received by Laboratory: Date/Time: Lab Remarks: Lab: Custody Intact? Yes No
 Comments and Special Analytical Requirements: SGCU - Silica gel cleanup 5.9°C
 Custody Seal No.: BNSF COC No.:

July 01, 2008

Sarah Albano
ENSR International - Seattle
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

RE: BNSF-Skykomish

Enclosed are the results of analyses for samples received by the laboratory on 06/24/08 09:00.
The following list is a summary of the Work Orders contained in this report, generated on 07/01/08
14:00.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
BRF0334	BNSF-Skykomish	01140-222-0100

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-222-0100

Project Manager: Sarah Albano

Report Created:

07/01/08 14:00

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
5-W-15-0608	BRF0334-01	Water	06/23/08 12:35	06/24/08 09:00
5-W-150-0608	BRF0334-02	Water	06/23/08 12:45	06/24/08 09:00
5-W-17-0608	BRF0334-03	Water	06/23/08 13:30	06/24/08 09:00
5-W-18-0608	BRF0334-04	Water	06/23/08 14:25	06/24/08 09:00
5-W-14-0608	BRF0334-05	Water	06/23/08 15:10	06/24/08 09:00
5-W-16-0608	BRF0334-06	Water	06/23/08 15:50	06/24/08 09:00
5-W-19-0608	BRF0334-07	Water	06/23/08 16:30	06/24/08 09:00
5-W-20-0608	BRF0334-08	Water	06/23/08 17:15	06/24/08 09:00
MW-500-0608	BRF0334-09	Water	06/23/08 17:45	06/24/08 09:00

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-222-0100

Project Manager: Sarah Albano

Report Created:

07/01/08 14:00

Analytical Case Narrative

TestAmerica - Seattle, WA

BRF0334

SAMPLE RECEIPT

The samples were received June 24th, 2008 by TestAmerica - Seattle. The temperature of the samples at the time of receipt was 7.3 degrees Celsius.

PREPARATIONS AND ANALYSIS

No additional anomalies, discrepancies, or issues were associated with sample preparation, analysis and quality control other than those already qualified in the data and described in the Notes and Definitions page at the end of the report.

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-222-0100 Project Manager: Sarah Albano	Report Created: 07/01/08 14:00
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRF0334-01 (5-W-15-0608)		Water			Sampled: 06/23/08 12:35					
Diesel Range Hydrocarbons	NWTPH-Dx	0.204	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 19:17	J
Lube Oil Range Hydrocarbons	"	0.145	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			100%		53 - 125 %	"			"	
Octacosane			93.6%		68 - 125 %	"			"	
BRF0334-02 (5-W-150-0608)		Water			Sampled: 06/23/08 12:45					
Diesel Range Hydrocarbons	NWTPH-Dx	0.207	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 19:43	J
Lube Oil Range Hydrocarbons	"	0.152	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			99.7%		53 - 125 %	"			"	
Octacosane			92.9%		68 - 125 %	"			"	
BRF0334-03 (5-W-17-0608)		Water			Sampled: 06/23/08 13:30					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 20:09	U
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	U
Surrogate(s): 2-FBP			106%		53 - 125 %	"			"	
Octacosane			90.1%		68 - 125 %	"			"	
BRF0334-04 (5-W-18-0608)		Water			Sampled: 06/23/08 14:25					
Diesel Range Hydrocarbons	NWTPH-Dx	0.511	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 20:35	Q3
Lube Oil Range Hydrocarbons	"	0.272	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			107%		53 - 125 %	"			"	
Octacosane			98.2%		68 - 125 %	"			"	
BRF0334-05 (5-W-14-0608)		Water			Sampled: 06/23/08 15:10					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 21:01	U
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	U
Surrogate(s): 2-FBP			96.8%		53 - 125 %	"			"	
Octacosane			92.8%		68 - 125 %	"			"	
BRF0334-06 (5-W-16-0608)		Water			Sampled: 06/23/08 15:50					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 21:27	U
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	U
Surrogate(s): 2-FBP			95.9%		53 - 125 %	"			"	
Octacosane			94.4%		68 - 125 %	"			"	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-222-0100 Project Manager: Sarah Albano	Report Created: 07/01/08 14:00
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRF0334-07 (5-W-19-0608)		Water			Sampled: 06/23/08 16:30					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 23:12	U
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			105%		53 - 125 %	"			"	
<i>Octacosane</i>			89.8%		68 - 125 %	"			"	
BRF0334-08 (5-W-20-0608)		Water			Sampled: 06/23/08 17:15					
Diesel Range Hydrocarbons	NWTPH-Dx	0.551	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 23:37	Q3
Lube Oil Range Hydrocarbons	"	0.292	0.0849	0.472	"	"	"	"	"	J
<i>Surrogate(s): 2-FBP</i>			112%		53 - 125 %	"			"	
<i>Octacosane</i>			102%		68 - 125 %	"			"	
BRF0334-09 (MW-500-0608)		Water			Sampled: 06/23/08 17:45					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/27/08 00:03	U
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			98.4%		53 - 125 %	"			"	
<i>Octacosane</i>			93.0%		68 - 125 %	"			"	

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-222-0100 Project Manager: Sarah Albano	Report Created: 07/01/08 14:00
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
 TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRF0334-01 (5-W-15-0608)		Water			Sampled: 06/23/08 12:35					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 19:26	U
Lube Oil Range Hydrocarbons	"	ND	0.151	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			80.4%		53 - 125 %	"			"	
<i>Octacosane</i>			90.2%		68 - 125 %	"			"	
BRF0334-02 (5-W-150-0608)		Water			Sampled: 06/23/08 12:45					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 19:54	U
Lube Oil Range Hydrocarbons	"	ND	0.151	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			81.9%		53 - 125 %	"			"	
<i>Octacosane</i>			89.0%		68 - 125 %	"			"	
BRF0334-03 (5-W-17-0608)		Water			Sampled: 06/23/08 13:30					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 20:23	U
Lube Oil Range Hydrocarbons	"	ND	0.151	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			92.1%		53 - 125 %	"			"	
<i>Octacosane</i>			88.0%		68 - 125 %	"			"	
BRF0334-04 (5-W-18-0608)		Water			Sampled: 06/23/08 14:25					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0419	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 20:52	J
Lube Oil Range Hydrocarbons	"	ND	0.151	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			89.4%		53 - 125 %	"			"	
<i>Octacosane</i>			90.3%		68 - 125 %	"			"	
BRF0334-05 (5-W-14-0608)		Water			Sampled: 06/23/08 15:10					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 21:22	U
Lube Oil Range Hydrocarbons	"	ND	0.151	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			85.2%		53 - 125 %	"			"	
<i>Octacosane</i>			90.9%		68 - 125 %	"			"	
BRF0334-06 (5-W-16-0608)		Water			Sampled: 06/23/08 15:50					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 21:51	U
Lube Oil Range Hydrocarbons	"	ND	0.151	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			84.3%		53 - 125 %	"			"	
<i>Octacosane</i>			94.4%		68 - 125 %	"			"	

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-222-0100 Project Manager: Sarah Albano	Report Created: 07/01/08 14:00
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
 TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRF0334-07 (5-W-19-0608)		Water			Sampled: 06/23/08 16:30					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/26/08 23:48	U
Lube Oil Range Hydrocarbons	"	ND	0.151	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			86.4%		53 - 125 %	"			"	
<i>Octacosane</i>			85.6%		68 - 125 %	"			"	
BRF0334-08 (5-W-20-0608)		Water			Sampled: 06/23/08 17:15					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/27/08 00:17	U
Lube Oil Range Hydrocarbons	"	ND	0.151	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			91.6%		53 - 125 %	"			"	
<i>Octacosane</i>			96.5%		68 - 125 %	"			"	
BRF0334-09 (MW-500-0608)		Water			Sampled: 06/23/08 17:45					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8F25034	06/25/08 12:35	06/27/08 00:47	U
Lube Oil Range Hydrocarbons	"	ND	0.151	0.472	"	"	"	"	"	U
<i>Surrogate(s): 2-FBP</i>			87.1%		53 - 125 %	"			"	
<i>Octacosane</i>			95.6%		68 - 125 %	"			"	

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-222-0100 Project Manager: Sarah Albano	Report Created: 07/01/08 14:00
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8F25034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8F25034-BLK1)													Extracted: 06/25/08 12:33	
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	06/26/08 17:33	U
Lube Oil Range Hydrocarbons	"	ND	0.0900	0.500	"	"	--	--	--	--	--	--	"	U
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>108%</i>	<i>Limits: 53-125%</i>	<i>"</i>								<i>06/26/08 17:33</i>	
<i>Octacosane</i>		<i>90.8%</i>		<i>68-125%</i>	<i>"</i>								<i>"</i>	
LCS (8F25034-BS1)													Extracted: 06/25/08 12:33	
Diesel Range Hydrocarbons	NWTPH-Dx	1.68	0.0400	0.250	mg/l	1x	--	2.00	83.8%	(61-132)	--	--	06/26/08 17:59	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>108%</i>	<i>Limits: 53-125%</i>	<i>"</i>								<i>06/26/08 17:59</i>	
<i>Octacosane</i>		<i>93.8%</i>		<i>68-125%</i>	<i>"</i>								<i>"</i>	
Matrix Spike (8F25034-MS1)													QC Source: BRF0334-08 Extracted: 06/25/08 12:33	
Diesel Range Hydrocarbons	NWTPH-Dx	2.12	0.0377	0.236	mg/l	1x	0.551	1.89	83.0%	(32-143)	--	--	06/26/08 18:25	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>114%</i>	<i>Limits: 53-125%</i>	<i>"</i>								<i>06/26/08 18:25</i>	
<i>Octacosane</i>		<i>95.9%</i>		<i>68-125%</i>	<i>"</i>								<i>"</i>	
Matrix Spike Dup (8F25034-MSD1)													QC Source: BRF0334-08 Extracted: 06/25/08 12:33	
Diesel Range Hydrocarbons	NWTPH-Dx	2.14	0.0377	0.236	mg/l	1x	0.551	1.89	84.0%	(32-143)	0.842%	(40)	06/26/08 18:51	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>110%</i>	<i>Limits: 53-125%</i>	<i>"</i>								<i>06/26/08 18:51</i>	
<i>Octacosane</i>		<i>94.9%</i>		<i>68-125%</i>	<i>"</i>								<i>"</i>	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-222-0100 Project Manager: Sarah Albano	Report Created: 07/01/08 14:00
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8F25034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8F25034-BLK2)								Extracted: 06/25/08 12:33						
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	06/26/08 17:29	U
Lube Oil Range Hydrocarbons	"	ND	0.160	0.500	"	"	--	--	--	--	--	--	"	U
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>95.1%</i>	<i>Limits: 53-125%</i>		<i>"</i>							<i>06/26/08 17:29</i>	
<i>Octacosane</i>			<i>92.2%</i>	<i>68-125%</i>		<i>"</i>							<i>"</i>	
LCS (8F25034-BS2)								Extracted: 06/25/08 12:33						
Diesel Range Hydrocarbons	NWTPH-Dx	1.63	0.0400	0.250	mg/l	1x	--	2.00	81.7%	(61-132)	--	--	06/26/08 17:58	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>100%</i>	<i>Limits: 53-125%</i>		<i>"</i>							<i>06/26/08 17:58</i>	
<i>Octacosane</i>			<i>92.6%</i>	<i>68-125%</i>		<i>"</i>							<i>"</i>	
Matrix Spike (8F25034-MS2)								QC Source: BRF0334-08				Extracted: 06/25/08 12:33		
Diesel Range Hydrocarbons	NWTPH-Dx	1.58	0.0377	0.236	mg/l	1x	ND	1.89	83.6%	(32-143)	--	--	06/26/08 18:27	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>98.1%</i>	<i>Limits: 53-125%</i>		<i>"</i>							<i>06/26/08 18:27</i>	
<i>Octacosane</i>			<i>88.3%</i>	<i>68-125%</i>		<i>"</i>							<i>"</i>	
Matrix Spike Dup (8F25034-MSD2)								QC Source: BRF0334-08				Extracted: 06/25/08 12:33		
Diesel Range Hydrocarbons	NWTPH-Dx	1.56	0.0377	0.236	mg/l	1x	ND	1.89	82.9%	(32-143)	0.819%	(50)	06/26/08 18:56	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>96.9%</i>	<i>Limits: 53-125%</i>		<i>"</i>							<i>06/26/08 18:56</i>	
<i>Octacosane</i>			<i>90.5%</i>	<i>68-125%</i>		<i>"</i>							<i>"</i>	

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-222-0100

Project Manager: Sarah Albano

Report Created:

07/01/08 14:00

Notes and Definitions

Report Specific Notes:

- J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
- Q3 - The chromatographic pattern is not consistent with diesel fuel.
- U - Analyte included in the analysis but not detected.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Seattle



Kate Haney, Project Manager

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September 30, 2008

Halah Voges
ENSR International - Seattle
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

RE: BNSF-Skykomish

Enclosed are the results of analyses for samples received by the laboratory on 09/24/08 09:20.
The following list is a summary of the Work Orders contained in this report, generated on 09/30/08
19:17.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
BRI0381	BNSF-Skykomish	01140-204-0340

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

09/30/08 19:17

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2A-W-10-0908	BRI0381-01	Water	09/22/08 16:55	09/24/08 09:20
2B-W-4-0908	BRI0381-02	Water	09/23/08 09:00	09/24/08 09:20
MW-39-0908	BRI0381-03	Water	09/23/08 09:45	09/24/08 09:20
2A-W-11-0908	BRI0381-04	Water	09/23/08 10:35	09/24/08 09:20
MW-500-0908	BRI0381-05	Water	09/23/08 10:50	09/24/08 09:20
1C-W-2-0908	BRI0381-06	Water	09/23/08 11:55	09/24/08 09:20
MW-38-0908	BRI0381-07	Water	09/23/08 12:35	09/24/08 09:20
5-W-4-0908	BRI0381-08	Water	09/23/08 13:15	09/24/08 09:20
2A-W-9-0908	BRI0381-09	Water	09/23/08 14:10	09/24/08 09:20
2A-W-90-0908	BRI0381-10	Water	09/23/08 14:20	09/24/08 09:20
MW-4-0908	BRI0381-11	Water	09/23/08 15:00	09/24/08 09:20
MW-3-0908	BRI0381-12	Water	09/23/08 15:50	09/24/08 09:20
1A-W-1-0908	BRI0381-13	Water	09/23/08 09:00	09/24/08 09:20
1A-W-3-0908	BRI0381-14	Water	09/23/08 09:50	09/24/08 09:20
1A-W-30-0908	BRI0381-15	Water	09/23/08 10:50	09/24/08 09:20
1A-W-4-0908	BRI0381-16	Water	09/23/08 10:52	09/24/08 09:20
1A-W-5-0908	BRI0381-17	Water	09/23/08 11:20	09/24/08 09:20
1C-W-1-0908	BRI0381-18	Water	09/23/08 13:15	09/24/08 09:20
1C-W-4-0908	BRI0381-19	Water	09/23/08 14:30	09/24/08 09:20
1B-W-3-0908	BRI0381-20	Water	09/23/08 15:46	09/24/08 09:20
1B-W-2-0908	BRI0381-21	Water	09/23/08 16:52	09/24/08 09:20
MW-35-0908	BRI0381-22	Water	09/23/08 17:56	09/24/08 09:20
MW-16-0908	BRI0381-23	Water	09/23/08 18:55	09/24/08 09:20

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

09/30/08 19:17

Analytical Case Narrative

TestAmerica - Seattle, WA

BRI0381

SAMPLE RECEIPT

The samples were received September 24th, 2008 by TestAmerica - Seattle. The temperature of the samples at the time of receipt was 6.0 degrees Celsius.

PREPARATIONS AND ANALYSIS

No additional anomalies, discrepancies, or issues were associated with sample preparation, analysis and quality control other than those already qualified in the data and described in the Notes and Definitions page at the end of the report.

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 09/30/08 19:17
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0381-01 (2A-W-10-0908)		Water			Sampled: 09/22/08 16:55					
Diesel Range Hydrocarbons	NWTPH-Dx	0.227	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/26/08 22:02	J
Lube Oil Range Hydrocarbons	"	0.153	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			87.7%		53 - 125 %	"			"	
Octacosane			100%		68 - 125 %	"			"	
BRI0381-02 (2B-W-4-0908)		Water			Sampled: 09/23/08 09:00					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/26/08 22:24	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			84.6%		53 - 125 %	"			"	
Octacosane			95.1%		68 - 125 %	"			"	
BRI0381-03 (MW-39-0908)		Water			Sampled: 09/23/08 09:45					
Diesel Range Hydrocarbons	NWTPH-Dx	0.642	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/26/08 22:45	Q3
Lube Oil Range Hydrocarbons	"	0.559	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			89.6%		53 - 125 %	"			"	
Octacosane			96.1%		68 - 125 %	"			"	
BRI0381-04 (2A-W-11-0908)		Water			Sampled: 09/23/08 10:35					
Diesel Range Hydrocarbons	NWTPH-Dx	0.860	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/26/08 23:06	Q3
Lube Oil Range Hydrocarbons	"	1.05	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			94.4%		53 - 125 %	"			"	
Octacosane			99.2%		68 - 125 %	"			"	
BRI0381-05 (MW-500-0908)		Water			Sampled: 09/23/08 10:50					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/26/08 23:28	
Lube Oil Range Hydrocarbons	"	ND	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			83.9%		53 - 125 %	"			"	
Octacosane			96.4%		68 - 125 %	"			"	
BRI0381-06 (1C-W-2-0908)		Water			Sampled: 09/23/08 11:55					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8126034	09/27/08 16:18	09/29/08 14:58	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			84.5%		53 - 125 %	"			"	
Octacosane			99.5%		68 - 125 %	"			"	

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 09/30/08 19:17
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0381-07 (MW-38-0908)		Water			Sampled: 09/23/08 12:35					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/26/08 23:49	
Lube Oil Range Hydrocarbons	"	ND	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			79.8%		53 - 125 %	"				"
Octacosane			93.3%		68 - 125 %	"				"
BRI0381-08 (5-W-4-0908)		Water			Sampled: 09/23/08 13:15					
Diesel Range Hydrocarbons	NWTPH-Dx	7.75	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 01:14	Q4
Lube Oil Range Hydrocarbons	"	2.49	0.0849	0.472	"	"	"	"	"	Q4
Surrogate(s): 2-FBP			106%		53 - 125 %	"				"
Octacosane			105%		68 - 125 %	"				"
BRI0381-09 (2A-W-9-0908)		Water			Sampled: 09/23/08 14:10					
Diesel Range Hydrocarbons	NWTPH-Dx	0.323	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 01:36	Q3
Lube Oil Range Hydrocarbons	"	0.147	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			79.0%		53 - 125 %	"				"
Octacosane			88.3%		68 - 125 %	"				"
BRI0381-10 (2A-W-90-0908)		Water			Sampled: 09/23/08 14:20					
Diesel Range Hydrocarbons	NWTPH-Dx	0.294	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 01:57	Q3
Lube Oil Range Hydrocarbons	"	0.171	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			86.1%		53 - 125 %	"				"
Octacosane			98.7%		68 - 125 %	"				"
BRI0381-11 (MW-4-0908)		Water			Sampled: 09/23/08 15:00					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 02:18	
Lube Oil Range Hydrocarbons	"	ND	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			79.6%		53 - 125 %	"				"
Octacosane			93.4%		68 - 125 %	"				"
BRI0381-12 (MW-3-0908)		Water			Sampled: 09/23/08 15:50					
Diesel Range Hydrocarbons	NWTPH-Dx	0.102	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 02:40	J
Lube Oil Range Hydrocarbons	"	0.143	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			83.9%		53 - 125 %	"				"
Octacosane			101%		68 - 125 %	"				"

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 09/30/08 19:17
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0381-13 (1A-W-1-0908)		Water			Sampled: 09/23/08 09:00					
Diesel Range Hydrocarbons	NWTPH-Dx	0.347	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 03:01	Q3
Lube Oil Range Hydrocarbons	"	0.152	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			81.6%		53 - 125 %	"			"	
Octacosane			98.1%		68 - 125 %	"			"	
BRI0381-14 (1A-W-3-0908)		Water			Sampled: 09/23/08 09:50					
Diesel Range Hydrocarbons	NWTPH-Dx	0.191	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 03:23	J
Lube Oil Range Hydrocarbons	"	0.420	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			86.4%		53 - 125 %	"			"	
Octacosane			104%		68 - 125 %	"			"	
BRI0381-15 (1A-W-30-0908)		Water			Sampled: 09/23/08 10:50					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0791	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 03:44	J
Lube Oil Range Hydrocarbons	"	0.180	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			82.9%		53 - 125 %	"			"	
Octacosane			102%		68 - 125 %	"			"	
BRI0381-16 (1A-W-4-0908)		Water			Sampled: 09/23/08 10:52					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 04:06	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			80.2%		53 - 125 %	"			"	
Octacosane			92.4%		68 - 125 %	"			"	
BRI0381-17 (1A-W-5-0908)		Water			Sampled: 09/23/08 11:20					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 04:27	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			74.4%		53 - 125 %	"			"	
Octacosane			92.6%		68 - 125 %	"			"	
BRI0381-18 (1C-W-1-0908)		Water			Sampled: 09/23/08 13:15					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0550	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 05:53	J
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			79.1%		53 - 125 %	"			"	
Octacosane			96.3%		68 - 125 %	"			"	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 09/30/08 19:17
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0381-19 (1C-W-4-0908)		Water			Sampled: 09/23/08 14:30					
Diesel Range Hydrocarbons	NWTPH-Dx	0.373	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 06:14	Q3
Lube Oil Range Hydrocarbons	"	0.105	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			72.6%		53 - 125 %	"			"	
Octacosane			97.2%		68 - 125 %	"			"	
BRI0381-20 (1B-W-3-0908)		Water			Sampled: 09/23/08 15:46					
Diesel Range Hydrocarbons	NWTPH-Dx	0.117	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 06:36	J
Lube Oil Range Hydrocarbons	"	ND	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			77.9%		53 - 125 %	"			"	
Octacosane			92.9%		68 - 125 %	"			"	
BRI0381-21 (1B-W-2-0908)		Water			Sampled: 09/23/08 16:52					
Diesel Range Hydrocarbons	NWTPH-Dx	0.507	0.0388	0.243	mg/l	1x	8126034	09/27/08 16:18	09/29/08 15:21	Q3
Lube Oil Range Hydrocarbons	"	0.170	0.0874	0.485	"	"	"	"	"	J
Surrogate(s): 2-FBP			94.1%		53 - 125 %	"			"	
Octacosane			108%		68 - 125 %	"			"	
BRI0381-22 (MW-35-0908)		Water			Sampled: 09/23/08 17:56					
Diesel Range Hydrocarbons	NWTPH-Dx	0.305	0.0381	0.238	mg/l	1x	8126034	09/27/08 16:18	09/29/08 15:44	Q3
Lube Oil Range Hydrocarbons	"	0.187	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			79.7%		53 - 125 %	"			"	
Octacosane			92.8%		68 - 125 %	"			"	
BRI0381-23 (MW-16-0908)		Water			Sampled: 09/23/08 18:55					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8126034	09/27/08 16:18	09/29/08 16:08	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			85.7%		53 - 125 %	"			"	
Octacosane			99.0%		68 - 125 %	"			"	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 09/30/08 19:17
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8125025 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8125025-BLK1)													Extracted: 09/25/08 08:52	
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	09/26/08 20:37	
Lube Oil Range Hydrocarbons	"	ND	0.0900	0.500	"	"	--	--	--	--	--	--	"	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>77.5%</i>			<i>Limits: 53-125%</i>	<i>"</i>						<i>09/26/08 20:37</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>94.5%</i>			<i>68-125%</i>	<i>"</i>						<i>"</i>	

LCS (8125025-BS1)													Extracted: 09/25/08 08:52	
Diesel Range Hydrocarbons	NWTPH-Dx	1.72	0.0400	0.250	mg/l	1x	--	2.00	85.9%	(61-132)	--	--	09/26/08 20:59	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>89.2%</i>			<i>Limits: 53-125%</i>	<i>"</i>						<i>09/26/08 20:59</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>95.9%</i>			<i>68-125%</i>	<i>"</i>						<i>"</i>	

Matrix Spike (8125025-MS1)													QC Source: BRI0381-12		Extracted: 09/25/08 08:52	
Diesel Range Hydrocarbons	NWTPH-Dx	1.73	0.0377	0.236	mg/l	1x	0.102	1.89	86.5%	(32-143)	--	--	09/26/08 21:20			
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>84.9%</i>			<i>Limits: 53-125%</i>	<i>"</i>						<i>09/26/08 21:20</i>			
<i>Octacosane</i>		<i>Recovery:</i>	<i>95.6%</i>			<i>68-125%</i>	<i>"</i>						<i>"</i>			

Matrix Spike Dup (8125025-MSD1)													QC Source: BRI0381-12		Extracted: 09/25/08 08:52	
Diesel Range Hydrocarbons	NWTPH-Dx	1.67	0.0377	0.236	mg/l	1x	0.102	1.89	83.0%	(32-143)	3.93%	(40)	09/26/08 21:41			
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>89.6%</i>			<i>Limits: 53-125%</i>	<i>"</i>						<i>09/26/08 21:41</i>			
<i>Octacosane</i>		<i>Recovery:</i>	<i>98.4%</i>			<i>68-125%</i>	<i>"</i>						<i>"</i>			

QC Batch: 8126034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8126034-BLK1)													Extracted: 09/26/08 16:18	
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	09/29/08 13:48	
Lube Oil Range Hydrocarbons	"	ND	0.0900	0.500	"	"	--	--	--	--	--	--	"	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>88.8%</i>			<i>Limits: 53-125%</i>	<i>"</i>						<i>09/29/08 13:48</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>102%</i>			<i>68-125%</i>	<i>"</i>						<i>"</i>	

LCS (8126034-BS1)													Extracted: 09/26/08 16:18	
Diesel Range Hydrocarbons	NWTPH-Dx	1.76	0.0400	0.250	mg/l	1x	--	2.00	88.2%	(61-132)	--	--	09/29/08 14:11	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>103%</i>			<i>Limits: 53-125%</i>	<i>"</i>						<i>09/29/08 14:11</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>105%</i>			<i>68-125%</i>	<i>"</i>						<i>"</i>	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle	Project Name: BNSF-Skykomish	
1011 SW Klickitat Way, Suite 207	Project Number: 01140-204-0340	Report Created:
Seattle, WA 98134	Project Manager: Halah Voges	09/30/08 19:17

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8126034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS Dup (8126034-BSD1)										Extracted: 09/26/08 16:18				
Diesel Range Hydrocarbons	NWTPH-Dx	1.74	0.0400	0.250	mg/l	1x	--	2.00	86.8%	(61-132)	1.53%	(40)	09/29/08 14:35	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery: 101%</i>		<i>Limits: 53-125%</i>		<i>"</i>						<i>09/29/08 14:35</i>		
<i>Octacosane</i>		<i>95.9%</i>		<i>68-125%</i>		<i>"</i>						<i>"</i>		

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

09/30/08 19:17

Notes and Definitions

Report Specific Notes:

- J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
- Q3 - The chromatographic pattern is not consistent with diesel fuel.
- Q4 - The hydrocarbons present are a complex mixture of diesel range and heavy oil range organics.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Seattle



Kate Haney, Project Manager

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CHAIN OF CUSTODY

LABORATORY INFORMATION

LAB WORK ORDER: BRIO 381

Laboratory: Test America Project Manager:
 Address: 11720 North Creek Pkwy, Ste 400 Phone: (425) 420-9200
 City/State/ZIP: Rothell, WA 98021 Fax:

SHIPMENT INFORMATION
 Shipment Method: Hand delivered
 Tracking Number:

BNSF PROJECT INFORMATION

Project State of Origin: WA
 Project City: Skykomish

CONSULTANT INFORMATION

Company: ENSR
 Address: 1011 SW Klickitat Way, Ste 207

Project Number: 01140-204-0340
 Project Manager: Halah Voges

BNSF Project Name: Skykomish

BNSF Contact: Bruce Sheppard

BNSF Work Order No.: TT0100-H08

City/State/ZIP: (206) 674-9349 (206) 674-7839

Phone: (206) 674-9349 Fax: (206) 674-7839

TURNAROUND TIME

- 1-day Rush
- 2-day Rush
- 3-day Rush
- 5- to 8-day Rush
- Standard 10-Day
- Other _____

DELIVERABLES

- BNSF Standard (Level II)
- Level III
- Level IV
- Other Deliverables?
- EDD Req. Format? RETEC - EQUIS

METHODS FOR ANALYSIS

NMPH-DX
 (w/o SGCU)

SAMPLE INFORMATION

Sample identification	Containers	Sample Collection			Filtered Y/N	Type (Comp/Grab)	Matrix	COMMENTS	LAB USE
		Date	Time	Sampler					
2A-W-10-0908	2	9/22/08	1655	FM/SS	N	W		BRIO 381-01	
2B-W-4-	2	9/23/08	0900	DNK				-02	
MW-39-	2		0945					-03	
2A-W-11-	2		1035					-04	
MW-500-	2		1050					-05	
IC-W-2-	2		1155					-06	
MW-38-	2		1235					-07	
S-W-4-	2		1315					-08	
2A-W-9-	2		1410					-09	
2A-W-90-	2		1420					-10	
MW-4-	2		1500					-11	
MW-3-	6		1550				Extra Sample for Lab Rec	-12	
1A-W-1-	2		0900	FM				-13	
1A-W-3-	2		0950					-14	
1A-W-30-	2		0950					-15	

Relinquished By: [Signature]
 Relinquished By:
 Relinquished By:
 Received by Laboratory:

Date/Time: 9/24/08 9:20
 Date/Time:
 Date/Time:
 Date/Time:

Received By: Lathy Gumble
 Received By:
 Received By:
 Lab Remarks:

Date/Time: 9/24/08 9:20
 Date/Time:
 Date/Time:
 Date/Time:

Comments and Special Analytical Requirements:
SGCU - Silica gel cleanup
6.0 u/s
 Custody Seal No.:
 BNSF COC No.:

TAT: _____

Paperwork to PM - Date: _____ Time: _____

Non-Conformances?

Page Time & Initials: _____

Circle or N

(If Y, see other side)

TEST AMERICA SAMPLE RECEIPT CHECKLIST

Received By: _____
(applies to temp at receipt)

Logged-in By: _____

Unpacked/Labeled By: _____

Cooler ID: 373, 307, 374, 303,
320, 361, 317 309

Date: 9/24

Date: 9/24

Date: 9/24/06

Work Order No. 303 318

Time: 9:20

Time: 1720

Time: 1800

Client: _____

Initials: CL

Initials: PT

Initials: FL

Project: _____

Container Type:

COC Seals:

Packing Material:

Cooler _____ Sign By _____
 Box _____ On Bottles _____ Date _____
 None/Other _____ None

Bubble Bags _____ Styrofoam _____
 Foam Packs _____
 None/Other _____

Refrigerant:

Received Via: Bill# _____

Gel Ice Pack _____
 Loose Ice _____
 None/Other _____

Fed Ex _____ Client _____
 UPS _____ TA Courier _____
 DHL _____ Mid Valley _____
 Senvoy _____ TDP _____
 GS _____ Other _____

Cooler Temperature (iR): _____ °C Plastic Glass (Frozen filters, Tedlars and aqueous Metals exempt)

Temperature Blank? _____ °C or NA 6.0, 5.7, 5.9, 4.9, 5.0, 5.9 5.0, 5.9, 4.4 Trip Blank? Y or N or NA

BP, OPLC, ARCO-Temperature monitoring every 15 minutes:

(initial/date/time): _____

Comments: _____

Sample Containers:

ID

ID

Intact? or N _____ Metals Preserved? Y or N or NA _____
Provided by TA? or N _____ Client QAPP Preserved? Y or N or NA _____
Correct Type? or N _____ Adequate Volume? or N _____
#Containers match COC? or N _____ (for tests requested)
IDs/time/date match COC? Y or N _____ Water VOAs: Headspace? Y or N or NA _____
Hold Times in hold? or N _____ Comments: _____

PROJECT MANAGEMENT

is the Chain of Custody complete? Y or N If N, circle the items that were incomplete

Comments, Problems _____

Total access set up? _____

Y or N

Has client been contacted regarding non-conformances? _____

Y or N

If Y, _____
Date Time

PM Initials: _____ Date: _____ Time: _____

October 08, 2008

Halah Voges
ENSR International - Seattle
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

RE: BNSF-Skykomish Remedial Design Investigation

Enclosed are the results of analyses for samples received by the laboratory on 09/24/08 09:20.
The following list is a summary of the Work Orders contained in this report, generated on 10/08/08
12:24.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
BRI0382	BNSF-Skykomish Remedial D	01140-204-0340

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish Remedial Design Investigation**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

10/08/08 12:24

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
5-W-20-0908	BRI0382-01	Water	09/23/08 09:25	09/24/08 09:20
5-W-14-0908	BRI0382-02	Water	09/23/08 10:25	09/24/08 09:20
5-W-17-0908	BRI0382-03	Water	09/23/08 11:40	09/24/08 09:20
5-W-18-0908	BRI0382-04	Water	09/23/08 12:50	09/24/08 09:20
5-W-19-0908	BRI0382-05	Water	09/23/08 14:35	09/24/08 09:20
5-W-15-0908	BRI0382-06	Water	09/23/08 16:40	09/24/08 09:20
5-W-150-0908	BRI0382-07	Water	09/23/08 16:45	09/24/08 09:20
5-W-16-0908	BRI0382-08	Water	09/23/08 18:00	09/24/08 09:20

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name:

BNSF-Skykomish Remedial Design Investigation

Project Number:

01140-204-0340

Report Created:

Project Manager:

Halah Voges

10/08/08 12:24

Analytical Case Narrative

TestAmerica - Seattle, WA

BRI0382

SAMPLE RECEIPT

The samples were received September 24th, 2008 by TestAmerica - Seattle. The temperature of the samples at the time of receipt was 6.0 degrees Celsius.

PREPARATIONS AND ANALYSIS

No additional anomalies, discrepancies, or issues were associated with sample preparation, analysis and quality control other than those already qualified in the data and described in the Notes and Definitions page at the end of the report.

TestAmerica Seattle



Kate Haney, Project Manager

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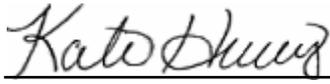


ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 10/08/08 12:24
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0382-01RE1 (5-W-20-0908)		Water			Sampled: 09/23/08 09:25					
Lube Oil Range Hydrocarbons	NWTPH-Dx	0.139	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 20:48	J
Surrogate(s):	2-FBP		62.5%		53 - 125 %	"				"
	Octacosane		84.3%		68 - 125 %	"				"
BRI0382-01RE2 (5-W-20-0908)		Water			Sampled: 09/23/08 09:25					
Diesel Range Hydrocarbons	NWTPH-Dx	0.305	0.0377	0.236	mg/l	1x	8125027	09/25/08 08:57	10/01/08 08:48	Q3
Surrogate(s):	2-FBP		72.6%		53 - 125 %	"				"
	Octacosane		98.0%		68 - 125 %	"				"
BRI0382-02RE1 (5-W-14-0908)		Water			Sampled: 09/23/08 10:25					
Lube Oil Range Hydrocarbons	NWTPH-Dx	ND	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:10	
Surrogate(s):	2-FBP		66.8%		53 - 125 %	"				"
	Octacosane		84.9%		68 - 125 %	"				"
BRI0382-02RE2 (5-W-14-0908)		Water			Sampled: 09/23/08 10:25					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8125027	09/25/08 08:57	10/01/08 09:12	
Surrogate(s):	2-FBP		79.4%		53 - 125 %	"				"
	Octacosane		98.7%		68 - 125 %	"				"
BRI0382-03RE1 (5-W-17-0908)		Water			Sampled: 09/23/08 11:40					
Lube Oil Range Hydrocarbons	NWTPH-Dx	ND	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:32	
Surrogate(s):	2-FBP		66.2%		53 - 125 %	"				"
	Octacosane		83.6%		68 - 125 %	"				"
BRI0382-03RE2 (5-W-17-0908)		Water			Sampled: 09/23/08 11:40					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8125027	09/25/08 08:57	10/01/08 09:36	
Surrogate(s):	2-FBP		80.3%		53 - 125 %	"				"
	Octacosane		99.3%		68 - 125 %	"				"
BRI0382-04RE1 (5-W-18-0908)		Water			Sampled: 09/23/08 12:50					
Lube Oil Range Hydrocarbons	NWTPH-Dx	0.197	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:54	J
Surrogate(s):	2-FBP		66.8%		53 - 125 %	"				"
	Octacosane		81.9%		68 - 125 %	"				"

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 10/08/08 12:24
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0382-04RE2 (5-W-18-0908)		Water			Sampled: 09/23/08 12:50					
Diesel Range Hydrocarbons	NWTPH-Dx	0.342	0.0377	0.236	mg/l	1x	8125027	09/25/08 08:57	10/01/08 10:00	Q3
Surrogate(s): 2-FBP			81.3%		53 - 125 %	"				"
Octacosane			100%		68 - 125 %	"				"
BRI0382-05RE1 (5-W-19-0908)		Water			Sampled: 09/23/08 14:35					
Lube Oil Range Hydrocarbons	NWTPH-Dx	ND	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 22:17	
Surrogate(s): 2-FBP			63.5%		53 - 125 %	"				"
Octacosane			79.1%		68 - 125 %	"				"
BRI0382-05RE2 (5-W-19-0908)		Water			Sampled: 09/23/08 14:35					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8125027	09/25/08 08:57	10/01/08 10:38	
Surrogate(s): 2-FBP			70.4%		53 - 125 %	"				"
Octacosane			92.8%		68 - 125 %	"				"
BRI0382-06RE1 (5-W-15-0908)		Water			Sampled: 09/23/08 16:40					
Lube Oil Range Hydrocarbons	NWTPH-Dx	0.104	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 22:39	J
Surrogate(s): 2-FBP			68.3%		53 - 125 %	"				"
Octacosane			83.7%		68 - 125 %	"				"
BRI0382-06RE2 (5-W-15-0908)		Water			Sampled: 09/23/08 16:40					
Diesel Range Hydrocarbons	NWTPH-Dx	0.272	0.0377	0.236	mg/l	1x	8125027	09/25/08 08:57	10/01/08 11:06	Q12
Surrogate(s): 2-FBP			76.9%		53 - 125 %	"				"
Octacosane			101%		68 - 125 %	"				"
BRI0382-07RE1 (5-W-150-0908)		Water			Sampled: 09/23/08 16:45					
Lube Oil Range Hydrocarbons	NWTPH-Dx	0.127	0.0857	0.476	mg/l	1x	8129034	09/29/08 11:59	10/01/08 00:09	J
Surrogate(s): 2-FBP			67.2%		53 - 125 %	"				"
Octacosane			80.5%		68 - 125 %	"				"
BRI0382-07RE2 (5-W-150-0908)		Water			Sampled: 09/23/08 16:45					
Diesel Range Hydrocarbons	NWTPH-Dx	0.347	0.0377	0.236	mg/l	1x	8125027	09/25/08 08:57	10/01/08 11:58	Q12
Surrogate(s): 2-FBP			75.7%		53 - 125 %	"				"
Octacosane			101%		68 - 125 %	"				"

TestAmerica Seattle



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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 10/08/08 12:24
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0382-08RE1 (5-W-16-0908)		Water			Sampled: 09/23/08 18:00					
Lube Oil Range Hydrocarbons	NWTPH-Dx	ND	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	10/01/08 00:31	
Surrogate(s):	2-FBP		60.9%		53 - 125 %	"				"
	Octacosane		79.6%		68 - 125 %	"				"
BRI0382-08RE2 (5-W-16-0908)		Water			Sampled: 09/23/08 18:00					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8125027	09/25/08 08:57	10/01/08 12:26	
Surrogate(s):	2-FBP		67.1%		53 - 125 %	"				"
	Octacosane		93.2%		68 - 125 %	"				"

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 10/08/08 12:24
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0382-01RE1 (5-W-20-0908)		Water			Sampled: 09/23/08 09:25					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 20:48	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			74.0%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			99.3%		68 - 125 %	"			"	
BRI0382-02RE1 (5-W-14-0908)		Water			Sampled: 09/23/08 10:25					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:10	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			73.6%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			91.7%		68 - 125 %	"			"	
BRI0382-03RE1 (5-W-17-0908)		Water			Sampled: 09/23/08 11:40					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:32	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			74.9%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			93.6%		68 - 125 %	"			"	
BRI0382-04RE1 (5-W-18-0908)		Water			Sampled: 09/23/08 12:50					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:54	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			73.1%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			90.6%		68 - 125 %	"			"	
BRI0382-05RE1 (5-W-19-0908)		Water			Sampled: 09/23/08 14:35					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 22:17	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			75.9%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			93.6%		68 - 125 %	"			"	
BRI0382-06RE1 (5-W-15-0908)		Water			Sampled: 09/23/08 16:40					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 22:39	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			75.4%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			91.9%		68 - 125 %	"			"	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 10/08/08 12:24
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0382-07RE1 (5-W-150-0908)		Water			Sampled: 09/23/08 16:45					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	8129034	09/29/08 11:59	10/01/08 00:09	
Lube Oil Range (SGCU)	"	ND	0.152	0.476	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			75.0%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			91.9%		68 - 125 %	"			"	
BRI0382-08RE1 (5-W-16-0908)		Water			Sampled: 09/23/08 18:00					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	10/01/08 00:31	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			69.6%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			90.9%		68 - 125 %	"			"	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 10/08/08 12:24
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8129034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8129034-BLK1)													Extracted: 09/29/08 11:59	
Lube Oil Range Hydrocarbons	NWTPH-Dx	0.119	0.0900	0.500	mg/l	1x	--	--	--	--	--	--	09/30/08 19:18	J
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>68.3%</i>	<i>Limits:</i>	<i>53-125%</i>	<i>"</i>							<i>09/30/08 19:18</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>83.3%</i>	<i>Limits:</i>	<i>68-125%</i>	<i>"</i>							<i>"</i>	
Blank (8129034-BLK3)													Extracted: 09/29/08 11:59	
Diesel Range Hydrocarbons	NWTPH-Dx	0.0830	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	10/01/08 07:13	J
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>82.1%</i>	<i>Limits:</i>	<i>53-125%</i>	<i>"</i>							<i>10/01/08 07:13</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>97.7%</i>	<i>Limits:</i>	<i>68-125%</i>	<i>"</i>							<i>"</i>	
Blank (8129034-BLK4)													Extracted: 09/29/08 11:59	
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	10/01/08 08:45	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>87.0%</i>	<i>Limits:</i>	<i>53-125%</i>	<i>"</i>							<i>10/01/08 14:19</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>113%</i>	<i>Limits:</i>	<i>68-125%</i>	<i>"</i>							<i>"</i>	
LCS (8129034-BS1)													Extracted: 09/29/08 11:59	
Diesel Range Hydrocarbons	NWTPH-Dx	1.49	0.0400	0.250	mg/l	1x	--	2.00	74.4%	(61-132)	--	--	09/30/08 19:41	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>71.8%</i>	<i>Limits:</i>	<i>53-125%</i>	<i>"</i>							<i>09/30/08 19:41</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>85.7%</i>	<i>Limits:</i>	<i>68-125%</i>	<i>"</i>							<i>"</i>	
LCS (8129034-BS3)													Extracted: 09/29/08 11:59	
Diesel Range Hydrocarbons	NWTPH-Dx	1.78	0.0400	0.250	mg/l	1x	--	2.00	88.9%	(61-132)	--	--	10/01/08 07:36	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>88.1%</i>	<i>Limits:</i>	<i>53-125%</i>	<i>"</i>							<i>10/01/08 07:36</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>99.6%</i>	<i>Limits:</i>	<i>68-125%</i>	<i>"</i>							<i>"</i>	
LCS (8129034-BS4)													Extracted: 09/29/08 11:59	
Diesel Range Hydrocarbons	NWTPH-Dx	1.95	0.0400	0.250	mg/l	1x	--	2.00	97.6%	(61-132)	--	--	10/01/08 14:47	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>85.8%</i>	<i>Limits:</i>	<i>53-125%</i>	<i>"</i>							<i>10/01/08 14:47</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>107%</i>	<i>Limits:</i>	<i>68-125%</i>	<i>"</i>							<i>"</i>	
Matrix Spike (8129034-MS1)													QC Source: BRI0382-05RE1 Extracted: 09/29/08 11:59	
Diesel Range Hydrocarbons	NWTPH-Dx	1.38	0.0377	0.236	mg/l	1x	ND	1.89	73.3%	(32-143)	--	--	09/30/08 20:03	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>68.6%</i>	<i>Limits:</i>	<i>53-125%</i>	<i>"</i>							<i>09/30/08 20:03</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>84.7%</i>	<i>Limits:</i>	<i>68-125%</i>	<i>"</i>							<i>"</i>	
Matrix Spike (8129034-MS3)													QC Source: BRI0382-05RE1 Extracted: 09/29/08 11:59	
Diesel Range Hydrocarbons	NWTPH-Dx	1.62	0.0377	0.236	mg/l	1x	ND	1.89	85.8%	(32-143)	--	--	10/01/08 08:00	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>80.3%</i>	<i>Limits:</i>	<i>53-125%</i>	<i>"</i>							<i>10/01/08 08:00</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>96.2%</i>	<i>Limits:</i>	<i>68-125%</i>	<i>"</i>							<i>"</i>	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 10/08/08 12:24
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8129034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (8129034-MS4)			QC Source: BRI0382-05RE1				Extracted: 09/29/08 11:59							
Diesel Range Hydrocarbons	NWTPH-Dx	1.91	0.0377	0.236	mg/l	1x	ND	1.89	101%	(32-143)	--	--	10/01/08 15:16	
Surrogate(s): 2-FBP		Recovery: 86.5%		Limits: 53-125%		"						10/01/08 15:16		
Octacosane		110%		68-125%		"						"		
Matrix Spike Dup (8129034-MSD1)			QC Source: BRI0382-05RE1				Extracted: 09/29/08 11:59							
Diesel Range Hydrocarbons	NWTPH-Dx	1.42	0.0377	0.236	mg/l	1x	ND	1.89	75.1%	(32-143)	2.42% (40)		09/30/08 20:25	
Surrogate(s): 2-FBP		Recovery: 68.7%		Limits: 53-125%		"						09/30/08 20:25		
Octacosane		84.4%		68-125%		"						"		
Matrix Spike Dup (8129034-MSD3)			QC Source: BRI0382-05RE1				Extracted: 09/29/08 11:59							
Diesel Range Hydrocarbons	NWTPH-Dx	1.72	0.0377	0.236	mg/l	1x	ND	1.89	91.4%	(32-143)	6.33% (40)		10/01/08 08:24	
Surrogate(s): 2-FBP		Recovery: 85.8%		Limits: 53-125%		"						10/01/08 08:24		
Octacosane		102%		68-125%		"						"		
Matrix Spike Dup (8129034-MSD4)			QC Source: BRI0382-05RE1				Extracted: 09/29/08 11:59							
Diesel Range Hydrocarbons	NWTPH-Dx	1.61	0.0377	0.236	mg/l	1x	ND	1.89	85.3%	(32-143)	17.1% (40)		10/01/08 10:10	
Surrogate(s): 2-FBP		Recovery: 73.1%		Limits: 53-125%		"						10/01/08 10:10		
Octacosane		91.9%		68-125%		"						"		

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 10/08/08 12:24
--	---	-----------------------------------

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8129034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8129034-BLK2)								Extracted: 09/29/08 11:59						
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	09/30/08 19:18	
Lube Oil Range (SGCU)	"	ND	0.160	0.500	"	"	--	--	--	--	--	--	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>75.1%</i>										<i>09/30/08 19:18</i>	
<i>Octacosane (SGCU)</i>			<i>90.9%</i>										<i>"</i>	
LCS (8129034-BS2)								Extracted: 09/29/08 11:59						
Diesel Range (SGCU)	NWTPH-Dx	1.52	0.0400	0.250	mg/l	1x	--	2.00	75.8%	(61-132)	--	--	09/30/08 19:41	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>79.4%</i>										<i>09/30/08 19:41</i>	
<i>Octacosane (SGCU)</i>			<i>88.0%</i>										<i>"</i>	
Matrix Spike (8129034-MS2)								QC Source: BRI0382-05RE1 Extracted: 09/29/08 11:59						
Diesel Range (SGCU)	NWTPH-Dx	1.56	0.0377	0.236	mg/l	1x	ND	1.89	82.5%	(32-143)	--	--	09/30/08 20:03	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>82.5%</i>										<i>09/30/08 20:03</i>	
<i>Octacosane (SGCU)</i>			<i>95.1%</i>										<i>"</i>	
Matrix Spike Dup (8129034-MSD2)								QC Source: BRI0382-05RE1 Extracted: 09/29/08 11:59						
Diesel Range (SGCU)	NWTPH-Dx	1.58	0.0377	0.236	mg/l	1x	ND	1.89	83.8%	(32-143)	1.52%	(40)	09/30/08 20:25	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>83.7%</i>										<i>09/30/08 20:25</i>	
<i>Octacosane (SGCU)</i>			<i>96.3%</i>										<i>"</i>	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle	Project Name:	BNSF-Skykomish Remedial Design Investigation
1011 SW Klickitat Way, Suite 207	Project Number:	01140-204-0340
Seattle, WA 98134	Project Manager:	Halah Voges
	Report Created:	10/08/08 12:24

Notes and Definitions

Report Specific Notes:

- C - Calibration Verification recovery was above the method control limit for this analyte. Analyte not detected, data not impacted.
- J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
- Q12 - Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
- Q3 - The chromatographic pattern is not consistent with diesel fuel.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Seattle



Kate Haney, Project Manager

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TAT: _____

Paperwork to PM - Date: _____ Time: _____

Non-Conformances? Circle **Y** or N

Page Time & Initials: _____

(If Y, see other side)

TEST AMERICA SAMPLE RECEIPT CHECKLIST

Received By: _____
(applies to temp at receipt)

Logged-in By: _____

Unpacked/Labeled By: _____

Cooler ID: BR10382

Date: 9/24

Date: 9/24

Date: 9/24/08

Work Order No. _____

Time: 0920

Time: 1720

Time: 1800

Client: _____

Initials: PTJ

Initials: PTJ

Initials: FL

Project: _____

Container Type:

COC Seals:

Packing Material:

Cooler _____ Ship Container _____ Sign By _____
 Box _____ On Bottles _____ Date _____
 None/Other _____ None

Bubble Bags _____ Styrofoam _____
 Foam Packs _____
 None/Other _____

Refrigerant:

Received Via: Bill# _____

Gel Ice Pack _____
 Loose Ice _____
 None/Other _____

Fed Ex Client
 UPS _____ TA Courier
 DHL _____ Mid Valley
 Senvoy _____ TDP
 GS _____ Other _____

Cooler Temperature (IR): _____ °C Plastic Glass (Frozen filters, Tedlars and aqueous Metals exempt)
(circle one)

Temperature Blank? _____ °C or NA 6.0, 5.7, 5.9, 4.9, 5.0, 5.0, 5.9, 4.4 Trip Blank? Y or N or **NA**

BP, OPLC, ARCO-Temperature monitoring every 15 minutes:
(initial/date/time): _____

Comments: _____

Sample Containers:

ID

ID

Intact? or N _____ Metals Preserved? Y or N or **NA**
Provided by TA? or N _____ Client QAPP Preserved? Y or N or **NA**
Correct Type? or N _____ Adequate Volume? or N _____
(for tests requested)
#Containers match COC? or N _____ Water VOAs: Headspace? Y or N or **NA**
IDs/time/date match COC? Y or _____ Comments: _____
Hold Times in hold? or N _____

PROJECT MANAGEMENT

Is the Chain of Custody complete? _____ Y or N if N, circle the items that were incomplete

Comments, Problems _____

Total access set up? _____
Has client been contacted regarding non-conformances? _____

Y or N
Y or N If Y, _____ / _____
Date Time

PM Initials: _____ Date: _____ Time: _____

NOTIFICATION OF DISCREPANCY

DATE: <u>9/24/08</u>	TIME: <u>1905</u>	PM: <u>K.H.</u>	SC INITIALS: <u>FL.</u>
Rush/Short Hold? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			

- Project Not Set Up in ELM New Client COC Received ON HOLD
 Analysis Requested on COC – Not Listed for Project in ELM

- PM To Add Analysis: _____
 Clarification of Analysis: _____
 Hold Time Expired: (Analysis) _____
 Turnaround Time Not Checked: _____
 Did Not Receive Sample(s) Listed on COC: _____
 Received Extra Sample(s) Not Listed on COC: _____

- Sample Description(s) or Date/Time Sampled Do Not Match COC:
Sample container has 1035 for 5-w-14, COC has 1025, Logged-in per COC

- Improper Preservative For method: _____
 Sample Received Broken: _____
 Insufficient Sample Volume: _____
 Sample preserved upon receipt: _____

- Temperature Outside recommended range ($4^{\circ}\text{C} \pm 2^{\circ}\text{C}$): _____
 Received on-ice within 4 hours of collection, temperature between ambient to 2°C acceptable.
 Other: _____

PROJECT MANAGER RESOLUTION:	(Date & Time when returned to SC)
Approval By:	Date: Time:

October 17, 2007

Stephen Howard
The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

RE: BNSF-Skykomish

Enclosed are the results of analyses for samples received by the laboratory on 10/03/07 16:15.
The following list is a summary of the Work Orders contained in this report, generated on 10/17/07
16:19.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
BQJ0118	BNSF-Skykomish	01140-204-340

TestAmerica - Seattle, WA



Kate Haney, Project Manager

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The RETEC Group, Inc.

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-340

Project Manager: Stephen Howard

Report Created:

10/17/07 16:19

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
5-W-14-1007	BQJ0118-01	Water	10/03/07 10:10	10/03/07 16:15
5-W-15-1007	BQJ0118-02	Water	10/03/07 10:45	10/03/07 16:15
5-W-150-1007	BQJ0118-03	Water	10/03/07 10:55	10/03/07 16:15
5-W-16-1007	BQJ0118-04	Water	10/03/07 11:40	10/03/07 16:15
5-W-17-1007	BQJ0118-05	Water	10/03/07 12:30	10/03/07 16:15
5-W-18-1007	BQJ0118-06	Water	10/03/07 13:50	10/03/07 16:15
5-W-19-1007	BQJ0118-07	Water	10/03/07 13:15	10/03/07 16:15
5-W-20-1007	BQJ0118-08	Water	10/03/07 14:40	10/03/07 16:15
MW-500-1007	BQJ0118-09	Water	10/03/07 15:00	10/03/07 16:15

TestAmerica - Seattle, WA



Kate Haney, Project Manager

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The RETEC Group, Inc.

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-340

Project Manager: Stephen Howard

Report Created:

10/17/07 16:19

Analytical Case Narrative

TestAmerica - Seattle, WA

BQJ0118

SAMPLE RECEIPT

The samples were received October 3rd, 2007 by TestAmerica - Seattle. The temperature of the samples at the time of receipt was 6.0 degrees Celsius.

PREPARATIONS AND ANALYSIS

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up): No additional anomalies, discrepancies, or issues were associated with sample preparation, analysis and quality control other than those already qualified in the data and described in the Notes and Definitions page at the end of the report.

TestAmerica - Seattle, WA



Kate Haney, Project Manager

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The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-340 Project Manager: Stephen Howard	Report Created: 10/17/07 16:19
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
 TestAmerica - Seattle, WA

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BQJ0118-01 (5-W-14-1007)		Water			Sampled: 10/03/07 10:10					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	7J05020	10/05/07 09:24	10/09/07 13:00	
Lube Oil Range Hydrocarbons	"	ND	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			74.5%		53 - 125 %	"				"
Octacosane			92.5%		68 - 125 %	"				"
BQJ0118-02 (5-W-15-1007)		Water			Sampled: 10/03/07 10:45					
Diesel Range Hydrocarbons	NWTPH-Dx	1.54	0.0381	0.238	mg/l	1x	7J05020	10/05/07 09:24	10/09/07 15:04	Q12
Lube Oil Range Hydrocarbons	"	0.425	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			84.3%		53 - 125 %	"				"
Octacosane			84.0%		68 - 125 %	"				"
BQJ0118-03 (5-W-150-1007)		Water			Sampled: 10/03/07 10:55					
Diesel Range Hydrocarbons	NWTPH-Dx	1.47	0.0377	0.236	mg/l	1x	7J05020	10/05/07 09:24	10/09/07 15:30	Q12
Lube Oil Range Hydrocarbons	"	0.397	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			79.0%		53 - 125 %	"				"
Octacosane			85.0%		68 - 125 %	"				"
BQJ0118-04 (5-W-16-1007)		Water			Sampled: 10/03/07 11:40					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0562	0.0377	0.236	mg/l	1x	7J05020	10/05/07 09:24	10/09/07 15:57	J
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			76.5%		53 - 125 %	"				"
Octacosane			91.7%		68 - 125 %	"				"
BQJ0118-05 (5-W-17-1007)		Water			Sampled: 10/03/07 12:30					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	7J05020	10/05/07 09:24	10/09/07 16:23	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			72.3%		53 - 125 %	"				"
Octacosane			90.8%		68 - 125 %	"				"
BQJ0118-06 (5-W-18-1007)		Water			Sampled: 10/03/07 13:50					
Diesel Range Hydrocarbons	NWTPH-Dx	0.623	0.0377	0.236	mg/l	1x	7J05020	10/05/07 09:24	10/09/07 16:50	Q12
Lube Oil Range Hydrocarbons	"	0.256	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			81.8%		53 - 125 %	"				"
Octacosane			96.8%		68 - 125 %	"				"

TestAmerica - Seattle, WA

Kate Haney

Kate Haney, Project Manager

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The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-340 Project Manager: Stephen Howard	Report Created: 10/17/07 16:19
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

TestAmerica - Seattle, WA

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BQJ0118-07 (5-W-19-1007)		Water			Sampled: 10/03/07 13:15					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	7J05020	10/05/07 09:24	10/09/07 17:16	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP</i>			70.9%		53 - 125 %	"				"
<i>Octacosane</i>			87.0%		68 - 125 %	"				"
BQJ0118-08 (5-W-20-1007)		Water			Sampled: 10/03/07 14:40					
Diesel Range Hydrocarbons	NWTPH-Dx	0.756	0.0377	0.236	mg/l	1x	7J05020	10/05/07 09:24	10/09/07 17:42	Q12
Lube Oil Range Hydrocarbons	"	0.393	0.0849	0.472	"	"	"	"	"	J
<i>Surrogate(s): 2-FBP</i>			84.8%		53 - 125 %	"				"
<i>Octacosane</i>			99.2%		68 - 125 %	"				"
BQJ0118-09 (MW-500-1007)		Water			Sampled: 10/03/07 15:00					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	7J05020	10/05/07 09:24	10/09/07 18:09	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP</i>			71.3%		53 - 125 %	"				"
<i>Octacosane</i>			89.5%		68 - 125 %	"				"

TestAmerica - Seattle, WA



Kate Haney, Project Manager

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The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-340 Project Manager: Stephen Howard	Report Created: 10/17/07 16:19
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica - Seattle, WA

QC Batch: 7J05020 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
---------	--------	--------	------	-----	-------	-----	---------------	-----------	-------	----------	-------	----------	----------	-------

Blank (7J05020-BLK1)

Extracted: 10/05/07 09:24

Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	10/09/07 08:36	
Lube Oil Range Hydrocarbons	"	ND	0.0900	0.500	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2-FBP		Recovery: 80.9%		Limits: 53-125%	"								10/09/07 08:36	
Octacosane		93.3%		68-125%	"								"	

LCS (7J05020-BS1)

Extracted: 10/05/07 09:24

Diesel Range Hydrocarbons	NWTPH-Dx	1.61	0.0400	0.250	mg/l	1x	--	2.00	80.7%	(61-132)	--	--	10/09/07 09:03	
Surrogate(s): 2-FBP		Recovery: 79.8%		Limits: 53-125%	"								10/09/07 09:03	
Octacosane		88.7%		68-125%	"								"	

LCS Dup (7J05020-BSD1)

Extracted: 10/05/07 09:24

Diesel Range Hydrocarbons	NWTPH-Dx	1.75	0.0400	0.250	mg/l	1x	--	2.00	87.7%	(61-132)	8.42% (40)	--	10/09/07 09:55	
Surrogate(s): 2-FBP		Recovery: 84.0%		Limits: 53-125%	"								10/09/07 09:55	
Octacosane		86.3%		68-125%	"								"	

Duplicate (7J05020-DUP1)

QC Source: BQJ0118-07

Extracted: 10/05/07 09:24

Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0396	0.248	mg/l	1x	ND	--	--	--	NR (40)	--	10/09/07 10:22	
Lube Oil Range Hydrocarbons	"	ND	0.0891	0.495	"	"	ND	--	--	--	NR	"	"	
Surrogate(s): 2-FBP		Recovery: 73.3%		Limits: 53-125%	"								10/09/07 10:22	
Octacosane		87.2%		68-125%	"								"	

Matrix Spike (7J05020-MS1)

QC Source: BQJ0118-07

Extracted: 10/05/07 09:24

Diesel Range Hydrocarbons	NWTPH-Dx	1.44	0.0377	0.236	mg/l	1x	ND	1.89	76.2%	(32-143)	--	--	10/09/07 10:48	
Surrogate(s): 2-FBP		Recovery: 70.2%		Limits: 53-125%	"								10/09/07 10:48	
Octacosane		84.2%		68-125%	"								"	

TestAmerica - Seattle, WA

Kate Haney

Kate Haney, Project Manager

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The RETEC Group, Inc.

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-340

Project Manager: Stephen Howard

Report Created:

10/17/07 16:19

Notes and Definitions

Report Specific Notes:

- J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
- Q12 - Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica - Seattle, WA



Kate Haney, Project Manager

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November 13, 2007

Sarah Albano
The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

RE: BNSF-Skykomish Remedial Design Investigation

Enclosed are the results of analyses for samples received by the laboratory on 11/02/07 13:00.
The following list is a summary of the Work Orders contained in this report, generated on 11/13/07
18:23.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
BQK0034	BNSF-Skykomish Remedial D	01140-204-0320

TestAmerica - Seattle, WA



Kate Haney, Project Manager

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The RETEC Group, Inc.

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish Remedial Design Investigation**

Project Number: 01140-204-0320

Project Manager: Sarah Albano

Report Created:

11/13/07 18:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
5-W-16-1107	BQK0034-01	Water	11/02/07 11:15	11/02/07 13:00
5-W-19-1107	BQK0034-02	Water	11/02/07 09:36	11/02/07 13:00
5-W-20-1107	BQK0034-03	Water	11/02/07 08:40	11/02/07 13:00
5-W-18-1107	BQK0034-04	Water	11/02/07 10:35	11/02/07 13:00
5-W-17-1107	BQK0034-05	Water	11/02/07 11:20	11/02/07 13:00
5-W-15-1107	BQK0034-06	Water	11/02/07 10:25	11/02/07 13:00
5-W-14-1107	BQK0034-07	Water	11/02/07 08:50	11/02/07 13:00
DUP01-110207	BQK0034-08	Water	11/02/07 08:00	11/02/07 13:00

TestAmerica - Seattle, WA



Kate Haney, Project Manager

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The RETEC Group, Inc.

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish Remedial Design Investigation**

Project Number: 01140-204-0320

Project Manager: Sarah Albano

Report Created:

11/13/07 18:23

Analytical Case Narrative

TestAmerica - Seattle, WA

BQK0034

SAMPLE RECEIPT

The samples were received November 2nd, 2007 by TestAmerica - Seattle. The temperature of the samples at the time of receipt was 7.0 degrees Celsius.

PREPARATIONS AND ANALYSIS

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up): No additional anomalies, discrepancies, or issues were associated with sample preparation, analysis and quality control other than those already qualified in the data and described in the Notes and Definitions page at the end of the report.

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up: No anomalies were associated with the sample preparation and analysis. All criteria for acceptable QC measurements were met.

TestAmerica - Seattle, WA



Kate Haney, Project Manager

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The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0320 Project Manager: Sarah Albano	Report Created: 11/13/07 18:23
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica - Seattle, WA

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BQK0034-01 (5-W-16-1107)		Water			Sampled: 11/02/07 11:15					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0676	0.0381	0.238	mg/l	1x	7K05023	11/05/07 10:02	11/07/07 11:39	J
Lube Oil Range Hydrocarbons	"	0.118	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			77.1%		53 - 125 %	"			"	
Octacosane			99.7%		68 - 125 %	"			"	
BQK0034-02 (5-W-19-1107)		Water			Sampled: 11/02/07 09:36					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	7K05023	11/05/07 10:02	11/07/07 12:08	
Lube Oil Range Hydrocarbons	"	0.134	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			85.3%		53 - 125 %	"			"	
Octacosane			100%		68 - 125 %	"			"	
BQK0034-03 (5-W-20-1107)		Water			Sampled: 11/02/07 08:40					
Diesel Range Hydrocarbons	NWTPH-Dx	1.01	0.0381	0.238	mg/l	1x	7K05023	11/05/07 10:02	11/07/07 12:38	
Lube Oil Range Hydrocarbons	"	0.820	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			80.8%		53 - 125 %	"			"	
Octacosane			88.1%		68 - 125 %	"			"	
BQK0034-04 (5-W-18-1107)		Water			Sampled: 11/02/07 10:35					
Diesel Range Hydrocarbons	NWTPH-Dx	1.10	0.0377	0.236	mg/l	1x	7K05023	11/05/07 10:02	11/07/07 13:07	
Lube Oil Range Hydrocarbons	"	0.855	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			85.0%		53 - 125 %	"			"	
Octacosane			90.6%		68 - 125 %	"			"	
BQK0034-05 (5-W-17-1107)		Water			Sampled: 11/02/07 11:20					
Diesel Range Hydrocarbons	NWTPH-Dx	0.141	0.0377	0.236	mg/l	1x	7K05023	11/05/07 10:02	11/07/07 13:37	J
Lube Oil Range Hydrocarbons	"	0.521	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			75.8%		53 - 125 %	"			"	
Octacosane			93.8%		68 - 125 %	"			"	
BQK0034-06 (5-W-15-1107)		Water			Sampled: 11/02/07 10:25					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0858	0.0377	0.236	mg/l	1x	7K05023	11/05/07 10:02	11/07/07 16:31	J
Lube Oil Range Hydrocarbons	"	0.177	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			79.3%		53 - 125 %	"			"	
Octacosane			95.0%		68 - 125 %	"			"	

TestAmerica - Seattle, WA

Kate Haney

Kate Haney, Project Manager

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The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0320 Project Manager: Sarah Albano	Report Created: 11/13/07 18:23
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
 TestAmerica - Seattle, WA

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BQK0034-07 (5-W-14-1107)		Water			Sampled: 11/02/07 08:50					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	7K05023	11/05/07 10:02	11/07/07 19:04	
Lube Oil Range Hydrocarbons	"	0.0870	0.0849	0.472	"	"	"	"	"	C, J
Surrogate(s):	2-FBP		77.2%		53 - 125 %	"			"	
	Octacosane		97.6%		68 - 125 %	"			"	
BQK0034-08 (DUP01-110207)		Water			Sampled: 11/02/07 08:00					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0736	0.0377	0.236	mg/l	1x	7K05023	11/05/07 10:02	11/07/07 19:33	J
Lube Oil Range Hydrocarbons	"	0.164	0.0849	0.472	"	"	"	"	"	C, J
Surrogate(s):	2-FBP		78.2%		53 - 125 %	"			"	
	Octacosane		99.2%		68 - 125 %	"			"	

TestAmerica - Seattle, WA

Kate Haney

Kate Haney, Project Manager

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The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0320 Project Manager: Sarah Albano	Report Created: 11/13/07 18:23
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
 TestAmerica - Seattle, WA

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BQK0034-01 (5-W-16-1107)		Water			Sampled: 11/02/07 11:15					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	7K05023	11/05/07 10:02	11/12/07 20:41	
Lube Oil Range (SGCU)	"	ND	0.152	0.476	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			75.1%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			94.6%		68 - 125 %	"				"
BQK0034-02 (5-W-19-1107)		Water			Sampled: 11/02/07 09:36					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	7K05023	11/05/07 10:02	11/12/07 21:06	
Lube Oil Range (SGCU)	"	ND	0.152	0.476	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			78.7%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			90.9%		68 - 125 %	"				"
BQK0034-03 (5-W-20-1107)		Water			Sampled: 11/02/07 08:40					
Diesel Range (SGCU)	NWTPH-Dx	0.0534	0.0381	0.238	mg/l	1x	7K05023	11/05/07 10:02	11/12/07 21:32	J
Lube Oil Range (SGCU)	"	ND	0.152	0.476	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			62.3%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			84.4%		68 - 125 %	"				"
BQK0034-04 (5-W-18-1107)		Water			Sampled: 11/02/07 10:35					
Diesel Range (SGCU)	NWTPH-Dx	0.0784	0.0377	0.236	mg/l	1x	7K05023	11/05/07 10:02	11/12/07 21:58	J
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			73.0%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			92.1%		68 - 125 %	"				"
BQK0034-05 (5-W-17-1107)		Water			Sampled: 11/02/07 11:20					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	7K05023	11/05/07 10:02	11/12/07 22:24	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			73.0%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			90.8%		68 - 125 %	"				"
BQK0034-06 (5-W-15-1107)		Water			Sampled: 11/02/07 10:25					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	7K05023	11/05/07 10:02	11/12/07 22:50	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			67.6%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			83.0%		68 - 125 %	"				"

TestAmerica - Seattle, WA

Kate Haney

Kate Haney, Project Manager

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The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0320 Project Manager: Sarah Albano	Report Created: 11/13/07 18:23
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
 TestAmerica - Seattle, WA

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BQK0034-07 (5-W-14-1107)		Water			Sampled: 11/02/07 08:50					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	7K05023	11/05/07 10:02	11/13/07 00:33	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			72.5%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			89.4%		68 - 125 %	"				"
BQK0034-08 (DUP01-110207)		Water			Sampled: 11/02/07 08:00					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	7K05023	11/05/07 10:02	11/13/07 00:59	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>			71.4%		53 - 125 %	"				"
<i>Octacosane (SGCU)</i>			86.6%		68 - 125 %	"				"

TestAmerica - Seattle, WA

Kate Haney

Kate Haney, Project Manager

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The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0320 Project Manager: Sarah Albano	Report Created: 11/13/07 18:23
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica - Seattle, WA

QC Batch: 7K05023 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7K05023-BLK1)										Extracted: 11/05/07 10:02				
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	11/07/07 09:43	
Lube Oil Range Hydrocarbons	"	ND	0.0900	0.500	"	"	--	--	--	--	--	--	"	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>76.6%</i>	<i>Limits: 53-125%</i>	<i>"</i>								<i>11/07/07 09:43</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>95.5%</i>	<i>Limits: 68-125%</i>	<i>"</i>								<i>"</i>	
LCS (7K05023-BS1)										Extracted: 11/05/07 10:02				
Diesel Range Hydrocarbons	NWTPH-Dx	1.65	0.0400	0.250	mg/l	1x	--	2.00	82.3%	(61-132)	--	--	11/07/07 10:11	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>82.4%</i>	<i>Limits: 53-125%</i>	<i>"</i>								<i>11/07/07 10:11</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>91.3%</i>	<i>Limits: 68-125%</i>	<i>"</i>								<i>"</i>	
Matrix Spike (7K05023-MS1)										QC Source: BQK0034-03 Extracted: 11/05/07 10:02				
Diesel Range Hydrocarbons	NWTPH-Dx	2.52	0.0381	0.238	mg/l	1x	1.01	1.90	78.9%	(32-143)	--	--	11/07/07 10:40	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>78.7%</i>	<i>Limits: 53-125%</i>	<i>"</i>								<i>11/07/07 10:40</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>90.3%</i>	<i>Limits: 68-125%</i>	<i>"</i>								<i>"</i>	
Matrix Spike Dup (7K05023-MSD1)										QC Source: BQK0034-03 Extracted: 11/05/07 10:02				
Diesel Range Hydrocarbons	NWTPH-Dx	2.42	0.0381	0.238	mg/l	1x	1.01	1.90	73.9%	(32-143)	3.87%	(40)	11/07/07 11:10	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery:</i>	<i>82.9%</i>	<i>Limits: 53-125%</i>	<i>"</i>								<i>11/07/07 11:10</i>	
<i>Octacosane</i>		<i>Recovery:</i>	<i>86.9%</i>	<i>Limits: 68-125%</i>	<i>"</i>								<i>"</i>	

TestAmerica - Seattle, WA

Kate Haney

Kate Haney, Project Manager

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The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0320 Project Manager: Sarah Albano	Report Created: 11/13/07 18:23
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Laboratory Quality Control Results
 TestAmerica - Seattle, WA

QC Batch: 7K05023 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7K05023-BLK2)										Extracted: 11/05/07 10:02				
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	11/12/07 18:57	
Lube Oil Range (SGCU)	"	ND	0.160	0.500	"	"	--	--	--	--	--	--	"	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>80.0%</i>		<i>Limits: 53-125%</i>	<i>"</i>							<i>11/12/07 18:57</i>	
<i>Octacosane (SGCU)</i>		<i>Recovery:</i>	<i>95.9%</i>		<i>68-125%</i>	<i>"</i>							<i>"</i>	
LCS (7K05023-BS2)										Extracted: 11/05/07 10:02				
Diesel Range (SGCU)	NWTPH-Dx	2.05	0.0400	0.250	mg/l	1x	--	2.00	102%	(61-132)	--	--	11/12/07 19:23	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>81.4%</i>		<i>Limits: 53-125%</i>	<i>"</i>							<i>11/12/07 19:23</i>	
<i>Octacosane (SGCU)</i>		<i>Recovery:</i>	<i>96.8%</i>		<i>68-125%</i>	<i>"</i>							<i>"</i>	
Matrix Spike (7K05023-MS2)										QC Source: BQK0034-03 Extracted: 11/05/07 10:02				
Diesel Range (SGCU)	NWTPH-Dx	1.59	0.0381	0.238	mg/l	1x	0.0534	1.90	80.7%	(32-143)	--	--	11/12/07 19:49	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>59.0%</i>		<i>Limits: 53-125%</i>	<i>"</i>							<i>11/12/07 19:49</i>	
<i>Octacosane (SGCU)</i>		<i>Recovery:</i>	<i>85.2%</i>		<i>68-125%</i>	<i>"</i>							<i>"</i>	
Matrix Spike Dup (7K05023-MSD2)										QC Source: BQK0034-03 Extracted: 11/05/07 10:02				
Diesel Range (SGCU)	NWTPH-Dx	1.53	0.0381	0.238	mg/l	1x	0.0534	1.90	77.8%	(32-143)	3.64%	(40)	11/12/07 20:15	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>57.5%</i>		<i>Limits: 53-125%</i>	<i>"</i>							<i>11/12/07 20:15</i>	
<i>Octacosane (SGCU)</i>		<i>Recovery:</i>	<i>75.6%</i>		<i>68-125%</i>	<i>"</i>							<i>"</i>	

TestAmerica - Seattle, WA



Kate Haney, Project Manager

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The RETEC Group, Inc. 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name:	BNSF-Skykomish Remedial Design Investigation
	Project Number:	01140-204-0320
	Project Manager:	Sarah Albano
	Report Created:	11/13/07 18:23

Notes and Definitions

Report Specific Notes:

- C - Calibration Verification recovery was above the method control limit for this analyte. Analyte not detected, data not impacted.
- J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica - Seattle, WA



Kate Haney, Project Manager

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CHAIN OF CUSTODY REPORT

Work Order #: *BDK 0034*

CLIENT: ENSR		INVOICE TO:		TURNAROUND REQUEST in Business Days *							
REPORT TO: <i>Renee Knecht</i> ADDRESS: <i>1101 SW Klickitat Way Suite 207 Seattle, WA 98134</i>		P.O. NUMBER:						Organic & Inorganic Analyses <input type="checkbox"/> 10 <input type="checkbox"/> 7 <input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> <1 STD. Petroleum Hydrocarbon Analyses <input checked="" type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> <1 STD.			
PHONE: <i>206-624-9349</i> FAX:		PROJECT NAME:		PRESERVATIVE							
PROJECT NUMBER:		<i>HCl</i>		REQUESTED ANALYSES							
SAMPLED BY:		<i>Handwritten</i>						* Turnaround Requests less than standard may incur Rush Charges.			
CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME							MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	TA WO ID
<i>1 SW-18-1107</i>	<i>11/2/07 1115</i>										<i>01</i>
<i>2 SW-19-1107</i>	<i>11/2/07 0936</i>										<i>02</i>
<i>3 SW-20-1107</i>	<i>11/2/07 0840</i>									<i>MS/MSD</i>	<i>03</i>
<i>4 SW-18-1107</i>	<i>11/2/07 1035</i>										<i>04</i>
<i>5 SW-17-1107</i>	<i>11/2/07 1120</i>										<i>05</i>
<i>6 SW-15-1107</i>	<i>11/2/07 1025</i>										<i>06</i>
<i>7 SW-14-1107</i>	<i>11/2/07 0850</i>										<i>07</i>
<i>8 DUP01-110207</i>	<i>11/2/07 0800</i>										<i>08</i>
9											
10											
RECEIVED BY: <i>Cassia</i>		DATE: <i>11/2/07</i>		RECEIVED BY: <i>Cathy Gumbel</i>		DATE: <i>11/2/07</i>					
PRINT NAME: <i>Cassia Smith</i>		FIRM: <i>ENSR</i>		PRINT NAME: <i>Cathy Gumbel</i>		FIRM: <i>TAT-SEA</i>					
TIME: <i>1330</i>		TIME:		TIME: <i>13:10</i>		TIME:					
RECEIVED BY:		DATE:		RECEIVED BY:		DATE:					
PRINT NAME:		FIRM:		PRINT NAME:		FIRM:					
TIME:		TIME:		TIME:		TIME:					
ADDITIONAL REMARKS:						TEMP: <i>7.0</i>					
COC REV 09/2004						PAGE OF					

w/o

November 17, 2008

Halah Voges
ENSR International - Seattle
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

RE: BNSF-Skykomish

Enclosed are the results of analyses for samples received by the laboratory on 09/24/08 09:20.
The following list is a summary of the Work Orders contained in this report, generated on 11/17/08
13:58.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
BRI0381	BNSF-Skykomish	01140-204-0340

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

11/17/08 13:58

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2A-W-10-0908	BRI0381-01	Water	09/22/08 16:55	09/24/08 09:20
2B-W-4-0908	BRI0381-02	Water	09/23/08 09:00	09/24/08 09:20
MW-39-0908	BRI0381-03	Water	09/23/08 09:45	09/24/08 09:20
2A-W-11-0908	BRI0381-04	Water	09/23/08 10:35	09/24/08 09:20
MW-500-0908	BRI0381-05	Water	09/23/08 10:50	09/24/08 09:20
1C-W-2-0908	BRI0381-06	Water	09/23/08 11:55	09/24/08 09:20
MW-38-0908	BRI0381-07	Water	09/23/08 12:35	09/24/08 09:20
5-W-4-0908	BRI0381-08	Water	09/23/08 13:15	09/24/08 09:20
2A-W-9-0908	BRI0381-09	Water	09/23/08 14:10	09/24/08 09:20
2A-W-90-0908	BRI0381-10	Water	09/23/08 14:20	09/24/08 09:20
MW-4-0908	BRI0381-11	Water	09/23/08 15:00	09/24/08 09:20
MW-3-0908	BRI0381-12	Water	09/23/08 15:50	09/24/08 09:20
1A-W-1-0908	BRI0381-13	Water	09/23/08 09:00	09/24/08 09:20
1A-W-3-0908	BRI0381-14	Water	09/23/08 09:50	09/24/08 09:20
1A-W-30-0908	BRI0381-15	Water	09/23/08 10:50	09/24/08 09:20
1A-W-4-0908	BRI0381-16	Water	09/23/08 10:52	09/24/08 09:20
1A-W-5-0908	BRI0381-17	Water	09/23/08 11:20	09/24/08 09:20
1C-W-1-0908	BRI0381-18	Water	09/23/08 13:15	09/24/08 09:20
1C-W-4-0908	BRI0381-19	Water	09/23/08 14:30	09/24/08 09:20
1B-W-3-0908	BRI0381-20	Water	09/23/08 15:46	09/24/08 09:20
1B-W-2-0908	BRI0381-21	Water	09/23/08 16:52	09/24/08 09:20
MW-35-0908	BRI0381-22	Water	09/23/08 17:56	09/24/08 09:20
MW-16-0908	BRI0381-23	Water	09/23/08 18:55	09/24/08 09:20

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

11/17/08 13:58

Analytical Case Narrative

TestAmerica - Seattle, WA

BRI0381

REVISED REPORT

The batch preparation date/time was listed incorrectly for the Blank, Blank Spike and Blank Spike Duplicate for laboratory batch 8I26034. The preparation date and time for the samples was listed correctly as 09/27/08 1618. The batch QC preparation dates and times have been revised in the enclosed report.

SAMPLE RECEIPT

The samples were received September 24th, 2008 by TestAmerica - Seattle. The temperature of the samples at the time of receipt was 6.0 degrees Celsius.

PREPARATIONS AND ANALYSIS

No additional anomalies, discrepancies, or issues were associated with sample preparation, analysis and quality control other than those already qualified in the data and described in the Notes and Definitions page at the end of the report.

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/17/08 13:58
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0381-01 (2A-W-10-0908)		Water			Sampled: 09/22/08 16:55					
Diesel Range Hydrocarbons	NWTPH-Dx	0.227	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/26/08 22:02	J
Lube Oil Range Hydrocarbons	"	0.153	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			87.7%		53 - 125 %	"			"	
Octacosane			100%		68 - 125 %	"			"	
BRI0381-02 (2B-W-4-0908)		Water			Sampled: 09/23/08 09:00					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/26/08 22:24	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			84.6%		53 - 125 %	"			"	
Octacosane			95.1%		68 - 125 %	"			"	
BRI0381-03 (MW-39-0908)		Water			Sampled: 09/23/08 09:45					
Diesel Range Hydrocarbons	NWTPH-Dx	0.642	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/26/08 22:45	Q3
Lube Oil Range Hydrocarbons	"	0.559	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			89.6%		53 - 125 %	"			"	
Octacosane			96.1%		68 - 125 %	"			"	
BRI0381-04 (2A-W-11-0908)		Water			Sampled: 09/23/08 10:35					
Diesel Range Hydrocarbons	NWTPH-Dx	0.860	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/26/08 23:06	Q3
Lube Oil Range Hydrocarbons	"	1.05	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			94.4%		53 - 125 %	"			"	
Octacosane			99.2%		68 - 125 %	"			"	
BRI0381-05 (MW-500-0908)		Water			Sampled: 09/23/08 10:50					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/26/08 23:28	
Lube Oil Range Hydrocarbons	"	ND	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			83.9%		53 - 125 %	"			"	
Octacosane			96.4%		68 - 125 %	"			"	
BRI0381-06 (1C-W-2-0908)		Water			Sampled: 09/23/08 11:55					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8126034	09/27/08 16:18	09/29/08 14:58	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			84.5%		53 - 125 %	"			"	
Octacosane			99.5%		68 - 125 %	"			"	

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/17/08 13:58
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0381-07 (MW-38-0908)		Water			Sampled: 09/23/08 12:35					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/26/08 23:49	
Lube Oil Range Hydrocarbons	"	ND	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			79.8%		53 - 125 %	"				"
Octacosane			93.3%		68 - 125 %	"				"
BRI0381-08 (5-W-4-0908)		Water			Sampled: 09/23/08 13:15					
Diesel Range Hydrocarbons	NWTPH-Dx	7.75	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 01:14	Q4
Lube Oil Range Hydrocarbons	"	2.49	0.0849	0.472	"	"	"	"	"	Q4
Surrogate(s): 2-FBP			106%		53 - 125 %	"				"
Octacosane			105%		68 - 125 %	"				"
BRI0381-09 (2A-W-9-0908)		Water			Sampled: 09/23/08 14:10					
Diesel Range Hydrocarbons	NWTPH-Dx	0.323	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 01:36	Q3
Lube Oil Range Hydrocarbons	"	0.147	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			79.0%		53 - 125 %	"				"
Octacosane			88.3%		68 - 125 %	"				"
BRI0381-10 (2A-W-90-0908)		Water			Sampled: 09/23/08 14:20					
Diesel Range Hydrocarbons	NWTPH-Dx	0.294	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 01:57	Q3
Lube Oil Range Hydrocarbons	"	0.171	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			86.1%		53 - 125 %	"				"
Octacosane			98.7%		68 - 125 %	"				"
BRI0381-11 (MW-4-0908)		Water			Sampled: 09/23/08 15:00					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 02:18	
Lube Oil Range Hydrocarbons	"	ND	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			79.6%		53 - 125 %	"				"
Octacosane			93.4%		68 - 125 %	"				"
BRI0381-12 (MW-3-0908)		Water			Sampled: 09/23/08 15:50					
Diesel Range Hydrocarbons	NWTPH-Dx	0.102	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 02:40	J
Lube Oil Range Hydrocarbons	"	0.143	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			83.9%		53 - 125 %	"				"
Octacosane			101%		68 - 125 %	"				"

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/17/08 13:58
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0381-13 (1A-W-1-0908)		Water			Sampled: 09/23/08 09:00					
Diesel Range Hydrocarbons	NWTPH-Dx	0.347	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 03:01	Q3
Lube Oil Range Hydrocarbons	"	0.152	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			81.6%		53 - 125 %	"			"	
Octacosane			98.1%		68 - 125 %	"			"	
BRI0381-14 (1A-W-3-0908)		Water			Sampled: 09/23/08 09:50					
Diesel Range Hydrocarbons	NWTPH-Dx	0.191	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 03:23	J
Lube Oil Range Hydrocarbons	"	0.420	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			86.4%		53 - 125 %	"			"	
Octacosane			104%		68 - 125 %	"			"	
BRI0381-15 (1A-W-30-0908)		Water			Sampled: 09/23/08 10:50					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0791	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 03:44	J
Lube Oil Range Hydrocarbons	"	0.180	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			82.9%		53 - 125 %	"			"	
Octacosane			102%		68 - 125 %	"			"	
BRI0381-16 (1A-W-4-0908)		Water			Sampled: 09/23/08 10:52					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 04:06	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			80.2%		53 - 125 %	"			"	
Octacosane			92.4%		68 - 125 %	"			"	
BRI0381-17 (1A-W-5-0908)		Water			Sampled: 09/23/08 11:20					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 04:27	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			74.4%		53 - 125 %	"			"	
Octacosane			92.6%		68 - 125 %	"			"	
BRI0381-18 (1C-W-1-0908)		Water			Sampled: 09/23/08 13:15					
Diesel Range Hydrocarbons	NWTPH-Dx	0.0550	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 05:53	J
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			79.1%		53 - 125 %	"			"	
Octacosane			96.3%		68 - 125 %	"			"	

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.



ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/17/08 13:58
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0381-19 (1C-W-4-0908)		Water			Sampled: 09/23/08 14:30					
Diesel Range Hydrocarbons	NWTPH-Dx	0.373	0.0377	0.236	mg/l	1x	8125025	09/25/08 08:52	09/27/08 06:14	Q3
Lube Oil Range Hydrocarbons	"	0.105	0.0849	0.472	"	"	"	"	"	J
Surrogate(s): 2-FBP			72.6%		53 - 125 %	"			"	
Octacosane			97.2%		68 - 125 %	"			"	
BRI0381-20 (1B-W-3-0908)		Water			Sampled: 09/23/08 15:46					
Diesel Range Hydrocarbons	NWTPH-Dx	0.117	0.0381	0.238	mg/l	1x	8125025	09/25/08 08:52	09/27/08 06:36	J
Lube Oil Range Hydrocarbons	"	ND	0.0857	0.476	"	"	"	"	"	
Surrogate(s): 2-FBP			77.9%		53 - 125 %	"			"	
Octacosane			92.9%		68 - 125 %	"			"	
BRI0381-21 (1B-W-2-0908)		Water			Sampled: 09/23/08 16:52					
Diesel Range Hydrocarbons	NWTPH-Dx	0.507	0.0388	0.243	mg/l	1x	8126034	09/27/08 16:18	09/29/08 15:21	Q3
Lube Oil Range Hydrocarbons	"	0.170	0.0874	0.485	"	"	"	"	"	J
Surrogate(s): 2-FBP			94.1%		53 - 125 %	"			"	
Octacosane			108%		68 - 125 %	"			"	
BRI0381-22 (MW-35-0908)		Water			Sampled: 09/23/08 17:56					
Diesel Range Hydrocarbons	NWTPH-Dx	0.305	0.0381	0.238	mg/l	1x	8126034	09/27/08 16:18	09/29/08 15:44	Q3
Lube Oil Range Hydrocarbons	"	0.187	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			79.7%		53 - 125 %	"			"	
Octacosane			92.8%		68 - 125 %	"			"	
BRI0381-23 (MW-16-0908)		Water			Sampled: 09/23/08 18:55					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8126034	09/27/08 16:18	09/29/08 16:08	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	
Surrogate(s): 2-FBP			85.7%		53 - 125 %	"			"	
Octacosane			99.0%		68 - 125 %	"			"	

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/17/08 13:58
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8125025 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8125025-BLK1)										Extracted: 09/25/08 08:52				
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	09/26/08 20:37	
Lube Oil Range Hydrocarbons	"	ND	0.0900	0.500	"	"	--	--	--	--	--	--	"	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery: 77.5%</i>		<i>Limits: 53-125%</i>		<i>"</i>						<i>09/26/08 20:37</i>		
<i>Octacosane</i>		<i>94.5%</i>		<i>68-125%</i>		<i>"</i>						<i>"</i>		
LCS (8125025-BS1)										Extracted: 09/25/08 08:52				
Diesel Range Hydrocarbons	NWTPH-Dx	1.72	0.0400	0.250	mg/l	1x	--	2.00	85.9%	(61-132)	--	--	09/26/08 20:59	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery: 89.2%</i>		<i>Limits: 53-125%</i>		<i>"</i>						<i>09/26/08 20:59</i>		
<i>Octacosane</i>		<i>95.9%</i>		<i>68-125%</i>		<i>"</i>						<i>"</i>		
Matrix Spike (8125025-MS1)										QC Source: BRI0381-12 Extracted: 09/25/08 08:52				
Diesel Range Hydrocarbons	NWTPH-Dx	1.73	0.0377	0.236	mg/l	1x	0.102	1.89	86.5%	(32-143)	--	--	09/26/08 21:20	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery: 84.9%</i>		<i>Limits: 53-125%</i>		<i>"</i>						<i>09/26/08 21:20</i>		
<i>Octacosane</i>		<i>95.6%</i>		<i>68-125%</i>		<i>"</i>						<i>"</i>		
Matrix Spike Dup (8125025-MSD1)										QC Source: BRI0381-12 Extracted: 09/25/08 08:52				
Diesel Range Hydrocarbons	NWTPH-Dx	1.67	0.0377	0.236	mg/l	1x	0.102	1.89	83.0%	(32-143)	3.93%	(40)	09/26/08 21:41	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery: 89.6%</i>		<i>Limits: 53-125%</i>		<i>"</i>						<i>09/26/08 21:41</i>		
<i>Octacosane</i>		<i>98.4%</i>		<i>68-125%</i>		<i>"</i>						<i>"</i>		

QC Batch: 8126034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8126034-BLK1)										Extracted: 09/27/08 16:18				
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	09/29/08 13:48	
Lube Oil Range Hydrocarbons	"	ND	0.0900	0.500	"	"	--	--	--	--	--	--	"	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery: 88.8%</i>		<i>Limits: 53-125%</i>		<i>"</i>						<i>09/29/08 13:48</i>		
<i>Octacosane</i>		<i>102%</i>		<i>68-125%</i>		<i>"</i>						<i>"</i>		
LCS (8126034-BS1)										Extracted: 09/27/08 16:18				
Diesel Range Hydrocarbons	NWTPH-Dx	1.76	0.0400	0.250	mg/l	1x	--	2.00	88.2%	(61-132)	--	--	09/29/08 14:11	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery: 103%</i>		<i>Limits: 53-125%</i>		<i>"</i>						<i>09/29/08 14:11</i>		
<i>Octacosane</i>		<i>105%</i>		<i>68-125%</i>		<i>"</i>						<i>"</i>		

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle	Project Name: BNSF-Skykomish	
1011 SW Klickitat Way, Suite 207	Project Number: 01140-204-0340	Report Created:
Seattle, WA 98134	Project Manager: Halah Voges	11/17/08 13:58

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8126034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS Dup (8126034-BSD1)										Extracted: 09/27/08 16:18				
Diesel Range Hydrocarbons	NWTPH-Dx	1.74	0.0400	0.250	mg/l	1x	--	2.00	86.8%	(61-132)	1.53%	(40)	09/29/08 14:35	
<i>Surrogate(s): 2-FBP</i>		<i>Recovery: 101%</i>		<i>Limits: 53-125%</i>		<i>"</i>						<i>09/29/08 14:35</i>		
<i>Octacosane</i>		<i>95.9%</i>		<i>68-125%</i>		<i>"</i>						<i>"</i>		

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

11/17/08 13:58

CERTIFICATION SUMMARY

TestAmerica Seattle

Method	Matrix	Nelac	Washington
NWTPH-Dx	Water		X

Any abnormalities or departures from sample acceptance policy shall be documented on the 'Sample Receipt and Temperature Log Form' and 'Sample Non-conformance Form' (if applicable) included with this report.

For information concerning certifications of this facility or another TestAmerica facility, please visit our website at www.TestAmericaInc.com

Samples collected by TestAmerica Field Services personnel are noted on the Chain of Custody (COC) .

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

11/17/08 13:58

Notes and Definitions

Report Specific Notes:

- J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
- Q3 - The chromatographic pattern is not consistent with diesel fuel.
- Q4 - The hydrocarbons present are a complex mixture of diesel range and heavy oil range organics.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Seattle



Kate Haney, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.





CHAIN OF CUSTODY

LABORATORY INFORMATION

LAB WORK ORDER: BR10381

Laboratory: Test America Project Manager:
 Address: 11720 North Creek Pkwy, Ste 400 Phone: (425) 420-9200
 City/State/ZIP: Rothell, WA 98021 Fax:

SHIPMENT INFORMATION
 Shipment Method: Hand delivered
 Tracking Number:

BNSF PROJECT INFORMATION

Project State of Origin: WA
 Project City: Skykomish

CONSULTANT INFORMATION

Company: ENSR
 Address: 1011 SW Klickitat Way, Ste 207

Project Number: 01140-204-0340
 Project Manager: Halah Voges

BNSF Project Name: Skykomish

BNSF Contact: Bruce Sheppard

BNSF Work Order No.: TT0100-H08

City/State/ZIP: (206) 674-9349 (206) 674-7839

Phone: (206) 674-9349 Fax: (206) 674-7839

TURNAROUND TIME

- 1-day Rush
- 2-day Rush
- 3-day Rush
- 5- to 8-day Rush
- Standard 10-Day
- Other _____

DELIVERABLES

- BNSF Standard (Level II)
- Level III
- Level IV
- Other Deliverables?
- EDD Req. Format? RETEC - EQUIS

METHODS FOR ANALYSIS

NMPH-DX
 (w/o SGCU)

SAMPLE INFORMATION

Sample identification	Containers	Sample Collection			Filtered Y/N	Type (Comp/Grab)	Matrix	METHODS FOR ANALYSIS	COMMENTS	LAB USE
		Date	Time	Sampler						
1 2A-W-10-0908	2	9/22/08	1655	PM/SS	N	W	X		BR10381-01	
2 2B-W-4-	2	9/23/08	0900	DNK			X		-02	
3 MW-39-	2		0945				X		-03	
4 2A-W-11-	2		1035				X		-04	
5 MW-500-	2		1050				X		-05	
6 IC-W-2-	2		1155				X		-06	
7 MW-38-	2		1235				X		-07	
8 S-W-4-	2		1315				X		-08	
9 2A-W-9-	2		1410				X		-09	
10 2A-W-90-	2		1420				X		-10	
11 MW-4-	2		1500				X		-11	
12 MW-3-	6		1550				X	Extra Sample for Lab Rec	-12	
13 1A-W-1-	2		0900	FM			X		-13	
14 1A-W-3-	2		0950				X		-14	
15 1A-W-30-	2		0950				X		-15	

Relinquished By: [Signature]
 Relinquished By: [Signature]
 Relinquished By: [Signature]
 Received by Laboratory:

Date/Time: 9/24/08 9:20
 Date/Time:
 Date/Time:
 Date/Time:

Received By: Lathy Gumble
 Received By:
 Received By:
 Lab Remarks:

Date/Time: 9/24/08 9:20
 Date/Time:
 Date/Time:
 Lab: Custody Intact? Yes No

Comments and Special Analytical Requirements:
SGCU - Silica gel cleanup
6.0 w/o
 Custody Seal No.:
 BNSF COC No.:



LABORATORY INFORMATION

Laboratory: Test America Project Manager:

Address: 1720 North Creek Hwy, Ste 400 (425) 470-9200 Phone:

City/State/ZIP: Bothell, WA 98011 Fax:

LAB WORK ORDER: BRI 0381

SHIPMENT INFORMATION

Shipment Method: Hand Delivered

Tracking Number:

CHAIN OF CUSTODY

BNSF PROJECT INFORMATION

BNSF Project Number:

BNSF Project Name: skykomish

BNSF Contact: Bruce Sheppard

Project State of Origin: WA

Project City: skykomish

BNSF Work Order No.: 110100-H08

CONSULTANT INFORMATION

Company: ENSR

Address: 1011 SW Klickitat Way, Ste 207

City/State/ZIP: Seattle, WA 98134

Project Number: 01140-204-0340

Project Manager: Halah Voges

Email:

Phone: (206) 624-9340 Fax: (206) 624-2839

TURNAROUND TIME

1-day Rush

2-day Rush

3-day Rush

5- to 8-day Rush

Standard 10-Day

Other _____

DELIVERABLES

Other Deliverables?

BNSF Standard (Level II)

Level III

Level IV

EDD Req. Format?

RETEX - EQUIS

METHODS FOR ANALYSIS

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

SAMPLE INFORMATION

	Sample identification	Containers	Sample Collection			Filtered Y/N	Type (Comp/Grab)	Matrix	METHODS FOR ANALYSIS	COMMENTS	LAB USE
			Date	Time	Sampler						
1	1A-W-4 -0908	2	9/23/08	1052	Fm	N	W	NUTPH-DX (w/ SGCH)		-16	
2	1A-W-5 -	2		1120						-17	
3	1C-W-1 -	2		1315						-18	
4	1C-W-4 -	2		1430						-19	
5	1B-W-3 -	2		1546						+20	
6	1B-W-2 -	2		1652						-21	
7	MW-35 -	2		1756						-22	
8	MW-16 -	2		1855	BS					-23	
9											
10											
11											
12											
13											
14											
15											

Relinquished By: [Signature] Date/Time: 9/24/08 9:20 Received By: Lathy Crumble Date/Time: 9/24/08 9:20

Relinquished By: _____ Date/Time: _____ Received By: _____ Date/Time: _____

Relinquished By: _____ Date/Time: _____ Received By: _____ Date/Time: _____

Received by Laboratory: _____ Date/Time: _____ Lab Remarks: _____ Lab: Custody Intact? Yes No

Comments and Special Analytical Requirements: SGCH - Silica gel cleanup

Custody Seal No.: _____ BNSF COC No.: _____

TAT: _____

Paperwork to PM - Date: _____ Time: _____

Non-Conformances?

Page Time & Initials: _____

Circle or N

(If Y, see other side)

TEST AMERICA SAMPLE RECEIPT CHECKLIST

Received By: _____
(applies to temp at receipt)

Logged-in By: _____

Unpacked/Labeled By: _____

Cooler ID: 373, 307, 374, 303,
320, 361, 317 309

Date: 9/24

Date: 9/24

Date: 9/24/06

Work Order No. 303 318

Time: 9:20

Time: 1720

Time: 1800

Client: _____

Initials: CL

Initials: PT

Initials: FL

Project: _____

Container Type:

COC Seals:

Packing Material:

Cooler _____ Sign By _____
 Box _____ On Bottles _____ Date _____
 None/Other _____ None

Bubble Bags _____ Styrofoam _____
 Foam Packs _____
 None/Other _____

Refrigerant:

Received Via: Bill# _____

Gel Ice Pack _____
 Loose Ice _____
 None/Other _____

Fed Ex _____ Client _____
 UPS _____ TA Courier _____
 DHL _____ Mid Valley _____
 Senvoy _____ TDP _____
 GS _____ Other _____

Cooler Temperature (iR): _____ °C Plastic Glass (Frozen filters, Tedlars and aqueous Metals exempt)

Temperature Blank? _____ °C or NA 6.0, 5.7, 5.9, 4.9, 5.0, 5.9 5.0, 5.9, 4.4 Trip Blank? Y or N or NA

BP, OPLC, ARCO-Temperature monitoring every 15 minutes:

(initial/date/time): _____

Comments: _____

Sample Containers:

ID

ID

Intact? or N _____ Metals Preserved? Y or N or NA _____
Provided by TA? or N _____ Client QAPP Preserved? Y or N or NA _____
Correct Type? or N _____ Adequate Volume? or N _____
#Containers match COC? or N _____ (for tests requested)
IDs/time/date match COC? Y or N _____ Water VOAs: Headspace? Y or N or NA _____
Hold Times in hold? or N _____ Comments: _____

PROJECT MANAGEMENT

Is the Chain of Custody complete? _____ Y or N If N, circle the items that were incomplete

Comments, Problems _____

Total access set up? _____

Has client been contacted regarding non-conformances? _____

Y or N

Y or N

If Y, _____

Date

Time

PM Initials: _____ Date: _____ Time: _____

BRI0382**ENSR International - Seattle****Report Date:**

Project: BNSF-Skykomish Remedial Design Investig Project#: 01140-204-0340

11/18/08 12:42

CLIENT SAMPLES**Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)**

Instrume	Method	Analyzed	FileID	LabNumber	Dil	Batch	Sequence	Calibration	Matrix	Initial	Final
GC-1F	NWTPH-Dx	09/30/08 20:48	I3008012.D	BRI0382-01RE1	1	8I29034	8I30006	8091202	Water	1060	1
GC-1F	NWTPH-Dx	09/30/08 21:10	I3008013.D	BRI0382-02RE1	1	8I29034	8I30006	8091202	Water	1060	1
GC-1F	NWTPH-Dx	09/30/08 21:32	I3008014.D	BRI0382-03RE1	1	8I29034	8I30006	8091202	Water	1060	1
GC-1F	NWTPH-Dx	09/30/08 21:54	I3008015.D	BRI0382-04RE1	1	8I29034	8I30006	8091202	Water	1060	1
GC-1F	NWTPH-Dx	09/30/08 22:17	I3008016.D	BRI0382-05RE1	1	8I29034	8I30006	8091202	Water	1060	1
GC-1F	NWTPH-Dx	09/30/08 22:39	I3008017.D	BRI0382-06RE1	1	8I29034	8I30006	8091202	Water	1060	1
GC-1F	NWTPH-Dx	10/01/08 00:09	I3008021.D	BRI0382-07RE1	1	8I29034	8I30006	8091202	Water	1050	1
GC-1F	NWTPH-Dx	10/01/08 00:31	I3008022.D	BRI0382-08RE1	1	8I29034	8I30006	8091202	Water	1060	1
GC-3	NWTPH-Dx	10/01/08 08:48	J0108008.D	BRI0382-01RE2	1	8I29034			Water	1060	1
GC-3	NWTPH-Dx	10/01/08 09:12	J0108009.D	BRI0382-02RE2	1	8I29034			Water	1060	1
GC-3	NWTPH-Dx	10/01/08 09:36	J0108010.D	BRI0382-03RE2	1	8I29034			Water	1060	1
GC-3	NWTPH-Dx	10/01/08 10:00	J0108011.D	BRI0382-04RE2	1	8I29034			Water	1060	1
GC-7	NWTPH-Dx	10/01/08 10:38	J0108006.D	BRI0382-05RE2	1	8I29034			Water	1060	1
GC-7	NWTPH-Dx	10/01/08 11:06	J0108007.D	BRI0382-06RE2	1	8I29034			Water	1060	1

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up

Instrume	Method	Analyzed	FileID	LabNumber	Dil	Batch	Sequence	Calibration	Matrix	Initial	Final
GC-1R	NWTPH-Dx	09/30/08 20:48	I3008012.D	BRI0382-01RE1	1	8I29034	8I30007	8091201	Water	1060	1
GC-1R	NWTPH-Dx	09/30/08 21:10	I3008013.D	BRI0382-02RE1	1	8I29034	8I30007	8091201	Water	1060	1
GC-1R	NWTPH-Dx	09/30/08 21:32	I3008014.D	BRI0382-03RE1	1	8I29034	8I30007	8091201	Water	1060	1
GC-1R	NWTPH-Dx	09/30/08 21:54	I3008015.D	BRI0382-04RE1	1	8I29034	8I30007	8091201	Water	1060	1
GC-1R	NWTPH-Dx	09/30/08 22:17	I3008016.D	BRI0382-05RE1	1	8I29034	8I30007	8091201	Water	1060	1
GC-1R	NWTPH-Dx	09/30/08 22:39	I3008017.D	BRI0382-06RE1	1	8I29034	8I30007	8091201	Water	1060	1
GC-1R	NWTPH-Dx	10/01/08 00:09	I3008021.D	BRI0382-07RE1	1	8I29034	8I30007	8091201	Water	1050	1
GC-1R	NWTPH-Dx	10/01/08 00:31	I3008022.D	BRI0382-08RE1	1	8I29034	8I30007	8091201	Water	1060	1

BRI0382**ENSR International - Seattle**

Project: BNSF-Skykomish Remedial Design Investig Project#: 01140-204-0340

Report Date:
11/18/08 12:42**QC SAMPLES****Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - QC**

Instrument	Method	Analyzed	FileID	LabNumber	Sequence	Calibration	Matrix	Source
GC-1F	NWTPH-Dx	09/30/08 19:18	I3008008.D	8I29034-BLK1	8I30006	8091202	Water	
GC-1F	NWTPH-Dx	09/30/08 19:41	I3008009.D	8I29034-BS1	8I30006	8091202	Water	
GC-1F	NWTPH-Dx	09/30/08 20:03	I3008010.D	8I29034-MS1	8I30006	8091202	Water	BRI0382-05RE1
GC-1F	NWTPH-Dx	09/30/08 20:25	I3008011.D	8I29034-MSD1	8I30006	8091202	Water	BRI0382-05RE1
GC-3R	NWTPH-Dx	10/01/08 07:13	J0108004.D	8I29034-BLK3	8J01002	8092201	Water	
GC-3R	NWTPH-Dx	10/01/08 07:36	J0108005.D	8I29034-BS3	8J01002	8092201	Water	
GC-3R	NWTPH-Dx	10/01/08 08:00	J0108006.D	8I29034-MS3	8J01002	8092201	Water	BRI0382-05RE1
GC-3R	NWTPH-Dx	10/01/08 08:24	J0108007.D	8I29034-MSD3	8J01002	8092201	Water	BRI0382-05RE1
GC-7R	NWTPH-Dx	10/01/08 08:45	J0108002.D	8I29034-BLK4	8J01011	UNASSIGNED	Water	
GC-7R	NWTPH-Dx	10/01/08 14:19	J0108011.D	8I29034-BLK4	8J01011	UNASSIGNED	Water	
GC-7R	NWTPH-Dx	10/01/08 14:47	J0108012.D	8I29034-BS4	8J01011	UNASSIGNED	Water	
GC-7R	NWTPH-Dx	10/01/08 15:16	J0108013.D	8I29034-MS4	8J01011	UNASSIGNED	Water	BRI0382-05RE1
GC-7R	NWTPH-Dx	10/01/08 10:10	J0108005.D	8I29034-MSD4	8J01011	UNASSIGNED	Water	BRI0382-05RE1

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - QC

Instrument	Method	Analyzed	FileID	LabNumber	Sequence	Calibration	Matrix	Source
GC-1R	NWTPH-Dx	09/30/08 19:18	I3008008.D	8I29034-BLK2	8I30007	8091201	Water	
GC-1R	NWTPH-Dx	09/30/08 19:41	I3008009.D	8I29034-BS2	8I30007	8091201	Water	
GC-1R	NWTPH-Dx	09/30/08 20:03	I3008010.D	8I29034-MS2	8I30007	8091201	Water	BRI0382-05RE1
GC-1R	NWTPH-Dx	09/30/08 20:25	I3008011.D	8I29034-MSD2	8I30007	8091201	Water	BRI0382-05RE1

November 18, 2008

Halah Voges
ENSR International - Seattle
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

RE: BNSF-Skykomish Remedial Design Investigation

Enclosed are the results of analyses for samples received by the laboratory on 09/24/08 09:20.
The following list is a summary of the Work Orders contained in this report, generated on 11/18/08
12:42.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
BRI0382	BNSF-Skykomish Remedial D	01140-204-0340

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish Remedial Design Investigation**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

11/18/08 12:42

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
5-W-20-0908	BRI0382-01	Water	09/23/08 09:25	09/24/08 09:20
5-W-14-0908	BRI0382-02	Water	09/23/08 10:25	09/24/08 09:20
5-W-17-0908	BRI0382-03	Water	09/23/08 11:40	09/24/08 09:20
5-W-18-0908	BRI0382-04	Water	09/23/08 12:50	09/24/08 09:20
5-W-19-0908	BRI0382-05	Water	09/23/08 14:35	09/24/08 09:20
5-W-15-0908	BRI0382-06	Water	09/23/08 16:40	09/24/08 09:20
5-W-150-0908	BRI0382-07	Water	09/23/08 16:45	09/24/08 09:20
5-W-16-0908	BRI0382-08	Water	09/23/08 18:00	09/24/08 09:20

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish Remedial Design Investigation**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

11/18/08 12:42

Analytical Case Narrative

TestAmerica - Seattle, WA

BRI0382

REVISED REPORT

Laboratory samples BRI0382-01 through 08 with RE2 designation were batched in the incorrect batch. The samples were inadvertently added to the original batch that was not reported due to failing QC. The samples should have been added to the re-extract batch. The batch has been corrected and is included in the enclosed report.

SAMPLE RECEIPT

The samples were received September 24th, 2008 by TestAmerica - Seattle. The temperature of the samples at the time of receipt was 6.0 degrees Celsius.

PREPARATIONS AND ANALYSIS

No additional anomalies, discrepancies, or issues were associated with sample preparation, analysis and quality control other than those already qualified in the data and described in the Notes and Definitions page at the end of the report.

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/18/08 12:42
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0382-01RE1 (5-W-20-0908)		Water			Sampled: 09/23/08 09:25					
Lube Oil Range Hydrocarbons	NWTPH-Dx	0.139	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 20:48	J
Surrogate(s): 2-FBP			62.5%		53 - 125 %	"				"
Octacosane			84.3%		68 - 125 %	"				"
BRI0382-01RE2 (5-W-20-0908)		Water			Sampled: 09/23/08 09:25					
Diesel Range Hydrocarbons	NWTPH-Dx	0.305	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	10/01/08 08:48	Q3
Surrogate(s): 2-FBP			72.6%		53 - 125 %	"				"
Octacosane			98.0%		68 - 125 %	"				"
BRI0382-02RE1 (5-W-14-0908)		Water			Sampled: 09/23/08 10:25					
Lube Oil Range Hydrocarbons	NWTPH-Dx	ND	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:10	
Surrogate(s): 2-FBP			66.8%		53 - 125 %	"				"
Octacosane			84.9%		68 - 125 %	"				"
BRI0382-02RE2 (5-W-14-0908)		Water			Sampled: 09/23/08 10:25					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	10/01/08 09:12	
Surrogate(s): 2-FBP			79.4%		53 - 125 %	"				"
Octacosane			98.7%		68 - 125 %	"				"
BRI0382-03RE1 (5-W-17-0908)		Water			Sampled: 09/23/08 11:40					
Lube Oil Range Hydrocarbons	NWTPH-Dx	ND	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:32	
Surrogate(s): 2-FBP			66.2%		53 - 125 %	"				"
Octacosane			83.6%		68 - 125 %	"				"
BRI0382-03RE2 (5-W-17-0908)		Water			Sampled: 09/23/08 11:40					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	10/01/08 09:36	
Surrogate(s): 2-FBP			80.3%		53 - 125 %	"				"
Octacosane			99.3%		68 - 125 %	"				"
BRI0382-04RE1 (5-W-18-0908)		Water			Sampled: 09/23/08 12:50					
Lube Oil Range Hydrocarbons	NWTPH-Dx	0.197	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:54	J
Surrogate(s): 2-FBP			66.8%		53 - 125 %	"				"
Octacosane			81.9%		68 - 125 %	"				"

TestAmerica Seattle

Kate Haney

Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/18/08 12:42
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0382-04RE2 (5-W-18-0908)		Water			Sampled: 09/23/08 12:50					
Diesel Range Hydrocarbons	NWTPH-Dx	0.342	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	10/01/08 10:00	Q3
Surrogate(s): 2-FBP			81.3%		53 - 125 %	"				"
Octacosane			100%		68 - 125 %	"				"
BRI0382-05RE1 (5-W-19-0908)		Water			Sampled: 09/23/08 14:35					
Lube Oil Range Hydrocarbons	NWTPH-Dx	ND	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 22:17	
Surrogate(s): 2-FBP			63.5%		53 - 125 %	"				"
Octacosane			79.1%		68 - 125 %	"				"
BRI0382-05RE2 (5-W-19-0908)		Water			Sampled: 09/23/08 14:35					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	10/01/08 10:38	
Surrogate(s): 2-FBP			70.4%		53 - 125 %	"				"
Octacosane			92.8%		68 - 125 %	"				"
BRI0382-06RE1 (5-W-15-0908)		Water			Sampled: 09/23/08 16:40					
Lube Oil Range Hydrocarbons	NWTPH-Dx	0.104	0.0849	0.472	mg/l	1x	8129034	09/29/08 11:59	09/30/08 22:39	J
Surrogate(s): 2-FBP			68.3%		53 - 125 %	"				"
Octacosane			83.7%		68 - 125 %	"				"
BRI0382-06RE2 (5-W-15-0908)		Water			Sampled: 09/23/08 16:40					
Diesel Range Hydrocarbons	NWTPH-Dx	0.272	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	10/01/08 11:06	Q12
Surrogate(s): 2-FBP			76.9%		53 - 125 %	"				"
Octacosane			101%		68 - 125 %	"				"
BRI0382-07RE1 (5-W-150-0908)		Water			Sampled: 09/23/08 16:45					
Diesel Range Hydrocarbons	NWTPH-Dx	0.193	0.0381	0.238	mg/l	1x	8129034	09/29/08 11:59	10/01/08 00:09	J
Lube Oil Range Hydrocarbons	"	0.127	0.0857	0.476	"	"	"	"	"	J
Surrogate(s): 2-FBP			67.2%		53 - 125 %	"				"
Octacosane			80.5%		68 - 125 %	"				"

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/18/08 12:42
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0382-08RE1 (5-W-16-0908)		Water			Sampled: 09/23/08 18:00					
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	10/01/08 00:31	
Lube Oil Range Hydrocarbons	"	ND	0.0849	0.472	"	"	"	"	"	"
<i>Surrogate(s): 2-FBP</i>			60.9%		53 - 125 %	"				"
<i>Octacosane</i>			79.6%		68 - 125 %	"				"

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/18/08 12:42
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0382-01RE1 (5-W-20-0908)		Water			Sampled: 09/23/08 09:25					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 20:48	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			74.0%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			99.3%		68 - 125 %	"			"	
BRI0382-02RE1 (5-W-14-0908)		Water			Sampled: 09/23/08 10:25					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:10	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			73.6%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			91.7%		68 - 125 %	"			"	
BRI0382-03RE1 (5-W-17-0908)		Water			Sampled: 09/23/08 11:40					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:32	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			74.9%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			93.6%		68 - 125 %	"			"	
BRI0382-04RE1 (5-W-18-0908)		Water			Sampled: 09/23/08 12:50					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 21:54	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			73.1%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			90.6%		68 - 125 %	"			"	
BRI0382-05RE1 (5-W-19-0908)		Water			Sampled: 09/23/08 14:35					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 22:17	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			75.9%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			93.6%		68 - 125 %	"			"	
BRI0382-06RE1 (5-W-15-0908)		Water			Sampled: 09/23/08 16:40					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	09/30/08 22:39	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			75.4%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			91.9%		68 - 125 %	"			"	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/18/08 12:42
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Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
BRI0382-07RE1 (5-W-150-0908)		Water			Sampled: 09/23/08 16:45					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0381	0.238	mg/l	1x	8129034	09/29/08 11:59	10/01/08 00:09	
Lube Oil Range (SGCU)	"	ND	0.152	0.476	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			75.0%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			91.9%		68 - 125 %	"			"	
BRI0382-08RE1 (5-W-16-0908)		Water			Sampled: 09/23/08 18:00					
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0377	0.236	mg/l	1x	8129034	09/29/08 11:59	10/01/08 00:31	
Lube Oil Range (SGCU)	"	ND	0.151	0.472	"	"	"	"	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>			69.6%		53 - 125 %	"			"	
<i>Octacosane (SGCU)</i>			90.9%		68 - 125 %	"			"	

TestAmerica Seattle



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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/18/08 12:42
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8129034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes		
Blank (8129034-BLK1)													Extracted: 09/29/08 11:59			
Lube Oil Range Hydrocarbons	NWTPH-Dx	0.119	0.0900	0.500	mg/l	1x	--	--	--	--	--	--	09/30/08 19:18	J		
Surrogate(s): 2-FBP		Recovery:	68.3%	Limits: 53-125%		"						09/30/08 19:18				
Octacosane		Recovery:	83.3%	Limits: 68-125%		"						"				
Blank (8129034-BLK3)													Extracted: 09/29/08 11:59			
Diesel Range Hydrocarbons	NWTPH-Dx	0.0830	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	10/01/08 07:13	J		
Surrogate(s): 2-FBP		Recovery:	82.1%	Limits: 53-125%		"						10/01/08 07:13				
Octacosane		Recovery:	97.7%	Limits: 68-125%		"						"				
Blank (8129034-BLK4)													Extracted: 09/29/08 11:59			
Diesel Range Hydrocarbons	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	10/01/08 08:45			
Surrogate(s): 2-FBP		Recovery:	87.0%	Limits: 53-125%		"						10/01/08 14:19				
Octacosane		Recovery:	113%	Limits: 68-125%		"						"				
LCS (8129034-BS1)													Extracted: 09/29/08 11:59			
Diesel Range Hydrocarbons	NWTPH-Dx	1.49	0.0400	0.250	mg/l	1x	--	2.00	74.4%	(61-132)	--	--	09/30/08 19:41			
Surrogate(s): 2-FBP		Recovery:	71.8%	Limits: 53-125%		"						09/30/08 19:41				
Octacosane		Recovery:	85.7%	Limits: 68-125%		"						"				
LCS (8129034-BS3)													Extracted: 09/29/08 11:59			
Diesel Range Hydrocarbons	NWTPH-Dx	1.78	0.0400	0.250	mg/l	1x	--	2.00	88.9%	(61-132)	--	--	10/01/08 07:36			
Surrogate(s): 2-FBP		Recovery:	88.1%	Limits: 53-125%		"						10/01/08 07:36				
Octacosane		Recovery:	99.6%	Limits: 68-125%		"						"				
LCS (8129034-BS4)													Extracted: 09/29/08 11:59			
Diesel Range Hydrocarbons	NWTPH-Dx	1.95	0.0400	0.250	mg/l	1x	--	2.00	97.6%	(61-132)	--	--	10/01/08 14:47			
Surrogate(s): 2-FBP		Recovery:	85.8%	Limits: 53-125%		"						10/01/08 14:47				
Octacosane		Recovery:	107%	Limits: 68-125%		"						"				
Matrix Spike (8129034-MS1)													QC Source: BRI0382-05RE1		Extracted: 09/29/08 11:59	
Diesel Range Hydrocarbons	NWTPH-Dx	1.38	0.0377	0.236	mg/l	1x	ND	1.89	73.3%	(32-143)	--	--	09/30/08 20:03			
Surrogate(s): 2-FBP		Recovery:	68.6%	Limits: 53-125%		"						09/30/08 20:03				
Octacosane		Recovery:	84.7%	Limits: 68-125%		"						"				
Matrix Spike (8129034-MS3)													QC Source: BRI0382-05RE1		Extracted: 09/29/08 11:59	
Diesel Range Hydrocarbons	NWTPH-Dx	1.62	0.0377	0.236	mg/l	1x	ND	1.89	85.8%	(32-143)	--	--	10/01/08 08:00			
Surrogate(s): 2-FBP		Recovery:	80.3%	Limits: 53-125%		"						10/01/08 08:00				
Octacosane		Recovery:	96.2%	Limits: 68-125%		"						"				

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/18/08 12:42
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Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8129034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (8129034-MS4)			QC Source: BRI0382-05RE1				Extracted: 09/29/08 11:59							
Diesel Range Hydrocarbons	NWTPH-Dx	1.91	0.0377	0.236	mg/l	1x	ND	1.89	101%	(32-143)	--	--	10/01/08 15:16	
Surrogate(s): 2-FBP		Recovery: 86.5%		Limits: 53-125%		"						10/01/08 15:16		
Octacosane		110%		68-125%		"						"		
Matrix Spike Dup (8129034-MSD1)			QC Source: BRI0382-05RE1				Extracted: 09/29/08 11:59							
Diesel Range Hydrocarbons	NWTPH-Dx	1.42	0.0377	0.236	mg/l	1x	ND	1.89	75.1%	(32-143)	2.42% (40)		09/30/08 20:25	
Surrogate(s): 2-FBP		Recovery: 68.7%		Limits: 53-125%		"						09/30/08 20:25		
Octacosane		84.4%		68-125%		"						"		
Matrix Spike Dup (8129034-MSD3)			QC Source: BRI0382-05RE1				Extracted: 09/29/08 11:59							
Diesel Range Hydrocarbons	NWTPH-Dx	1.72	0.0377	0.236	mg/l	1x	ND	1.89	91.4%	(32-143)	6.33% (40)		10/01/08 08:24	
Surrogate(s): 2-FBP		Recovery: 85.8%		Limits: 53-125%		"						10/01/08 08:24		
Octacosane		102%		68-125%		"						"		
Matrix Spike Dup (8129034-MSD4)			QC Source: BRI0382-05RE1				Extracted: 09/29/08 11:59							
Diesel Range Hydrocarbons	NWTPH-Dx	1.61	0.0377	0.236	mg/l	1x	ND	1.89	85.3%	(32-143)	17.1% (40)		10/01/08 10:10	
Surrogate(s): 2-FBP		Recovery: 73.1%		Limits: 53-125%		"						10/01/08 10:10		
Octacosane		91.9%		68-125%		"						"		

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle 1011 SW Klickitat Way, Suite 207 Seattle, WA 98134	Project Name: BNSF-Skykomish Remedial Design Investigation Project Number: 01140-204-0340 Project Manager: Halah Voges	Report Created: 11/18/08 12:42
--	---	-----------------------------------

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Laboratory Quality Control Results
 TestAmerica Seattle

QC Batch: 8129034 Water Preparation Method: EPA 3520C

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (8129034-BLK2)								Extracted: 09/29/08 11:59						
Diesel Range (SGCU)	NWTPH-Dx	ND	0.0400	0.250	mg/l	1x	--	--	--	--	--	--	09/30/08 19:18	
Lube Oil Range (SGCU)	"	ND	0.160	0.500	"	"	--	--	--	--	--	--	"	C
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>75.1%</i>										<i>09/30/08 19:18</i>	
<i>Octacosane (SGCU)</i>			<i>90.9%</i>										<i>"</i>	
LCS (8129034-BS2)								Extracted: 09/29/08 11:59						
Diesel Range (SGCU)	NWTPH-Dx	1.52	0.0400	0.250	mg/l	1x	--	2.00	75.8%	(61-132)	--	--	09/30/08 19:41	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>79.4%</i>										<i>09/30/08 19:41</i>	
<i>Octacosane (SGCU)</i>			<i>88.0%</i>										<i>"</i>	
Matrix Spike (8129034-MS2)								QC Source: BRI0382-05RE1 Extracted: 09/29/08 11:59						
Diesel Range (SGCU)	NWTPH-Dx	1.56	0.0377	0.236	mg/l	1x	ND	1.89	82.5%	(32-143)	--	--	09/30/08 20:03	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>82.5%</i>										<i>09/30/08 20:03</i>	
<i>Octacosane (SGCU)</i>			<i>95.1%</i>										<i>"</i>	
Matrix Spike Dup (8129034-MSD2)								QC Source: BRI0382-05RE1 Extracted: 09/29/08 11:59						
Diesel Range (SGCU)	NWTPH-Dx	1.58	0.0377	0.236	mg/l	1x	ND	1.89	83.8%	(32-143)	1.52%	(40)	09/30/08 20:25	
<i>Surrogate(s): 2-FBP (SGCU)</i>		<i>Recovery:</i>	<i>83.7%</i>										<i>09/30/08 20:25</i>	
<i>Octacosane (SGCU)</i>			<i>96.3%</i>										<i>"</i>	

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle

1011 SW Klickitat Way, Suite 207
Seattle, WA 98134

Project Name: **BNSF-Skykomish Remedial Design Investigation**

Project Number: 01140-204-0340

Project Manager: Halah Voges

Report Created:

11/18/08 12:42

CERTIFICATION SUMMARY

TestAmerica Seattle

Method	Matrix	Nelac	Washington
NWTPH-Dx	Water		X

Any abnormalities or departures from sample acceptance policy shall be documented on the 'Sample Receipt and Temperature Log Form' and 'Sample Non-conformance Form' (if applicable) included with this report.

For information concerning certifications of this facility or another TestAmerica facility, please visit our website at www.TestAmericaInc.com

Samples collected by TestAmerica Field Services personnel are noted on the Chain of Custody (COC) .

TestAmerica Seattle



Kate Haney, Project Manager

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ENSR International - Seattle	Project Name: BNSF-Skykomish Remedial Design Investigation	
1011 SW Klickitat Way, Suite 207	Project Number: 01140-204-0340	Report Created:
Seattle, WA 98134	Project Manager: Halah Voges	11/18/08 12:42

Notes and Definitions

Report Specific Notes:

- C - Calibration Verification recovery was above the method control limit for this analyte. Analyte not detected, data not impacted.
- J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
- Q12 - Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
- Q3 - The chromatographic pattern is not consistent with diesel fuel.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Seattle



Kate Haney, Project Manager

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TAT: _____

Paperwork to PM - Date: _____ Time: _____

Non-Conformances? Circle Y or N

Page Time & Initials: _____

(If Y, see other side)

TEST AMERICA SAMPLE RECEIPT CHECKLIST

Received By: _____
(applies to temp at receipt)

Logged-in By: _____

Unpacked/Labeled By: _____

Cooler ID: BR10382

Date: 9/24

Date: 9/24

Date: 9/24/08

Work Order No. _____

Time: 0920

Time: 1720

Time: 1800

Client: _____

Initials: PTJ

Initials: PTJ

Initials: FL

Project: _____

Container Type:

COC Seals:

Packing Material:

Cooler
 Box
 None/Other _____

Ship Container
 On Bottles
 None
Sign By _____
Date _____

Bubble Bags
 Styrofoam
 Foam Packs
 None/Other _____

Refrigerant:

Gel Ice Pack _____
 Loose Ice _____
 None/Other _____

Received Via: Bill# _____

Fed Ex
 Client
 UPS
 DHL
 Senvoy
 GS
 TA Courier
 Mid Valley
 TDP
 Other _____

Cooler Temperature (IR): _____ °C Plastic Glass (Frozen filters, Tedlars and aqueous Metals exempt)
(circle one)

Temperature Blank? _____ °C or NA 6.0, 5.7, 5.9, 4.9, 5.0, 5.0, 5.9, 4.4 Trip Blank? Y or N or NA

BP, OPLC, ARCO-Temperature monitoring every 15 minutes:
(initial/date/time): _____

Comments: _____

Sample Containers:

	ID	ID
Intact?	<input checked="" type="checkbox"/> or N _____	Metals Preserved? Y or N or <input checked="" type="checkbox"/> NA
Provided by TA?	<input checked="" type="checkbox"/> or N _____	Client QAPP Preserved? Y or N or <input checked="" type="checkbox"/> NA
Correct Type?	<input checked="" type="checkbox"/> or N _____	Adequate Volume? <input checked="" type="checkbox"/> or N _____ <small>(for tests requested)</small>
#Containers match COC?	<input checked="" type="checkbox"/> or N _____	Water VOAs: Headspace? Y or N or <input checked="" type="checkbox"/> NA
IDs/time/date match COC?	Y or <input checked="" type="checkbox"/> NA	Comments: _____
Hold Times in hold?	<input checked="" type="checkbox"/> or N _____	_____

PROJECT MANAGEMENT

Is the Chain of Custody complete? _____ Y or N if N, circle the items that were incomplete

Comments, Problems _____

Total access set up? _____
Has client been contacted regarding non-conformances? _____

Y or N
Y or N If Y, _____ / _____
Date Time

PM Initials: _____ Date: _____ Time: _____

NOTIFICATION OF DISCREPANCY

DATE: <u>9/24/08</u>	TIME: <u>1905</u>	PM: <u>K.H.</u>	SC INITIALS: <u>FL.</u>
Rush/Short Hold? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			

- Project Not Set Up in ELM New Client COC Received ON HOLD
 Analysis Requested on COC – Not Listed for Project in ELM

- PM To Add Analysis: _____
 Clarification of Analysis: _____
 Hold Time Expired: (Analysis) _____
 Turnaround Time Not Checked: _____
 Did Not Receive Sample(s) Listed on COC: _____
 Received Extra Sample(s) Not Listed on COC: _____

- Sample Description(s) or Date/Time Sampled Do Not Match COC:
Sample container has 1035 for 5-w-14, COC has 1025, Logged-in per COC

- Improper Preservative For method: _____
 Sample Received Broken: _____
 Insufficient Sample Volume: _____
 Sample preserved upon receipt: _____

- Temperature Outside recommended range ($4^{\circ}\text{C} \pm 2^{\circ}\text{C}$): _____
 Received on-ice within 4 hours of collection, temperature between ambient to 2°C acceptable.
 Other: _____

PROJECT MANAGER RESOLUTION:	(Date & Time when returned to SC)
Approval By:	Date: Time:

Appendix C

Data Validation Reports

Prepared for:
BNSF Skykomish

May 19, 2008

Organic Data Verification Report

BNSF Skykomish
Sitewide Groundwater Monitoring
Groundwater with Water QC Samples
Test America, Inc. data
March 2008

Prepared By Sue Milcan
Environmental Scientist/Quality Assurance Manager

ENSR Corporation
May 2008
Document No.: 01140-204-0340

Overview

The samples analyzed for the BNSF Skykomish Sitewide Groundwater Monitoring sampling effort from March 2008 are listed in the Table of Samples Analyzed (page 2). Data verification was performed on a total of thirty eight groundwater samples and one equipment rinse blank water QC sample.

Samples were analyzed by TestAmerica, Inc. of Bothell, WA. The verified analysis was Diesel Range Hydrocarbons (DRH) and Lube Oil Range Hydrocarbons (LORH) by WDOE method NWTPH-Dx (with or without Acid/Silica Gel cleanup).

The ENSR Analytical Data Verification Checklist is presented as pages 3-7. Data were evaluated based on validation criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review*, document number EPA540/R-99/008 of October 1999 and the *USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review*, document number USEPA-540-R-07-003, July 2007, as they applied to the reported methodology. Washington State Department of Ecology (WDOE) methods were also reviewed as per *WDOE Analytical Methods for Petroleum Hydrocarbons*, ECY 97-602 of June 1997. Field duplicate RPD review and applicable control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, December 1996.

The following data components were reviewed during the data verification procedure:

Submitted Deliverables
Chain-of-Custody form(s) and sample integrity
Case Narrative and assigned laboratory flags
Sample results (including holding times, reporting limits, dilutions)
Method Blank results
LCS (blank spike) results
MS, MSD (matrix spike/matrix spike duplicate) results
Surrogate recoveries
Laboratory Duplicate results
Field Duplicate RPDs (calculated)
Equipment Rinse Blank results
Electronic data deliverable (EDD) file

Data Verification Qualifiers Assigned During this Review

J estimated concentration

Assigned qualifiers are detailed in the ENSR Analytical Data Verification Checklist and are summarized in the Table of Qualified Analytical Results (page 8).

Overall Data Assessment

Precision, accuracy, method compliance, and completeness of the data set have been determined to be acceptable, based on the data provided. There were no rejected or missing data points associated with this data set. The data are suitable for their intended use with the qualifications and clarifications noted.

**Table of Samples Analyzed
 BNSF Skykomish – Sitewide Groundwater Monitoring
 Groundwater with Water QC Samples
 TestAmerica (Bothell, WA) Laboratory Report BRC0418
 March 2008**

Matrix	Sample ID		Sample Date and Time	Lab SDG	Lab Sample ID
Groundwater	2A-W-11-0308		3/24/2008 15:10	BRC0418	BRC0418-01
Groundwater	1C-W-4-0308		3/24/2008 15:30	BRC0418	BRC0418-02
Groundwater	1C-W-3-0308		3/24/2008 15:45	BRC0418	BRC0418-03
Groundwater	5-W-14-0308		3/25/2008 09:10	BRC0418	BRC0418-04
Groundwater	5-W-15-0308		3/25/2008 09:55	BRC0418	BRC0418-05
Groundwater	5-W-16-0308		3/25/2008 10:50	BRC0418	BRC0418-06
Groundwater	5-W-160-0308	5-W-16-0308 Dup	3/25/2008 10:50	BRC0418	BRC0418-07
Groundwater	5-W-17-0308		3/25/2008 11:35	BRC0418	BRC0418-08
Groundwater	1B-W-1-0308		3/25/2008 13:05	BRC0418	BRC0418-09
Groundwater	1A-W-3-0308		3/25/2008 13:35	BRC0418	BRC0418-10
Groundwater	5-W-18-0308		3/25/2008 14:20	BRC0418	BRC0418-11
Groundwater	5-W-19-0308		3/25/2008 15:05	BRC0418	BRC0418-12
Groundwater	5-W-20-0308		3/25/2008 16:10	BRC0418	BRC0418-13
Water QC	MW-500-0308	Equipment Rinse Blank	3/25/2008 16:25	BRC0418	BRC0418-14
Groundwater	1A-W-1-0308		3/25/2008 09:40	BRC0418	BRC0418-15
Groundwater	1A-W-4-0308		3/25/2008 10:50	BRC0418	BRC0418-16
Groundwater	1B-W-2-0308		3/25/2008 12:20	BRC0418	BRC0418-17
Groundwater	2B-W-4-0308		3/25/2008 14:45	BRC0418	BRC0418-18
Groundwater	MW-35-0308		3/25/2008 16:05	BRC0418	BRC0418-19
Groundwater	1B-W-3-0308		3/25/2008 17:50	BRC0418	BRC0418-20
Groundwater	1C-W-2-0308		3/25/2008 08:50	BRC0418	BRC0418-21
Groundwater	MW-34-0308		3/25/2008 09:25	BRC0418	BRC0418-22
Groundwater	1C-W-1-0308		3/25/2008 10:10	BRC0418	BRC0418-23
Groundwater	5-W-4-0308		3/25/2008 11:00	BRC0418	BRC0418-24
Groundwater	5-W-40-0308	5-W-4-0308 Dup	3/25/2008 11:00	BRC0418	BRC0418-25
Groundwater	MW-38-0308		3/25/2008 13:10	BRC0418	BRC0418-26
Groundwater	1A-W-5-0308		3/25/2008 14:00	BRC0418	BRC0418-27
Groundwater	MW-16-0308		3/25/2008 14:45	BRC0418	BRC0418-28
Groundwater	2A-W-9-0308		3/25/2008 15:45	BRC0418	BRC0418-29
Groundwater	2A-W-10-0308		3/25/2008 16:20	BRC0418	BRC0418-30
Groundwater	2A-W-1-0308		3/26/2008 09:00	BRC0418	BRC0418-31
Groundwater	2A-W-100-0308	2A-W-1-0308 Dup	3/26/2008 09:00	BRC0418	BRC0418-32
Groundwater	MW-3-0308		3/26/2008 09:50	BRC0418	BRC0418-33
Groundwater	MW-4-0308		3/26/2008 10:35	BRC0418	BRC0418-34
Groundwater	MW-39-0308		3/26/2008 11:05	BRC0418	BRC0418-35
Groundwater	MW-37-0308		3/26/2008 09:30	BRC0418	BRC0418-36
Groundwater	2A-W-6-0308		3/26/2008 10:45	BRC0418	BRC0418-37
Groundwater	2A-W-60-0308	2A-W-6-0308 Dup	3/26/2008 10:45	BRC0418	BRC0418-38
Groundwater	MW-19-0308		3/26/2008 11:20	BRC0418	BRC0418-39

ENSR ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: BNSF Skykomish	Laboratory: TestAmerica, Inc., Bothell, WA					
Project Reference: Sitewide Groundwater Monitoring	Sample Matrix: Groundwater with Water QC samples					
ENSR Project: 01140-204-0340	Sample Start Date: 03/24/2008					
Verified By/Date Verified: Sue Milcan 05/19/2008 (completed)	Sample End Date: 03/26/2008					
Samples Analyzed: see Table of Samples Analyzed, BNSF Skykomish - Sitewide Groundwater Monitoring, Groundwater with Water QC Samples, March 2008 (page 2).						
Parameters Verified: Diesel Range Hydrocarbons (DRH) and Lube Oil Range Hydrocarbons (LORH) by WDOE method NWTPH-Dx (with or without Acid/Silica Gel cleanup). Not all samples were scheduled for analysis with clean-up. Refer to the COC records for the exact analyses requested for each sample.						
Laboratory Project ID (SDG): BRC0418						
PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT						
Precision:	X	Acceptable		Unacceptable	SM	Initials
Comments: Precision is the measure of variability of individual sample measurements. Field precision was determined by comparison of field duplicate sample results. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of field and laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. RPD precision measurements were compared to EPA published and/or laboratory control-charted QC limits. No data require qualification based on these measurements and overall field and laboratory precision is acceptable. Precision measurements are reviewed in items 17 and 21.						
Accuracy:	X	Acceptable		Unacceptable	SM	Initials
Comments: Field accuracy, a measure of the sampling bias, was determined by reviewing equipment rinse blank results for evidence of contamination stemming from field activities. Laboratory accuracy is a measure of the system bias, and was measured by evaluating laboratory control sample (LCS), matrix spike and matrix spike duplicate (MS, MSD), and organic system monitoring compound (surrogate) percent recoveries (%Rs). LCS %Rs demonstrated overall analytical performance. MS, MSD %Rs provided information on sample matrix interferences. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis. %Rs were compared to EPA published and/or laboratory control charted QC limits. No data require qualification based on these measurements, and overall field and laboratory accuracy is acceptable. Accuracy measurements are reviewed in items 12, 14, 15, 16, and 20.						
Method Compliance:	X	Acceptable		Unacceptable	SM	Initials
Comments: For this data set, method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. Although some data require qualification based on detection below the practical quantitation limit/reporting limit (see item 6), overall method compliance is acceptable, based on the data submitted, since a majority of the data are unqualified and no data points are rejected based on these measurements. Method compliance measurements are reviewed in items 4, 6, 8, 11, 13, 18, 19, 20, and 22.						

ENSR ANALYTICAL DATA VERIFICATION CHECKLIST

Completeness:	X	Acceptable		Unacceptable	SM	Initials
<p>Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals were set at 90-100%. Determination of completeness during this data verification procedure included a review of chain of custody records, laboratory analytical methods and detection limits, laboratory case narratives, and project requirements. Completeness also included 100% review of the laboratory sample data results and QC summary reports. The electronic data deliverable file (EDD) was QA'd 100% for positive target analytes and reporting limits. EDD corrections/additions were made by the data validator during this review procedure as outlined in item 23.</p> <p>All of the data received were useable, some with qualification. Since no data points were missing or rejected, completeness of the data set was calculated to be 100% and is compliant.</p>						
VERIFICATION CRITERIA CHECK						
<p>Data verification qualifiers assigned in this review:</p> <p>J estimated concentration</p> <p>The following comments identifying sample results requiring qualification are in bold type. The other comments are of interest, but qualification of the sample results is not necessary.</p> <p>Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 8).</p>						
1. Did the laboratory identify any non-conformances related to the analytical results?		Yes	X	No	SM	Initials
<p>Comments: There were no problems noted in the provided case narrative. Any assigned laboratory flags were reviewed during the verification procedure.</p> <p>Data qualification, if any, related to the assigned laboratory data flags are discussed in the following sections.</p>						
2. Were sample Chain-of-Custody forms complete?	X	Yes		No	SM	Initials
<p>Comments: The COC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, and laboratory date and time of sample receipt.</p>						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	X	Yes		No	SM	Initials
<p>Comments: All requested analyses as documented on the original COCs were completed.</p>						
4. Were samples received in good condition and at the appropriate temperature?	X	Yes		No	SM	Initials
<p>Comments: All samples were received intact and in good condition with acceptable cooler temperatures of 5.9°C as noted on the signed and accepted COC records, and in the case narrative comments.</p>						
5. Were the reported analytical methods in compliance with WP/QAPP, permit, or COC?	X	Yes		No	SM	Initials
<p>Comments: The reported method met the COC request or else is in compliance with the parameters requested and the sample matrix.</p>						

ENSR ANALYTICAL DATA VERIFICATION CHECKLIST

6. Were detection limits in accordance with WP/QAPP, permit, or method?	X	Yes		No	SM	Initials
<p>Comments: The reporting limits (RLs) are achievable by the quoted method. All samples were reported at undiluted levels.</p> <p>Sample results reported at concentrations \geq the method detection limit (MDL) but < the practical quantitation limit or method reporting limit (PQL/MRL), require J qualifiers to indicate estimated concentrations. The analyte cannot be accurately quantitated at this trace concentration level.</p> <p>Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 8).</p>						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	X	Yes		No	SM	Initials
Comments: Only analytes applicable to the requested method were reported.						
8. Were sample holding times met?	X	Yes		No	SM	Initials
Comments: The method-required extraction and analytical holding time was met for all submitted sample data.						
9. Were correct concentration units reported?	X	Yes		No	SM	Initials
Comments: All results were reported as mg/L (ppm).						
10. Were the reporting requirements for flagged data met?	X	Yes		No	SM	Initials
Comments: Data verification qualifiers override any assigned laboratory data flags.						
11. Were laboratory blank samples free of target analyte contamination?	X	Yes		No	SM	Initials
Comments: Supplied laboratory method blanks were free of target analyte contamination.						
12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?	X	Yes		No	SM	Initials
Comments: The submitted equipment rinse blank sample, MW-500-0308, was free of target analyte contamination. Field blank and trip blank samples were not submitted/not required for this data set.						
13. Were instrument calibrations within method or data validation control limits?		Yes		No	SM	Initials
<i>Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.</i>						
14. Were surrogate recoveries within control limits?	X	Yes		No	SM	Initials
Comments: Reported surrogate %Rs for organic analyses were within laboratory control-charted QC limits for all project samples and associated QC samples.						
15. Were laboratory control sample recoveries within control limits?	X	Yes		No	SM	Initials
Comments: Reported LCS recoveries were within data validation QC limits (70-130% for organics) for all target analytes, or were within laboratory control-charted QC limits for organic target analytes as allowed for SW-846 organic methods.						

ENSR ANALYTICAL DATA VERIFICATION CHECKLIST

16. Were matrix spike recoveries within control limits?	X	Yes		No	SM	Initials
Comments: Project specific MS and MSD recoveries for target analytes were within laboratory control-chartred QC limits.						
17. Were duplicate RPDs and/or serial dilution %Ds within control limits?	X	Yes		No	SM	Initials
Comments: Laboratory RPDs for target analytes in project-specific MS/MSD samples were within data validation QC limits of 0-20%. <i>Serial Dilution %D data for metals analysis is not applicable for this level of data verification or for the analytical method reported.</i>						
18. Were organic system performance criteria met?		Yes		No	SM	Initials
<i>Comments: Not applicable for this level of data verification – Organic system performance data were not supplied in analytical laboratory reports and were therefore not included in this data review.</i>						
19. Were internal standards within method criteria for GC/MS sample analyses?		Yes		No	SM	Initials
<i>Comments: Not applicable for this level of data verification or for the analytical method reported.</i>						
20. Were inorganic system performance criteria met?		Yes		No	SM	Initials
<i>Comments: Not applicable for this level of data verification or for the analytical method reported.</i>						
21. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	X	Yes		No	SM	Initials
Field Duplicates for method NWTPH-Dx (without cleanup):						
Duplicate Sample No.	2A-W-100-0308	Primary Sample No.	2A-W-1-0308			
Duplicate Sample No.	2A-W-60-0308	Primary Sample No.	2A-W-6-0308			
Duplicate Sample No.	5-W-40-0308	Primary Sample No.	5-W-4-0308			
Duplicate Sample No.	5-W-160-0308	Primary Sample No.	5-W-16-0308			
Field Duplicates for method NWTPH-Dx (with A/SG cleanup):						
Duplicate Sample No.	5-W-160-0308	Primary Sample No.	5-W-16-0308			
<p>Comments: Field duplicate RPDs were within data validation QC limits of 0-30% for water matrices, or RPDs were not applicable due to results that were undetected in both samples. Field duplicate and native sample concentrations that were both undetected are not reflected in the table below since RPDs are not applicable.</p> <p>The following RPDs were calculated:</p>						
Method	Units	Analyte	2A-W-1-0308	2A-W-100-0308	RPD	Qualifiers
NWTPH-Dx	mg/L	DRH	1.53	1.49	2.6	
NWTPH-Dx	mg/L	LORH	0.583	0.561	3.8	
Continued on next page						

ENSR ANALYTICAL DATA VERIFICATION CHECKLIST

Method	Units	Analyte	2A-W-6-0308	2A-W-60-0308	RPD
NWTPH-Dx	mg/L	DRH	2.54	2.52	0.8
NWTPH-Dx	mg/L	LORH	0.497	0.481	3.3
Method	Units	Analyte	5-W-4-0308	5-W-40-0308	RPD
NWTPH-Dx	mg/L	DRH	0.188	0.211	11.5
NWTPH-Dx	mg/L	LORH	0.175	0.188	7.2

22. Were qualitative criteria for organic target analyte identification met?	X- laboratory comment	Yes		No	SM	Initials
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Comments: Not applicable for this level of data verification – Chromatograms, library searches, and quantitation reports were not supplied in analytical laboratory reports and were therefore not included in this data review. However, GC/MS quantitation reports and chromatograms were reviewed by trained laboratory personnel in accordance with the laboratory’s internal QA/QC program.

No identification/quantitation flags were assigned by the laboratory, but the following notations were made:
The reported DRH results in samples MW-35-0308, 1C-W-1-0308, 2A-W-9-0308, 2A-W-1-0308, 2A-W-100-0308, MW-39-0308, MW-37-0308, 2A-W-6-0308, 2A-W-60-0308, and the reported LORH results in samples 2A-W-9-0308, 2A-W-1-0308, 2A-W-100-0308, 2A-W-6-0308, 2A-W-60-0308 were identified by the laboratory as having hydrocarbon patterns most closely resembling transformer oil.

23. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	X	Yes		No	SM	Initials
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Comments: 100% EDD QA/QC of positive concentrations and RLs was done as part of this data verification procedure. The following changes were made to the EDD file during data verification:
Significant figures were resolved with hardcopy entries (per validation protocol, the hardcopy results were chosen as the correct results). The sample_matrix_code was changed from WG (groundwater) to WQ (water QC) for the equipment rinse blank sample, MW-500-0308, to more accurately reflect the sample matrix.
The ENSR project manager was informed of all changes made to the EDD file via this Checklist. The EDD file, with corrections and data validation qualifiers and reason codes added, was returned to the project manager and database manager in Seattle, WA on 05/19/2008.

24. General Comments: Data were evaluated based on validation criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review*, document number EPA540/R-99/008 of October 1999 and the *USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review*, document number USEPA-540-R-07-003, July 2007, as they applied to the reported methodology. Washington State Department of Ecology (WDOE) methods were also reviewed as per *WDOE Analytical Methods for Petroleum Hydrocarbons*, ECY 97-602 of June 1997. Field duplicate RPD review and applicable control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, December 1996.

Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 8).

Table of Qualified Analytical Results
BNSF Skykomish – Sitewide Groundwater Monitoring
Groundwater with Water QC Samples
TestAmerica (Bothell, WA) Laboratory Report BRC0418
March 2008

Sample ID	Lab ID	Method	Dilution Factor	QC Batch	Analyte	Concentration	Qualifier	Reason Code
Qualified, Reportable Groundwater data:								
1C-W-4-0308	BRC0418-02	NWTPH-Dx	1	8C28014	DRH	0.174 mg/L	J	< MRL
1C-W-4-0308	BRC0418-02	NWTPH-Dx	1	8C28014	LORH	0.111 mg/L	J	< MRL
5-W-15-0308	BRC0418-05	NWTPH-Dx	1	8C28014	LORH	0.153 mg/L	J	< MRL
5-W-18-0308	BRC0418-11	NWTPH-Dx	1	8C28014	LORH	0.362 mg/L	J	< MRL
5-W-18-0308	BRC0418-11	NWTPH-Dx A/SG	1	8C28014	DRH	0.0446 mg/L	J	< MRL
5-W-20-0308	BRC0418-13	NWTPH-Dx	1	8C28014	LORH	0.326 mg/L	J	< MRL
5-W-20-0308	BRC0418-13	NWTPH-Dx A/SG	1	8C28014	DRH	0.0396 mg/L	J	< MRL
1A-W-1-0308	BRC0418-15	NWTPH-Dx	1	8C28014	DRH	0.183 mg/L	J	< MRL
1B-W-2-0308	BRC0418-17	NWTPH-Dx	1	8C28014	DRH	0.175 mg/L	J	< MRL
1B-W-2-0308	BRC0418-17	NWTPH-Dx	1	8C28014	LORH	0.118 mg/L	J	< MRL
MW-35-0308	BRC0418-19	NWTPH-Dx	1	8C28015	LORH	0.357 mg/L	J	< MRL
1B-W-3-0308	BRC0418-20	NWTPH-Dx	1	8C28014	DRH	0.116 mg/L	J	< MRL
1B-W-3-0308	BRC0418-20	NWTPH-Dx	1	8C28014	LORH	0.0960 mg/L	J	< MRL
MW-34-0308	BRC0418-22	NWTPH-Dx	1	8C28015	DRH	0.0808 mg/L	J	< MRL
1C-W-1-0308	BRC0418-23	NWTPH-Dx	1	8C28015	LORH	0.170 mg/L	J	< MRL
5-W-4-0308	BRC0418-24	NWTPH-Dx	1	8C28015	DRH	0.188 mg/L	J	< MRL
5-W-4-0308	BRC0418-24	NWTPH-Dx	1	8C28015	LORH	0.175 mg/L	J	< MRL
5-W-40-0308	BRC0418-25	NWTPH-Dx	1	8C28015	DRH	0.211 mg/L	J	< MRL
5-W-40-0308	BRC0418-25	NWTPH-Dx	1	8C28015	LORH	0.188 mg/L	J	< MRL
MW-38-0308	BRC0418-26	NWTPH-Dx	1	8C28015	DRH	0.0840 mg/L	J	< MRL
2A-W-10-0308	BRC0418-30	NWTPH-Dx	1	8C28015	DRH	0.136 mg/L	J	< MRL
2A-W-10-0308	BRC0418-30	NWTPH-Dx	1	8C28015	LORH	0.245 mg/L	J	< MRL
MW-4-0308	BRC0418-34	NWTPH-Dx	1	8C28015	DRH	0.0812 mg/L	J	< MRL
MW-4-0308	BRC0418-34	NWTPH-Dx	1	8C28015	LORH	0.119 mg/L	J	< MRL
MW-39-0308	BRC0418-35	NWTPH-Dx	1	8C28015	LORH	0.222 mg/L	J	< MRL
MW-37-0308	BRC0418-36	NWTPH-Dx	1	8C28015	LORH	0.284 mg/L	J	< MRL
MW-19-0308	BRC0418-39	NWTPH-Dx	1	8C28015	DRH	0.0380 mg/L	J	< MRL

Reason Codes:

< MRL - concentration reported is \geq the method detection limit but is < the practical quantitation limit/method reporting limit

Prepared for:
BNSF Skykomish

July 28, 2008

Organic
Data Verification Report

BNSF Skykomish
Sitewide Groundwater Monitoring
Groundwater with Water QC Samples
Test America, Inc. data
June 2008

Prepared By Sue Milcan
Environmental Scientist/Quality Assurance Manager

ENSR Corporation
July 2008
Document No.: 01140-204-0340

Overview

The samples analyzed for the BNSF Skykomish Sitewide Groundwater Monitoring sampling effort from June 2008 are listed in the Table of Samples Analyzed (page 2). Data verification was performed on a total of eight groundwater samples and one equipment rinse blank water QC sample.

Samples were analyzed by TestAmerica, Inc. of Bothell, WA. The verified analysis was Diesel Range Hydrocarbons (DRH) and Lube Oil Range Hydrocarbons (LORH) by WDOE method NWTPH-Dx (with and without Acid/Silica Gel cleanup).

The ENSR Analytical Data Verification Checklist is presented as pages 3-7. Data were evaluated based on validation criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review*, document number EPA540/R-99/008 of October 1999 and the *USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review*, document number USEPA-540-R-07-003, July 2007, as they applied to the reported methodology. Washington State Department of Ecology (WDOE) methods were also reviewed as per *WDOE Analytical Methods for Petroleum Hydrocarbons*, ECY 97-602 of June 1997. Field duplicate RPD review and applicable control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, December 1996.

The following data components were reviewed during the data verification procedure:

Submitted Deliverables
Chain-of-Custody form(s) and sample integrity
Case Narrative and assigned laboratory flags
Sample results (including holding times, reporting limits, dilutions)
Method Blank results
LCS (blank spike) results
MS, MSD (matrix spike/matrix spike duplicate) results
Surrogate recoveries
Laboratory Duplicate results
Field Duplicate RPDs (calculated)
Equipment Rinse Blank results
Electronic data deliverable (EDD) file

Data Verification Qualifiers Assigned During this Review

J estimated concentration

Assigned qualifiers are detailed in the ENSR Analytical Data Verification Checklist and are summarized in the Table of Qualified Analytical Results (page 8).

Overall Data Assessment

Precision, accuracy, method compliance, and completeness of the data set have been determined to be acceptable, based on the data provided. There were no rejected or missing data points associated with this data set. The data are suitable for their intended use with the qualifications and clarifications noted.

**Table of Samples Analyzed
 BNSF Skykomish – Sitewide Groundwater Monitoring
 Groundwater with Water QC Samples
 TestAmerica (Bothell, WA) Laboratory Report BRF0334
 June 2008**

Matrix	Sample ID		Sample Date and Time	Lab SDG	Lab Sample ID
Groundwater	5-W-15-0608		6/23/2008 12:35	BRF0334	BRF0334-01
Groundwater	5-W-150-0608	5-W-15-0608 Dup	6/23/2008 12:45	BRF0334	BRF0334-02
Groundwater	5-W-17-0608		6/23/2008 13:30	BRF0334	BRF0334-03
Groundwater	5-W-18-0608		6/23/2008 14:25	BRF0334	BRF0334-04
Groundwater	5-W-14-0608		6/23/2008 15:10	BRF0334	BRF0334-05
Groundwater	5-W-16-0608		6/23/2008 15:50	BRF0334	BRF0334-06
Groundwater	5-W-19-0608		6/23/2008 16:30	BRF0334	BRF0334-07
Groundwater	5-W-20-0608		6/23/2008 17:15	BRF0334	BRF0334-08
Water QC	MW-500-0608	Equipment Rinse Blank	6/23/2008 17:45	BRF0334	BRF0334-09

ENSR ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: BNSF Skykomish		Laboratory: TestAmerica, Inc., Bothell, WA				
Project Reference: Sitewide Groundwater Monitoring		Sample Matrix: Groundwater with Water QC samples				
ENSR Project: 01140-204-0340		Sample Start Date: 06/23/2008				
Verified By/Date Verified: Sue Milcan 07/28/2008		Sample End Date: 06/23/2008				
Samples Analyzed: see Table of Samples Analyzed, BNSF Skykomish - Sitewide Groundwater Monitoring, Groundwater with Water QC Samples, June 2008 (page 2).						
Parameters Verified: Diesel Range Hydrocarbons (DRH) and Lube Oil Range Hydrocarbons (LORH) by WDOE method NWTPH-Dx (with and without Acid/Silica Gel cleanup).						
Laboratory Project ID (SDG): BRF0334						
PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT						
Precision:	X	Acceptable	<input type="checkbox"/>	Unacceptable	SM	Initials
Comments: Precision is the measure of variability of individual sample measurements. Field precision was determined by comparison of field duplicate sample results. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of field and laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. RPD precision measurements were compared to EPA published and/or laboratory control-charted QC limits. No data require qualification based on these measurements and overall field and laboratory precision is acceptable. Precision measurements are reviewed in items 17 and 21.						
Accuracy:	X	Acceptable	<input type="checkbox"/>	Unacceptable	SM	Initials
Comments: Field accuracy, a measure of the sampling bias, was determined by reviewing equipment rinse blank results for evidence of contamination stemming from field activities. Laboratory accuracy is a measure of the system bias, and was measured by evaluating laboratory control sample (LCS), matrix spike and matrix spike duplicate (MS, MSD), and organic system monitoring compound (surrogate) percent recoveries (%Rs). LCS %Rs demonstrated overall analytical performance. MS, MSD %Rs provided information on sample matrix interferences. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis. %Rs were compared to EPA published and/or laboratory control charted QC limits. No data require qualification based on these measurements, and overall field and laboratory accuracy is acceptable. Accuracy measurements are reviewed in items 12, 14, 15, 16, and 20.						
Method Compliance:	X	Acceptable	<input type="checkbox"/>	Unacceptable	SM	Initials
Comments: For this data set, method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. Although some data require qualification based on detection below the practical quantitation limit/reporting limit (see item 6), or pattern match discrepancies/evidence of interference (see item 22), overall method compliance is acceptable, based on the data submitted, since a majority of the data are unqualified and no data points are rejected based on these measurements. Method compliance measurements are reviewed in items 4, 6, 8, 11, 13, 18, 19, 20, and 22.						
Completeness:	X	Acceptable	<input type="checkbox"/>	Unacceptable	SM	Initials
Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals were set at 90-100%. Determination of completeness during this data verification procedure included a review of chain of custody records, laboratory analytical methods and detection limits, laboratory case narratives, and project requirements. Completeness also included 100% review of the laboratory sample data results and QC summary reports. The electronic data deliverable file (EDD) was QA'd 100% for positive target analytes and reporting limits. EDD corrections were made by the data validator during this review procedure as outlined in item 23.						
All of the data received were useable, some with qualification. Since no data points were missing or rejected, completeness of the data set was calculated to be 100% and is compliant.						

ENSR ANALYTICAL DATA VERIFICATION CHECKLIST

VERIFICATION CRITERIA CHECK						
<p>Data verification qualifiers assigned during this review:</p> <p>J estimated concentration</p> <p>The following comments identifying sample results requiring qualification are in bold type. The other comments are of interest, but qualification of the sample results is not necessary.</p> <p>Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 8).</p>						
1. Did the laboratory identify any non-conformances related to the analytical results?		Yes	X	No	SM	Initials
<p>Comments: There were no problems noted in the provided case narrative. Any assigned laboratory flags were reviewed during the verification procedure.</p> <p>Data qualification, if any, related to the assigned laboratory data flags are discussed in the following sections.</p>						
2. Were sample Chain-of-Custody forms complete?		Yes	X	No	SM	Initials
<p>Comments: The COC record from field to laboratory was complete, and custody was maintained as evidenced by field and laboratory personnel signatures, and laboratory date and time of sample receipt.</p>						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?		Yes	X	No	SM	Initials
<p>Comments: All requested analyses as documented on the original COCs were completed.</p>						
4. Were samples received in good condition and at the appropriate temperature?		Yes	X	No	SM	Initials
<p>Comments: All samples were received intact and in good condition with an acceptable cooler temperature of 7.3°C as noted in the case narrative comments. Samples received at greater than 6°C were determined to be in acceptable condition since no other preservation issues were noted and temperatures were well below 24°C (room temperature). No action is required other than to note this observation.</p>						
5. Were the reported analytical methods in compliance with WP/QAPP, permit, or COC?		Yes	X	No	SM	Initials
<p>Comments: The reported method met the COC request and is in compliance with the parameters requested and the sample matrix.</p>						
6. Were detection limits in accordance with WP/QAPP, permit, or method?		Yes	X	No	SM	Initials
<p>Comments: The reporting limits (RLs) are achievable by the quoted method. All samples were reported at undiluted levels.</p> <p>Sample results reported at concentrations \geq the method detection limit (MDL) but $<$ the practical quantitation limit or method reporting limit (PQL/MRL), require J qualifiers to indicate estimated concentrations. The analyte cannot be accurately quantitated at this trace concentration level.</p> <p>Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 8).</p>						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?		Yes	X	No	SM	Initials
<p>Comments: Only analytes applicable to the requested method were reported.</p>						

ENSR ANALYTICAL DATA VERIFICATION CHECKLIST

8. Were sample holding times met?	X	Yes		No	SM	Initials
Comments: The method-required extraction and analytical holding time was met for all submitted sample data.						
9. Were correct concentration units reported?	X	Yes		No	SM	Initials
Comments: All results were reported as mg/L (ppm).						
10. Were the reporting requirements for flagged data met?	X	Yes		No	SM	Initials
Comments: Data verification qualifiers override any assigned laboratory data flags.						
11. Were laboratory blank samples free of target analyte contamination?	X	Yes		No	SM	Initials
Comments: Supplied laboratory method blanks were free of target analyte contamination.						
12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?	X	Yes		No	SM	Initials
Comments: The submitted equipment rinse blank sample, MW-500-0608, was free of target analyte contamination. Field blank and trip blank samples were not submitted/not required for this data set.						
13. Were instrument calibrations within method or data validation control limits?		Yes		No	SM	Initials
<i>Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.</i>						
14. Were surrogate recoveries within control limits?	X	Yes		No	SM	Initials
Comments: Reported surrogate %Rs for organic analyses were within laboratory control-charted QC limits for all project samples and associated QC samples.						
15. Were laboratory control sample recoveries within control limits?	X	Yes		No	SM	Initials
Comments: Reported LCS recoveries were within data validation QC limits (70-130% for organics) for all target analytes, or were within laboratory control-charted QC limits for organic target analytes as allowed for SW-846 organic methods.						
16. Were matrix spike recoveries within control limits?	X	Yes		No	SM	Initials
Comments: Project specific MS and MSD recoveries for target analytes were within laboratory control-charted QC limits.						
17. Were duplicate RPDs and/or serial dilution %Ds within control limits?	X	Yes		No	SM	Initials
Comments: Laboratory RPDs for target analytes in project-specific MS/MSD samples were within data validation QC limits of 0-20%. <i>Serial Dilution %D data for metals analysis is not applicable for this level of data verification or for the analytical method reported.</i>						
18. Were organic system performance criteria met?		Yes		No	SM	Initials
<i>Comments: Not applicable for this level of data verification – Organic system performance data were not supplied in analytical laboratory reports and were therefore not included in this data review.</i>						

ENSR ANALYTICAL DATA VERIFICATION CHECKLIST

19. Were internal standards within method criteria for GC/MS sample analyses?		Yes		No	SM	Initials																					
<i>Comments: Not applicable for this level of data verification or for the analytical method reported.</i>																											
20. Were inorganic system performance criteria met?		Yes		No	SM	Initials																					
<i>Comments: Not applicable for this level of data verification or for the analytical method reported.</i>																											
21. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	X	Yes		No	SM	Initials																					
Field Duplicates for method NWTPH-Dx (without cleanup):																											
Duplicate Sample No.	5-W-150-0608	Primary Sample No.	5-W-15-0608																								
Field Duplicates for method NWTPH-Dx (with A/SG cleanup):																											
Duplicate Sample No.	5-W-150-0608	Primary Sample No.	5-W-15-0608																								
<p>Comments: Field duplicate RPDs were within data validation QC limits of 0-30% for water matrices, or RPDs were not applicable due to results that were undetected in both samples. Field duplicate and native sample concentrations that were both undetected are not reflected in the table below since RPDs are not applicable.</p> <p>The following RPDs were calculated:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 15%;">Method</th> <th style="width: 10%;">Units</th> <th style="width: 25%;">Analyte</th> <th style="width: 15%;">5-W-15-0608</th> <th style="width: 15%;">5-W-150-0608</th> <th style="width: 10%;">RPD</th> <th style="width: 10%;">Qualifiers</th> </tr> </thead> <tbody> <tr> <td>NWTPH-Dx</td> <td>mg/L</td> <td>Lube Oil Range Hydrocarbons</td> <td style="text-align: center;">0.145</td> <td style="text-align: center;">0.152</td> <td style="text-align: center;">4.7</td> <td></td> </tr> <tr> <td>NWTPH-Dx</td> <td>mg/L</td> <td>Diesel Range Hydrocarbons</td> <td style="text-align: center;">0.204</td> <td style="text-align: center;">0.207</td> <td style="text-align: center;">1.5</td> <td></td> </tr> </tbody> </table>							Method	Units	Analyte	5-W-15-0608	5-W-150-0608	RPD	Qualifiers	NWTPH-Dx	mg/L	Lube Oil Range Hydrocarbons	0.145	0.152	4.7		NWTPH-Dx	mg/L	Diesel Range Hydrocarbons	0.204	0.207	1.5	
Method	Units	Analyte	5-W-15-0608	5-W-150-0608	RPD	Qualifiers																					
NWTPH-Dx	mg/L	Lube Oil Range Hydrocarbons	0.145	0.152	4.7																						
NWTPH-Dx	mg/L	Diesel Range Hydrocarbons	0.204	0.207	1.5																						
22. Were qualitative/quantitative criteria for organic target analyte identification met?		Yes	X – lab observation only	No	SM	Initials																					
<p><i>Comments: Not applicable for this level of data verification – Chromatograms, library searches, and quantitation reports were not supplied in analytical laboratory reports and were therefore not included in this data review. However, GC/MS quantitation reports and chromatograms were reviewed by trained laboratory personnel in accordance with the laboratory's internal QA/QC program.</i></p> <p>No identification/quantitation flags were assigned by the laboratory, but the following notations were made.</p> <p><u>Method NWTPH-Dx without cleanup -</u></p> <p>The laboratory noted that the chromatographic patterns for DRH results reported for samples 5-W-18-0608 and 5-W-20-0608 were not consistent with diesel fuel. The laboratory report identifies the reported analyte as DRH, however, the EDD/database identifies the reported analyte as diesel fuel. Although supporting documentation to fully evaluate the laboratory comments can not be made with this level of report deliverable, professional judgment determines that the reported values require J qualifiers to indicate estimated concentrations since the concentration of diesel fuel is affected by other analytes or interferences within the specified carbon range.</p> <p>Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 8).</p>																											

ENSR ANALYTICAL DATA VERIFICATION CHECKLIST

23. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	X	Yes		No	SM	Initials
<p>Comments: 100% EDD QA/QC of positive concentrations and RLs was done as part of this data verification procedure. The following changes were made to the EDD file during data verification:</p> <p>Significant figures were resolved with hardcopy entries (per validation protocol, the hardcopy results were chosen as the correct results). The sample_type_code was changed from FB to FD for the field duplicate sample 5-W-150-0608. The sample_matrix_code was changed from WG (groundwater) to WQ (water QC) for the equipment rinse blank sample, MW-500-0608, to more accurately reflect the sample matrix.</p> <p>The ENSR project manager was informed of all changes made to the EDD file via this Checklist. The EDD file, with corrections and data validation qualifiers and reason codes added, was returned to the project manager and database manager in Seattle, WA on 07/28/2008.</p>						
<p>24. General Comments: Data were evaluated based on validation criteria set forth in the <i>USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review</i>, document number EPA540/R-99/008 of October 1999 and the <i>USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review</i>, document number USEPA-540-R-07-003, July 2007, as they applied to the reported methodology. Washington State Department of Ecology (WDOE) methods were also reviewed as per <i>WDOE Analytical Methods for Petroleum Hydrocarbons</i>, ECY 97-602 of June 1997. Field duplicate RPD review and applicable control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, December 1996.</p> <p>Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 8).</p>						

**Table of Qualified Analytical Results
 BNSF Skykomish – Sitewide Groundwater Monitoring
 Groundwater with Water QC Samples
 TestAmerica (Bothell, WA) Laboratory Report BRF0334
 June 2008**

Sample ID	Lab ID	Method	Dilution Factor	QC Batch	Analyte	Concentration	Qualifier	Reason Code
Qualified, Reportable Groundwater data:								
5-W-15-0608	BRF0334-01	NWTPH-Dx	1	8F25034	Diesel Range Hydrocarbons	0.204	mg/L	J < MRL
5-W-15-0608	BRF0334-01	NWTPH-Dx	1	8F25034	Lube Oil Range Hydrocarbons	0.145	mg/L	J < MRL
5-W-150-0608	BRF0334-02	NWTPH-Dx	1	8F25034	Diesel Range Hydrocarbons	0.207	mg/L	J < MRL
5-W-150-0608	BRF0334-02	NWTPH-Dx	1	8F25034	Lube Oil Range Hydrocarbons	0.152	mg/L	J < MRL
5-W-18-0608	BRF0334-04	NWTPH-Dx	1	8F25034	Diesel Range Hydrocarbons	0.511	mg/L	J pattern
5-W-18-0608	BRF0334-04	NWTPH-Dx	1	8F25034	Lube Oil Range Hydrocarbons	0.272	mg/L	J < MRL
5-W-18-0608	BRF0334-04	NWTPH-Dx w/SG	1	8F25034	Diesel Range Hydrocarbons	0.0419	mg/L	J < MRL
5-W-20-0608	BRF0334-08	NWTPH-Dx	1	8F25034	Diesel Range Hydrocarbons	0.551	mg/L	J pattern
5-W-20-0608	BRF0334-08	NWTPH-Dx	1	8F25034	Lube Oil Range Hydrocarbons	0.292	mg/L	J < MRL

Reason Codes:

< MRL - concentration reported is \geq the method detection limit but is < the practical quantitation limit/method reporting limit

pattern – chromatographic pattern shows stated interference from non-targets; does not match diesel standard chromatogram; this qualifier was assigned since analyte is identified as Diesel Fuel rather than Diesel Range Hydrocarbons in the project database.

Prepared for:
BNSF Skykomish Remedial Design Investigation

Organic and Inorganic Data Verification Report BNSF Skykomish Remedial Design Investigation Water Sampling, August, 2008

Prepared for:
Sara Albano
Project Manager

Prepared by:
Ann Biegelsen
Environmental Quality Assurance Chemist

ENSR Corporation
September 22, 2008
Document No.: 01140-222-0230

Overview

The samples analyzed for the BNSF Skykomish Remedial Design Investigation Water sampling event from August 2008 are listed in the Table of Samples Analyzed (page 2). Data verification was performed on one water sample.

The samples were analyzed by TestAmerica of Bothell, WA. The verified analyses were: Diesel Range Hydrocarbons, and Lube Oil Range Hydrocarbons by GC Method NWTPH-Dx, and NWTPH-Dx with Acid/Silica Gel Cleanup.

The Analytical Data Verification Checklist is presented as pages 4-7. Data were evaluated based on validation criteria set forth in the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review, document number USEPA-540-R-08-01, June 2008 with additional reference to USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review, document number EPA 540/R-99-008 of October 1999, as they applied to the reported methodology.

The following data components were reviewed during the data validation procedure:

Submitted Deliverables
Case Narratives
Chain-of-Custody form(s) and sample integrity
Sample results, reporting detection limits, method detection limits, dilution factors
Holding times
Method blank results
LCS/LCSD (blank spike) results
Organic surrogate recoveries
Electronic data deliverables (EDDs)

Data Validation Qualifiers Assigned During this Review

J detected result, estimated concentration

Assigned qualifiers are detailed in the Analytical Data Verification Checklist and are summarized in the Table of Qualified Analytical Results (page 3).

Overall Data Assessment

Precision, accuracy, method compliance, and completeness of the data set have been determined to be acceptable, based on the data submitted. The data are suitable for their intended use.

Table of Samples Analyzed
BNSF Skykomish Remedial Design Investigation
Water Sampling
TestAmerica of Bothell, WA Laboratory SDG BRH0364
August 2008 Sampling

Matrix	Sample ID	Sample Date and Time	Lab SDG	Lab Sample ID
Water	SkySeep1-082708	08/27/2008 11:20	BRH0364	BRH0364-01

Table of Qualified Analytical Results
BNSF Skykomish Remedial Design Investigation
Water Sampling
TestAmerica of Bothell, WA Laboratory SDG BRH0364
August 2008 Sampling

Sample ID	Method	Analyte	Concentration	Qualifier	Reason Code
Sky-Seep1-082708	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.111 mg/l	J	BRL
Sky-Seep1-082708	NWTPH-Dx	Diesel Range Hydrocarbons	0.261 mg/l	J	CHRO
Sky-Seep1-082708	NWTPH-Dx SG Addon	Diesel Range Hydrocarbons	0.042 mg/l	J	BRL

Qualifier Definitions

J – Estimated concentration

Reason Code Definitions

BRL – Reported concentration is greater than the MDL but less than the reporting limit.

CHRO – Detected response in the diesel range, but the chromatographic pattern does not match the diesel calibration standard.

ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: BNSF Skykomish Remedial Design Investigation		Laboratory: TestAmerica Analytical Testing Corporation, Bothell, WA					
Project Reference:		Sample Matrix: Groundwater with Water QC					
Project No.: 01140-222-0230		Sample Start Date: 08/27/2008					
Verified By/Date Verified: Ann Biegelsen / 09/22/2008		Sample End Date: 08/27/2008					
Samples Analyzed: Refer to the Table of Samples Analyzed (page 2).							
Parameters Verified: Diesel Range Hydrocarbons, and Lube Oil Range Hydrocarbons by GC Method NWTPH-Dx, and NWTPH-Dx with Acid/Silica Gel Cleanup.							
Laboratory Sample Delivery Group (SDG) IDs: BRH0364							
PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT							
Precision:		X	Acceptable		Unacceptable	AB	Initials
<p>Comments: Precision is the measure of variability of individual sample measurements. Field precision could not be determined, as there were no field duplicate samples included in this data set. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Laboratory RPD limits referenced EPA published QC limits. No data require qualification based on field or laboratory duplicate precision measurements, and overall field and laboratory precision is acceptable. Precision measurements are reviewed in items 17, 20, and 21.</p>							
Accuracy:		X	Acceptable		Unacceptable	AB	Initials
<p>Comments: Field accuracy, a measure of the sampling bias, could not be determined as there were no trip blank, field blank, or equipment rinse blank samples included in this sampling. Laboratory accuracy is a measure of the system bias, and was measured by evaluating laboratory control sample/laboratory control sample duplicate (LCS/LCSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). LCS/LCSD %Rs, which demonstrated the overall performance of the analysis, were compared to EPA published QC limits. System monitoring compound or surrogate recoveries, which measured system performance and efficiency during organic analysis, were compared to EPA published QC limits or laboratory control charted limits. No data require qualification based on field or laboratory accuracy measurements, and overall field and laboratory accuracy is acceptable. Accuracy measurements are reviewed in items 12, 14, 15 and 16.</p>							
Method Compliance:		X	Acceptable		Unacceptable	AB	Initials
<p>Comments: Method compliance was determined by evaluating sample integrity, holding time, and laboratory blanks against method specified requirements, while applying EPA data validation guidelines. Although some data require qualification based on analytes detected with concentrations less than the reporting limits (RLs), but greater than the method detection limits (MDLs) (see item 6), or based on chromatographic pattern match (see item 22), overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 6, 8, 11, 13, 18, 19, 20 and 22.</p>							
Completeness:		X	Acceptable		Unacceptable	AB	Initials
<p>Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with verified analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, laboratory case narratives, and project requirements. Completeness also included 100% review of the laboratory sample data results, QC summary reports, and electronic data deliverables (EDDs). All of the data received from the laboratory are useable with qualification. Completeness of the data is 100% and is acceptable.</p>							

ANALYTICAL DATA VERIFICATION CHECKLIST

VERIFICATION CRITERIA CHECK						
<p>Data validation flags used in this review: J – detected result, estimated concentration</p> <p>The following comments requiring qualification are in bold type. The other comments are of interest, but qualification of the samples was not necessary.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).</p>						
1. Did the laboratory identify any non-conformances related to the analytical results?	X	Yes		No	AB	Initials
<p>Explanation by laboratory: The temperature of the samples at the time of receipt was 14.1°C.</p> <p>Assigned laboratory flags were noted and considered as part of this data review. Data qualification, if any, related to the laboratory observations are discussed in the following sections.</p>						
2. Were sample Chain-of-Custody forms complete?	X	Yes		No	AB	Initials
<p>Comments: COC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.</p>						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	X	Yes		No	AB	Initials
<p>Comments: All requested analyses as documented on original COC records were completed by the laboratory.</p>						
4. Were samples received in good condition and at the appropriate temperature?	X	Yes		No	AB	Initials
<p>Comments: Samples were received on ice, intact, and in good condition with cooler temperatures outside the 4°C ± 2°C acceptance range at 14.1°C as noted on COCs and Sample Receiving Checklist forms. Cooler temperatures that were greater than 6°C are judged acceptable as the sample was hand delivered within 2 hours of sampling and there is evidence of the commencement of cooling.</p>						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	X	Yes		No	AB	Initials
<p>Comments: Reported methods and target analyte lists were in compliance with COC records.</p>						
6. Were detection limits in accordance with WP/QAPP, permit, or method?	X	Yes		No	AB	Initials
<p>Comments: Reported detection limits are achievable by the quoted methods.</p> <p>Analytes reported with concentrations below the laboratory reporting limits, but above the laboratory Method Detection Limits (MDLs), were qualified as J to indicate that the concentrations are estimated.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).</p>						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	X	Yes		No	AB	Initials
<p>Comments: Only the requested target analytes were reported.</p>						
8. Were sample holding times met?	X	Yes		No	AB	Initials
<p>Comments: Extraction and analytical holding times were met for all samples and analyses.</p>						

ANALYTICAL DATA VERIFICATION CHECKLIST

9. Were correct concentration units reported?	X	Yes		No	AB	Initials
Comments: Correct concentration units were reported. All parameters are reported in units of mg/L (ppm).						
10. Were the reporting requirements for flagged data met?	X	Yes		No	AB	Initials
Comments: Data validation qualifiers override assigned laboratory flags.						
11. Were laboratory blank samples free of target analyte contamination?	X	Yes		No	AB	Initials
Comments: All laboratory blanks were free of target analyte contamination.						
12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?	NA	Yes	NA	No	AB	Initials
Comments: There were no trip, field or equipment rinse blank samples included in this data set. Field accuracy could not be evaluated in this data review.						
13. Were instrument calibrations within method control limits?	NA	Yes	NA	No	AB	Initials
<i>Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.</i>						
14. Were surrogate recoveries within control limits?	X	Yes		No	AB	Initials
Comments: Surrogate percent recoveries (%Rs) for organic analyses were within data validation QC criteria for all samples.						
15. Were laboratory control sample recoveries within control limits?	X	Yes		No	AB	Initials
Comments: LCS and LCSD (blank spike) recoveries were within data validation or laboratory control-charted QC limits for all target analytes.						
16. Were matrix spike recoveries within control limits?	NA	Yes	NA	No	AB	Initials
Comments: There were no MS/MSD samples reported with this laboratory report. This aspect of laboratory accuracy could not be evaluated as part of this data review.						
17. Were RPDs within control limits?	X	Yes		No	AB	Initials
Comments: Laboratory RPDs for target analytes in LCS/LCSD samples were within data validation control limits. <i>Serial Dilution %D data is not applicable for the reported methods.</i>						
18. Were organic system performance criteria met?	NA	Yes	NA	No	AB	Initials
<i>Comments: Not applicable for this level of data verification – Organic system performance data were not supplied in the analytical laboratory reports and were therefore not included in this data review.</i>						
19. Were internal standards within method criteria for GC/MS sample analyses?	NA	Yes	NA	No	AB	Initials
<i>Comments: Not applicable for this the reported method – Internal standard addition is not required for the reported method.</i>						
20. Were inorganic system performance criteria met?	NA	Yes	NA	No	AB	Initials
<i>Comments: Not applicable for this level of data verification – Inorganic system performance data were not supplied in the analytical laboratory reports and were therefore not included in this data review.</i>						

ANALYTICAL DATA VERIFICATION CHECKLIST

21. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.		Yes	X	No	AB	Initials
Comments: There were no field duplicate samples included in this sample delivery group. Field precision could not be evaluated as part of this data review.						
22. Were qualitative criteria for organic target analyte identification met?		Yes	X	No	AB	Initials
<p><i>Comments: Not applicable for this level of data verification – GC quantitation reports and chromatograms were not supplied in analytical laboratory reports and were therefore not included in this data review. However, retention times and chromatography were reviewed by trained laboratory personnel in accordance with the laboratory’s internal QA/QC program and the laboratory included the notations described below.</i></p> <p>Method NWTPH-Dx without Acid/Silica Gel Cleanup: For the Diesel Range Hydrocarbons result in sample Sky-Seep1-082708, the laboratory has noted that the chromatographic pattern is not consistent with diesel fuel. This result has been qualified as J in this sample to indicate the concentration is estimated.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).</p>						
23. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	X	Yes		No	AB	Initials
Comments: There were no discrepancies between the EDD concentrations and reporting limits and the hardcopy data reports.						
<p>24. General Comments: Data were evaluated based on validation criteria set forth in the <i>USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review</i>, document number USEPA-540-R-08-01, June 2008 with additional reference to <i>USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review</i>, document number EPA 540/R-99-008 of October 1999, as they applied to the reported methodology.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).</p>						

Prepared for:
BNSF Skykomish

Organic Data Verification Report

BNSF Skykomish

Groundwater Sampling, September 2008

Prepared for:
Sarah Albano
Project Manager

Prepared by:
Ann Biegelsen
Environmental Quality Assurance Chemist

November 23, 2008
Document No.: 01140-204-0340

Overview

The samples analyzed for the BNSF Skykomish Groundwater sampling event from September 2008 are listed in the Table of Samples Analyzed (page 2). Data verification was performed on thirty-one groundwater samples.

The samples were analyzed by TestAmerica of Bothell, Washington. The verified analyses were: Diesel Range Hydrocarbons and Lube Oil Range Hydrocarbons by Method NWTPH-Dx and NWTPH-Dx with Acid/Silica gel Clean-up.

The Analytical Data Verification Checklist is presented as pages 4-9. Data were evaluated based on validation criteria set forth in the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review, document number USEPA-540-R-08-01, June 2008 with additional reference to USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review, document number EPA 540/R-99-008 of October 1999, as they applied to the reported methodology. Field duplicate RPD control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, February 1988, upheld in DRAFT 1993.

The following data components were reviewed during the data validation procedure:

Submitted Deliverables
Case Narratives
Chain-of-Custody form(s) and sample integrity
Sample results, reporting detection limits, method detection limits, dilution factors
Holding times
Method blank results
LCS/LCSD (blank spike) results
MS/MSD (matrix spike) results
Laboratory duplicate results
Organic surrogate recoveries
Blind field duplicate results
Electronic data deliverables (EDDs)

Data Validation Qualifiers Assigned During this Review

- J detected result, estimated concentration
- U result has been evaluated to be undetected at the reporting limit or at the reported concentration; result is considered to be a false positive

Assigned qualifiers are detailed in the Analytical Data Verification Checklist and are summarized in the Table of Qualified Analytical Results (page 3).

Overall Data Assessment

Precision, accuracy, method compliance, and completeness of the data set have been determined to be acceptable, based on the data submitted. The data are suitable for their intended use.

**Table of Samples Analyzed
BNSF Skykomish
Groundwater Samples
Pace Analytical Services, Inc. Laboratory SDGs BRI0381 and BRI0382
September 2008 Sampling**

Matrix	Sample ID	Parent Sample ID	Sample Date and Time	Lab SDG	Lab Sample ID
Groundwater	1A-W-1-0908	1A-W-3-0908	9/23/2008 9:00	BRI0381	BRI0381-13
Groundwater	1A-W-30-0908		9/23/2008 9:50	BRI0381	BRI0381-15
Groundwater	1A-W-3-0908		9/23/2008 9:50	BRI0381	BRI0381-14
Groundwater	1A-W-4-0908		9/23/2008 10:52	BRI0381	BRI0381-16
Groundwater	1A-W-5-0908		9/23/2008 11:20	BRI0381	BRI0381-17
Groundwater	1B-W-2-0908		9/23/2008 16:52	BRI0381	BRI0381-21
Groundwater	1B-W-3-0908		9/23/2008 15:46	BRI0381	BRI0381-20
Groundwater	1C-W-1-0908		9/23/2008 13:15	BRI0381	BRI0381-18
Groundwater	1C-W-2-0908		9/23/2008 11:55	BRI0381	BRI0381-06
Groundwater	1C-W-4-0908		9/23/2008 14:30	BRI0381	BRI0381-19
Groundwater	2A-W-10-0908	2A-W-9-0908	9/22/2008 16:55	BRI0381	BRI0381-01
Groundwater	2A-W-11-0908		9/23/2008 10:35	BRI0381	BRI0381-04
Groundwater	2A-W-90-0908		9/23/2008 14:20	BRI0381	BRI0381-10
Groundwater	2A-W-9-0908		9/23/2008 14:10	BRI0381	BRI0381-09
Groundwater	2B-W-4-0908		9/23/2008 9:00	BRI0381	BRI0381-02
Groundwater	5-W-4-0908		9/23/2008 13:15	BRI0381	BRI0381-08
Groundwater	MW-16-0908		9/23/2008 18:55	BRI0381	BRI0381-23
Groundwater	MW-3-0908		9/23/2008 15:50	BRI0381	BRI0381-12
Groundwater	MW-35-0908		9/23/2008 17:56	BRI0381	BRI0381-22
Groundwater	MW-38-0908		9/23/2008 12:35	BRI0381	BRI0381-07
Groundwater	MW-39-0908	9/23/2008 9:45	BRI0381	BRI0381-03	
Groundwater	MW-4-0908	9/23/2008 15:00	BRI0381	BRI0381-11	
Groundwater	MW-500-0908	9/23/2008 10:50	BRI0381	BRI0381-05	
Groundwater	5-W-14-0908	5-W-15-0908	9/23/2008 10:25	BRI0382	BRI0382-02
Groundwater	5-W-150-0908		9/23/2008 16:45	BRI0382	BRI0382-07
Groundwater	5-W-15-0908		9/23/2008 16:40	BRI0382	BRI0382-06
Groundwater	5-W-16-0908		9/23/2008 18:00	BRI0382	BRI0382-08
Groundwater	5-W-17-0908		9/23/2008 11:40	BRI0382	BRI0382-03
Groundwater	5-W-18-0908		9/23/2008 12:50	BRI0382	BRI0382-04
Groundwater	5-W-19-0908		9/23/2008 14:35	BRI0382	BRI0382-05
Groundwater	5-W-20-0908		9/23/2008 9:25	BRI0382	BRI0382-01

**Table of Qualified Analytical Results
BNSF Skykomish
Groundwater Samples
Pace Analytical Services, Inc. Laboratory SDGs BRI0381 and BRI0382
September 2008 Sampling**

Lab SDG	Sample ID	Method	Analyte	Concentration	Qualifier	Reason Code
BRI0381	1A-W-1-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.152 mg/l	J	BRL
BRI0381	1A-W-1-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.347 mg/l	J	CHRO
BRI0381	1A-W-30-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.180 mg/l	J	BRL
BRI0381	1A-W-30-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.0791 mg/l	J	BRL
BRI0381	1A-W-3-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.420 mg/l	J	BRL
BRI0381	1A-W-3-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.191 mg/l	J	BRL
BRI0381	1B-W-2-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.170 mg/l	J	BRL
BRI0381	1B-W-2-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.507 mg/l	J	CHRO
BRI0381	1B-W-3-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.117 mg/l	J	BRL
BRI0381	1C-W-1-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.0550 mg/l	J	BRL
BRI0381	1C-W-4-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.105 mg/l	J	BRL
BRI0381	1C-W-4-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.373 mg/l	J	CHRO
BRI0381	2A-W-10-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.153 mg/l	J	BRL
BRI0381	2A-W-10-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.227 mg/l	J	BRL
BRI0381	2A-W-11-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.860 mg/l	J	CHRO
BRI0381	2A-W-90-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.171 mg/l	J	BRL
BRI0381	2A-W-90-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.294 mg/l	J	CHRO
BRI0381	2A-W-9-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.147 mg/l	J	BRL
BRI0381	2A-W-9-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.323 mg/l	J	CHRO
BRI0381	5-W-4-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	2.49 mg/l	J	CHRO
BRI0381	5-W-4-0908	NWTPH-Dx	Diesel Range Hydrocarbons	7.75 mg/l	J	CHRO
BRI0381	MW-3-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.143 mg/l	J	BRL
BRI0381	MW-3-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.102 mg/l	J	BRL
BRI0381	MW-35-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.187 mg/l	J	BRL
BRI0381	MW-35-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.305 mg/l	J	CHRO
BRI0381	MW-39-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.642 mg/l	J	CHRO
BRI0382	5-W-150-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	< 0.476 mg/l	U	MB, BRL, original result was 0.127 mg/L
BRI0382	5-W-15-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	< 0.472 mg/l	U	MB, BRL, original result was 0.104 mg/L
BRI0382	5-W-15-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.272 mg/l	J	CHRO
BRI0382	5-W-18-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	< 0.472 mg/l	U	MB, BRL, original result was 0.197 mg/L
BRI0382	5-W-18-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.342 mg/l	J	CHRO
BRI0382	5-W-20-0908	NWTPH-Dx	Lube Oil Range Hydrocarbons	< 0.472 mg/l	U	MB, BRL, original result was 0.139 mg/L
BRI0382	5-W-20-0908	NWTPH-Dx	Diesel Range Hydrocarbons	0.305 mg/l	J	CHRO

Qualifier Definitions

J – Estimated concentration

U – Undetected at the reporting limit or at the reported concentration; result is considered to be a false positive

Reason Code Definitions

BRL – Reported concentration is greater than the MDL but less than the reporting limit.

CHRO – Detected response in the diesel range, but the chromatographic pattern does not match the diesel calibration standard.

MB – Method blank contamination.

ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: BNSF Skykomish		Laboratory: TestAmerica Analytical Testing Corporation, Bothell, WA			
Project Reference: Site wide Groundwater Monitoring		Sample Matrix: Groundwater			
Project No.: 01140-204-0340		Sample Start Date: 09/22/2008			
Verified By/Date Verified: Ann Biegelsen / 11/23/2008		Sample End Date: 09/23/2008			
Samples Analyzed: Refer to the Table of Samples Analyzed (page 2).					
Parameters Verified: Diesel Range Hydrocarbons and Lube Oil Range Hydrocarbons by Method NWTPH-Dx and NWTPH-Dx with Acid/Silica gel Clean-up. Not all samples were analyzed for every parameter. Refer to individual Chain of Custody reports for the exact analyses requested.					
Laboratory Sample Delivery Group (SDG) IDs: BRI0381 and BRI0382					
PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT					
Precision:	X	Acceptable		Unacceptable	AB Initials
Comments: Precision is the measure of variability of individual sample measurements. Field precision was determined by comparison of field duplicate sample results. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of both field and laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD QC limits were set at 0-30% for water samples. Laboratory RPD limits referenced EPA published QC limits. No data require qualification based on field or laboratory duplicate precision measurements, and overall field and laboratory precision is acceptable. Precision measurements are reviewed in items 17, 20, and 21.					
Accuracy:	X	Acceptable		Unacceptable	AB Initials
Comments: Field accuracy, a measure of the sampling bias, could not be determined as there were no trip blank, field blank, or equipment rinse blank samples included in this data set. Laboratory accuracy is a measure of the system bias, and was measured by evaluating laboratory control sample/laboratory control sample duplicate (LCS/LCSD), matrix spike/matrix spike duplicate (MS/MSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). LCS/LCSD %Rs, which demonstrated the overall performance of the analysis, were compared to EPA published QC limits. MS/MSD %Rs, which provided information on sample matrix interferences, were compared to EPA published QC limits or laboratory control charted limits. System monitoring compound or surrogate recoveries, which measured system performance and efficiency during organic analysis, were compared to EPA published QC limits or laboratory control charted limits. No data require qualification based on laboratory accuracy measurements, and overall laboratory accuracy is acceptable. Accuracy measurements are reviewed in items 12, 14, 15 and 16.					
Method Compliance:	X	Acceptable		Unacceptable	AB Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, and laboratory blanks while applying EPA data validation guidelines. Although some data require qualification based on analytes detected with concentrations less than the reporting limit (RL) but greater than the method detection limit (MDL) (see item 6), laboratory blank contamination (see item 12), or chromatographic match agreement (see item 22), overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 6, 8, 11, 13, 18, 19, 20 and 22.					

ANALYTICAL DATA VERIFICATION CHECKLIST

Completeness:	X	Acceptable		Unacceptable	AB	Initials
<p>Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with verified analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, laboratory case narratives, and project requirements. Completeness also included 100% review of the laboratory sample data results, QC summary reports, and electronic data deliverables (EDDs). All of the data received from the laboratory are useable with qualification. Completeness of the data is 100% and is acceptable.</p>						
VERIFICATION CRITERIA CHECK						
<p>Data validation flags used in this review: J – detected result, estimated concentration U – result has been evaluated to be undetected at the reporting limit or at the reported concentration; result is considered to be a false positive</p> <p>The following comments requiring qualification are in bold type. The other comments are of interest, but qualification of the samples was not necessary.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).</p>						
1. Did the laboratory identify any non-conformances related to the analytical results?	X	Yes		No	AB	Initials
<p>Explanation by Laboratory: <u>Revised Report</u>: SDG BRI0381: The batch preparation date/time was listed incorrectly for the blank, blank spike, and blank spike duplicate for the laboratory batch 8126034. The preparation date and time for the samples was listed correctly as 9:27/2008 1618. The batch QC preparation dates and times have been revised in the enclosed report. SDG BRI0382: Laboratory samples BRI0382-01 through 08 with RE2 designation were batched in an incorrect batch. The samples were inadvertently added to the original batch that was not reported due to failing QC. The samples should have been added to the re-extract batch. The batch has been corrected and is included in the enclosed report. Laboratory footnotes were considered as part of this data review. Data qualification, if any, related to the laboratory observations are discussed in the following sections.</p>						
2. Were sample Chain-of-Custody forms complete?		Yes	X	No	AB	Initials
<p>Comments: COC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt, with the following exceptions. SDG BRI0381s and BRI0382: The laboratory noted that for sample 1A-W-5, the sampled time on the container was 11:30, while the sampled time on the COC was 11:20. The laboratory noted that for sample 5-W-14, the sampled time on the container was 10:35, while the sampled time on the COC was 10:25. Both of these samples were logged in per the sampled times listed on the COCs. No action is required other than to note these discrepancies.</p>						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	X	Yes		No	AB	Initials
<p>Comments: All requested analyses as documented on original COC records were completed by the laboratory.</p>						
4. Were samples received in good condition and at the appropriate temperature?	X	Yes		No	AB	Initials
<p>Comments: Samples were received on ice, intact, and in good condition with cooler temperatures within the 4°C ± 2°C acceptance range at 4.4°C to 6.0°C as noted on COCs and Sample Receiving Checklist forms.</p>						

ANALYTICAL DATA VERIFICATION CHECKLIST

5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	X	Yes		No	AB	Initials
Comments: Reported methods and target analyte lists were in compliance with COC records.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?	X	Yes		No	AB	Initials
<p>Comments: Reported detection limits are achievable by the quoted methods.</p> <p>Analytes reported with concentrations below the laboratory reporting limits (RLs), but above the laboratory method detection limits (MDLs), were qualified as J to indicate that the concentrations are estimated. The quantitation of analytes with concentrations outside the calibration range of the instrument is inherently less reliable.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).</p>						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	X	Yes		No	AB	Initials
Comments: Reported target analytes were consistent with COC requests.						
8. Were sample holding times met?	X	Yes		No	AB	Initials
Comments: Extraction and analytical holding times were met for all samples and analyses.						
9. Were correct concentration units reported?	X	Yes		No	AB	Initials
Comments: Correct concentration units were reported. All parameters are reported in units of mg/L (ppm).						
10. Were the reporting requirements for flagged data met?	X	Yes		No	AB	Initials
Comments: Data validation qualifiers override assigned laboratory flags.						
11. Were laboratory blank samples free of target analyte contamination?		Yes	X	No	AB	Initials
<p>Comments: All laboratory blanks were free of target analyte contamination with the following exceptions.</p> <p>Method NWTPH-Dx: SDG BRI0382: The laboratory blank sample associated with laboratory batch 8I29034 reported lube oil range hydrocarbons at 0.119 mg/L and diesel range hydrocarbons at 0.0830 mg/L. Diesel range hydrocarbons was not detected in the associated samples with concentrations less than the concentration in the blank, and no diesel range hydrocarbons results require qualification based on the blank detection. Lube oil range hydrocarbons were also detected below the reporting limits in samples 5-W-150-0908, 5-W-15-0908, 5-W-18-0908, and 5-W-20-0908 and has been qualified as U at the reporting limit in these samples to indicate the analyte has been determined to be undetected at the reporting limit and is considered to be a false positive below the reporting limit due to contamination in the laboratory.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).</p>						
12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?		Yes	X	No	AB	Initials
Comments: There were no trip, field or equipment rinse blank samples included in this data set. Field accuracy could not be evaluated in this data review.						

ANALYTICAL DATA VERIFICATION CHECKLIST

13. Were instrument calibrations within method control limits?	NA	Yes	NA	No	AB	Initials
<i>Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.</i>						
14. Were surrogate recoveries within control limits?	X	Yes		No	AB	Initials
Comments: Surrogate percent recoveries (%Rs) for organic analyses were within data validation QC criteria for all samples.						
15. Were laboratory control sample recoveries within control limits?	X	Yes		No	AB	Initials
Comments: LCS and LCSD (blank spike) recoveries were within data validation or laboratory control-charted QC limits for all target analytes.						
16. Were matrix spike recoveries within control limits?	X	Yes		No	AB	Initials
Comments: Project specific MS and MSD recoveries for target analytes were within data validation QC limits or were not applicable due to required sample dilution, or to sample concentrations which exceeded four times the amount spiked (applicable to inorganic analytical methods only), except as noted below. MS and MSD spike recoveries for non-project samples were not considered since matrix similarity to project samples could not be guaranteed.						
17. Were RPDs within control limits?	X	Yes		No	AB	Initials
Comments: Laboratory RPDs for target analytes in LCS/LCSD and project-specific MS/MSD samples were within data validation control limits. All laboratory duplicate samples met data validation RPD criteria. Laboratory duplicates for non-project samples were not considered since matrix similarity to project samples could not be guaranteed.						
18. Were organic system performance criteria met?	NA	Yes	NA	No	AB	Initials
<i>Comments: Not applicable for this level of data verification – Organic system performance data were not supplied in the analytical laboratory reports and were therefore not included in this data review.</i>						
19. Were internal standards within method criteria for GC/MS sample analyses?	NA	Yes	NA	No	AB	Initials
<i>Comments: Not applicable for this data set – Internal standard addition is not required for the analyses reported.</i>						
20. Were inorganic system performance criteria met?	NA	Yes	NA	No	AB	Initials
<i>Comments: Not applicable for this data set – There were no inorganic parameters requested for the samples in this data set.</i>						

ANALYTICAL DATA VERIFICATION CHECKLIST

21. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	X	Yes		No	AB	Initials
Duplicate Sample No.	1A-W-3-0908	Primary Sample No.	1A-W-30-0908			
Duplicate Sample No.	2A-W-9-0908	Primary Sample No.	2A-W-90-0908			
Duplicate Sample No.	5-W-15-0908	Primary Sample No.	5-W-150-0908			

Comments: The RPDs for the duplicates were within the 0-30% data validation QC limits for water samples, or RPDs were not applicable due to results that were \pm the detection limit or were undetected in both samples as indicated in the table below. Field duplicate and native sample concentrations that were both undetected are not reflected in the table below since RPDs are not applicable.

The following RPDs were calculated:

Method	Analyte	1A-W-3-0908	1A-W-30-0908	RPD	Qualifier	Samp RL	Dup RL	Units
NWTPH-Dx	Lube Oil Range Hydrocarbons	0.180	0.420	80.00	NA, result is <2XRL	0.472	0.476	mg/l
NWTPH-Dx	Diesel Range Hydrocarbon	0.0791	0.191	82.86	NA, result is <2XRL	0.236	0.238	mg/l

Method	Analyte	2A-W-9-0908	2A-W-90-0908	RPD	Qualifier	Samp RL	Dup RL	Units
NWTPH-Dx	Lube Oil Range Hydrocarbons	0.171	0.147	15.09		0.476	0.476	mg/l
NWTPH-Dx	Diesel Range Hydrocarbon	0.294	0.323	9.40		0.238	0.238	mg/l

Method	Analyte	5-W-15-0908	5-W-150-0908	RPD	Qualifier	Samp RL	Dup RL	Units
NWTPH-Dx	Lube Oil Range Hydrocarbons	0.127	0.104	19.91		0.476	0.472	mg/l
NWTPH-Dx	Diesel Range Hydrocarbon	0.193	0.272	33.98	NA, result is <2XRL	0.238	0.236	mg/l

No data require qualification based on the field duplicate RPDs.

22. Were qualitative criteria for organic target analyte identification met?	X	Yes		No	AB	Initials
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Comments: Not applicable for this level of data verification – GC quantitation reports and chromatograms were not supplied in analytical laboratory reports and were therefore not included in this data review. However, retention times and chromatography were reviewed by trained laboratory personnel in accordance with the laboratory's internal QA/QC program. The laboratory notations regarding chromatography were reviewed and considered in the qualification of associated data as detailed below.

Method NWTPH-Dx: SDGs BRI0381 and BRI0382: For the diesel range hydrocarbons result in samples 1A-W-1-0908, 1B-W-2-0908, 1C-W-4-0908, 2A-W-11-0908, 2A-W-90-0908, 2A-W-9-0908, MW-35-0908, MW-39-0908, 5-W-18-0908, and 5-W-20-0908, the laboratory noted that the chromatographic pattern is not consistent with diesel fuel. These results have been qualified as J in these samples to indicate the concentration is estimated.

SDG BRI0381: For the diesel range hydrocarbons and lube oil range hydrocarbons result in sample 5-W-4-0908, the laboratory noted that the hydrocarbons present are a complex mixture of diesel range and heavy oil range organics. The result in this sample has been qualified as J to indicate the concentration is estimated.

SDG BRI0382: For the diesel range hydrocarbons result in samples 5-W-15-0908 and 5-W-150-0908, the laboratory noted that the detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference. These results have been qualified as J in these samples to indicate the concentration is estimated.

Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).

ANALYTICAL DATA VERIFICATION CHECKLIST

23. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	X	Yes		No	AB	Initials
<p>Comments: The EDD entries were resolved with the hardcopy data results and corrected as necessary. According to validation protocol, the hardcopy data report was accepted as the correct reference. The data validator provided corrected EDDs as part of this verification report. The EDD file, with data validation qualifiers and reason codes added, was returned to the database manager in Seattle on 11/24/2008.</p>						
<p>24. General Comments: Data were evaluated based on validation criteria set forth in the <i>USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review</i>, document number USEPA-540-R-08-01, June 2008 with additional reference to <i>USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review</i>, document number EPA 540/R-99-008 of October 1999, as they applied to the reported methodology. Field duplicate RPD control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, February 1988, upheld in DRAFT 1993.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).</p>						

Prepared for:
BNSF Skykomish

Organic Data Verification Report

BNSF Skykomish

Groundwater Sampling, October-December 2008

Prepared for:
Sarah Albano
Project Manager

Prepared by:
Robert Davis
Environmental Scientist

January 13, 2009
Document No.: 01140-204-0320

Overview

The samples analyzed for the BNSF Skykomish Groundwater sampling events from October-December 2008 are listed in the Table of Samples Analyzed (page 2). Data verification was performed on twenty-eight groundwater samples.

The samples were analyzed by TestAmerica of Bothell, Washington. The verified analyses were: Diesel Range Hydrocarbons and Lube Oil Range Hydrocarbons by Method NWTPH-Dx and NWTPH-Dx with Acid/Silica gel clean-up.

The Analytical Data Verification Checklist is presented as pages 5-10. Data were evaluated based on validation criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review*, document number USEPA-540-R-08-01, June 2008 with additional reference to *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review*, document number EPA 540/R-99-008 of July 2007, as they applied to the reported methodology. Field duplicate RPD control limits were taken from the *USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses*, February 1988, upheld in DRAFT 1993.

The following data components were reviewed during the data validation procedure:

Submitted Deliverables
Case Narratives
Chain-of-Custody form(s) and sample integrity
Sample results, reporting detection limits, method detection limits, dilution factors
Holding times
Method blank results
LCS/LCSD (blank spike) results
MS/MSD (matrix spike) results
Laboratory duplicate results
Organic surrogate recoveries
Blind field duplicate results
Electronic data deliverables (EDDs)

Data Validation Qualifiers Assigned During this Review

- J detected result, estimated concentration
- JN Analyte must be considered presumptively present at an estimated concentration.

Assigned qualifiers are detailed in the Analytical Data Verification Checklist and are summarized in the Table of Qualified Analytical Results (page 3-4).

Overall Data Assessment

Precision, accuracy, method compliance, and completeness of the data set have been determined to be acceptable, based on the data submitted. The data are suitable for their intended use with some qualification.

**Table of Samples Analyzed
BNSF Skykomish
Groundwater Samples
Pace Analytical Services, Inc. Laboratory SDGs BQJ0118, BQK0034, and BQL0232
October-December 2008 Sampling**

Matrix	Sample ID	Parent Sample ID	Sample Date and Time		Lab SDG	Lab Sample ID
Groundwater	5-W-14-1007	5-W-15-1007	10/03/2007	10:10	BQJ0118	BQJ0118-01
Groundwater	5-W-15-1007		10/03/2007	10:45	BQJ0118	BQJ0118-02
Groundwater	5-W-150-1007		10/03/2007	10:55	BQJ0118	BQJ0118-03
Groundwater	5-W-16-1007		10/03/2007	11:40	BQJ0118	BQJ0118-04
Groundwater	5-W-17-1007		10/03/2007	12:30	BQJ0118	BQJ0118-05
Groundwater	5-W-18-1007		10/03/2007	13:50	BQJ0118	BQJ0118-06
Groundwater	5-W-19-1007		10/03/2007	13:15	BQJ0118	BQJ0118-07
Groundwater	5-W-20-1007		10/03/2007	14:40	BQJ0118	BQJ0118-08
Groundwater	MW-500-1007		10/03/2007	15:00	BQJ0118	BQJ0118-09
Groundwater	5-W-16-1107	5-W-14-1107	11/02/2008	11:15	BQK0034	BQK0034-01
Groundwater	5-W-19-1107		11/02/2008	09:36	BQK0034	BQK0034-02
Groundwater	5-W-20-1107		11/02/2008	08:40	BQK0034	BQK0034-03
Groundwater	5-W-18-1107		11/02/2008	10:35	BQK0034	BQK0034-04
Groundwater	5-W-17-1107		11/02/2008	11:20	BQK0034	BQK0034-05
Groundwater	5-W-15-1107		11/02/2008	10:25	BQK0034	BQK0034-06
Groundwater	5-W-14-1107		11/02/2008	08:50	BQK0034	BQK0034-07
Groundwater	DUP-01-110207		11/02/2008	08:00	BQK0034	BQK0034-08
Groundwater	5-W-14-1207	5-W-17-1207	12/12/2008	18:55	BQL0232	BQL0232-01
Groundwater	5-W-16-1207		12/12/2008	20:10	BQL0232	BQL0232-02
Groundwater	5-W-19-1207		12/12/2008	21:15	BQL0232	BQL0232-03
Groundwater	5-W-20-1207		12/12/2008	22:15	BQL0232	BQL0232-04
Groundwater	5-W-170-1207		12/13/2008	07:15	BQL0232	BQL0232-05
Groundwater	5-W-17-1207		12/13/2008	08:15	BQL0232	BQL0232-06
Groundwater	5-W-15-1207		12/13/2008	09:25	BQL0232	BQL0232-07
Groundwater	5-W-18-1207		12/13/2008	10:50	BQL0232	BQL0232-08
Groundwater	1C-W-1-1207		12/13/2008	12:40	BQL0232	BQL0232-09
Groundwater	2A-W-6-1207		12/13/2008	14:10	BQL0232	BQL0232-10
Groundwater	MW-500-1207		12/13/2008	14:00	BQL0232	BQL0232-11

**Table of Qualified Analytical Results
BNSF Skykomish
Groundwater Samples
Pace Analytical Services, Inc. Laboratory SDGs BQJ0118, BQK0034, and BQL0232
October-December 2008 Sampling**

Lab SDG	Sample ID	Method	Analyte	Concentration	Qualifier	Reason Code
BQJ0118	5-W-15-1007	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.425 mg/l	J	BRL
BQJ0118	5-W-15-1007	NWTPH-Dx	Diesel Range Hydrocarbons	1.54 mg/l	JN	ID
BQJ0118	5-W-150-1007	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.397 mg/l	J	BRL
BQJ0118	5-W-150-1007	NWTPH-Dx	Diesel Range Hydrocarbons	1.47 mg/l	JN	ID
BQJ0118	5-W-16-1007	NWTPH-Dx	Diesel Range Hydrocarbons	0.0562 mg/l	J	BRL
BQJ0118	5-W-18-1007	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.256 mg/l	J	BRL
BQJ0118	5-W-18-1007	NWTPH-Dx	Diesel Range Hydrocarbons	0.623 mg/l	JN	ID
BQJ0118	5-W-20-1007	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.393 mg/l	J	BRL
BQJ0118	5-W-20-1007	NWTPH-Dx	Diesel Range Hydrocarbons	0.756 mg/l	JN	ID
BQK0034	5-W-16-1107	NWTPH-Dx	Diesel Range Hydrocarbons	0.0676 mg/l	J	BRL
BQK0034	5-W-16-1107	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.118 mg/l	J	BRL
BQK0034	5-W-19-1107	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.134 mg/l	J	BRL
BQK0034	5-W-17-1107	NWTPH-Dx	Diesel Range Hydrocarbons	0.141 mg/l	J	BRL
BQK0034	5-W-15-1107	NWTPH-Dx	Diesel Range Hydrocarbons	0.0858 mg/l	J	BRL
BQK0034	5-W-15-1107	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.177 mg/l	J	BRL
BQK0034	5-W-14-1107	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.0870 mg/l	J	CCV
BQK0034	DUP-01-110207	NWTPH-Dx	Diesel Range Hydrocarbons	0.0736 mg/l	J	BRL
BQK0034	DUP-01-110207	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.164 mg/l	J	CCV
BQK0034	5-W-20-1107	NWTPH-Dx	DRH (SGCU)	0.0534 mg/l	J	BRL
BQK0034	5-W-18-1107	NWTPH-Dx	DRH (SGCU)	0.0784 mg/l	J	BRL
BQL0232	5-W-14-1207	NWTPH-Dx	Diesel Range Hydrocarbons	0.0499 mg/l	J	BRL
BQL0232	5-W-16-1207	NWTPH-Dx	Diesel Range Hydrocarbons	0.0476 mg/l	J	BRL
BQL0232	5-W-20-1207	NWTPH-Dx	Diesel Range Hydrocarbons	0.912 mg/l	J	MI
BQL0232	5-W-20-1207	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.403 mg/l	J	BRL
BQL0232	5-W-15-1207	NWTPH-Dx	Diesel Range Hydrocarbons	0.121 mg/l	J	BRL
BQL0232	5-W-18-1207	NWTPH-Dx	Diesel Range Hydrocarbons	0.858 mg/l	J	MI
BQL0232	5-W-18-1207	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.406 mg/l	J	BRL
BQL0232	IC-W-1-1207	NWTPH-Dx	Diesel Range Hydrocarbons	1.28 mg/l	J	MI
BQL0232	IC-W-1-1207	NWTPH-Dx	Lube Oil Range Hydrocarbons	0.357 mg/l	J	BRL
BQL0232	2A-W-6-1207	NWTPH-Dx	Diesel Range Hydrocarbons	4.98 mg/l	J	MI
BQL0232	5-W-14-1207	NWTPH-Dx	DRH (SGCU)	0.0516 mg/l	J	BRL
BQL0232	5-W-16-1207	NWTPH-Dx	DRH (SGCU)	0.0479 mg/l	J	BRL
BQL0232	5-W-20-1207	NWTPH-Dx	DRH (SGCU)	0.0450 mg/l	J	BRL
BQL0232	5-W-18-1207	NWTPH-Dx	DRH (SGCU)	0.0567 mg/l	J	BRL
BQL0232	IC-W-1-1207	NWTPH-Dx	DRH (SGCU)	0.0433 mg/l	J	BRL
BQL0232	2A-W-6-1207	NWTPH-Dx	DRH (SGCU)	0.243 mg/l	JN	ID

Qualifier Definitions

J – Estimated concentration

JN – Analyte must be considered presumptively present at an estimated concentration.

Reason Code Definitions

BRL – Reported concentration is greater than the MDL but less than the reporting limit.

CCV – Continuing calibration verification outside of the acceptable limits.

MI – Matrix interference, result biased high.

ID – Detected hydrocarbons in the diesel range do not have a distinct diesel pattern.

ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: BNSF Skykomish	Laboratory: TestAmerica Analytical Testing Corporation, Bothell, WA					
Project Reference: Site wide Groundwater Monitoring	Sample Matrix: Groundwater					
Project No.: 01140-204-0320	Sample Start Date: 10/03/2008					
Verified By/Date Verified: Robert Davis 01/13/2009 Reviewed by Gregory Malzone 01/14/2009	Sample End Date: 12/13/2008					
Samples Analyzed: Refer to the Table of Samples Analyzed (page 2).						
Parameters Verified: Diesel Range Hydrocarbons and Lube Oil Range Hydrocarbons by Method NWTPH-Dx and NWTPH-Dx with Acid/Silica gel Clean-up. Not all samples were analyzed for every parameter. Refer to individual Chain of Custody reports for the exact analyses requested.						
Laboratory Sample Delivery Group (SDG) IDs: BQJ0118, BQK0034, and BQL0232						
PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT						
Precision:	X	Acceptable		Unacceptable	RD	Initials
Comments: Precision is the measure of variability of individual sample measurements. Field precision was determined by comparison of field duplicate sample results. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of both field and laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD QC limits were set at 0-30% for water samples. Laboratory RPD limits referenced EPA published QC limits. No data require qualification based on field or laboratory duplicate precision measurements, and overall field and laboratory precision is acceptable. Precision measurements are reviewed in items 17, 20, and 21.						
Accuracy:	X	Acceptable		Unacceptable	RD	Initials
Comments: Field accuracy, a measure of the sampling bias, could not be determined as there were no trip blank, field blank, or equipment rinse blank samples included in this data set. Laboratory accuracy is a measure of the system bias, and was measured by evaluating laboratory control sample/laboratory control sample duplicate (LCS/LCSD), matrix spike/matrix spike duplicate (MS/MSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). LCS/LCSD %Rs, which demonstrated the overall performance of the analysis, were compared to EPA published QC limits. MS/MSD %Rs, which provided information on sample matrix interferences, were compared to EPA published QC limits or laboratory control charted limits. System monitoring compound or surrogate recoveries, which measured system performance and efficiency during organic analysis, were compared to EPA published QC limits or laboratory control charted limits. No data require qualification based on laboratory accuracy measurements, and overall laboratory accuracy is acceptable. Accuracy measurements are reviewed in items 12, 14, 15 and 16.						
Method Compliance:	X	Acceptable		Unacceptable	RD	Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, and laboratory blanks while applying EPA data validation guidelines. Although some data require qualification based on analytes detected with concentrations less than the reporting limit (RL) but greater than the method detection limit (MDL) (see item 6), laboratory blank contamination (see item 12), or chromatographic match agreement (see item 22), overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 6, 8, 11, 13, 18, 19, 20 and 22.						

ANALYTICAL DATA VERIFICATION CHECKLIST

Completeness:	X	Acceptable		Unacceptable	RD	Initials
<p>Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with verified analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, laboratory case narratives, and project requirements. Completeness also included 100% review of the laboratory sample data results, QC summary reports, and electronic data deliverables (EDDs). All of the data received from the laboratory are useable with qualification. Completeness of the data is 100% and is acceptable.</p>						
VERIFICATION CRITERIA CHECK						
<p>Data validation flags used in this review: J – detected result, estimated concentration JN – Analyte must be considered presumptively present at an estimated concentration. The following comments requiring qualification are in bold type. The other comments are of interest, but qualification of the samples was not necessary. Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3-4).</p>						
1. Did the laboratory identify any non-conformances related to the analytical results?	X	Yes		No	RD	Initials
<p>Explanation by Laboratory: Laboratory footnotes were considered as part of this data review. Data qualification, if any, related to the laboratory observations are discussed in the following sections.</p>						
2. Were sample Chain-of-Custody forms complete?	X	Yes		No	RD	Initials
<p>Comments: COC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.</p>						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	X	Yes		No	RD	Initials
<p>Comments: All requested analyses as documented on original COC records were completed by the laboratory.</p>						
4. Were samples received in good condition and at the appropriate temperature?		Yes	X	No	RD	Initials
<p>Comments: Samples were received on ice, intact, and in good condition with cooler temperatures within the $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$ acceptance temperature of 6.0°C for log numbers BQJ0118 and BQL0232 as noted on COCs and Sample Receiving Checklist forms. Log number BQK0034 was received at a temperature of 7.0°C which is outside of the acceptable limits of $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$. The samples were delivered to the laboratory within hours of collection; therefore, no action is necessary.</p>						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	X	Yes		No	RD	Initials
<p>Comments: Reported methods and target analyte lists were in compliance with COC records.</p>						

ANALYTICAL DATA VERIFICATION CHECKLIST

6. Were detection limits in accordance with WP/QAPP, permit, or method?	X	Yes		No	RD	Initials
<p>Comments: Reported detection limits are achievable by the quoted methods.</p> <p>Analytes reported with concentrations below the laboratory reporting limits (RLs), but above the laboratory method detection limits (MDLs), were qualified as J to indicate that the concentrations are estimated. The quantitation of analytes with concentrations outside the calibration range of the instrument is inherently less reliable.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3-4).</p>						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	X	Yes		No	RD	Initials
<p>Comments: Reported target analytes were consistent with COC requests.</p>						
8. Were sample holding times met?	X	Yes		No	RD	Initials
<p>Comments: Extraction and analytical holding times were met for all samples and analyses.</p>						
9. Were correct concentration units reported?	X	Yes		No	RD	Initials
<p>Comments: Correct concentration units were reported. All parameters are reported in units of mg/L (ppm).</p>						
10. Were the reporting requirements for flagged data met?	X	Yes		No	RD	Initials
<p>Comments: Data validation qualifiers override assigned laboratory flags.</p>						
11. Were laboratory blank samples free of target analyte contamination?	X	Yes		No	RD	Initials
<p>Comments: All laboratory blanks were free of target analyte contamination.</p>						
12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?		Yes	X	No	RD	Initials
<p>Comments: There were no trip, field or equipment rinse blank samples included in this data set. Field accuracy could not be evaluated in this data review.</p>						
13. Were instrument calibrations within method control limits?	NA	Yes	NA	No	RD	Initials
<p><i>Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in the analytical laboratory reports and were therefore not included in this data review.</i></p>						
14. Were surrogate recoveries within control limits?	X	Yes		No	RD	Initials
<p>Comments: Surrogate percent recoveries (%Rs) for organic analyses were within data validation QC criteria for all samples.</p>						
15. Were laboratory control sample recoveries within control limits?	X	Yes		No	RD	Initials
<p>Comments: LCS and LCSD (blank spike) recoveries were within data validation or laboratory control-charted QC limits for all target analytes.</p>						

ANALYTICAL DATA VERIFICATION CHECKLIST

16. Were matrix spike recoveries within control limits?	X	Yes		No	RD	Initials		
Comments: Project specific MS and MSD recoveries for target analytes were within data validation QC limits or were not applicable due to required sample dilution, or to sample concentrations which exceeded four times the amount spiked (applicable to inorganic analytical methods only), except as noted below. MS and MSD spike recoveries for non-project samples were not considered since matrix similarity to project samples could not be guaranteed.								
17. Were RPDs within control limits?	X	Yes		No	RD	Initials		
Comments: Laboratory RPDs for target analytes in LCS/LCSD and project-specific MS/MSD samples were within data validation control limits. All laboratory duplicate samples met data validation RPD criteria. Laboratory duplicates for non-project samples were not considered since matrix similarity to project samples could not be guaranteed.								
18. Were organic system performance criteria met?	NA	Yes	NA	No	RD	Initials		
<i>Comments: Not applicable for this level of data verification – Organic system performance data were not supplied in the analytical laboratory reports and were therefore not included in this data review.</i>								
19. Were internal standards within method criteria for GC/MS sample analyses?	NA	Yes	NA	No	RD	Initials		
<i>Comments: Not applicable for this data set – Internal standards are not used for the analyses reported.</i>								
20. Were inorganic system performance criteria met?	NA	Yes	NA	No	RD	Initials		
<i>Comments: Not applicable for this data set – There were no inorganic parameters requested for the samples in this data set.</i>								
21. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	X	Yes		No	RD	Initials		
Duplicate Sample No.	5-W-150-1007		Primary Sample No.	5-W-15-1007				
Duplicate Sample No.	DUP-01-110207		Primary Sample No.	5-W-14-1107				
Duplicate Sample No.	5-W-170-1207		Primary Sample No.	5-W-17-1207				
Comments: The RPDs for the duplicates were within the 0-30% data validation QC limits for water samples, or RPDs were not applicable due to results that were \pm the detection limit or were undetected in both samples as indicated in the table below. Field duplicate and native sample concentrations that were both undetected are not reflected in the table below since RPDs are not applicable.								
The following RPDs were calculated:								
Method	Analyte	5-W-15-1007	5-W-150-1007	RPD	Qualifier	Samp RL	Dup RL	Units
NWTPH-Dx	Lube Oil Range Hydrocarbons	0.425 J	0.397 J	6.8		0.476	0.472	mg/l
NWTPH-Dx	Diesel Range Hydrocarbon	1.54 JN	1.47 JN	1.5		0.238	0.236	mg/l
Method	Analyte	5-W-14-1107	DUP-01-110207	RPD	Qualifier	Samp RL	Dup RL	Units
NWTPH-Dx	Lube Oil Range Hydrocarbons	0.0870 J	0.164 J	61	NA, result is <2XRL	0.472	0.472	mg/l
NWTPH-Dx	Diesel Range Hydrocarbon	ND	0.0736 J		NA, result is <2XRL	0.236	0.236	mg/l
No data require qualification based on the field duplicate RPDs.								

ANALYTICAL DATA VERIFICATION CHECKLIST

22. Were qualitative criteria for organic target analyte identification met?	X	Yes		No	RD	Initials
<p><i>Comments: Not applicable for this level of data verification – GC quantitation reports and chromatograms were not supplied in the analytical laboratory reports and were therefore not included in this data review. However, retention times and chromatography were reviewed by trained laboratory personnel in accordance with the laboratory's internal QA/QC program. The laboratory notations regarding chromatography were reviewed and considered in the qualification of associated data as detailed below.</i></p> <p>Method NWTPH-Dx: SDG BQJ0118: For the diesel range hydrocarbon results in samples 5-W-15-1007, 5-W-150-1007, 5-W-18-1007, and 5-W-20-1007; the laboratory noted that the detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference. These results have been qualified as JN in these samples to indicate the concentration is estimated.</p> <p>Method NWTPH-Dx: SDG BQK0034: For the Lube oil range hydrocarbon results in samples 5-W-14-1107 and DUP-01-110207; the laboratory noted that the continuing calibration verification (CCV) was outside of the acceptable limits biased high. These results have been qualified as J in these samples to indicate the concentration is estimated because of high instrument bias.</p> <p>Method NWTPH-Dx: SDG BQL0232: For the diesel range hydrocarbon results in samples 5-W-20-1207, 5-W-18-1207, and IC-W-1-1207; the laboratory noted that the results in the diesel organics range are primarily due to overlap from a heavy oil range product. These results have been qualified as J in these samples to indicate the concentration is estimated and biased high because of matrix interference.</p> <p>Method NWTPH-Dx: SDG BQL0232: For the diesel range hydrocarbon with acid/silica gel cleanup result in sample 2A-W-6-1207; the laboratory noted that the detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference. This result has been qualified as JN in these samples to indicate the concentration is estimated.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3-4).</p>						
23. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	X	Yes		No	RD	Initials
<p><i>Comments: The EDD entries were resolved with the hardcopy data results and corrected as necessary. According to validation protocol, the hardcopy data report was accepted as the correct reference. The data validator provided corrected EDDs as part of this verification report. The EDD file, with data validation qualifiers and reason codes added was returned to the database manager in Seattle on 11/24/2008.</i></p>						
<p>24. General Comments: Data were evaluated based on validation criteria set forth in the <i>USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review</i>, document number USEPA-540-R-08-01, June 2008 with additional reference to <i>USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review</i>, document number EPA 540/R-99-008 of October 1999, as they applied to the reported methodology. Field duplicate RPD control limits were taken from the <i>USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses</i>, February 1988, upheld in DRAFT 1993.</p> <p>Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3-4).</p>						